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Permanent Way of Railroads.

A very interesting discussion recently took place on the above subject at a meeting of the Society of Engineers in London. It arose from the reading of two papers on the subject—one by W. Bridges Adams, C. E., and another by P. M. Parsons, C. E. The facts elicited were of considerable importance. It was stated that one thousand miles (single line) of iron permanent way had been laid in England, and that Greaves' system (illustrated on page 89, this vol., SCIENTIFIC AMERICAN,) had been extensively and satisfactorily used in Egypt. As to the assumed rigidity of cast iron permanent way, an objection urged against this system by some persons, this had been demonstrated to be a fallacy. It was found after a number of years of hard usage to be in an excellent state of preservation, and had not produced any injurious effect upon the rolling stock—engines and cars. The general opinion of the engineers present seemed to be that cast iron sleepers were preferable to those of wood.

Curious Chemical Explosion.

On the 25th ult., while the assistant of Professor Doremus was preparing some oxygen gas, in the laboratory of the Medical College, this city, from the chlorate of potash, the receiver exploded with terrific violence, shattering the windows and otherwise doing considerable damage. At the time this accident took place, neither the Professor nor any other person could account for its cause. The gas itself is not explosive. What, then, was the cause? The flask containing the chlorate of potash, from which the gas was generated, became red hot, consequently the gas passed over in a highly heated state. In this condition, it is believed, it decomposed a portion of the receiver, which was india rubber, converting it into carburetted hydrogen gas, which being saturated with the oxygen, acquired a highly explosive character and was ignited by the hot oxygen.

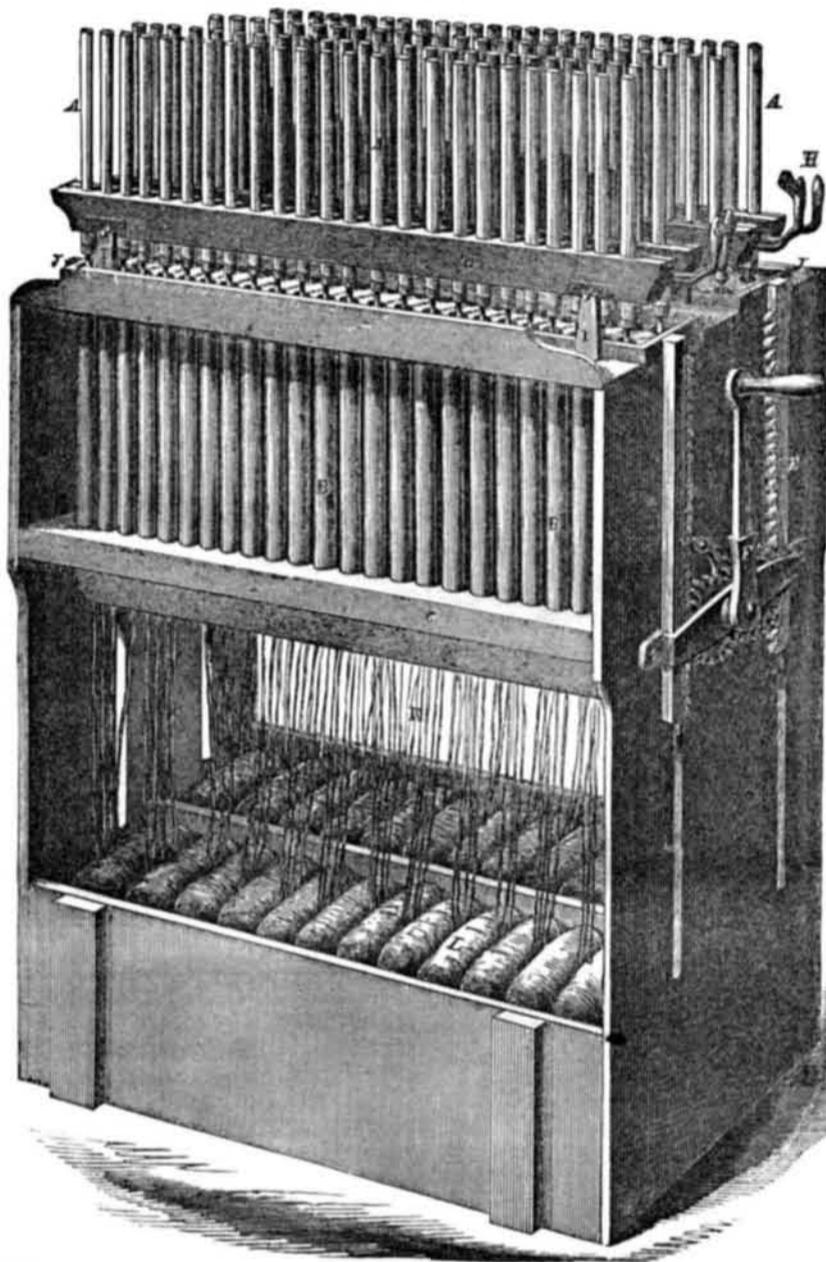
The Menal Tubular Bridge.

The Philadelphia Ledger, which is usually so correct in mechanical matters, gives Brunel, Jr., too much credit in attributing to him the authorship of the above named celebrated bridge. William Fairbairn, C. E., discovered the best form of bridge, and he certainly is the inventor of it, as it is now constructed. Brunel, Jr., had nothing to do whatever with its construction or erection.

Caution to Flies, Mosquitoes, Roaches &c.

We have received from Mr. I. S. Clough, inventor, 168 Broadway this city, some samples of his ingenious fly, mosquito, and roach traps. They are sure death to all unfortunate vermin which enter. We have seen practical evidence of this fact. These traps are particularly useful at this season of the year; and as they are cheap in price and ornamental in appearance, they will please everybody.

HUMISTON'S CANDLE MACHINE.



Although in large towns and under favorable circumstances for the introduction of the successive innovations, it may with propriety be said that candles have long since given way to oil, and this again to burning fluid, which latter has been, in turn, superseded by gas, there are peculiar conveniences attending the use of the ordinary tallow candle, which will probably forever create for it an extensive demand. The many processes for forming these may be included under the heads either of dipping or molding, and the superior perfection of the product induces a strong preference for the latter. There are several machines in use to facilitate the manufacture by this method of these important illuminators, one of the most important and efficient of which is represented in the accompanying engraving. The wicks are drawn, by an automatic movement, through the mold, and held in place, while the melted tallow, poured by hand, congeals around them, and the finished candles are expelled by an easy movement, and conveniently removed in dozens or hundreds at a time, by the aid of simple clamps which grasp them.

The machine is a tolerably simple construction of moderate size, as represented in the accompanying illustration. The view is taken at a moment when the candles have just been thrust up from the molds, and are in the act of being seized by the clamps for removal.

