

make use of a new engine recently patented by Mr. P. W. Willans (a gentleman connected with Messrs. Penn's factory), which could be easily placed in the limited space in the stern. The work connected with the fitting of this engine on board the boat has just been completed.

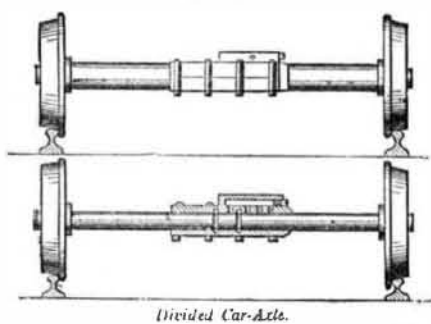
Mr. Willans' engine is constructed with three cylinders, and the only working parts are three pistons, three connecting rods, and a three-throw crank axle; these are enclosed in a cast iron casing, so that nothing can be seen of the engine itself except the two ends of the axle which appear through the casing. The cylinders are placed side by side; and it is by a system of ports which connect the cylinders one with the other, together with a peculiar construction of piston, that the piston of one cylinder acts as the slide, and admits to the next or third cylinder. All these ports meet in a three-way cock, and by turning this cock the direction of the steam is altered, and the engine is stopped or reversed with marvelous rapidity. It will thus be seen that all slides, eccentrics, link motion, and other complicated reversing gear are done away with; there is no exposed machinery to catch the dresses of people passing, no oil and grease flying about, and none of the other disadvantages which make steam engines in small boats so disagreeable. Besides this, the engine is so simple that it is completely under the control of any one, and is so compact that it can be lifted in or out of the boat by two men; two men can also take it to pieces, examine every part, and put it together again in less than an hour. The steam acts on one side of the piston only, and as the pressure is always downwards the engine is perfectly noiseless. By means of a very simple arrangement the engine is made to work expansively, and cuts off at $\frac{1}{2}$ of its stroke. Though in this particular case more than 380 revolutions per minute are not required, yet an engine of the kind has been constructed to make 1,000 revolutions; and at these great speeds, by allowing a small quantity of oil to remain in the bottom of the casing, the lubrication of the working parts is perfect, and such a thing as a hot bearing is unknown. The diameter of the cylinders of the engine under notice is 7 inches, the stroke being the same; and with 90 lbs. of steam and 380 revolutions, the indicator cards showed a little under 40 horse power. The weight of the engine by itself is 7 cwt.

No reliable trials of the speed of this boat have yet been made, but she steamed from Limehouse to Erith, a distance of thirteen miles, the other day, in 75 minutes against a slack tide. As the mean draft of the boat is $\frac{1}{4}$ greater than it was with the old engine, in consequence of the additions to the cabins, and as the trim of the boat is considerably altered, it would be scarcely fair to draw a comparison between the speed with the twin screws and with the new engine. Many engineers of eminence have inspected the engine at work, and have expressed themselves greatly pleased with its arrangement and performance. The length of the boat is 50 feet, beam 7'4". The engine was made for Mr. Willans by Messrs. Tangye, of Birmingham; and Messrs. Penn supplied and fitted the boiler, propeller, shafting, and all other gear.—*Iron*.

CAR AXLES AND COUPLINGS.

We continue below our series of extracts from Mr. E. H. Knight's "Mechanical Dictionary,"* selecting for the present paper a variety of interesting engravings of car axles, and a number of railway couplings,

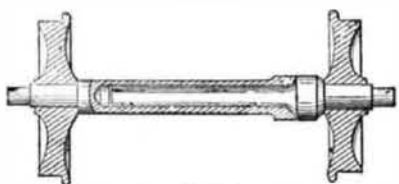
FIG. 1



Divided Car-Axle.

In Figs. 1 and 2 are represented two forms of divided car axle. When the axle is constructed of a single piece of metal, with the wheels fixed firmly thereon, it is subject to severe torsional strain in turning curves. The outer wheel has a larger circle to traverse, thus compelling the wheel on the inner and shorter circle to slip. This torsion of the axle

FIG. 2.



