adopt my system. In this paper I have confined myself to the advantages gained in speed or the saving of fuel by my system; but I will briefly name eight other important advantages in connection with it. (1) Thorough protection to the propellers. (2) Smaller screws and engines only are required. (3) No vibration whatever is produced by the propellers. (4) Ships so fitted can be stopped much sooner in case of danger. (5) There will be no loss of speed through racing of the engines. (6) Greater facility for steering and maneuvering. (7) Greater safety through dividing the power. (8) Ship can carry more canvas, and sail better. To sum up the result of my experiments, I find that to obtain the advantages of my system the propellers must be placed in tunnels, by means of which an extra supply of solid water will be kept up to the propeller, which cannot be effected in open water, and the extra supply of water can be obtained by using the bow and stern screws together, or by single screw ships, either at the bow or stern tunnels, by having the tunnel mouths enlarged or bell-mouthed. It may be thought there would be a loss of speed through the friction of the water passing through the tunnels when the ship is under canvas only, which, however, is not the case."

It is proper for us to add that Mr. Griffiths' conclusions appear to be based upon experiments with small models, which may have led to deceptive results as compared with trials upon ordinary vessels. The subject is one of interest and we shall notify any progress made by thorough and practical experiments.

Skin Grafting.

Dr. R. J. Levis, of the Pennsylvania Hospital, gives, in the *Medical Times*, an interesting article on this subject. The operation of skin grafting, he says, is now conclusively accepted as one of the resources of surgery.

The utility of the transplantation of minute pieces of skin, to granulating surfaces, has been demonstrated in a vast number of instances. It is admitted that, by creating centers of eccentric cicatrization on extensively ulcerated surfaces, the rapidity of the healing process can be much increased. Ulcers of a chronic character, which have obstinately resisted cicatrization in a concentric direction, can be healed by the ingrafting of new centers of germination in the midst of the areas of ulceration. Experience has also shown that the procedure is applicable to plastic surgery in facilitating the cicatrization of surfaces denuded by gaping in the division of cicatrices, and in the sliding of flaps of integument.

Besides the increase in the rapidity of healing, due to extending the lines of cicatrizing edges, a decided and important physiological influence is exerted by the presence of the grafts on ulcerated surfaces. The surface of an indolent ulcer seems to be stimulated to renewed vital action, and the increased healing impulse even influences to active germination the peripheral limits of an ulcer in which granulation has long entirely ceased.

The utility of skin grafting has, in my observation, been in no instances more demonstratively shown than in cases of extensive denudation caused by destruction of skin, as in burns, and loss of large areas of integument from traumatic injuries. In the case of a man whose back was extensively charred at a lime kiln, while lying under the toxic influence of its emanations, the sloughing integument having left an immense area of ulceration over his dorsal and lumbar regions, the successful ingrafting of numerous minute pieces of skin healed the vast ulcer with astonishing rapidity. In an instance of the entire loss of the skin of a leg, caused by deeply burning with coal oil, which had filled a shoe and saturated a stocking, the healing process was by the same procedure rendered as surprising and satisfactory.

It seems now probable that amputation, which, as a final resource, is by surgical authority justified in certain cases of extensive ulcers of the leg which all expedients have failed to heal, may be substituted by the simple device of skin grafting.

All of the conditions essential to successful skin grafting I have not, after extended observation, fully determined. The most favorable condition for the development of the grafts is certainly that of healthy, active granulation of an ulcer; and the more nearly this state is approached, the greater, as a rule, will be the success.

One of the beneficial claims for skin grafting is with reference to the avoidance of the eventual contraction which disfigures, deforms, and impairs motion after extensive loss of integument. Observation seems to show that where cutification is rapid from a number of skin forming centers, the resulting cicatrix is less violently contractile in its tendency.

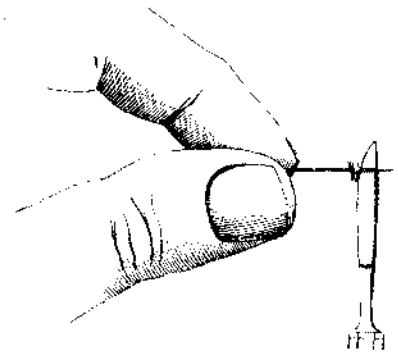
For successful skin grafting, it is simply essential that a minute portion of skin be removed from a sound part of the body of the patient, or from another individual, and placed on an ulcerated surface. It is customary to take the pieces to be transplanted from the patient's own skin; and I have generally chosen locations where the derma is thin, and not densely covered with cuticle, as on most of the front of the body, and, as a choice, from the inner surfaces of the arms and thighs. Grafts from the integuments of other individuals develop as readily, and I have frequently practiced removing them from limbs amputated for traumatic injuries, with apparently equal success. To avoid the possibility of conveying some form of specific infection by the process, it is certainly, as a rule, most advisable to transplant only from the patient's own skin.