A represents the candles, which are molded base uppermost. B are the molds of tinned

iron, or any suitable material slightly tapered. C is the flooring on which the molds are supported, and which is, in some of these constructions, lined with lead, and made to support ice water, which surrounds the molds, B, to hasten the cooling. D represents a movable platform capable of sliding vertically in the slots at each extremity, and attached to which are racks, E E, operated by the crank, F, which is turned by hand. Fixed in D are tubes or hollow plungers, smaller than the candles, through which the wicks, K, are led from the spools, L, below. When the candles are sufficiently cooled in the molds, revolving the crank, F, elevates D, and consequently thrusts them out at the top as represented. The upper ends of the tubes or hollow plungers are spread and made to fit nicely to the ends of the candles, as shown at the lower extremities of A. To facilitate the pouring of the tallow into the molds after the frame, D, has been depressed by a counter revolution of the crank, F, the cast iron troughs, J, are provided at the top as represented. G represents the clamps, each of which are composed of four parts, to embrace two rows of candles, all operated by one movement of the handles, H. These clamps are supported on the standards, I, and may be readily removed by hand to deposit them in the boxes.

The operation of candle making by this machine is simply as follows:—Commencing with the parts in the position represented, the pawl is elevated, and the crank, F, revolved in such manner as to lower the racks,

E, thus depressing the platform, D, and drawing downwards the hollow plunger through the molds. The wicks being still fast to the candles above, remain, of course, stationary. When D is in its lowest position, the troughs, J, are filled with tallow from the ladle, and after a few minutes cooling, the wicks connected to A, are cut by a rapid movement of a long handled knife, and the link represented being previously on the handles, H, the clamps, G, are lifted, and the candles, A, removed. Meantime the tallow in B has been rapidly cooling, and after a length of time depending on the temperature of the air, or of the water surrounding B, the superfluous tallow and wicking is scraped from the molds by an implement made to traverse in J, and the clamps, G, having been placed on the uprights, I, and opened as widely as possible to allow the easy ascent of the still somewhat soft candles, the crank, F, is moderately revolved, and the lot of candles gradually lifted, drawing with them the wicks, K, which are delivered from the spools below. The operation is very simple and rapid, and the machine cannot be too much admired, either for its labor saving qualities, or the cleanliness and perfection with which this operation is conducted.

This machine was patented April 4, 1854. For further particulars address the inventor, Mr. Willis Humiston, Troy, N. Y.

Rezoil.

Mr. S. Piesse, in the *Gardeners' Chronicle*, says: It is well known that the patience and labors of the horticulturist are frequently rendered unavailable by the appetite of some insects. For preserving their flowers from these enemies, gardeners have adopted several plans, not one of which appears to be effective, more especially against the earwig, which is most to be feared as the flowers approach maturity. How many show dahlias are thus "cut off in their bloom!" With the hope that the following recipe will offer some check to these marauders, I send to you, assured that its cheapness and easy application will render it universally appreciated. Take of common rosin, 1 1-2 lbs.: sweet oil, 1 lb.: place them in a pipkin over the fire until the rosin is melted, stir the materials together, that they may be well blended; when cold the substance formed, which I call "rezoil," will be of the consistency of molasses. To use the rezoil it should be spread with a brush upon shreds or any fitting material, and wrapt round the stem of the plant; if any support is used, that should be brushed over also. No insect can possibly, or will attempt to cross this barrier; the rezoil never dries, but always remains sticky and clammy—its action as a trap is therefore obvious. To preserve grapes and other wall fruit we have only to nail a strip of list upon the wall round the entire plant, and then paint it well with the rezoil on both sides, if it can be managed, to keep insects from crawling under as well as over. Other modes of application will suggest themselves without my here enumerating them. Birds, cats and mice equally avoid soiling themselves with this substance.

The two mammoth steamships which are talked of to form a new line for California, will probably be constructed by Messrs. Perrine, Stack & Patterson, of Williamsburg. They are to be 450 feet long, with two pairs of paddle wheels.

The *Roanoke*, another of the new screw frigates, has just made a successful trial trip, and has been sent off on a cruise. Her speed under steam alone was eight knots, burning 3600 pounds of coal per hour.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS Issued from the United States Patent Office

FOR THE WEEK ENDING JUNE 2, 1857.

DOOR LOCK—Thomas B. Atterbury, of Pittsburgh, Pa. I claim, first, The use of the vibrating arm, Q, Q, arranged and constructed as described, which whilst it acts as a tumbler to the bolt, B, serves, in combination with the follower, D, as a means of disconnecting the spindle from the bolt when the door is locked, and connecting them when unlocked, as specified.

Second, I do not claim the use of a dead latch operating directly on the locking bolt, to prevent it being locked or unlocked by the key, as that device is well known.

But I claim the use of an armor lever, F, which, when pressed upon the tumbler of the lock, prevents its being raised, thus forming a guard which protects the locking bolt from any action of the key, and prevents the locking or unlocking of the bolt, in the manner substantially as explained.

SLEEVE FASTENER—Wm. A. Bates, of Boston, Mass. I do not claim forming a sleeve fastener by means of hinged spring arms, a slot and ears, as patented by Farr & Thompson, assignees of John Mansure, my invention differing materially therefrom, and having important advantages over the same.

Nor do I claim in buttons or fastenings for clothes having one end of the eye or tongue hinged, or rigidly fastened to the button, and making the tongue or eye elastic, and forming a cavity or counter sink in the body, to facilitate the entrance of the tongue or eye into its hole in the body, such being the subject of a patent granted to Richard Oliver, Oct. 10, 1854. My invention differs from this—the body in my clasp being made so as to spring longitudinally.

I claim my improved bracelet clasp, made with a slotted tongue and catch hook, and with its body to spring lengthwise, as described.

SKATES—R. W. Belson, of Philadelphia, Pa. I do not claim separately forming the runner of two parts, for this has been previously done.

I am also aware that the stock formed of a certain number of parts, and the runner of a skate, have been cast solid or in one piece, and a patent was granted to B. F. Shelabarger for this mode of construction. In Shelabarger's skate the object appears to be economy only, no reference being had to the formation of the gutter.

Neither do I claim casting the stock and runner in one piece, for this has also been previously done.

But I claim constructing the skate entirely of cast metal, and of two parts connected together, substantially as shown and described.

[This skate is cast in two longitudinal equal parts, which are afterwards fastened together by screws, and the runner is chilled, so that it is rendered very durable, and not liable to wear. This improvement greatly reduces the cost of manufacturing skates.]

HYDRANT—Wm. W. Binney, of Seneca Falls, N. Y. I claim the pipe, D, fitted within the case, A, and within the tube or neck, d, the pipe having a flanch or collar, i, upon it, above the neck, d, and provided with a valve, f, at its perforated lower end, said pipe being fitted within the neck or tube, d, and used in connection with the box or chest, C, and spring, h, the whole being arranged as shown, for the purpose set forth.