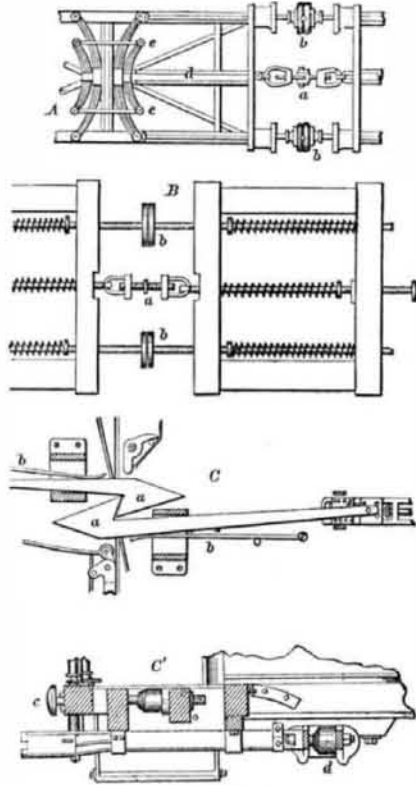
Hollow Divided-Axle.

is very detrimental, and the slipping of the wheel is equivalent to grinding on the rail, retarding the train. To avoid these difficulties, the axle has been made in two parts, examples of which construction are given in Fig. 1, in which the axle is divided at mid-length, the inner ends being supported in a box or sleeve, and in Fig. 2, which shows one portion of the axle hollow, forming a sleeve for the other part.

Figs. 3, 4, and 5 are sections, etc., of a number of car couplings. The English coupling, A, Fig 3, is a right and left screw shackle, a, on the median line, making a connection sufficiently rigid to compress the buffers, b b. The draw

bar, d, of the coupling is connected to an elliptic spring, e, which diminishes the jerk of the cars in starting the train. Some of these features are also found in B, which is an old form of United States coupling, with buffers copied from the English. C and C' are respectively plan and elevation of the Miller coupling, which connects automatically as the

Fig. 3.

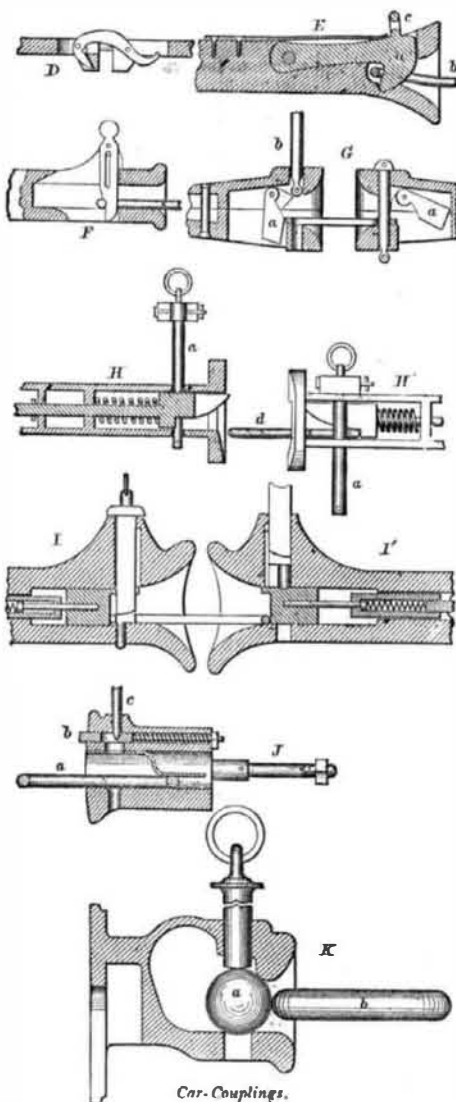


Car-Couplings.

respective point-headed hooks come in collision. The springs, b, keep the hook together when connected. The lower view, C', exhibits also the spring buffers, c, above the hooks, which act as fenders to the cars and deaden the blow as the cars strike against each other when the speed of the train is checked. The coupling hooks have, besides, springs, d, for the same purpose.

In Fig. 4, D is a falling latch hook. E has a gravitating

Fig. 4.

