

## ENGINEERING INVENTIONS.

A cheap and efficient device for expanding the ends of boiler tubes has been patented by Messrs. Joseph T. & William H. H. Griscom, of Nashville, Tenn. Rollers reduced in size to form a head at the end are held in radial slots in circular plates, and can be moved out or in radially from the central opening, which passes entirely through the expander. The rollers being inserted in the tube to be expanded, a tapering mandrel is passed through the central opening of the expander, and is operated by a hand lever for turning the device around in the end of the tube and expanding it.

An ingenious car coupling has been patented by Mr. Leander King, of Georgetown, O. The draw bar and draw head are attached to the car in the usual way. The coupling pin is connected by a pin to a clevis hinged to the top bar of a stirrup, and the side bars of the stirrup are hinged near their upper ends to a rod which works in bearings on the end of the car body, the stirrup and coupling pin being raised and lowered by turning the rod. The lower ends of the side bars of the stirrup are pivoted to the inner ends of bars which are hinged to the under side of the timbers that support the drawhead. Their outer ends are beveled and supported on an inclined plate that guides the coupling link into the mouth of the drawhead.

A novel car coupling has been patented by Mr. Ferdinand J. Blanke, of Whitewater, Wis. In the drawhead of the car is a clutch composed of two arms, having central projections through which an ordinary coupling pin passes, pivoting them and forming the connecting clutch. Between their rear ends is a spring that throws them apart and closes the front ends. The front end of each arm is in the form of a catch, one arm having a projection that corresponds with an opening in the other. In practice, the clutch is inserted in one drawhead and a coupling pin of the usual construction is inserted in the drawhead of the car to be coupled, and the cars are closed together, when the front ends of the clutch will be opened by the coupling pin of the car to be coupled, and after the heads pass the pin they are closed by the springs at their ends.

A machine of novel construction for grinding and pulverizing rock has lately been patented by Mr. Jacob Hause, of Chewsville, Md. The outer faces of the ends of the frame of the machine have bearings for the shafts of the rolls. There are grooved rolls in the upper part of the frame for crushing the larger lumps of stone, and below these are rolls with smooth surfaces for pulverizing the material. The shafts of all the rolls are horizontal. The axes of two crushing and two pulverizing rolls are in the same vertical plane, and the axes of one crushing roll and two of the pulverizing rollers on one side of the machine are in the same vertical plane. Each roll on one side is arranged to work against two rolls on the opposite side of the machine, so as to increase the crushing and pulverizing effect.

## MECHANICAL INVENTIONS.

A hinge by which gates or doors are closed automatically from either direction has been patented by Mr. Ezra Ale, of Altoona, Pa. A plate adapted to be attached to a door frame has two jaws projecting from its flat surface, and between these is passed a corresponding jaw that is attached to the edge of a hinge plate made to receive the edge of a door. A pintle passes through the jaws to form a hinge. A tubular casing projects from the rear surface of the hinge plate on the door frame, and contains a spiral spring, one end of which rests against the hinge plate, and to the other end is attached an eye bolt. To the eye of the bolt is secured the ends of chains that pass out through a transverse slot in the hinge plate and are secured to the sides of the opposing hinge. When the door is moved either way the spring is compressed, and if the door is released the spring closes it.

Mr. Hiram McIlroy, of Poplar Ridge, N. Y., has patented an invention by which the runners of bob sleighs adapt themselves to an uneven roadway. The sides of the sleighs are separate and are secured to the outer ends of tubes, and between the tubes and the raves of the sleigh are bearing blocks, the whole being connected and held by a clip. The tubes of each bob are held in place by a rod which passes through them and has nuts at each end. This rod also passes through lugs on the bolster plate, and is strengthened by braces that extend from its center to the forward ends of the raves. To the rear ends of blocks placed on top of and at right angles to the bolsters, half elliptic springs are attached at their centers, while their ends rest on the rear ends of the raves to hold the sleighs flat to the ground. At the rear sleigh the box rests on these blocks at the forward sleigh on a fifth wheel placed on the blocks.