[This hydrant is self-closing in its character; it has few parts, and these are arranged in a very simple manner to effect the self-closing of the valve, when no more water is to be drawn; also to allow the waste water to flow down, and prevent the hydrant from freezing in cold weather; the box, the tube, and its valve, can also be easily disconnected from the top and lifted up for repairing when necessary—a very convenient and useful arrangement. The hydrant is opened by pressure on a lever; when this (the pressure) is removed, the valve closes by the pressure of a spring and the water on its bottom; the waste water in the tube then flows down through passages into a chamber below the reach of frost.]

FASTENINGS FOR GARMENTS—Jeremy W. Bliss, of Hartford, Conn. I am aware that narrow flat hooks have been soldered on the plates used for belts and another purposes, hooking into holes or eyes prepared for them.

Also that wire pins have been secured on ornaments having blunt ends, so that by pricking holes through any article to which it is desirable they shall be attached, the said pins may pass through, and be fastened thereto by bending the pins down—all such arrangements I do not claim.

I claim the new manufacture of fastening for garments described, to wit, a plain or ornamental plate or bar, having sharp hooks permanently fastened to it, pointing towards each other or towards the center, so arranged as to be conveniently hooked into the garments to be fastened or unhooked therefrom.

MOWING MACHINES—S. P. Briggs, of Saratoga Springs, N. Y. I claim the peculiarly constructed attachment described, when connected to and used in combination with the Ketchum mowing machine, in the manner and for the purposes set forth.

PRINTING PRESSES—Jason L. Burdick, of New York City. I claim, first, The arrangement of working the roller, A, upon which the type is attached, in such a manner as to communicate to the same a forward and backward motion, in connection with a rotating motion, substantially as described.

Second, I claim the arrangement of a guide piece, for the purpose of guiding the type roller in the latter part of its forward motion, so as to bring the types always square against the platen, T, containing the paper or card to be printed.

DOOR HINGE—S. M. Bullard, of Holliston, Mass. I do not claim the inclined planes, for they have been long known and used.

But I claim the detached anti-friction roller inserted between two inclined planes, in the manner and for the purpose described.

PREPARING THE FIBRE OF BANANA, PLANTAIN ALOE, &c.—Francis Burke, of British West Indies. Patented in England July 14, 1855. I do not claim any of the parts of the machine separately.

But I claim the combination of the beating cylinder with the endless apron or yielding table, or surface under the apron, substantially as explained.

HANGING MILL-STONES—Wm. A. Clark, Samuel D. Porter, and Wm. D. Simpson, of St. Louis, Mo. I claim suspending the upper stone from above by means of a ball and socket joint, or its equivalent, when the eye of the said stone is made to embrace the upper portion of the spindle of the running stone, and is secured thereto with a sufficient degree of rigidity, by means of an elastic packing, substantially in the manner and for the purpose set forth.

PACKING PISTONS AND STUFFING-BOXES OF STEAM ENGINES—Patrick Clark, of Rahway, N. J. I claim the foil or plastic sheet metal packing, as set forth.

FEEDING GAS GENERATORS—C. B. Loveless, of Syracuse, N. Y. I make no claim to cut-off valves broadly.

But I claim an improvement in portable gas apparatus the connection of feeder, H, with the retort, R, by the arrangement of pipes, a and b, when combined with the cut-off valve, V, the entire arrangement operating substantially as set forth.

STEAM PUMPING APPARATUS—George H. Corlies, of Providence, R. I. I claim the arrangement of a series of steam cylinders and pumps combined radially around a central crank shaft, with a central crank and crank shaft, with which the whole series of pumps and steam cylinders are connected, substantially in the manner and for the purpose described.

I also claim the method described of forming the connection between the pistons of a series of cylinders and a single crank pin, by means of a disk-ended connecting rod, and which is appropriated to one piston in the series, and which is fitted with a series of pins, to which the remaining connecting rods of the series of cylinders are applied, thus obviating the direct application of all the connecting rods in the series to the same crank pin.

LOCK—Julius M. Cook, of Hinsdale, Pa. I claim the set arranged and operating in connection with the wheels, fly and shaft, as described.

WATER WHEEL—Reuben Daniels, of Woodstock, Vt. I am aware that it is common in all wheels to bind or hold the ends of the buckets by means of narrow rims which cover the ends of the buckets, and therefore I do not claim such rims.

I also disclaim, broadly, confining the stream of water to its effective course. An example of this is seen in E. Parker's patent, dated July 24, 1847.

I also disclaim, broadly, the admitting of water within the wheel, and discharging from its periphery, as such wheels are in general use.

I also disclaim any special form of the buckets I also disclaim every feature of the described invention which is seen in any other water wheel of this class.

But to the best of my belief no wheel has ever been made of the class now shown in which a flanch, c, was employed in the manner and for the purpose described. The use of such a flanch causes the wheel to present new virtues of a great and important character.

I claim the use of a flanch, c, or its equivalent, in the manner and for the purposes substantially as described.

[This wheel receives its water at the center and discharges it at the periphery. It has an extended flanch, to which the top of the buckets are secured, and which flanch forms a cover to the mouth of the flume. The water is discharged at the sides, and air is admitted at the top of the cover. The water escapes from it freely, not being dragged around by the wheel, or offering resistance to its movements, as in most other wheels.]

SEWING MACHINES—James E. A. Gibbs, of Millpoint, Va. I claim the revolving hook described, constructed and arranged in relation to, and operating in connection with, the needle, as set forth.

I also claim, when sewing with a single thread, interlacing or twisting the threads of the loop after passing the cloth to be sewed, and before taking a fresh loop, substantially in the manner and for the purpose specified.

POTATO DIGGERS—Isaac Griffon, of Quaker Springs, N. Y. I claim the arrangement of the drag, G, axle, H, and swinging fork, F, substantially in the manner and for the purpose set forth.

PLOWS—John S. Hall, of West Manchester, Pa. I claim vibrating the beam in a circular bearing in the land side, together with the oblique adjusting and securing slots, i, the hole combined and arranged substantially as described, whereby the draft end of the beam may be vertically adjusted, and the beam so secured to the land side as that it is impossible for the former to slip.

BLOCK FOR BLACKING BOOTS AND SHOES—Francis G. Harding, of Boston, Mass. I do not claim two shells in connection with a spring and screw, irrespective of peculiarity of construction, and merely viewed as a stretching block or tree, for such devices are now used for such purposes.

I claim the described new article of manufacture, consisting of the thin metallic shells, A and B, hinged at a, the former having an extension, b, to serve as a handle to the implement, and fitting the front inside of the shoe, and the latter fitting the inside of the heel, the said shells being distended, and the shoe thereby firmly held by means of the screw, C, passing through the shells, B, and abutting against the projection, c, of the shell, A, in the manner and for the purpose specified.