A graft of skin should merely consist of the simple structures of cuticle and derma, and should avoid the underlying fatty and connective tissues. That even the whole thickness of the derma is not essential is demonstrated by the fact that successful grafting has been effected by using mere scrapings of the cuticle, in which are contained some cells of the superficial or papillary layer of the derma; but the practice is uncertain, and has not practical merit. The thickness of the true skin on the front of the body, it should be borne in mind, does not average more than from a quarter to half a line, and this depth should never be exceeded in the removing of grafts.

The operation of removing the portions of skin for grafting may be done by a knife or scissors, cutting off minute particles of the size to be used immediately in transplanting; or by taking a larger piece which is to be afterwards subdivided. I have adopted a method, first suggested to me by Dr. C. H. Thomas, of Philadelphia, which, for simplicity, convenience, painlessness, and effectiveness, may well displace all others.

It consists, as seen in the illustration, in merely penetrating the cuticle with a very delicate sewing needle, elevating a small point, and shaving off the minute elevation of cuticle and upper stratum of derma with a very sharp knife. The same may be accomplished, but hardly in so perfect and painless manner, by using fine scissors for the excision of the portion transfixed.

The operation, if properly performed, should be free from really painful sensation, and patients never object to its most frequent repetition. I have frequently done it without more than a tint of discoloration from blood, and blood need never actually flow from the very minute wound.

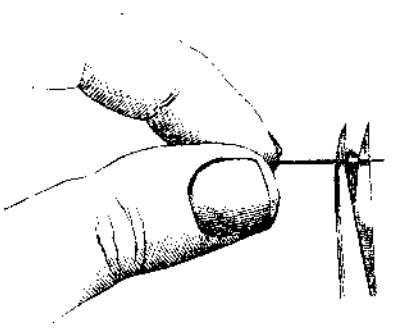


SKIN GRAFTING.

The graft is then immediately pushed from the point of the needle, and placed on the surface of the ulcer, the only care being to lay it with its epidermic surface upward. The graft need not be inserted into the granulating surface by making a wound for its reception, as has been advised and practiced, for such puncture allows a flow of blood that may elevate the graft from contact with the granulations.

As simple adhesion of the graft is all that is desirable, I have sometimes, with large and actively secreting surfaces, allowed them to be exposed to the desiccating influence of the atmosphere, so that the secretion may become viscid and hold the transplanted particles surely in position. To facilitate the same object of fixation after the grafts are deposited, I have occasionally allowed the ulcerated surface to remain uncovered until they became well agglutinated to it.

All active medication to the ulcer should be avoided, and the surface of ulceration be simply covered with a light pressing, for protection from disturbing influences. For this purpose the ulcer may be covered with a piece of muslin, saturated with oil or covered with cerate, or it may be merely protected with the waxed tissue paper, such as is extensively used for general purposes of a dressing in the Pennsylvania Hospital.



SKIN GRAFTING.

On most ulcers the dressing need not be removed for two or three days after the operation; but when secretion is profuse, the ulcer may be washed daily by allowing a stream of water to flow over it, carefully avoiding the wiping of the surface with sponges or cloths, which may disturb the grafts.

One of the earliest changes noticeable in the graft, after the first few days, is the detachment of its cuticle, which may occasionally be seen floating in the secretions of the ulcer, or it may be detached by a slight touch, leaving the true germinating material fixed in position. The graft, as it commences development as a germinal center, becomes so blended and identified with the granulations as to be for a time almost lost sight of, its re-appearance becoming evident in a bluish or lilac tinted pellicle, which indicates the progress of cutification.

In regard to the size of grafts for transplanting, I have, in several instances, grafted by removing, from recently amputated limbs, pieces of skin measuring one third or one fourth of an inch square; but such large pieces are very likely to fail in retaining their vitality, and I have had much more satisfactory success with quite small grafts; and for reasons already stated, this latter practice is certainly the best.

The number and position of the grafts will vary in accordance with the size of the ulcerated surface; and in large ulcers they may be distributed at short intervals, both centrally and near the periphery. Those near the circumference will stretch their granulations outward and stimulate the borders of the ulcer to activity; and with regard to the advantage of centrally located grafts, it will be well to remember their importance with reference to the difficulty often experienced in eventually healing the last of a chronic ulcer. A large ulcer, on which successful grafting has been performed, will soon present islets, from which cicatrization progresses in directions of the nearest healing points, until all are joined by an interlacement of newly formed tissue.

