edges are to be sewn together with strong thread or wire; for which the patentee claims, the making of that description of combs called curry-combs, with flexible backs.

The improvements in brushes relate, first, to that class of brushes employed in dry brushing, as hair brushes, clothes brushes, horse brushes, and machine brushes; and secondly, to brushes employed for painting, colouring, varnishing, whitewashing, &c.

With respect to the dry brushes, the improvement consists principally in making them with flexible backs, the same as those of the curry-combs, and in making brushes of a curvilinear form. The bristles, or hairs, are fixed in a flexible back, which is then attached to a solid back of the form required. When the whole of the back is to be made flexible, the mode of proceeding is similar to that above described for curry-combs, only that when it is desirable to give such brushes as much springiness as possible, a thin piece of horn, metal, or whalebone, is introduced between the two pieces forming the back.

In making brushes of a circular form, commonly called wheel brushes, the solid disc should have a groove cut round its periphery for the reception of the flexible back, which may be composed of canvass, felt, leather, or other firm but yielding substance, to which the bristles or hairs are attached by the usual method of drawing.

If of a cylindrical form, the solid cylinder should have a spiral groove cut on its external surface, with such distances between the threads, that when the flexible belt of bristles is wound round it, the whole surface of the cylinder may be covered with the bristles or hairs; the flexible backs may be secured in the grooves by nails, pins, screws, or cement. It is sometimes of importance to be able to expand brushes, or parts of brushes; for this purpose, the patentee attaches to the under piece of a flexible backed

brush, a piece or pieces of sheet caoutchouc, or of cotton varnished with caoutchouc, and unites the edges of such piece or pieces to the flexible back, so as to form an air tight space or spaces. These spaces are connected with a tube, or tubes, leading to a screw plug in the handle of the brush, in such a manner that the brush, or parts of the brush, can be inflated as may be required. In order to protect those brushes which are employed by hatters, and occasionally in water, from being loosened, the patentee attaches to the under side of the flexible back, previous to drawing the hairs or bristles, a piece of india rubber waterproof cloth, by means of a solution of caoutchouc. The drawings show a flexible backed brush containing the bristles or hairs, attached to the two ends of a solid curvilinear back, in such a manner as to leave a space between the solid and the flexible back; so that when the face of the brush is pressed against anything, the yielding takes place upwards, towards the solid arched back of the wood.

For the above description of brushes, the patentee claims the making of such description of brushes as are chiefly used for dry brushing, with flexible backs.

The improvements in constructing brushes employed for painting, colouring, varnishing, and whitewashing, consist in a method of affixing the bristles or hairs more firmly to the handle, so as not to give way when exposed to wet, and variations in the temperature. For this purpose the patentee inserts a knot of hairs or bristles into a cylinder, or round socket of tin; and then passes through the centre of the bristles, and through an orifice in the centre of the socket, a taper ferule of tin, so that the bristles or hairs are compressed between the exterior surface of the ferule and the interior surface of the socket; the socket and ferule should then be secured by soldering at the orifice in the

socket. A taper handle of wood or metal, which is made to fit the ferule, can be inserted, and detached when the brush is not in use. The knot of bristles, besides being compressed between the socket and ferule, can be imbedded or set in pitch, or other suitable cement.

There is also a drawing of a flat brush, such as is employed for whitewashing, made with a metal stock or foundation. For this description of brushes the inventor claims, the making of them with metal stocks or foundations, and handles such as hereinbefore described; or with metal stocks or foundations combined with wooden handles; or with metal handles combined with wooden stocks, and whether the stock consists of a socket and ferule connected together, or a metal ferule only.

SPECIFICATION enrolled 23rd September, 1842, of a PATENT granted 23rd March, 1842, to MOSES SPERRY BEACH, of Norfolk Street, Strand, printer, for "*improvements in machinery used for printing with type, and in the construction of type for printing.*" Being a communication.

THE principal feature of this machine consists in the application of four cylinders, two of which are called the type cylinders, the other two the impression cylinders, and are covered with a quantity of cloth or blanketing, in order to obtain a good impression from the type cylinder.

These cylinders are supported by a suitable frame, and arranged one above the other in such a manner that the paper will be printed on both sides, each type cylinder being provided with a trough and a set of inking rollers. The paper is wound on a roller in a damp state; this

roller is supported on bearings at one end of the machine, the paper is drawn from it in an inclined direction by the first pair of cylinders, the type cylinder being above, and the impression cylinder below it, which therefore prints the paper on the top side; the paper is then carried in a horizontal position to the next pair of cylinders, in which the type cylinder is below and the impression cylinder above, so as to print the paper on the under side. The paper then passes on to the end of the machine and to the folders, and between a pair of vertical rollers, one of which has a knife in its periphery, which meets the edge of a stationary knife, and the paper is cut into sheets.

The types are formed with a small projection on one side, and a recess or indent on the other; so that on setting up the type the projection of one will be received by the indent of the other; they are also made on two edges a little taper, so as to suit the curve of the cylinder on which they are to be set up. It will be seen that the types cannot be used for cylinders of different diameters, as the two sides of each type, when placed on the cylinder, must form radial lines. In composing or setting up, the types are placed in a curvilinear composing stick, and arranged in a column round a cylinder, from which they are to be lifted and placed on the type cylinder. For this purpose the patentee employs "a gab," which consists of a cylinder of brass, whose internal diameter is equal to the external diameter of the cylinder of type; the periphery of this brass cylinder is provided with four vertical springs bent at their ends, so as, when compressed, to project under the bottom edge of the cylinder. When one column of type has been arranged as before stated, the cylinder is placed over it, and on sliding a ring over the brass cylinder, the springs will be forced underneath its edge and under the type, so that on raising the cylinder the column of

type will be raised with it, and may then be placed on the type cylinder; a circular ring, provided with an indent on one side and projection on the other, may then be placed on the type, so as to form the column line. It will be seen, that in book printing, spaces and broad rings may be introduced, so as to form the margin.

Another part of these improvements relates to the construction of a proof press, and consists of a frame supporting a quadrant of type; on each side of the frame is a lever moving on an axis; these two levers are joined together at the opposite end from the axis, so as to form a frame which supports a roller or cylinder, so arranged, that on moving the frame from one side of the press to the other, the cylinder is carried over, and presses on to the quadrant of type. In taking a proof from the type in this machine it is only necessary to place the paper on the type, and pass the handle of the moveable frame from one side of the press to the other. This apparatus may be used as a proof press or otherwise.

In order to damp and pack the paper previous to printing, it is placed in a machine, in which the paper passes from one roller, and is rolled on to a second, which is in contact with a damp cylinder, covered with blanketing or cloth, and as the roll increases in diameter the damping cylinder, together with the trough containing water with which it is connected, recedes; the trough runs upon four wheels and has a band passing over a pulley, to which is attached a weight; by this means the damping roller is pressed against the roll of paper, so as to pack it as it is wound on the roller ready for the printing machine.

Claim.—First, the peculiar form or shape of the type with indents and projections as described, and its combination with the taper on the sides corresponding with the top and bottom of the letter; secondly, the construc-

tion of the type having the taper in the sides corresponding with the tops and bottoms of the letters, either with or without the indent and projection; thirdly, the mode of securing the type to the cylinder by means of the indents and projections in combination with the circular column, rules and rings; fourthly, the mode of folding and cutting the paper; fifthly, the mode of constructing the hand press for obtaining proofs or otherwise; sixthly, the mode of constructing a machine for placing the column or ring of type upon the type cylinder; seventhly, the method of constructing the machine for damping and packing the paper previous to printing.

SPECIFICATION enrolled 28th September, 1842, of a PATENT granted the 15th of April, 1842, to CHARLES FARINA, late of Leicester Square, in the county of Middlesex, but now of No. 83, Upper East Smithfield, in the county of Middlesex, chemist, for "*a new method of making soap, candles, and sealing wax.*"

THE first of these improvements consists in a method of producing lees; secondly, in a new combination of animal and vegetable matter to be introduced into soap, and a new method of discharging the colour and smell therefrom, and also from grease, oil, or resin; and thirdly, in a new method of making candles and sealing wax.

For producing the lees, the inventor takes those alkalies commonly used for making soap, and throws them gradually into boiling water, which is to be continually stirred, to prevent the alkali from adhering to the bottom of the pan, the water being kept boiling till the alkali is

dissolved; the lees are then removed from the vessel and thrown into an iron "back" charged with salt and lime, to obtain the caustic properties of the lime, and will then become caustic lees, and may be used in the soap copper of any required strength. The patentee states that when the lees prepared in this manner are spent, they are run through a filter, to separate any impurities contained in them, and are afterwards run into another "back" containing fresh lime; and so soon as they have passed through the lime, they are drawn off in the usual way and put into another vessel, and alkali thrown in, until the required strength of lees is obtained, and the colour discharged, by filtering with animal charcoal obtained from calcined bones.

Secondly.—The manner of combining animal and vegetable matter with soap, and the mode of discharging the colour and smell therefrom, and also from grease and resin, is as follows: the patentee first takes bones in a rough state, or hoofs, horns, and other refuse animal matter, and purifies them in lime water; they are then washed in clean water, after which they are boiled until all the fat is obtained, which is to be run off, whilst in a liquid state, into another vessel heated by steam or fire, and boiled with a portion of alumina and animal charcoal, and then run off through a filter into a soap copper; lees are then added, and soap made in the usual way. The same process is made use of for discolouring and purifying all kinds of grease, resin, and oils.

The bones or animal charcoal, after the fat is extracted as above, are taken out and dried, and when in a sufficiently dry state, are ground into a fine powder, and boiled in water until all the gelatine or glutinous matter is obtained. This glutinous matter is taken off, and the remaining portion of bones boiled in fresh water, acidu-

lated with muriatic or sulphuric acid sufficient to destroy the remaining portion of bones, or phosphorus of the bone, that is left; the liquid is strained through a filter, and added to the first extract obtained; the whole is then purified in the same way as the fat, grease, or oil, and introduced into the soap copper, as before. If a great degree of whiteness is required, the soap copper is charged with about one-third of lime water, and then filled with grease, oil, or other material of which the soap is to be made, such material having first been purified. The mixture is then to be gradually boiled, and chloride of lime introduced: after boiling three or four hours the water is pumped away, and then lees are added, and the soap finished as before directed.

With respect to the vegetable matters, the patentee takes potatoes or other vegetable substances, which are to be cleansed if required, and afterwards put into a wooden vat, and boiled until reduced to a jelly, and then strained to separate the husk. The husks may also be prepared by grinding them in a mill, and then boiling them in water acidulated, which is afterwards to be neutralized, by introducing soda or other alkalies: the substance thus obtained is put into the copper, and mixed with soap made in the usual way.

The inventor mixes from 20 to 25 per cent. of this composition with the quantity of grease, oil, or tallow used: after the combination of these materials with soap, resin is to be added in such proportion as the soap may require.

For making candles or sealing wax, gelatine is obtained from any of the above animal substances, and boiled with alumina and ivory black, or animal charcoal, and then filtered, to which is added an equal quantity of purified resin. The filtered galatine is boiled with tallow or wax, until it becomes of the consistency required, and the

candles or sealing wax are made in the usual way. The alumina referred to in the foregoing process is produced by a combination of lime and soda, the caustic property of the soda neutralizing the acetic property of the lime; the lime is to be dissolved, and an equal quantity, by weight, of soda added.

In the foregoing process, the patentee uses 10 per cent. of the different purifying and discolouring properties to the quantity of other material made use of.

Claim.—A new method of manufacturing soap, candles, and sealing-wax, and the new way of preparing lees, together with the combination contained in the description.

SPECIFICATION enrolled 30th September, 1842, of a PATENT granted 31st March, 1842, to JULIUS SEYBEL, of Golden Square, Westminster, manufacturing chemist, for "*improvements in the manufacture of sulphate of soda and chlorine.*"

THESE improvements relate, first, to the manufacture of sulphate of soda, by decomposing common salt with sulphuric acid; and secondly, to a method of manufacturing chlorine, by employing the vapours of muriatic acid to act on manganese immersed in water; such vapours being conducted below, and permitted to escape upwards, through the water and manganese.

The apparatus employed for the above purpose consists, first, of a vessel or retort, made or lined with lead, and provided at the top with a man-hole, for the purpose of charging it with salt; two pipes are attached to the upper part of this vessel, one leading into the chimney, and the other into a vessel containing sulphuric acid of the specific

gravity of 1.71, and each pipe is provided with a valve. This retort is placed in an iron vessel containing oil, or other suitable material, to act as a heating medium, and having also a false bottom, perforated, so as to allow the heating medium to come in contact with the retort. The vessel is to be heated by a fire, or furnace, having a flue, provided with a damper to regulate the heat, which is required to be at a temperature of from 300° to 330° Fahrenheit. In order to effect the process of decomposition, the retort is to be charged with 20 cwt. of common salt; the man-hole lid being fixed, 30 cwt. of sulphuric acid of 1.71 are poured in; during the time that the acid is being poured in, the valve leading to the chimney should be open, but closed so soon as the operation is finished; the muriatic gas evolved by the decomposition of the salt, then passes through another pipe placed in the upper part of this vessel, to a second vessel, or retort, for making the chlorine. This retort is lined with fire-brick, or tiles, so as to resist, as much as possible, the action of the acid; the pipe from the first retort passes through the top of the second retort, and through the mixture contained in it, to the bottom; this part of the pipe which passes through the mixture is made of earthenware, and terminates in a perforated pipe in the form of a ring, passing round the bottom of the vessel; a vertical shaft, also protected from the action of the acid, passes through a stuffing box, having at its lower end an agitator. This vessel is charged with about 7 cwt. of ground manganese, and from 11 to 12 cwt. of water. The temperature of the heating medium being gradually raised to 300° Fahrenheit, is kept at that temperature until the charge is nearly worked off, which will be in about fifteen hours, the temperature being then got up to 330° Fahrenheit. By this arrangement it will be seen, that the muriatic acid gas formed by the decomposition of the

salt, passes, on shutting the valve leading to the chimney, through the pipe which conducts it to the bottom of the second retort, and through the water and manganese, and forms the chlorine, which passes through a pipe in the upper part of this vessel, to another retort containing water with about 10 lbs. of manganese; and also through another similar retort, from which it may be received and formed into chlorides, as will be understood. The sulphate of soda thus obtained is drawn, or run into, and finished in an ordinary reverberatory furnace, adding and mixing therewith from 9 to 10 cwt. of common salt.

The claims are, first, the mode of manufacturing sulphate of soda, by decomposing common salt by sulphuric acid, in close vessels or retorts, made or lined with lead, and heated as described; secondly, the mode of manufacturing chlorine by means of the vapours, or gases, of muriatic acid introduced below water in which manganese is immersed; thirdly, the stirring, or agitating, of manganese with water, when acted upon by the vapours or gas of muriatic acid, in the manufacturing of chlorine.

SPECIFICATION enrolled 30th September, 1842, of a PATENT granted 31st March, 1842, to JOSEPH CLISILD DANIELL, of Tiverton Mills, near Bath, clothier, for "*improvements in making and preparing food for cattle.*"

THE first part of these improvements relates to a mode of preparing and treating certain substances to be used as food for cattle, designated ligneous matter, (because such matter is of the nature of wood) as oak, sycamore, hazel, brushwood, hedgewood, brambles, furze, heath, or any

other fibrous matter possessing the same qualities as those above stated.

The mode of preparing such ligneous substances, is by cutting them up into small pieces, and passing them through certain machinery for grinding them to a powder. A description of a machine suitable for this purpose was described in a former Specification of Mr. Daniell's. The ground wood thus obtained, is further reduced or pulverized, by passing it through a mill, similar to a coffee mill, or a mill used for grinding malt, but much stronger; after which it is further reduced, and the grosser part separated by grinding it betwixt stones, and by other processes similar to those used in preparing flour. It will be necessary to have the wood in a dry state, which may be effected by placing it in a kiln, or oven; and wood which has a bitter taste will be improved by this process.

The second part of these improvements consists in a mode of treating and preparing grass, either common grass or lucerne, green clover or green vetches, or straw of any description, or halm, or hay, such as may be used as food for cattle. In preparing straw or halm with grass, the former is to be used in a dry state, with about double its quantity of grass newly cut, previous to making it into hay. The grass, when free from external moisture, is to be mixed with the straw, or halm, and put into a vat or tank, surrounded by steam, when by the application of heat, the straw will be impregnated with the moisture from the grass. The heat having been applied about twenty-four hours, a current of atmospheric air is made to pass through the grass and straw, by means of an air pump, which is to be worked from six to eight hours, and thus any moisture that may remain will be expelled. If after having been removed from the tank, the hay and grass are not sufficiently dry, they may be exposed to the sun or

the wind, when they will, after being well mixed together, be ready for the stack. The inventor states that old hay may be very much improved by the foregoing process.

The manner in which the powdered wood is to be used for feeding cattle, is (for horses) by mixing half a peck of ground wood, or ligneous matter, together with a bushel of chaff and a pint of corn or barley meal; the mixture may be moistened by sprinkling it with water, or steaming it in the usual way, or the ligneous matter may, previously to mixing it with the chaff, be moistened with a solution of eight ounces of soda dissolved in one gallon of water to each bushel of powdered wood, or ligneous matter. For horned cattle or sheep, about half a peck of ground wood mixed with a bushel of chaff; and the same, after being moistened as before stated, may be used alone, or mixed with grains, potatoes, turnips, carrots, or mangel wurzel, in which case a greater quantity of ground wood may be used.

Claim.—First, the mode of making and preparing food for cattle, by pulverizing ligneous matter, and applying the same to feed cattle; secondly, the mode of treating all kinds of grass and straw, or halm, or grass and hay, in a vat, or tank, when preparing the same for food for cattle.

A DISCLAIMER has been entered on the 5th September, 1842, with the Clerk of the Patents, in the PATENT granted the 28th May, 1840, to DANIEL GOOCH, of Paddington Green, in the county of Middlesex, engineer, for "*certain improvements in wheels and locomotive engines to be used on railways,*" whereby the patentee disclaims the following words in the title of his Patent, "*and locomotive engines.*"

SPECIFICATION of the PATENT granted 31st March, 1842, to WILLIAM LIVERSIDGE TRIPPETT, of Charlton-upon-Medlock, Lancaster, agent, for "*improvements in looms for weaving by hand or by power,*" due 30th September last, has not been enrolled during that month.

BYNNER'S PATENT.

[*Continued from page 75.*]

ciple, and that the chimney which he and Roberts first used was the same as Bynner's.

Cross-examined by the Attorney-General.—The witness stated that he had been a bankrupt in 1829—30. He was then an oil and colourman. That the principle of getting the air below the point of combustion was very old; that Roberts was joint patentee with him, and that part of the patent was sold to Messrs. Ratcliff, who were to pay 1*s.* 6*d.* for a certain term per label, and 1*s.* for the remainder—that was the flat wick lamp: this occurred about nine or twelve months before Bynner's Patent was sealed. He sold the remainder to Messrs. Smith three months before Bynner's Patent was sealed—the consideration which they were to give, was that they should cancel an account of about £120. though he thought that he owed them nothing. In the lamp (No. 1 safety) put into witness' hands, the wire was for raising the wick and knocking off the crust. The wick should be placed about $\frac{1}{8}$ of an inch below the cap. That the wick in the one produced by the Attorney-General, was too high, and it would spoil the effect—the pricker should be out of the way of the wick. That the lamp which he had exhibited in court (No. 1.) was made for mining purposes—it was a flat wick lamp. [Guise's and Bynner's lamps were then shewn to the witness, who stated that they were the same in principle.] Mr. Upton admitted that he and his son were defendants in an action brought by Messrs. Smith for an infringement of Bynner's Patent. That he had advised the present proceedings, and had pressed Mr. Smith, of Finch Lane, as far as he could, to institute them,

but he did not know who the sureties were; that the *scire facias* was tested on 31st January, and the declaration filed on 15th April.

Re-examined by Mr. Kelly.—Stated that the lamps under his Patent were made, some with round and some with flat wicks; that the principle of admitting the air below the point of ignition and of deflecting it above, was old; and the use of metal cones in argand lamps was also old. Roberts had shewed him one so constructed, a long time since. That his failure was in the oil trade and other speculations; that a very great change took place in the price of oils; sperm oil rose in price in 1837—8—9—40, almost to a prohibitory price, whilst southern oil fell: that this caused men to exert themselves to devise means to burn the cheaper oils, and that circumstance had caused the great demand for their lamps.

By the Attorney-General.—That the price of oils began to rise in 1834—5, but that it rose more in 1836; and began to get very high in 1837.

Mr. Guise examined by Mr. Hindmarch.—Stated that he was a gas fitter and lamp manufacturer residing in Margaret Street, Spa Fields; that he was in the employ of Mr. Meadows in 1829—30: that he knew Upton's Patent, and had made many of his pipe wick and flat wick lamps; that Mr. Meadows was employed by Mr. Upton to make them, and that witness made them under Mr. Upton and Mr. Roberts' direction: that he had never read the defendant Bynner's Specification, nor seen any of his lamps until within the few last days. A lamp called Meadows' lamp was then shewn to the witness, who stated that he had made about five or six dozen of them in the early part of 1830, and none since; that in 1830 he was principally engaged in making oil lamps, the top of the cap of which was placed between $\frac{1}{3}$ or $\frac{2}{8}$ths of an inch above the top of the wick holder. Mr. Guise then further stated, that he made for his own use a similar lamp, but of a smaller size, the top of the cap of which was above the bottom part of the flame. The lamp itself was produced (Guise's) to witness, who said that it was the lamp which he had made for

himself; that Upton and Roberts procured the lamps with the caps from Meadows; that in 1830 he had made some safety lamps with caps; [two patterns of such lamps were exhibited to the jury]; that he is quite certain that the top of the wick was below the level orifice of the cone; that in 1832 he had made a great many cones for gas argand burners, some with regulators, some without, all of which were sold.

Cross-examined by Mr. M. D. Hill.—The witness stated, that after 1832 he chiefly made gas cones, and left off making oil lamps; that in the lamp which he made for himself, the top of the wick holder was but $\frac{3}{8}$ths of an inch below the level of the orifice of the cap at the centre, and $\frac{1}{8}$th at the sides; had used it on various occasions, but not for the last eight years, as the glass was unfortunately broken; that the holes in the lamp holder were made to admit air between a globe glass and the chimney; the lamp was first used with a globe glass and chimney, until the globe glass was broken; that he had cut off the outer edge, but was obliged to leave part of the holes.

Re-examined by Mr. Hindmarch.—That he had made the outer holes in his own lamp, in order to admit a draught of air between the chimney and the globe; but that the lamps which he made for Upton and Roberts had holes in the gallery between the chimney and the cap, by way of experiment.

Mr. George Roberts examined by Mr. Hugh Hill.—Stated that he was the son of the late Mr. Roberts, the late partner of Mr. Upton, and that he was well acquainted with safety lamps; that he had bought several from Messrs. Smith and Son, and had sold many for his father and Mr. Upton previous to Bynner's Patent, and that Jeremiah Bynner was at that time in Messrs. Smith's service; that he recollects well his father making deflective argand lamps, and that the one which he now produces was one made by him and used as an experimental lamp; that not many of these argands were made, perhaps a few dozens, they had glass chimnies with metal tops; that the metal top was shorter and not so wide as the glass; that the safety lamps were all made with cones.

Cross-examined.—Stated that the wick in Upton's lamp (No. 1.) was placed the wrong way; that Upton and Roberts employed Messrs. Smith; but he cannot say whether the tin lamp is in the same condition as those his father sold; witness has not carried on business since his father's death in 1840; Messrs. Ratcliff manufactured for them; that they carried on their trade in Bilston, and his father and Mr. Upton had a shop in London; that his father and himself never had any lamps from Messrs. Ratcliff with Messrs. Smith's or Bynner's private mark on them.

Re-examined.—That in the lamp produced, and those which his father sold, the only difference was that the orifice in the one produced was larger; that in all those which his father sold the top of the cap was higher than the top of the wick. The witness also stated that the names of the parties to whom he had sold safety lamps were Messrs. Charles and Walter, Dudley Corbyn, Hull Colliery; Mr. Francis Downing, Agent to Lord Dudley and Ward; Mr. Best, the Manager of the Staffordshire Works of the British Iron Company; and Mr. Samuel Banks, of Bilston.

Mr. Hetherington examined.—Stated that he was in the lamp trade formerly in Everett Street, but now in the Quadrant, and had been in the trade 25 years; that in the year 1827 he used to make lamps for Upton and Roberts, but has not since; that he then made three or four dozen of one sort, and may be one dozen of another; that the air in these lamps was admitted below the point of ignition, and conveyed to the top of the cotton by a cone or metal cap. [A model was then produced.] That the air struck the cotton at the point it was ignited, and struck the flame at the top of the cotton below the cap; that he should call the top of the wick the point of ignition; that the caps which he made in 1826 and 1827, were $\frac{5}{8}$ths of an inch above the top of the wick; they were sold. Mr. Hetherington further stated, that he knew Bynner's Specification, and that the principle therein claimed was the same as in the lamps made by him. Miller's lamp was also the same.

[*To be continued.*]

List of New Patents.

PATENTS GRANTED IN ENGLAND, FROM SEPTEMBER 29 TO OCTOBER 27, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

Edward Bell, of the College of Civil Engineers, Putney, professor of practical mechanics, for "improvements in applying heat in the manufacture of artificial fuel, which improvements are applicable to the preparation of asphalt, and for other purposes." Sealed September 29.

Samuel Henson, of New City Chambers, Bishopsgate-street, engineer, for "certain improvements in locomotive apparatus, and in machinery for conveying letters, goods, and passengers, from place to place through the air, part of which improvements are applicable to locomotive, and other machinery to be used on water or on land." Sealed September 29.

William Smith, of Grosvenor-street, Camberwell, gentleman, for "improvements in treating certain animal matters, to obtain products applicable to the manufacture of candles, and other purposes." Sealed September 29.

John Rand, of Howland-street, Fitzroy-square, artist, for "improvements in making and closing metallic collapsable vessels." Sealed September 29.

James Hyde, of Duckenfield, Cheshire, machine-maker, and John Hyde, of the same place, cotton-spinner and manufacturer, for "a certain improvement or improvements in the machinery used for preparing cotton, wool, silk, flax, and similar fibrous materials for spinning." Sealed September 29.

John Ridsdale, of Leeds, for "improvements in preparing fibrous materials for weaving, and in sizing warps." Sealed September 29.

John Fry Wilkey, of Mount Vernon, Exeter, commission agent, for "improvements in carriages." Sealed September 29.

John George Shipley, of Bruton-street, Berkeley-square, saddler, for "certain improvements in saddles." Sealed October 6.

John Oliver York, of Upper Coleshill-street, Eaton-square, for "improvements in the manufacture of axles for railway wheels." Sealed October 8.

Wilton George Turner, of Gateshead, Durham, doctor in philosophy, for "improvements in the manufacture of alum." Sealed October 8.

Claude Edward Deutsche, of Fricour's Hotel, St. Martin's-lane, gentleman, for "improvements in combining materials to be used for cementing purposes, and for preventing the passage of fluids, and also for forming or constructing articles from such compositions of materials." Sealed October 8.

Samuel Dotchin, of Myrtle-street, Hoxton, jeweller, for "improvements in paving, or covering, and constructing roads, ways, and other surfaces. Being a communication from his son lately deceased. Sealed October 13.

William Edward Newton, of Chancery-lane, for "certain improvements in the manufacture of artificial fuel." Being a communication. Sealed October 13.

Charles Thomas Holcombe, of Valentines, near Ilford, Essex, Esquire, for "an improved mode of using certain materials as fuel; also an apparatus or method for collecting the smoke or soot arising from the combustion of such fuel; which apparatus or method is applicable to collecting the smoke or soot arising from the ordinary combustion of fuel, and also the application of the products arising from the combustion of the first mentioned materials, as a manure, and for other useful purposes." Sealed October 13.

Robert William Sievier, of Henrietta-street, Cavendish-square, gentleman, for "certain improvements in looms for weaving, and in the mode or method of producing plain or figured goods or fabrics." Sealed October 13.

PETER KAGENBUSCH, of Lyth, in the county of York, dyer, for "certain improvements in the treatment of the alum rock, or schist, and in the manufacture and application of the products derived therefrom." Sealed October 13.

HENRY BROWN, of Selkirk, manufacturer, and THOMAS WALKER, of the same place, manufacturer, for "improvements on woollen carding engines." Sealed October 13.

THOMAS SEVILLE, of Royton, Lancaster, cotton spinner, for "certain improvements in machinery used in the preparing and spinning of cotton, flax, and other fibrous substances." Sealed October 20.

JAMES PALMER BUDD, of Ystalyfera Iron Works, Swansea, merchant, for "improvements in the manufacture of iron." Sealed October 20.

WILLIAM LONGMAID, of Plymouth, accountant, for "improvements in treating ores and other minerals, and in obtaining various products therefrom, certain parts of which improvements are applicable to the manufacture of alkali." Sealed October 20.

JAMES STATHAM, of West-street, St. Giles's, Venetian lock maker, for "improvements in the construction of locks for Venetian blinds used in carriages." Sealed October 20.

GILBERT CLAUDE ALZARD, of Tichborne-street, gentleman, for "certain improvements in bread, biscuits, macaroni, vermicelli, and pastry, and the mode of making the same." Sealed October 20.

GEORGE HAZELDINE, of Lant-street, Southwark, coach manufacturer, for "certain improvements in omnibuses." Sealed October 27.

JAMES GARDNER, of Banbury, ironmonger, for "improvements in cutting hay, straw, and other vegetable matters for the food of animals." Sealed October 27.

JOHN MULLINS, of Battersea, surgeon, for "improvements in making oxides of metals in separating silver and other metals from their compounds, with other metals, and in making white lead, sugar of lead, and other salts of lead, and salts of other metals." Sealed October 27.

ROWLAND WILLIAMS, of Manchester, fustian shearer, for "certain improvements in machinery, or apparatus for raising, shearing, and finishing velvets, or other piled goods by power." Sealed October 27.

PATENTS GRANTED FOR SCOTLAND, FROM SEPTEMBER 26 TO OCTOBER 25, 1842.

EDWIN WARD TRENT, of Old Ford, Bow, in the county of Middlesex, rope maker, for "an improved mode of preparing oakum and other fibrous substances for caulking ships and other vessels." Sealed September 29.

PETER KAGENBUSCH, of Welter on Rhur, in Westphalia, in the Kingdom of Prussia, dyer, now residing in the parish of Lyth, in the county of York, in England, for "certain improvements in the treatment of the alum rock or schist, and in the manufacture and application of the products derived therefrom." Sealed September 29.

HENRY BEWLEY, of Dublin, in the county of the City of Dublin, licentiate apothecary and chymist, for "an improved chalybeate water." Sealed October 4.

ALFRED JEFFREY, of Lloyd's-street, Pentonville, in the county of Middlesex, gentleman, for "a new method of preparing masts, spars, and other wood for ship building, and other purposes." Sealed October 18.

CLAUDE EDWARD DEUTSCHE, of Fricour's Hotel, St. Martin's-lane, in the county of Middlesex, gentleman, for "improvements in combining materials to be used for cementing purposes, and for the preventing the passage of fluids; and also for forming articles from such composition of materials." Communicated by a Foreigner. Sealed October 18.

JOHN RIDSDALE, of Leeds, in the county of York, for "improvements in preparing fibrous materials for weaving and in sizing warps." Sealed October 20.

SAMUEL CARSON, of York-street, Covent-garden, in the county of Middlesex, gentleman, for "improvements in purifying and preserving animal substances." Sealed October 20.

HENRY BROWN, of Selkirk, manufacturer, and THOMAS WALKER, of the same place, manufacturer, for "improvements on woollen carding machines." Sealed October 20.

ALPHONSE DE TROISBRIOUX, of Great Russell-street, Bloomsbury, in the county of Middlesex, gentleman, for "improvements in lithographic and other printing presses." Communicated by a Foreigner. Sealed October 20.

PATENTS GRANTED IN IRELAND IN OCTOBER 1842.

WILLIAM HENRY KEMPTON, of South-street, Pentonville, in the county of Middlesex, gentleman, for "improvements in the manufacture of candles." Sealed October 6.

ALEXANDER JOHNSTON, of Hill-house, in the county of Edinburgh, Esq., for "certain improvements on carriages, which may also be applied to ships, boats, and various other purposes where locomotion is required." Sealed October 6.

CHARLES AUGUSTUS PRELLER, of 16, Eastcheap, in the City of London, merchant, for "improvements in machinery for preparing, combing, and drawing wool and goats' hair. Sealed October 6.

WILLIAM GEEVES, of Old Cavendish-street, in the county of Middlesex, gentleman, for "improvements in machinery for cutting cork." Sealed October 6.

WILLIAM BAKER, of Grosvenor-street, Grosvenor-square, in the county of Middlesex, surgeon, for "certain improvements in the manufacture of boots and shoes." Sealed October 8.

THOMAS BANKS, of Manchester, in the county of Lancaster, engineer, for "certain improvements in the construction of wheels, and tires of wheels, to be employed upon railways." Sealed October 14.

JOHN ANTHONY TIELENS, of Fenchurch-street, in the City of London, merchant, for "improvements in machinery or apparatus for knitting." Communicated by a foreigner. Sealed October 14.

EUGENE DE VARROC, of Bryanstone-street, Portman-square, in the county of Middlesex, gentleman, for "apparatus to be applied to chimnies, to prevent them taking fire, and for rendering sweeping of chimnies unnecessary." Sealed October 14.

WILLIAM REVELL VIGERS, of Russell-square, in the county of Middlesex, Esq., for "a mode of keeping the air, in confined places, in a pure or respirable state to enable persons to remain or work under water, and in other places, without a constant supply of fresh atmospheric air." Sealed October 14.

THOMAS MARSDEN, of Salford, in the county of Lancaster, machine maker, and SOLOMON ROBINSON, of the same place, flax dresser, for "improvements in machinery for dressing or hackling flax and hemp." Sealed October 15.

THOMAS BELL, of St. Anstell, in the county of Cornwall, mine agent, for "improvements in the manufacture of copper." Sealed October 15.

JULIUS SEYBEL, of 11, Golden-square, Westminster, in the county of Middlesex, manufacturing chemist, for "certain improvements in the manufacture of sulphate of soda and chlorine." Sealed October 15.

ISHAM BAGGS, of Wharton-street, in the county of Middlesex, chemist, for "improvements in obtaining motive power by means of carbonic acid." Sealed October 15.

JAMES WHITELAW, of Glasgow, in the county of Lanark, engineer, and JAMES STIRRAT, of Paisley, in the county of Renfrew, manufacturer, for "improvements in rotary machines to be worked by water." Sealed October 19.

The Record

OF

PATENT INVENTIONS.

No. III.

SPECIFICATION enrolled 5th October, 1842, of a PATENT granted 6th April, 1842, to JOHN BEVAN, of No. 15, Whitehead's Grove, Chelsea, in the county of Middlesex, gentleman, for "*an improved mode of expelling the air from certain cases or vessels for the preservation of various articles of food.*"

THE nature of this invention consists in expelling the air from cases intended for preserving animal and vegetable matter, by connecting such cases with a vacuum chamber on the one hand, and with a vessel containing gelatine on the other, in such a manner, that by opening a communication to the vacuum chamber, the air from the vessel will pass into the exhauster, and the space be subsequently filled by the gelatine. The patentee remarks that the mode hitherto practised has been to subject such cases to a high temperature; and that a patent was obtained for the use of a bath, in which by chemical mixtures, a heat of 280° Fahrenheit was considered necessary to expel the air; but in the present improvement the temperature is not required to be higher than 120°, and by this arrangement

the inventor is enabled to cook the matter to be preserved in an almost perfect vacuum.

The vessel containing the matter is to be placed in a bath, and is connected by tubes, provided with stop cocks, with the vacuum chamber, which consists of an hemispherical vessel provided with pipes and stop cocks for the induction and eduction of steam; and also with the vessel containing the gelatine, which is placed in a warm bath for the purpose of keeping it in a fluid state. The substance to be preserved being inclosed in an air-tight vessel, and the same being placed in a bath at the temperature of 120° Fahrenheit; by turning the cock which opens the communication to the vacuum chamber, the air in the vessel becomes exceedingly rarified; and the inventor states that the temperature of 120° or thereabouts is sufficient to cook and throw off the fixed air contained in the animal or vegetable matter inclosed therein. Having maintained this temperature for a short time (say about fifteen minutes) for a fowl, the communication is opened to the vessel containing the gelatine which is allowed to run into the vessel containing the animal or vegetable matter, and expels any remaining portion of rarified air that may be left in the vessel: the tubes being hermetically closed, the case is then submitted for a few minutes to the action of boiling water, according to its size; if for a fowl, about thirty minutes—the vessel is then allowed to cool, when the process is complete. Claim is, the use of an exhauster or vacuum chamber for expelling the air in cases employed for the preservation of animal and vegetable matter to be used as articles of food; and where the articles will admit, the introduction of gelatine or other like substance into the said cases as described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JAMES SMITH, of Deanston, in the Parish of Kilmadock, and county of Perth, cotton spinner, and JAMES BUCHANAN, of the city of Glasgow, merchant, for "*certain improvements applicable to the preparing and spinning of cotton, wool, flax, hemp, and other fibrous substances.*"

THE first part of these improvements relates to a mode of heckling or combing wool, flax, hemp, and other fibrous substances, by attaching the "parcels" of wool or such like substances to the periphery of a revolving cylinder, by the motion of which the fibres are thrown out upon the comb or heckle, which is so affixed as to give way upon any extra pull or stress of the fibres.

