ENGINEERING INVENTIONS.

An improved car coupling has recently been patented by Mr. George T. Arnold, of Lancaster, Ky., in which a coupling bar is used, that has a short bar pivoted in a slot in each of its ends, and so arranged that when the bar is set for coupling the short bar will project in the line of the coupling bar, for entering the link sockets of the drawheads. This socket has a pin on one of its sides and a shoulder on the other, against which, as the cars are coupled, the short piece of the coupling bar is turned into position to draw by a spring plate in the bottom of the socket. When the pin is pulled out, the short bar is turned into position to uncouple by being drawn against the shoulder only. A device for holding the pin up for self-coupling by the ordinary link is tripped by the link when it enters the socket, allowing the pin to drop.

Mr. William E. Hill, of Big Rapids, Mich., has patented a device to steady saw-mill saws, and prevent the breaking of the saw or guides by a sudden jar. The base plate of the saw-guide is bolted adjustably to the mill-frame in such a position as to receive the saw between the two jaws. To the plate are also attached two bearings, to receive the shaft of the guide jaws, and by a lever secured to the shaft, the jaws can be turned to bring them nearer or farther from the timber. One of the jaws is adjustable, so that the space between them may be adapted to the thickness of the saw. On a hand wheel shaft, placed at right angles with the guide shaft, is secured an eccentric which works between two lugs secured by jam nuts to the guide shaft. By this device the saw guide may be moved laterally in either direction. Between the jam nuts and the lugs are interposed elastic washers that prevent the saw or guide from being broken by a sudden jar.

A car coupling that is certain in its action, cheap, and durable, has been patented by Mr. William Hallett, of Truro, Nova Scotia. Back of the throat of an ordinary drawhead is a recess in which is a pawl that swings up when the coupling-link enters the recess, and drops back to a vertical position when the link has passed in. On the top of the drawhead, over the pawl, are projections which are perforated for the passage of pins. To the lower pin the pawl is pivoted, and to the upper one a tumbling weight that is connected to the pawl is pivoted by a small chain. The tumblers are of greater weight than the pawls, and when turned so that their center of gravity passes the pivot, their weight will elevate the pawls and disengage the coupling-links.

Mr. Thomas F. Witherbee, of Port Henry, N. Y., has patented a regulator for blowing engines, by which a given supply of air may be furnished to blast furnaces, regardless of the steam pressure or the resistance of the air. A piston which works in an air cylinder, connected to the blast pipe, is attached to the rod of a speed governor which controls the supply of steam to the engine. Weights placed upon the rod are so proportioned as to represent a given number of revolutions of the engine, and the size of the air cylinder is proportioned as required to vary the governor rod according to the variations in the air pressure. To the piston rod is also attached a piston which works in a steam cylinder connected by a pipe with the steam generator, the steam and air cylinders being of proper relative proportions. In operation, if the air pressure increases, the piston of the air cylinder is pressed down, causing more steam to be admitted to the engine, and if the steam pressure increases, it causes the piston in steam cylinder to move up and shut off steam to the extent required to keep down the revolutions.

A car coupling of great strength and durability has been patented by Mr. Leslie Long, of Sublette, Ill. The front end of the drawhead is of the usual construction. Two levers that extend from the front to near the back end of the drawhead are pivoted near their middle in its upper and lower sides, and to their front ends pivoted pins that work in the pin holes of the drawhead. The inner ends of the pins bend slightly backward to form hooks, and spiral springs at their outer ends keep the hooks pressed toward each other. The inner ends of the levers connect by chains to a windlass, whose shaft has bearings in the drawhead, and at its outer end has a hand wheel by which the windlass is operated. The coupling bar, which has a double hook at each end, is forced into the drawhead of the other cars between the pin hooks, which, after the barbed part of the coupling bar passes them, are immediately forced into their former places by their springs, preventing the coupling bar from being withdrawn.

