

to the rooms of Mr. L.; a few months later still, was on a dark, rainy afternoon. I found him this time without sitters, though as busy as ever in that mysterious "no admission room," finishing up his day's work and preparing for the next. This suited very well, as it gave me a fine opportunity to scrutinize more carefully his little lens, without being in anybody's way. There were quite a large number of these tubes and lenses of the different sizes, as they are usually gotten up, lying about on shelves and tables, waiting for lucky purchases. But the one Mr. L. himself used interested me the most of all; it was tube, lens, and camera box combined, done up in brass, and reminded one of a small telescope—the only one of this description I have ever seen—and although, as it appears, not a success, it was to my notion a perfect beauty from head to foot, and I fell dead in love with it at first sight. No child ever looked with more covetous eyes at toys in the shop windows than I did at this unique, brass-clad camera. The price of it was not extravagantly high either; yet I could only look at it, wishing all the while it were mine. I never in the whole course of my life felt so much the real want of the wherewithal as then, nor so effectually broke the tenth commandment. I left the Exchange that day with a heavy heart, though with a fixed determination to have without delay a Voigtlander lens, even if I had to sell my almost anything I possessed; and I went to work with renewed energy to that end, which was soon accomplished. Our business in those days did not fortunately lie altogether in making faces, but also (as you are aware) in teaching others how to make them, or how to spoil them (whichever is the most proper.) Of this sort of thing I already had my hands full, and it now steadily increased. I frequently have had under my own special care at one time six or eight young and old aspirants to high art, some rubbing or scratching away at plates, some polishing and coating, while others were sitting as patient models to those more advanced in the mysteries of the art. This state of things kept going on until I at length became quite alarmed, fearing that the art I had adopted as a profession would soon be completely ruined by too much competition, and in order to check it a little I advanced my terms for tuition. But this, strange to say, had the contrary effect. My valuable instructions, as it seemed, were appreciated according to the price I put upon them, for they flocked in upon me thicker and faster than ever (let those who think to increase their business by making cheap pictures take a hint from this). Here was a dilemma for me, and how to get out of it I did not know. I was afraid to raise my price again for fear it would have the same effect, and I had no room for any more. I often look back to those dark, foggy days of the art, when the teacher not infrequently was in turn taught by his pupil, and wonder how we made out so well as we did, for it was certainly "the blind leading the blind" over again. We stumbled and fumbled more over our dark experiments than we ever did in our dark room, and yet with our feeble assistance a great many managed to grope their way into the art, who in a little while made for themselves no ordinary name in the profession. But then there were also many others who promised much and performed but little. It was quite amusing to see the big worded signs that were so plentifully swung out about the city by these freshly made artists. I will here give a description of one which will answer for the most of them: "John Smith, artist, daguerreotyping taught, and improved apparatus for sale. N. B.—Likenesses taken in cloudy weather." This last was useless information for anybody who had ever seen John's pictures hanging at his door, for they were all more suggestive of clouds than of anything else. John was one of my promising young pupils. It had been but a few weeks since he had left the profession of dentistry to woo the sun, preferring drawing faces to drawing teeth. On some of these signs was the following liberal invitation: "Free exhibition; walk up"—but they didn't say how high up which I suppose was on account of their extreme modesty; they would rather that their patrons should find out for themselves how high their art was, though they should lose their breath in the effort of reaching it. These few casual incidents and recollections of the art, occurring under my own notice, and although not by any means a complete picture of the times, but only a sketch and, as the artists say, merely rubbed in with neutral colors, may still serve to give some little idea of the Daguerrean art and its pioneer profession, prior to the year 1842. At that period or thereabouts the art received a new value by the timely discovery of the gilding process, which gave to the daguerrotype a rich golden tinge, and, as we now well know, an unquestioned permanence, falsifying all prophecies to the contrary. This was an auspicious era in the daguerrotype art, and thenceforward it made greater advances than ever towards the perfection to which it ultimately attained. Between the years 1844 and '54 there were a great many most excellent daguerrotypes made—I think (I hope I may be excused for thinking so) that I made some few myself, and have only to refer to my early patrons to prove that I also got off many that were poor; I rather suspect that they were too Rembrandtish for the time. I often think of my first sitters with of pleasure and sorrow: sorrow that I was compelled to sit many of them so often to so little purpose (artistically speaking), and pleasure because they were such patient sitters, ever ready to make allowance for the many failures incident to this bewildering, soul-stirring process; and if such a thing were at all possible, I would gladly retake many of them, as a sort of conscience-soother, not that their pictures were so far below the then average, but because the then average was so low. But alas! this cannot be. My old register reminds me that most of them are now, like the old camera I then used, laid by in the dust."