## AGRICULTURAL INVENTIONS.

Shears specially adapted for cutting or picking grapes and flowers have been patented by Mr. John Sager, of Thamesville, Can. The jaws of the shears are made concave on their cutting edges, and upon the pivot which joins the parts together is placed a finger which extends along and a little below the cutting edge of the lower jaw. This finger has a spring extension along the arm of the jaw and is riveted to it. The edge of the finger is made flat, as is also the edge of the opposing blade. The blade with the finger forms a clamping device, by which the grapes or flowers, after being severed, will be firmly held.

A corn planter which insures the planting of the hills at uniform distances, whether the ground is uneven or level, has been patented by Mr. Alfred A. McIntosh, of Lincoln, Neb. The frame, channel opening runners, seed boxes, and dropping slides, are of the usual construction. To the ends of an axle are secured wheels made with eight spokes, and to the outer ends of the spokes are attached cross-heads to mark the ground, and spikes to revolve the wheels and axle. By a suitably arranged system of cams and levers, in connection with the wheels and axle, the seed dropping devices placed over the rear of the channel runners are operated. The spokes of the wheels are made adjustable in their length to make the wheels larger and increase the distance between the hills.

An improved sulky cultivator has been patented by John W. Rockafellow, of Stockton, N. J. The cultivator axle is bent in U form, and to its center the tongue is attached. The lower ends of the axle are bent to the rearward, so that the cultivator balances on its wheels, when the plows are raised from the ground. Triangular frames, resting at their lower ends on the ground, are suspended from the axle and tongue by rods, and regulate the plows for depth of work. To these frames the forward parts of the plow beams are rigidly attached, and on the upper side of the frames are crosshead plates, to which auxiliary plow beams are attached, that may be adjusted laterally. The plow frame may be raised and attached to the rear end of the tongue to support the plows from the ground in turning or passing from place to place.

## MISCELLANEOUS INVENTIONS.

Mr. Frank T. Knauss, of Scranton, Pa., has patented an improved device for attaching the legs of tables to their frames. The rails of the table are attached to a metallic corner piece by bolts or screws, and the leg of the table is secured to the corner piece by a bolt which passes through the corner piece and leg, and receives a thumb nut on its inner end. The leg is slotted in its upper end so as to be slipped upon the bolt without entirely removing the nut from the bolt. The corner piece will be cast with a lug which enters the slot when the leg is in place and holds it steady.

Mr. George P. Cole, of Johnstown, N. Y., has recently patented an improved manner of attaching sweat pads to horse collars. In the usual method of securing pads to collars, by stitching through the pad, and the thin web between the rim and the body of the collar, the thread soon rots and leaves the pad loose. The inventor cords the edge of the pad with wire, and inserts back of the wire, wire staples, which are passed through the thin web of the collar, and clinched at their ends, securing them firmly. The upper end of the wire is also passed through the collar and clinched, and on its lower end a loop is formed through which a staple is passed to secure it to the collar.

A simple and effective fire escape has been patented by Mr. Frank P. Fish, of New York city. It is a ladder made of two semi-cylindrical sides, hinged together by suitable rods, and extending from near the ground to the cornice of the building. One of the pieces is secured to the wall by staples, and the other is left free to swing outward upon the hinged rounds. For folding the ladder a small wire cable is attached to the top of the movable side and extends over a pulley, and has secured to its outer end a counter balance weight. The cable is placed so that it may be reached from every story to release the movable ladder, and it is provided with projections that strike the levers of alarm bells at every story as it is carried up by the fall of the ladder. The ladder is held in position by suitable devices when it is closed.

Mr. Henry A. Tobey, of Dayton, O., has patented a register for air flues that prevents liquid and solid filth from being thrown into the flue. The bottom of the register inclines upward from its forward edge, so that any fluid thrown into it will flow out at the front. The back of the register is formed of slats, secured to its side walls, each upper slat being further forward than the preceding one, and overlap each other at such a distance apart that they may be easily cleaned. With this construction it will be impossible for filth to get from the register to the air flue. The front of the register is closed by a grate, secured by a lock. This register is especially designed for insane asylums, prisons, and infirmaries.