This machine or apparatus consists of a cylinder having three groves or cavities, equidistant from each other, cut across its periphery, which receive plates with suitable projections for holding one end of the tress "or parcel" of wool to be combed. The drawing shows three tresses or "parcels" attached to one plate. On imparting a rotary motion to the cylinder, the fibres of the wool will be thrown by the centrifugal force, so as to form a tangent to the cylinder, and upon the comb which is placed below the centre of the cylinder with its teeth in an inclined position; but in order that such parcels of wool may come in contact with the comb gradually, beginning with the end of the parcels of fibres, such fibres are inclosed between the periphery of the cylinder and a concentric case attached to and revolving with the cylinder; this case revolves round, or partly round, the periphery of the cylinder, which is effected in the following manner:—

On the end of the cylinder shaft is a wheel which takes into and drives a similar wheel keyed on the end of a stud, passing through the frame side in a suitable bearing; at the opposite end of this stud is another wheel which takes into and gives motion to a wheel keyed on a bush working loosely on the cylinder shaft; at the opposite end of this bush is a bevil wheel which drives a radial shaft revolving with the cylinder, on the opposite end of which is another bevil wheel taking into and driving a bevil wheel keyed on the end of a transverse shaft passing through the arm or arms of the cylinder; and on the opposite end of this shaft is a spur wheel gearing into and driving a large wheel to which are attached the concentric cases; by this contrivance, the motion of the shaft upon which the cylinder is fixed communicates a rotary motion to the radial and transverse shaft, and thus drives (at the same time as they are carried round with the cylinder) the concentric cases partly round the cylinder: it will be seen that this motion of the cases, "between which and the periphery of the cylinder the 'parcels' of wool are placed," will, as the cylinder revolves, cause the ends of the fibres to be gradually liberated and come in contact with the comb, beginning at the point or end of the fibres, and gradually receding until the whole length of the fibres is liberated so as to come in contact with the comb or heckle. For the purpose of gathering the fibres into the space occupied by the comb, a trough or case with bevilled sides and open in front is fixed in a slanting position in front of the cylinder, so that when the fibres are thrown from the cylinder they are collected by the bevilled sides of the trough, the position of which also prevents them from entering the teeth of the comb further than is required. The comb is also held by radial rods, and is provided with a spring underneath its back,

so as to alter the inclination of the teeth upon any extra pull or stress of the fibres.

Claim is for the fixing to a revolving cylinder portions of flax, hemp, wool, or other fibrous substance, so that the centrifugal force arising from the motion of the cylinder shall throw the end of the parcel of fibres beyond the line of the periphery of the cylinder, and upon the heckle placed to receive them; and also the gradual exposure of the different lengths of the fibres which are being heckled or combed, to the action of the heckle. He also claims the attachment of the heckles in their working position in such a manner as to yield to any extra pull, yet having the power to retain their position so soon as the extra strain is removed.

The second improvement relates to a peculiar arrangement of mechanism whereby the sliver as it flows from the delivery rollers of a carding engine, drawing frame, or slubbing frame, is deposited in parallel rows or layers. This apparatus is shown in the drawing as attached to one side of a compound carding engine, and consists of a can or receiver in the form of an oblong square, mounted upon a joint or axis at the lower end, so as to allow of an oscillating motion being given to it by fixing on the end of one of the doffer shafts a heart wheel, which communicates a slow oscillating movement to a pendent arm or lever, moving upon an axis at its upper end, the opposite end being attached by means of a connecting rod to the oscillating can or receiver; thus as the fibres are stripped from the two doffers in a sheet, they pass through the delivery rollers, and from thence (in the form of a sliver) over a guide roller and between another pair of rollers to the can or receiver, which at every revolution of the doffers moves backwards and forwards over a space equal to the length of the sliver delivered from the doffer; the rollers through which the sliver last passes, and which are just above the

can or receiver, also serve to press the sliver down as it is laid in parallel rows one above the other, as just described. The application of this apparatus to the drawing frames differs somewhat from the preceding in this respect, that on account of the slivers being much narrower and more than one single row of the sliver being required to be deposited, a lateral motion is given to the can or receiver, so as to deposit the sliver in three parallel rows or layers, side by side.

Claim.—The depositing slivers, slubbings, or rovings in cans or suitable receivers, in regular successive parallel layers as they flow from the carding engine, drawing frame, slubbing frame, or tube frame, such slivers being compressed by the flowing rollers; also the oscillating and reciprocating movement of the receivers, and in conjunction with a transverse movement when more than single rows of slivers are to be deposited.

The third improvement relates to the application to drawing and other frames, of a self-stopping apparatus, which is acted upon when any of the slivers have been broken or terminated. The slivers in passing from the cans or receivers are conducted over a guide roller placed at some distance from the receiving rollers of the frame, and below the slivers is fixed in a vertical position a lever, moving on an axis and supporting at its upper end a plate having a number of teeth similar to a comb; therefore when one of the slivers breaks or terminates, the end of such sliver will fall from the guide roller and on to the teeth of the comb, which will, by the motion of the sliver, be drawn towards the frame, and the opposite end of the lever to which the comb is attached will act upon a catch or detent, so as to release the strap guider, which is forced by means of a spring on to the loose pulley: a counterbalance weight affixed to a bent arm of the comb-formed lever, draws it to its original position. It will be seen that

this toothed or comb plate may extend from one end of a machine to the other so as to be acted upon by any of the slivers.

The claim is for the self-stopping of drawing frames, slubbing frames, or roving frames when any of the slivers shall have been broken or terminated by the dropping of the end or terminating of the sliver upon what the patentee calls "a toothed palm," in the manner described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JOHN READ, of Regent Street, in the county of Middlesex, machinist; HENRY RUTLAND, of Hurst Green in the county of Sussex, farmer, and CHARLES WOODS, of Fore Street, Cripplegate, in the county of Middlesex, commercial traveller, for "*improvements in the construction and make of driving reins, harness, bridles, and reins, and in bridles and reins for riding.*"

THIS invention relates to the mode of constructing or making reins and bridles in such manner that they are capable of acting on two powers of leverage of the same bit, or of two bits used at the same time, whereby the horse will, under ordinary circumstances, be governed by the lesser power, or leverage of the bit; but when that is not sufficient, the greater power or leverage is brought into action, and answers the purpose of double reins.

This improved bridle or rein consists of a single strap to hold by, but is made at each end, that is to say, on each side of the horse's neck, to branch out into two parts, thus forming four ends to the bridle, two of which are attached

to the bit, so as to obtain sufficient leverage under ordinary circumstances; the other two are attached lower down or near the end of the bit, so as to obtain greater leverage; the former are made elastic by inclosing a spiral spring in a case; the latter hang loosely below the flexible reins. Thus by pulling at the rein, the lesser power or leverage will be acted upon, and will answer the purpose of an ordinary rein, but when not sufficient to control the horse, the spring will give way, and the other ends which are attached to the greater leverage will be brought into use, and produce the effect of a double rein.

Claim.—The mode of constructing and making driving reins, harness, bridles, and reins, and bridles and reins for riding, by forming thereon two means of attaching each end thereof, the one to be attached to a more powerful part of the leverage, and the other to a less power of leverage, of a bit, or to separate bits; the attachment to the lesser power of the bit being through an elastic medium in order that the same may yield, to allow of the greater power being brought into use.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 6th April, 1842, to JEAN GEORGE SUE CLARKE, of Euston Grove, in the county of Middlesex, engineer, for "*improvements in supplying and regulating air to furnaces of locomotive engines.*"

THIS invention relates to certain apparatus for heating and regulating the supply of atmospheric air to the furnace of locomotive engines. The chamber through which the air passes consists of two compartments, made of plate iron, and placed below the fire bars; the arrangement

being such, that by turning a handle which imparts motion to a screw placed near the engine driver, the apparatus, which is supported by a hinge joint at one end, can be lowered, for the purpose of clearing away the ashes. The air is admitted through an aperture at one end of the chamber, which is provided with a lid or cover, moving upon a hinge joint, and actuated by a combination of levers, so as to enlarge or contract the opening for the admission of air, which passes through the upper compartment, and in contact with the surfaces of such compartment which have become heated by the fire; the air in a heated state then passes to the lower compartment, and is conducted in a lateral direction to the ash-pit, for the purpose of supplying the fire.

Claim.—First, the mode of supplying heated air to the furnace of locomotive engines, by applying an apparatus below the fire bars; secondly, the mode of regulating the supply of air to such apparatus, as described.

SPECIFICATION enrolled 6th October, 1842, of a PATENT granted 15th April, 1842, to JOHN LAMB, of Kidderminster, in the county of Worcester, machinist, for "*certain improvements in engines to be worked by steam, air, gas, or vapour; which improvements are also applicable to pumps for raising or forcing water, air, or other fluids.*"

THIS invention of improvements in engines to be worked by steam, air, gas, or vapours, applicable also to pumps for raising or forcing water, air, or other fluids, relates to that description of engine commonly called and known by the name of rotary engines, and consist of one cylinder

working in a peculiar manner inside another, so as to impart a rotary motion to the main or driving shaft.

The outer case or cylinder of this engine is firmly fixed to a foundation plate by screw bolts, and is in form similar to a gas meter; the main or driving shaft, which is in a horizontal position, has its end enlarged: this enlarged end passes through an opening in the centre of the outer cylinder or case, and is surrounded by a collar or ring, concentric with the cylindrical case, and forms part and parcel of such case: thus leaving between the periphery of the collar and the interior surface of the cylindrical case, an annular space, which is divided by a vertical steam stop, that is to say, a vertical plate, which slides into two dove-tailed grooves, one of which is formed in the periphery of the collar, (at the top side of the circle) and the other in the inner surface of the case; this vertical steam stop is somewhat narrower than the depth of the cylinder, but is equal to the length of the collar which surrounds the enlarged part of the shaft, and on each side of this steam stop there is an aperture for the induction and eduction of steam. The inner or revolving cylinder has but one end; and when inserted into the annular space, (for which purpose it will be observed, that there must be a transverse slot cut across its periphery, to receive the vertical steam stop) the edge of which is ground, forms a steam tight junction against the back or end of the cylindrical case; and the end of the collar and shaft also fits tight against the bottom or end of the cylinder; and the internal and external diameter of the inner or revolving cylinder is such, that it respectively binds or fits tight against the periphery of the collar and the interior of the large cylinder or case; that is to say, the periphery of the interior or revolving cylinder, forms a steam tight junction with the interior of the outer cylinder or case; and the

interior of the inner or revolving cylinder also forms a steam tight junction with the periphery of the collar.

There is a certain arrangement of a compound or double wedge, acted upon by two wedge pieces, connected together by a right and left hand-screw, by turning which, the parts just referred to are brought to bear against each other. Suppose a pin or axis to be passed through the centre of the end of this eccentric cylinder, and into the end of the enlarged part of the driving shaft; this pin, it will be seen, is on one side of the centre of the shaft, and will therefore form a crank axis to the main shaft, and by a peculiar motion of this cylinder, a rotary motion will be imparted to the crank. The operation of the engine is as follows :—

It will first be necessary to state, that the interior cylinder does not revolve upon its own axis, its motion round the interior of the case being like that of the planetary wheel in the sun and planet motion. Presuming the end of the outer cylinder to be firmly bolted on, and the centre or axis of the revolving cylinder to be at or near the top centre, on admitting steam through one of the apertures formed at each side of the vertical steam stop, the interior cylinder, which is open at that end, will be filled with steam, and its elastic force will be exerted on the stationary steam stop, and on one half of the interior of the cylinder, the steam being prevented entering its other half by its close contact with the collar; the elastic force, therefore, will cause the cylinder to recede; a space will then be formed between the outside of this cylinder and the interior of the case, and the steam will act on its periphery: when it has arrived at the bottom centre, having made half a revolution, the communication with the inside will be cut off by the edge of the cylinder having passed below the induction passage, and the force of the steam will be

exerted on the periphery alone, and will cause it to recede still further, when a communication with the inside of the cylinder, by its motion upwards, will be gradually opened with the eduction passage, for the escape of steam which is on the opposite side of the vertical steam stop; and at the same time that this communication is being opened, steam is again entering the interior of the cylinder on the opposite side to the steam stop; and in this manner the eccentric cylinder is carried round by the elastic force of the steam admitted inside, and also between the spaces formed by the periphery of the said cylinder and the interior surface of the cylindrical case, and imparts a rotary motion in the manner described, to the main shaft.

Note.—The pin or axis of the revolving cylinder enters the compound or double wedge, the object of which has previously been described. There is also a radial slot in the cylinder, into which works a metal piece, mounted on an axis at its upper end, and fixed to the stationary steam stop; this piece vibrates as the cylinder moves round, and is for the purpose of guiding the revolving cylinder on its own axis. The patentee also shows the application of a slide valve box, of the ordinary construction, by which means the motion of the engine can be reversed.

The drawings show a modification of the engine above described, suitably arranged for working expansively; (that is to say) the steam having exerted its elastic power in the engine, as above described, passes therefrom to other chambers, constituting another engine of enlarged capacity, and from thence to any ordinary condensing apparatus. The inventor remarks, with respect to the engine above described, that no alteration or arrangement of parts will be positively necessary when the apparatus is to be applied for the purpose of forcing air, as in the blast engine, or for pumping water or other fluids, the

induction passage being in communication with the fluid to be pumped or forced, and the eduction passage in connection with the receptacle into which the fluid is to pass; for which the patentee claims, first, the construction of an engine to be worked by steam, air, gas, or vapours, consisting in the operation of the eccentric cylinder or cylinders, in combination with the stationary stop or stops; such cylinder or cylinders being capable of turning on their own axes, and performing the motion above described; secondly, the like arrangement of apparatus for the purpose of raising or forcing water, air, or other fluids.

SPECIFICATION enrolled 7th October, 1842, of a PATENT granted 7th April, 1842, to THOMAS CLIVE, of Birmingham, iron founder, for "*certain improvements in the construction of candlesticks.*"

THESE improvements consist, first, in the construction of a new apparatus, or "push up," for raising the candle in the socket of a candlestick; and secondly, in the combination of this new push up with an elastic holder, for holding the candle securely in the candlestick, for which (in part) a patent was granted to JAMES BARLOW, of Birmingham, on the 25th of April, 1839.

This new apparatus or "push up," consists simply of a disc, which forms a base for the candle to rest upon, and has a vertical rack attached to its under side; a transverse shaft passes through the cylindrical part of the candlestick, having a pinion fixed upon it, which takes into the teeth of the rack: by turning round a knob fixed on the end of the shaft, and projecting from the side of the candlestick,

the push up will be raised or lowered as may be required. It will be evident that this push up can be effected with a rack and pinion in a variety of ways, of which several are shewn in the drawings.

The elastic holder, which is to be rivetted or otherwise affixed to the upper part of the push up, consists of a thin plate of metal cut out in the form of a star, the points or ends being turned upwards so as to approach each other; and on inserting a candle, the same will be held by the ends of the plate pressing against the side of the candle.

The patentee claims as his invention, any push up in which a rack and pinion are used, of whatever form and however placed; and also the methods described in the Specification of giving motion to the rack and pinion.

SPECIFICATION enrolled 7th October, 1842, of a PATENT granted 7th April, 1842, to JOHN ANTHONY TIELENS, of Fenchurch Street, in the city of London, merchant, for "*improvements in machinery or apparatus for knitting*." Being a communication.

THIS machine, which is of a cylindrical form, is to be suspended from the roof or ceiling by a vertical shaft, and consists principally of four circular plates, placed one above the other, to which the minor parts of the machine are connected. The first or upper plate, together with the vertical shaft, remains stationary, and is termed the "support plate," having certain other parts of the machine or apparatus attached to it. The second, which is called the needle plate, has arranged round its circumference a number of needles, affixed so as to form radial lines; this plate works loosely on the shaft, and receives

a rotary motion by means of a pair of bevil wheels, one of which is fixed to and revolves with the plate; and the other is keyed on the end of a transverse shaft, having at its opposite end a handle. The third plate, which is connected by means of vertical bolts and revolves with the second, is provided with a number of radial slots cut through it, near its circumference, and is called the "comb plate;" this plate is for the purpose of supporting in a vertical position a number of jacks or sinkers, which work through the slots of the plate and between the needles. The fourth plate also remains fixed to the vertical shaft, and is provided with a circular projection, having undulations or inclined planes in its edge, which cause the sinkers to move up and down in a vertical direction, their position being maintained by the slots in the comb plate; from the circumstance of these sinkers (which are carried round by the two revolving plates) moving with their lower end on the undulated projector, which cause them to rise and fall, this plate is termed the railway plate. These sinkers have also an outward motion, which is effected by certain cams, suspended by bolts from the upper or support plate, so as to press against their back or inner circular edge, thus causing them, as they are carried round, to move outwards; and, for the purpose of forcing them back to their original position, two helical springs are bound round, or caused to encircle the whole series of sinkers. From the above description, it will be observed, that on giving a rotary motion to the machine, the sinkers or jacks will, besides having a rotary motion, be caused to move up and down between the needles, "which revolve with them," and also backwards and forwards between such needles.

The threads for forming the work enter the machine by four trumpets, or conical tubes, and are conducted under

the hooks or notches of the sinkers, and laid along the needles; during the motion of the sinkers, and when descending one of the inclined planes of the railway plate, the front notch of the sinkers taking hold of the thread which is drawn so as to form a loop hanging between the needles, and at the same time these sinkers are pressed forward between the needles by coming in contact with one of the cams placed behind them, by which means the loop is brought towards the end of the needles and under the beard or back of such needle; when the sinker comes in contact with the opposite incline of the railway plate, it will be raised, and having at this time passed the highest part of the cam, it will, by means of the helical springs, or a suitable projection, be forced back: during the upward or rising motion, the sinker will be raised out of the loop, but on being pressed back as aforesaid, another part of the sinker takes hold of the work, and draws it from under the beard or beak of the needle, which is then closed by being brought under the edge of a circular revolving presser plate; at this moment, the sinker comes in contact with another cam, which gradually forces it outwards, and forces the work over the beard of the needle, which has before been stated to be closed by the circular pressure plate, and in this manner the loops are formed; and the sinker ultimately presses the loop of the work over the end of the needle, and over a loop which has just been formed, and which loop remains at the end of the needle until another by the next two needles is made; and when the work is thrown over, the sinkers are pressed back to their original position by the helical springs.

The claims are, first, the peculiar arrangement of mechanism, or combination of parts, for performing the operation of knitting or producing looped work; secondly, the arrangement and construction of the needles, which

are placed radially round a circular plate or disc, and the application of such plate for the production of knitted or looped fabrics; thirdly, the construction of the comb plate, railway plate, and sinkers; fourthly, the peculiar arrangement and combination of the circular disc and wheel for closing the beak of the needles, &c.; and also the peculiar mode of fixing and removing the needles employed in knitting by machinery.

SPECIFICATION enrolled 8th October, 1842, of a PATENT granted 8th April, 1842, to MARC CARLOTTI, of No. 3, Little Argyll Street, Regent Street, in the county of Middlesex, gentleman, for "*certain improvements in the construction and manufacture of boots, half boots, shoes, clogs, and galoches.*"

THIS invention consists, first, in the introduction and concealment of wooden soles between the outer leather sole and lining of boots, half boots, shoes, clogs, and galoches, and has for its object the better protection of the foot from damp, and combines both lightness and economy of wear and tear, and at the same time dispenses with the necessity, or nearly so, of sewing the sole and the vamp, and the various pieces of the sole together, and presents the appearance of leather; and, secondly, in an improved construction and arrangement in the manufacture of clogs and galoches, having for its object the superseding of ancle straps, buckles, or any other fastening across the instep or ancle, and enabling the wearer to introduce and remove his foot, and to fasten on the clogs or galoches, or loosen them without the application of his hands or the necessity of stooping.

The improvement in this part of the invention consists in the employment of a sole of wood either in one or two parts, that is to say, a toe and heel piece; if the latter be used, the two parts or pieces are to be joined together, or connected by an intermediate piece of leather which is to be nailed to the corresponding ends of the two pieces; the vamp, if for boots or shoes, or the toe and heel pieces, if for clogs or galoches, are then adjusted round the circumference of the wooden sole; and when the toe and heel piece are connected by means of a piece of leather in the manner described, the corresponding edge of the vamp and such connecting pieces are to be stitched together. A piece of leather from one-inch to one-and-a-half inch wide, according to the thickness of the wooden sole, is then to be nailed round the sole, or if in parts round the toe and heel piece, the edge of such piece of leather being level with the bottom edge of the wooden sole, so that the other part of the leather may cover a portion of the vamp; and upon the piece of leather thus attached is nailed a thin piece or ribbon of metal; the leather is then turned down, and drawn tightly over the lower edge of the sole and nailed to the underside, so as to give the edge of the wood the appearance of leather; the leather sole is afterwards nailed on to the sole prepared in the manner just described.

The improved arrangement and construction of clogs and galoches consists, firstly, in the use of one or several springs placed one over another; these springs are placed in a recess formed along the inner or upper surface of the sole of the clog or galoche, that is to say, of such as have a divided tread, the springs being held at each end by two metal plates, beneath which they play freely in a longitudinal direction; and, secondly, in the application of a thin metal half circle, which is introduced within the project-

ing heel of the clog or galoche, which half circle is fastened by each end to the sides of the projecting heel by means of two pins or rivets upon which it works; to the centre of the lower part of this half circle is fixed a small curved spring, the arrangement being such that when the foot is introduced into the clog, the half circle will be pressed upwards against the heel of the boot or shoe. There are other modifications of the application of this half circular piece for the purpose of holding the clog firmly to the foot; and in order to remove these clogs or galoches from the feet, it is only necessary to press with the toe of the other foot upon a little stud or projecting piece attached to the curved spring.

The patentee in conclusion says, "I do not claim as any part of this said invention so much in the above description as relates to the employment or use of wooden soles or of vamps for boots, half boots, shoes, or galoches, or toe and heel pieces for clogs, or as relates to the construction, employment, or use of the springs or studs, or knobs fixed to the heels of clogs or galoches themselves when furnished only with the springs, but I do claim all else that is hereinbefore described, and that, whether the same is employed together or separately, having the same object."

SPECIFICATION enrolled 13th October, 1842, of a PATENT granted 13th April, 1842, to WILLIAM FALCONER, of Clapham Common, gentleman, for "*improvements in apparatus for attaching buttons and fasteners to gloves and parts of garments.*"

THE first part of these improvements relates to certain fasteners for gloves, and consists, first, of two small square

plates, attached together so as to form a hinged joint by means of two small projecting studs rivetted to two corners of the bottom plate; these studs pass through openings or holes in the upper plate, which allow the two plates a little play, and to separate; the bottom plate has also a screw in its centre which passes loosely through a hole in the other plate, and by screwing on the button, which is provided with a female screw passing through the centre or shank, the two clamps or plates will be bound together, so that on placing the edge of the glove between the two plates, the inner surfaces of which are roughed, the button will be held securely, and can be removed to any part of the glove, so as to make it when buttoned fit tight to the wrist of the wearer. The second part also relates to certain fasteners for gloves, and consists of a button made at the shank with an extended surface in the form of a disc, in the centre of which there is a female screw, which receives a screw having a flat round head: for this description of button, a hole is required to be made through that part of the glove to which the button is to be fixed, in order to allow the screw to pass through into the button; by this arrangement it will be seen that such part of the glove is held between the two discs of metal. This mode of affixing buttons to parts of garments is also shown as applied to a covered button; in both cases the inner surfaces of the discs are made rough by forming points or projections thereon, for which the patentee claims, firstly, the mode of fastening buttons or fasteners to gloves and parts of garments by means of the button pressing together two clamping surfaces; and secondly, the mode of attaching buttons to gloves and other parts of garments by forming "roughings," points, or projections at the stems or shanks, or to discs or enlargements formed on or fixed to the ends of the stems or

shanks of buttons, there being a disc fixed to one end of the male screw which enters the stem or shank of the button, which disc is suitably prepared for holding the material to which it is affixed between the two surfaces.

The third improvement relates to fastenings for trowsers' straps; for this purpose the patentee provides a narrow plate of metal about two inches long, having a button projecting from one side, and in the middle of the plate, which is also made rough, or provided with projections at its lower edge, so as to prevent it, after being introduced into the seam, from moving out of its place. In the seam at the bottom of the trowsers' leg, and in the inside, is made a hole similar to a button hole, sufficiently large to admit the narrow plate of metal, together with the projecting button; the plate, after being pushed through along the seam, is then drawn half way back until the projecting button comes opposite the hole; it is then drawn through so as to serve as a button for the purpose of fastening the strap; the plate may be bent a little, so as to suit the curvilinear form of the trowsers, and it will be seen that the plate applied in the manner described can be easily removed from trowsers which require washing, and the plate extending on each side of the button will have the effect of drawing the trowsers equally straight, as if more buttons were used. There is another application of this principle, wherein the plate with the button is attached to a piece of leather, and such piece of leather, together with the plate, is stitched to the trowsers; and also where plates are used having a cavity in their edge, for the purpose of receiving the button stitched to the ends of the trowsers' straps, for which the patentee claims the mode of attaching buttons or fasteners by means of plates in the manner described, whether the straps referred to are applied or not.

SPECIFICATION enrolled 15th October, 1842, of a PATENT granted 15th April, 1842, to THOMAS RICHARDS, of Liverpool, in the county of Lancaster, bookbinder, for "*certain improvements in the art of bookbinding, and also in the machinery or apparatus to be employed therein.*"

THESE improvements consist in the application of machinery for the purpose of sewing, weaving or binding a number of sheets of paper together, so as to form a book, and also in a peculiar arrangement of machinery, consisting of a table sliding to and fro on the edge of the frame, in order to supply the sheets of paper separately into the machine; and also in certain needle bars or holders for presenting the needles with the threads for stitching the sheets as they are consecutively delivered to the machine, and, by certain arrangements of mechanism, a series of holding fingers or pincers advances and takes hold of the needles and draws them through the sheet of paper, and afterwards returns them to their respective holders.

The sheets intended to be bound together by this process are to be folded, and introduced into the machine singly, that is to say, they are not folded one within another, nor are several sheets stitched through at one and the same time; but the single sheets are prepared for the machine by introducing a piece of gummed thread between the fold, and nearly the whole length of the fold, the two ends of the gummed thread being passed through the sheet within a short distance from the top and bottom of such sheet.

The machine consists of three longitudinal shafts, which give motion by means of cams, eccentrics, &c., to the

several parts of the machine, the principal features of which are the horizontal sliding table upon which the sheets of paper are placed; and a series of needle holders, which have also a horizontal movement, and a longitudinal bar, which moves by means of two eccentrics in vertical V grooves cut in the frame sides; this bar is provided with a series of holding fingers or pincers composed of a number of vertical steel springs attached to the bar; in front of these springs is a bar having one portion of its circumference flat; the object of which is, that when such part is turned towards the series of springs, such springs will not be acted upon, but on turning the round side towards the springs, such springs will then be pressed against the lower edge of the bar upon which they are affixed, so as to form a series of pincers or holders for drawing through the needles, after which certain arms or levers take the sheet having the threads passed through it, and place it upon a table which is below the sliding table. Motion being communicated to the machine by means of a treadle, in the same manner as a foot lathe, or by any other means, a sheet of paper, folded in the manner described, is placed on the sliding table, which moves in a horizontal direction towards the needle holders, which support the needles, together with their threads in a vertical position; the table having arrived at a certain point, the needle holders advance, so as to be brought underneath the folded edge of the paper; at this moment a longitudinal bar takes hold of the edge of the paper and presses it upon the points of the needles, when, by means of the two eccentrics, the longitudinal bar, with its series of finger holders is lowered over the points of the needles, the flat sided bar being partly turned round, the series of springs will be compressed in the manner described, and thus hold the needles, which are by the upward motion of the

slide drawn through the sheet of paper, which is afterwards taken hold of by means of a pair of levers or arms, and drawn over the suspended threads and placed on a horizontal table, and in this manner the sheets are stitched and laid one upon another. It must be here observed, that there are two sets of needles and needle holders to this machine, each set of needle holders advancing to stitch through every alternate sheet; it is by this arrangement, that what the patentee terms "weaving" the sheets together, is formed, and constitutes one of the principal features of the invention. For the sake of illustrating this part more clearly, suppose one set (called the first set) of needles to be threaded with black thread, and the other or second set with white thread. On setting the machine to work, the first set advances and stitches the paper in the manner before described; the needle holders, after the needles have been returned to them, recede, and on the next sheet advancing, by means of the table, the second set of needles, or those with white thread, advances to stitch the second sheet, which is carried away in the manner described and laid upon the first; the next sheet brought by the table is stitched with the first set of needles, having the black thread, and in this manner they advance to stitch every other sheet, the threads passing over the folded edge of the intermediate sheets, thus forming, with the cross or gummed threads which are within the fold, a complete woven fabric; the vertical or needle threads constituting what may be termed the warp, and the cross or gummed threads the weft. When the sheets have accumulated in sufficient number to form a book, they are ready to be submitted to the subsequent operation of boarding and finishing, the threads being left long enough to form a substitute for the end papers commonly employed to secure the boards to the back of the book.

The patentee does not confine himself to the mechanical arrangements, as others may be substituted without deviating from the object of the invention.

SPECIFICATION enrolled 15th October, 1842, of a PATENT granted 15th April, 1842, to ALFRED JEFFERY, of Lloyd's Street, Pentonville, gentleman, for "*a new method of preparing masts, spars, and other wood, for ship building and other purposes.*"

THESE improvements consist in a new mode of preparing masts, spars and other wood for ship building, and also for other purposes, by the application of a glue, which is insoluble in water, and more elastic than the ordinary prepared glue, and is called by the patentee "Jeffery's marine glue," and which is made with a preparation of caoutchouc: such glue may also be made without the application of caoutchouc. When the glue is made with caoutchouc, the patentee prepares a solution of what he calls "my" or "Jeffery's crude naphtha caoutchouc solution," and which consists of caoutchouc of the best quality, dissolved in coal naphtha, commonly called crude naphtha, in the proportion of one pound of caoutchouc to four gallons of the crude naphtha; the caoutchouc is to be cut into shreds or strands, and the mixture occasionally stirred, which will take from ten to twelve days in dissolving. In making this improved marine glue with caoutchouc, the patentee takes one part by weight of the crude naphtha caoutchouc solution, and two parts by weight of gum lac or shell lac, preferring the latter; this mixture is put into an iron pan, having a tap at the bottom, and heat applied either by hot water, steam or

fire, and by frequent stirring, the compound becomes amalgamated; it is afterwards to be drawn off by means of the tap, on to a slab and allowed to cool, after which it may be cut into pieces ready for use.

To make marine glue without caoutchouc, the patentee mixes one part by weight of coal naphtha, called crude or rough naphtha, and two parts by weight of gum lac, or shell lac, (preferring the latter) and proceeds to mix them in the manner before stated with respect to making glue with the crude naphtha caoutchouc solution.

The patentee adds, that the proportion mentioned for making the marine glue for ship building and other purposes may be varied; for instance, a larger proportion of lac may be used to produce greater hardness in the glue, and where the material to be prepared is to be exposed to greater atmospheric action: or a larger proportion of caoutchouc solution may be used, (when the glue is made with caoutchouc) to give it greater elasticity.

To prepare the glue for use, it is to be put in an iron vessel and heated by fire to about 250° Fahrenheit; the melted glue is then to be laid over the surfaces with a brush, care being taken that they are perfectly dry; the two surfaces are then placed together and pressure applied in the usual way; it will be found that the temperature of the glue, after being laid on the surface, will decrease quickly, in which case irons heated to about 140° Fahrenheit may be applied, and the joining cramped in the ordinary manner.

The patentee claims as his invention the use or application in preparing masts, spars, and other wood for ship building and other purposes, of glue insoluble in water and more elastic than glue in ordinary.

SPECIFICATION enrolled 17th October, 1842, of a PATENT granted 18th August, 1842, to WILLIAM RAYBOULD, of St. James's Walk, Clerkenwell, in the county of Middlesex, brass-founder, for "*a new or improved soldering iron.*"

IN the ordinary mode of making soldering irons the copper head is fastened to the shank by means of rivets, and the handle by which the workman holds the tool is fixed and stationary: so that a great number of tools of different lengths and sizes are required for different descriptions of work.

These improvements consist, first, in affixing the copper head of a soldering iron to the shank, so as to be easily removed: for this purpose the shank is made in the same form as in the ordinary construction, with this difference, that the patentee employs screws to fasten the copper head thereto, in place of rivets as heretofore, the object of which is to facilitate the removal of the head when required; and secondly, in place of boring the hole only partly through the handle, and fixing the same stationary to the shank, the patentee bores the hole wholly through the handle, and lines it with iron or other metal, so that it may slide freely on the shank. In order to fix it in any required place, a thumb screw is passed through the hoop of the handle, which, on being tightened up, binds against the shank; and by this arrangement the length of the soldering iron can be altered as may be required.

The claim for these improvements is the method or methods of readily fastening and unfastening the copper head to and from the shank of the soldering iron, in the manner described, or any other mechanical means which may be adapted to the purpose.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to KENT KINGDON, of Exeter, in the county of Devon, cabinet maker, for "*certain improvements in impressing and embossing patterns on silk, cotton, and woven or felted fabrics.*"

THESE improvements consist, first, in producing, by means of flock, a raised or embossed pattern on any unprepared surface of woollen, cotton, and other fabrics; and secondly, in the use and application of a solution of india rubber, which renders more perfect and durable the raised or embossed part produced by the flock; and thirdly, in the employment of a solution of india rubber spread over the surface of linen, wool, silk, or cotton; which solution, by preventing absorption, admits of a gold size being spread on the surface, and thereby enables the cloth to be gilt or bronzed. The cloth prepared in the above manner is to be embossed by passing it between cylinders in the ordinary manner. In order to produce embossed surfaces on cloth, the patentee takes, for instance, a piece of woollen damask quite plain, and impresses thereon, by means of a wooden or other block, the pattern required, with a solution of india rubber. When this is dry, he prints flocking varnish over the india rubber with the same or a similar block, and afterwards dusts the flock on the varnish; and when dry, the flock, by adhering to the varnish, forms the pattern required. If the ground is intended to be gilt or bronzed, the patentee takes a piece of thin calico and covers it entirely with a solution of india rubber; after it is dry, he spreads over it a coat of gold size made in the usual way, which may either be gilt or bronzed, and the embossing produced by passing the gilt

or bronzed cloth between engraved surfaces; and if it is wished to form a pattern in flock, he proceeds in the manner before described: for which the inventor claims, first, the use of flock for the purpose of forming embossed or raised figures or patterns on unprepared surfaces of woollen, cotton, and other fabrics; and secondly, the application of india rubber to the surfaces of linen, woollen, silk, and other fabrics, which, by preventing the absorption, enables either the flocking varnish or the gold size to be applied so that the surface can be bronzed or gilt and embossed in the usual way, and afterwards flocked if required.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to WILLIAM NOEL, of Jermyn Street, St. James's, in the city of Westminster, boot and shoe maker, for "*certain improvements in the manufacture of boots and shoes.*"

THESE improvements consist in giving greater elasticity or flexibility to boots and shoes, by the application of metallic springs between the in-sole and out-sole, so that during the action of walking the foot will have greater freedom and easiness of motion; and further, the insertion of shank pieces, for the purpose of giving greater stiffness to the "waist," is rendered wholly unnecessary. The description of spring used for this purpose is a well tempered piece of steel, slightly curved, and covered with paint to protect it from rust; and in manufacturing a boot or shoe according to this invention, the patentee says, "I take the sole down, from the joints backward to the heel, quite thin, leaving the leather all its substance to be placed under the heel; the spring is then fastened at one

end to the back part of the sole under the heel by means of pins or rivets, and the other end of the spring, which extends half way between the heel and toe of the boot or shoe, is left loose; the spring thus fastened at one end is allowed some play between the in-sole and out-sole, it being one essential feature of the invention that the spring shall be fixed at one end, so that the play before referred to may take place." Although the inventor prefers to fix the spring in the manner described, yet such spring may be fastened by pins or rivets in the middle, so as to leave it at liberty at both ends: for which he claims, the improvements in the manufacture of boots and shoes by the use and application of metallic springs, in the manner described.

SPECIFICATION enrolled 21st October, 1842, of a PATENT granted 21st April, 1842, to ALPHONSE DE TROISBRIOUX, of Great Russell Street, Bloomsbury, gentleman, for "*improvements in lithographic and other priniing presses.*"

THIS invention consists in the construction of a press, and in the peculiar arrangement and combination of parts and apparatus connected therewith, for the purpose of obtaining impressions from cylinders of stone and other suitable materials; as for instance, a metal cylinder, or a cylinder covered with metallic plates, the pattern or device being drawn and arranged on the surface of the cylinder by any of the known methods. The patentee then proceeds to describe the construction of a press, and the arrangement of parts which has been found to answer extremely well.