## THE FRANKLIN INSTITUTE EXHIBITION.

No. I.

If the measure of the success of the approaching Centennial is at all to be gaged by that which has been achieved by the Exhibition now open in Philadelphia, the impossibility of its failure is assured. A single city, representing but a fractional part of the nation's manufacturing powers, has produced an exhibition of which the country at large may well be proud. The same has been done in a number of other cities throughout the country. Any single one of the most successful of them might fairly be taken as representative of the characteristic industries of our land. What then may we not fairly expect when the combined wealth of all sections of the country is collected in the huge exhibition grounds at Fairmount, and contrasted with the products of the entire civilized world?

On the 14th of September the Franklin Institute, having obtained the temporary occupancy of the immense building at Thirteenth and Market streets, formerly occupied as a freight depot by the Pennsylvania Railroad Company, opened an exhibition of arts, manufactures, and machinery. Notwithstanding the openly expressed fears of the timid, the energy and good sense of the managers succeeded in transforming the previously unsightly building into one of the most convenient and beautiful temporary exhibition halls ever occupied in the city. The full confidence which the managers had in its success was shown in the liberal expenditures that were incurred in order to make the buildings not only suitable for the Exhibition, but also beautiful and attractive to the visitors. At first the size of the building, covering, as it does, over two acres of ground, led to the belief among the less prudent that ample space could be obtained up to the time of opening. Too late, however, have they discovered their mistake. The applications came in so rapidly that soon all available room was appropriated, and at the present time over five hundred applications have been rejected for want of space.

Those who recollect the Exhibition building only as a freight depot would be surprised at the marvelous change that has been effected in so short a time. Entering at the main door on Market street, the visitor finds himself in a broad aisle, the roofing of which is gaily decorated with flags of all nations. The exhibits or gas fixtures and chandeliers, which occupy the two extremities of this aisle, add much to the general effect of the decoration. At night, when all two thousand odd lights are burning, the general effect is exceedingly fine. The entire right hand side of the building, occupying rather more than half its area, is devoted to the exhibition of machinery in motion. Two lines of shafting of 2 $\frac{1}{8}$  inches diameter supply the requisite power. One line is driven at the speed of 120, and the other at 240, revolutions per minute. The inconvenience often experienced at former exhibitions in regard to a want of uniformity of motion has been obviated by all the driving pulleys being supplied by the Institute. The steam power is furnished by the various boilers that are on exhibition, of which there are quite a number. At the extreme southeast corner of the Exhibition, a large leaden tank has been erected to hold the water for a full exhibit of steam and other pumps, which are all in active working. The left hand side of the building is devoted to the exhibition of household goods, philosophical instruments, drugs, dyestuffs, and chemicals, fine arts, printing establishments, sewing machines, carpets, fancy goods, mantels, carriages, and hosts of other articles. Steam heaters, stoves, and ranges occupy the extreme northeast corner of the building.

Having now obtained some idea of the ground plan of the building, we will now examine in detail some of the most interesting features of the Exhibition. As it will be impossible, in the necessarily restricted limits of a single letter, to describe all the exhibits, we will select here and there those which we believe will be the most interesting to the general run of our readers.

Beyond all doubt the feature of the Franklin Institute is the machinery. This fairly outstrips all other classes of exhibits. Nor should this occasion surprise. Not only is the Institute mainly designed for the promotion of the mechanic arts, but Philadelphia is unquestionably one of the centers of the country for the production of machinery and machine tools. In this way, then, has been produced the finest exhibition of machinery in motion ever shown in Philadelphia, perhaps in America.