NEW BOOKS AND PUBLICATIONS.

A HAND BOOK OF THE LOCOMOTIVE, including the Construction and Management of Locomotive Engines and Boilers. With Illustrations. By Stephen Roper, Engineer. Philadelphia: Claxton, Remsen and Haffelfinger, 624-626 & 628 Market street.

The author of this work very truly believes that in a book, as in a clock, any complication of its machinery has a tendency to impair its usefulness and affect its reliability. Hence, in preparing a book which is intended to be a guide for the practical locomotive engineer, he avoids "mathematical problems and entangling formulæ," and offers a pocket volume, full of information, theoretical as well as practical, succinctly and clearly condensed. There are chapters on heat, combustion, water, air, gases, and steam; others on the construction of the locomotive and of its various parts, entered into with considerable details; instructions for the care and management of boilers and engines, tables of strength of materials, and useful practical hints for the guidance of the engineer. In brief, the volume is, as its name indicates, a hand book to which the locomotive mechanic can turn for information regarding almost every branch of his trade. It is neatly illustrated and bound in morocco, in convenient pocket book form.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From April 7 to April 13, 1874, inclusive.

ELECTRIC LIGHT.—M. Day, Mansfield, Ohio.
FIRE TELEGRAPH.—J. H. Guest, Brooklyn, N. Y.
FOOD FROM MILK.—B. Smith, San Francisco, Cal.
IRON, STEEL, AND FURNACE.—J. Henderson, New York city.
METAL ROLLING MACHINE.—H. W. Hayden, Waterbury, Conn.
OIL STOVE.—J. H. Thorp, New York city.
SOLE SCREWING MACHINE.—J. Mundell *et al.*, Philadelphia, Pa.
WATER CLOSET BASIN.—J. Burns, New York city, *et al.*
WATER METER.—H. F. Read, Brooklyn, N. Y.
WATER METER.—J. S. Swan *et al.*, Kanawha, W. Va.

Recent American and Foreign Patents.

Improved Railroad Signal.

Jane D. Evans, West Chester, Pa., executrix of Henry S. Evans, deceased.—This is an improved railroad signal, so constructed that the advancing train will itself set the signals to indicate its approach and departure. Two pairs of inclined bars are pivoted at the sides of one of the rails in such positions that the free ends of said inclines will be struck and pressed down by the wheels of the cars. The inner ends of the inclines of each pair are pivoted to opposite arms of a three armed lever, which is placed in a notch in the tie, with its third arm projecting downward. To each pair of levers is attached a chain, which passes over and is secured to a wheel formed upon the signals, which are pivoted to the upper ends of two posts. Either of said signals may be operated from the other, and both set or both withdrawn at the same time. The three armed levers are again raised to their former position, as soon as the pressure of the wheels is removed from the levers or inclines, by springs attached to ties.

Improved Rotary Harrow.

James W. Hanger and Joseph H. Ryan, Clinton, Mo.—This invention relates to means for adjusting the pivoted harrows, so as to cause one side thereof to work deeper in the ground than the other; also to a spring connection between the tongue and axle and a caster wheel, the same also supporting the driver's seat, whereby the weight of the driver effects little change in the pressure on the harrows in passing over rough ground, while yet exerting a constant spring leverage on the tongue; and lastly, to the means of adjustment for the pivoted axles of the harrows.

Improved Steam Boiler.

Joseph Shackleton, Rahway, N. J.—This invention relates to an improvement on the improved steam boiler upon which the same inventor received a patent dated April 5, 1870. The water receptacle is provided with a water induction pipe at the lower part, and a steam eduction pipe at the top. A system of pipes extends through in horizontal direction, and is arranged symmetrically to the horizontal axis of the system in such a manner that an intermediate series of pipes is placed diagonally between and sidewise of the adjoining series of pipes. Every two corresponding horizontal pipes are connected in vertical direction by elbows to form pipe rectangles, which extend gradually from the smallest innermost tier to the larger outermost series, each rectangle being placed in separate connection with the water receptacle. A horizontal plate is immediately below the upper pipes of the innermost rectangles, extending laterally to the full width of the receptacle, and causing the impinging of the fire thereon, so that it is deviated from its direct upward course toward the chimney at the top of the furnace and thrown sidewise, passing between and around the vertical pipes toward the upper corner of the rectangles, and thence along the top of the furnace to the chimney. The upper parts of the pipe rectangles are thereby fully brought into effective participation, and the heating power of the fuel and the gases of combustion utilized.