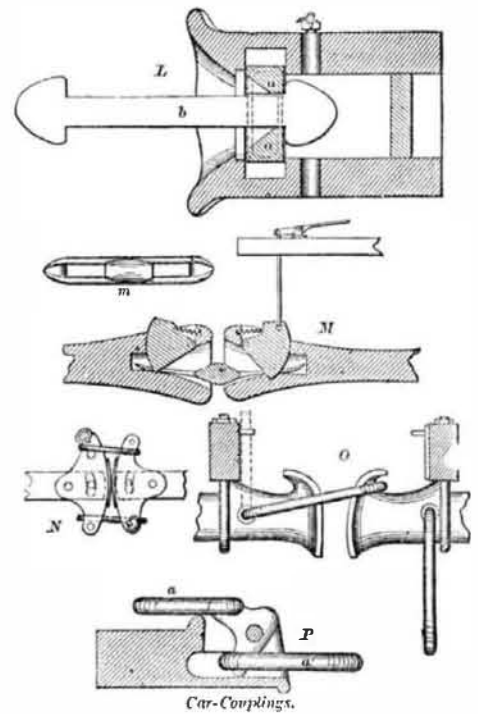


Car-Couplings.

hook provided with a spring, so that it yields to the thrust of the entering link in coupling. On the back of the hook, a, is a handle, c, which is lifted to uncouple the link. F has a vertically sliding bolt which rises automatically as the link collides with its lower inclined portion when coupling, and then falls down into engagement. G shows a pair of drawheads, in which the tumbling latch, a, holds up the pin until thrust back by the entering link. The pin, b, when fixed for coupling, rests on the toe of the latch. H H' are two drawheads, in the first of which the pin, a, rests on a sliding latch, which gives way before the thrust of the link, d, a result already accomplished in H'. I I' are two matching drawheads, in which sliding pistons hold up the link, and

are pushed back in the same manner as described in the preceding case. J exhibits a plate to hold the projecting link, a, in coupling position, and a small sliding latch, b, above, to hold the coupling pin, c, which is dropped, when the drawheads come in actual collision, and thrust in the latch. K has a ball, a, which holds up the pin but allows same to fall when pushed back by the entering link.

Fig. 5.



Car-Couplings.

In Fig. 5, L has an arrowhead bolt which is grasped between spring jaws. M has a bar, m, with two slots. As the end enters the drawhead, it thrusts up the gravitating latch, which immediately falls into the slot of the bar. N is a plan view of a coupling in which each drawhead has a link which couples over a horn on the corresponding drawhead of the other car. O is an elevation of a pair of drawheads, each of which has a link which may be coupled over a horn on the other. P has a two-horned tumbler, one horn of which carries a link, a, which may couple to a corresponding drawhead, and the other forms a latch for a link, a', proceeding from the other drawhead.

The Brain Not the Sole Organ of the Mind.

Dr. W. A. Hammond, President of the Neurological Society, recently delivered an address before that body upon the above topic. The discourse included accounts of the speaker's original investigations, and in general advocated the theory that the spinal cord shares with the brain the faculties of perception and volition. The following is an abstract:

Dr. Hammond began by saying that, where there is no nervous system, there is no mind, and that where there is injury or derangement of the nervous system there is corresponding injury or derangement of the mind, and proceeded to review at length experiments conducted upon living animals, the brains of which had been previously removed. A frog continues to perform those functions which are immediately connected with the maintenance of life. The heart beats, the stomach digests, and the glands of the body continue to elaborate the several secretions proper to them. If the web between the toes be pinched, the limb is immediately withdrawn; if the shoulder be scratched with a needle, the hind foot of the same side is raised to remove the instrument; if the animal is held up by one leg, it struggles; if placed on its back—a position to which frogs have a great antipathy—it immediately turns over on its belly; if one foot be held firmly with a pair of forceps, the frog endeavors to draw it away; if unsuccessful, it places the other foot against the instrument, and pushes firmly in the effort to remove it. Still not successful, it writhes the body from side to side, and makes a movement forward. All these and even more complicated motions are performed by the decapitated alligator, and in fact may be witnessed to some extent in all animals. The speaker had repeatedly seen the headless body of the rattlesnake coil itself into a threatening attitude, and, when irritated, strike its bleeding trunk against the offending body.

Dr. Hammond then proceeded to explain a large number of experiences under his theory. He said that the phenomena of reverie are similar in some respects to those of somnambulism. In this condition the mind pursues the train of reasoning, often of a most forcible character, but yet so abstract and intense that, though actions may be performed by the body, they have no relations with the current of thought, but are essentially automatic, and made in obedience to sensorial impressions which are not perceived by the brain. In the case of a person performing on the piano, and at the same time carrying on a conversation, we have a most striking instance of the diverse though harmonious action of the brain and spinal cord. Here the mind is engaged with ideas, and the spinal cord directs the manipulations necessary to the proper rendering of the musical composition. In somnambulism the brain is asleep, and this quiescent state of the organ is often accompanied in nervous and excitable persons by an excited condition of the spinal cord, and then we have the highest order of somnambulist manifestations, such as walking and the performance of complex and apparently systematic movements. If the sleep of the brain be some-