The steam boilers are all placed on the ground floor, some dozen odd feet below the general level of the Exhibition floor. In the space thus appropriated are collected some of the most interesting features of the Exhibition. The Pennsylvania Diamond Drill Company have on exhibition one of the Leschot diamond-pointed steam drills. The drill of the one exhibited contains ten diamonds, and bores a two inch hole through marble at the rate of one foot in sixty seconds; through sandstone, at the rate of one foot in fifty-five seconds. The actual working of the drill always attracts crowds of the curious. The following important advantages are claimed for this drill over the ordinary steel drill, driven either by hand or steam power: The diamond drill, furnishing as it does a solid core of the rock penetrated, is of great value in prospecting mineral or other lands, since it brings up an actual section of the strata. In this way a far more accurate idea of the nature of the rock is obtained than when it is brought up either broken or pulverized, as in the ordinary methods. This feature gives the drill great advantages over all others for coal and mineral lands. The drill is also well adapted for the boring of artesian wells. The bore is round and true, and will admit of the introduction of a tube nearly as broad as the hole itself. A nine inch hole, 357 feet

deep, has been successfully bored for the Wilkesbarre Coal Company, in the Empire mine.

## THE HYDRAULIC BRAKE.

Nearly opposite the diamond drill is a large working model of the McBride hydraulic brake. Ordinary sized car wheels are run at a rapid rate by belting, and stopped at will by the application of the brake. The principal advantages claimed are simplicity and hence diminished cost, and general efficacy, the brake being very powerful. The power is taken directly from the boiler. Under each car is placed a cast iron cylinder of suitable size, furnished with a piston, to the rod of which the brake levers are attached. To prevent the freezing of the water in the brake cylinders and pipes, mixtures of glycerin and water are employed, the relative proportions of the two being determined by the severity of the climate of the country through which the road runs. The cost of rendering the water non-freezing is comparatively slight, since but a small quantity of the glycerin is required: and when the pipes, etc., are once filled, no more is required except in case of accident or leakage. A peculiar feature of the brake is the almost instantaneous transmission of the power and its undiminished efficacy at the end of a long train. The very slight compressibility of water allows the same force to be applied to the last car of a long train as is applied directly to the car in connection with the engine. No other limit can be found to the number of cars the brake can thus stop, except the power of the locomotive to draw them. Since the power employed to work the brake is derived from the steam pressure against the water in the boiler, the locomotive boiler being tapped below the water line, the power is not actually less. During the operation of the brake, the gage does not indicate the loss of as much as half a pound of steam. We understand that the hydraulic brake is in successful operation on the West Chester road.

## THE BOILERS.

In this portion of the Exhibition building, as we have already mentioned, are the boilers which furnish the steam for the various engines. Among a number of others we notice the following, namely: Shearman's improved upright tubular boiler, which claims as its distinctive features economy of fuel and space, cleanliness, convenience, safety, and cheapness. It claims to produce one horse power with twelve square feet of heating surface.

The well known Harrison steam generator is represented by a large boiler. The advantages of this form of generator, as our readers are probably aware, are security from destructive explosions and economy of fuel. A combination of cast iron hollow spheres, each eight inches outside diameter, and connected together by curved necks, with rebate machine-made joints, are held together with wrought iron bolts with caps at the ends. Each boiler is tested up to 300 pounds to the square inch by hydraulic pressure. The safety of the boiler is to be found in the number of joints that can give, in case the pressure of the steam becomes too great; while at the same time, the mode of connection of the hollow spheres of cast iron allows of great pressure without leakage. Experiments have been made in which a pressure of 850 pounds per square inch failed to rupture the boiler or start the joints. This boiler gets up steam quickly and can furnish superheated steam without the addition of extra apparatus. The number of small parts of which it is constructed offers great facilities for transportation and erection, no large opening being required for the introduction of the boilers. The largest can be put through an opening one foot square, when desired.

The Wiegand patent safety sectional steam generator also exhibits a large working boiler. The peculiar advantages it possesses are safety from dangerous explosions, economy of fuel, and a rapid generation of steam. The practical test for the efficiency of the boilers is to be found in the fact that they are now in use by a number of large manufacturing establishments throughout the country who know the requirements of a good steam generator, and who would not permit a poor instrument to remain in their works. With an hourly consumption of ten pounds of coal per square foot of grate surface, the area of which is 22 square feet, an hourly evaporation of 117.8 pounds of water is effected for every square foot of grate surface. The total evaporating power of one pound of coal equals 11.22 pounds of water. The Aetna grate bars are attached to this boiler, and apparently give general satisfaction. It is exhibited by Mosely & Metzgar.