Improved Post Hole Digger.

James W. Thomson, Portland Mills, Ind.—The post hole diggers now known to the public have the ends of the blade or the two blades pressed farther and farther apart until the lowest portion of the cut is reached, and leave a long slip on one side of the tool uncut, in which are often roots that bind the parts of earth together. This causes these old tools to stick, and to be raised with so much difficulty that they are thereby rendered impracticable in actual use. To avoid this difficulty the ends of the tool are, in the present invention, caused to overlap each other, so that they are only in line, and end to end at the bottom of cut, every particle of the sides being thoroughly excised, and the whole core coming out clean and without obstruction from the sides.

Preparing Transfers for Panel Sign Painting.

Charles H. Gordon, Brooklyn, N. Y.—Paper is first covered with a coat of starch, then calendered, and another coat applied, followed by a wash of gum arabic. The whole is next covered with a coating of clear white varnish. When the varnish is thoroughly dry it is dusted over with French chalk, and the letters or figures printed from the first plate with strong clear varnish. Said letters or figures are dusted with first color, say gold or red. When dry, and all superfluous color cleaned off, the foundation for the next color is laid, say blue, using the same process as for the first color (printing in varnish), and so in each color, till the whole of the picture or sign is printed on the transferring medium. When quite dry a solid ground is printed, of white or color, which, when transferred to the panel, will form the groundwork or base of the picture, etc. After this has stood some time to dry, but before it is quite dry, it is laid on a smoothly planed panel and passed through a machine, which causes the printed matter to adhere to the wood. It is afterward slightly damped and the paper removed, when the whole, groundwork, color printing, and varnish will be found transferred to the panel. Any and every kind of printing, it is claimed, can be treated in the above manner, lithographic, letter press or the finest steel engravings.

Improved Flocking Machine.

Edwin C. Gould, Bridgeport, Conn.—A shaft which revolves in bearings in the middle part of the frame is so arranged that one of its revolutions will oscillate a second shaft. To the latter are attached two pairs of arms projecting from its opposite sides. To the ends of each pair of arms is attached a striker, the edges of which, when the shaft rocks or oscillates, strike against the under side of the cloth as it passes from the flock box or sifter to the roller. The striker bars should strike the cloth in as nearly a perpendicular direction as possible, and the effect of their action is to straighten the flock, spread it evenly over the cloth, and at the same time knock off the surplus flock. The oscillating striker renders unnecessary the roller by which, in the original machine, the flock was pressed down upon the cloth, and produces a better article than when said roller was used.

Improved Brick Machine.

John S. Derby, Leavenworth, Kas.—This invention consists of a rotary brick press with radial molds, which turn in a mold ring supported on a suitable frame, and are rotated by a radial arm with pivoted catch. The bricks are molded in the ordinary manner and placed into the molds, and undergo successively the operations of pressing by means of an upper and lower press board, worked by suitable hand lever power, of cutting off to size, and of smoothing the upper surface. The lower press board of each mold is then carried up by means of its sliding piston and spring top, in connection with the hand lever, so that the bricks may be removed, and the board, by passing under stiff brushes, be cleaned, with the top of the mold, from sand and other impurities. The contact of the spring top with a projecting pin releases the lower press board, and carries it back into position for receiving a new brick. A shield or casing of the upper press board retains the clay therein, while suitable adjusting devices regulate the size to which the bricks have to be pressed.

Improved Brake and Rest for Carts.

William C. Jardine, Westchester, Pa.—This invention consists in arranging, on an ordinary tilting cart or dray, a brake and rest, so that when a cart is propelled down an incline the brake will hold and check the speed, and at the same time the front part of the body of the cart will be supported and the body retained in a horizontal position, thus relieving the weight and strain from the horse's back.

Improved Billiard Table Leveler.

Lyman A. Hunt, North Adams, Mass., assignor to himself and Sylvester N. Gardner, Troy, N. Y.—This invention consists of an inverted metal cup resting on the floor, with an oval-headed screw screwing up and down in a hole in the vertical axis of said cup, and carrying on its head a disk on which the table leg rests. The disk has a socket in the center of the under side, in which the head of the screw fits to keep said disk from jarring off. Each leg being provided with a foot, the screws are turned either way, as required, by a wrench applied to the head to raise or lower the table, and thus adjust it most accurately with but very little labor, and in a short time.

Improved Tree Protector.