Plate.—Fig. 1, represents a front elevation of a double

Fig. 1.

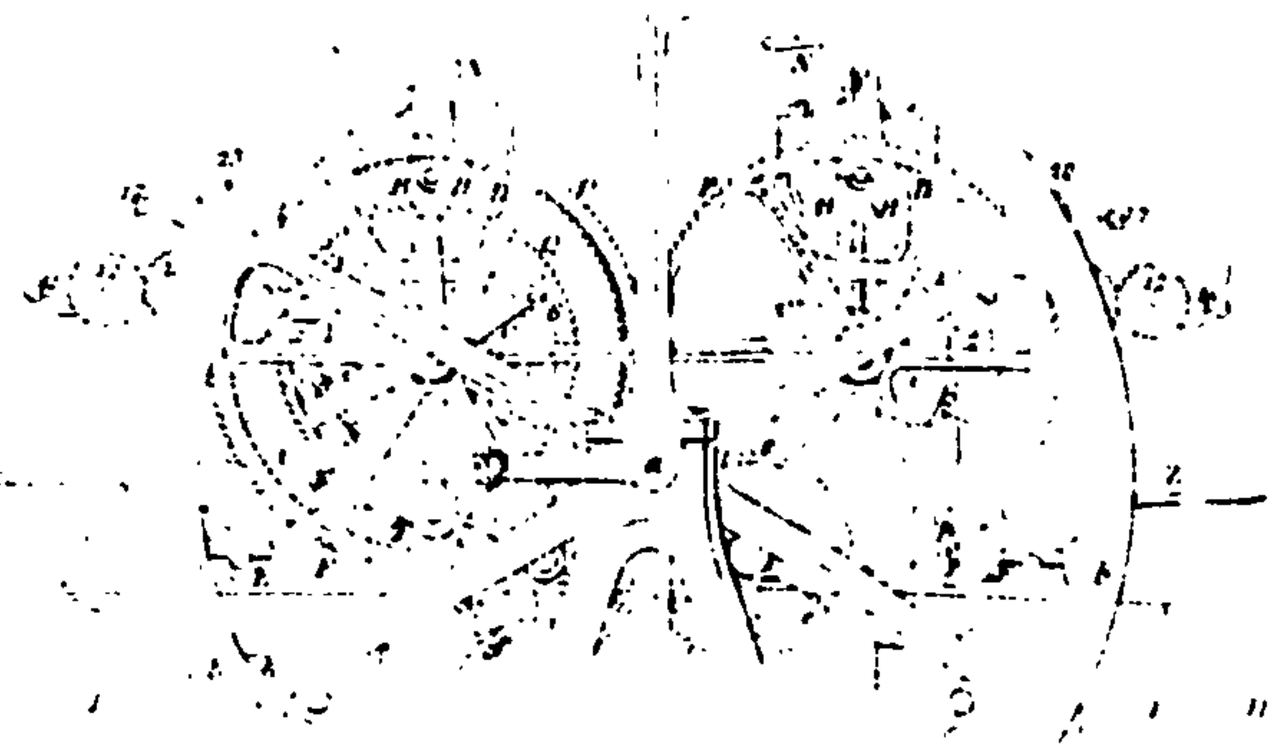


Fig. 5.

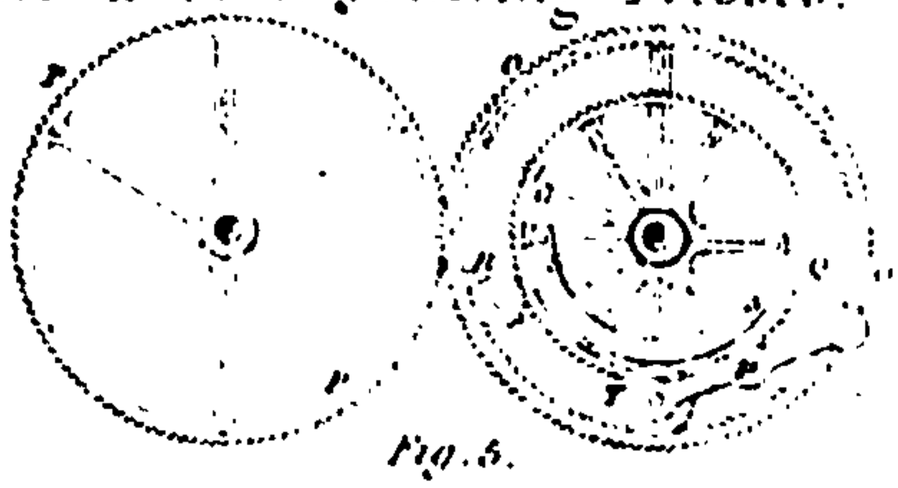


Fig 6.

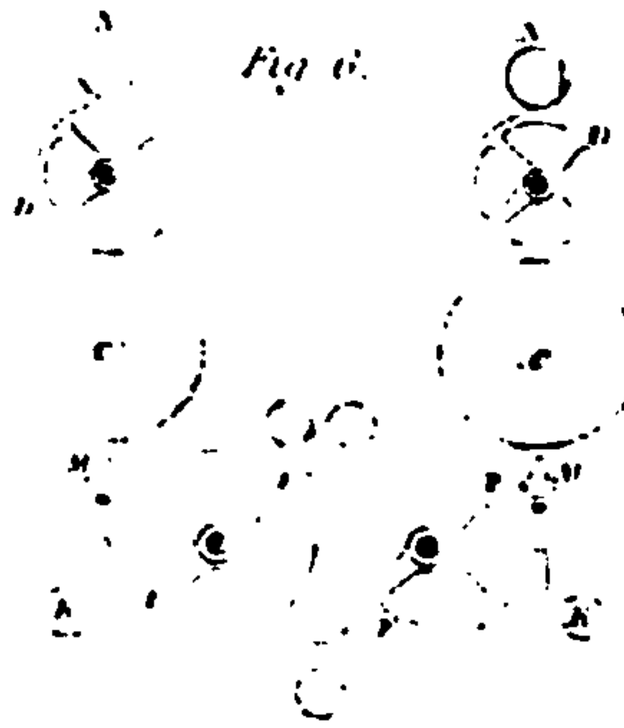


Fig 3

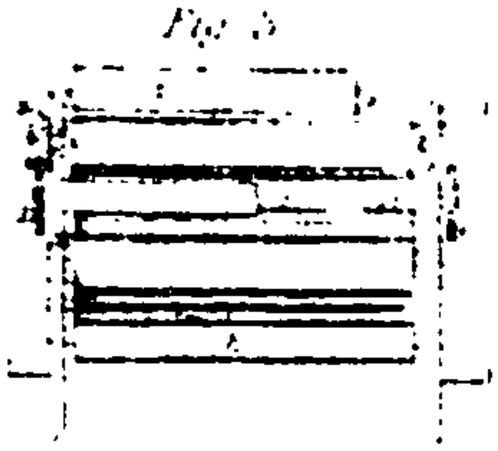
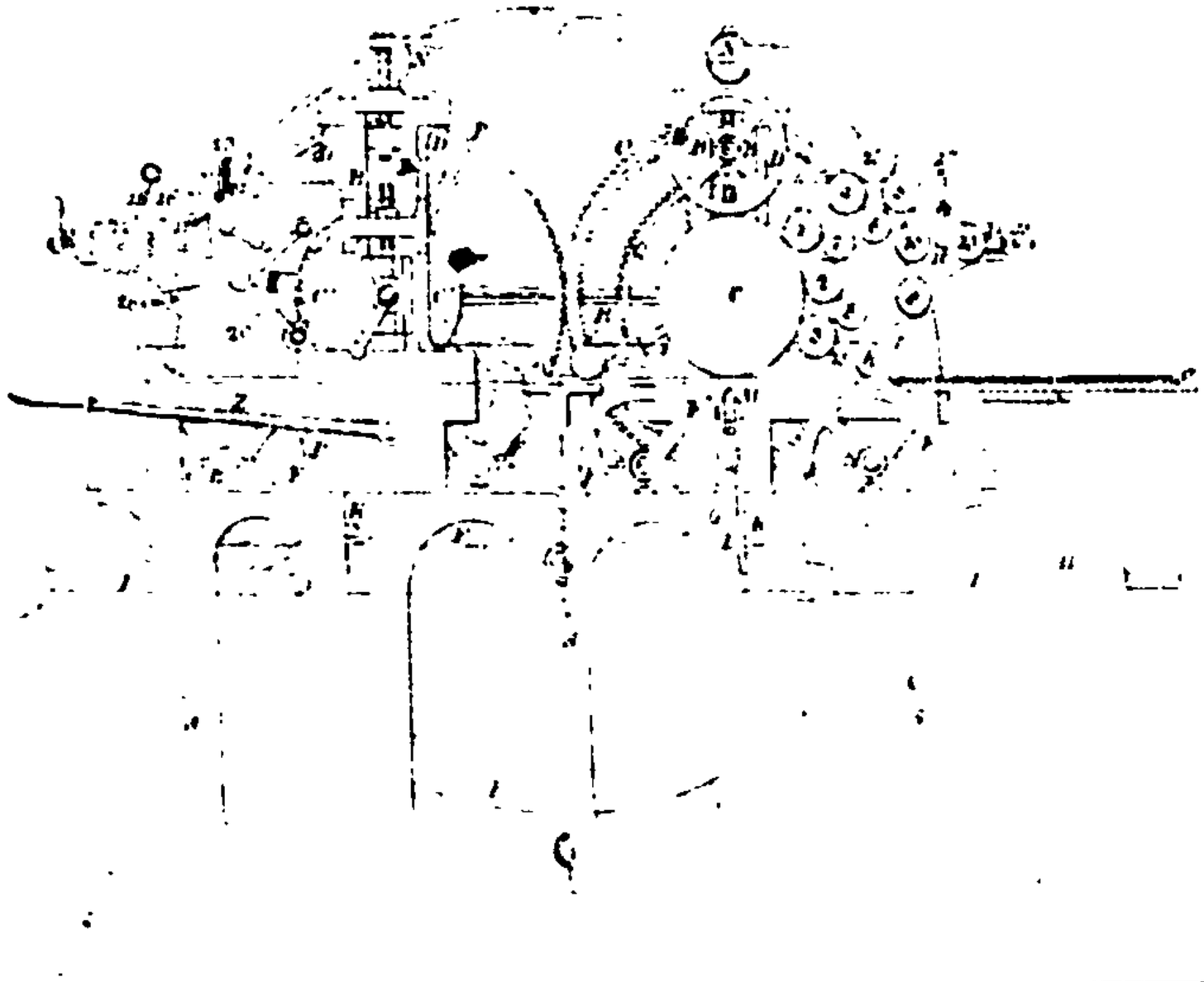
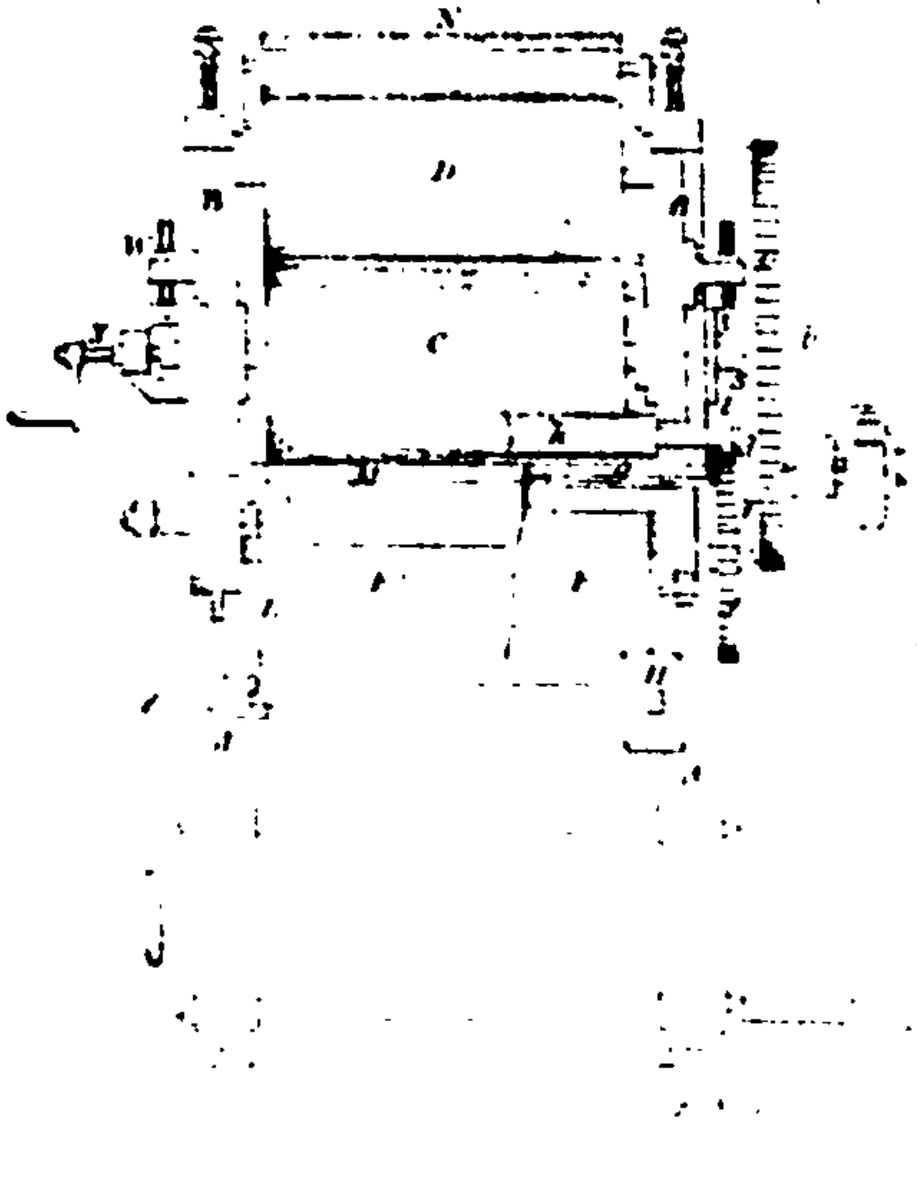


Fig 4





acting lithographic printing press, one half thereof being in section.

Fig. 2, an end view of the same.

Fig. 3, an end view of the inking apparatus.

Fig. 4, a back elevation of the driving gear.

Fig. 5, a detached elevation of the regulator.

Fig. 6, a detached longitudinal section, taken through the several cylinders, by which the course of the sheet of paper is clearly represented, together with the relative position of the cylinder.

A A, the frame of cast iron, at the upper part of which standards B B are securely bolted, slots being formed therein for carrying the stone cylinders C C*, and damper cylinders D D; E E, plummer blocks or bearings, for supporting the hollow cast iron cylinders F F; around these cylinders an endless band or skin G passes, and turns continuously therewith, the same being kept in contact by pressure from the adjustable weight H, placed upon one end of the lever I, the other end thereof pressing against the tension roller K; L, a jointed link, one end of which is connected to the aforesaid lever, and the other end to the scraper M, which extends across the whole breadth of the skin or band; this scraper forms an important feature in these improvements, as the correctness and clearness of the print depends entirely upon the proper working of the same. The band which has hitherto been used is of calves skin, and the part of the scraper in contact with the band is made of hard wood, as ebony, placed between two plates of metal, as seen in Fig. 6. When the pressure is applied to the scraper, the skin or band G will be brought into close contact with the stone cylinders C C*, and as the band advances, the friction between the surfaces of the band and stone cylinders, which are kept in forced contact, will cause the stone cylinders to revolve upon

their fixed axes; motion will then be imparted to the damper cylinders D D, which are in contact with the stone cylinders, and from thence to the metal cylinders N N, which are in contact with the damper cylinders. The metal cylinders N N contain water, and have small perforations in the direction of their length, through which the water passes, an arrangement being provided for regulating the quantity of water supplied to the damper cylinders D D. The damper cylinders are covered with a woollen cloth, which absorbs the water, and distributes the same uniformly upon the stone cylinders. 1, 2, 3, three inking rollers, around which an endless band or skin passes, and is kept in contact with the surface of the stone cylinder, which revolving, imparts motion thereto, the endless band or skin passing over a series of rollers 4, 5, 6, 7, 8, 9, and communicating with a roller 10. Upon the axis of this roller, a toothed wheel 11 is keyed, taking into a corresponding wheel 12 fixed upon the axis of the roller 13; this roller is in direct communication with the trough 14, containing the printing ink. To regulate the quantity supplied to this roller, adjusting screws 15, 15 are caused to act against the back of the trough, by the withdrawing or advancing of which, the quantity of ink is regulated. 16, a forked lever, the upper extremity of which is mounted upon studs 17, 17 situated at each side of the frame; 18, a small roller, having its axis supported by the lower extremities of the vibrating levers 19 situated at each side of the framing 20, the upper extremities of which are secured upon the rods 17, 17. It will be seen upon referring to the drawing, that the furnishing roller 18 is about one-fourth of the diameter of the rollers 10 and 13, for the purpose of disposing readily of the ink; and as the supply thereof is only required at intervals, this roller 18 is caused to rock or vibrate by pins 21 and 22 suitably

placed against the inner surface of the toothed wheels 11 and 12; and it will appear evident, that upon motion being imparted to these wheels, the pins fixed thereto will be brought into contact successively with the prongs of the forked lever 16, when the necessary rocking or vibrating motion will be produced. 23, a roller, which takes its bearing upon the rollers 4, 5, being for the purpose of uniformly distributing the ink upon the skin or band; this is effected by pins being fixed against the outer surface of the toothed wheels 11, 12, pieces of cord being attached thereto, pass over pullies 24, 24, and are made fast to the ends of the roller 23; whence as the wheels 11, 11 revolve, the pins which actuate the roller being placed in opposite directions, and at opposite sides of the machine, will have the effect of sliding the same across the surfaces of the rollers (and skin) 4 and 5, and uniformly distributing the ink thereon, a knife 25 being situated at the underside of the skin or band for removing the superfluous ink. 26, a screw, having a lever attached thereto, for causing tension of the skin or band when necessary—the roller 2 having a similar arrangement for the same purpose. *a*, the main driving shaft, upon which is keyed the fly wheel *b*, for equalizing the motion of the machine; upon one end of this shaft a winch *c* is fixed; power being applied thereto, imparts motion to a pinion *d* fixed upon the other end of the driving shaft; this pinion takes into a spur wheel *e* keyed upon the axis of the hollow cylinder F*, and gearing into a corresponding wheel *f*, imparts motion thereto.

The operations of the machine are as follows:—The paper being placed upon the table *g* in a fit state for printing, the roller *h* being previously raised, (by an arrangement hereafter described) the workman introduces the sheet of paper, when by the depression of this roller,

which is provided with endless tapes, *i i*, passed around a portion of each extremity thereof, the paper is firmly held and advanced (in the direction of the arrows) by the endless skin or band G, motion being imparted thereto as hereinbefore described, when by the pressure of the lever I, the scraper will be brought into close contact with the underside of the band, by which the paper will be firmly held, and uniformly pressed against the stone cylinder, causing the same to revolve, and consequently taking the impression therefrom. This being done, the sheet is then conducted in the direction of the arrows until it is brought into contact with the stone cylinder C*, when the pressure being applied to the scraper M, the verso is obtained; but in order that the sheet may come right for the verso, spur wheels O P connected to the stone cylinders at *a*, are employed, which being of corresponding diameters, ensure a perfectly uniform and similar motion of the stone cylinders, which are likewise of corresponding diameters. To regulate the band which conducts the paper to be printed, a spur wheel Q is employed; this wheel revolves loosely upon the same axis as that upon which the spur wheel O is keyed, and is driven by a pinion R, which receives motion from the wheel O, as represented by the drawing. S, a cam, fixed to the arms of the wheel Q; this cam is caused to act against a friction roller T, situated at one end of the vibrating lever U, having its fulcrum at V, the other end of which carries the axis of the receiving roller *h*; it will appear evident, that as the wheel Q revolves, the cam will act successively upon the friction roller T, by the raising and depressing of which the necessary motion is obtained. In order that the stone cylinders may be used as their diameters become reduced, the same may be lowered by means of the screws and nuts W W*, a screw X being situated at the end of the fixed axis, around

which the cylinders revolve, screws Y being employed for adjusting the damper cylinders. The machine, as represented in the drawing, and as above described, is a double printing press, that is, both sides of the paper or substance to be printed receive the impression during the passage of the said paper or substance through the press; but it is evident that the machine may also be used as a single press, that is, one cylinder only being printed from.

The arrangement above described may be applied to printing several colours, either from the same or different cylinders, without departing from the principles of the above invention, of communicating motion to the printing cylinder by the forced contact of a band in motion, and of imparting motion from the printing cylinder to the other parts of the apparatus. The arrangements hereinbefore described are adapted more particularly for printing from the surface of the cylinder, but the several arrangements and principle of the said improvements will also serve as a press for printing from engraved cylinders, the damper cylinder being removed, and the well known apparatus for washing and cleaning the cylinder, according to the process of calico and other printing, being supplied.

The patentee states, that he is aware of stone cylinders, with axes passing through them, having been attempted to be used before for the purposes of lithography, but such attempts have, he believes, failed: he does not therefore claim the exclusive use of stone cylinders for lithography, in whatever manner the same may be applied; nor does he claim the exclusive use of any of the several parts hereinbefore described, except when such several parts shall be employed for the purposes of the said invention, as above described and hereinafter more particularly mentioned; but he claims—firstly, the exclusive use, for the

purpose of lithographic printing, of a cylinder of stone, moveable on pivots, and receiving and communicating motion as above described; secondly, the exclusive use of the apparatus, or general combination and arrangement of parts herein described, for the purposes of printing; thirdly, the exclusive use, for the purpose of printing, of the arrangement herein described, whereby the printing cylinder receives its motion from contact with the surfaces to be printed; fourthly, the exclusive use of the arrangements herein described, whereby the printing cylinder is made to receive and communicate motion to the apparatus for transferring the ink or colouring matter to the printing cylinder.

SPECIFICATION enrolled 25th October, 1842, of a PATENT granted 26th April, 1842, to SEPTIMUS COCKING, of Birmingham, in the county of Warwick, draughtsman, for "*certain improvements in the production of light, by the burning of oil, tallow, and wax, and in the apparatus for regulating and extinguishing the same.*" Being partly a communication.

THIS invention, in the first place, relates to certain improvements in lamps, whereby the arrangement of tubes for raising and lowering the wick of an argand lamp is such, that the surface of the oil is brought nearer the top of the wick, whereas in lamps of the ordinary construction, the revolving tube, which is supported by projecting wires resting upon the end of an external tube, is shorter than the tube which is surrounded by the wick; in consequence of which the surface of the oil is not brought so near the top of the wick as in the improved lamp; and in

place of attaching the gallery or glass holder to the projecting wires, by turning which the wick is raised or lowered, it is, in this arrangement, quite distinct.

In this improved lamp the wick holder is raised, as in the ordinary argand lamp, by means of two tubes having a spiral and vertical groove, between which the wick is placed. In place of attaching projecting wires for supporting the revolving tube, to which the gallery in the ordinary construction is affixed, the end of the tube is turned back so as to form a flange, which rests upon the end of the outer tube; to the edge of this flange is attached, by soldering or other means, a short tube of sufficient calibre to pass over the external tube, upon the end of which the revolving tube is supported, in the manner described; by turning round the short tube the wick will be raised or lowered, as may be required, for the purpose of regulating the flame; the two tubes between which the wick is placed and the oil conducted, are both of the same height. The glass chimney for this lamp is enlarged at the lower end, by being made conical, and the gallery for holding the same is supported from the tubes which supply the lamp with oil, by two projecting arms, which being in the same plane as the tubes, cast no additional shadow.

Claim, is for the arrangement of gallery and revolver for an argand lamp, by which the surface of the oil is brought nearer the top of the wick than in lamps of ordinary construction; and also for the mode of supporting the glass holder on the tubes through which the oil is conducted to the burner, by which means the bottom part of the glass is kept cool.

Another improvement is for defending the flame from currents of air: for this purpose, the glass chimney is surrounded by a conical glass tube, and both rest on the same

gallery; the annular space in the gallery, formed by the two glasses, is perforated with a number of holes; the air for supplying the flame enters at the top of the conical glass, between it and the glass chimney, and is conducted through the holes in the annular space to the flame, and owing to its circuitous passage, the flame will be protected from sudden currents of air.

Claim.—The arrangement of two glasses for defending the flame from sudden currents of air.

For the purpose of supplying lamps having solid wicks with oil, the patentee constructs the wick holder of two parts. If that part of the lamp which contains the tube for holding the wick is made of a disc of metal a quarter of an inch thick, such piece is dished out, and a hole drilled through the centre of its bottom for holding the tube for the wick, which, when inserted, forms an annular space or cup between the tube and the edge or side of the piece of metal, into which the oil is poured, there being holes made round the exterior of the tube in order that the oil may pass into the lamp; when the lamp is filled, a corresponding piece of metal, with a hole through the centre to allow the tube to pass through, is fitted, by means of a screw cut on its periphery, into the annular space, so as to form a cover or top to that part which contains the tube. Another mode is, by forming two such pieces, fitting one within the other, and having holes made through them similar to a ventilator; so that by turning one piece partially round, the holes in each piece are brought to coincide, and to form openings into the lamp through which the oil can be poured; and by turning the top piece back again, the holes will be closed: the object being, to supply the lamp with oil without the necessity of having an additional hole for that purpose.

Claim.—The mode of introducing oil into lamps having

solid wicks, without the necessity of removing the wick, or having an additional hole in the lamp for that purpose.

The next improvement is, for the peculiar arrangement of a lamp, consisting of three compartments one above another, and having a similar arrangement of glasses to those already described.

This lamp can be made of any form that fancy or taste may suggest. The first or bottom compartment, which is within the base of the lamp, consists of a vessel, having its sides made of india rubber or other flexible material, which can be attached to the upper part of the said vessel and also to the projecting edge of the bottom, by overlapping such parts with the india rubber or other flexible material, and binding the same with cord: the bottom part of this vessel is acted upon by a spiral spring, placed underneath in such a manner as to force it into the upper part of the vessel, and by so doing, expels the air therefrom, which passes from this vessel through a tube into the upper vessel containing the oil. The middle vessel is for the purpose of receiving the oil which overflows from the wick, which is conducted by a tube passing through the vessel containing the oil.

In order to supply this vessel with oil, it will be necessary in the first place to inflate or fill the lower vessel with air, which is done by taking hold of a ring and drawing the bottom of the vessel downwards, where it will be held in that position by a spring catch on each side of the vessel; a plug is then removed from the upper vessel, which is to be filled with oil; the plug being replaced, and the spring catches which hold the bottom of the lower vessel being released, the air contained therein will be compressed, and such pressure will be transmitted through the tube to the surface of the oil, which will be forced up a tube and through a chamber to the wick. In order to

regulate the supply to the wick, a number of discs, of woollen or other cloth, having a small spring between them for the purpose of keeping them apart, are compressed by means of a screw, and forced against an aperture in the chamber through which the oil passes to the wick.

It will therefore be seen, that the object of the lower vessel is to force the oil (by compressing the air in the vessel) up the tube to the wick, the quantity of which is regulated by the cloth discs, in the manner described.

Claim.—The general arrangement of the lamp described.

The last improvements in lamps relate to certain improvements in the fountain lamp. The fountain consists of a cylindrical vessel, moving upon its axis, and having an aperture in its periphery, which is covered by a projecting curvilinear tongue, placed inside the vessel, and when it is required to supply the vessel with oil, it is only necessary to turn it upon its axis till the aperture comes to the top side, when the oil can be poured in; on moving it back to its proper position, the oil will flow from the vessel as it is consumed by the wick. There is another modification of this fountain, which is applied to the argand lamp; in which case the vessel moves upon a hinge joint, which is to be thrown back for the purpose of filling the fountain; and in order to render the oil less liable to fall out when turning the vessel up to its proper position, the patentee employs two projecting tongues or plates, one projecting over the other; for which the patentee claims, the construction of a fountain lamp, having an aperture with a projecting piece as described, whether such fountain be removable from that part of the lamp to which the burner is attached, or connected thereto by a hinge joint or a central axis.

The next part of these improvements relates to certain improvements in candlesticks, by introducing into the

socket a moveable tube, which can be brought to the top of such socket by means of a projecting stud or push up, when it is required to place a smaller candle in the stick, and whereby the same can be lowered when it is required to introduce a candle which is large enough to fit the socket itself. The drawings show a mode of raising a candle in the socket by the application of a tube having a spiral slot cut through it; this tube is connected with the flange or top of the candlestick, and the plate or disc of metal upon which the candle rests moves with the tube; there is also a vertical slot cut through the socket of the candlestick; a stud projects from the moveable part upon which the candle rests, and passes through the spiral slot in the revolving tube, and also through the vertical slot in the socket of the candlestick; it will therefore be seen, that on turning round the collar or flange connected to the top of the rotary tube, that the candle will be raised or lowered in the socket, as may be required; and it will also be seen that the spiral slot may be in the socket and the vertical slot in the rotary tube.

The patentee claims, first, the introduction of moveable tubes within the sockets of candlesticks, so as to render them capable of raising and lowering candles of different sizes; and secondly, the raising and lowering of candles in the sticks, whether the support for the candle is raised or lowered by the stud fixed upon it, working in a spiral slot in the inner tube and a vertical slot in the outer tube, or *vice versâ*.

The patentee in the next place describes an apparatus for supporting candles of different sizes in a vertical position; for this purpose, the projecting flange or top part of the candlestick is formed of two parts, one of which contains a spring made in the form of an ellipsis or oval, having two projecting arms fixed to it in the direction of

its shorter axis, with their ends somewhat hollow or in the form of segments; it will be seen, that on compressing the elliptical spring in the direction of its longer axis, that its shorter axis will be enlarged, and will therefore increase the space between the two projecting pieces, and on introducing the candle between them and removing the pressure, the shorter axis of the spring will collapse and the candle will be held between the two projecting pieces in a vertical position. The other part consists of a plate which fits on the top of that part which contains the spring, so as to cover or inclose the spring; this plate has on each side a piece of metal, which, when in its place, presses on the outside of the spring, and by turning the same partly round, the plates will have the effect of compressing the spring in the manner described. There is another arrangement given, wherein the elliptical spring is acted upon in a direction of its longer axis by means of a screw.

Claim is for the mode of supporting candles in a vertical position by means of arms fixed on an elliptical spring in a direction of its shorter axis, whether the compression of the spring be effected in the manner described or by any other means.

Improvements in snuffers.—The first relates to a novel construction of snuffers, which may be called a vertical cylindrical snuffer; it consists of a cylinder divided about the middle into two compartments, the upper of which contains mechanism for opening and closing the door, and the bottom compartment forms a receptacle for the snuff; a portion of the side of this lower compartment works upon a hinge-joint so as to form a door; to the top and bottom edge of this door is rivetted a piece of curved steel to fit the inner circle of the door; the bottom or lower projecting piece of steel forms, as the door closes, a cutting

edge against the bottom of the compartment. The method of using these snuffers is by taking hold of a handle which is attached to the side of the cylinder, and by pressing with the thumb or finger upon a vertical pin, which passes through the centre of the top of the cylinder, a piece of metal in the form of a wedge acts against the projection fixed to the top part of the door and forces it open; after opening to a certain extent the door is released, and is suddenly drawn to by the action of a spring. There is another modification of this snuffer, the principle of which is the same, the only difference being in the arrangement of mechanism, in which case the thumb-plate, in place of being in the centre of the cylinder, is on one side, but in both cases the thumb-plate is returned to its original position by means of a spiral spring.

The patentee also introduces certain improvements in the common snuffers, which consist, first, in the application of a scraper, actuated by certain arrangements of mechanism, so that when the snuffers are closed the scraper will fall upon the cutting edge, and when in the act of opening them, the cutting edge is drawn under the edge of the scraper, which effectually cleans such edge, and also prevents any of the snuff falling from the snuffers. The second improvement is in the application of a spring for the purpose of pressing the two cutting edges of the snuffers together. There is also an instrument for taking off, in one piece or annular ring, the hard carbonaceous deposit from the wick of an argand lamp, which consists of two small cylinders connected together by a tube, and provided with a handle for the purpose of holding the instrument; the top cylinder contains a spiral spring which acts upon a piston or piece of strong wire passing through the top cylinder through the tube to the bottom cylinder, and having at its end a round piece or disc of

metal; this lower cylinder also contains a number of vertical springs arranged in a conical form; to the bottom end of these springs, or apex of the cone, there is attached (to each spring) a horizontal projecting point similar to a pin point: thus, when the piece of wire is pressed down by means of a thumb-plate, the disc of metal presses out the lower ends of the springs and forces the projecting points through holes formed in the side of the cylinder; it will be seen that, on inserting the end of this instrument (which is made below the projecting points in the form of a cone) into the tube, which is surrounded by the wick, and applying the thumb to the thumb-plate, that the points will be forced through the wick, and on raising the instrument the carbona. eous substance will be removed. The last improvement relates to extinguishers, and consists in the application of two, three, or more tubes sliding one within another, in the same manner as the tubes of a telescope, for the purpose of lengthening the extinguisher when used for extinguishing candle lamps.

The patentee claims, first, the construction of a vertical cylindrical snuffer, in which the door is opened by the depression of a projection or thumb-plate at the top or side of the cylinder in which the door is closed, by the action of a spring; secondly, the introduction of scrapers in the boxes of snuffers, for the purpose of removing the snuff from the cutting edge of a snuffer and preventing it from falling out on the re-opening of the snuffers, and also the use of a spring for forcing together the cutting edge of snuffers; thirdly, the instrument for removing the hard carbonaceous deposit from the wicks of argand lamps; and lastly, the employment of sliding tubes for the purpose of lengthening or shortening extinguishers.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to OTTO ROTTON, of Gracechurch Street, in the city of London, doctor of medicine, for "*certain improvements in machinery or apparatus for spinning cotton, wool, silk, and other fibrous substances.*" Being a communication.

THIS invention of improvements in apparatus for spinning cotton, wool, silk, and other fibrous substances, consists in the peculiar arrangement or combination of machinery, constituting what is commonly called a throstle, the novelty of which is in ranging the bobbins, spindles, or flyers in a circular form, in place of having them in right lines as heretofore; which arrangement or disposition of parts allows of the peculiar mode of driving the bobbins, spindle, and flyers, by means of a friction wheel having a bevilled edge; thus dispensing with the assistance of bands and riggers.

This throstle frame consists of a circular rail constituting the spindle rail, supported by suitable feet or pedestals, the continuation of which above the spindle rail supports the roller beam, which is of a polygonal form. The spindles for this machine differ somewhat from those generally used, in this respect, that the lower end of each spindle passes through a boss formed on the under side of the spindle rail, in which they remain stationary by means of a set screw passing through the said boss which binds against the spindle. The upper part of this spindle is formed with a tubular cavity, which receives another spindle, screwed at its upper end for the purpose of holding the flyer, which is to be screwed upon it; just below the screwed part of this spindle is a collar which rests upon

the tubular edge or end of the outer spindle; by this arrangement the inner spindle supporting the flyer can be made to revolve within the tubular part of the outer spindle, which, as before stated, remains quiescent. One of the principal novelties of this invention is the manner of communicating motion to the bobbins, which revolve and slide up and down on the outer spindle, and is effected in the following manner. In the centre of this circular machine is a vertical shaft, about the middle of which is fixed, by means of a key or binding screw, a horizontal bevilled edge friction wheel, upon which the lower ends of the bobbins, when on the spindles, rest. The bobbins are similar in shape to those in ordinary use, with the exception of the lower end, which is in form like an inverted frustum of a cone, the bevil of which corresponds with the bevil of the horizontal wheel upon which they (the bobbins) rest; it will be seen that on giving motion to the horizontal wheel, which is keyed on the vertical shaft, that the bobbins will be caused to revolve upon the spindles by the friction of contact. The rollers and roller stands are arranged in pairs and disposed in a polygonal form, in order to accommodate them to the circular form and arrangement of the bobbins and flyers upon the circular plate or spindle rail, and the ends of each corresponding pair of rollers, which project beyond the sides of the stands, are formed with teeth similar to bevil wheels, and the teeth of the rollers in the first box or set take into and drive those of the second, and in like manner with the remainder; so that on giving motion to the first box or end rollers, motion will be communicated to the whole series. The creel for holding the rovings is supported by pillars within the circular or polygonal range of the drawing rollers.

The main or driving shaft is in a horizontal position, supported by suitable bearings underneath the spindle

rail; on the outer end is a loose and a fast pulley in the usual manner, and on the other end is a bevil wheel taking into and driving a similar bevil wheel upon the vertical shaft; this shaft is provided with a fixed key, so that it may slide through the wheel for the purpose of raising and lowering the bobbins, as will be hereafter described. Motion is communicated to the series of rollers by a similar pair of bevil wheels at the upper end of the vertical shaft, one of such wheels being keyed on the end of a horizontal radial shaft, which imparts motion to a number of wheels at its extreme end, and through them to the series of rollers.