Mr. Phillip Hufeland, of New York city, has recently patented an elastic metal clasp for holding the covers of an album closed. A bent plate is fastened on the edge of the cover of an album, and to this plate a rod is pivoted that is provided with two tubular projections open at their outer ends. A U-shaped loop is surrounded by a coiled spring, and the ends of the spring are passed into the tubular projections and soldered, forming a bow or loop. When the album is closed the outer end of the loop formed by the spiral spring is drawn outward, and the spring is stretched, permitting it to pass over a headed stud on the opposite cover, and when the spring is released it presses against the stud and locks the two covers of the album.

Mr. William H. Hill, of New York city, has patented a combined horse collar and breast band, the breast band being attached to and extending down from the ends of the collar, so as to fit tightly against the animal's breast, and is provided at its ends with trace buckles and loops, and near its top with terrets for the reins. The breast-band is cut in such a manner that it inclines downward slightly from the ends of the collar, and fits close to the breast. It will not chafe or cut as a straight band does, and with this device the strain is distributed equally over the collar and the pad.

An improvement in corkscrews has been patented by Mr. Harry L. Perryman, of Lincoln, Neb. To the middle of the handle is attached a tube that has longitudinal slots opposite each other. Near the upper end of the shank of the corkscrew are studs fitting in the slots of the tube and guiding it in its reciprocations on the shank, and also acting as stops in its upward and downward movement. In use the screw is inserted into the cork and the handle pressed down, when a rapid pull is given to the handle, and the tube moves up the shank until the studs strike the lower end of the slots, imparting a sudden jerk to the screw and cork.

Mr. Elias Edwards, of Remus, Miss., has lately patented an improvement in four wheeled velocipedes. The vehicle has the usual wheels, axles, and springs, and upon the springs there is a cross bar upon which are placed the ends of curved parallel side pieces extending beyond the bars and held together at their forward ends by a crosspiece. In this cross piece, and in that portion of the reach in front of the forward axle, is journaled a vertical shaft to which is secured suitable gearing and a lever which reaches back to the rider's knees, for guiding the vehicle. The hubs of the rear wheels have ratchets and pawls secured to them, and rocking levers carry the pawls to propel the vehicle forward. The vehicle may be propelled either by the hands or feet alone, or by both hands and feet. By a

peculiar arrangement rods attached to the spokes are forced down to engage with the earth and prevent any slipping of wheels.

A device for cutting button holes of different sizes has recently been patented by Messrs. Charles C. B. Carlton and Heman W. Clapp, both of Springfield, Mass. The device consists of a revolving plate, having on its periphery a number of cutting blades of different width, and in its center a hole for a pivot upon which it revolves between the branches of a forked shank, to which is attached a suitable handle. To the shank near the handle is secured one end of a flat spring, the other end of which is provided with a stud that works through a hole in a branch of the forked shank, and a spring catch engages with a series of holes in the revolving plate. A lever attached to the shank raises the spring and stud to allow the plate to revolve.

A ladder adapted to be used as an extension or step ladder has been patented by Mr. Winfield S. Thomas, of East Dixfield, Me. The ladder is of the usual construction of side pieces and rounds, and is made in two sections, the side pieces converging to a point at the top. A spike is inserted in the end of the top section, for better security when this section is used as brace for the lower section. The top section is pivoted at its lower ends to the lower section by a rod on which it turns when shifted from the extension to the step ladder. Notches are made in the upper end of the side bars of the bottom section into which a rod, that passes through the lower part of the top section, drops and forms a locking device when the parts are connected for an extension ladder. To one of the side bars of the lower section an adjustable extension foot is attached for use upon uneven ground.

An invention that provides a means for protecting the bristles of hair, bath, and other brushes from injury by water, has been patented by Mr. Louis Yvon, of Brooklyn, N. Y. The stock of the brush has rows of holes bored in it to receive the bristles, and in the back of the stock, in line with the holes, are grooves to receive wires by which the bristles are drawn into and fastened in the holes, the wires and the bends of the bristles being below the surface of the back of the brush. Small metal bars that fit snugly are pressed into these grooves, after which the back of the brush is finished in the usual manner.