Dwight Hitchcock, New York city.—In straps of light sheet metal, three or more of which are used, according to the required hight of the protector, are cut pairs of short parallel slits. The metal between the slits is bent outward to form a half-round transverse groove, and at the sides inward to form a half-round transverse groove. In this way are formed sockets to receive the wires, the arms of the loops or bends of which overlap or interweave with each other. Upon one end of each strap is formed a small tongue, which fits into a short transverse slot, formed in said straps near their other ends. Holes are also made in the straps, in such positions as to coincide with each other when the ends are overlapped, to receive a short bolt, which is secured in place by a nut screwed upon it. The outer arm of the last wire loop at each end of the straps overlaps the last arm of the loop at the other ends of the said straps. This construction enables the protectors to be opened out flat for convenience in packing for storage or transportation, and to be conveniently placed around the trees when required.

Improved Wash Boiler.

William Kolb and Mathias Kolb, New York city.—A partition wall divides the boiler into two divisions, the lower parts of which communicate with each other, while their upper parts only do so by means of a valve. After the boiler has been filled with soap suds up to the grate, it is set over the fire. As soon as steam forms, the suds will be forced out of one compartment into the other and through the wash. When nearly all the water has been forced out of the first compartment, a buoy connected with the valve will no longer be supported; the valve will, therefore, open, the steam will escape, and the suds will rush back into the first compartment. When the suds have risen so high therein that they float the buoy, the valve will be closed again, and the confined steam will again force the suds out of the compartment, and a continuous circulation will thus be maintained.

Improved Felt Cleaner for Paper Machines.

George Dunn and Robert McAlpine, Lee, Mass.—This invention consists of a suction box and a pump, in combination with the first felt of a paper machine, for cleaning it, mainly on the under side, of the matters collecting upon and adhering in the progress of the work, by suction continuously applied to the felt while in the performance of its function. It also consists of a perforated jet pipe, in combination with the felt and the pump, also for cleaning the felt, but more particularly its upper side, by blowing jets of air against the under side and up through it. The object is to enable the felt to be cleansed without stopping the regular work of the machine; also, without removing the felt for washing, as is required in some cases, and it is also designed, by acting continuously on the felt while it is at work, to keep it clean and in its best state at all times.

Improved Steam Boiler.

Nicolas D. Harvey, New Orleans, La.—The sides of the fire flue, back of the bridge wall, or the back ends of the boilers, are jacketed, and the mud drum is connected therewith. In this arrangement the feed water is pumped into the jacket, and not directly into the boiler. Before the feed water enters the boiler it is heated to the boiling temperature, and the sediment is deposited in the jacket, and readily finds its way to the mud drum, and is blown off. The water in the boiler is, therefore, kept comparatively pure.

Improved Water Feeder for Locomotive Tenders.

Mirabeau N. Lynn, New Albany, Ind.—The first part of this invention consists of a jointed arrangement of the spout, of peculiar construction, to adapt it for swinging laterally to the well in the tender, in case the latter does not stand directly in front of the spout, and thus save the adjusting of the tender so exactly as is now required, and which is difficult to do. The second part of the invention consists of a float open to the water below, and closed to the air at the top, with a pipe to admit air to the surface of the water in the interior space, so that the water will not be prevented by atmospheric pressure from flowing out through the spout when the surface is inclosed airtight by a strong cover of ice. A description and illustration of this device will be found on page 102 volume XXVIII., of this journal.

Improved Revolving Swing.

William A. Lowery, John A. J. Lowery, and William W. Lowery, Salem, Ind.—The swing seats are carried by arms attached permanently to the shaft: the latter is arranged in a step at the bottom, and a bearing at the top, to be revolved for carrying the seats around. The guys, for supporting the outer ends of the arms, are connected at the upper end with the top of the shaft by a cap, to revolve with the shaft, so that the latter is rotated by horse power, communicated to a sweep, below the arms.

Improved Cutlery Handle.

George A. Seaver, New York city, and John C. Milligan, South Orange, N. J.—This invention consists of two concavo-convex pieces of sheet metal, with flat margins, combined with the tang of a knife, fork, or other article, to form a handle. The pieces are placed on one side of the tang, with the convex side outward, and secured by lapping the edges of one over the edges of the tang and on the margins of the other, and stamping or pressing them together, thus making a strong and durable handle, with the requisite amount of swell, out of thin sheet metal.

Improved Wheel Plow.