From the foregoing it will be observed, that on giving motion to the main or driving shaft, by means of a band from any first mover, the central vertical shaft upon which is fixed the horizontal bevilled edge wheel will be driven by the aforesaid bevil wheels, and rotary motion will be given to the bobbins which are ranged round and in contact with the bevilled edge wheel, and the rollers will be drawn by the pairs of bevil wheels and radial shaft in the manner before described. The copping or traverse motion is effected as follows: the bottom end of the vertical shaft rests in a foot step fixed on the end of a lever, which moves on a fulcrum; this lever is caused to vibrate or move up and down by an arrangement of wheels and a heart wheel, by which means the vertical shaft, besides having a rotary motion, will be caused to rise and fall with the end of the vibrating lever, and thus elevate and depress the bobbins which rest upon the horizontal bevilled edge wheel. The patentee here only describes the mode of driving the bobbins by this novel method, as he states that it will be obvious to any practical man, that such can be applied to the flyers and also to two sets of bobbins when required.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to WILLIAM WOOD, of Wilton, in the county of Wilts, carpet manufacturer, for "*a new mode of weaving carpeting and other figured fabrics.*"

THIS invention of a new mode of weaving carpeting and other figured fabrics consists in weaving two pieces in one loom at the same time, by certain arrangement of parts in the loom, whereby the two pieces are woven face to face. For this purpose the inventor employs two separate linen warps, and into or on to which is woven the pattern from a worsted or other warp placed between the two linen warps; and by the evolutions of the loom, the pattern is alternately bound to the bottom linen warp, and then to the top linen warp; by this arrangement it will be seen that the two warps are bound together by the pattern of worsted working up and down from one linen warp to the other, the worsted warp being secured to the linen ground by means of linen shoots of weft obtained from shuttles. The pattern of the worsted warp is raised by a jacquard apparatus and bound into the upper linen warp, and the remaining portion of the worsted warp is bound into the under linen warp by every shoot of the weft; the fabric thus produced is afterwards divided or cut asunder by means of a knife or some other cutting instrument.

The upper warp beam is fixed to the upright frame at the back of the loom with a guide roller just below it, and the lower warp beam is fixed in the same manner with a guide roller above it; the distances of these two linen warp beams from each other are such that the threads passing from them and over the guide rollers to the healds, form two inclined planes, the worsted warp passing between

them in a horizontal position; in front of the slay, which is provided with two shuttles, there is a guide bar extending across the loom, and having a longitudinal slot through which the whole of the warp threads pass; this slot is capable, by means of screws, of being made wider or narrower for the purpose of regulating the length of the vertical threads which constitute the pattern in the double fabric, and also (when the fabric is divided) the length of the pile; this guide bar works to and fro similar to the slay, so as to pass over the edge of the woven part of the fabric at every motion of the slay, in order to allow the slay to beat up the weft; and in front of this guide bar, or between the guide bar and breast beam, is the cutting apparatus. This consists of a thin knife working in a longitudinal slit or groove cut in the edge of a piece of wood bevilled off in the form of a wedge at the top and bottom side; at that edge where the knife passes through, it moves rapidly to and fro in a direction of its length by means of bands passing over a large pulley fixed on the end of a horizontal shaft, which is actuated by the motion of the first heald, in such manner that, as the fabric is woven, it is divided by the knife into two pieces, which pass over the breast beam and are wound on to two separate cloth beams in front of the loom in the ordinary manner.

The patentee claims as his invention, the manufacture hereinbefore described of carpets and other fabrics having a pile on their surface by the use of an upper and under ground warp, the pattern of the said carpeting and other fabrics being bound into the upper warp and under ground warp alternately, and afterwards cut asunder. The patentee disclaims the mode of weaving hereinbefore described, except when the same shall be applied to carpeting and other figured fabrics.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to JOSEPH MEGE, of Keppel Street, Russell Square, in the county of Middlesex, for "*improvements in making and constructing trowsers.*"

THIS invention relates to trowsers principally intended for soldiers, and consists in constructing them in such a manner, that they may be opened behind when required, and closed again by means of one hand of the wearer; the object being to arrange the parts of the trowsers so as to avoid the necessity of the soldier displacing his accoutrements, or even laying down his musket, or releasing his trowsers from the braces.

The mode of constructing the hinder part according to this invention, is by straps or bands, which are placed between the lining and the cloth, and brought to the front part, where they are attached by buttons or other suitable fastenings. It will be necessary in constructing these trowsers, that the hinder part should be fuller than that of trowsers of the ordinary construction, in order that the part where the opening is may be concealed; and in place of the parts being sewed together between the legs, such parts are sufficiently full so as to allow of their being buttoned in front; and the trowsers, when the soldier is not on march, may be laced up behind. In place of sewing together the two parts forming the back part of the trowsers, one side is made with a flap so as to lap over the other; to the edge of this flap is attached a strap, which passes between the outer cloth and the lining, and through a sort of button hole made at the side of the trowsers; a second strap is attached to the other edge of the back part of the trowsers, and passes through a slit made in the aforesaid flap, and also between the lining and cloth, in

the same manner as that before described. It will be seen that on tightening the straps, the parts of the opening will be drawn so as to overlap each other; the straps, which are of sufficient length to admit of the back part opening, are fastened (when such part is closed) by a button at each side of the trowsers, or other convenient means; and "in order to open the part behind, the lower front button, which is closed, is to be unbuttoned, and the straps or bands are to be released, when the hind parts to which the straps are attached, on the soldier bending the person in the act of 'squatting,'" will be opened, and will be kept in that position without the necessity of the wearer holding them apart; and when it is required to close the back of the trowsers, it is only necessary again to fasten the lower button in front, and to draw the ends of the straps and fasten them at the sides in the manner described. The mode of fastening them in front is by buttons in the ordinary manner.

Claim is for the mode of constructing trowsers as herein described, by having an opening behind, combined with the means of closing and opening the parts closed, as described.

SPECIFICATION enrolled 26th October, 1842, of a PATENT granted 26th April, 1842, to HENRY ROBINSON PALMER, of Great George Street, Westminster, civil engineer, for "*an improvement or improvements in the construction of roofs and other parts of buildings; and also for the application of corrugated plates or sheets of metal to certain purposes, for which such sheets or plates have not heretofore been used.*"

THIS invention may be divided into two parts; the first

of which relates to certain improvements upon a former Patent granted to the said Henry Robinson Palmer, bearing date 28th April, 1829, in which Mr. Palmer claimed the use and application of fluted, indented, or corrugated metallic sheets or plates, for the purpose of constructing roofs and other parts of buildings, and consists in certain methods of forming or constructing the joints of corrugated iron, and of connecting iron or other metal sheets or plates for the purpose herein described; the joints being made in such a manner, that the strength of the roof or joints thereof may not depend on the strength of any bolts or rivets employed in forming or connecting such plates or sheets together.

In order to effect this, several methods are shown which differ somewhat from each other, yet are all constructed upon the same principle, viz., the ends of the metal sheets or plates are made to abut so as to support each other; for this purpose, one end of each plate is jumped up or bent in such a manner, that when the next plate is joined to it, the part bent shall lap over the end of the second plate, and allow the ends of the two plates to abut against each other, precisely in the same manner as the socket joint of two cast iron pipes, presuming such part or joint to be opened out so as to form a plane surface; these two plates are held by a projecting piece fixed to the end of the straight plate, the bent plate having a corresponding slot to receive it when the plates are joined together. This projecting piece or pieces serve to support or bind the ends of the two plates together transversely; the longitudinal or side joinings are made by means of a bar of iron, having a groove cut in each edge to receive the plates joined in the manner described. There is another method of joining the ends of the plates together, by cutting corresponding slots in each plate,

so as to receive a piece of iron having a groove cut all round its edge, which, when inserted, and the two plates put together, forms a fastening or support to the plates.

The patentee makes no claim to the use of the corrugated plates for the purposes described, except when the plates are made to abut against and to support each other; but what he claims is, the use and application of corrugated metal plates for the above purposes, when the said plates are made to abut against and to support each other in the manner described.

The second part of these improvements relates to the use of such corrugated plates for the purpose of building, or constructing arches and bridges. For this purpose, the patentee employs corrugated plates of cast iron, bent so as to form the circle of the arch; these plates have flanges all around them, perforated with holes to receive the bolts; the end or abutting flanges connect the plates longitudinally by means of the bolts, and the side flanges connect them transversely together in the same manner, the side flanges of the outside plate or plates being bolted to the spandrill or ribs of the bridge. It will be observed, that the use and application of corrugated plates in the construction of bridges, depend entirely upon the plates abutting together in the manner described.

Claim is, the construction of the arch by corrugated plates of metal abutting against or upon, and supporting each other as described.

The last improvement is in the application of corrugated plates to the construction of wheels. For this purpose, a disc is formed of such iron, which, when the wheel is constructed, answers the purpose of arms or spokes; for which the patentee claims, the application of corrugated iron to the construction of wheels.

SPECIFICATION enrolled 25th October, 1842, of a PATENT granted 26th April, 1842, to RAOUL ARMAND JOSEPH JEAN, COMTE DE LA CHATRE, Chevalier de la Légion d'Honneur, of Leicester Square, in the county of Middlesex; RICHARD TAPPIN CLARIDGE, of Weymouth Street, in the county of Middlesex, gentleman; and RICHARD HODGSON, of Salisbury Street, Strand, in the county of Middlesex, gentleman, for "*improvements in preparing of fabrics to be used in covering roofs, floors, and other surfaces.*" Being a communication.

THIS composition, which the patentees call "oropholithe," is made by mixing together linseed oil, litharge, or white lead, dry powdered whiting, and dry sand, in the following proportions by weight, that is to say, of linseed oil eight parts, litharge or white lead four parts, dry powdered whiting nine parts, and dry sand 36 parts. In order to amalgamate these ingredients, the oil and white lead, or litharge, are to be thoroughly mixed together in a convenient vessel, after which the dry powdered whiting is to be added, and well mixed with the previous mixture; the sand is then to be added, and also thoroughly mixed with the compound above described. Although the patentees find this mode of adding and mixing the substances herein described to be the most convenient, such peculiar mode is not essential, the only object being to mix the substances of which the "oropholithe" is composed thoroughly together. When it is desired to make the composition of a particularly white colour, it will be necessary to use boiled linseed oil; and in all cases where light colour is not

required, the patentees prefer to use the red litharge; they also prefer the sand to be that usually called "white sand," or "silver sand;" in lieu of which, the same proportion of yellow sand, or brick or tile, ground to a fine powder and perfectly dry, may be used. The "oropholithe" can be made of any shade required, by adding colouring matter; but this it appears destroys, in some degree, its tenacity. In covering surfaces, the composition is laid on about $\frac{1}{16}$ of an inch thick: and in covering fabrics intended for covering roofs, the fabrics are stretched on a frame or table, (a description of which apparatus is given in the Specification) and the fabric covered on both sides, so that the composition sinks or penetrates through the interstices of the fabrics, and the two surfaces of the "oropholithe" meet and join together with the fabric between them; or the same, when colouring matter is used, may be laid on so as to represent various devices or patterns.

The patentees do not claim any of the instruments described or mentioned to be used in applying the said composition called "oropholithe," but what they claim is, the making the said composition called "oropholithe," in whichever mode hereinbefore described, and with whichever of the substances mentioned as being capable of being used in the composition thereof, the same may be composed of, and whether combined or not with colouring matter; and the covering one or both surfaces of fabrics to be used in covering roofs and floors, and other surfaces with the said composition.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to JOHN VARLEY, of Colne, in the county of Lancaster, engineer; and EDMONSON VARLEY, of the same place, cotton manufacturer, for "*certain improvements in steam engines.*"

THIS invention consists in the application of certain arrangements of mechanism to be substituted in place of the ordinary eccentric for working the D or other slide valves of a steam engine. The object of this improvement is to enable the steam employed in working steam engines to be worked expansively and compressively, and thus to economize the consumption of fuel; and also to effect an increase of power, by the application of certain arrangement of parts, which shall cause the steam to be admitted into the cylinder and cut off at any required angle of the crank shaft during its revolution.

The arrangement of the eccentric rod, for effecting these improvements, is the same as those in ordinary use, the only difference being in the application of a tappet, bolted to the periphery of the crank shaft, in place of the ordinary eccentric; and also in forming the ring, which is generally made of two semicircular pieces of brass or other metal, with two projections or cams, that is, one cam in each half circular piece, against the face or surface of which the periphery of the tappet at each half revolution acts; the eccentric rod is attached to the ring by means of nuts in the ordinary manner, or the two semicircular pieces, or ring, may be made with two horizontal projecting pieces, which may work in two standards; and to the end of one of these projecting pieces, which pass through the standards in which they slide, may be attached the eccentric

rod for working the valves. By this arrangement, as the crank shaft revolves, the first rise or lift of the tappet will act against the surface of the cam, which will cause the eccentric rod to move so as to cut off the steam at the quarter stroke, (or any other given point,) and as the tappet continues its revolution, the second or extreme rise of the tappet will force the eccentric rod still further, and open the valve port to the full extent for the admission of steam; the completion of the stroke will cause the double tappet to act upon the other surface or cam, and consequently reverse the action of the valves: by this arrangement, the valves receive a double or interrupted movement instead of the ordinary progressive motion produced by the eccentric, that is to say, owing to the peculiar form of the tappet, there are two separate movements for opening the slide valve ports into the cylinder, and also two for closing the same at each revolution of the crank shaft; the first stroke of the tappet closes the induction port, shuts off the steam, and causes that which is contained in the cylinder to work expansively, leaving the eduction port partially open until the piston has moved a little further, when the eduction port is closed and the uncondensed steam which remains in the cylinder becomes compressed therein, nearly to the extremity of the stroke of the piston, until the second stroke of the tappet opens the contrary eduction port, at which time the compressed steam and the newly admitted steam meet together, and form a counterbalance and reaction in the return-stroke of the piston, the eduction port being opened a little previous to the induction port. It will be observed that these two strokes of the tappet take place in one half revolution of the crank shaft, and are again repeated in the other half revolution, admitting and cutting off the steam at any required angle of the crank,

in each entire revolution. This double tappet may, if preferred, be made in two parts, for the purpose of regulating any adjustment in the striking part.

The patentees claim the substitution and employment of a double tappet or tumbler, in connection with the internal cam and eccentric, or valve rod, in place of the ordinary eccentric motion for the purpose of working the D or slide valves, in order that engines so constructed may be enabled to work the steam expansively and compressively.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to WILLIAM LOSH, of Newcastle-upon-Tyne, esquire, for "*improvements in the construction of wheels for carriages and locomotive engines intended to be employed on railways.*"

THESE improvements consist in certain modes of securing the iron tire of wheels upon the ring or felloe by the elongation of the iron bars employed in making the wrought-iron spokes, either with or without the intervention of wood, felt, rope, or such like flexible material between the same; by which method the patentee avoids the necessity of heating the tire for the purpose of securing it by contraction; and also in certain modes of fixing a cast-iron tire upon a straight or curved malleable iron spoke; and, lastly, in a method of forming the malleable iron spokes of wheels.

The drawing represents a wheel produced by bending bars of iron in such a manner that the two ends of each bar are made fast in the nave in the usual manner, whereby such bar produces two spokes, the middle por-

tion of each forming part of the ring or felloe, and the whole producing nearly a complete ring or felloe, so as to give he requisite support or bearing to the tire when applied to the wheel; the usual mode of fixing the tire upon these wheels is by shrinking.

The principle employed by the inventor is that of producing firm attachment between the felloe and the tire, by diminishing the size of the tire until it firmly grasps the felloe; but it is obvious that the same effect will be accomplished by increasing the size of the felloe when placed within the tire. The mode of carrying this principle into effect is as follows:—

For the purpose of securing the iron tire upon a wheel constructed as in the foregoing, that is to say, having malleable iron arms or spokes bent in such a manner that the middle part thereof shall form a portion or segment of a circle, and that a number of such arms shall collectively form, or nearly so, a complete circle. The arms so formed, when fixed into the nave of the wheel, are placed at such distances from one another that the corners or bent parts formed by the ends of the segments, and the arms, are about two inches apart, and between such parts two blocks of iron formed so as to fit the recess made by the bent parts of the arms are then introduced between them; these blocks have each a groove cut in them, so as to form, when put together, a key-way, into which is to be driven a key; by so doing, the two blocks will be separated, and each piece of iron forming the two arms will be forced towards each other, and the circular part, it will be seen, will be forced outward against the interior of the tire, and will have the effect of securing it firmly upon the circular ends of the arms, which may either have wood or other flexible material between such parts, or

otherwise, and afterwards pinned or rivetted to the tire in the usual manner.

There is another mode of effecting this by bending the pieces of iron, when single arms are employed, so that the part bent will form a portion of a circle with its end resting upon the end of the next arm or spoke; the segments of the spokes or arms bent in this peculiar manner, are forced out against the interior of the tire in the same manner as those above described.

Another mode of fixing the tire upon wheels having spokes constructed of the form described in the first improvement, is, by placing upon the periphery or circular part of the spokes a strong hoop, in such a manner that one edge of the spokes shall project beyond the face of the hoop, which is composed of several parts, so as to be capable, by means of keys or bolts, or both, of being drawn together, and thereby contract or reduce its diameter; this hoop being put on the circular part of the spokes, and the keys and bolts tightened up, the spokes, owing to their peculiar form, will spring or give way with the hoop. The tire having been made of a proper size, is then placed on to that circular part of the spokes which projects above the face of the hoop, and the hoop removed; the tire is then, by means of suitable pressure, forced on to the spokes, which, by their elasticity or tendency to spring outward, press against the interior surface of this tire so as to hold it securely in its place.

Claim for this part of the invention is, first, the method of fixing the tire, whether of cast or of malleable iron, upon the felloes of wheels by iron keys employed so as to enlarge the circumference of the felloe, and thus produce the necessary pressure against the tire; secondly, the mode of fixing the tire, whether of cast or of malle-

able iron, upon the felloes of wheels by powerfully compressing the felloes, and in this state fixing them within the tire.

For the purpose of fixing the cast iron tire upon straight or curved arms, the tire is cast with certain lugs or projections; these projections are two in number, and form a dovetailed recess for each spoke; and the bottom of these recesses the patentee prefers to be made of a curvilinear or circular form, which circle should be struck with a radius much less than that of the wheel, the object of which will be hereafter explained.

Suppose, for instance, that two straight arms, having their outer ends bent back (similar to a Y, presuming the lower part to be double) so as to fit the dovetailed form of the recess formed by the projections; if these straight arms were to be separated at the bottom end, the upper ends, which are turned back as described, would approach each other, and in this manner they are inserted into the tire, and their length is such that the ends of the arms touch the bottom of the recesses; it will therefore be seen that on forcibly separating them, which is done by means of a key driven between them, the ends of the arms will be forced along the curvilinear part or bottom of each recess which gradually approaches the centre of the wheel. The effect of this will be, that the end of each arm will press against the bottom of each recess in a direction from the centre of the wheel, and finally be brought to bear against the dovetailed sides of the recess, and thus hold the tire securely.

The last improvement is for the forming a compound spoke by introducing a number of spokes or pieces of iron bent in the same form as those first described, which may be placed, when the wheel is in a horizontal position, either directly above each other, or with the joints of the

different layers intersecting each other, and which are fastened in the nave of the wheel in the usual manner.

Claims are—The mode of fixing the cast iron tires upon straight or curved malleable iron arms by wedging, in the manner described; also the making of malleable iron arms in several pieces placed against each other, and secured in the nave as usual, so as to form a compound spoke in place of having the same formed of one piece; by which is secured a firm junction and great flexibility in the form or felloe, and less liability to fail when exposed to sudden shocks. The patentee also claims the placing of these separate pieces of each compound spoke, either directly above each other when the wheel is placed in a horizontal position, or with the joints of the different layers intersecting each other.

SPECIFICATION enrolled 28th October, 1842, of a PATENT granted 28th April, 1842, to JOHN HENRY PAPE, of Grosvenor Street, Bond Street, in the county of Middlesex, piano-forte maker, for "*improvements in carriages and in the construction of wheels.*"

THE inventor in the first place describes an improved axle, which consists of an axle revolving within a metal tube; this tube Mr. Pape prefers to make of two or three thicknesses of iron, in order to obtain greater strength. There are two pieces of brass which fit into the ends of the tube through which the axle passes, and which form bearings for the same; in order to prevent any lateral movement, the axle is made with a collar at each end, which bears against the inner surfaces or ends of the two pieces of brass; on each end of the tube which contains the axle,

there is a socket, one end of which is made to fit on the tube and is secured to it; the other receives the nave of the wheel, which has a groove cut round its periphery to receive the points of pins or screws which pass through the periphery of the socket; the wheel is further secured by having bolts fixed to the spokes and at right angles to them; these bolts are bent at right angles at the end so as to form a hook, and project over the edge of a collar formed on the periphery of the socket, thus preventing the possibility of the wheel disengaging itself. Should the axis break, it will be seen, that if such were to occur, the nave of the wheel would still revolve within the socket, and be held there by the aforesaid pins and hook or bolts. The drawings also show another support for the wheel, placed outside, having a similar contrivance for holding the nave; when this support is employed, the hooks may be dispensed with. There is also a number of rings within the tube for preventing the vibration of the shaft or axis; the tube also forms a reservoir for the oil, which is ladled up at every revolution of the axle by a projection or scoop fixed to each collar of the axle.

Claim.—The arrangement of an axis revolving within a tube, in place of the axletree commonly used, which contrivance renders the fracture of the axis by strong vibration or concussion scarcely possible; and should it even occur, the tube would, by means of the contrivance above described, answer the purpose of an axletree, enabling the carriage to proceed on its journey without interruption.

The next improvement is for a contrivance for stopping all kinds of carriages when the moving power is removed. This is effected by placing inside the tube of an axle constructed as in the foregoing, two brass steps or other metal

bearings; these two metal bearings are drawn together so as to bind tight on the shaft by means of a screw, which passes through the tube and binds on the top bearing; this screw is acted upon by a spring connected to the draw-bar or hook of the carriage, in such a manner, that on applying power to move the carriage the action of the spring will be removed from the screw; but immediately the moving power ceases to act, the spring, by an arrangement of levers, will move the screw partly round, and cause the two bearings to be drawn together, and the friction applied in the manner described.

Claim.—The contrivance described, which being in connection with the moving power, applies friction to a revolving part of the carriage the moment the moving power ceases. The patentee also claims the use of tubes for shafts and framing of carriages.

The Specification, in the next place, shows several modifications of the application of a coiled or convolute spring as applied to carriages, in place of the ordinary spring now in use, for which the inventor claims the use of coiled springs, as shown in the drawings, for the purpose of giving elasticity to carriages.

Improvements in wheels for carriages.—The spokes of these wheels are made of tubes, and contain a spiral spring; a bar of iron, made to fit the bore of these tubes, rests with its end upon the spring, the opposite end being divided and turned back in opposite directions so as to form a coiled spring, the termination of which is fixed to the tire of the wheel, which is made of a flat bar of iron, having its two edges bent at right angles to the periphery of the wheel, so as to form two internal flanges, the breadth and thickness of which will depend upon the strength of the wheel required; it will therefore be seen that the periphery of the wheel is supported entirely upon springs.

The periphery is then covered with plates, which the patentee prefers to make of some alloy, such as zinc and lead, which will be found to make very little noise, and when worn out may be recast; these plates are fixed to the periphery of the wheel by means of bolts, having first placed a layer of some flexible material round the wheel; or the periphery may be covered with wood.

Claim.—Construction of the wheel described.

The last improvement is for the peculiar construction of a carriage having from four to seven seats; the principal advantages of its arrangement is, that the whole weight of the carriage rests upon two wheels, as is usual in cabriolets, and which is said to diminish very much the labour of the horses; another advantage is, that the carriage is very low, and the door is placed at the side behind the wheels, which renders it much more convenient to get in and out.

Behind or underneath this carriage is placed an additional small wheel, similar to a castor, which is for the purpose of maintaining the equilibrium, as in a four-wheeled carriage.

The SPECIFICATION of the PATENT granted 13th April, 1842, to JOHN BYRON DAWES, of Trafalgar Square, Charing Cross, in the county of Middlesex, for "*a certain improved composition or compositions, to be employed in the preparation of glass or other media of light,*" due 13th October last, has not been enrolled during that month.

BYNNER'S PATENT.

[*Continued from page* 173.]

Cross-examined.—That the solar lamp was a new name, but the lamp was old in principle; that the price of oil was the cause of the great demand for lamps. Witness further stated, that he had purchased solar lamps from Messrs. Ratcliff's, marked "patent solar;" and that he did not know but that they were Messrs. Smith's until those gentlemen complained; and that since then he had not sold any unless made by Messrs. Smith, as he could not afford to contest a patent.

Mr. G. A. Miller, examined by Mr. Kelly.—Was a lamp manufacturer, carrying on business under the firm of Miller and Sons, Piccadilly, and had manufactured a great many chamber lamps in the year 1824, known as Miller's chamber lamp; that he first constructed them with a large chimney, but that in 1832 he introduced a cone; the air was admitted below the point of ignition, and was conducted to the flame by the cone, and struck it above the point of ignition; that he had sold about six dozen, and then introduced a change in the manner of getting the air above the point of ignition. Mr. Kelly here read Bynner's Specification, when the witness declared that the principle mentioned in it was not new; and on Bynner's lamp being shown to him, he stated that it was the same in principle as his, but that in Bynner's the cone was higher.

Cross-examined.—That the size of the aperture in the cone was larger, and the height at which it was placed less than in Bynner's lamp; that the top of the wick was above the cone; and that if the wick were placed below, the beneficial action of the deflector would be lost, and the flame become smoky, as if no cone at all were used.

Mr. A. Stockwell, foreman to Mr. Miller, corroborated the whole of Mr. Miller's evidence.

Mr. Wm. Tye, examined by Mr. Hugh Hill.—That he was bookkeeper to Mr. Ratcliff, of Birmingham; that the flat wick lamps, and Argand lamps, were sold by them before 1837; and he produced a list of persons to whom such lamps had been forwarded.

Cross-examined.—That he saw Bynner's lamp in the morning; that "patent solar lamp" was put on Ratcliff's lamp; the licences were granted by Messrs. Smith, but that he did not know where Messrs. Ratcliff got the cone from; there was a great increase in the demand for common oil lamps; and the demand for solar lamps was very great.

Mr. John Milner, examined by Sir W. Follett.—Was formerly a lamp manufacturer in London, but since retired in Dublin. That the models shown to him were made by himself; the air was admitted below the combustion, and carried up and thrown upon the flame by the cone; no other air was admitted but what was within the cone. Sir W. Follett then read Bynner's Specification, when the witness said that his lamp was precisely the same in principle; that he had made the Argand lamps for Messrs. Sivewright's lottery office, in the Haymarket, with metal cone deflectors, and that they were used until superseded by gas. Mr. Milner also produced various specimens of old cones, and explained their action: and also stated that he had made flat-wick lamps the same in principle as Bynner's; and also Argand gas cones; and that he used the ordinary French chimney.

Cross-examined.—That the lamp produced was one of the original ones he had made in London; that he had given some suggestions to Messrs. Upton and Roberts as to the cone, and the safety part of their lamps.

Mr. Thomas Clutton Salt, examined.—Stated that he had been a lamp manufacturer in Birmingham for a considerable number of years; had seen the solar lamp; it was not new in principle; in 1816 he had purchased Palmer's patent, (really Simpson's) and had made and sold lamps under it; that the air in them was admitted below, and deflected upon the flame by a cone above; Palmer's lamp was specified chiefly for oil, and was used in shops until superseded by gas. Witness further stated, that he had sent word to Messrs. Smith, that he did not admit their patent, and that he would sell deflectors to them or their Attorney to bring into Court; that Messrs. Smith said that he mistook the point of their patent, and told him that if he sawed off one-half of their deflector, the effect would be, that the flame would be deflected in somewhat a horizontal direction; that his answer was, that he had never made the experiment; that he tried with Palmer's lamp by cutting off one-half of the deflector, and that the same effect was produced; that he made peace with Messrs. Smith, upon terms of having labels at half price.

Cross-examined.—That he paid sixpence per label; did not remember when he first heard of the solar lamp, but considered it a great improvement on the Argand lamp, and on every lamp to which it could be applied; that all persons who made Palmer's lamp, varied the elevation and contraction to their taste; and that he considered Messrs. Smith's elevation and contraction the best; that he had a partner, whose name was Wright; that they made experiments and differed; that he complained that the cone was made so high that it buried the light; and that his partner complained that the cone was so low that it smothered the light.

Re-examined.—That there was nothing in Bynner's Specification indicating the height or contraction; it was what Messrs. Smith had adopted in practice, and that a manufacturer must learn the elevation and contraction by experiments.

Mr. Thomas Blakeway and Mr. Taylor, proved that the principle of Simpson's patent was the same as Bynner's; and that they had made and sold many of Palmer's lamps before 1837.

Mr. Robert Douglass, examined.—Stated that he was a large lamp manufacturer in Piccadilly; and that he was well acquainted with the solar lamp; that the Argand deflecting lamps, as first introduced by Messrs. Smith, did not succeed, principally in consequence of a thin ordinary sperm oil cotton wick being employed; and that he suggested the use of the thick wick of unbleached Smyrna cotton, to which in a great measure it was owing that he tried the peculiar chimnies, stated by the patentee to be essential to produce the effect here required, but that for Argand lamps they entirely failed; and that he introduced the use of a totally different chimney, which he showed to Messrs. Smith, and which they had since adopted.

Professor Cumming examined.—Stated that he was Professor of Chemistry in the University of Cambridge; that he had lectured on light and heat there; that the point of ignition was absurd, as applying the point to the surface of a flame, and ambiguous if it meant the commencement of ignition, and as not stating what was ignited. That there was nothing in Bynner's Specification to show the limits or extent of contraction or elevation of the cone, and that no explanation was given of the point of ignition; that he had heard part of the evidence given. Various models were then shown to the witness. (Milner's). That lamp was constructed on the same principle as Bynner's; the air came in below, and would be deflected above the highest point of ignition. (Upton's and Miller's.) These were constructed on the same principle; that they differed merely in degree, and that the principle was common to both. (Hetherington's) was the same in principle. (Guise's flat-wick and small-wick). The form of the cone was the same. (Ratcliff's.) The only difference in this lamp was that the air was admitted through a circle of holes near the top of the cone. (Palmer's) (Simpson's) was the same; that the principle in all was the same, viz., the curve of the upper cone; the difference was one of degree; the principle was the same, it deflected the air. (Roberts.') This was also the same, but admitted of an adjustment, so that it might impinge at any height above the flame.

Mr. George Soames gave a list of the different prices of sperm oil and common oil, from before 1830 to 1841.

Mr. Maugham stated that he was a chemist at the Polytechnic Institution; and that he had made experiments with gas lamps and Bynner's cone; that the loss was nearly 15 per cent.

This closed the case on the part of the Crown.

The Attorney-General then addressed the Jury for the Defendant.—The learned gentleman began by stating that the proceedings were founded in fraud and supported by perjury; but that he would not condescend to particularise either the one or the other; that the whole question was where the air was deflected; and that the question as to the height of the cone was one of degree; upon that he joined issue. In order to refute the evidence of the prosecution, he would call most respectable witnesses—professors, and persons in the lamp trade; Mr. Greensill of the Strand; eight or ten witnesses in the trade in London, and five or six from Birmingham. That the impinging of the air against the flame above the point of ignition was peculiar

to Bynner's lamp. That the patentee made two claims; he claimed both the deflector and the chimney; that no lamp had been produced which was the same as Bynner's; none which was not a fraud. In Bynner's drawing, the blue part of the flame was shown, and the air impinged above, and that there was nothing in Simpson's drawing like Bynner's. That all the witnesses on the part of the prosecution were interested, being lamp makers, particularly Mr. Upton, against whom an action was pending. That if the Jury had any doubt on their minds, Mr. Bynner was entitled to the benefit of it. The learned gentleman concluded his lengthened address by saying, "I ask you to give a verdict, not for the Defendant, but according to the evidence, for the party entitled to it, without reference to the speeches of counsel. I make these observations with great anxiety, because I hear that there never was a *scire facias* in which the patent did not fail."

Professor Cowper examined by Mr. M. D. Hill.—Stated that he was a lecturer on manufactures, &c. at King's College, and inventor of the improved printing machine, and was conversant with specifications; and had read Bynner's; that the patentee's objects were, greater length and steadiness of flame and brilliancy of light; that by "point of ignition" was meant where the thing was ignited; and that the words "formed below the point at which the currents of air strike or act," showed that the flame ought to be perfect where the air struck. Did not consider the flame formed until above the blue part of the flame. That there would be no difficulty in constructing the articles mentioned in Bynner's Specification. [Lamp Patent No. 1. was then put into witness's hands,] when he stated that in that lamp (purchased of Miller) the wick was above the deflector, but in that produced the day before, the wick was one-eighth of an inch below the deflector, and that neither of these lamps were the same as Bynner's; that he considered the deflecting power injured by the largeness of the aperture, but not practically destroyed; that in Miller's lamp the deflector was so constructed that the air had a tendency to impinge on the flame, but that if one half was cut away, it would cause the flame to be blown down in a horizontal direction. (Guise's small lamp.) In this lamp the air would not be deflected equally all round, as at the end it was straight; but it would not make a long unsteady flame. (Ratcliff's universal lamp.) That this lamp had holes in the deflector, which were inconsistent with the patentee's object, and which would have the effect, as far as they went, of destroying the power of the deflector, and of shortening the flame. (Palmer's lamp.) The effect of the button was to spread out the flame and render a globe glass necessary. (Upton's lamp.) That if a workman made the lamp No. 4. in Upton's Specification, the blue flame would come above the deflector; if made by Bynner's Specification, the deflector would be higher; that Upton's safety lamp was different from Bynner's; the deflector was not so high, and the orifice was larger. (Hetherington's lamp.) That the aperture at the ends was on a level with the top of the wick, and the fish-mouthed cap was not at all within Defendant's patent. That the same observation applied to Milner's green lamp only in a smaller degree, the top of the wick being nearly on a level with the top of the deflector; that the holes in the gallery would keep the

glass cool, and that there could be no current of air if the holes were not within the glass. That Milner's argand was not at all within the Defendant's patent, the orifice was too wide. (Roberts' tin lamp.) That in that lamp the orifice was obviously too large to produce the effect of the patent lamp; that he had no doubt none of the lamps produced the same effect as Bynner's, and that the specification and drawings would enable a workman to make a solar lamp whether he drew a general conclusion or not.

Cross-examined by the Solicitor-General.—Had been sometimes a witness in patent causes; that using the word "principle" as meaning deflection, he should say that all the lamps exhibited to him were on the same principle as Bynner's, but varying in their construction, and consequently varying in effect; that they were almost every one formed upon the principle of admitting the air below the point of ignition; that some were formed on the principle of deflecting the air above the point of ignition; some partly so, and some not. That he was of opinion that none of the lamps produced were within the Defendant's patent; they were not constructed in the same manner as the patent lamps. [Ratcliff's universal lamp was then put into witness's hands,] when he stated in answer to the learned Counsel's questions, that the air was admitted below the point of ignition, and was deflected above, but that he thought that the holes round the cone would operate injuriously, as they prevented the air deflecting against the flame; that he had only formed his opinion because the lamp departed from the construction of the patent lamp, and from the absence of holes in the latter; that he did not know that any person could say that the lamp would not burn as well without making an experiment. [A glass (oxydator) was shown to witness.] That the holes in the top of the cone or ring prevented it being within the patent, but that he could not tell whether these holes would operate injuriously or beneficially. That from the Defendant's Specification the air should strike above the point of ignition; from the drawings, above the blue flame, and also at a certain distance above where the flame was formed; that he had measured the distance between the top of the wick and the top of the cap; in figure 3 it was five-sixteenths of an inch; that if it were one-quarter of an inch, it would come within Defendant's patent; any thing that deflected the air above the blue flame would also be within the patent. [A lighted lamp was put into witness's hand.] That the blue flame in that was not above one-sixteenth of an inch; the blue flame in gas was higher; and that he did not expect accuracy in the drawings. (Miller's lamp.) That in this lamp the air was admitted below the point of ignition; there was a deflector, by means of which the air was deflected above the point of ignition; that his objection to that lamp was that the orifice was too wide, and that if he saw a lamp varying from Bynner's he did not think it so good. If the aperture were narrowed, it would be the same as Bynner's.

To the Judge.—That the only difference between the patent lamp and Miller's was, that the patent lamp was an improvement upon Miller's, in narrowing the aperture of the deflector; that in every other respect they were similar.