Messrs. William H. Stewart and Emery J. Chapman, of Denver, Col., have patented a novel and efficient device for removing sediment from the bottom of holes being drilled in rock. A tube that is threaded, and has a series of notches at its lower end, has also at this end a series of upwardly projecting funnel shaped cups. The upper end of the tube is removably attached to an air compressor. The tube is placed in the drill hole, and when the air compressor is operated, the compressed air is forced through the lower end of the tube. The air strikes against the sediment at the bottom of the drill hole and carries it upward, when it falls back and the greater part drops in the cups. When the cups are filled the tube is drawn up and emptied. The operation is repeated until the sediment is removed.

A coupling device, especially adapted for use on freight cars, has been patented by Mr. David B. Duncan, of New Richmond, O. The drawhead has its top and front end open, and the coupling hooks, which are alike, have their front edges at such an angle as to ride over an abutment to connect in coupling. At the heel of the hook is a lateral cam that forms the abutment for the engagement of the opposite hook. The heel of the hook is pivoted to the sides of the drawhead by a bolt from which a link is also suspended. A chain secured to each hook connects it with a crank shaft journaled in bearings on the end of the car, and turned either by a lever at the side of the car, or by a wheel placed at the top of the car. When the cars are run together, the end of each hook rides over and engages with the cam on the heel of the opposite hook.

MECHANICAL INVENTIONS.

An invention by which a stay is provided for the body of a buggy, that prevents it from swaying backward or forward and at the same time allows the body to rise and fall vertically, has been patented by Edwin J. Strong, of Powhattan, Ia. A bent hanger is bolted to the bottom of the buggy body, and near its lower end is pivoted at its middle a vertical compensating lever. To the upper end of the lever a rod is hinged that is pivotally secured to a brace attached to the front end of the reach, and to its lower end is hinged a rod of the same length, the outer end of which is jointed to an arm secured to the rear axle. As the box moves up and down, the opposite ends of the lever describe opposite curves, and its pivotal point moves up and down vertically.

An improvement in the class of breech-loading firearms, in which the dropping down of the barrel is made to effect the cocking of the hammers by deflecting a cocking lever, has been patented by Messrs. John T. Rogers & John Rogers, of Birmingham, Eng. The barrels of the firearm are connected by and hinged to the body by a base pin which is of the usual construction and placed in the usual position. Intermediate pressure levers are placed between the part of the barrel beyond the base pin and the cocking devices, in such a manner that they can be worked for operating the cocking device, without striking the base pin or passing its center. When the barrels are depressed to open the breech in the act of loading, the pressure on the intermediate levers at their outer ends raises the opposite ends that are beneath the hammers, and the hammers are thus thrown back.

AGRICULTURAL INVENTIONS.

Mr. Phillip Smith, of Sidney, O., has patented an improved earth scraper, the body of which is made of a sheet of steel, struck up to form its sides, and an end plate is formed with flanges at its ends and on its bottom edge, and is secured to the sides and bottom of the body, by rivets. Runners are secured on the bottom of the scraper by means of screws, that are beveled at their ends, and are concaved on their under side, to prevent the scraper from sliding around when in use. Handles are secured to the outside of the scraper by means of staple plates, and bolts which pass from the inside of the scraper, through the handles and the staple plates, and are secured by nuts on the outside of the plates. The draw bail is attached in any suitable manner.

A convenient and cheap safety tie for cattle has been patented by Mr. Merrill J. Worth, of Wilton, N. C. A cylindrical stanchion bar, secured at top and bottom, is provided with two rings that encircle it. A metal rod of suitable size and shape has a loop at one end which incloses the upper of the rings, and the lower is formed into a hook to engage with the lower ring of the bar. The hook is provided with a spring catch. From the upper stanchion bar, a short arm depends that is provided with a pin upon which the hook of the bow is placed when the animal is let out of the stanchion. With this construction the animal tied is restrained in the least possible degree.

An invention by which ensilage in silos is protected from the effects of air has been patented by Mr. Charles H. Roberts, of Lloyd, N. Y. The door opening of the silo is provided with rabbets to receive the ends of the planks used to close it. A piece of tarred felt paper, or any fabric impervious to air and moisture, is placed against the inner sides of the planks in such a manner that the covering overlaps the ends of the planks and also laps down on the bottom of the silo. The ensilage is packed against the covering as the silo is filled, and when it is full a cover of the fabric may be spread over the top and the usual planks and weights placed above it.