[This block for stretching the leather of shoes is made in two halves—a front and a back shell section of the foot—which are united at the top by a screw, capable of distending the block and stretching the leather smoothly and accurately to the proper shape—a very convenient improvement.]

GAGE FOR HAND SAWS—Michael Kennedy, of Troy, N. Y. I claim making the gage for regulating the depth of the saw cut with adjustable clamps, C, C, which are formed to fit and gripe the saw back and are attached to the arms of the gage independently of the set screws, by which the clamps are fastened to the saw back, as described, so that the gage can not only be fastened at any desired place upon the blade without requiring the blade or the saw back to be perforated, but so that the gage can also be removed from and replaced upon the saw without altering the set of the gage, and so that the gage can be adjusted upon the blade, without loosening the clamps which hold the gage to the saw.

FAUCET—Lucius J. Knowles, of Warren, Mass. I claim combining with or arranging with respect to the valve stem and eduction passage of the body of the faucet, as described, the secondary chamber or drip passage, D, the same being for the purpose or to operate as specified.

I also claim arranging an annular groove, g, in that part of the valve stem which slides in and out of the recess, d, of the body of the faucet, the same being for the purpose as specified.

LIFE PRESERVERS—James Knight, of New York City. I claim the construction of the supporter, to sustain the head in the position assumed by persons when swimming, thus relieving the wearer from muscular effort, and attached to this supporter a shield to protect the mouth and nostrils from the violence of the waves, and the supports and floats fitted to and worn around the neck, server as worn around the body, by having attached to them sheaths, as represented, one of them fitted with a sheath, to admit the stem of the supporter for adjustment to the wearer. The whole when combined constitutes my improvement.

LOCOMOTIVE BOILERS—J. E. McConnell, of Wolverton, Eng. Ante-dated Dec. 2, 1855. I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of my invention.

What I consider to be novel and original, and therefore claim, is the fire-box increased in size, so as to extend into the barrel of the boiler, and in connection therewith the tubular stays conveying a supply of fresh air into the extension described, whereby the products of combustion are consumed in a more perfect manner, substantially as set forth.

I also claim the water tubes, E, arranged in relation to the fire-box and the surrounding boiler, in the manner and for the purpose specified.

SCROLL SAWING MACHINE—John J. Curtis, of East Boston, Mass. I claim, first, The rotating bed or table, C, arranged substantially as shown, and in such a relation to the saw that the bed or table may rotate around the cutting edge of the saw as a center, for the purpose set forth.

Second, I claim the feeding wheel, Q, arranged and operated substantially as shown, when used in connection with a rotating bed or table, C, for the purpose specified.

[This improvement embraces a rotating bed and a feeding wheel, the latter being operated automatically, and feeding the stuff properly to the saw, in whatever position the work may be placed, as conducted by the operator. This feed motion is always regular in proportion to the stroke of the saw, and is a very ingenious improvement.]

MANUFACTURING SCREWS—John L. Mason, of New York City. I claim the mode described of forming screw threads on cups, hollow cylinders, or hollow cones, of thin soft metal, substantially as described.

SOWING SEED BROADCAST—Daniel Haldeman, of Morgantown, Va. I am aware that vibrating scatterers with upward projecting pins have been used, in connection with the bottom of the hopper, but incapable of vertical movement.

I am also aware of the notched bars for graduating the seed discharge.

I do not claim these devices of themselves.

But I claim the vertically adjustable graduating bar, G, with recesses, as described, in combination with the vibrating scatterer and agitator connected therewith, when said parts operate together, as set forth.

HARVESTING HEMP—John B. McCormick, of Versailles, Ky. I claim the combination of the adjustable bar, I, and seat, J, with the bars, K, K, rods, Q, Q, movable bar, L, and narrow platform, G, when said parts are arranged in relation to each other, to facilitate the harvesting of hemp, as described.

[In this hemp harvester there is an adjustable seat for the driver, also an adjustable reel. The seat is set to give the driver the most suitable position, and the reel its proper line of action, according to the height of the hemp. There is also a movable platform, for enabling the driver to discharge the cut hemp on the ground in gables—no raking attachment being employed.]

ATMOSPHERIC CHURNS—Robert McCutcheon, of Towanda, Pa. I do not claim using atmospheric air in a churn to produce butter, by the mechanical disturbance of the cohesion of the oily and serous part of milk or cream by agitation, as that is known and used.

But I claim the bellows, F, F', the chambers, C and D, and the air pipe, M, when arranged in relation to each other and to the body of the churn, in the manner and for the purposes set forth.

SOWING SEED BROADCAST—A. C. Miller, of Morgantown, Va. I claim, in combination with the adjustable beam, K, and its openings, G, and the stirrer, D, B, the secondary hinged bottom composed of the two pieces, H, H, with their openings, m, the whole being combined in manner and for the purpose set forth.

PARING HORSES' HOOF—V. N. Mitchell, of Concord, N. C. I do not claim the machine described, nor any of the portions thereof, in themselves.

Nor do I limit myself to the use of the precise mechanism described, as other forms thereof may be more advantageous for the working of my improvement.

I claim the reciprocating frame, C, provided with the knife, D, and plate, E, the frame being attached to the upright, B, having a recess, c, in its upper end, the whole being arranged specifically as shown and described, for the purpose set forth.

[This is a useful and much required improvement for blacksmiths. The paring knife is fitted into a reciprocating frame; it works in guides, and its cuts are regulated by adjustable plates. The horse's hoof to be pared is placed in a recess, and the blacksmith operates the knife by a lever, paring the hoof rapidly, smoothly, accurately, and with ease.]

CAST IRON CAR WHEELS—Albert L. Moury, of Cincinnati, O. I claim providing the hub, a, with a concave or other formed channel around the center of the circumference, and arranging in the said channel, the bead, f, f, and ribs, g, g, and therewith the hub thus constructed, uniting it with the wheels, as specified, when the parts of the wheels are made and proportioned, all as and for the purposes mentioned.

FLUID METER—James R. Maxwell, of Cincinnati, O. I claim the arrangement of the piston, with the parts employed, for moving the valve, g, all arranged as represented, and for the purposes mentioned.

CHURNS—Henry C. Nicholson, of Mount Washington, O. I am aware flutter wheels have been used in churns, but in such manner as to prevent the free agitation of the cream, viz., by causing them to rotate against a division board, or by causing a hoop around their periphery, either of which do not effect the object I have in view. I do not claim either of these plans.

But I claim the so arranging of the flutter wheels upon bent arms as that the cream agitated by them shall not re-act against any dividing surface, or be impeded by any surrounding piece, and thus I allow the agitation to be more direct in a vertical line, and not follow the rotation of the shaft on which they are placed, as set forth and represented.