The Keystone Portable Forge Company have an excellent display of portable and stationary forges, either for hand or power. They also exhibit their rotary positive pressure blowers, which they claim to be the most powerful blowers known. Lovegrove & Co. have a fine display of gages, etc.

## THE STEAM HAMMERS.

Quite a lively effect is produced in the basement by the working of the steam hammers, one exhibited by W. Bement & Son, and the other by Wm. Sellers & Co. The latter is peculiarly light and graceful in appearance, when its power is taken into consideration. It is the old "Morrison steam hammer," with a number of improvements which the Messrs. Sellers have since added. The hammer is formed of a long bar of wrought iron to which the piston is welded, forming, in fact, a part of the piston itself. No side guides are employed, the bar being guided by the top and bottom cylinder heads only. The advantage thus gained is apparent. The entire space below the cylinder is free, and the workmen is enabled to handle his work more effectually than when two of the sides are occupied. At the same time the hammer head and die are more effectually guided

and the frames subjected to a less severe strain. An improvement has been made in the shape of the hammer head and the mode of its attachment. By increasing the sectional area of the piston rod toward the hammer head, the greatest mass of the metal is brought nearest the point of impact, and a much greater efficiency is thus given to the blow. Again, the hammer head, instead of forming a continuous piece with the piston, is now attached to the lower cylindrical end of the hammer bar by a circular taper key, thus preventing the breaking of the bar by concussion. A modification of the ports of the steam chest allows the use of a supplemental valve which throttles the exhaust steam below the piston, but does not affect that above it. In this way the hammer is enabled to strike quick, light blows for finishing, since, the exhaust above the piston being unaffected, the hammer can rise as quickly as before; but in coming down, its force may be regulated by the cushion of steam on which it descends. This compressed steam expands on the upstroke, and thus effects an economy of the steam power. We have seen one of these 300 pound steam hammers drive a pin in a beam by a dozen or more blows. In this instrument the workman has as perfect control of the rapidity, force, and character of the blow as if he were enabled to actually wield the hammer in his hand, and control it directly by his will.

### Recent American and Foreign Patents.

#### Improved Invalid Bedstead.

Henry Bull, Newport, R. I.—This bed bottom is provided with rollers, and adapted to be slid on and off rails which are hinged to the bedstead at one end, and may be lowered at the other by a windlass or other suitable means. On said bed bottom are hinged pieces and a fixed apertured seat piece, so that, when extended, the said hinged pieces form part of the floor, and when otherwise adjusted one of them drops down, and the others are elevated and connected by hooks to adapt them to support the patient.

#### Improved Friction Brake.

Elisha C. Sanders, Westery, R. I.—This invention consists of a friction clamp, of two independent parts, one of which is stationary and has contrivances whereby the other part is fastened to it, so as to hold the drum against being turned by the strain to which it is subject. The other fastening device is so contrived that by the revolving of a tappet against it the pressure is relaxed so as to let the drum turn a little. The pressure is varied by a screw and a spring, so as to subject the drum to more or less resistance; and the tappet wheel employed for relaxing the pressure will become fast or slow, and otherwise varied to suit the requirements of the case. The invention is especially intended to be employed as a let-off attachment for looms, in which case the relaxing holder will be raised once for each beat of the loom by the tappet wheel.

#### Improved Pegging Awl.

Michael Fichter and John P. Dexheimer, Lawrenceburgh, Ind.—The handle is made hollow from its upper end nearly to its lower end. It has a square hole extending from said cavity to its lower end, into which the shaft stem or holder fits. The lower end of the shaft is split, to form jaws to receive the shank of the awl, which jaws are drawn together to clamp the said shanks by a nut made with a polygonal flange to receive the wrench. When the nut is screwed on the awl, neither can move up or down or turn in its holder.

#### Improved Hay Press.

William H. Penniston, Fox, Mo.—This is an improved device for operating the beater in beater presses so as to make it prompt in its action, and so as to diminish the amount of slack rope when the beater falls, and thus lessen the distance the horse has to travel to again raise the said beater, and consequently to lessen the time required to complete the bale.

#### Improved Nut Lock.

Clark Hutchinson, Tonic, Ill.—This is an improvement in means for preventing the turning of nuts on screw bolts; and it consists in cutting the screw thread transversely and tying a wire around the bolt at that place. By means of a channel the wire is prevented from working upward, while it securely locks the nut.