* Publishers, J. B. Ford & Co., New York city.

what less profound, or the spinal cord less excitable, the somnambulistic manifestations do not extend beyond sleep-talking. A still less degree of cerebral inaction, or of spinal excitability, produces simply a restless sleep and a little muttering; and when the sleep is perfectly natural and the nervous system well balanced, the movements do not extend beyond changing the position of the head and limbs and turning over in bed. The phenomena of catalepsy, trance, and ecstasy are also indications of an independent action of the spinal cord, inasmuch as the power of the brain is not exercised over the body, but is either quiescent or engrossed with subjects which have made a strong impression upon it.

Dr. Hammond, in closing his address, said that he did not contend that the spinal cord, to say nothing of the sympathetic system, is, in the normal condition of the animal body, as important a center of mental influence as is the brain. The latter organ predominates, the very highest attributes of the mind come from it, and the cord is subordinate when the brain is capable of acting. But it seems illogical to deny mental power to the spinal cord after a consideration of such experiments and other facts brought forward, and hence we are justified in concluding:

I. That of the mental faculties perception and volition are seated in the spinal cord as well as in the central ganglia.

II. That the cord is not probably capable of originating mental influence independently of sensorial impressions—a condition of the brain also, till it has accumulated through the operation of the senses.

III. That, as memory is not an attribute of the mental influence exerted by the spinal cord, it requires, unlike the brain, a new impression in order that mental force may be produced.

Useful Recipes for the Shop, the Household, and the Farm.

To make perpetual paste—which will remain sweet for a year—dissolve a teaspoonful of alum in a quart of water, to which add sufficient flour to make a thick cream. Stir in half a teaspoonful of powdered resin and half a dozen cloves, to give a pleasant odor. Have on the fire a teacup of boiling water, pour the flour mixture into it, stirring well at the time. In a few minutes it will be of the consistence of mush. Pour it into an earthen vessel; let it cool; lay a cover on, and put it in a cool place. When needed for use, take out a portion and soften it with warm water.

A beautiful ornament for the sitting room can be made by covering a common glass tumbler with moss, the latter fastened in place by sewing cotton wound around. Then glue dried moss upon a saucer, into which set the tumbler, filling it and the remaining space in the saucer with loose earth from the woods. Plant the former with a variety of ferns, and the latter with wood violets. On the edge of the grass also plant some of the nameless little evergreen vine, which bears red (scarlet) berries, and whose dark, glossy, ivy-like foliage will trail over the fresh blue and white of the violets with beautiful effect. Another good plan is to fill a rather deep plate with some of the nameless but beautiful silvery and light green and delicate pink mosses, which are met with in profusion in all the swamps and marshes. This can be kept fresh and beautiful as long as it is not neglected to water it profusely once a day. It must, of course, be placed in the shade, or the moss will blanch and die. In the center of this a clump of large azure violets should be placed, adding some curious lichens and pretty fungous growth from the barks of forest trees, and a few cones, shells, and pebbles.

The following solder will braze steel, and may be found very useful in case of a valve stem or other light portion breaking when it is important that the engine should continue work for some time longer: Silver 19 parts, copper 1 part, brass 2 parts. If practicable, charcoal dust should be strewn over the melted metal of the crucible.

A simple method of case hardening small cast iron work is to make a mixture of equal parts of pulverized prussiate of potash, saltpeter, and sal ammoniac. The articles must be heated to a dull red, then rolled in this powder, and afterward plunged in a bath of 4 ounces of sal ammoniac and 2 ounces of prussiate of potash dissolved in a gallon of water.

Recent American and Foreign Patents.

Improved Milk-Testing Process.

Alvin Middaugh, Scio, N. Y.—This consists in heating a given quantity of standard milk and a given quantity of each farmer's supply to be tested, in separate vessels, to about 90° Fahrenheit, then coagulating the standard and samples, and finally compressing the undrained and unsalted curd. The specified heat develops the odors of the impurities, and the quantity of curd or whey indicates the water present.

Improved Combined Cupboard and Sink.