LEATHER SHOE BINDING—Eugene L. Morton, of Charlestown, Mass. I claim the improved process described of manufacturing shoe binding, by dividing the skin or sheet of leather into strips of equal width, joining them at their ends, so as to connect them into one long strip, and coloring the same when so formed, the whole being formed or reduced to an uniform thickness, and the fleshy or surplus portions of the leather removed by splitting, or otherwise.

FEEDING GRAIN TO MILL-STONES—Milton and Chas. Painter, of Owning's Mills, Md. We disclaim every part and feature of our device which is seen in any other grain feeding apparatus.

But to the best of our knowledge and belief it is new to regulate the feed of the grain by the swaying of a cup, L, which is located and combined with, and at the mouth of a swinging tube, as described.

We claim in grain feeders, regulating the feed of the grain by the swaying of the cup, L, in the manner substantially as described.

[The grain is fed into the stone in such a manner that the eye of the stone is never clogged, and the feed is uniform. A gyrating tube is inserted into the eye of the runner, and it has a cup located near its upper part, or mouth. The cup is filled from the spout of a hopper, and it gyrates with the tube, the grain overflowing and falling over its sides into the feed tube, and down into the stones. The quantity of grain fed into the stones is uniform with their velocity, and the position of the hopper in the cup. The feed is altered by raising or lowering the spout of the hopper in the cup. These are very simple and practical devices for feeding grain to mill-stones.]

HYDRAULIC BLAST GENERATOR—August F. W. Partz, of New York City. I do not claim a wheel or cylinder composed of coiled or tormented compartments, which communicate with a hollow shaft.

Nor do I claim the vessel containing the fluid wherein said wheel is partially immersed.

I claim, first, The arrangement of the several parts of my machine.

Second, A chamber attached to and communicating near its bottom with the vessel enclosing the wheel, into which chamber the hollow shaft of said wheel opens and discharges, and which contains one outlet for the air accumulating in its upper part, substantially in the manner and for the purpose described.

CONDENSING VAPORS AND GASES FOR EVAPORATING LIQUIDS—A. F. W. Partz, of New York City. I claim in apparatus for facilitating the absorption of vapors and gases, &c., and the evaporation of liquids, the combination of the revolving perforated disks or sheets, with the vessel containing the liquid of absorption or evaporation into which they dip, and the hood or cover which guide the vapor and gases that are introduced through the unimmersed portions of said disks, substantially in the manner and for the purpose described.

OSCILLATING PRINTING PRESSES—Chas. Potter, Jr., of Westery, R. I. I do not claim lifting the feed board for the purpose of carrying the sheet to the grippers, independent of its application or adaptation as described.

Neither do I claim actuating the "fly" by a cam and spring, as that is common.

But I claim, first, The manner of adjusting the impression by means of the levers, h, and screws, i, substantially as described.

Second, I claim the use and adaptation of the lifting feed board, l, for carrying the sheet to the grippers, when combined with the oscillating eccentric segment, D.

Third, I also claim operating the "fly" by the cam, S, when so constructed as to cause said fly to conform with the eccentric, B, and oscillating eccentric segment, D, as fully set forth.

MACHINE FOR MAKING SHOVELS—D. B. Rogers, of Pittsburgh, Pa. I claim the use of the rollers, C, P, Q, in connection with the dies K and R, and the pitman, J, J, arranged and operating in the manner specified.

SEED PLANTERS—S. G. Randall, of Dixon, Ill. I claim hinging the seed hopper with its drive wheel, G, and other appliances connected with it to the side pieces of the harrow by the pivoted arms, D, so that when said hopper is thrown forward, it shall rest on and be operated by said drive wheel, which runs on the ground for that purpose, and when thrown back, rest on said pieces, and be out of action as set forth.

HARVESTERS—Wm. T. B. Read, of Alton, Ill. I claim making the shoe, E, in one piece, as described, so that by its peculiar formation, it shall serve not only as a support for the fingers bar, A, and as a support and guide for the inner end both of the sickle bar, C, and connecting rod, D, but also as a means of preserving the connection between the connecting rod and sickle bar, as set forth.

[This improvement relates to the sickle of harvesters which are operated by a crank motion. It provides for the strain which comes upon the sickle bar, tending to bend it, when the crank is at its upper and lower points of rotation. The sickle bar is so guided by the devices described, that it is not subject to oblique strains, therefore the sickle cuts with greater ease, much friction being obviated, and at the same time the bar is prevented from being twisted.]

DIE STOCK—J. F. Schaver, of New York City. I am aware that circular plates having dies or recesses of graduated different sizes cut on the peripheries have been used before, and I do not claim the same.

But I claim the arrangement of the die plate, B, when held steadfast in connection with the die plate, D, having a slight adjusting motion, constructed and operated as specified.

PORTABLE CROSS-CUT SAWING MACHINE—Stephen Scott, of Wayne county, Ind. I do not claim attaching a saw or saw frame to the piston of a steam engine, or the use of a simple dog, to attach the machine to a tree or log, for they are both embodied in a patent granted to S. R. Wilmot, Aug. 1856.

But I claim, first, The peculiar arrangement for feeding the saw to its work, and for changing the saw from a perpendicular to a horizontal position, substantially in the manner and for the purposes set forth.

Second, I claim a slotted saw, K and screw bolt, h, for the purposes indicated.

Third, I claim block, R, in combination with dog, Q, for purposes set forth.

CUTTING OUT HEELS OF BOOTS AND SHOES—John Shaw, of Natick, Mass. I claim in the described cutter the cutting wings, a, extended from it, substantially in the manner so as to remove the waste portion from the strip of leather, while the heel piece is being formed therefrom in manner as specified.

COOKING RANGES—Chas. J. Shepard, of Brooklyn, N. Y. I do not claim a metallic conductor between the fire and oven, as the same has been used in the form of a separate block, on which the fire brick rested, but I am not aware that the side plate of the oven has ever before been formed with the thickened part at the point of curvature in said plate as specified, whereby the direct heat of the fire (which would cause burning) is intercepted, and the whole plate is heated by the conducted heat, which would not be the case if the plate and conductor (2) were in separate pieces, and by this means the oven is enlarged and rendered more efficient.

I claim forming the plate, m, that encloses the whole side of the oven next the fire, with the conductor and radiator, 2, substantially as and for the purposes specified, whereby the said radiator, 2, in contact with the fire, conducts the heat to and disperses the same throughout the side oven plate, m, heating the oven more uniformly and preventing burning, at the same time that the oven is enlarged as specified.

PRINTERS' COMPOSING STICKS—Jas. and Wm. Tidge, well, of Middletown, Conn. We do not claim making a composing stick adjustable to different widths.

Nor do we claim making it with a solid foot or bottom stile without apertures for the insertion of the fastening screw.

But we claim the application to the slide of a composing stick of the flange, C, and the screw, E, in combination with the washer, F, interposed between the point of the screw, and the exterior surface of the foot or bottom stile of the stick, as described, and for the purposes set forth.