#### Improved Spring Bed Bottom.

Henry Whiteside, Jr., Ottawa, Canada.—This is an improved bed bottom frame, formed of parallel side bars and transverse bottom slats arranged in a lower plane. The means of support and connection between them consist of blocks and bolts. The blocks serve to keep said slats and bars equidistantly separated and support the latter on the former, the slats resting on the cleats of the side rails of the bedstead when the bed bottom is in use.

#### Improved Cross Head for Locomotives.

William A. Alexander, Mobile, Ala.—This invention consists in the arrangement of a detachable wrist pin placed into side recesses of the cross head, and fastened suitably thereto. It consists further in arranging the jaws of the crosshead at a certain angle or inclination to the horizontal axis of the same, and placing thereon adjustable slotted wedge pieces for setting the top and bottom plates squarely thereon, and securing them by means of screw bolts.

#### Improved Billiard Table Leveler.

George C. Brotherton, San Quentin, Cal.—This invention consists of legs, separated into two parts near the top, and connected by dowel pins and an adjusting screw, all so contrived that the screw may be readily turned by a pin introduced into holes in the head through a slot in the side of the leg. The slot may be covered by a pivoted or sliding panel or other piece of ornamental work. The head of the screw is fitted into a metal cap, fixed in the top part, and a metal nut for the screw is fitted into the lower part of the leg.

#### Improved Gin Saw Filing Machine.

Wiley J. Johnson, Hernando, Miss.—In this machine there is a triangular file head, having three holes for files at unequal distances apart, and arranged to shift around on the stock. The stock race is pivoted centrally and in line with the crankshaft, so that it may be turned to any angle.

#### Improved Spike Extractor.

William Devine, Brownsville, Tex.—A gripe or grapple is formed of hinged jaws which are connected to a tube which is swiveled to the hoisting or jack screw. By turning the jack screw, the tube and grapple will be raised vertically, thereby drawing the spike.

#### Improved Razor.

Ferdinand Erdmansk, Hiawatha, Kan.—This is a detachable blade which is inserted into the supporting back part of the razor. It is fastened therein by its hinged top half, which is secured by a suitable slide piece on the lower or main part. The steady position of the razor blade is secured by means of pins of the main part of the supporting frame, passing through symmetrically arranged holes of the blade into recesses of the hinged part.

#### Improved Grist Alarm.

Joseph H. Curtis, Chariton, Iowa.—This invention provides for the conducting spouts, hoppers, and other parts of the mill, an automatic alarm, which is operated by the pressure of the grain, flour, or bran on the valve part, indicating, by the ringing of a bell, the interruption of the supply. When the supply of grain, flour, etc., is steadily kept up in the spouts, hoppers, etc., the pressure on the valve will carry the clapper away from the bell, and prevent thereby the ringing of the same; but as soon as the pressure is discontinued, the rotating shaft will strike the bell stem and give the alarm, so that the miller has ample time to supply the spout before the burrs run empty or other parts of the mill machinery are stopped.

#### Improved Link Motion.

John Sandall, Jr., Charlottetown, Can.—This link is formed in two parts each part being connected with an eccentric, and both parts communicating with a central eccentric, by the rod of which the two parts are made to operate as though hinged together.

#### Improved Ironing Table.

William O. Donnell, Pittsburgh, Pa.—This ironing board is adapted to be attached to a vertical wall and supported in a horizontal position by means of a hinged brace.

#### Improved Nut Lock.

James U. Fisher and Hiram W. Fisher, Penn Station, Pa.—The locking plate has a reduced part which is bent up at the end. Said part is inserted into a groove in the bolt from the upper side of the nut, and its lower end is turned up on the underside of the same. The lower side of the nut has a circular rabbet, which receives the end of the hook plate where it is subject to no friction in turning the nut; then the nut is turned home, and the part of the plate is bent over and on the edge of the nut, thus effectually locking the device.

#### Improved Paneling Machine.

William Cobban and Charles H. Smith, Bloomer, Wis.—This invention consists of a carriage adapted to hold the boards on which panels are to be raised, so as to present them sidewise and endwise to a pair of rotating panel-raising tools. A clamp is provided, which both holds the boards in place and springs them out of wind, so that they will be dressed exactly alike on both sides all around the edges.