John R. McConnell, Waterloo, Iowa.—The bent axle arm may be moved up and down to adjust the machine to run level. The furrow wheel works between the rear part of the mold board and the land side of the plow, and its lower side supports the downward pressure of the plow, and thus diminishes the friction, and consequently the draft. The draft bar and beam are made of such a length that the furrow may be turned by the rear plow just in the rear of the furrow wheel. The rear plow may be readily adjusted to take more or less land, as may be desired; and by suitable mechanism, governed by a hand lever, the plows may be raised from the ground, or adjusted to any desired depth in the ground.

Improved Spindle.

William G. Bartley, Rochester, Minn., assignor to himself and Anson B. Beach, of same place.—This invention consists of a funnel on the under side of the bolster rail, extending into a cup on the top of the pulley, to receive the oil which drips from the bolster bearing above; also, holes through the pulley to conduct the oil down, and also a tube on the under side of the pulley, extending down the spindle for some distance, to conduct the oil which drips from the bolster rail down to the step, and prevent it from getting on the face of the pulley and on the band. The invention is designed for the spindles of jacks, mules, and other spinning machinery.

Improved Fender for Vehicles.

Washington Bryant, Batesville, Ark.—This invention is an improved device for keeping the wheels of a wagon free from mud, to prevent it from clogging the brakes or loading down the wheels. The invention consists in the arrangement of scrapers attached to extensions of the rear ends of hounds, with the wheels of a wagon. They extend along the inner side of the wheel to the periphery of the inner end of the hub, so as to scrape both it and the felly, and also the spokes.

Improved Graining Roller.

William H. Burns, Chicago, Ill.—This is an improved roller for transferring the natural graining of any desired wood to a wood or other surface, so constructed as to enter the corners of panels and work close to the floor, thus enabling roller graining to be applied in places where the ordinary graining roller cannot be used. To this end, it is made with a shoulder at a sharp angle.

Improved Plow.

Thomas M. Allen, Macon, Ga.—This invention is an improvement in the class of plows whose standards and the braces therefor are made adjustable to vary the inclination of the share, and thereby regulate the depth it shall enter and run in the ground. The plow plate may be detached when desired, and the beam, standard, and brace may be readily adjusted to cause the plow to work deeper or shallower, as may be desired.

Improved Machine for Making Gear Wheel Patterns.

Joseph L. Hewes, Newark, N. J.—By this invention, it is proposed to do all the fitting of the rim, the teeth, and the finishing of the teeth of pattern wheels by mechanical devices, and thus to secure exact uniformity of shape and dimensions for special work, but largely economize in time and labor as well. The wheel rim of an ordinary gear cutting machine is fitted with teeth on the arbor whereon the wheels to have teeth cut in them are placed, to utilize the dividing apparatus for spacing the rim for the grooves; then, in place of the slide carrying the gear cutter, a slide is applied having a saw capable of adjustment, so as to saw the face of the rim for dovetail grooves. With the same sawing apparatus, but with several different interchangeable cutters and an adjustable clampholder for holding the blocks of which the teeth are to be formed, mounted on the mandrel for holding the rim to have the grooves cut in it, said rim being removed, are fitted the teeth with tenons for the grooves of the rim, so that all are finished expeditiously and alike.

Improved Printing Press.

Rason B. Cooper, Monticello, N. Y.—One of two toggle jointed arms is pivoted to the stationary type bed, and the other is mounted on a support, which is movable in slots in the frame toward and from the stationary pivot of the first, and springs are attached to draw it up toward said stationary pivot. This movable support is connected with arms which carry the platen. The arms are connected at their joint by a yoke and connecting rod with the foot treadle for forcing the treadle up to the type bed by pressing the foot treadle down, which slides the support away from the bed, and, at the same time, brings down the joint so that the powerful action of the arms comes into use when the platen comes to the bed. By connecting the toggle jointed arms to the platen arms by the movable support, greater movement is obtained with arms of a given length than a connection with the joint would give.

Improved Pressure Regulator for Fluids.

Harmon S. Young and William H. Berger, Danville, Pa.—The object of this invention is to regulate the flow of gas or other fluids in conducting pipes, and consists in valves applied to the same stem or rod, and having different areas, and so located within a shell or case with reference to its inlet and outlet orifices as to rise or fall, according as the pressure of the fluid varies below or above a given number of pounds to the inch. The pressure is determined at will by a tension spring and nut, applied to the stem of the valves.

Improved Percolator.

Laurent Dursse, Grafton, W. Va.—This invention relates to glass percolators used in the preparation of medicines, and consists in novel means which enable the tendency to a too rapid evaporation to be entirely overcome.

Improved Attachments to Carpenters' Squares.