FILING SAWS FOR COTTON GINS—J. T. Turner, of Bridgewater, Mass. I claim giving the files a reciprocating rotary or rolling motion, by devices such as are described or their equivalents, for the purposes set forth.

I claim the adjustable vibrating frame carrying the traverse rods, which operate the files when arranged to vibrate parallel with the plane of the saws, so as to adjust and adapt the files to the saws as described.

I claim giving the saws a continuous rotary motion while they are operated upon by the files by means of a belt applied directly upon the saw cylinder.

I claim a yielding or spring file holder, in combination with a traversing rod, having a reciprocating rolling motion.

UNITING THE PANELS OF PORTABLE FENCES—Chas. Van De Mark, of Oakes Corners, N. Y. I claim the end locking piece or board h, combined with the locking board, d, and rails e, f, and g, the whole constructed and operating substantially as and for the purposes specified.

FOLDING BEDSTEPS—J. B. Wickersham, of New York City. I do not claim a fold-up bedstead, neither do I claim securing the side rails by the invention of a pin through two holes.

But I claim securing the side rails in place when the bedstead is in an unfolded position, by the combined operation of the stop, I, and pin, J, inserted above the rail, substantially as and for the purposes specified.

HAT STANDS—John B. Wickersham, of New York City. I do not claim wrought iron rods, connecting plates and castings of iron; neither do I claim furniture formed in the shape of horizontal terraces connected by vertical columns or supports.

But I claim the manner specified of attaching the hooks of hat stands on vertical studs or rods, so that said hooks can be turned around horizontally, substantially as and for the purposes specified.

FLOW CLAVIS—J. D. Willoughby, of Pleasant Hill, Penn. I claim the stem, C, and the flange, G, with the grooves, E', in combination with cylinder, B, and its elevation, i, the whole being arranged and operated in the manner and for the purpose substantially as described.

PRINTING PRESSES—D. H. Windner, of Cincinnati, O. I claim the arrangement of the rollers, a, substantially as set forth of the roller bearings (n, o, r, s) pivoted to the flattened branch or arm, m, from the driving shaft and provided with the spring button, t, in combination with the hook, v, or equivalent devices for the tripping and inversion of the inking roller between the consecutive makings as explained.

DOOR BOLT—Amos Wescott, of Syracuse, N. Y. I do not claim any particular method of moving door bolts, but I claim the supporting and guiding of the rear or inner end of the bolt, H, by connecting it with the knob, shaft C, substantially in the manner and for the purpose set forth.

WOOD GAS GENERATORS—C. F. Werner, of New York City. I claim the arrangement of a moveable boiler or retort, B, and cylinder, C, being combined in the manner and for the purpose as described.

CORN HUSKER—I. N. Whitaker, of Peconic, Ill. I claim the levers, C, C, and flanches or lips, e, e, attached to the levers A, A, and constructed and arranged substantially as shown and described for the purpose set forth.

[This is an improvement on hand husking machines; the butts of the ears of corn are removed with cutters attached to levers. There is a bevelled lip attached to each lever above its cutter, so that when they are closed in cutting, they also force the husks from the ears.]

DRESSING WATER FURROWS IN LAND—Jesse Whitehead, of Manchester, Va. I claim in combination with the couler E, and mold boards G, which scrape and smooth the sides of the furrow, and serve to guide and direct the machine along said furrow, the horizontal plate F, which shaves off the top of the furrow, and receives all the excess of earth, and the distributors, H, for scattering the earth therefrom, so as not to leave it in ridges, the whole being combined and operating together

substantially in the manner and for the purpose set forth.

PICKERS FOR LOOMS—T. J. Mayall, of Roxbury, Mass., assignor to himself and Geo. N. Davis, of Boston, Mass.: I claim a picker made of vulcanized rubber, without seams, in the manner set forth.

POMMY MACHINES—O. F. Mayhew (assignor to W. H. Weeks and O. F. Mayhew) of Indianapolis, Ind.: I claim the combination and arrangement of the concave A, wings or dividers, C, C, C, and the adjustable openings D D D, when constructed and operated substantially as set forth.

HOLDERS FOR SADDLE IRON, &c.—Leon Londinsky, of New York City: I claim a detachable handle or holder, made in sections of wood, to be placed upon the handle of a smoothing iron for tailors, haters, and laundry use, constructed and arranged substantially as and for the purposes set forth.

SPLITTING LEATHER AND HIDES—Isaie Lippmann, of Paris, France, assignor to Michel J. A. Guist of New York City: I claim the method described for splitting skins, and by first submitting them to a felling or beating action as described, and then when so prepared, passing them through an apparatus or machine, the cutting apparatus of which has a rapid vibrating motion against which the skin is pressed slowly, substantially as specified, by which method of felling and cutting combined, I am enabled more perfectly to split skins than has heretofore been done.

WATER GAGES FOR STEAM BOILERS—D. E. Rugg (assignor to N. H. Forces and D. E. Rugg), of New York City: I do not claim a metallic pipe connecting with the steam and water spaces of the boiler in itself. Neither do I claim a transparent water gage in itself.

But I claim the combination of the metallic pipe, connected to the steam and water spaces with the surrounding transparent tube or cylinder to indicate by the ebullition of the fluid in said cylinder the water level of the boiler, substantially as and for the purposes specified.

TO PREVENT COUNTERFEITING BANK NOTES, &c.—C. D. Seropyan, of New York City, assignor to Wm. Couland, of New York City and J. B. Bald, of Philadelphia: I claim the application of at least two colors to the manufacture of bank notes, drafts, and all other papers representing value, both of which will equally or nearly so absorb the chemical rays of light, or neither of which will transmit or reflect such rays, and leaves the color or the tint of the paper less fugitive than the color of the other parts.

DOOR BOLTS—S. R. Wilmot, (assignor to S. B. Guernsey), of Watertown, Conn.: I claim the method described of forming a raised bar from a flat plate, without straining the material injuriously, by corrugating the plate at the ends of the bar, and sliding the sides of the bar from the plates, substantially as set forth.

DIES FOR PUNCHING FORK TINES—L. S. White, of Hartford, Conn., assignor to S. S. Rogers, E. W. Sperring, J. H. Ashmead and E. Hurlbut, of same place: I claim supporting the small bars or slender part of the ismperated die, b, by suitable supports or dies of metal, a, constructed and used, substantially in the manner described.

PLOWS—John Ormiston, of Center Township, O., assignor to D. N. Allard, Kokeby, O.: I claim unking and adjusting the shank of the point D, to and with the shank of the point E, by means of the screw and piece D, on the rack on the shank of said coulters, and the stirrup and set screw, substantially in the manner and for the purpose set forth.

RE-ISSUES.