#### Improved Ornamental Chain for Necklaces, etc.

Saintemmes Diolot, New York city.—This invention consists in a chain constructed of alternating closed rings and opening spring links, the latter being made of two separate links, soldered to each other at one side, so that the free ends of both links join by their spring action at opposite sides into socket-shaped connecting ends. The closed links are then readily inserted.

#### Improved Clothes Line Fastener.

Joseph Hill, Wabash, Ind.—This invention consists in making a clothes line fastener of a flanged plate having a projection, a lock piece having a diagonal slot, and a bolt having an oblong head. This construction enables it to be attached to, and detached from, a fence, paling, or wall with great facility, while it allows the line to be secured and quickly made fast.

#### Improved Wagon Seat.

Stephen G. Peabody, Champaign, Ill.—This invention relates to providing a wagon seat with an improved attachment for connecting it to, and supporting it upon, the wagon body.

#### Improved Bouquet Holder.

John Boyd, New York city.—This is a small ornamental receptacle, pressure of the lid of which on the stem of the bouquet retains the same firmly in the holder, while it admits of the instant removal and replacing by releasing the lid. The cavity of the holder may be employed, if desired, for taking up a small quantity of water, by which the flowers may be kept fresh for a longer period of time.

#### Improved Adjustable Picture Frame Suspender.

Albert Gorrell and Robert J. McClure, Holmesville, Ohio.—Wires or strips of woods are attached to the back of the frame, so as to allow adjusting rings to slide freely thereon. At the lower ends of the wires are used eyes, to which the ends of the suspending cord are attached before being passed through the rings. As the latter slide readily up or down, the points of suspension are thus readily and very quickly adjusted up or down the back.

#### Improved Storage Box for Firemen's Implements.

Thomas A. Colgan, Brooklyn, N. Y.—This invention consists of storage boxes for containing firemen's implements, located in convenient positions throughout the fire districts, and sunk in the sidewalk or roadway. The boxes have a corrugated or roughened top, and are provided with hooks, brackets, or slings for the reception of axes, pikes, and the like. The contrivances for locking them are such as to be readily opened with a hydrant wrench.

#### Improved Cone Sawing Machine.

Juntus Harris, Titusville, Pa.—This invention consists of a cone saw in the form of a tapered tube, with teeth on the large end. The tube is slitted along one side from end to end, to allow it to expand and contract, and near the large end is fitted between a cone on the shaft for turning the saw and a corresponding collar, which is secured to the cone by a screw passing through the slit. At the other end, it is connected to a sliding collar on the shaft, provided with a lever, by which the saw is shoved forward along the cone and collar to the work, and expanded and drawn back and contracted suitably for sawing bungs and other conical articles. The invention also consists of a table top for holding the work to the saw, contrived with a hinge joint and a foot treadle for working it, so as to press the work up to the centering point in the end of the shaft over which the saw works, to hold the work at the beginning, and to drop down to discharge the sawn pieces.

#### Improved Suspension Truss Bridge.

Jacob B. Bausman, Minneapolis, Min.—The cables are made of wire, and semi-cylindrical in form. The chords are each of two sections of iron, placed parallel with each other, and confined together by a covering plate. The truss posts are confined to the chords, and are connected to the foot blocks by dowels, as are also the transverse stay pieces. The cables pass through the foot blocks, and are connected at each end with swivel or socket yokes, which connect them with the anchor bars. The side diagonal braces fit into lozenge-shaped recesses in the bottom of the foot blocks, or slip over projections at the same points. The transverse diagonal braces are held in place by the dowels of struts. The posts and strut bars are made of star iron, which form gives them remarkable strength, stiffness, and durability. With the exception of the tension bars at each end, the cables are continuous throughout each span. Owing to the manner in which the lower connections are made with the foot blocks, the trusses can be adjusted from the roadway, and the structure can be erected, when the same may be desirable, without employing substantial scaffolding, as is usual in the erection of bridges, the use of screw bolts being confined to points which are easily accessible.

#### Improved Rockers for Cradles, etc.

Phineas R. Strong, Colchester, Conn.—This invention consists of cradle rockers with additional pieces pivoted to them in such a manner that they produce, when folded to form extensions of the rockers, a cradle, while a standing crib is obtained by turning them in upright position as extensions to the standards or feet.