[Guise's small lamp shown to witness.]—That the air was admitted below the point of ignition; and that if the corners were not so low the air would be

deflected above all round; that the difference between this lamp and Bynner's was, that Bynner's had a differently formed aperture. (Guise's flat wick.) Air was also admitted below the point of ignition; and if the top of the cap was one-half or five-eighths of an inch above the top of the wick holder, the air would be deflected above the point of ignition all round; and that if half of this cone were cut off, it would have the effect of blowing the flame to almost a horizontal position, if not quite; that he would not say that it was a defect, if it were described in a specification without noticing the corners. (Palmer's lamp.) That the only difference was the button, and also that the area was greater in Palmer's than in Bynner's; that in Upton and Roberts' Specification the air was admitted below, and deflected above the point of ignition. [Hetherington's cone was put into witness's hands.] He stated that it was constructed as mentioned in Upton and Roberts' Specification, except that the aperture was larger; that the air would be deflected above the point of ignition in the centre, but not at the sides; that he could not tell the accurate measurement from Upton and Roberts' Drawings. (Upton's lamp, No. 2, Newcastle.) That the difference with Bynner's was one of degree. (Milner's green lamp.) That the difference in that was in the air being admitted in the glass; that if the glass fitted close to the cone, it would remove the defect of admitting the air; that the cone was but three-eighths of an inch above the wick holder, and was not high enough to produce the effect of the solar lamp, and that it would be an improvement to have it higher; that in Miller's copper lamp, and Roberts' tin lamp, the orifices were too large, but that if they were smaller, they would resemble Bynner's lamp; that the distance from the edge of the deflector to the wick holder was only three-eighths of an inch; and at that distance the air would have some effect.

Re-examined.—That the conditions in Bynner's Specification were, first, getting the air below the point of ignition: secondly, having it deflected above the point of ignition where the flame was formed; and, thirdly, having the same distances and measurement as shewn in the drawings; that in no one of the lamps shewn were all the conditions observed; that it was all a question of degree, and that some of the lamps were deficient in orifices, and some in height.

Mr. Thomas Greensill, examined.—That he was a lamp manufacturer in the Strand, and had been in the trade forty years; that he knew the solar lamp well; and that it was quite new, and was the greatest improvement since Argand's invention; that it had a great sale; it was simple, economical, and produced the greatest light; that the lamp trade was always good; but that the solar lamp trebled the sale, and helped to meet the inconvenience resulting from the high price of oil.

Cross-examined.—That the sale increased two or three years ago—was greatest last year; that it effected a great saving by burning common oil, on account of the high price of sperm oil; a thicker wick was used for it.

Mr. William Dunn proved the same thing as the former witness.

Richard Willis, examined.—Stated that he was a partner in the house of Perry & Co., in Bond Street; that they had a large trade, and supplied

Buckingham Palace; that he had been in the trade for fifteen years, and remembers the solar lamp being brought out; that it was three or four years since he first saw it; it was quite new to him; the flame was bright, long, and steady; that each of these requisites was very important, and that none of the lamps shown would produce the length, steadiness, and brilliancy of light that the patent lamp did; that it was about four years before the solar lamp came out that Ratcliff brought his lamp to him, but he did not think it worth his notice; that he had not seen Upton's lamp until within the few last weeks; that Ratcliff's lamp was never taken up by the trade; and that he had turned it out at once.

Cross-examined.—That the lamp then shewn to him (the brass one) was of the same construction as the one Ratcliff had shewn him; that it was substantially according to Upton's patent, except the holes at the top of the cone; that in the Argand lamps he had sold, he had never sold the peculiar chimney described by the patentee.

Mr. Thomas Finn, Mr. John Blakeway, Mr. John Warner, Jun., Mr. Parkinson, and Mr. Thomas Abbott, severally stated that they considered the solar lamp a very excelle t one, and different from any they had ever seen before.

Mr. Muntz, exami ed.—Stated that he carried on trade in Birmingham, and that his offices were fitted up with gas; that Mr. Smith supplied the gas burners.

Mr. Newby, examined.—Stated that he had been a lamp maker for thirty years, and worked for Mr. Messenger of Birmingham; that he remembered the first time he saw the solar lamp, about three years ago; that it had astonished him; that he would have no difficulty in making the lamp from the drawing; that he had made two dozen lamps for Mr. Upton about twelve years ago; the wick was a little under the deflector, and the flame was not so good as Defendant's—not so long.

Cross-examined.—That Mr. Upton's lamps had caps; but could not swear that the caps were made at his manufactory at Birmingham; that he had seen one of the lamps alight which Upton had brought, but none that he had made; recollected the caps; this object was to deflect the air on the flame; that he did not think the air was deflected on the flame, the top of the wick was so near the top of the cap.

Re-examined.—That in drawing his hand over the deflector, it would touch the top of the wick; that he thought the tin lamp was made to have the deflector put down to the bottom; and that there was a wire in the centre of the lamp for a button.

Mr. Pearce and Mr. Samuel Messenger severally gave evidence as to the novelty of Bynner's lamp, and as to its extensive sale.

Professor William Thomas Brande, examined.—Was a professor at the Royal Institution; had read Bynner's Specification, and considered the invention a contrivance for driving the air on the flame so as to produce the maximum of light in a flame properly adapted for the lamp; that the great length, steadiness, and brilliancy of flame, arose from the combination mentioned in the Specification; that he presumed that the air should be struck on the flame

when it became white, and assumed the character of a perfect flame; and that the drawing accorded with that; it was right on chemical principles that the air should strike there, as he conceived that the flame would then be enabled to consume a greater quantity of carbon, and to give a greater quantity of light; and if the air did not strike there, the flame would be smoky, and would not give so much light; smoke was carbon unconsumed; and the point of ignition, the place where the flame was first generated in contact with the oil; popularly speaking, it was the top of the wick; that Bynner's lamp produced a very brilliant light, by the quantity of carbon thrown down by the air, and almost at the same moment consumed—on that the brilliancy depended. It was important that the upper part of the glass should be smaller than the lower part; that the current of air was increased, and descending currents were excluded, and by the narrow chimney the heat was better kept up. [Some experiments were then made by the learned Professor with Upton's and Bynner's pipe wick, and Argand lamp.] That it appeared that the aperture was very little larger than the wick; it was important that it should be so; that in Milner's, if the deflector was intended for an Argand lamp, the aperture was much too large. [Further experiments were then tried with Milner's deflector and Bynner's.] That he had never seen another lamp which produced such a light as Bynner's; that he had attended to the various lamps produced, and to the examination of the witnesses upon them; but that he had not seen any of the lamps in which all the directions as to Bynner's lamps were observed.

Cross-examined by the Solicitor General.—That he had attended as a witness in patent causes; he collected from the Specification that the air ought to impinge above the blue flame, that is to say, at a certain point above the point of ignition; he considered there was a difference between the term "point of ignition," and the term "point where the flame begins to be formed into a perfect flame;" that one expression conveyed one idea to the mind, and the other another. [A chimney, shaped like a peculiar patented chimney, was then tried on the Argand lamp, which burnt with a brilliant light.] That the chimney tried was not according to the patent; it was higher than the chimney shown in drawing No. 1. [Several other chimnies were afterwards tried, but they failed.] He had seen a straight chimney used within the last twenty years, and had used it himself. [A common French glass tried.] This was better than the straight glass. [Deflector taken off and oxydator tried.] This was better than the deflector with the French chimney.

Re-examined.—That by pinching in the glass it made a deflector; he considered a straight chimney an ordinary chimney; and that the invention might be used with the ordinary chimney, but not so well as with the patent chimney.

Professor Daniell, examined.—That he was professor of chemistry at King's College, and had given much attention to lamps; had never seen a lamp so perfect as Bynner's; that its excellence consisted in increase of flame, steadiness, and brightness of light; that all these advantages resulted from the construction pointed out in the patent; and that the steadiness was the effect of contracting the glass.

Cross-examined.—Admitted that the principle on which Bynner's lamp was

constructed, was precisely the same as Simpson's, Upton's, Ratcliff's and other lamps produced; and that the only difference in practice was one of degree; the contraction of the cone being greater than that ordinarily employed in some of the old lamps.

Professor Philipps, examined.—That he was the curator of the Museum of Economic Geology, and a lecturer for many years on chemistry, and had attended to the subject of combustion. Had never seen any lamp, including those brought by the prosecutors, comparable to Bynner's, and considered the parts specified to produce the excellence of those lamps; that he had looked at Upton's Specification, but not minutely; that his lamps had the wick near the deflector, and that the flame would not be struck at the point where it began to become a perfect flame; that was essential to Bynner's lamp, and that he attributed incandescence to that impinging on the flame; had seen various glasses and deflectors used; but that none produced the effect that Bynner's did, and that no lamp combined all the parts of Bynner's Specification. In Miller's lamp there could not be the impinging on the flame to produce the effect of Bynner's. In Roberts' lamp the orifice was too large to produce the proper effect, and that a sufficient quantity of air could not come up between the two caps; and that the aperture was comparatively greater than Bynner's in proportion to the size of the wick. That all the lamps produced were on the same principle as Bynner's, but not properly carried out.

Cross-examined.—Could not say whether the distance of the top of the deflector from the wick was the same in gas and oil lamps; nor whether there was any difference in the distance at which the flame was formed in oil and gas lamps; that he could not say if in Miller's lamp the air was admitted below the point of ignition, nor whether it would impinge on the flame above the point of ignition; that in Upton's safety lamp the air was deflected above the point of ignition, and slightly over the wick, and was constructed on the same principle as Bynner's, but not carried out to the same degree.

Re-examined.—That in Upton's lamp the air did not impinge at the same point as Bynner's, but a little above the wick; that in Miller's there was not room between the top of the wick and deflector for the air to impinge, that there might be a sufficient current, but not to produce a good effect.

This closed the case for the Defendants.

The Solicitor-General then replied:—and after referring to the attack the Attorney-General had thought proper to make upon the parties concerned in the prosecution, and vindicating them from the charges of fraud and perjury, which were as unfounded in fact as unsupported by even a shadow of evidence, he directed the attention of the Jury, first, to the evidence for the prosecution, which he stated was as fair and conclusive as it was uncontradicted, and next, to the evidence for the defence, which, had it stood alone, he declared must have insured a verdict for the Crown. The learned gentleman then remarked, that although generally there existed a very proper desire on the part of the Court and the Jury to support *bonâ fide* patentees, and protect them from the consequences of any unintentional error, that such feeling ought not to be allowed in the present case; for from the evidence for the prosecution it was

impossible to doubt that Mr. Bynner had appropriated the invention of another person, and imposed upon the Crown in declaring sincerely and solemnly that he was the inventor thereof, and that the same had never, to his knowledge or belief, been practised within this realm; whereas, in fact, he was taught the very invention by Mr. Upton, and manufactured these lamps for his employers, the Messrs. Smith, who were licencees of Upton's patent right. The learned gentleman then directed the attention of the Jury to the leading cases of patent law, particularly to the case of Carpenter *v.* Smith, and contended that the evidence before the Court entitled the Crown to a verdict upon all the issues except the seventh; and on behalf of the prosecution he submitted that as this issue was immaterial, and no evidence had been produced to support it, a verdict might very properly be given for the Defendant; but with respect to the remaining issues, all of which were material, he, with confidence, claimed their verdict for the Crown.

Mr. Justice Coleridge then summed up the case at great length.—This was a proceeding by *scire facias* to repeal a patent; the grounds of repeal were that the invention was not new or useful, and that there was not sufficient specification. The declaration stated many such objections, and the pleas denied them; issues were joined which the Jury would have to determine; that there were substantially but two or three questions raised; the utility was admitted, but notwithstanding utility, the facts must be found according to law. The first issue raised the question whether the patent was contrary to law. Two, 3, 4, 5, and 6, whether Bynner's invention was new in December, 1837, and whether Bynner was the first inventor.

7.—Whether or not a manufacture. There was no evidence on either side, but this issue ought to be found for Defendant.

8.—Sufficiency of Specification.

First.—Was the invention new in December, 1837?

Secondly.—Was Bynner the inventor?

Thirdly.—Was Specification sufficient?

Questions 1 and 2 depended in part, and to a great extent, on the nature of the invention in the Specification, it was therefore necessary to consider that first. The Specification must describe the nature of the invention accurately and honestly, and so clearly, that a workman might understand the same, and it must so state, that a party might understand what the party claimed, and next in what manner his invention was to be performed, in such terms, that a person of ordinary skill in the business might make it as well as the patentee. It should be on the face of the Specification what the patentee did, and in what manner he did it. If patentee referred to drawings, they were to be taken as part of the Specification; but if the drawings were not upon a scale, they could not be looked upon as giving the same degree of assistance as if more accurately drawn. Every Specification might be bad in two ways; first, unintelligible; or, secondly, though intelligible, yet if applied to the evidence, it did not describe accurately the invention. The Specification was tolerably clear, so far as it went. The title was "Improvements on Lamps." The Solicitor-General took a distinction founded in law between an improvement and an

entirely new discovery. If the invention was merely an improvement, and claimed as an absolutely new discovery, the patent was void. Bynner's invention consisted in the application of certain deflecting surfaces in combination with peculiarly constructed chimnies; it did not specify where the narrower part of the chimney was to be. It should seem from the words that it was important that the air should strike above the point where the flame was formed; the air must strike above where the perfect flame was formed, but no particular point or distance was mentioned, and the drawings could not be relied on as showing any precise point.

Another matter was as to the use of these chimnies; *read the words* "it is important that the chimney should be of such a figure, in order to produce the fullest effect;" *read also* as to ordinary chimnies. Bynner claimed the combination of the deflectors with peculiarly constructed chimnies; also the use of ordinary chimnies.

The Jury will have to say—

First.—Whether any particular point of deflection was necessary?

Secondly.—Whether a particular size of orifice was necessary?

If the air must impinge at a precise point, or the orifice vary in proportion, the Specification was bad.

The Jury will also have to say—

First.—Whether chimnies of the peculiar form mentioned in the Specification were necessary to produce the fullest effect?

Secondly.—Whether ordinary chimnies would do to produce the same beneficial effect?

Next as to novelty. It was alleged by the prosecution, that there was no novelty as to principle. The Defendants alleged that it all depended on degree or nicety, and that it was a new lamp. The Jury will have to determine whether it was but an improved application of instruments known before, or whether it was a new discovery.

The witnesses on the part of the Crown consist of persons biassed as being in the trade, and proprietors of expired patents, and scientific persons.

First.—As to Specification and peculiar chimney, the learned Judge read the evidence of Douglass, Willis, Pearce, Messenger, and Brande, and commented on it, and left it to the Jury to say—

Whether the fullest effect was produced by the use of the peculiar chimney?

Or, whether it would, in a substantial degree, be produced at all by the ordinary chimney?

Next, as to whether any particular point at which the air should strike, or whether any precise size of orifice was necessary?

Read evidence of Salt, Cumming, Cowper, and Brande.

The Specification did not state at what precise point of the perfect flame the air should strike; the Specification showed the lowest point, but not the highest; and did not show the precise point where the flame began.

Next as to novelty.

Was the Defendant the inventor of a mode of deflecting air on the flame above the point of ignition, or that mode, that is, that principle having been

before discovered, had he only made some practical improvement upon it? If only the latter, the Defendant claimed too much.

In considering the evidence, it ought to be borne in mind, that the witnesses spoke with the knowledge of 1842.

The learned Judge then read Upton and Roberts' Specification, and Cowper and Newby's evidence as to it.

It became a very nice point whether the use had been such as to render the invention not new.

The learned Judge then recapitulated all the lamps that had been produced, and commented upon the evidence given by the witnesses in reference to them.

Professor Cumming made it altogether a question of degree, but that there was identity of principle.

The Defendant called manufacturers to prove the great utility, as well as the novelty of the invention. The learned Judge stated the names and evidence, and commented thereon.

All the manufacturers said might be perfectly true, yet if the invention was in any thing like public use before Bynner's patent, the patent could not be supported.

The points for the consideration of the Jury would be,

First.—Whether upon evidence, a precise point of the flame was necessary to be impinged on?

Secondly.—Whether a precise size of orifice was necessary?

Thirdly.—Whether the fullest effect would be produced by chimnies of the peculiar construction.

Fourthly.—Whether the effect would be produced at all substantially by ordinary chimnies, understanding thereby a straight chimney, like that produced in evidence.

Fifthly.—Had Mr. Bynner invented, in truth, a new mode of applying air to lamps, or that mode having been discovered before, had he only made some practical improvement?

The Jury found as follows:—

We find, for the Crown; we find unanimously, that,

First.—A precise point is necessary; and that such point is not set forth in the Specification and drawings.

Secondly.—We also consider the precise size of orifice to be necessary; and that such is not set forth in the Specification and drawings.

Thirdly.—We find that the peculiar chimney does not produce the fullest effect.

Fourthly.—We find an ordinary or cylindrical chimney of no substantial advantage.

Fifthly.—We find that the invention is not new; it is but a practical improvement of a matter previously known.

Verdict for the Crown upon the first, second, third, fourth, fifth, sixth, and eighth issues; for the Defendant on the seventh issue.

COURT OF QUEEN'S BENCH.—4th November, 1842.

THE QUEEN *v.* BYNNER.

In this case (reported above) the Attorney-General applied to the Court for a rule to shew cause why the verdict should not be set aside and a new trial had.

The Court, at the earnest entreaty of the learned counsel, took time to consider their judgment, which has not yet been given.

COURT OF QUEEN'S BENCH.—8th November, 1842.

THE QUEEN *v.* WALTON.

In this case a *scire facias* had been issued for the purpose of trying the validity of a patent the defendant had obtained for certain improvements in wire cards, used in carding cotton, wool, &c. The invention consists in the application and adaptation of India rubber through which to set the teeth of card, instead of leather, before used, whereby superior elasticity and uniformity are obtained. The issues set up on the part of the Crown were, that the invention was not new as to public use, that it was not found out by the defendant, that it was not a new manufacture, that the Specification was insufficient, and that it was useless for some of the purposes stated in the Specification. The trial took place before Lord Denman, in the sittings after Trinity term, and the Jury found a verdict for the Crown.

Sir Thomas Wilde now moved for a rule *nisi* for a new trial, on the ground that the verdict was against evidence. The validity of the patent had been tried twice before, in actions brought by the patentee for infringements of his patent, in both of which he had received verdicts. On the trial it was contended that the invention did not essentially differ from the inventions of Mr. Macintosh and Mr. Hancock, in neither of which did elasticity constitute any feature of their invention; whereas in Mr. Walton's, it constituted the main characteristic of his invention.

Lord Denman thought it a very fit case for further inquiry; and the Court, after hearing the learned counsel at great length, granted the rule.

List of New Patents.

PATENTS GRANTED BY THE FRENCH GOVERNMENT DURING THE SECOND QUARTER OF 1842.

AYGALENQ-BLANQUET, of Arras, for "a new machine for making bricks."

CHEVALIER, 140, Rue-montmartre, for "a portative stove."

CHUARD, 25, Rue-d'enfer, for "an instrument, called Gazoscope, for detecting detonations of the atmosphere in mines and in rooms where gas is used, so as to guard against explosions."

COLMAN, at M. Truffaut's, 8, Rue-favart, for "improvements in the manufacture of starch."

DELAROCHE, 40, Rue-du-bac, for "a new steam boiler for culinary purposes."

FOULQUIE, 4, Rue-Caumartin, for "an instrument to chop meat, vegetables, &c."

MLLE. GALY-CAZALAT, 23, Rue-folie-mericourt, for "a new tea or coffee pot which acts by steam."

GUEUDET, 47, Rue-du-ponceau, for "a machine for the manufacture of matches."

GUIRAL, of Vigan (Gard) for "a new veneering instrument."

HADDAN, at M. Duret, 4, Rue-vide-Gousset, for "improvements in the construction of railway carriages, axles, wheels, &c."

[*To be continued.*]

PATENTS GRANTED IN ENGLAND, FROM NOVEMBER 2nd TO NOVEMBER 17th, 1842.

Six Months allowed for Enrolment of Specification, unless otherwise expressed.

MATTHEW GREGSON, of Toxteth-park, Liverpool, esquire, for "improvements applicable to the sawing or cutting of veneers." Being a communication. Sealed November 2.

JOSEPH EDWARDS, of Bloomsbury-square, clerk, for "an improved razor-strop, or instrument for sharpening certain cutting edges, and an improved material for covering the same, which material is also applicable to other purposes." Sealed November 2.

SIR JOHN SCOTT LILLIE, of Chelsea, for "certain improvements in roads." Sealed November 2.

PIERRE PELLETAN, of Bedford-square, esquire, for "improvements in the production of light." Sealed November 2.

JAMES BULLOUGH, of Blackburn, overlooker, for "certain improvements in the construction of looms for weaving." Being a communication. Sealed November 3.

RICHARD BEVAN, of Liverpool, wine merchant, for "certain arrangements connected with the circulation of steam employed in pipes or tubes for producing heat, and the application of such arrangements to various purposes." Sealed November 5.

JOHN ROTHWELL, of Great Bolton, grocer, for "a certain composition and preparation to promote the ignition and combustion of coke, coal, and other combustible substances, in stoves, furnaces, and grates." Sealed November 5.

WILLIAM COLEY JONES, of Vauxhall-walk, Lambeth, practical chemist, for "improvements in treating or operating upon a certain unctuous substance, in order to obtain products therefrom for the manufacture of candles, and other purposes." Sealed November 8.

PIERRE FREDERICK INGOLD, of Buckingham-place, Hanover-square, watch-maker, for "improvements in machinery for making parts of watches and other time-keepers." Sealed November 8.

ARTHUR HARVIE, of Wilmington-square, gentleman, for "improvements in the process of vinous fermentation." Being a communication. Sealed November 8.

THOMAS WRIGLEY, of Bridge-hall, Bury, Lancaster, paper manufacturer, for "certain improvements in machinery for manufacturing paper." Sealed November 8.

JOHN MITCHELL, of Birmingham, steel pen-manufacturer, for "a certain improvement in the manufacture of metallic pens, and a certain improvement in the manufacture of pen holders." Sealed November 8.

JOHN SPINKS, the younger, of John-street, Bedford-row, gentleman, for "an improved apparatus for giving elasticity to certain parts of railway and other carriages requiring the same." Sealed November 8.

HENRIK ZANDER, of North-street, Sloane-street, engineer, for "certain improvements in steam-engine boilers and furnaces, and in the methods of feeding and working the same; as also in the machinery for applying steam power to propelling purposes." Sealed November 8.

JOHN BARNES, of Church, Lancashire, manufacturing chemist, and JOHN MERCER, of Oakenshaw, Lancashire, calico printer, for "certain improvements in the manufacture of articles used in printing and dyeing cotton, silk, woollen, and other fabrics." Sealed November 10.

CHARLES ROWLEY and JAMES TURNER, of Birmingham, button manufacturers, for "improvements in the manufacture of perforated metal buttons." Sealed November 15.

ANDRE EUSTACHE GRATIEN AUGUSTE MAURRAS, of Cornhill, gentleman, for "certain improvements in the process and apparatus for filtering water and other liquids." Being partly a communication. Sealed November 15.

CHARLES SMITH, of Newcastle-street, Strand, for "improvements in the manufacture and application of bricks, tiles, and other plastic articles or surfaces, and for cements or compositions to be used with, in, and about the same, for building and other useful purposes." Sealed November 17.

PATENTS GRANTED IN IRELAND IN NOVEMBER, 1842.

JOSEPH WHITWORTH, of Manchester, in the county of Lancaster, engineer, for "certain improvements in machinery or apparatus for cleaning roads, and which machinery is also applicable to other similar purposes." Sealed November 1.

CLAUDE EDWARD DEUTSCHE, of Fricour's Hotel, Saint Martin's Lane, in the county of Middlesex, gentleman, for "improvements in combining materials to be used for cementing purposes, and for the preventing the passage of fluids, and also for forming articles from such composition of materials." Being a communication. Sealed November 7.

JOHN COX, of Gougie Mills, near Edinburgh, tanner and glue manufacturer, for "improvements in the processes of tanning and leather dressing."

JAMES PILBROW, of Tottenham Green, in the county of Middlesex, engineer, for "certain improvements in the application of steam, air, and other vapours, and gaseous agents, to the production of motive power, and in the machinery by which the same is effected." Sealed November 18.

The Record

OF

PATENT INVENTIONS.

No. IV.

SPECIFICATION enrolled 3rd November, 1842, of a PATENT granted 3rd May, 1842, to JOHN ROBINSON, of Watney Street, Commercial Road East, in the county of Middlesex, engineer, for "*improvements in windlasses and capstans.*"

THE first improvement relates to windlasses, and consists in the application and use of two barrels, with guide rollers or pullies between them; one of the barrels is of the ordinary description, the other is about half the length; on the axis of each barrel is a cog wheel, with an intermediate wheel between them; and on the same axis as the intermediate wheel is a number of guide pullies. The cable, in passing from the barrel of one windlass to the other, passes over the guide pullies. The object of this arrangement, is that the cable may be continuously wound, without stopping to move it on the surface of the barrels.

Claim.—The mode of connecting two barrels, having guiding surfaces or pullies between them.

The second improvement consists in another method of effecting the same object, namely, avoiding the necessity of stopping from time to time, for the purpose of moving

the cable on the barrel of a windlass; in this case, the barrel, at that part where the cable is wound on, is made conical, and with a number of bits, or projecting surfaces, around the periphery of the conical part; these surfaces extend in a direction of the length of the cone, and also across its axis somewhat in a spiral form, which causes the coils of the cable to slip down as they are wound on the barrel.

Claim.—The mode of applying a series of inclined planes or bits, in a direction across the axis of the barrel of the windlass.

The third improvement consists in the application of a guide plate for facilitating the giving out of the cable. This plate is fixed in a vertical position, and moves upon an axis at its lower end, and consists of a rectangular or oblong plate of iron, standing at right angles to the axis of the windlass, and having a portion of one edge removed, so as to embrace the barrel. When it is required to run the cable out, it is placed between the said plate and a guide pulley.

Claim.—The mode of applying a guide plate to give out the cable.

The fourth improvement relates to that description of windlass having a motion similar to a pumping action; and consists in making the cross-head with four sockets in place of two, as in those of the ordinary construction. By this arrangement it will be seen, that four bars can be employed in working the cross-head, in place of having only two.

Claim.—The construction of a cross-head for working the barrels of windlasses, whereby four bars may be used in giving motion to the cross-head.

The fifth improvement is an improved method of giving motion to windlass barrels. The barrel, in this case, is

made with an enlarged part or collar; a band or strap passes round the periphery of this collar, which is attached at one end, by means of a link, to two plates. These plates are connected together, and are placed at each side of the collar, which is made with a circular projection on each side; and within these projections the plates, which have concentric projections formed on one edge, fit; a horizontal lever works between and upon an axis carried by the plates; one end of this lever is joined to a connecting rod, which passes from the cross-head; and the other end is connected by a link to the opposite end of the strap or band which passes round the periphery of the collar. By this contrivance, when the end of the horizontal lever is lifted by means of the connecting rod, the opposite end will be depressed, together with the link, and the end of the metal strap which passes round the collar, and is attached at its opposite end to the bottom edge of the two plates, will be drawn so as to embrace the periphery of the collar tightly; and on further raising the end of the lever, the barrel of the windlass will be caused to move partly round; and on depressing the end of the said lever, the band will be released and slip on the periphery of the collar, so as to be ready for the next rise or lift of the lever.

Claim is the mode of giving motion to windlass barrels, by employing a band or strap with the plates and other parts connected therewith.

The sixth improvement relates to another mode of giving motion to windlass barrels by forming the surface of the collar into teeth, and in the application of a plate of iron in the form of a segment of a circle. This plate is placed between the end of a lever similar to that above described, and the toothed surface; in this case, the end of the lever is formed so that whenever its opposite end is raised, the

lever will nip against the back of the plate, and thus bind or press it tight against the toothed surface; and on further raising the lever, the barrel will be forced partly round. This arrangement also admits of a pall or catch being fixed to the top part of the two plates supporting the lever (as before described), and taking into the teeth of the surface, which is formed like a ratchet wheel.

Claim.—The forming the surface into teeth, and using a plate between such surface and the nipping lever.

The seventh improvement.—This arrangement shows the application of a plate between the nipping lever and a plane surface, which is embraced by a hoop fixed to the plates which carry the lever; and also a mode of applying a friction band for retarding or giving motion to windlass barrels. This friction band passes round a collar or enlarged part of the windlass barrel; to one of its ends is firmly attached a projecting piece, which forms a radial line to the circle made by the band; to the other end of the band is connected, by a pin joint, a piece of iron having a socket in its outer end; the middle of this latter piece, which moves upon a pin joint, and the outer end of the former, are connected together by a link; consequently, if a handspike be inserted into the socket, and the same be depressed, the two ends of the strap or metal band will be drawn together by the connecting li...; and on raising the handspike, the metal band will be slackened, and will slip round the surface upon which it is placed, ready to take another hold.

The eighth improvement shows the application of a second barrel to a windlass, which is grooved for the purpose of keeping the cable straight; and also the application of an apparatus for holding the cable, in order to release the windlass when the ship is riding at anchor. The frame of this apparatus is fixed a-head of the wind-

lass, and consists of a series of levers which move a block of iron having a concave or grooved surface, with suitable projections, for holding the cable, which passes underneath it. By raising or depressing the block, the cable will be held or released, as may be required.

Claim.—The mode of applying a second barrel to windlasses, when one of the barrels is grooved; also the mode of constructing a stopper for the purpose above described.

The ninth improvement relates to a mode of employing two barrels to capstans. A cog wheel is fixed on the axis of each of the barrels, which are connected together by an intermediate wheel keyed on the axis of a vertical shaft, placed between the barrels; on the upper end of this shaft, is fixed the head of the capstan, which can be removed when less power is required, and placed on the end of one of the barrels. The cable is guided from one barrel to the other by means of guide pullies.

Claim.—The mode of constructing capstans with two barrels, when guide pullies or rollers are used between them.

The tenth improvement relates to a mode of lowering, and thereby releasing, the nipping apparatus hereinbefore described. For this purpose, the frame or bearing which supports the axis of the cross-head is capable, by an arrangement of levers, of being lowered, and with it the connecting rods which actuate the levers, and thus release the nipping apparatus when it is required to give out cable: and in order to raise the palls from the teeth of the pall wheel, a semicircular piece of iron, connected with the frame, partly embraces the surface of the wheel; at one end of this semicircular piece there is a socket to receive a handspike, for the purpose of moving it round the said surface; on doing which, the opposite end will be forced between the surface of the wheel and the ends,

or underneath the palls, and thereby force them out of the wheel.

Claim.—The mode of putting the nipping parts out of action, by lowering the cross-head; and also the mode of putting out the palls by means of the plate, as described.

The eleventh improvement consists in a mode of working a windlass on the main-deck by means of the top-gallant capstan. Underneath the top-gallant forecastle deck is fixed a horizontal shaft, having two forked ends; the forks of one end are connected with and work the cross-head of the windlass, and those of the other end (and which are provided with anti-friction pullies) rest upon the top side of a horizontal tappet wheel, keyed on the lower end of the axis of a capstan barrel, which passes through the deck: by this contrivance, when motion is imparted to the capstan, the projections on the face of this tappet wheel, as it revolves, first raise one forked arm of the horizontal shaft, and then the other, alternately; and thus impart a reciprocating movement to the cross-head, or other suitable driving tackle of the windlass.

Claim.—The mode of giving motion to a windlass, by means of connecting the cross-head, or other apparatus (which works suitable driving tackle of the windlass,) with the working of a capstan.

The twelfth improvement relates to the application of two eccentrics for working the barrel of a windlass, in place of the cross-head; the eccentrics are fixed on a horizontal shaft, on the end of which is a winch for giving a rotary motion to the same; the connecting rods, in place of being connected with the cross-head, are attached to rectangular frames, within which the eccentrics work.

Claim.—The mode of giving motion to a windlass barrel by means of eccentrics working the connecting rods, which actuate the parts for driving the barrel of a windlass.

The thirteenth improvement relates to a mode of applying power to capstans. This improved capstan consists of a vertical shaft, which remains stationary; upon this shaft is a tube which works loosely; and upon this tube, in the same manner works the barrel of the capstan; a plate of iron is bolted to the bottom end of the barrel, having a projecting rim of a cylindrical form, so as to cover the wheel-work inclosed within, the lower end or periphery of which forms a ratchet wheel, which receives palls or catches fixed upon a plate below the first. This plate is precisely of the same form as that described, with this difference, that the projecting rim or cylindrical part forms an internal wheel. To the upper end of the tube which passes through the barrel is fixed the head of the capstan; and to its lower end is keyed a pinion, which gives motion, by means of an intermediate wheel (the axis of which is carried by the barrel of the windlass), to the internal wheel, or bottom plate. It will be seen, that on giving motion to the tube working on the fixed shaft, that motion will be imparted by the intermediate wheel to the internal wheel which forms part and parcel of the plate; and that, by means of the catches fixed upon this plate, and taking into the pall wheel formed on the upper plate, motion will also be given to the barrel. The capstan head may, when less power is required, be fixed to the barrel of the windlass, in place of the tube; the two plates being locked together, motion will be communicated to the whole. There is another modification of the capstan, the principle of which is the same.

Claim is the mode of applying power to a capstan, as described.

SPECIFICATION enrolled 3rd November, 1842, of a PATENT granted 3rd May, 1842, to JOHN RAILTON, of Blackburn, in the county of Lancaster, machine maker, for "*certain improvements in machinery or apparatus for weaving.*"

THE first improvement relates to certain arrangements of mechanism for stopping the loom when the weft is not properly supplied, or the shuttle not thrown into the shuttle box: for this purpose a horizontal arm supports at its end a double lever or forked piece; at one end of the reed are two wires, or more coarse dents of a reed or wires, between which the forked piece passes when not intersected by the weft thread; but at every pick, so long as the weft is thrown across, the forked piece is kept in a vertical position or nearly so by the intersection of the thread between such piece and the coarse dents of the reed; when the weft breaks, the end of the forked piece passes through the wires and falls down, when it comes in contact with the end of a bent lever, which forces forward the fork and the arm upon which it is fixed, and actuates at its opposite end the knocking-off lever, and thus stops the loom. With respect to this stopping apparatus, the inventor only claims the arrangement of levers shown for stopping the working of a loom.

The second improvement is for self-acting temples. This arrangement consists in the application of two or more round bars or rollers, extending across the cloth; one or both of which are fluted, commencing at the middle, and continued to each end, and similar to a right and left hand screw, and also in a direction of their length, so as to present a surface of fine points. The drawings show

the application of one roller fluted as above, and the other plain, with the cloth passing over the former and under the latter; which arrangement the patentee prefers. A roller fluted in the manner described is substituted in place of the ordinary breast beam.

Claim.—The novel and peculiar construction of temples above described, and the mode of their application to looms in general.

The third improvement consists in an improved elastic connecting link, to be used in place of the ordinary connecting rod, between the crank shaft and the slay. This connecting rod is constructed of two parts, and when put together, one part, which is of a cylindrical form, fits into and slides within the other, and the two parts so connected are acted upon by a spiral spring which keeps them extended: by this arrangement, the crank and crank shaft are less liable to break from any accident which may occur to the loom, in consequence of the parts giving way.

Claim.—The making the connecting links, used between the slay and crank in power looms, elastic or yielding, whether the springs employed be helical or elliptical, or of any other form.

The fourth improvement is for certain arrangements of mechanism for the purpose of effecting the recoil of the warp-beam, in order to bring back the cloth any number of picks, in case the loom should make a few picks without weft. This is effected as follows: a small lever is attached to the common clicks or catches of a taking-up wheel, and by lifting up this lever when it is required, the taking-up motion will be released and the weighted warp roller recoil, and will pull back the warp and cloth until a catch lever falls upon the taking-up wheel of the cloth roller and stops the recoil or running back of the

warp beam. The upper part of this catch lever is made with a slot sliding upon a stud, and in the top of the slot is a set screw, which regulates the running back of the cloth roller.

Claim.—The peculiar arrangement for effecting and regulating the recoil of the warp beam.

SPECIFICATION enrolled 7th November, 1842, of a PATENT granted 9th May, 1842, to JAMES PRINCE WALKER, of Manchester, in the county of Lancaster, coal merchant, for "*certain improvements in the manufacture of candles, candlesticks, or candleholders, and in the apparatus connected therewith.*"

THE improvements in candles consist in making them of an oval, circular, or other form, and with three separate wicks, which run through the candle parallel to each other. The light produced from these candles is stated to be much more intense than those of the ordinary construction, and the combined flame of the three wicks to be similar to a "bat's-wing." In making these candles, the wicks are placed in a mould of a circular or oval form, a little distance apart, and the operation of filling the moulds is conducted in the same manner as for ordinary mould candles. For dips, the candles, after being partly made, are placed together in lots of two or three, according to the number of wicks intended for each candle, and are then finished by dipping in the usual way.

The candlesticks referred to consist, first, of a candlestick having three separate tubes for holding three candles, which are represented as being less in diameter than those of the ordinary construction. These tubes have

each a rod passing through them at their lower end, for the purpose of raising the candles, which may be effected by a stud passing through the socket of the candlestick. Another improvement in candlesticks consists in making them oval to suit the form of candle described; and in order to make them hold candles of different sizes, a sliding piece of metal is inserted in a horizontal recess formed in the upper part of the socket and actuated by a screw, by turning which the candle is forced against the opposite side of the socket: this arrangement of a sliding piece is also shown applied to a candlestick having a circular socket, in which case the sliding piece is forced against the side of the candle by means of a spiral spring in place of a screw.