A cheap and economical power for running cotton gins has been patented by Mr. William H. Davis, of Verona, Miss. An upright kingpost, journaled in a suitable frame, carries at its upper end a horizontal wheel grooved on its periphery for a rope or belt. Below this wheel the kingpost has arms to which animals are to be attached. In upright posts in front of the kingpost a horizontal shaft is journaled which has a large band pulley and a small grooved pulley. Over the small pulley the belt from the large drive wheel passes, and transmits motion to the shaft and large pulley, and from this pulley motion is transmitted to the pulley of a gin or other machine by a belt. The main belt, as it passes between its pulleys, is supported, guided, and tightened by a system of vertical and horizontal rollers attached to a guide located between the two pulleys.

A plow, in which the height and width of the plowshare can be adjusted, has been patented by Mr. Matthew M. Beard, of Holmes Co., Miss. The front shank of the plow frame has a vertical longitudinal slot near its middle, and a short distance below this is a similar slot that is notched on its edges, and the shank also has a rabbet along its outer edge. The plowshare has two apertures that correspond with the slots in the front shank, and it also has a flange on its edge. The plowshare is so placed upon the shank that its flange passes into the rabbet of the shank, and bolts passed through the slots of the shank, and the apertures of the plowshare secure them. The bolts are placed near the upper or lower ends of slots, according as the share is to be adjusted higher or lower.

A simple and effective machine for breaking the stalks of cotton plants has been patented by Mr. Neill McDuffie, of Kentyre, S. C. A roller about twelve inches in diameter, and of such a length as to reach over two rows of stalks, has near each of its ends a series of sharp radial blades, which are as long as the width of the row. This roller is hung in a frame, so as to rotate as it is drawn over the ground. Diverging arms are attached to the front side of the frame, which gather the leaning stalks, in advance of and into line with the blades of the roller, where they are held until they are caught by the blades and broken.

Mechanism for holding gates securely in place when opened has been patented by Mr. William H. Mills, of Clear Creek, Ill. The gate and posts are of the usual construction, and to one or both sides of the lower part of the forward end of the gate is hinged a pawl, in such a position that its lower end will rest upon the ground. To an eye on the upper side of the pawl is secured a rod, the other end of which is attached to the forward end of a lever that is pivoted on the top of the gate. The hinges of the pawls are so formed that the free end of the pawl, when it is raised, will come in contact with the gate before the eye to which the connecting rod is attached. A spring presses the forward end of the lever down to hold the pawls to the ground, and a loop on to the gate can be swung over its rear end to hold the parts away from the ground when opening and closing the gate.

Mr. Miles Robinson, of Wichita, Kan., has patented a combined drag and sulky plow, by which plowing and harrowing may be done at the same time. The drag is attached to the outside of an ordinary sulky plow frame, and is so constructed that it may be raised or lowered to suit the depth of furrow turned by the plow, and it may also be swung up out of contact with the ground, so as not to interfere with turning or marking out the lands. When the drag is set the proper height from the bottom of the plow, if the plow is not in the ground the drag will be suspended above it, but when the plow enters the ground the drag will rest sufficiently upon the furrows to cause them to be thoroughly harrowed.

MISCELLANEOUS INVENTIONS.

A smoke-consuming fireplace has been patented by Mr. Mathew Ingram, of Manchester, Eng. The main combustion chamber of the fireplace has the ordinary front bars, and a solid bottom. Below this chamber is an auxiliary combustion chamber, which has a door and air valve, and is divided longitudinally by a diaphragm, which extends nearly to its door. A flue leads from the main chamber to the auxiliary chamber, and from thence under the diaphragm to the main chimney flue. A damper is placed in the direct draught above the main combustion chamber, and is to be open when the fire is started, and when the chimney is sufficiently hot to create a draught this damper is closed and the flue damper opened, and the draught is taken through the auxiliary chamber. This causes the products of combustion from the main chamber to pass into the auxiliary chamber, where they are mixed with the air from the valve in the door, causing them to burst into a flame.