#### Improved Steam Trap.

Josiah Anoney, Mamaroneck, N. Y.—The feed water vessels provided with a tube, passing centrally therethrough, having slots and a valve, which shuts off the steam that enters an enlargement through the live steam inlet. A float surrounds the tube, and, sliding thereon, lifts a valve rod. As usual, the float rises with the inlet of water, unseats the valve, and admits steam, which forces the water to the boiler. As the water falls, the valve closes and water rushes in. By interposing the tube between the valve rod and the float, the said rod can always move with perfect freedom, and without receiving any interference from the float.

#### Improved Adjustable Knife for Cutting Hat Boxes.

William Marx, New York city.—This is an improved knife for cutting out hat boxes, so constructed as to enable a number of boxes to be cut at one operation, and which may be readily adjusted to cut larger or smaller boxes, as may be required. The knife is adjusted for cutting different sized boxes by detaching end knives and replacing them with longer or shorter ones. The shorter end knives have a wedge-shaped plate attached to their outer side to bring them into proper position to give the box the proper flare, and make the bottom of the proper size.

#### Improved Burial Case Fastener.

William S. Wood, Newtown, N. Y.—This invention is to provide means for holding burial cases fast in their boxes when they are packed and being transported or stored, and it consists of a bracket of wood and metal, made in any form so that it will hold the case by entering screw holes on the sides or ends of the case, which are made for fastening the body of the case together.

#### Improved Method of Protecting Crops from the Chinch Bug.

Leman H. Faunce, Montrose, Ill.—A ditch, about a foot deep, is made around the field in which the crop is growing, or in which the bugs have been hatched, by plowing two or three furrows in the same place, and then drawing a small log along the ditch until the dirt is reduced to fine dust. In the bottom, a rod, more or less apart, are set small tin cans, made with funnel-shaped tops. The cans are sunk in the bottom of the ditch until their tops are a little below the surface of the ground. The bugs, in seeking to enter or leave the field, pass into the ditch; and being unable to ascend the other side of the ditch readily they begin, after a time, to pass longitudinally along it, and fall into the cans. The latter, at convenient times, are taken up, and the bugs are emptied into hot water and destroyed.

#### Improved Operating Car Brake.

William C. Shearer, Savannah, Ga.—This invention consists in augmenting the friction of brake shoes, and thus facilitating the braking of a train of cars by combining with the ordinary rock shaft along arm whose bifurcations have end pulleys, over which and a pair of pendent fixed pulleys passes a chain that connects the rear car with a spirally grooved winding drum on the tender.

#### Improved Sewing Machine Case.

William Salisbury, Wheeling, W. Va.—This invention relates to a mode of constructing the box and table of a sewing machine so that the cover of box may be conveniently applied as an extension to the table, and so that the drawers or apartments may be easily attached together or detached for convenience.

#### Improved Hand Car.

Montgomery Crossman, Marshall, Mich.—Hitherto the levers of hand cars have been connected by means of suitable rods, with a double crank axle. The attendant disadvantages of such arrangement are avoided in this invention, which consists in the construction and arrangement of parts, more particularly in connecting the levers with a single wrist pin on a toothed wheel, which is fixed on a short shaft arranged in a plane above and in rear of the driving axle of the car; also in the means for shifting the power from one axle pinion to another, and thus varying the speed.

#### Improved Asphalt Pavement.

Edwin E. Glaskin, Boston, Mass.—This invention consists in forming a new material, for roofing, paving, and other like purposes, from an asphaltic dolomite as a base. The process consists in treating said base by first subjecting it to the action of heat, then adding naphtha or oxidized petroleum, and albertite coal and sesquioxide of iron. The final step consists in adding a fresh quantity of the basic material, to wit, the dolomite.

#### Improved Seed Planter.

Charles Frankish, Abilene, Kansas.—This invention is an improvement in the class of corn and dropping devices adapted for attachment to the beams of an ordinary turning or furrowing plow. The improvement relates, first, to the means of attachment of the coupler or pilot wheel and seed-dropping devices to the plow beam; secondly, to the construction and arrangement of parts for adjustment of the wiper for the revolving seed cylinder; thirdly, to the adaptation of parts for removal of said cylinder from its case and from the shaft of the revolving pilot wheel.