Charles H. McKee, Oakdale Station, Pa.—This invention consists in a carpenter's square of novel structure. One great object of this device is to enable a true diameter to be obtained by simply placing the legs so that each is tangential to a circle with the bisecting arm in place; and another to enable different radial lines to be made from the same center, without any change in the adjustment of the instrument, but by simply pivoting it at one end and turning it over the desired distance or part of a circle.

Improved Middlings Purifier.

Joseph E. Gardner, Mt. Gardner, Va.—This invention relates to purifying middlings, and consists in centrally apertured friction disks placed in the case, and having a spout combined with an inclined revolving cloth bolt with subjacent conveyer chamber.

Improved Self Corking Bottle.

Henry Miller and Thomas Miller, Pittsburgh, Pa.—This invention relates to an improvement in soda and other self stoppered bottles. Hitherto these have been provided with stoppers in spherical form and of such specific gravity as to require the bottle to be inverted in order to be filled. In this invention the stopper is of less specific gravity than liquids, which adapts the bottle to be filled without inversion. The neck of the bottle is also constructed in a peculiar manner, conducing to strength and providing a suitable support for the stopper when the contents have been discharged.

Improved Scaffold Clamp.

John R. Crockett, Oso, Tex.—This invention consists of a clevis which is placed around the upright post of the scaffold, secured by a bolt, and provided with a central curved projecting part, to which the supporting piece of the joists is hung by means of a loop. The supporting piece is secured to the main post by an arm with a forked sharpened end, while a forward projecting U-shaped arm takes up the joist, pressing the forked end strongly into the post by the weight upon the joist.

Improved Car Starter.

William T. Beckman, Petersburgh, Ill.—This invention relates to improvements in car starters of the class in which the draft is applied to a segment pivoted on the axle, and so arranged as to be connected therewith by a pawl and ratchet when moving backward. The improvement consists in the combination and arrangement of a draft bar of peculiar construction with segments placed contiguous to or against the inner sides of the wheels, so that they may take up no extra space but project upward into the same box with the wheels. It consists, also, in stops with the wheels arranged to lift the pawls off the ratchet wheels when the segments rotate backward.

Improved Saw Jointer.

George S. Prince, West Salisbury, N. H.—A short flat bar of steel, not quite as long as the radius of the saw, has a crotched end adapted to rest on the saw arbor. It also has clips attached to the edges to form guides, in which another short plate is fitted to slide forward and back. This last plate has a head on the outer end, in which a short flat file is secured by setscrews, so that the points of the teeth of the saw may be caused to run against the sides and be filed off to dress them all to the same length. The arrangement of parts is such that a screw rod serves both to adjust the one plate on the other, and to hold it fixed in any position to which it may be adjusted, while screws are so arranged with the head that the file may be adjusted higher or lower on either side, or at either end, according to the bevel required to be given to the saw teeth.

Improved Book and Music Stand.

Julius E. Ulber, Port Huron, Mich., assignor to himself and Frederick I. Merryman, same place.—A sector shaped plate is hinged by its back strip to a standard, in relation to which it may be arranged under any suitable angle. A slatted side piece is applied to the plate, and is moved up or down, as required. The music rest is pivoted to the lower end of the slide, and may be turned again under any angle to the slide. The music, book, or other article which is intended to be used or exhibited on the stand, is placed on the rest, and the same then adjusted in the exact position desired, which is easily accomplished by means of set screws.

Improved Press for Hay, Cotton, etc.

Christopher D. Findlay and David D. Craig, Macon, Ga.—This invention consists in providing the tube or nut of a press follower with simple recesses and a single ball in each recess, the whole series of recesses and balls being arranged in spiral order corresponding to the thread of the follower screw, and also in combining, with the flanges of the tube and nut, conical rolls and a top-apertured and side-notched ring.

Improved Furnace Grate Bar.

William C. Wren and William Meyrick, Jeddo, Pa.—This invention consists of short parallel bars for holding the coal, mounted above a long supporting bar extending across the furnace, by short transverse plates, which sustain the heat so far above the supporting bar that it is kept comparatively cool, and is not, therefore, liable to be warped, bent, or burnt, or to crack; and the bars which are subject to the heat, being made in short pices, do not strain the supporting bars. The short bars break joints at the meeting ends, to prevent a straight open space across the whole; also to guide the rake used by the fireman in cleaning the fire.

Improved Rocker for Cradles, etc.

Wendell Wright, Phœnicia, N. Y.—The object of this invention is to convert at will a rocking cradle or chair into a standing crib or standing chair; and the invention consists in adjustable feet attached to the rocker, which, when the rocker is in use, are turned inward, so that they do not in any manner interfere with the rocker. When it is desired to have the cradle stand firm, the feet are turned down.