Mr. Carl Beseler, of New York City, has patented a device by which a strong light may be thrown into the patient's mouth during dental operations. The light chamber is a sheet metal cylinder, which has a downward extension to admit the burner, and an upward extension for the escape of the products of combustion. In one end of the cylinder is a concaved reflector, and near the other end is a convex lens which concentrates the rays of light from the burner. On the light chamber is an arm to which mirrors are attached, so that the light from the light chamber is reflected upon the work to be done, and a shade placed on the forward end of the chamber protects the eyes of the operator from the light. The head of the stand is adjustable vertically, and is provided with a circular shelf for holding the dentist's tools.

Mr. George C. Miller, of Johnstown, Pa., has patented an inkstand in which the evaporation and thickening of the ink are prevented, and dust and similar matter are kept from it. The inkstand may be of any suitable form, and is provided in its top with an aperture, which is closed by a lid pivoted to the under side of the top, and a weight attached to the lid retains it closed. An angular arm projects from the top toward the right-hand side of the inkstand, and when the pen is to be dipped into the ink the arm of the lid is pressed downward by the little finger of the hand holding the pen, carrying with it the lid, and the pen is passed into the ink, but when the hand and pen are withdrawn the weight closes the lid automatically.

Annie S. Evans, of Kingston, Can., has patented a device by means of which sick and infirm persons may be comfortably raised and supported in different postures on ordinary bedsteads. The invention consists of a divided and hinged bed bottom, to the under side of which braces are hinged, the lower ends of which are hinged upon the sideboard. The braces at the head of the couch may be made extensible, so as to raise the head of the bed bottom higher than the center, so that the bottom may be used either as a chair or reclining couch. For raising or lowering the bed a windlass is journaled on the sideboards of the bed, and receives a strap connected to the cross-bars of the hinged bed. An adjustable rest is provided for the feet.

Mr. Stephen S. Ward, of Greenfield, Mass., has recently patented improvements in the manner of attaching the handles to knives and forks, by which greater strength and durability are secured. The blade of the knife is formed with two outside tangs, having at their ends hook-shaped lugs turning inward and backward, and a middle tang that is shorter, and comes to a point at its end. The handle is grooved on its edges for receiving the outer tangs and formed with a central hole for the middle tang, and also has a cross aperture connecting the grooves for the outer tangs, in which metal is cast to bind the hooks of the tangs firmly. Bolsters and caps may be applied in the usual manner.

An improved guard for carving-forks has recently been patented by Mr. Stephen S. Ward, of Greenfield, Mass. The guard piece has its end forked to stride the neck of the fork, and at a slight distance back of the point of separation is a slot. The device which retains the guard to the fork consists of a plate spring attached at one end of the neck of the fork, and has at its outer end a lip which takes over the bar which forms the bottom of the slot in the guard, and retains the guard in its closed position. When the guard is raised for use the end of the spring enters the slot, and the lip prevents the guard from slipping forward.

An improvement in fastenings for bracelets and scarf rings has been patented by Mr. Elijah Atkins, of Birmingham, Eng. The bracelet is made in two parts, hinged together at one end. To the outer end of one of these parts are attached two stationary catches that are rounded at their ends, and have slots on their inner edges. In the outer end of the other part are catches consisting of angle plates, having short and long arms. From the edges of the short arms lugs project outward, that engage with the slots of the catches of the opposite part, and their long arms project through the sides of the bracelet. The catches are pressed apart by a spring, to engage with the catches of the other part of the bracelet when the parts are closed together.

Mr. William H. Brownell, of Brooklyn, N. Y., has patented an improvement in easels by which the surface to be painted on can be placed in the most desirable position. The support of the easel is a folding frame consisting of front standards, supporting legs, and notched holding pieces to prevent the frame from spreading. An auxiliary frame for supporting the work is hinged at its lower end to the front portion of this frame, and corresponds with it in width and length above its hinges. The inner edges of the upright parts of the auxiliary frame are grooved, and slides which hold the work move up and down in these grooves. Notched bars pivoted to this frame engage with pins on the main frame to hold it in position.