Henry Cull, Marshalltown, Iowa.—The object of this invention is to combine a cupboard, provision, or milk safe with a sink in such a manner that, on being closed, it represents the appearance of a cupboard, while on being opened it furnishes a regular sink for the cleaning of dishes, etc. The invention consists of a cupboard with a hinged lid, constructed as a sink, and connected by a short pipe with a receptacle and waste pipe for conveying the water off.

Improved Boot and Shoe.

Charles F. Hill, Baltimore, Md.—This invention relates to certain improvements in boots and shoes; and it consists in the combination with the upper, the insole, and the outsole of a top sole, depressed without break or incision upon the upper side, and trimmed off upon the lower side, so as to leave a raised projecting edge for the vamp.

Improved Piston for Steam Engines, Pumps, etc.

Franz Felbinger and Johann G. Koch, Vienna, Austria.—This invention relates to pistons for steam engines, pumps, etc., having a series of small pistons, which operate to expand the packing ring by the pressure of the steam. The diameter and number of the small pistons may be varied according to the pressure and object for which the engine is intended.

Improved Gas Wrench.

Samuel B. H. Vance, New York city.—This invention consists in a key or wrench for turning the plugs of gas pipes in dwellings, etc., and relates particularly to the construction of the same, hollow hemispherical in shape, with an inner strengthening rib for each of the segments, into which its rim is divided by a series of notches. The ribs also strengthen the wrench, and so enable it to be made light and neat.

Improved Machine for Inserting Fibrous Screw Fastenings in Boots and Shoes.

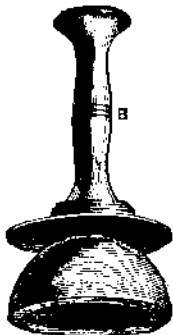
George V. Sheffield, New York city.—This invention consists of a machine for fastening on shoe soles, or fastening together leather work, pieces of rubber, and other analogous substances, by screws made of petrified hide or other animal fiber. The machine is essentially a combination of a boring tool for making the holes, also feeding the work along, if preferred, a screw tap for cutting the threads in the holes, a chuck for inserting the screws, and cutters for cutting off the screws after they are inserted, together with apparatus for operating the said devices. It also consists of these instrumentalities so contrived that the boring tool, tap, and chuck move up to the place for operating on the work, perform their part, and then move away, while the work remains in position for work in which the fastenings are to be inserted in curved and irregular lines.

Improved Chemical Fire Extinguisher.

Jacob B. Van Dyne, Louisville, Ky.—This invention relates to certain improvements in chemical fire extinguishers, and it consists in a hollow trunnioned extinguisher having a swivel joint connection with a stand pipe, and a trigger and catch device connected with an operating rod, whereby the extinguisher may be inverted and operated from any floor. It also consists in the peculiar construction of the acid vessel, and the means for sealing the same.

Improved Elastic Force Cup.

John S. Hawley, 144 Chambers Street, New York city, whom address for information.—The invention illustrated herewith is for clearing the discharge pipes of wash bowls, bath tubs, stationary wash tubs, etc., when they become partially or entirely stopped. A is a rubber cup; B is a handle of wood; C is an iron disk. A screw passes from the rubber cup to the handle, thus holding the three pieces securely together, as shown in the engraving. In using this device, allow water to flow into the bowl or tub to a depth of three or four inches; the rubber cup is then placed directly over the vent, and the handle is forced down three or four times with a quick motion. The water beneath the cup is thus forced into the discharge pipe, with a sudden impulse, dislodging the obstruction and forcing it through the pipe. Patented through the Scientific American Patent Agency, January 19th, 1875.



Improved Earth Auger.

Don Juan Arnold, Brownville, Neb.—This consists in a spiral flange, provided with a series of V-shaped cutters, arranged on an inclination outward toward the circumferential edge of the auger, the object being to make the flange take hold of and work its way into the hardest soil.

Improved Cotton Bale Tie.

J. J. Holloman, Humboldt, Tenn.—This invention consists in a bale tie, formed of a wire having a horizontal hook on one end, and on the other end, at right angles to the first, a second hook arranged vertically. This is used in connection with an intermediate plate having an aperture therein, the whole forming a simple, cheap and reliable tie.

Improved Chemical Fire Extinguisher.

Jacob B. Van Dyne, Louisville, Ky.—This invention relates to certain improvements in portable wheeled chemical fire extinguishers; and it consists in the peculiar construction of the acid vessel having studs, in combination with the holder ring having notches and also vertical slots, whereby the security of the contents of the acid vessel is increased and the inadvertent mixture of the acid with the alkaline solution prevented.