Improved Cultivating Plow.

William C. Bell, Orange Court House, Va.—This is an improved plow for cultivating tobacco, corn, and other crops planted in hills or rows, so constructed as to cut up and destroy grass, weeds, briers, etc., which may be growing among the plants, and which will allow the parts subject to wear to be readily detached and replaced by new ones, or by others better adapted to the state of the plants to be cultivated.

Improved Lamp Holder.

James Telfer, L'Anse, Mich.—An arm of S shape is screwed directly into the standard of a sewing machine. The arm swings in its socket in every direction, and allows thereby the adjustment of the same, as required. The base part of the holder is provided with downward-extending feet on which the lamp holder rests when screwed off, forming a neat base for the lamp, without requiring the taking out of the latter, which is retained on the holder by band springs, which enclose the lamp firmly until spread for taking the same out for refilling, cleaning, etc. By means of a shade, the light is thrown to the needle or part of the article to be sewn.

Improved Harvester Rake.

Erasmus H. Donaldson, Staceyville, Iowa.—To the forward end of a rotating shaft is rigidly attached a cross bar, to the ends of which are pivoted rakes, made in two parts or halves, which are placed upon the opposite sides of the bar. Rods slide longitudinally in keepers attached to the cross bar, and have cross heads formed upon their outer ends, which, when the said rods are pushed outward, catch upon the shanks of the rakes, and hold said rakes extended while sweeping the grain across the platform. As the gavel is swept into the receiving trough or upon the ground, the rakes are released by the inward movement of the rods. Suitable mechanism is provided to withdraw the catch rods to release the rakes at the proper time. The platform, which is curved into the arc of the circle, and through which the rake heads sweep, starts a little above the level of the cutter bar, passes below the same, and rises, at its inner end, above the drive wheel, and with its end is connected a trough to receive the gavel from the rake, and from which it is taken by the binders. A guide is attached to the outer end of the platform, to prevent the rakes from swinging outward, and to cause them to descend in proper position at the outer end of the platform.

Improved Shipper Lever,

Isaac F. Hoyt, Glenville, Conn., assignor to himself and J. R. Pilling, of same place.—This invention consists of the handle portion of the lever jointed to the main portion, and provided with a curved extension beyond the joint in a slot in the other portion. This raises the spring catch out of the notches of the quadrant bar, when the handle, after being taken in hand by the operator, is turned into line with the principal part of the lever.

Improved Feed Water Heater.

Robert O'Neill, Negaunee, Mich.—The casing is divided into four sections, from one of which the water is taken for the supply of the boiler. Flanges project inward from the inner surface of the shell, which support the heating plates. The plates are provided with a series of tubes, through which the water passes in descending from one section to another. These tubes are about three fourths of an inch in diameter, and each plate is provided with a large number of them, so that the water is divided and exposed to the exhaust steam from the engine, and is heated by condensing and absorbing the heat thereof.

Improved Sulky Cultivator.

Ephraim Ives, Pleasant Hill, Ind.—This invention relates to an arrangement of means for adjusting the plows toward and from each other, and for locking a pivoted portion of the frame. In this way the driver has complete control over his plows, so that he can guide them in plowing crooked rows, in avoiding irregular hills, and in plowing closer to or farther from the plants, as circumstances may require. The wheels and axle may be adjusted forward or back, according to the weight of the driver, so that his weight may balance the machine.

Improved Ratchet Drill.

William M. Ellison, Kingston, N. Y.—This invention consists of a sleeve on the upper part of the drill spindle or stock, with a screw cap and a collar, so formed that when the feed screw is adjusted to its bearing at the upper end it can be bound fast to the sleeve. The latter extends down to a chamber in the head of the drill handle, where it has a toothed wheel rising on another toothed wheel on the drill stock and geared with it by a little shaft and two pinions. The wheel of the sleeve has a few more teeth than the one on the drill stock, so that it turns slower, and thus causes the feed screw to turn slower than the spindle does, and thus slowly to screw out of it and feed the drill. The pawl of the handle acts on the wheel of the spindle for turning it. By loosening the screw cap at the top of the sleeve, the screw is freed so as to be turned readily by hand for setting the drill and releasing it.

Improved Reversible Plow,

John P. Dexheimer, Lawrenceburgh, Ind.—The pivots of an extension mold board are fixed in bearing brackets, one of which is arranged to slide in a bearing in the bottom of the plow, and is provided with a bolt to hold it at any desired point. The mold board may thus be extended more or less to regulate the turning of the furrow, as may be desired for different kinds of work.