For candleholders, the patentee bends a piece of metal (by preference steel) in the form of a U, which is to be considerably reduced in breadth at that part where the bend takes place, so as to form a spring for holding the candle; another of these pieces, formed in the same manner, is attached to the first by rivetting the two bent parts together thus  , the only difference being that the two pieces are thrown at right angles to each other; the lower piece fits in the socket of the candlestick, and the upper piece receives the candle: and owing to the flexibility of the spring, the former will accommodate itself to sockets of different sizes, and the latter will in the same manner answer for candles of different sizes.

For the purpose of snuffing candles made with three wicks as hereinbefore described, the inventor constructs snuffers with their cutting edge of a convex or curvilinear form, so that the middle wick may be cut off or snuffed shorter than the two outside wicks, by which means a less quantity of smoke is made than if the wicks were all snuffed of the same length.

Claim is for the manufacture of candles with three or more wicks; and also the exclusive use, for the purpose of such manufacture, of the moulds and parts hereinbefore described; also the several improvements in candlesticks or candleholders, and the parts connected therewith for the purpose hereinbefore described.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to GEORGE HAWE, of Manchester, in the county of Lancaster, gentleman, for "*certain improvements in machinery or apparatus for sweeping and cleansing chimnies and flues.*"

THE first part of these improvements relates to a mode of sweeping chimnies and flues by means of a chain, or wire rope, traversing up and down the chimney or flue with a brush attached to it; and secondly, in a mode of rendering the chain suspended in the flue a nonconducting medium for the electric fluid; and thirdly, in a mode of sweeping or cleansing chimnies, by sudden concussion or disturbing of the air therein.

In carrying out the first improvement, the patentee fixes to the fire-place a frame, having two barrels or windlasses, round which are coiled the two ends of a chain, or wire rope, passing up the chimney and over a pulley fixed at the top. At the several angles or corners of the chimney are placed bars of iron, for the purpose of keeping the chain at a proper distance from the sides of the chimney. When it is required to sweep the chimney, a sufficient length of chain is wound on one of the barrels, if the machine or apparatus be previously fixed to the fire-place, and the brush is attached to the chain at or near to the

apparatus, when by turning a handle or winch fixed on the axis of the other barrel, the brush will be drawn by the ascending chain up the chimney to the top, and over the pulley, and by the descending chain down the chimney to the bottom; and by placing the handle on the other windlass, the operation can be repeated until the whole of the soot is removed.

For the purpose of preventing the rope or chain, when not in use, from conducting the electric fluid, two pieces of glass, having grooves cut round them in two directions, are introduced into the chain or wire rope, so as to disconnect the metallic parts of the chain by the interposition of the said pieces of glass.

The apparatus for removing the soot by a sudden concussion or disturbance of the air, consists of a cylinder, made of sheet iron or other material, open at both ends, and having a piston fitting therein, which is rendered air-tight by packing in the ordinary manner. A fire board is fitted into the fire-place, having a hole large enough to receive the end of the cylinder into which it is fitted, together with the fire-board in the fire-place, sufficiently air-tight for the purpose required; to the end of the piston rod is fixed a vertical spring, having a horizontal projecting arm, acted upon by a tappet mounted on a shaft, having a handle or winch at each end, and supported by a suitable frame resting upon the floor of the room. By turning the handle or handles of the tappet shaft, the piston will be gradually forced into the cylinder, until the tappet has made one revolution, when the end of the projecting arm will be released, and the piston being suddenly withdrawn by the spring, will form in the cylinder a partial vacuum; and the air, in rushing down the chimney to supply the place, removes, by its sudden concussion, the soot from the sides of the chimney, which falls into the

fire-place: this operation may be continued until the whole of the soot is removed.

The patentee, in conclusion, says, that he does not claim the use and application of a chain and windlass, in the manner herein described, when separately considered, as he remarks that such have before been used; but what he claims is, first, the employment and use of windlasses, in connection with such chain or rope, as the means or instrument of motion by which the brush is made to travel up and down the chimney or flue; secondly, the contrivance herein described for interrupting the continuity of the chain or rope, as a conductor of electric fluid, by the interposition of pieces of glass, or other bodies being nonconductors of electric fluid; and thirdly, the contrivance for removing soot from chimnies or flues by the sudden disturbance of the air therein, by means of the apparatus hereinbefore described, or any other similar apparatus for producing a similar effect on the air in the chimney or flue.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to THOMAS EDGE, of Great Peter Street, in the city of Westminster, gas apparatus manufacturer, for "*certain improvements in apparatus for measuring gas water and other fluids.*"

THE first part of this invention consists in improvements in the ordinary water gas meter, by means of which a more correct registration is obtained; and also whereby the action of the meter is stopped with greater certainty, when the water sinks below the proper level by evaporation or other causes. It is well known that when the

water, in ordinary meters, gets below its proper level, the ingress of gas is prevented by means of a valve connected with a float; but this part of the apparatus, according to the present construction, is subject to become corroded, and its action thereby stopped. To obviate this, the patentee fixes the valve on the end of a horizontal lever, moving upon a pin joint at its opposite end; and the mode of raising or lowering this valve is by a spherical float, having a vertical rod attached to it, and connected at its extreme end to the lever; so that as the water becomes raised or depressed by the action of the gas thereon, or by evaporation, the float will be acted upon, the vertical motion of the same being preserved by a weight attached to the lower part of the spherical float. A shield, or piece of metal, is placed over the valve, in such a position as to entirely prevent the deposition of any matter from the inlet pipe, and also to protect it against injury or alteration.

The second improvement is for compensating for either an increase or decrease of water in a gas meter. The axis of the drum gives motion by means of a worm and worm wheel to a vertical shaft; at the upper end of this shaft is a drum in the form of a frustum of a cone; this cone imparts motion, by means of a band, to another cone placed in an inverted position upon another vertical shaft, which gives motion to the series of wheels, or registering apparatus. The band for communicating motion to the second shaft is actuated by a guide connected to a float, in such manner, that as the level of the water varies, the band will be moved up or down on the peripheries of the two cones, and thereby accelerate or diminish the speed of the second cone; for instance, if it be supposed that the registering of the meter varies 10 per cent., by an increase or decrease of one inch in the level of the water,

then the larger and smaller extremities of the frustums of the cones should vary about one-twentieth in diameter; by which means the different situations of the band would communicate such rotary motion to the counting machine as would indicate the quantity of gas passed through, presuming the cones to be previously adjusted.

The second improvement consists in constructing a station meter for gas works, whereby the total quantity of gas consumed and issuing from the gasometer or holder may be ascertained, and its pressure regulated. There are several modifications of this improvement; one of which consists of a gas holder, placed in a tank in the ordinary manner. The gas enters through a pipe, as usual; into which pipe is suspended, from the centre of the top of the gas holder, a parabolic cone; the top part of the inlet pipe being contracted, so that when the holder is raised by the gas to its highest altitude, the parabolic cone forms a valve, and closes the aperture, which has gradually been contracted during its ascent. On the top of the gas holder is fixed a vertical rack, which takes into and drives a wheel supported by a suitable framing, and having fixed at one end of its axis a lever or arm, which carries a weight capable of being adjusted, that is, of being moved to any part of the said arm, for the purpose of regulating the pressure on the gas holder. This frame also supports, in an elevated position, a common-going clock, having a vertical spindle connected with it; upon this spindle is a drum, covered with a sheet of paper, graduated vertically round its periphery into twelve compartments, answering for the twelve hours of the night, and also into horizontal compartments corresponding to the altitude of the gas holder; the upper end of the rack carries a pencil, with its point in contact with the periphery of the drum; and as the gas holder rises or falls,

the point of the pencil marks its altitude; and the rotation of the drum, actuated by the clock, shows the time and extent of opening the aperture or valve, and consequently, the quantity of gas which has passed at any time during its action, as ascertained and known by previous experiments. Another modification of a station meter is shown, in which the quantity of gas passed through is ascertained by the measurement of a fractional part of the volume only, by which the whole quantity is inferred.

The third improvement consists in the peculiar arrangement of parts constituting a meter for measuring water and other fluids. This apparatus consists of a rectangular vessel, divided into two compartments; the water is admitted by a pipe, through the bottom of one compartment, into one of three passages; these passages are alternately opened and closed by a valve in the form of a fan, having its face dished out similar to a D valve of a steam engine, so as to form a communication with the two passages at one and the same time. A spherical ball or float is supported in this compartment, by a lever on a horizontal shaft; to which shaft is attached a pendulous arm, actuating at every vibration, by means of a tappet wheel, the slide valve. Suppose the passage to this compartment to be open, and the water from the inlet pipe passing through into the vessel; while the vessel is filling, the float will be elevated, and the pendulous arm (when the vessel is sufficiently full), will have moved the valve so as to close the communication, and open that which leads into the other compartment; the water, in passing from one vessel to the other, will allow the float to descend, and the valve will again be moved for the purpose of refilling the vessel, and at the same time open a communication between the other compartment and the outlet pipe, in the same manner as the steam from a high-pressure engine passes from

the cylinder to the eduction port. The quantity of water the vessel contains being ascertained, the number of vibrations or times the float rises and falls is shown by a registering apparatus.

The fourth improvement relates to an improved method of constructing the counting apparatus of meters, whereby the quantity of gas, or other fluid, that passes through the compartment, may be more easily ascertained. For this improved counting apparatus, the inventor employs ratchet wheels in place of the ordinary cog wheels. Motion is communicated from the drum, by means of a vertical shaft and worm wheels, to a horizontal shaft placed in the box of the counting apparatus; upon the axis of this shaft is a peculiar formed tappet wheel, which at every revolution raises the end of a lever moving upon a pin joint, at its extreme end; this lever is provided with a click or pall, which at every vibration of the lever, or revolution of the tappet wheel, takes into one tooth of the first ratchet wheel; and by the action of a spring on the top side of the lever, the ratchet wheel is forced forward one tooth as the tappet wheel recedes; it will, therefore, be seen, that every revolution of the tappet wheel causes the first ratchet wheel to move one tooth; a projecting pin is fixed in the side of this wheel, which at every revolution enters and moves the second ratchet one tooth, and the second wheel in the same manner; and by means of a projecting pin moves the third ratchet wheel. Supposing that each of these ratchet wheels to have ten teeth, and the tappet wheel to make one revolution for every 100 feet of gas passed through the meter, then the first wheel, being moved one tooth, would indicate 100 feet; and one revolution 1000 feet—which would be indicated by the next wheel moving one tooth; and one revolution of this wheel would indicate 10,000—which would be shown or

Thos. Waterhouse's Patent.

Fig. 1.

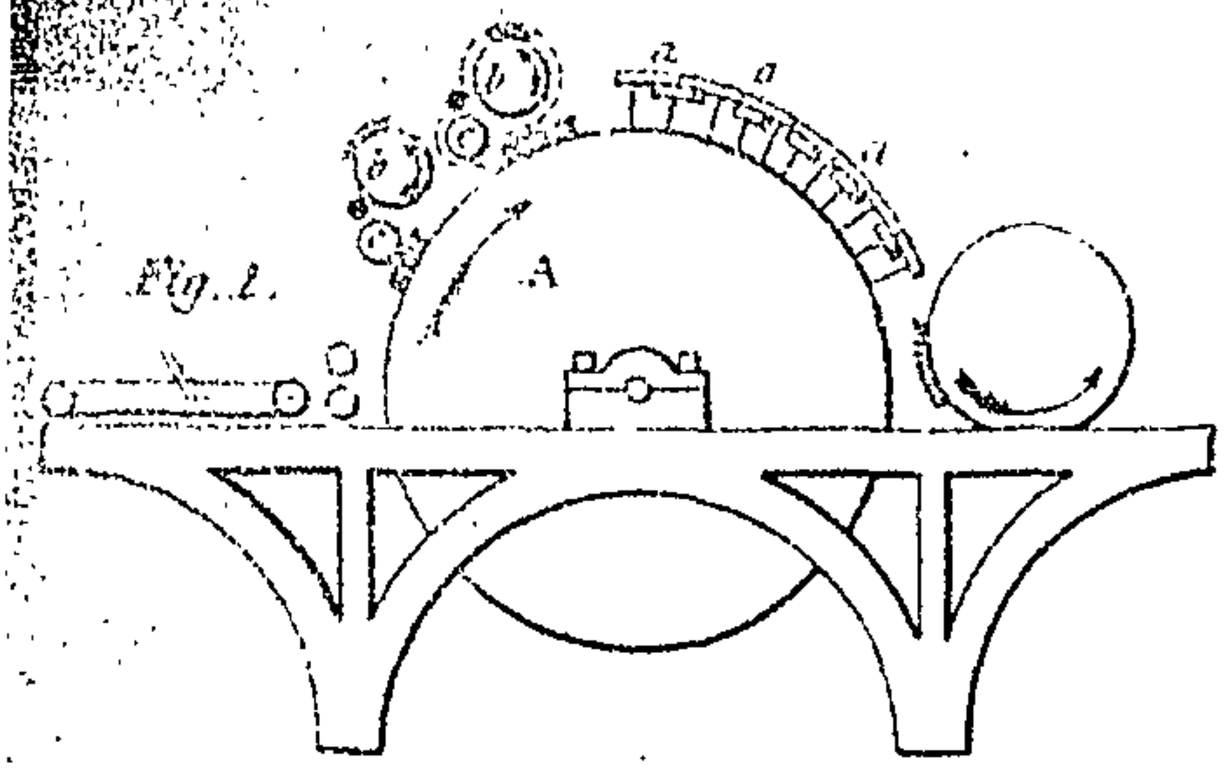


Fig. 2.

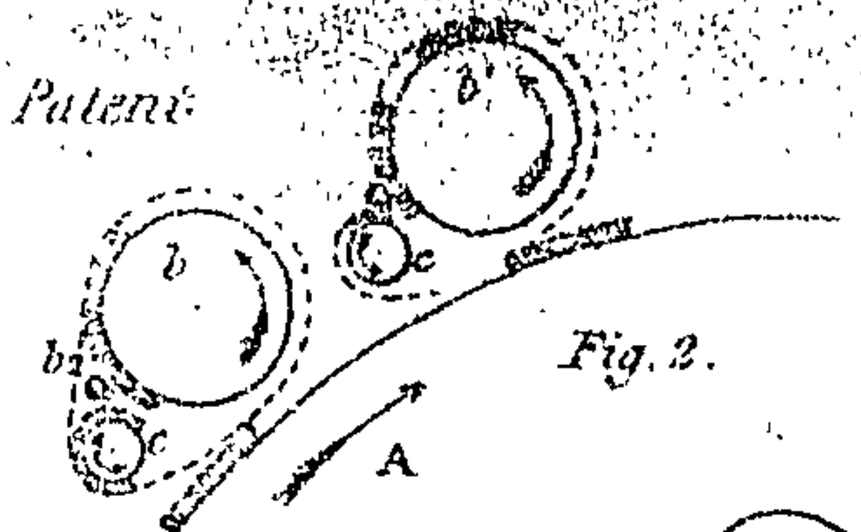
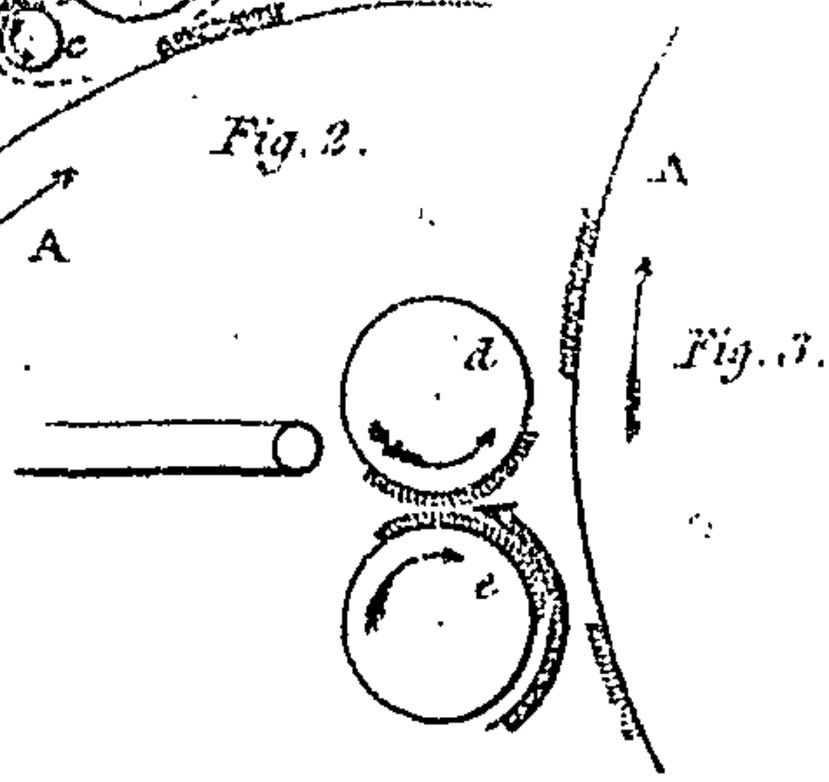


Fig. 3.



Sam.l Hall's Patent.

Fig. 1.

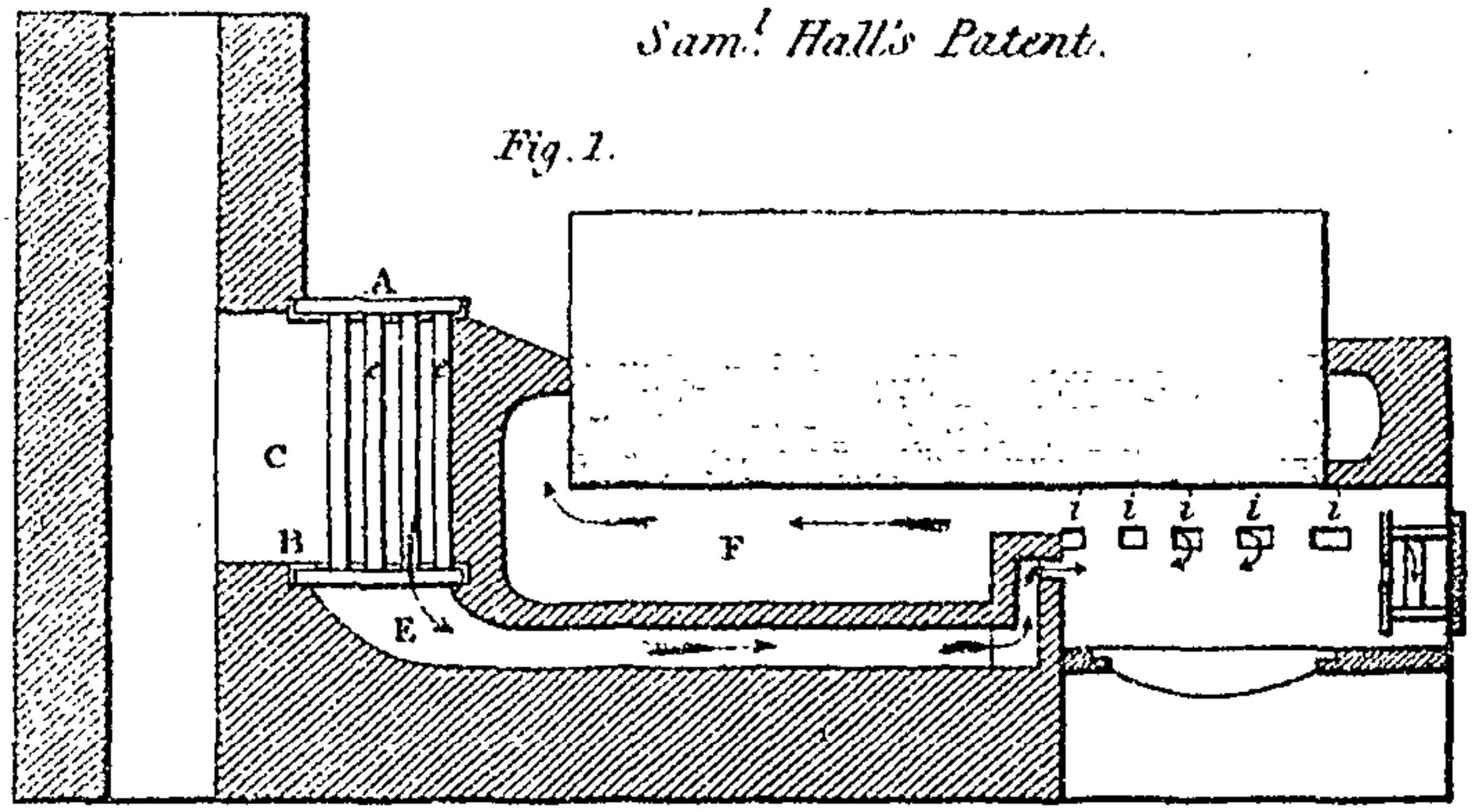
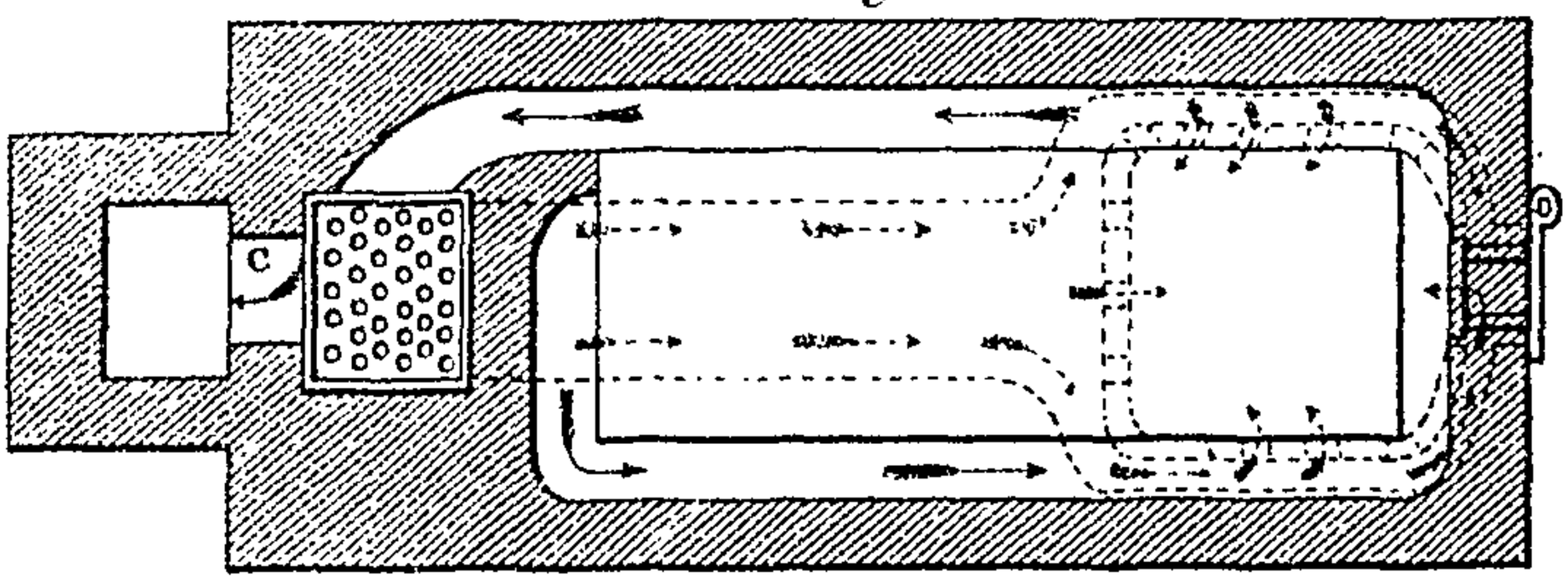
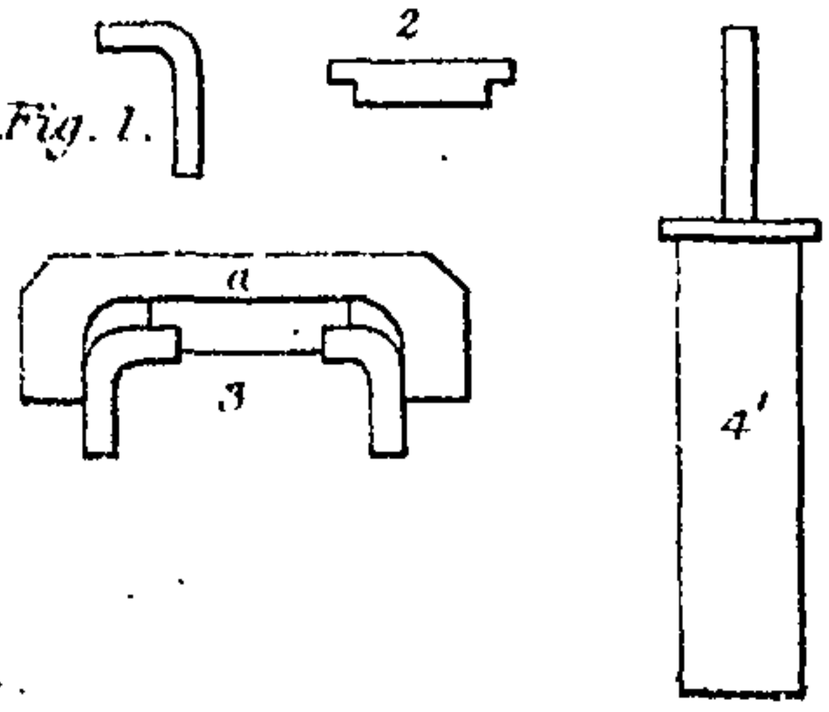


Fig. 2.

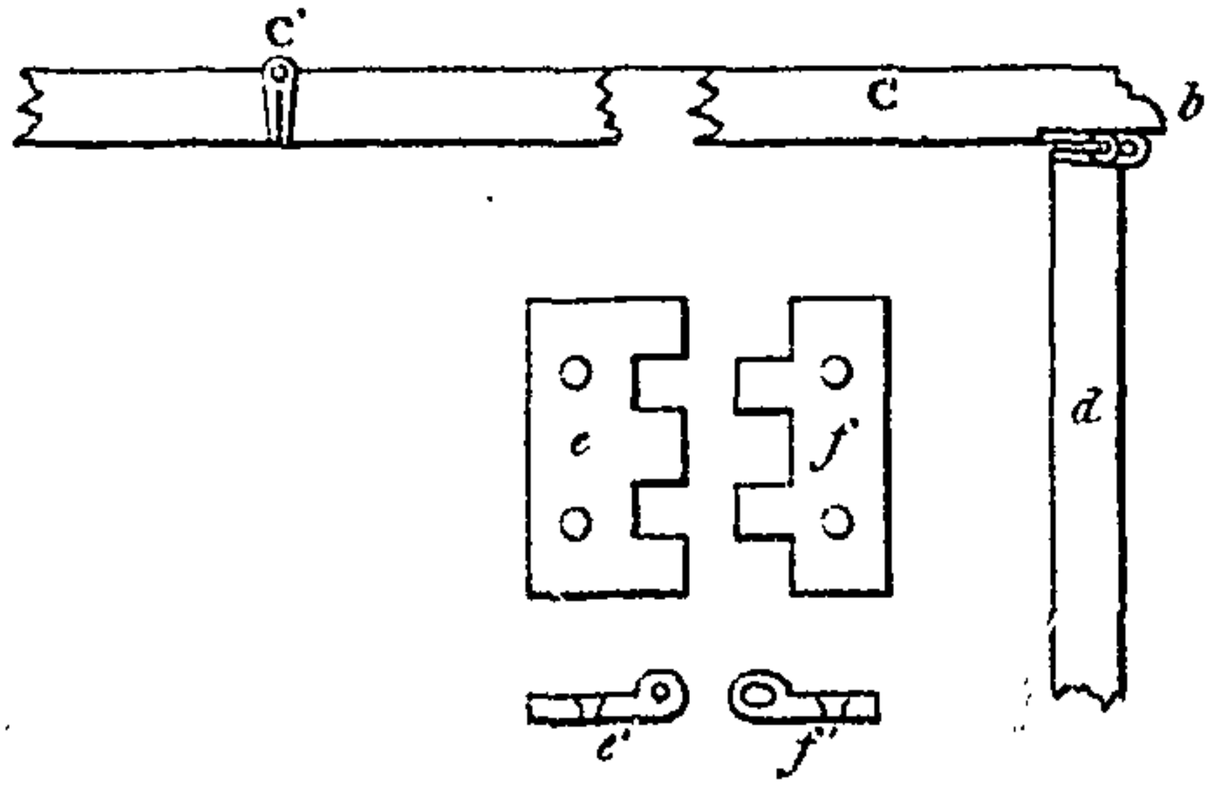


James Boydell's Patent.

Fig. 1.



James Stewart's Patent.



indicated by the third wheel moving one tooth in like manner. Another modification of this counting apparatus is shown, the principle of which is the same, the novelty being in the application of ratchet instead of cog wheels.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to SAMUEL HALL, of Basford, in the county of Nottingham, civil engineer, for "*improvements in the combustion of fuel and smoke.*" (With a Drawing.)

THIS invention is for certain improvements and additions upon former patents granted to the said Samuel Hall, dated 24th June, 1836, 30th July, 1838, and 14th January, 1841.

The first improvement consists in a peculiar arrangement of flues, for the introduction of atmospheric air to the furnace of an ordinary waggon boiler of a stationary engine. Fig. 1, in the accompanying drawing, is an elevation, and Fig. 2 a plan of this improvement applied to a waggon boiler of a stationary engine. A B are two perforated plates, connected together by a number of vertical tubes, *e e*; these plates are fixed in the brickwork, in such manner, that the tubes pass through the flue C, leading to the chimney, as will be seen by the plan. The air for supplying the fire passes through the vertical tubes, and along the flue E, which is made underneath the main flame flue F, until it arrives at the bridge; at which place it branches off to the right and left, terminating at each side of the fire door; thus allowing the air to pass all round the fire and through the holes I I I, made in the brickwork at each side of the fire, and also at the bridge. There are also holes made in the guard. An arrangement of tubes

or apparatus for supplying air, which may either be previously heated or otherwise, on every side of the furnace, is also shown applied to pans for brewing, bleaching, dyeing, &c., and also to bakers' ovens.

The patentee showed, in a former Specification, a mode of conducting air to furnaces of marine boilers; in which case the tubes passed through the water spaces, and were secured by a double nut. The improvement in this part consists in a mode of fastening the tubes; which is effected by driving conical ferules in the ends of the tubes, in the same manner as the tubes in locomotive boilers are fixed.

Claim.—First, the peculiar mode of taking air, for effecting the combustion of smoke, from the atmosphere, and conducting it underneath the main flame flue or passage from the fire-place, which passes underneath the bottom of the steam engine boiler, in combination with the introduction of such atmospheric air at the bridge of the fire-place; secondly, the mode of taking atmospheric air as described, in combination with its introduction either in the front or sides of the fire-place, or both, or all round it; thirdly, the mode of taking air as described, in combination with the previous heating of the air, together with the introduction of air all round the fires of bleachers, brewers, dyers, and other similar pans, or as nearly all round as may be convenient; fourthly, an improved method of fixing the pipes for supplying air to furnaces of marine and other similar boilers. The patentee also claims the combination of the feeders for supplying the fire with fuel, and known by the name of "Stanley's feeders," with each of the methods described, with respect to the present Specification, of supplying air to furnaces; and also in those of the former patents, to which furnaces such feeders are applicable.

In order to effect a more rapid combustion in the furnaces of locomotive engines, the inventor constructs the

fire-box with a number of tubes or holes, for the admission of atmospheric air to the carbonaceous part of the flame as well as to the volatile parts; for this purpose, some of the tubes of the boiler are elongated, so as to pass through the smoke box, for the purpose of admitting air to the back part of the fire as well as to both sides. The inventor also introduces, in the centre of the fire box, an apparatus consisting of a vertical tube connected with the boiler. This tube, at the lower end, is enlarged, so as to form an oval or annular water space; the air from the ash pit passes up the centre of this space, and through lateral openings, to the carbonaceous part of the flame.

Claim.—The use of one or more tubes placed round and near the bottom of the fire, to effect the combustion of the carbonaceous parts of the fire, in the same way as the tubes above effect the combustion of the volatile inflammable parts of the fire; also the employment of the apparatus within the furnace, to give a still further supply of air to the furnace.

As the above arrangement will not have the effect of causing a draught when the engines are stopped, the inventor introduces a pipe, which proceeds from the front of the engine, or steam chamber, to the chimney, in order to create a draught; this pipe is provided with a stop-cock, and can be connected to a pipe leading from any other boiler, for the purpose of getting up the fire and steam in the first instance. The same effect may be produced by inserting a pipe down the chimney which proceeds from some other boiler, and which can be removed when required.

Claim.—The means of causing a draught of air through the fire when the engines are stopped; and also the introduction of a jet of steam into the chimney from any other boiler, for the purpose above described.

There are some improvements in the smoke box; the first of which is the introduction of a bent tube, which proceeds from the force pump; this tube is perforated with a number of small holes, through which a jet or jets of water can be forced, for the purpose of cooling and quenching any fire that may remain therein. Another is for the application of a bent plate, so as to form a lining; this plate is to be perforated with a number of small holes, the aggregate amount of area of which should exceed that of the chimney; the object of this plate, or perforated lining, is for the purpose of preventing any sparks passing up the chimney. And lastly, for constructing the chimney with a casing, between which and the chimney a portion of the water from the tender is passed, in order to heat it previous to entering the boiler.

Claim.—The use of a jet of water within the smoke box at pleasure, for the purpose of keeping it cool, and also for quenching the sparks that may remain therein. The means of supplying a portion of water to the boilers of locomotive engines, by passing it through a casing round the chimney.

SPECIFICATION enrolled 9th November, 1842, of a PATENT granted 9th May, 1842, to JACOB WILSON, of Welbeck Street, Cavendish Square, in the county of Middlesex, upholsterer, for "*certain improvements in bedsteads.*"

THE nature of this invention consists in constructing bedsteads in such a manner that the tester may be raised or lowered at pleasure for the purpose of fastening, cleaning, adjusting, or removing the furniture, whereby the trouble and inconvenience attending the use of steps for the pur-

pose are avoided. The frame of this improved bedstead differs from the ordinary one in this particular, that the posts are to be made from 3 ft. 9 in. to 4 ft. 6 in. high, or any other convenient height, with a head and foot board, to each of which is fixed a box extending from the top of the foot and head board to the floor, and about 14 inches wide; a screw, having a handle on the top, passes down the centre of the box and through a nut or cross-piece made to fit in the interior of the box, which can be raised or lowered by turning the handle of the screw; to each end of this nut is affixed a vertical rod, which passes through the end of the box and supports one end of the tester; it will be seen, that by turning the handles of the apparatus described, fixed at the foot and head of the bed, the rods will descend in the boxes, and the tester will be raised or lowered as may be desired.

Claim is for the construction of bedsteads in the manner described, whereby the tester can be raised or lowered by mechanical means to any extent, whether the means employed be the same as those described or not.

SPECIFICATION enrolled 10th November, 1842, of a PATENT granted 9th May, 1842, to JOSEPH WARREN, of Heybridge, in the county of Essex, agricultural implement maker, for "*certain improvements in ploughs.*"

THE first improvement consists in regulating the depth to which the ploughshare enters the ground, and also the height or elevation of the beam to suit the line of draught; the former is effected by a wedge, which enters at the back part of the ploughshare in such manner as to depress the point in the same proportion as the back part is elevated; the mode of forming the wedge is by a screw

made of a conical form near the head, upon which part rests one end of a bell-cranked lever, attached at its opposite end to the front part of the mould board; so that as the screw is forced forward for the purpose of depressing the point of the ploughshare, the mould board will be depressed in the same proportion by the bell-cranked lever. The beam is attached to the frame of the plough by two bolts, the holes through which they pass being made about twice the length of the thickness of bolt, so as to admit of the beam being raised or lowered at pleasure; the beam is further secured by a regulating screw, which is attached to the frame of the plough, and passes in a vertical direction through the beam.

Claim.—The regulating the depth of the shares and mould boards of ploughs, by means of a wedge-screw and crank, in the manner described; also the raising and lowering of the beam by means of shifting bolts and a regulating screw.

The second improvement is merely a modification of some of the parts of the foregoing.

The third improvement is for a mode of depressing the point of the ploughshare by raising the frame of the plough: for this purpose the sole of the plough is attached to the front part of the frame by a pin joint, and to the after part by a vertical screw-bolt; by turning which, the frame is raised from the sole, and the share depressed in the same proportion.

Claim.—The mode of depressing the shares of ploughs in the manner set forth; also the several modes described of raising the height and inclination of the beams and depth of mould boards and shares of ploughs; and also the peculiar form of a plough described, in which the beam is connected to the top part of the frame, and such part of the frame to the handle by means of "shifting bolts" and regulating screws, similar to those described.