#### Improved Door Check.

Daniel Gundelfinger, Jefferson City, Mo.—This invention relates to means whereby the knobs of doors may be prevented from striking the paper, paint, or wall of a room, and may be secured in a position that will not allow the door to be swung back by a draft or accidental force. The invention consists in placing a spring catch on the door, which receives the end of a notched arm projecting from the wall, said arm being adapted to fold, and being provided with its own lock.

#### Improved Bale Tie.

John Colley, New Orleans, La.—This invention consists of a notched plate fastened to one end of the hoop permanently. It receives the hook of the other end in its notch, and has a bolt for fastening said hooked end which swings around into the hook on a pivot, and then slides lengthwise a little on a rivet. The end is notched to engage the rivet, and the hole for the pivot on which the bolt swings is slotted to allow the bolt to slide. The two rivets are headed down, so as to hold the bolt fast.

#### Improvement in Folding Tables, Beds, etc.

John N. Valley, New York city.—This invention relates to that class of tables which, for convenience and portability, are intended to fold up when not in use and be laid away in a small space, and is a new and improved arrangement which may equally well be applied to either a table, bed, lapboard, stand, or any other similar article of furniture. It consists in the arrangement of the legs, which are attached by means of metallic straps to transverse pieces under the table, and folding inwardly, said sets of legs being braced and locked in position by a hinged brace attached to a longitudinal bar under the table by similar metallic straps.

#### Improved Washing Machine.

James B. Farrar, Caribonon, N. C.—This invention relates to certain improvements in washing machines. It consists of a bench or table having at one end a transverse opening in which are disposed two spring-seated and vertically adjustable rubbers connected with back plates which are detachably fastened to the bench or table. The clothes are fed from a tub of water on said table through the mouth formed by the two rubbers, and pass through a slot in a horizontally reciprocating slide below the rubbers, by means of which the clothes are subjected to a sufficient amount of rubbing and squeezing to cleanse them thoroughly, the said clothes passing below into a tub of rinsing water under the table.

#### Improved Traction Engine.

Edward P. Gowles, Wequock, Wis.—This invention relates to the construction of wheel hubs and axles, whereby the wheels are adapted to be vibrated or adjusted with reference to the direction of motion of the engine. It also relates to the means for effecting the adjustment; and lastly, to an arrangement for varying the speed. For running the machine fast when light, it is geared directly with the axle; but for running slower, when loaded, and still slower for drawing plows and the like, a countershaft is provided, which will gear with a train, by suitable interposing mechanism, according to the speed required. The wheel of the train which turns the rear axle is connected to it by a universal joint, like the traction wheels, except that this wheel can vibrate in every direction to allow the axle to rise and fall independently of the boiler.

#### Improved Lever Escapement for Watches.

William G. Schoof, Clerkenwell, Great Britain.—This invention consists in the planting—in place of the common notch of the roller, and a single pin or jewel in the lever acting on each side of the notch alternately—of a jewel or other pallet in the middle of a small crescent-shaped recess at the edge of the roller. This jewel engages two upright pins of the lever, and performs the unlocking action in connection with or without a ruby pin near the center of the roller. The resilient or elastic banking of the lever is obtained in connection with banking pins of a pivoted lever plate, and a yielding spring action thereon, which gives way when banking occurs. The resilient action may also be produced by mounting the spring upon the lever as a substitute for the spring plate, and using stationary banking pins at both sides of the lever.

#### Improved Whiffletree.

Andrew J. Dibble, Franklin, N. Y., assignor to himself and Daniel Miller, same place.—The end irons are made in the form of a socket, and have hooks upon their forward side cast in one piece with the body. In the end, and opposite the point of the hook, is a hole extending entirely through said irons, in which is placed a block which is held out against the said hook by a coiled spring, the rear end of which rests against an adjusting screw.

#### Improved Corn Planter.

James R. Ball, John S. Ball, and John G. Mole, Xenia, Neb.—The seed hoppers are attached to the upper ends, and open into the cavity of standards. A plate is placed in the cavity, and its lower part curves rearward. It is hinged to another plate, the lower end of which is bent back at an angle, and rests against the dropping slide, against which it is held by a spring. The device thus forms a cut-off to prevent any more seed being carried out by the dropping slide than enough to fill its dropping cavity. The levers which operate the dropping slide pass so as to be struck by blocks attached to the spokes of the center wheel. The marker may be folded alongside the seat across the axle and frame, when not in use.