Improved Carriage Bow Rest.

William E. Yeager, Lawrence, Kan.—This is a rest for the back bow of a carriage and buggy top, which consists of an arm fixed on the pivot of the bow prop, so as to be supported thereby when projecting back horizontally, and having at the rear end a groove into which the back bow falls near the top, so as to be supported and at the same time sustained against lateral play. The arm is made capable of swinging upon the pivot to a certain extent, and it is connected to the bow by links so as to swing up with it, to avoid projecting backward when the top is up. It is provided with lugs on its hub, to be held by a stop on the pivot in the horizontal position, and in the vertical position also.

Improved Lock for Pocket Books.

Bart M. J. Blank, Jersey City Hights, N. J., assignor to Charles Kohlmann, New York city.—This is a small lever plate, which is pivoted to the flap-binding frame of the pocket book, and provided with a recessed lower part, that enters and locks to a recessed plate attached to the pocket book, and defines the motion of the lever. By swinging the lever to either side until stopped by the binding frame, the hook is placed in the direction of the slot, and at the same time released therefrom.

Improved Process of Manufacturing Ammonia.

Farnham Maxwell-Lyte, Paris, France.—This invention relates to an improved process for the manufacture of ammonia, and it consists in combining a triad or pentad element with a readily oxidizable element, so as to form an alloy of the two, which shall be of a spongy character to present increased surface. This said alloy is subjected to a moderate degree of heat in a closed chamber, and a mixture of nitrogen and hydrogen (or a hydrogen compound) is then passed over the alloy, which produces, under the influences of heat and chemical affinity, a combination of nitrogen and hydrogen to form ammonia. An alloy of antimony and sodium or potassium, for instance, which decomposes water at ordinary temperatures, and rapidly at the boiling heat, is of this nature.

Improved Wagon Seat Fastening.

Charles Dixon, Weedsport, N. Y.—This is a strong and durable fastening for attaching seats to wagons, sleighs, and other vehicles, and it consists of a main plate with perforated lugs for the bolt of the clamping piece, that is firmly secured by an incline and shoulder of the upper lug, in connection with a recessed cam-shaped lever, the required position of the clamping piece being obtained by a projecting shoulder of the same sliding in a recessed part of the lower supporting lug.

Improved Pocket Book Fastening.

Morris Rubens, New York city.—This is an improved means of locking the hinged jaws of pocket books, cigar cases, etc. Each jaw is provided, near its center, with a clasp that is soldered, so as to project toward the other jaw, binding on it, and producing thereby a double fastening. The clasps are made concave on the under side, and are provided with projecting knobs or buttons, which serve for the purpose of opening the frame by pressing with the fingers against them in opposite directions.

Improved Side-Bar Wagon.

Ephraim Soper, New York city.—A bolster mounted on the hind axle is used instead of the spring commonly employed for the support of the side bars, and to serve, at the same time, for a truss to stiffen the axle. The C spring, by which the side bar is attached to the bolster, is arranged to extend under the bolster, and up behind it, and over the top to the point of connection, so as to economize space.

Improved Barrel Hoop.

Leopold Weil, New York city.—This invention relates to a mode of fastening bands or hoops on barrels, casks, kegs, or analogous packages, and consists in a hoop having a cross-slotted wide end to receive a narrow end, both ends being locked together by reversed lips rising from opposite sides.

Improved Railway Rail Support.

Samuel L. Porter and Duane Peck, Rochelle, Ill.—The main object of this invention is to so confine the ends of the rails that the usual fish plates will be dispensed with; and it consists of a bed plate having two strong ledges cast thereon, in combination with a cast iron block and key and a set screw, the latter passing through a ledge, and holding the key in place. It also consists in orifices through the top of the bed plate for the admission of screw nuts and bolts.

Improved Bedstead Fastening.

Wyly Merritt, Atlanta, Ga., assignor to himself and M. T. Castleberry, of same place.—The invention consists of a fastening plate contrived with a curved T head, which enters a curved undercut mortise in the post, and holds fast by the head without screws or bolts. The plate has a cylindrical enlargement, which enters a round hole at the bottom of a slot in the end of the rail, and holds it without screws or bolts, and without requiring the attachment of a special piece to the rail. The novelty lies in the contrivance of the fastening in one piece, and in the contrivance of the form so that the slots or mortises for connecting it to the post and rail may be quickly made by revolving cutters.