GRASS HARVESTERS—Wm. F. Ketchum, of Buffalo, N. Y. Patented Feb. 10, 1852.—Re-issued Feb. 23, 1854: I claim, first, extending the shoe, H G, from the heel of the rack or finger bar upward and forward, and firmly connecting its continuation with the draught when the finger bar is located as set forth, so that the power by which the machine is drawn shall through the shoe be communicated to the shoe, H G, from the heel of the rack or finger bar, to assist in relieving the strain which would otherwise come upon the lateral connections of the rack or finger bar with the wheel frame, while the heel is enabled to slide over obstructions substantially as shown.

Second, when the main wheel and inner end of the finger bar or rack, D, are located relatively as described, I claim containing the shoe, H G, from the heel of the rack or finger bar upward and forward until the upper end of its extension reaches a part of the machine which always runs above the mown grass, and which will keep the said grass down and prevent it rising over the point of the extended shoe, thus aiding the shoe to ride over the mown grass even when accumulated before it, substantially as shown.

Third, I claim supporting the heel of the rack or finger bar sufficiently near the ground, and at a convenient distance laterally from the main wheel by arms extending upwards and forwards and upwards and backwards therefrom, and connected with the frame or spring bars firmly bolted across the frame in front and rear of the said rack or finger bar, while the said frame or bars are arranged as substantially shown.

Fourth, supporting the rack or finger bar at the side of and lower than the main frame, by means of auxiliary framing in a fixed position at the side thereof, and extending downwards and forwards so that while the finger bar is held as near the ground as desired, and lower than the main frame, it may be nearly horizontal, in the line of draught and at any convenient height, to avoid clogging, or accommodate the diameter of the main wheel as shown, such an auxiliary frame, as a whole is shown in the drawings, composed of bar C, rods E E I, and rack or finger bar D, but its details, may, of course, be varied, while the principle of my invention is retained.

Fifth, supporting the rack or finger bar, D, in its position at the side and lower than the main frame, by extending a strong bar, C, behind said rack or finger bar firmly supported by said frame, and rigidly connecting said rack or finger bar to said bar C, by a straight brace or braces, E E, said frame being elevated, and said bar being elevated and placed sufficiently in rear of said rack or finger bar to avoid clogging or lodging of the mown or cut grass against said parts, and the parts are arranged in relation to each other, substantially as shown.

Sixth, supporting the outer end of the rack or finger bar by a rod extending downwards and forwards from the cross bar, C, to the finger bar, parallel or nearly so to the face of the main wheel, when the frame and bar C are elevated above the rack or finger bar, in the manner and for the purposes contemplated in the last claim, to avoid the falling or clogging of the cut grass against such rod, as set forth.

GAS BURNERS—O. H. Johnson, of Boston, Mass. Patented June 26, 1855.—Additional improvement, dated March 18, 1856: I claim combining the gas distributor, B, or the same and the purifier C, as described, with the burner, so as to operate therewith, substantially as set forth.

I also claim elevating the top of the orifice, a, for injecting the gas into the chamber of the burner above the base of said chamber, by a cone or its equivalent, and so as to form a chamber and said orifice for holding tarry matter, as well as for removing it from the orifice.

And I also claim extending the orifice, a, into the distributor, and among its wires, so as to attain advantages explained.

DESIGNS.

COOKING STOVES—Thos. H. Wood, F. S. Hubbell, and J. E. Roberts, of Utica, N. Y.

COOKING STOVES—J. D. Marshbank, of Lancaster, Pa.

Glue in Bones.

Bone contains from 30 to 36 per cent of earthy matter, chiefly phosphate of lime, and the remainder is gelatine. When bones are digested in muriatic acid, they become transparent and flexible like leather, the earthy matter is dissolved, and after the acid is all carefully washed away, pieces of glue of the same shape as the bones remain, which are soluble in hot water, and adapted to all the purposes of ordinary glue.

Expansion of Cast Iron in Solidifying.

MESSEES EDITORS—Allow a subscriber and constant reader to correct an erroneous statement made in the last number of your valuable scientific journal (page 301) in regard to the expansion and contraction of cast iron. Your two correspondents, Messrs. Beckwith, of Michigan, and Seward, of Indiana, have (as "practical" men very often do) made a mistake. It is unalterably true, as stated in your paper of May 16, (page 285), that "cast iron expands in becoming solid, and therefore takes the impression of the mold with exactness," provided the mold be perfectly unyielding. It is further true that "cast iron shrinks about one-eighth of an inch to the foot" after it has become solid, and hence the patterns must always be made in that proportion larger than the desired size. But it is not true, as added by Mr. Seward, that this shrinkage occurs to the metal "in becoming solid."

The fact is, that general as the law is that "heat expands bodies," the law is just as general that immediately after the melting point is reached a further heat will contract all bodies. At least, I am aware of no exception to the statement that liquids in being cooled down invariably expand for some time before being congealed, after which they again contract. Hence it is familiar to every founder that melted iron is heavier (that is, denser,) than solid iron, and that a pig of iron thrown into the freshly filled ladle will float on the top of the incandescent liquid, instead of going to the bottom, as it should if the melted metal were the more expanded. The same is true of lead, copper, silver, gold, &c.; and the same is true of ice, which, as known to every one, is more expanded than the water many degrees warmer, in which it floats. Water, like iron, "expands in becoming solid," and bulky anvils have been split by a few drops freezing within a small cavity, in attestation of this law of nature. D.

[Dr. Lardner in his "Treatise on Heat" says:—"Most of the metals undergo a sudden contraction in passing from the liquid to the solid state, but to this there are three exceptions namely, cast iron, bismuth, and antimony. A metal which contracts in passing from the liquid to the solid state cannot be made to take the shape of a mold, owing to its sudden contraction causing it in the solid form to be of less magnitude than the mold which it filled while liquid. It is for this reason that money composed of silver, gold, or copper cannot be cast, but must be stamped. Cast iron on the contrary, as it dilates, takes the impression of a mold with great exactness."]

Dr. Lardner evidently teaches the doctrine that cast iron, antimony, and bismuth expand and stay expanded in cooling from a liquid state. His opinions on this point are somewhat different from those of our correspondent, whose ideas are clearly as follows:—Molten iron when poured into molds expands as its temperature decreases, until it congeals—becomes a solid—when it contracts; every one knows how much. Evidently, there is no difference between his views and those of Messrs. Beckwith and Seward, whom he intends to correct on the main point of the question. Their understanding of it is simply that castings of iron are of less magnitude than the iron in a molten state. They evidently did not intend to convey any other idea.

If, according to our correspondent, molten iron expands in cooling, then it should burst molds to pieces. He instances the prodigious power of water, in becoming ice and splitting anvils; surely, if the molten metal expands in cooling, he should be able to instance cases of the explosion of molds by the expansion of the metal, however small that expansion may be. On the other hand, if iron contracts in the mold, how are we to account for the exactitude of iron castings? His views on the contraction of the metal after it is congealed—all parts then shrinking equally—will account for this. If the metal shrunk in the mold before it was congealed, it certainly would not take an exact impression.