The fourth improvement consists in giving the ploughshare intended for tilling stony land, a more elongated and pointed form than those of ordinary construction.

The fifth improvement consists in giving the mould boards of a double-breasted plough a peculiar form or curve, so as to present an outline continually diverging outwards from the base to the upper extremity.

Claim.—The making of double-breasted ploughs with mould board of the peculiar form represented.

The sixth and last improvement relates to a plough for making drains, and consists of a frame mounted upon two wheels, supporting the plough between them. To the frame of the plough are affixed two vertical racks, actuated by pinions keyed on two horizontal shafts supported by the frame. These shafts are each provided with a handle; by this contrivance, if the handles be turned simultaneously, the plough will be raised or lowered, as may be required; if only one handle be turned, the inclination of the plough will be altered in such manner as to raise or depress at pleasure the ploughshare.

Claim.—The general arrangement of parts, of which the wheel plough for cutting drains consists.

SPECIFICATION enrolled 10th November, 1842, of a PATENT granted 26th May, 1842, to PETER KAGENBUSCH, late of the parish of Whitby, and now of Sandsend, in the parish of Lyth, in the county of York, for "*an improvement in the dyeing of wool, woollen cloths, cotton, silk, and other fabrics and materials.*"

THE nature of this invention consists in the use and application of the residual mother liquors from alum works, from which is obtained a certain product, to be employed as a mordant in dyeing and also for fixing colours.

The inventor takes any convenient quantity of the residual mother liquors from the alum works, that is, rough alum, or alum for rocking, and from which the Epsom salts have been taken in one or more crops; and he also takes the residual mother liquor of that manufacture in which muriate of potassa or sulphates have been employed, but preferring the liquor of the alum from the natural rock. To this residual mother liquor, when heated to boiling, common salt or brine is to be added, in sufficient quantity to neutralise the sulphuric acid contained in the mother liquor: the quantity of salt to be added depends entirely upon the quantity of acid existing in the mother liquor. The salted liquor thus obtained is ready for use, as a mordant for dyeing all colours but red; but if not found to be sufficiently strong, the strength may be increased by continued boiling and evaporation. For the purpose of transport, the patentee prefers to boil it so that the salt will, when left to cool, readily crystallize. The mordant thus obtained should be protected from the atmosphere; and when required for use, it is to be dissolved in water, and more or less of the mordant used according to the depth of shade required.

Claim is, the improvement in dyeing, by the use and application of the residual mother liquors of the alum works, and of the product obtained therefrom, as a mordant.

SPECIFICATION enrolled 11th November, 1842, of a PATENT granted 11th May, 1842, to JOHN MELVILLE, of Upper Harley Street, in the county of Middlesex, esquire, for "*certain improvements in propelling vessels.*"

THE following improvements in propelling are chiefly

intended for the service of sailing vessels, in which steam power is occasionally employed as an auxiliary; and consist, first, in a peculiar manner of attaching the float boards or paddles to the arms of the wheel, in order that the float may enter and leave the water at a curve of small resistance. The ends of each pair of arms of a wheel are connected together by a shaft parallel to the main axis; and to each of these shafts, which work loosely in the ends of the arms, is suspended a float board or paddle, in such a manner that the area of the board on each side of the shaft shall be nearly equal; consequently, when the float is immersed in water, its action will be in a direct line to the line of motion, and the float, in consequence of being made heavier on one half than the other, so as to preponderate, will keep in a vertical position so long as it remains immersed; but immediately on leaving the water, the action of the water against the board will cause it to vibrate, owing to the axis upon which it is fixed working loosely in the arms of the wheel, the amount of vibration being regulated by a chain attached to the edge of the float and the wheel, or by any other convenient stop which will allow the float to vibrate in an arc of about 90 degrees, which the inventor states to have found, from practice, to be attended with good effect.

Claim.—Floats or boards suspended upon an axis or spindle, and vibrating in arcs, the extent of which is regulated by chains or other suitable stops.

Secondly, in constructing a paddle wheel in such a manner that some of the arms can be turned upon the shaft, so as to assume a position nearly parallel to the other arms, and the whole laid nearly in a horizontal position, whereby the floats are prevented from retarding the vessel's progress, when their action is not required. In order to effect this, a number of bosses are employed, to which are bolted

the arms of the wheel; the two outside bosses are keyed fast to the shaft; but such bosses as are between them are so affixed to the outside bosses or shaft as to be readily released and turn upon the axis of the shaft, by means of which the arms can be brought parallel or nearly so to each other.

Claim.—A paddle wheel with moveable arms, as described.

The third, and last improvement, consists in employing one pair only of floats or paddles, that is, one on each side of the vessel; for this purpose, the arms on each side of the vessel may be fixed to the shaft, or the arms on one side of the vessel may be keyed to the shaft, and those on the other side may be connected to the shaft by a clutch or other convenient means, so that they can be turned on the axis at pleasure, parallel or at right angles to each other; in which latter case the arms will act on the water alternately.

Claim.—The employment of a pair of arms or levers on each side of the vessel, arranged in the manner described.

SPECIFICATION enrolled 12th November, 1842, of a PATENT granted 12th May, 1842, to JOHN BROWN, of Brighton, in the county of Sussex, esquire, for "*improvements in the manufacture of mud boots and overalls.*"

THE improvement consists in making the legs of mud boots and overalls in two parts, that is, open in front and behind. Each side or half of the leg is supported or kept in its position by a vertical spring, having a swivel joint about the middle or half way up the leg of the boot, the object of the hinge or swivel joint being to facilitate the

movement of the leg when walking. In some cases, the vertical springs have frames rivsted or otherwise affixed to them, for the purpose of keeping the two sides of a proper shape; the spring has at all times a tendency to close the two sides of the boot or overall, so as to cover the leg; at the same time the boot may be readily removed, by opening or separating the sides.

Claim.—The making of mud boots and overalls, each with two sides capable of separating, and which are caused to close together by means of springs.

SPECIFICATION enrolled 17th November, 1842, of a PATENT granted 17th May, 1842, to THOMAS WILLIAMS, of Bangor, in the county of Carnarvon, smith, for "*an improved churn.*"

THERE are four modifications of this improved churn; the first consists in the application of a vertical shaft fixed in the centre of the churn. Upon the axis of this shaft are fixed, at right angles to each other, four vanes or beaters, and to the inside of the churn are affixed four abutments or projections; on the top of the vertical shaft is a bevil wheel, taking into a similar bevil wheel fixed on a horizontal shaft, to one end of which is attached a handle, and to the other a fly wheel; motion being given to the last mentioned shaft, a rotary motion will be imparted to the vertical shaft, which will, by means of the vanes, beat the milk against the projections.

In the second modification the arrangement of parts is similar, excepting that there are two beaters, one above the other, and at right angles to each other, with a sliding piece between them, against which the milk is beaten.

The third description of churn is of a rectangular form, and has a horizontal shaft fixed to the top part of the frame, to which is suspended, inside the churn, a vertical board or beater. On the end of the shaft is a bent lever, having at one end a weight, and at the other a rope; by pulling which an oscillating motion is given to the shaft, to which is attached the board, by means of which the milk will be beaten against the ends of the vessel.

The fourth modification consists in the use and application of an Archimedean screw, which raises the milk from the bottom of the churn and pours it upon a perforated breaker, on which the butter is deposited, the residue of the milk being allowed to pass through.

Claim.—The improved churn of any of the peculiar forms represented.

SPECIFICATION enrolled 18th November, 1842, of a PATENT granted 23rd May, 1842, to SIR JAMES MURRAY, of Merrion Square, Dublin, knight and doctor of medicine, for "*an improved method of combining various materials, in a manner not hitherto in use, for the purpose of manure.*"

THE main object of this invention or improvement is to produce a compound, such that when mixed in by ploughing, harrowing, raking, digging, or otherwise, with soil, earth, mould, or any ordinary compost, it shall cause to be generated or evolved within such soil, earth, mould, or compost, carbonic acid and useful salts, so as to augment the supply of nutriment for vegetables, and improve the quality of crops generally. This is effected by drying up and solidifying the common mineral acids, which in their

ordinary state, as articles of sale, are not well adapted for purposes of manure, and also phosphoric acid, by mixing them with dry, porous, and absorbent matters, vegetable, animal, or mineral, such as bran, sawdust, dust of malt, husks of seeds, brewers' or distillers' grains, ground rags, pulverized rape or linseed cakes, the refuse of flax, leaves, bark, dry tan, siliceous sands, peat or other sandy mould, dry dust, earth, or clay, fine sifted cinders, ashes, and the like; in which form they may be more conveniently and advantageously combined with alkaline substances; and so combined, may be worked into the ground in a dry state, the chemical action by which the carbonic acid is evolved, and the salts generated, taking place subsequently, and in the most advantageous manner, in the soil itself, when excited by the moisture then present in it, or which may afterwards fall upon it in rain or dew. The acids which the patentee finds most suitable are, first, the phosphoric acid; second, the nitric, or common aquafortis of the shops; third, the hydrochloric or muriatic acid; fourth, the sulphuric acid; and he uses the following processes, whereby, as will be seen, different compounds are produced, but all with this common property, that they are acids, fixed in a solid state, by mechanical mixture with, or absorption into, porous or powdery matters. Thus, first, the patentee mixes any suitable quantity of the mineral apatite, or asparagus stone, or native phosphate, or phosphorite of lime, or fossil bone earth, with an equal weight of common or cheapest sulphuric acid, or any other of the above-mentioned acids. This paste or mixture is well agitated in an earthen vessel during two or three days, and is then ultimately incorporated with one, two, or more of the absorbent substances above enumerated, in sufficient quantity to convert this acidulous phosphoric mixture into a compost, called "phosphoric compound or

powder." In this process, although the phosphoric acid and the super-phosphate of lime thus produced from the mineral phosphate of lime or apatite are specified, which phosphoric acid and phosphate are well adapted to the compound, and are now first applied to such purpose, yet the process is not restricted to the use of this mineral phosphate, inasmuch as any phosphoric acid, and super-phosphate of lime, however obtained, will equally answer the purpose. Secondly, the patentee mixes any suitable quantity of nitric acid or aquafortis with such a quantity of one or more of the absorbent substances already mentioned, as is found sufficient to incorporate the entire mixture into a dry or powdery compost; this compound, when intended to be used for manure, is again mixed intimately with an equal weight of powdered alabaster, or gypsum, or sulphate of lime, whereby the acid fumes are more confined and held in; and the manuring properties are aided when these various substances are well and thoroughly incorporated by stirring and mixing them upon a suitable floor, or in proper vessels. The mixture so obtained is put into casks or earthen jars, from which the air is carefully excluded. This compound, called by the patentee "acidulous nitric powder," is well adapted for producing carbonic acid and the useful class of nitrates within soils, when introduced together with alkaline or earthy carbonates in the manner hereafter shown. Thirdly, the patentee mixes any suitable quantity of hydrochloric or muriatic acid, with such quantity of one or more of the already mentioned porous substances as is found sufficient for incorporating the whole mixture into a dry or powdery compound for agricultural purposes; to this is added an equal weight of powdered alabaster or gypsum, and the whole is intimately mixed together; the resulting mixture is then put into casks, or stone vessels, and secured from

the air; and to this compound the patentee has given the name of "acidulous muriatic powder." Fourthly, any suitable quantity of sulphuric acid is mixed with such quantity of one or more of the most appropriate of the absorbent substances already mentioned, as is sufficient to form a dry powdery compost as before; to this, when intended for agricultural purposes, an equal weight of dry and powdered acidulous sulphate of soda is added, and the same weight of dry and pulverised acidulous sulphate of potass; these, when well mixed and incorporated together, form another compound, which is put into casks or vessels, and called "acidulous vitriolated powder." Each of the acids above mentioned, the inventor has found to require for mixture, about one-half its weight of one or more of the light absorbent porous substances above mentioned; more, however, should be added when necessary, to secure a perfectly dry and pulverisable combination; the nitric acid, or common aquafortis of the shops, being frequently unequal in strength, it has been found convenient to reduce it to a uniform specific gravity of about 1.200. When compounded with alabaster or gypsum, as described in the second process, the compound should be kept separate; the sulphuric acid employed should be diluted with water to a strength of about 1.600; any one or more of the above mentioned acidulous powdery compounds may be used either together or separate, in carrying out the principal object of this invention, as explained in the commencement; and in making the selection, regard must be had to the nature and quality of the lands to which the compost is to be applied, and the kind of crops proposed to be obtained. Thus, phosphates, nitrates, muriates, or sulphates, all or any as may be desired, or be found advantageous, may be generated within the soils by the chemical union of the several acid powdery compounds respectively,

with a sufficient quantity of alkaline matter, either already existing in the ground, or artificially introduced into it for the purpose; but the patentee has found it peculiarly advantageous to conjoin two or more of the before mentioned acid compounds, or all of them together, taking equal quantities of each into one general mixture, which he calls "consolidated acid compound;" and which combination, whether of all or any two or more, constitutes a fifth species of the acid compound, which the patentee claims as one part of his invention.

The next part of the invention proceeds to specify the alkaline substances with which, for the purpose of manure, these compounds are to be mixed. The substances which may be beneficially employed for this purpose are supercarbonates, carbonates, and even subcarbonates of soda, potass, and ammonia; and also earthy carbonates of lime, as lime stone, marble, chalk, calcareous marl, coral, coraline, or shells, or the carbonate of lime remaining after the purification of coal gas, and also magnesian carbonate, such as the mineral called dolomite, or any of them. In order to secure abundance and variety of alkaline matter, (for as the saline constituents of plants are numerous, a variety of alkalies as well as of acids is beneficial), the method which the patentee uses is the following: he takes 1 cwt. powdered sesqui-carbonate of ammonia; 1 cwt. sesqui-carbonate, or bi-carbonate of soda; 1 cwt. powdered dolomite; 1 cwt. of carbonate of lime, coral, or coraline; and 1 cwt. bi-carbonate of potass: all these he mixes well with 1 cwt. of silicate of potass or soda. The powder so obtained the patentee calls his "alkaline mixture;" but he does not claim either the ingredients or the combination as any part of the invention; he only states and describes it as part of the process whereby the general result is effected. For obtaining the silicate, seven parts

of powdered hornblende, nap, or felspar are mixed with three parts of black soda ash, obtained from salt, or with twenty parts of kelp, are fused together for four hours, or until the silicate is formed, in a furnace or kiln; the alkaline mixture so obtained is mixed in equal quantities with either or any of the four acidulous powders, or with the same consolidated acid compound severally above described; this resulting mixture the patentee calls his "fertilizing compost or powder," and he claims it as another and distinct part of his invention. The fertilizing compost is to be put up in casks and kept dry till used. It is to be ploughed, harrowed, or raked into mould or soils; and it may be introduced into subsoils to improve their quality, or may be mingled with clay, earth, or other compost heaps or pits for manure. For wet lands, it is useful to dry the various materials above mentioned, in such manner and at such temperature as are used for drying grain for grinding; and in such lands, in order to retard the too sudden escape of the fixed air, through rain or floods, and to retard and prolong the chemical action, the acid or acids, and the alkaline or alkalies above mentioned, are separately mixed with one-third their bulk of cohesive or gelatinous substances, such as coal or gas tar, liquid pitch, and animal size or jelly, in order to retard and prolong the action of the above manures. On the contrary, for parched land, it is beneficial to make up and use the series of acids or alkalies, or any of them, in a less dried state; and in that state to keep them separate until wanted, and then to mix them together at the time of introducing them into soils and composts, so that their action may sooner commence, by being confined in a moist state within the mould or earth. Another highly beneficial mode of using them is the following: by being briskly agitated or rolled in strong casks, with twenty-four times their bulk of water

or stable liquids, they will impregnate such fluids with fixed air, which may then be applied, by irrigation or sprinkling, to the fertilizing of lands, pastures, meadows, or gardens.

The patentee, after thus describing his invention, states, he would have it understood that he does not claim to have discovered any of the above named mineral acids or alkaline ingredients; but he claims as one part of his invention, the acid powdery compound (five several kinds of which he has above enumerated and described), whereby the hitherto liquid acids are rendered solid and portable, and thereby capable of being brought advantageously and conveniently into combination with alkalies and alkaline earths. And he also claims as a further part of his invention, the combination of the acid powdery compound with an alkaline mixture, and the compost and manure thence resulting. And as he is aware that other combinations of acids and alkalies may be used, differing in some degree both as to the ingredients and the proportions, from those herein described, but capable of producing similar effects, he does not restrict his invention, or any part of it, to the particular mineral acids, or the particular alkaline substances before enumerated, or the exact number or proportion of the specified ingredients; but he claims as his invention, the compound resulting from the mixture of a mineral acid or acids with a porous powdery substance, so as to mechanically solidify the acid or acids, or absorb it or them into the powder; and also the combination of such compound with alkaline or earthy carbonates, for the evolving of carbonic acid within the soil, and about the roots of vegetables; and for generating salts upon and within the ground itself, instead of spreading such salts in crystals or powder over the surface of land as heretofore.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 23rd May, 1842, to JOSEPH GIBSON, of Birmingham, in the county of Warwick, manufacturer, for "*certain improvements in axle-trees and axle-tree boxes.*"

To prevent any lateral motion of the axle-tree, that part of the axle technically termed the coned part works in a cylindrical nut of bell-metal, turned or dished out at one end to receive a collar formed on the axle-tree; a left-hand screw is cut on the periphery of the nut, and made to fit the axle-tree box; this nut is kept in close contact with the collar of the axle-tree by a six-square nut, which fits on the coned part of the axle-tree, and binds against the end of the bell-metal nut; consequently, when the axle-tree box is screwed upon the bell-metal nut, so as to bring the end of the box against a collar formed upon the nut, any lateral motion of the axle will be prevented, in consequence of the bell-metal nut in which the axle revolves being securely held between the collar of the said axle, and the six-square nut screwed upon the coned part.

In order to lubricate the parts of the axle, a longitudinal groove is cut on the top side the whole length of the cylindrical part of the axle-tree, and communicates at the end with a vertical hole drilled through the collar; a similar hole is also drilled through the collar of the bell-metal nut; so that by turning round the box, and bringing the two holes opposite each other, oil may be poured in, which will run along the groove on the top side of the axle-tree and into the oil cup at the opposite end of the axle-tree box.

At each end of the bell-metal nut, that is, between such nut and the six-square nut, and also the collar of the axle-

tree, there is a leather washer, and, in order to prevent such nuts from working loose, a radial hole is drilled through the middle of every square of the six-square nut, for the purpose of inserting (when the nut is screwed up) a pin, the point of which enters the groove on the top side of the axle-tree, thus preventing it from turning back. With respect to the bell-metal nut, a recess is formed in its collar which receives a bolt, acted upon by a spring, so as to force it out of the recess in a lateral direction, and against the end of the axle-tree box, which is made with a number of cavities, in the same manner as a pall wheel; consequently, as the boss is screwed upon th nut, and when nearly up to the shoulder or collar of the same, the bolt will be forced into the recess; but every time one of the cavities of the axle-tree box comes opposite the bolt, such bolt will be forced, by means of the spring, out of the recess, and into the cavity of the axle-tree box, and thus prevent the box from turning back, precisely in the same manner as the pall holds a pall wheel.

Claims.—First, the mehtod of preventing the lateral motion of an axle-tree box upon an axle-tree, by means of a screw collar or nut upon the coned part of the axle-tree.

Secondly.—The method of lubricating the moving parts of an axle-tree and axle-tree box.

Thirdly.—The mode of screwing the axle-tree box on the axle-tree, as described.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 23rd May, 1842, to BENJAMIN COOK, junior, of Birmingham, in the county of Warwick, brass-founder, for "*improvements in the construction of bedsteads, both of metal and wood.*"

THESE improvements consist in coating or covering the

shafts and posts, or other parts of the framing of bedsteads with paper, pasteboard, papier-mâché, or other similar composition, or attaching to such framing figures or devices of similar material, and afterwards ornamenting the external surface of the same, by painting, japanning, gilding, silvering, &c. In order to carry this into effect, the patentee takes the parts of the bed previously fitted and jointed together, and covers them by any of the well-known means with the material above-mentioned.

Claim.—For the invention of decorating bedsteads with suitable ornaments and materials, as above stated.

SPECIFICATION enrolled 22nd November, 1842, of a PATENT granted 24th May, 1842, to JOSEPH DUCE, the younger, of Wolverhampton, in the county of Strafford, lock manufacturer, for "*an improved loch and key to be used therewith, and an improved slide bolt for the said lock, applicable also to other purposes.*"

ONE of the peculiarities of this lock consists in the tumbler having a lateral movement in place of a lifting or vertical movement; the tumbler is made, as in the usual way, of a thin piece of metal, supported at one end, in a horizontal position, by a stud; a projection is formed on the upper edge of the tumbler, which prevents the bolt from shooting, in consequence of a projecting stud, which is riveted to the tail part of the bolt, coming in contact with the projection of the tumbler; on the underside of this projecting stud, which stands at right angles to the tail of the bolt, and slides upon the upper edge of the tumbler, a transverse slot is cut through, so as to receive,

when the tumbler is forced a little on one side, its projection, and thereby allow the boit to shoot. This lateral movement of the tumbler is effected by the key, which is made with an inclined plane or surface; thus, when the key is partly turned round, such part of the key comes in contact with the side of the tumbler, and forces it on one side, so as to bring the edge of the projecting piece opposite the slot in the projecting stud of the bolt, and thereby allow the bolt to shoot. A modification of this principle is shown applied to the latch lock, in which case the tumbler is dispensed with, and the tail part of the bolt is made to move from side to side; in doing which, the tail end of the bolt, which has a small hole through it, is lifted off the end of a projecting stud, fixed in a moveable piece actuated by the handle of the lock; so that when the key is applied to shoot the bolt, the tail end is forced sideways, which liberates it from the projecting pin, and when the bolt is shot, the handle has no control over it, until the key is applied for moving it back, so as to bring the small hole opposite the projecting stud, in which position it drops on to the stud, and by turning the handle of the lock, the bolt will be acted upon.

Claim.—The improved lock having a tumbler as described, *videlicet*, with a motion to be given by the key from side to side, instead of up and down, as usual; also, the key with inclined surfaces or planes to be used with the said lock.

The Specification gives a description of an improved bolt for the said lock, and applicable to other purposes, such as window fasteners, &c. The projecting part of the bolt, which slides in a slot made in the upper or under edge of a lock, rests upon the edge of an inclined piece of metal, one end of which moves upon a centre pin, and the other is bent down at right angles, so that when the

metal piece is depressed, by means of the projecting piece of the slide moving along its edge, such piece will be depressed, and the end will be forced into a notch made in the edge of the bolt of the lock, and thus prevent it from moving.

The last improvement consists in constructing door handles, so that the spindle can be screwed into the knob, whereby the spindle will be shortened to suit different thicknesses of doors.

Claim.—The slide bolt, which has a projection acting against an inclined plane in the manner described.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JOHN BENNET LAWES, of Rothamstead, in the county of Hertford, gentleman, for "*certain improvements in manures.*"

THESE improvements in manures are as follows, and consist in decomposing bones, bone dust, bone ash, and other phosphoritic substances, previous to using them for manure, by mixing with the bones, bone ash, bone dust, or with apatite or phosphorite, or with any other substance containing phosphoric acid, a quantity of sulphuric acid, sufficient to set free as much phosphoric acid as will hold in solution the undecomposed phosphate of lime; whereby the free phosphoric acid is enabled to unite itself with the various alkaline earths contained in the soil, and the undecomposed phosphate of lime is left in a greater state of division than can be obtained by mechanical means.

The second improvement relates to manures applicable to soils which are deficient in any particular alkali, as potash, soda, magnesia, or ammonia. For such soils the

patentee makes use of manure compounded of a mixture of phosphoric acid with the particular alkali required, as potash, soda, magnesia, or ammonia.

The third improvement relates to soils of which silica forms an essential component part, and from which a crop of wheat or other plant is intended to be raised. For this purpose, manure composed of a combination of silica, such as ground flint, sand, or glass, with either of the alkalies, as potash, or soda, is used.

The claims are, first, the combination, for the purposes of manure, of bones, bone ash, or bone dust, or apatite or phosphates, or other substances containing phosphoric acid, with sulphuric acid; secondly, the combination, for the purposes of manure, of phosphoric acid with either of the alkalies, as potash, soda, or ammonia, or with any of the alkaline earths, as magnesia or alumina; thirdly, the combination, for the purposes of manure, of silica with the several alkalies, as above mentioned.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JOHN BISHOP, of Poland Street, in the city of Westminster, in the county of Middlesex, jeweller, for "*a new or improved construction of break apparatus applicable to railway carriages.*"

THESE improvements consist of a complicated arrangement of mechanism, for the purpose of putting all the breaks of a train of carriages into action. To one of the links of the drag chain, which the inventor states should be from forty to sixty feet or more in length, is attached the end of a small chain, passing over certain guide rollers, and

attached at its extreme end to a loop, which embraces a vertical shaft, and is connected at its opposite end by a pin joint to a horizontal bar. Upon the main axle of the carriage is a worm, taking into and driving a wheel fixed on the end of the vertical shaft; a clutch box is fixed upon this shaft, which, when the drag chain is slackened so as to allow the loop or end of the horizontal connecting bar to fall upon it, drops into gear, and puts the whole of the breaks into action; the arrangement being such, that when the drag chain is slackened, previous to the engine starting, all the breaks will be in action; but when the engine is set to work, and the chain is drawn tight, the short chains lift the end of the horizontal bar, and the breaks are then inactive. By this arrangement, if the engine should get off the rails, these self-acting breaks, by means of the chains being slackened, will all be brought into action. There are also certain arrangements shewn, by which the breaksman can put one or all of the breaks on at the same time.

There are three modifications of these improvements; the breaks in the third, in place of being applied to the wheels, are brought in contact, by means of an arrangement of levers and a vertical bar, with the rails.

Claim.—First, is the use of an endless screw on the main axle, in connection with a toothed wheel and clutch box on the vertical shaft; secondly, the mode of putting the break parts into gear, by means of a horizontal connecting bar with a loop falling when the drag chain slackens; thirdly, the means of limiting the amount of friction in the break, with the necessary apparatus connected therewith.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to JAMES PILBROW, of Tottenham, in the county of Middlesex, engineer, for "*certain improvements in steam engines.*"

THESE improvements in steam engines are stated by Mr. Pilbrow to consist in a new discovery in the properties of steam, by which he has ascertained the proper effect of force due to its expansive velocity, viz., that the whole available power and extreme duty from expansion may be obtained from the simple expansive velocity of the steam, when applied in the peculiar manner hereafter described, as well in locomotive as in other high-pressure and condensing engines; also in the engine and parts by which such discovery is made available for propulsion and general purposes, and in the laws or rules by which the best velocities of this engine are ascertained to give the maximum effect; which improvements combined, form a steam engine characterized by the inventor, to distinguish its principle from that of others, as "the in-jet reaction rotatory engine;" also in two methods of connecting the same with the machinery to be moved, one of which the patentee calls "the roller and wheel connection," and the other "the bevilled groove and spherical tongue connection," which is to be used where more than ordinary adhesion or contact is required between the moving parts.

It occurred to the inventor in the course of a series of experiments, which were commenced upon the most simple form of engine, namely, the one invented by Hero, that a current of steam from an orifice loses almost entirely that power of lateral expansion which it possesses when cut off and allowed to expand from a state of comparative rest. The steam engine as invented by Hero, it

is well known, consists of a hollow axle, having two arms, through which the steam or hot air passes, and is afterwards allowed to escape through orifices, which causes the engine to revolve by the force of unbalanced pressure; but if a flat plate be attached to the arm so as to be immediately above the orifice, the steam will impinge thereon, and its course will be changed, and the arms will become stationary, shewing that the force of impingement equals that of unbalanced pressure; if, however, the orifice be covered with a cavity instead of a flat plate, that is to say, a hollow vessel attached to the arm or arms, at such an angle that the in-jet of steam can be returned by its reaction clear of the arm without impinging on the same, the arm will revolve in an opposite direction with greater power than that with which it revolved previous to the cavity being put on; shewing that the cavity not only received the same amount of impingement as the flat plate received, which was equal to the unbalanced pressure, but by this peculiar in-jet and re-issue of the steam, its whole velocity was arrested, and the cavity thus acquired another power of equal amount; from this formula, *videlicet*, that the expansibility of steam issuing from an orifice is not in a lateral direction, but in a line of its motion, and the invariable law that motion is power—power in proportion to its velocity—the patentee constructs a steam engine, or steam wheel, into which the steam is injected, and returned again on the wheel so as to be used over and over again. The construction is as follows, and consists of a wheel enclosed in a case, having a number of cavities around its circumference, similar to the buckets of a water wheel (but of a peculiar form); the case which encloses it should be made sufficiently strong to resist the pressure of the atmosphere, and of such dimensions as to leave about half an inch between

the said case and the periphery of the wheel; a number of orifices are made in the case, through which the steam is conducted by pipes leading from a circular valve box, placed at such an angle as will produce the greatest amount of useful effect upon the cavities of the wheel; there are also a number of cavities formed in the case, into which the steam enters after impinging on the wheel, and from which it is thrown back again on to the wheel. The wheel is made double, or with two sets of cavities inclining in opposite directions; and the valve box, which is of a circular form, has ten holes, five of which lead to the cavities on one side of the wheel, and five to those of the other side, for the purpose of reversing its motion. These ten holes are covered with two-thirds of an annular plate or valve, mounted upon an axis; by turning which, 1, 2, 3, 4, or all the holes leading to either side of the wheel can be opened, and when the engine is in a state of rest the whole of the holes are covered; and by increasing the number of holes and emission pipes round the periphery of the wheel, almost any amount of power is stated to be obtained, from 100 progressively to 1000 horses, without increasing the size of the wheel, by merely applying a greater number of jets of steam; and in condensing engines, the increase of weight would not amount to more than ten tons for the largest.

The mode of applying the engine to locomotives is as follows: The case of the steam wheel is fixed in the smoke box; upon the flange of the driving wheel, which in this case is made somewhat thicker, and flat in the periphery, rests a small roller, the frame being so constructed that this roller, which is attached to the frame, supports the engine; consequently, the weight of the engine, in place of being supported by the axle of the driving wheels, is supported by the wheel itself, and the frictional power

of contact or adhesion between the roller and the wheel will be equal to that of the wheel to the rail; upon the end of this roller is a crank, which is attached, by means of a connecting link, to a crank fixed on the axis of the steam wheel; the object of the link is to allow for the vibration of the springs, and to prevent the wheel from sudden jerks; thus motion is communicated from the steam wheel by means of the cranks to the rollers, and from the rollers to the driving wheels, by the friction of contact, which the inventor calls "the roller and wheel connection." The proportions of this engine, as shewn in the drawings, are intended for a locomotive boiler, which evaporates, at 60 lbs. pressure per square inch, sixty cubic feet of water in one hour; and for such steam wheel, the patentee prefers the periphery to revolve at the rate of 34,830 feet per minute, which will give, at the above pressure, the net actual power of 153 horses. Presuming the driving wheels to be four feet in diameter, and the rollers about three in diameter, and the steam wheel to revolve at about 35,000 feet per minute, the locomotive will be propelled at the rate of about thirty miles per hour. There is a table given in the Specification, showing the best velocity of the steam wheel to obtain the maximum effect in horses power.

The "bevilled groove and spherical tongue connection", where greater adhesion is required, consists in making two bevilled grooves or nicks in the periphery of the roller, into which two projections formed on the periphery of the wheel, and made completely spherical on their edge, work; or in making a groove in the periphery of the driving wheels, bevilled on each side, so as to get narrower as it approaches the bottom, and sufficiently wide to receive the spherical edges of the rail. It will be seen that the adhesion of the wheel to the rail on this

principle, will be increased as the angle formed by the two bevilled sides is more acute; and the same might be beneficially employed in assisting locomotive engines up inclines.

Another improvement, for increasing the adhesion between the wheels and the rail, and also lessening the obstruction of the air upon the engine, is by applying a curvilinear guard or shield, fixed in front of the engine, at an angle of forty-five degrees; by this arrangement, one-half of the total amount of resistance caused by the impingement of the air upon the curved plate will be thrown in a vertical direction, and the other half will have the effect of adding to the weight, or pressing the engine to the rail.

The steam wheel is also shown applied to steam navigation, and having an improved rotary condenser, which consists of a cylindrical vessel, having an eccentric shaft working within it, and extending the whole of its length, and forming a steam tight junction between the ends of the vessel. There are two longitudinal openings in the side of the vessel, one for the induction of steam and hot water from the condenser, and the other for the eduction which leads to the hot well; between these openings there is a spring, which extends the whole length, and bears upon the periphery of the eccentric, so as to form an air and water-tight joint between the two apertures; thus as the eccentric shaft revolves within the cylindrical case, a space will be formed between the induction part and the periphery of the eccentric, which will be filled with water; and as it revolves, the water will move round with the eccentric, and finally escape through the aperture leading to the hot well.

The inventor claims the exclusive use of the invention described, namely, an engine or wheel, with cavities in the

circumference, and the use of two or more jets of steam; also the double row of cavities for reversing the wheel, together with the roller and wheel connection; and the bevilled groove and spherical tongue connection; and the general arrangement and application of such engines to steam navigation.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to THOMAS MIDDLETON, of Leman Street, in the Borough of Southwark, and county of Surrey, engineer, for "*an improved method of preparing vegetable gelatine or size for paper, and also an improved mode of applying the same in the manufacture of paper.*" Being a communication.

INSTEAD of dissolving the resin in potash lye by the action of a strong fire, so as to obtain a brown lye product, which is afterwards put into a cylinder, and the potass neutralized by alum, in order that the alum may act upon the size; the patentee proceeds in the following manner:—

Into a vessel heated by steam is put (say) 50 lbs. of pulverised resin and 100 lbs. of water, together with a proper quantity of soda or potassa, "and if the lye, when cold, marks 100 on Baume's areometer, the proportions will be correct;" when the potassa or soda lye is in a boiling state, the pulverised resin must be gradually added, and the whole stirred well together for five or ten minutes; if the resin continues brittle, it will be necessary to stir the mixture a little longer, in order to make the alkaline lye act upon and soften it; the bath is then allowed to cool, and the alkaline lye is to be drawn off, and the re-

sinous product will be found at the bottom of the boiler. This compound, which is somewhat of the character of white resinous soap, only requires to be dissolved in order to make it into size of the proper strength for mixing with paper pulp; this is effected with boiling water in the proportion of eight pounds of water to one of the resinous product, after which a proper quantity of alum is to be added; the size thus prepared will contain only the proper quantity of potassa, and is ready to be mixed with the pulp in the ordinary or following manner; which latter constitutes the second improvement, and consists in introducing the size into a separate reservoir, from which it flows through a cock provided with a regulator, by means of which the pulp can be sized to any required degree.

At one end of the pulp-vat is fixed a cylindrical vessel, having a spherical float, the rod of which passes through the top, and is connected with a cock leading to the vessel containing the size. By this arrangement the size in the cylindrical vessel is always kept at the same level; there is another cock fixed to the bottom of this vessel provided with an index hand moving over an index plate, by means of which the quantity of size which flows through can be regulated; the size flowing from the vessel in the manner described, falls into a trough through which the pulp runs into a vessel containing a wheel or beater mounted upon a horizontal shaft; this beater is provided with a number of teeth or radial projections, and immediately below it there is also a number of projections against which the pulp is beaten by the revolving wheel, and the size thoroughly incorporated with the pulp previous to entering the paper-making machine. The advantages of this mode of applying size to paper is, that the pulp is brought from a reservoir in an unsized state, and

sized to any required degree with great exactness before it enters the paper-making machine.

The Claims are—First, the producing a paper size, by causing the resin or other equivalent ingredient to absorb as much alkali as required, then drawing off the superfluous alkali, and treating the product with alum or other suitable material, whereby the size is obtained with just the proper proportion required; and—

Secondly—Sizing the pulp with the improved or other size in a separate vessel, into which the size and pulp are brought separately and mixed in any proportions which may be regulated, and from which vessel the paper pulp flows into the paper-making machine.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to WILLIAM TUDOR MABLEY, of Henrietta Street, Covent Garden, in the county of Middlesex, mechanical draughtsman, for "*improvements in machinery or apparatus for making nails.*" Being a communication.

THIS invention consists, first, in certain improvements in making that class of nails commonly known as "cut nails," by a peculiar combination of mechanical parts and motions forming a cut nail machine; the novelty of which is in the application of two heading tools, placed one at each side of the machine, and coming alternately against the ends of the strips of metal as they are cut off by the machine. By this arrangement, the operation of turning the strips of metal is avoided.