Improved Steak Broiling Pan.

David Burrell Smith, Bastrop, La.—The object of this invention is to provide an improved device for cooking steak and other meat, by means of which all the flavor and juices of the meat are preserved, the tendency to burn obviated, and the meat cooked free from ashes, and without the taste of smoke. It consists in two symmetrically shaped pans containing griddles, which pans, when placed together, fit tightly to form a closed chamber and hold the meat between the griddles in the center of the chamber, the pans being detachably connected by means of a curved lip and an extension at one end, and the two handles which are grasped together at the other end.

Improved Sliding Bench Vise.

Pierre Reinbold, San Antonio, Tex.—The object of this invention is to confine a piece of lumber of any length by pressure on its two ends instead of on its sides, for the purpose of holding the same while being dressed. It consists of a frame containing a sliding carriage, which is operated horizontally by a screw. This sliding carriage has an adjustable portion, which, being provided with a vertical screw and a guide rod, is capable of vertical adjustment above the table.

Improved Sash Holder.

Thomas Walker, Pleasantville, Md.—The object of this invention is to provide an improved fastening for window sashes, for the purpose of maintaining the same in any desired position. It consists in a bolt which is screw-threaded at one end, and provided with an adjustable friction pad, and pivoted at the other to a short crank. Said bolt carries a washer, between which and the friction pad, and surrounding said bolt, is a spiral spring which forces the pad against the edge of the sash to hold it in the required position, and the crank is rigidly attached to a shaft terminating in a knob, by means of which the device is operated.

Improved Plow.

David Burrell Smith, Bastrop, La.—This invention relates to certain improvements in plows; and it consists in the peculiar construction of a subsoiling device, in which an adjustable foot cuts a straight line through the hard pan below the plow, which, while it meets all the requirements of a subsoiler, lightens the draft, and enables the detachable device to be used in front of the plow for a coultter.

Improved Evaporator for Saccharine Liquids.

Thomas Scantlin, Evansville, Ind.—The primary objects of this invention are first to construct an evaporator consisting of a series of pans, all communicating one with another, without the use of solder or rivets; and second, to provide for a continuous side passage by which one pan of the series may be made, at will, to communicate with any one or more of the series, whether adjacent or not. To these ends, the evaporator is composed of a series of metal pans and communicating open side passages or channels, the latter being provided with sliding valves, stoppers, and plugs, so that the liquid may be conducted from any pan of the series to an adjacent one, or past an adjacent one to another which is remote in the series, and thereby the contents of the several pans may be kept separate, or commingled more or less, as required, or according as the heat varies in intensity in different parts of the furnace.

Automatic Governor for Hot Air Furnaces.

Solomon Kepner, Pottstown, Pa.—The object of this invention is to provide an automatic or self-regulating governor for hot air furnaces, in which the blast of hot air is made to regulate the draft to the fire box, or from the combustion chamber of the furnace. It consists in a pivoted lever provided with a valve and damper so arranged that, as the valve is moved by the blast of hot air, the damper opens communication from the outer air to the fire box or smoke pipe, and by diminishing the draft correspondingly reduces the generation of heat in the furnace. The lever is graduated and provided with a balance weight, by means of which the sensitiveness of the device may be regulated.

Improved Non-Explosive Lamp Collar and Filler.

James A. S. Hanford, Chicago, Ill.—The object of this invention is to obviate the danger attending the explosion of the accumulated gas or oil vapor in the body of the lamp; and it consists in the combination, with an ordinary lamp collar having side perforations, of hinged stoppers, which act as safety valves in the event of an explosion, and also afford a means for filling the lamp while it is burning, without danger. The invention also consists in a supplemental collar provided with the above devices, which said collar is screw-threaded, so as to be interposed between the collar and burner of any ordinary lamp, whereby the advantages of the invention are available in all kinds of lamps without alteration or injury.

Improved Thill Coupling.

Alfred W. Forwood, Georgetown, Ky.—An adjustable box fills the space between the journal and the clip, and is fitted into the jack. The forward side of the box is made a half circle to receive the journal, while its rear side bears against the clip. The arm curves from its upper side back over the clip, and near its end is an adjusting screw. When the draft pin becomes worn and the connection loose, so that the thills or pole rattle, the set screw is turned down which throws the arm up, and consequently the circle forward, so that the box fits closely to the journal.