It is our opinion that the cause of the flattening of solid metal upon the top of molten metal is not that the latter is of greater spe-

cific gravity, according to our correspondent's views, but a repulsive action between the two. This can be demonstrated by dropping a piece of lead into molten tin; the lead, which is of far greater specific gravity, will actually float upon the tin.

It is necessary to make patterns in some degree larger than the intended iron castings, to allow for their contraction in cooling, which equals from about the ninety-fifth to the ninety-eighth part of their length, or nearly one per cent. This allowance is very easily and correctly managed by the employment of a contraction rule which is made like a surveyor's rod, but one-eighth of an inch longer in every foot than ordinary standard measures. When a wood pattern is made, from which an iron one is to be cast—the latter being intended as a permanent foundry pattern, as there are two shrinkages to allow for—a double contraction rule is employed, or one the length of which is one-quarter of an inch in excess in every foot.

Compasses on Iron Ships.

The Liverpool (Eng.) Compass Committee, formed by the late Dr. Scoresby and others, for the purpose of inquiring into the cause of, and, if possible, providing a remedy for, the extraordinary variations of the compass on board iron ships, has been disbanded. The Liverpool Courier says:—

"Its decrease could not have occurred at a more inopportune time than the present, when naval disasters through 'errors of the compass' are so rife. We need only instance the cases of the new iron clipper ships City of Madras and Charlemagne, lost within the past few days in the Clyde, and worth, with their cargoes, upwards of £200,000; of the iron screw steamer Arcadia, reported ashore in the Gulf of Smyrna; of the iron screw steamer Amelia, ashore near Milford; of the late total wreck of the iron screw steamer S. Andrew, on the coast of Syria; and of the complete loss, last week, on the Blackwater Bank, off the Irish coast, of the wooden clipper ship Emperor, a few hours after leaving this port for the Brazils. Surely these instances ought to suffice to show the imperative necessity that still exists for discovering a remedy for these destructive 'errors of the compass.'"

This is a subject of great importance, both as it relates to science and commerce. If the compass is unreliable on iron ships, on account of the local attraction of the magnet, then such vessels never can be unswervingly trusted, at least with such a guide as a magnet to direct them in their course over oceans and seas.

Notes on Science and Foreign Inventions.

Steel Tubes.—Messrs. J. J. Russel and J. B. Howell, England, have secured a patent for making tubes from sheets or strips of cast steel, previously rolled to the thickness desired. To make lap-jointed tubes they take a strip of cast steel of the required dimensions, and scarf the edges to form the joint; then they bend it into the shape of a tube, with the edges overlapping each other, as in making lap-welded iron tubes. The skelp thus prepared is put into a furnace, and heated to a welding temperature, then taken out, and passed between rollers over a mandrel, so as to weld the lap edges together, thus forming a cast steel tube, which is afterwards finished by being drawn through dies, to reduce it to the proper size. It is not easy to see in what respect this differs from that employed in making iron tubes.

Waterproofing Paper, Cloth and Leather.—P. Pierre Hoffman, of Strasbourg, has taken out a patent in England for a new varnish, which, when applied to the articles named in the above caption, render them, it is stated, air and water-proof, while at the same time they keep dry under all variations of temperature in the open air, are elastic, and do not become sticky—the latter being a fault common to a number of varnishes. The articles are coated with a mixture either of siccative linseed oil and sulphur, called balm of sulphur, or of a mixture of sulphur with a quantity of siccative oil, gum copal, gum opal, yellow amber, resin, india rubber, and gutta percha and

with the essences of turpentine or naphtha, &c., the two latter keeping in solution the above named substances, which may be mixed separately or at the same time with the balm of sulphur.

The chief features of the invention consist in the use of the balm of sulphur for rendering fabrics air and water-proof, and in preparing the balm in the following manner:—When the siccative or common drying oil has boiled for about two hours, in order to thicken it and separate its mucilaginous parts it is left a few days to settle, previous to decantation; then ten parts, by weight, are taken and submitted to slow boiling, during which small quantities of flowers of sulphur are added, and agitation is kept up the whole time. When from one to two parts of flowers of sulphur have been thus thrown in small quantities into the oily mixture, a transformation soon takes place, and the balm of sulphur now assumes a homogeneous mass of a brownish color, cohesive and elastic, somewhat like india rubber. The constituents of this composition or coating are then the following (by weight):—Ten parts of siccative thickened linseed oil, and from one to two parts of sulphur in powder. The balm of sulphur, thus prepared, is used as the coating, and liquified either by the action of heat, or by means of solvents, such as spirits of turpentine, naphtha, &c. When it is desired to obtain a harder coating, gallipot gum, yellow amber and resin, &c., may be added.

The fabric to be coated is dipped into the material when hot, and in the liquid state, from which it is withdrawn and made to pass between six scrapers adjusted transversely above the vessel, so that any excess of the material is removed, and drops into the vessel again.

Subohurized Oil Paint.—At a recent meeting of the Society of British Architects, J. B. Daines stated that by subjecting 8 parts (by weight) of linseed oil and 1 part of sulphur to a temperature of 278°, in an iron vessel, he obtained a species of paint possessing singularly preservative properties. Applied to the surface of a building with a brush it effectually keeps out air and moisture, prevents deposits of soot and dirt, and preserves the beauty of the stone, wood or brickwork to which it is applied.

It has long been known that a portion of sulphur can be dissolved in oil, but until recently such a composition, as a paint or varnish, has attracted no notice, in fact, its preservative and impervious qualities when dry were unknown. It is well known to chemists that sulphur (the substance employed to give body to the oil) is unalterable in the air, and is not acted upon by moisture, hence its quality as a preservative for coating the outside of structures exposed to the weather. It is capable of preserving plaster of Paris figures exposed to the air, also monuments, and buildings of the brown free-stone, which are liable to detrition from the action of the weather. It is stated that it improves the color of the stone to which it is applied, as well as preserves it, therefore it is a most useful paint, and deserves to be very generally employed.

Engineers and Firemen.—In a communication to the Paris Academy of Sciences, Dr. Duchesne states that engineers and firemen on locomotives improve in health and grow stout during the first two years of their employment, but after this period a dangerous change takes place in their health. Among the earliest unfavorable symptoms are a weakening of sight, loss of hearing, and rheumatic pains, chiefly on the right side. These are followed by pain, and a difficulty of standing while the locomotive is in motion. We have never heard of American railroad engineers being affected in this manner.

Salt in Dyeing.—F. A. Gatty, of Accrington, Eng., has taken out a patent for the use of common salt (chloride of sodium) in dyeing with garancine, alizarine, and other preparations of madder. One pound of the salt is employed to every twenty-five pounds of the garancine in the boiler or a vat. The salt, it is stated, produces more beautiful and permanent colors. Some of our country dyers employ salt in coloring woolen goods black.