A gauge for use in boring railroad ties for the insertion of intersecting bolts, has been patented by Mr. Thomas J. Bush, of Lexington, Ky. The main frame of the gauge consists of two main base plates, upon which are upright supports and an elevated table placed on the supports. The uprights rest on each side of the rail, and have at their outer sides lugs to which are pivoted swinging jaws for clasping the tread of the rail. The base plates have holes near the bottom, through which the boring tool passes, and at the outer edges are upward extensions to which are attached plates in which the boring tool rests, and that are adjustable in all directions, to bring the tool in such position that the holes in each side of the rail will have the same inclination, and will properly intersect each other.

A feed water heater, in which the water is purified as well as heated, has been patented by Mr. Robert W. Jones, of London, O. The heater is a horizontal cylinder divided into two unequal chambers by a vertical diaphragm that is perforated near its top and bottom. In the larger chamber are pans, one above another, having perforated sides, and below the pans is a grating, all being suitably supported. The feed water enters this chamber through a pipe at its top, and the exhaust steam from the engine enters the end of the smaller chamber through a pipe in its upper part, and through the perforations in the upper part of the diaphragm passes into the larger, and heats the feed water as it falls from one pan to another, and causing it to deposit the greater portion of the lime held in solution. The water then flows through the lower part of the diaphragm to the small chamber and, becoming further heated, is taken out to the boiler.

A device by which the axles and boxes of cars are prevented from being heated has been patented by Mr. Henry Bouchard, of St. Elmo, Ala. A rotary fan secured to the lower face of one of the trucks is driven by a belt that passes over a pulley on one of the car axles. To the nozzle of the fan is secured a rubber tube that is attached at its outer end to a pipe secured to the bottom of the car. From this pipe rubber tubes lead to pipes that open into the car axle boxes. Branch pipes also lead up from the main pipe through the floor of the car. When the car is in motion the fan is rotated and air forced into the car, cooling and ventilating it, and is also forced into the axle boxes, keeping the axle cool. A small lubricating box, that has on its upper surface a semicircular bearing for the passage of the axle, has between its lower face and the bottom of the axle box springs that keep the lubricant contained in the box in contact with the car axle.

Mr. William F. Wellman, of Belfast, Me., has patented an improved table leaf supporter that locks itself automatically when raised, and can be unlocked readily in case the leaf is to be lowered. One end of a bar is pivoted to the under side of the leaf of the table, and its opposite end is pivoted to a bar twice as long as this bar, the outer end of the longer bar being pivoted to the lower edge of the rail between the table legs. A keeper rod is secured to the upper surface of the longer bar, and extends from the lower end to the middle of the bar. A spiral spring is attached at its ends to the under side of the table leaf and to the keeper, on which it moves up and down. The joint of the long and short bars will pass a trifle above a right line when the leaf is raised, and the spring holds it in this condition until it is drawn down, when it slides along the keeper until it is at the lower end, and the leaf hangs down perpendicularly.

An invention to provide a means by which doors may be readily raised or lowered on their sheaves has been patented by Mr. Isaac Somers, of Detroit, Mich. The sheave is inclosed in a casing formed of angle plates, concaved on their faces, and having flanges for screws, and it is journaled in a saddle that slides in ways on the inside of the casing. Above the ways in which the saddle moves is a projection, and between this and the upper end of the saddle a wedge is placed by which the sheave can be adjusted. The wedge is moved for adjustment by means of a thumbscrew, the inner end of which engages with the wedge. The casing is let into a recess made in the lower corner of the door, and it is only necessary to turn the thumbscrew in one direction or the other to raise or lower the door as desired.

Mr. David Grubb, of Union, Ind., has patented improvements in the class of wagon brakes in which the brake is applied by the animal's holding back upon the tongue. A plate is secured on top of the rear hounds of the wagon, which supports the brake bar and to which it is hinged. The two ends of a forked arm are secured near the ends of the brake bar, and the closed end of the fork connects with the rear end of the wagon tongue. The tongue is constructed and arranged with the front hounds, so that when the horses hold back against it the rear end presses against the front end of the forked bar and operates the brake. By a peculiar construction of the head of the wagon-hammer, when it is turned to the rear, the tongue cannot press the brake, and the wagon can be backed without applying the brake.

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