The machine consists of a beam, which is caused to

vibrate by means of a connecting rod attached to a crank shaft, and provided with a cutter in the usual manner; the strip of metal, which is equal in breadth to the length of the nail required to be cut, is placed upon a horizontal table or slide, and forced up to the cutters by meaus of a weight attached to a band or chain, the opposite end of which is connected to a slide which forces the strip of metal against the cutters. The outer end of the table upon which the strip of metal is placed, moves upon a centre or stud, the opposite end being connected to a series of levers; and is caused by means of an eccentric to move to and fro, in order to present first one corner of the end of the strip of metal to the cutters, and then the other, so as to cut off, at each stroke or vibration of the beam, a piece of metal of the size of the nail required. Underneath the beam is a slide having a groove cut throughout its whole length, into which is inserted a nipper; there are also two other similar grooves which receive the holding dies, and are regulated at the end by a key or wedge passing through a vertical slot in the slide, and acted upon by a screw. The slide containing the nipper and holding dies is actuated by the beam in such manner that, as the nails are cut off, they are securely held by the nipper and dies during the operation of heading, which is effected by two powerful levers or beams fixed in a vertical position, and moving upon an axis at each side of the frame; these levers are joined together at the bottom end by a connecting link, so that the upper end of each beam, as the nails are cut off, strikes alternately against the heading dies, which are so arranged as to be adjusted at pleasure.

Claim.—The employment of two heading apparatus for the purpose of performing the operation of heading first on one side and then on the other, of a nail-making machine; also, the means by which the heading dies are

held adjusted and removed at pleasure; together with the mode of applying the nipper, such mode allowing it to be withdrawn through the groove which extends throughout the whole length of the slide.

The second improvement consists in a peculiar method of cutting plates of metal into what are commonly called "bills" and "brads" for shoemakers' and joiners' use. This object is effected by a machine with two cutters fixed in frames moving in vertical slides; these cutters are acted upon alternately by means of a crank shaft and connecting rods, the principal novelty in this machine being in the cutters, and consisting in making one pair (that is, the moveable and fixed cutter) grooved, so as to present to the plate under operation a serrated edge, and the other pair of cutters plain. The piece of metal is placed upon a slide which moves alternately from one cutter to the other. Supposing the end of the piece of metal under operation to be plain, it is first presented to the serrated cutter, which severs from the end a number of triangular pieces, which form the bills or brads intended; the end of the plate, having these pieces cut out, presents the appearance of a number of triangular projections, similar to the teeth of a saw, each projection being equal to one of the pieces cut out. The slide now moves on to the plain cutters which cut off the number of projections, and also form "bills or brads," equal to those cut out by the grooved cutters; the end of the metal plate, which is now plain, is again presented to the grooved cutters, and so on, until the whole plate is cut up, which is done without any waste.

Claim.—The production of those nails commonly called "bills and brads," by means of grooved or serrated and plain cutters, alternately, in whatsoever manner the said cutters

are caused to act upon the plate of metal so as to produce the said bills and brads.

Thirdly.—This part consists in certain methods of feeding cut-nail machines of the ordinary construction, whereby the constant attendance of the workman is rendered unnecessary.

This apparatus, fixed in front of the nail-machine, consists of a frame supporting on an axis at its upper end a pendulous bar, which is caused to vibrate by means of a connecting rod at every movement of the beam or cutters; the bottom end of this pendulous bar is made hollow and receives a plunger, the end of which works in grooves made in the periphery of a horizontal cylinder; two of these grooves are of a spiral form, and two straight, and extend the length of the cylinder, and are so constructed that the ends of the straight grooves join those of the spiral grooves; these latter are made at one end with a step, or, in other words, are cut deeper than the spiral groove; at the end of this cylinder are two inclined planes, each of which extends half way round the cylinder; these inclined planes work against similar inclined planes joined to a nut, through which, and also through the cylinder, a horizontal screw passes; this screw has a slot or groove cut in its periphery extending the whole length, into which works a key affixed to the interior of the cylinder; to the end of this screw is attached, by a socket joint, a pair of clams for holding the strip of metal plate to be cut into nails. The action of the apparatus is as follows: Suppose the moveable cutter to be descending, the end of the pendulous bar will move along one of the straight grooves of the cylinder, and on arriving at the end thereof, the plunger will drop down the step, and will then be in the end of one of the spiral grooves; when, by the ascent of the

beam, the pendulous bar will move in an opposite direction and along the spiral groove, which will cause the cylinder to make half a revolution, and thereby turn the screw, together with the plate, the same having advanced sufficiently for the width of a nail to be cut off the end of the said plate by the next motion of the cutter: during this half revolution, the inclined planes of the cylinder have been acting against those of the nut, and the former have caused the latter to recede, drawing with them the screw, and also the plate under operation, the object of this motion being to clear the end of the plate from the cutter during its ascent; thus, when the inclined planes have arrived in such position that the projection of one has passed that of the other, the screw, together with the plate, is forced forward and underneath the cutter, by means of a spring acting against the nut, and in this manner the operation is continued until the whole of the plate is cut into nails.

There is another modification of this apparatus in which the half turn of the plate is obtained by the connecting rod giving motion by means of a ratchet wheel to a pair of bevil wheels, the plate in this case being forced up by means of a fusee or barrel containing a convolute spring.

Claim.—The feeding of nail-cutting machines by means of a revolving and longitudinal travelling screw; also the method of turning over the strip of metal by means of a grooved cylinder, together with the application of inclined planes abutting against other inclined planes upon the box of the screw for the purpose of drawing back the sheet of metal when the cutter is ascending; also, the mode of turning round the sheet of metal by means of a ratchet wheel and bevilled wheels, and also the mode of introducing the metal to the cutter by the application of a fusee or other barrel operated upon by a spring.

SPECIFICATION enrolled 23rd November, 1842, of a PATENT granted 23rd May, 1842, to FREDERICK GOOS, of Manchester, in the county of Lancaster, jacquard machine maker, for "*certain improvements in the jacquard machine or apparatus to be used or employed in looms for weaving.*"

BY these improvements, the operations of the jacquard apparatus are stated to be performed in a more perfect and efficient manner, and the several working parts rendered less liable to derangement,

The first improvement consists in the application of a press board, which forces the card against the needles. In front of the front board through which the ends of the needles pass, is placed the press board, which consists of a flat board, having the requisite number of perforations to receive the points of the needles; this press board moves to and fro in slides, in the same manner and for the same purpose as the cylinder in the ordinary jacquard machine; the cylinder in this machine is removed from its original position and placed above the press board, and is made solid in place of being indented or perforated; as its application in this case is merely to present the cards which pass (after leaving the cylinder) between the front board, or points of the needles, and the press board; and in order to ensure greater accuracy, two pins are fixed in the front board to receive the cards, in the same manner as those pins on the cylinder; thus, as the cards are presented, the press board forces them against the points of the needles; and those which come in contact with the card, press the hooks from off the "griff" or grate in the ordinary manner; the card, as the press board returns, is forced over the points of the needles by two bars passing

through the front board. These bars have round plates or discs at the end, and are actuated by spiral springs.

Another improvement is in reversing the position of the holdfasts upon the "lantern," and also in the application of an independent lantern outside the framing, having a flange to guide the latches, which are in one piece instead of two.

Another improvement is in having the cylinder guide frame open at the end; and also in making the bottom part adjustable by bolts, whereby the cards are more easily got in and out.

Another important feature in this invention is, in making the tail end of the hooks to extend above the top row of needles; and in placing between such tail end and the wire hook a horizontal wire. By this arrangement, when the needle is forcing the hook from off the "griff," and consequently out of its perpendicular position, the tail end of the hook comes in contact with the horizontal wire, and acts as a spring; whereby the spring box, or series of helical springs for acting upon the needles, is entirely dispensed with. Again, the guides at the bottom end of the hooks in this improvement are made of thin plate or sheet iron, perforated with a number of slots, to receive the ends of the hooks; and are attached to the bottom end of the rack or griff, which is worked by a number of studs or circular teeth in place of the ordinary cog teeth.

A further improvement in the jacquard machine consists in the application of a disc, having studs or circular teeth for working into the rack of the griff, instead of a toothed segment as heretofore; and also in employing an improved mode of fastening the segment plate to the links.

Claim.—The improvement as described and set forth, viz., the press board, the holdfasts, the bottom plate and wires, also the tail end of the hooks extending above the

top needles, and the springs for pushing the cards off the needles or front board; the placing the cylinder slide or carriage inside the guide rails, instead of outside; the circular teeth for working in the rack upon the griff; and the improved stud for fastening the links.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to WILLIAM GEEVES, of Old Cavendish Street, in the county of Middlesex, gentleman, for "*improvements in machinery for cutting cork.*"

THE first part of these improvements consists in certain apparatus for cutting cork of a cylindrical form for the stoppers of bottles. This machine is similar to a foot lathe, having a fast headstock with a revolving spindle, which receives its motion from a wheel on the crank shaft. The spindle, which is made hollow, has a tubular cutter fixed on its end, for the purpose of cutting the cork, which is inserted, by means of a hopper or trough, between the cutter and a horizontal square bar or "ram," which works to and fro by means of a connecting rod, actuated by an eccentric keyed on to a transverse shaft at the opposite end of the machine. One side of the slide, within which the ram moves, works upon a vertical pin; so that every time the connecting rod advances to push the end of the ram towards the cutter, it presses outward one end of the moveable part of the slide; and the opposite end being to the same extent forced inwards, holds the square piece of cork steady between it and the opposite part of the slide, during the time the end of the ram is pushing

it between such holding surfaces against the end of the tubular cutter; the holding surfaces are also a little bevilled at the end, so as to allow the waste part of the cork to shell off, and also to prevent it binding against the sides of the cutter. At the top side of the cutter is an oil brush, and at the other side a fine Turkey stone, both of which are brought against the cutter every time the ram is drawn back, for the purpose of lubricating and sharpening the same. Motion being given to the machine by means of a treadle, the corks, as they drop in between the end of the ram (which has a piece of cork attached to it to prevent the cutter being injured), and the tubular cutter will be forced against the same and cut into a cylindrical form; the corks, as they are cut, passing through the hollow spindle and out at the opposite end.

The second improvement consists in cutting discs of cork for wadding for fire arms, and other purposes. This is effected by two horizontal circular knives or cutters, which receive a rotary motion by means of a band; above the revolving cutters is a sliding table, which moves to and fro, similar to the ram above described. On each side of the horizontal circular knives are two vertical tubes or hoppers, into which the cylindrical pieces of cork are placed. Motion being imparted to the machine, the table upon which the vertical hoppers are fixed moves to and fro, so as to bring the cylindrical pieces of cork, as they fall by their own weight, below the bottom end of the tube, alternately against the edge of the circular revolving knives; the discs, which at the commencement of cutting rested upon a plate, are brought by the time the knives pass through them over a vertical tube, through which they fall and are received into baskets.

Claim.—First, the mode of constructing and applying a tubular cutter, in such a manner, that the corks as they

are cut are forced through the tubular cutter; also the mode of lubricating and sharpening a tubular cutter used in cutting corks; and the holding a piece of cork, when cut by a tubular cutter, in such manner, that the cork may protrude beyond the holding surfaces as the cut is made into the piece of cork; then allowing the external surface of cork to shell off and not bind on the outer surface of the tubular cutter which may be used.

Secondly, the mode of cutting circular discs of cork, by means of the tubes acting with suitable cutters.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to JAMES BOYDELL, junior, of the Oak Farm Works, near Dudley, in the county of Stafford, iron master, for "*improvements in the manufacture of keel-plates for vessels, iron gates, gate-posts, fencing, and gratings.*" (With a drawing.)

THE first improvement relates to an improved mode of manufacturing keel-plates for vessels, which the patentee effects by rolling in place of hammering, as heretofore, and consists in bending two plates, by means of rolling, into the form seen at fig. 1, in the accompanying drawing; and also one plate of the form shown at 2, which subsequently forms the bottom of the keel-plate. These three plates, which the inventor prefers to be from seven to nine feet long, are placed together, as seen at 3, and held in such position by wood cramps *a*, and then placed in a suitable furnace, and heated to a welding heat; the wood cramps will be burnt away, but the metal will have run sufficiently to hold the plates together, for the purpose of

withdrawing them from the furnace, and placing them between suitable rollers, whereby the joinings will become firmly welded together. The keel-plate may also be formed of flat plates, by subjecting them to three more rollers of different sizes.

Claim.—The mode of forming keel-plates for vessels, by rolling iron into the proper form, as described.

Secondly, in a mode of making gates, grates, and fencings, such as hurdles. In forming a gate or grate, the bars of iron are cut to the proper length, and placed one over the other in the form required. The parts of the bars, where they intersect each other, are lapped with wire, so as to hold the separate parts together till they are placed in a suitable furnace, for the purpose of heating them to a welding heat; when they are withdrawn, and the welding effected by running them between a pair of rollers.

Claim.—The mode of making gates, fencings, and grates, by welding bars, as described.

Thirdly, in a method of forming feet on iron posts, for gates and other purposes. Fig. 4', represents a cylindrical vessel of sheet iron, into which is fixed, in a perpendicular position, the piece of iron intended for the gate post, which is then to be filled with the scoriæ as they run from the cupola of an iron furnace, whereby the semi-fluid matter becomes firmly fixed to the piece of iron, and forms a foot for inserting in the ground.

Claim.—The mode of applying feet to iron posts, for gates and for fences, by means of the scoriæ from a furnace, as described.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to JAMES STEWART, of Osnaburgh Street, Regent's Park, piano-forte maker, for "*improvements in hinges for piano-fortes, and other purposes.*" (With a drawing.)

THIS invention consists in forming the bearings of the pins or axis of the flaps of hinges, which are to be used for connecting the parts of a piano-forte, or for other purposes, so that the shutting or closing of such parts will not be deranged by the contraction or shrinking of the wood. The improvement consists simply in making the holes through which the pin or axis passes, in one of the flaps of an oval or oblong form, and in the other flap of a cylindrical form, so as to fit the pin; in all other respects the hinge is the same as those of ordinary construction, the object of the invention being to apply one pair of these improved hinges to the cover of a piano-forte, or for other purposes, so that the oblong hole through which the axis passes in one of the flaps may give way, or move upon the axis or pin, and compensate for any contraction or shrinkage of the part to which they may be attached. The application of this improvement will be seen, reference being had to the drawing. *e*, *f*, fig. 1, plan of an improved hinge; *e'*, *f'*, edge view; *b*, fig. 2, represents the hinge, applied to a lid or cover *c* of a piano-forte; the hinge at *c'* may be of the ordinary construction.

Claim.—The mode of constructing a hinge, by forming the bearing for the pins or axis in such a manner as to allow of the flaps moving to and from each other, by the sliding of the axis or pins in their bearing.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 24th May, 1842, to THOMAS WATERHOUSE, of Edgely, in the county of Chester, manufacturer, for "*a certain improvement or improvements in the machinery for carding cotton, wool, flax, silk, and similar fibrous materials.*" (With a drawing.)

THESE improvements consist in the application of certain rods or straight-edges to that class of carding engines in which top rollers and clearers are employed, either in connection with or without top cards or flats; whereby the fibres in the process of carding are retained in the top roller by the rod or straight-edge, and subjected to the action of combing or carding.

Fig. 1, in the accompanying drawing, shows the improvement as applied to a carding engine of ordinary construction, and in connection with top cards or flats *a, a, a*. Fig. 2, is an enlarged view of the parts; A, portion of a cylinder; *b, b'*, the top revolving cards or rollers, and *c, c*, the clearers; the bar or straight-edge is shown in section between the rollers and clearers, and extends the whole length of the rollers, and is supported at each end by the framing. Presuming the engine to be at work, the cylinder and rollers moving in the direction of the arrows, the fibres of cotton or other substance will pass from the cylinder to the roller *b*, and (previous to the application of this improvement) from thence in a direction of the dotted lines b^2, to the clearer *c*, and be delivered to the cylinder in nearly the same state as they left it; but by the application of the bar or straight-edge, the fibres are retained by the roller *b'*, and carried down between the bar, (shown by dotted lines) and are then taken by the clearer, which strips them off the roller, and draws them underneath the bar, and afterwards delivers them to the

cylinder. By this arrangement, the fibres are subjected more or less to an action similar to combing, according to the thickness and form of the bar, a transverse section of which is shown in the drawing as being circular; but a flat bar having a circular edge, or a bar of a wedge-like form, may be employed, the edge varying according to the length of the fibres or staple.

The next improvement consists in the introduction of a bar or straight-edge between the ordinary licker-in and the dirt roller, by means of which the cotton will be more effectually cleaned from moats and dirt. *d*, fig. 3, is the licker-in; *e*, the dirt roller, having the bar or straight-edge between them, and in close contact with the dirt roller, which moves with a slow motion, and has always a tendency to strip the licker-in; but by the application of the bar, the fibres are re-taken and delivered to the cylinder. In this case the bar is made to cover that side of the dirt roller nearest the cylinder, in order to prevent the dirt or moats getting into the same. The patentee states, that carding engines having the above improvements applied, will turn out from 30 to 50 per cent. more work than the ordinary machine.

Claim.—The application of a bar or straight-edge between the clearer and the card roller; also between the licker-in and the dirt roller.

SPECIFICATION enrolled 24th November, 1842, of a PATENT granted 25th May, 1842, to JAMES POTTER, of Manchester, manufacturer, for "*certain improvements in spinning cotton, flax, and other fibrous substances.*"

THE motion of the carriage in self-acting mules, when spin-

ning numbers below fifty, is continued throughout the whole length of the draught with one speed or unvaried movement, and in like manner with the rotary motion of the spindles; but in spinning fine counts, or numbers above fifty, it is desirable to reduce the speed of the carriage when the drawing rollers cease to revolve, and at the same time to increase the rotary motion of the spindles. The reduced speed of the carriage is commonly called the "after draught," and the increased velocity of the spindles, the "double speed;" these two important movements for spinning fine yarn form part of these improvements.

There are other improvements in certain motions, all of which are shown as being applied to that description of self-acting mule for which a patent was granted to Mr. Potter, on the 21st of December, 1838.

The outward motion of the carriage is effected in the following manner: motion is communicated by a bevil wheel on the front roller to an inclined shaft, which, (by means of a bevil wheel at its opposite end,) imparts motion by a series of wheels to two pinions revolving at different speeds; these two pinions are supported by a vibrating lever having three arms, two of which carry the studs upon which the pinions revolve; the third, which is in a vertical position, is actuated by a horizontal connecting rod; by moving this rod, the pinions will alternately be thrown in and out of gear with a spur wheel, which takes into and drives a horizontal rack attached to the underside of the carriage; suppose the carriage at the commencement of the draught, and the same to be coming out, (which is effected by one of the pinions driving the spur wheel, which latter, as described, gears into the teeth of the rack); the carriage having arrived at a certain part of the draught, such part being the commencement of the "after draught," comes in contact with an inclined plane

or lever, the motion of which is transmitted through a series of levers to the connecting rod, which causes the three-armed lever to vibrate, and thus throw out of gear that pinion which has hitherto driven the spur wheel, and put the other into gear, which latter revolving at a less speed than the former, imparts a slower motion to the carriage to the end of the draught, at which time both pinions are thrown out of gear with the wheel so as to leave such wheel free to revolve by the motion of the carriage going in. It must be observed, that the same arrangement of levers which actuates the pinions for the commencement of the "after-draught" also stops the motion of the drawing rollers.

In order to effect the "double speed," the face of the spur wheel which drives the carriage is made with a projecting flange or ring, the greater part of which is concentric with the wheel. This flange has two openings provided with guides or loose pieces, moving freely upon a stud; one of such pieces, as the wheel revolves, will fall down, so as to open or close such opening according to the position of the wheel. On the interior of this flange works a roller or pulley affixed to the end of a weighted lever moving upon a fulcrum; a vertical connecting rod is attached to this lever, the upper end of which is connected by a pin joint to a bell crank, the vibration of which, upon a horizontal shaft, connects and disconnects an arrangement of wheels connected with the rim, for the purpose of varying the rotary motion of the spindles.

The effect of this arrangement is as follows: as the spur wheel revolves, in driving out the carriage, the roller or pulley of the lever will pass over that opening in the flange which has been closed by the loose piece of metal, and on to the next opening, at which place the after-draught commences, and the pulley drops through and throws

into gear, by means of the connecting rod and bell crank, the "double speed," which continues during the "after-draught," the pulley of the lever working on the periphery of the flange, which pulley, by the reverted motion of the wheel, comes in contact with an inclined plane, and is forced through the opening over which it passed and into the interior of the projecting flange, ready for the commencement of the succeeding stretch.

For the purpose of restraining the impetus of the carriage when going in, the patentee employs a grooved pulley affixed to the carriage, round which a band passes, extending in a horizontal direction, and attached at each end to the framing; when the carriage is going in, the grooved pulley is prevented from revolving by means of a ratchet wheel and click, and therefore offers a resistance to the motion of the carriage, owing to the friction of the band on the periphery of the pulley, but on the carriage coming out, the grooved pulley is permitted to revolve.

The putting down of the faller wire is effected as described in the former Specification, but the governing or guiding its position as the winding-on proceeds, is dependent on an inclined plane or shaper, which is well known and in common use, the peculiar form of which is shown in the drawings; the only additional improvement in this part of the invention is a small lever connected to the under faller, by weighting which the tension of the ends of yarn can be regulated, and when the carriage arrives near the roller beam, the lever is lifted by an inclined plane, and the under faller removed preparatory to the succeeding stretch.

The backing off movement remains the same as in the former Specification; also the going in of the carriage, with the exception of a scroll or pulley, which varies the speed of the going in of the carriage. The winding-on

movement in the former patent was effected by a conical drum, which, in these improvements, is entirely removed; and on the same shaft as that upon which the cone was, is placed an expanding or contracting pulley consisting of three discs of metal, the first of which has a number of radial slots, into each of which works a slide, having a projecting stud; the second has an equal number of slots of a curvilinear form, which receive the ends of the projecting studs: this plate or disc which works loosely upon the shaft is placed between the first and third, which two latter are fixed to the shaft by means of keys; thus, by turning round the middle plate, having the curvilinear slots, the studs and slides will be increased or diminished in diameter, or in other words, will be caused to move from, or approach the axis or shaft. The chain, which was, in the former Specification, wound round the conical drum, is in this improvement supported by or wound round the projecting studs, which, at the commencement of the cop, are at their largest diameter; but as the spinning proceeds, gradually decrease, by an arrangement of mechanism attached to the face of the third plate. Another improvement which is added to the winding-on movement, consists in giving a small rotation to the spindles after they have arrived up to the front roller, and when the faller wires are moving out of the way for the succeeding stretch.

The inventor claims as follows:—First, the combination of machinery by which the "double speed" required for fine spinning is effected; secondly, the mechanical arrangements by which the coming out of the carriage is effected; thirdly, the application of a spiral pulley in conjunction with a crank for effecting the bringing in of the carriage; fourthly, the application of a new mechanical movement in the self-acting mule for preventing

snarles at the time the faller wires are removed for the commencement of the succeeding stretch by giving a small rotation to the spindles, and thus taking up the yarn; fifthly, the improved winding-on motion, as set forth in the Specification; sixthly, the application of a spring for increasing or diminishing the tension of the yarn during the winding-on, likewise the grooved break pulley attached underneath the carriage for restraining its impetus when going in.

SPECIFICATION enrolled 28th November, 1842, of a PATENT granted 28th May, 1842, to WILLIAM [illegible]NG, of Queen Street, in the city of London, lamp maker, for "*improvements in lamps and candlesticks.*"

THE principal features of these improvements, the Specification of which is accompanied with six sheets of drawings, are as follows:

The first improvement relates to the construction of lamps, with parts so arranged, that an argand or ring burner is produced, by combining a series of wicks together in such manner as to have air passed up the interior of the lamp. These improvements are shown in the first case, as being applied to a reading lamp; and consist of an oil vessel, adjustable by means of a set screw to any part of a vertical standard; the vessel containing the wick is attached to the oil vessel by means of a tube, which supplies the former with oil. The principal novelty in this lamp is the burner, which is composed of a number of tubes, the form of which, when put together, is somewhat hemispherical, with lateral openings between the tubes for the passage of air to supply the interior of the

flame, which may be composed of any number of wicks arranged in the manner described. In order to regulate the quantity of wick exposed to the flame, a hoop or ferule is made to fit the inner circle formed by the wick, and a flat ring to fit the external part; this hoop and ring are connected together, and supported by three or more arms, affixed at their lower end to a ring, made to slide upon the periphery of the tube, supporting the series of tubes containing the wicks; thus by raising or lowering the apparatus, the hoop and ring, between which the wicks pass, will regulate the quantity of such wicks exposed to the action of the flame.

The next improvement shows a similar arrangement of three tubes, which are applied to a table lamp; in which case there is an apparatus for raising the three wicks at one time, in place of raising them singly, as in the foregoing improvement.

The fourth part of the invention consists in a mode of raising the cylindrical wicks of argand lamps between two tubes, by a spiral action, without the necessity of turning the wicks between such tubes. The wicks in this case are pressed against the periphery of the interior tube, by serrated plates, acted upon by a spring; there are two projections attached to the back of these plates, which pass through vertical slots, made on each side of the exterior tube, and into two spiral slots of a third tube, which encloses the other two; thus by turning the former, the wick, which is held by the serrated plates, and pressed against the interior tube, will be caused to ascend or descend between the said tubes, as may be required.

The fifth improvement relates to lamps for burning naphtha or turpentine spirit. This lamp is similar to that described in the first improvement; in which case the air is introduced into the interior of the flame, between the

separate parts of which the ring of wicks is composed; and in order to prevent the heat from descending to the spirit, a cylindrical block of wood, or other non-conducting substance, is inserted in the tube which supports the ring of wicks, round which piece of wood is tied a piece of cotton, which is in contact with the lower part of the wicks, and conducts the spirit to the same; there is also an apparatus similar to that described, for regulating the flame.

The sixth part relates to lamps for consuming tallow. In this case two wicks are employed for forming the argand wick, and are so arranged, that the air for supplying the interior of the flame passes between the separate wicks, as before described. A cylindrical piece of tallow (or a candle may be employed) is placed into the stem of the lamp, and is forced, by means of a spring, against a convex cover, screwed on the top of the stick, after the candle is inserted; this cover, which is in the centre, and just below the flame, is perforated with three or four holes, and becomes heated, and the melted tallow, which is pressed against the under side, flows through the holes and into a vessel for the purpose of supplying the wicks. If a candle is not used, it will be necessary to place between the end of the cylindrical piece of tallow and the perforated plate a piece of cotton, which will prevent the melted tallow from running down the sides of the piece of tallow, and into the tubular socket which contains it; but if a candle be used, the wick will answer the same purpose, and will accumulate underneath the perforated cover as the candle melts away.

The seventh part relates to candlesticks, and to modes of supporting candles on suitable surfaces applied to the upper part of candlesticks, whereby candles of various sizes may be supported in a vertical position, and such

candles consumed to the end when once set up. For this purpose the upper part of the candlestick is formed with two projections, having horizontal set screws passing through them, the ends of which are attached to the lower ends of two vertical levers, with semi-circular pieces at their upper ends to embrace the candle; thus by turning the two screws, the candle, which rests upon a concave dish, will be held by such pieces pressing against its sides. There are several modifications of this mode of applying screws to support candles upon candlesticks.

The eighth improvement has for its object precisely the same end as that last described, but the same result is obtained without lever holders, which is effected by the application of screws passing through standards, and bending against the sides of the candles; but in place of screws, wedge pieces may be employed so as to penetrate the sides of the candle as it is forced down between the standards, and various sizes of candles set up, the surface on which the candle rests acting as a "save-all," which constitutes the peculiarity of the invention.

The inventor claims, first, the mode of constructing lamps, whereby a series of wicks are used to produce a ring of flame, and in such manner that the air passing into the interior of the flame passes between the wicks; secondly, the application of the apparatus, which being raised or lowered, governs the height of the series of wicks which are offered to the flame; thirdly, the mode of constructing and applying the wick holder to lamps where separate wicks are used to produce a ring flame; fourthly, the mode of raising the wick or cotton of an argand lamp by a spiral action, so that the wick passes up vertically between two tubes, without the wick turning between such tubes; fifthly, the mode of constructing spirit lamps, whereby a series of wicks are used to produce

a ring flame, and in such manner, that the air to support the interior of the flame passes between the separate wicks; and also the mode of applying the apparatus described, for regulating the quantity of the wick which shall be presented to the flame, together with the mode of applying wood or other non-conductor of heat, for the purpose of preventing the heat from descending to the spirit, as described; sixthly, the mode of applying burners to lamps for burning tallow, whereby the air for the interior of the flame passes between the separate wicks; and also the mode of applying tallow to the vessel, by means of a candle or cylinder of tallow forced up towards the burner, as described; seventhly, the mode of holding candles in candlesticks by means of lever holders, as described; eighthly, the mode of holding candles on candlesticks, so that the candle may be securely held by standards, and completely consumed without having to be removed from sockets of candlesticks and placed in "save-alls," as heretofore.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to PHILIP JACOB KEYSER, of Gracechurch Street, in the city of London, manufacturer, for "*improvements in the construction of lamps.*"

THIS improved lamp consists, first, of a cylindrical vessel, having a half-round tube soldered, or otherwise affixed, to the outside, the lower end of such tube communicating with the lower part of the vessel, and the upper part with a tube leading to the burner; in the interior of the cylindrical vessel there is a weight, which the inventor prefers to be in the form of an egg, the upper end having a disc

of metal attached, upon which is placed a disc of leather, that binds against the sides of the vessel, and is firmly secured thereon by another disc of metal placed on the top and affixed by means of screws. This weight is suspended from the upper part of the vessel by means of a chain passing over a pulley, the axis of which is made so that a key can be applied for the purpose of drawing up the weight. The object of this weight is to force the oil from the cylindrical vessel up the external tube, and to the burners of the lamp.

Claim.—The mode of forcing the oil up an external tube to be consumed.

Secondly, in the application of a regulator to the burner; and consists of a small tube about one inch high, the lower part of which is thicker than the upper part, and fits closely into the inner part of the burner; the upper part is notched to retain the wick, and the lower part has also several notches sufficiently deep to retain the oil, which rises to keep the lamp properly supplied.

Claim.—The regulator which is placed in the burner, and which serves at the same time as a wick holder.

There are also two other modifications of this lamp having a weight applied in the manner described; in one of which the oil vessel is placed above the burners, as in chandeliers; in which case, the descent of the weight forms a vacuum in the upper part of the vessel, into which the oil which overflows or drops from the burners (and which is received in a vessel below the lamp), is forced through a pipe communicating with the said vessel and that in which the vacuum is formed, the object of which is not clearly shown.

Claim.—The forming a vacuum in the reservoir to receive the oil which drops from the burners that are lower than the reservoir.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to HENRY WILKINSON, of Pall Mall, in the county of Middlesex, gun maker, for "*improvements in unloading shipping, especially those vessels called colliers.*"

THIS invention consists simply in the application of steam power in the place of manual labour; which the inventor effects by constructing a portable engine, so as to take up the least possible room, and just large enough to lift the heaviest weight required. This engine is to be bolted to the deck, and provided with the necessary tackle for raising such weights. The Specification gives a description of an engine suitable for this purpose; which consists of a horizontal cylindrical boiler, having the cylinder attached to one side; and upon the fly wheel shaft, which is at one end of the boiler, is placed a crane barrel, which can be put into gear, with a lever acting upon a clutch box. Although the inventor describes the engine suitable for the purpose, yet he does not claim any part thereof, "the object of the invention being to apply steam engines of small power in combination with vessels, for the purpose of loading and unloading such vessels."

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to RICHARD WATSON, junior, of Cloth Fair, within the city of London, gas fitter, for "*improvements in draining land, embankments and cuttings of railways, and other engineering work.*"

THE first part of these improvements relates to the construction of tubes for the purposes hereafter described;

and consists in making the tubes, which may either be of iron or other composition, such as is employed for tiles, with a number of holes or perforations, which are to be wider on the inside than the outside of the tube, that is, the perforations are made gradually to increase in size from the outside to the inside of the tube, such holes being either circular or in the form of a slot.

The second part relates to the application of such tubes for the purpose of draining embankments, cuttings of railways, and other works, by first boring a hole or holes in the embankments to be drained, and then inserting the perforated tubes, which will have the effect of draining and consolidating the parts to which they are applied. The drawings show the application of the tubes to various parts of engineering work, such as tunnels and embankments, where masonry and brickwork are employed; the number of tubes employed, and the various inclinations at which they are laid, will of course depend upon the land to be drained, and the judgment of the engineer.

The third improvement relates to boring holes in brickwork or masonry; and consists of a drill or bit of a tubular form, having at the bottom end a number of inclined teeth, and at the upper end (which is formed with a screw for attaching it to the boring rods or bars), a lid or cover, which can be removed; the object of this cover is to prevent the cylinder of brick, or other substance, which passes up the tubular part of the bit, from clogging or fastening the boring instrument in the hole.

The inventor claims, first, the mode of constructing perforated drain tubes and tiles with holes or openings enlarging from the outside inwards; secondly, the mode of draining embankments, cuttings of railways, and other engineering work, by applying perforated tubes from the face of an embankment, or of an open or other cutting as described, and whether faced with a wall of masonry

or not; thirdly, the apparatus described for boring holes in brickwork or masonry, for draining cuttings and embankments of railway and other engineering work, which are faced or not with brickwork or masonry.

SPECIFICATION enrolled 30th November, 1842, of a PATENT granted 31st May, 1842, to LOUIS NICOLAS DE MECKENHEIM, of the Kingdom of Austria, but now of London, engineer, for "*improvements in the manufacture of iron.*"

THIS invention consists, first, in utilising for various heating purposes the superabundant gases evolved by the blast and other furnaces; which superabundant gases are suffered, in the present mode of manufacturing iron, to escape into the air; and by this new system a great saving of fuel is stated to be effected; secondly, in a new mode of constructing the several furnaces used in the manufacture of cast or pig iron, and malleable iron; and in a new method of manufacturing such iron, whereby a great saving of fuel is also stated to be effected.

The inventor first describes his mode of collecting and employing the gases evolved by blast and other furnaces as follows: In order to collect the gases evolved from the blast furnace, several passages are formed in its circumference. These passages must be sufficiently large and considerably inclined, and should be below the range of the vapour, and generally from ten to fifteen feet below the charging place or tunnel head. The conducting passages in the furnace must be lined with fire brick, and each of them separately closed by a cast iron plate, having two holes in it; to one of which is fitted the receiver for

collecting the gases; the other is used for clearing the passage into the furnace, and must be kept hermetically closed, so that no air may penetrate from the exterior. The mouth of the furnace is kept shut, and the gases are forced into the conducting pipes by the compression produced by the blowing engine, added to the pressure of the superincumbent mass of materials, as well as by the effect of their expansion. When these means are not found sufficient, it may then be necessary to employ a fan or ventilator. The gases, after flowing through the passages formed in the brickwork of the furnace, pass into receivers, and are from thence forced by means of the fan, either into the blast furnace itself, from which they are taken, or into the adjoining furnace. There are several methods shown in the drawing of collecting these gases; and the inventor states, that these gases may be employed for heating the steam engine boiler, or the kiln for washing the ore, &c. &c., and for all other purposes where heat is required. The mode of constructing the improved furnaces is as follows: A certain number of furnaces are to be placed against each other with a feeding furnace between each, and behind either a fan or ventilator to collect the gases, or a draught chimney. An apparatus, with regulating valves, determines the force of the current, and the quantity of atmospheric air to be admitted, not only under the hearths but also into the furnaces, by regulating the quantity necessary for the complete combustion of the gases, and distributing it as each furnace may require.

The improvements in manufacturing iron consist in employing the superabundant gases collected as above described, conjointly with coke, as in the present method, for the purpose of producing cast or pig iron. But in making malleable iron, the patentee employs exclusively the gases which he obtains by distillation or otherwise,

without the addition o ny other fuel whatever, whether such iron is made fro n cast or pig iron, or whether the ore is at once converted into malleable iron without passing through the intermediate state of cast or pig iron, as in the "Catalan" method.

A DISCLAIMER has been entered on the 8th November, 1842, with the Clerk of the Patents, in the matter of the PATENT granted 13th April, 1840, to THOMAS YOUNG, of Queen Street, in the city of London, merchant, for "*improvements in lamps.*"

The patentee, after reciting that his invention related, first, to the method of regulating the supply of oil to the burners of fountain lamps by means of a float; secondly, to a mode of using bags, or flexible vessels, to contain the oil in fountain lamps, together with the means of causing the oil to be expressed from such bags or flexible vessels; thirdly, to a mode of applying a perforated plate at a position above the point of combustion of the wicks of lamps, and thereby obtaining a more favourable application of the air to the flame of lamps; fourthly, to a mode of improving the combustion and consequent flame of lamps, by applying a coil of wire round the flame thereof; then goes on to say, that, having discovered that three of his improvements, viz., the first, second, and fourth, were comparatively useless, but that the third improvement had proved to be of great value, he disclaims all that part of his Specification and Drawing having reference to such first, second, and fourth above mentioned improvements; as also the *s* in the title; so that the Patent will now be for "*an improvement in lamps;*" and will consist in "a mode of applying a perforated plate at a position above the point of combustion of the wicks of lamps, and thereby obtaining a more favourable application of the air to the flame of lamps."

A DISCLAIMER has been entered on the 17th November, 1842, with the Clerk of the Patents, in the matter of the PATENT granted 8th September, 1841, to NATHANIEL CARD, of Man-