A vehicle spring composed of three parts, and made in such a manner as to preserve the elasticity of each, has been patented by Mr. Lafayette A. Melburn, of Denver, Col. The side bars of a buggy are secured to the front head block, and the rear axle and the ends of the spring are secured to them, the body of the buggy being supported upon the convex middle portion of the spring. The middle part of the spring corresponds in shape to the common half spring, while the two outer parts are constructed with a cylindrical bearing to form a joint with the downward curved end of the middle part. From the joint they are curved outward in nearly circular form and then inward underneath the side bars to which they are secured by clip.

An improvement in axles for wagons and other wheeled vehicles has been patented by Mr. Robert F. Ivey, of Cuthbert, Ga. To the underside of the ends of an axletree are adjustably secured metallic boxes made self-oiling by means of apertures, leading from their sides to their centers. Spindles are fitted to each of these boxes, that are a little more than double the length of the boxes, and are of uniform size and diameter throughout except at their center, which is formed with a collar, and their ends, which are reduced to receive nuts. The nuts on the outer ends of the spindles hold the wheels fast. The nuts on the opposite end hold the spindles to their places in the boxes. By this construction the wheels are stronger, and the spindles will not wear flat, and the boxes are always accessible and self-oiling.

Improvements in farm gates that move longitudinally across the roadway, and are operated by cords, have been patented by Mr. William C. Hooker, of Abingdon, Ill. The gate is of the ordinary construction, the top bar being extended to the rearward, and beneath it a parallel bar is placed, the two being connected at their rear ends by a cross bar. The gate moves back and forth between posts, to which, upon both sides of the gate, are attached bars corresponding with the extension bars of the gate. Two flanged rollers are placed loosely between the bars of the gate and the corresponding bars, and are journaled in the forked ends of a connecting bar. Upon the upper edge of the forward end of the track bars are double inclined projections, and upon the lower edges of upper bars are corresponding recesses. When the cord attached to the gate is pulled the gate is drawn back, the double incline and the momentum causing it to move on after the cord is released.

Mr. David W. Smith, of Port Townsend, W. T., has recently patented a fire and water proof safe that will float from the vessel should the vessel sink. The inner safe for containing valuables is rectangular in form, and is made burglar proof. Fastenings are secured to its outer surface by which a jacket of sufficient buoyancy to float the safe is attached, and the door has a water-tight packing. The buoyant jacket has a door opposite the door of the safe, that is secured when closed by any ordinary device. The safe is placed in an iron box on the deck of the vessel, and should the vessel sink it would float out of the box and not be carried down. A sheet metal buoy extends above the safe, and is painted with bright colors, designed to attract attention when the safe is in the water.

Improvements in car axles and wheels have been patented by Mr. William S. Penleton, of Fort Worth, Tex. The inventor provides each end of the car axle with a fixed ratchet-wheel, and the car wheels with spring pawls that engage with the ratchets. The car wheels are placed loosely upon the axle, and when rounding curves the wheel upon the outside of the curve will not be retarded by the slower motion of the inner wheel, the ratchet and pawl mechanism permitting the axle to turn in the inner wheel to accommodate the speed of the wheel on the outside of the curve. When the car is running in a straight line the wheels and axle move together the same as the usual construction.

An improvement in water tuyeres has been patented by Mr. Frederick Bowen, of Barnhart's Mills,

Pa. The tuyere consists of two pipes coiled parallel to each other, forming a double coil. The water enters the pipes at one side of the tuyere and is discharged at the other. The tuyere is made tapering toward the front end; the pipes are arranged close together, and the rear end is surrounded by a band which holds the pipes together. With this construction the water passes through a shorter length of pipe, which is cooled much better, depositing less sediment, avoiding one of the causes of the destruction of the pipes.

Mr. Julius Leede, of Washington, D. C., has recently patented an improved water meter that is operated solely by the buoyancy of the water. The meter is placed at the highest point in the building where water is to be distributed, and the service pipe is carried directly up to it and connects with the primary distributing chamber. Two measuring chambers, into which the water flows from the distributing chamber, are formed by dividing the main portion of the meter casing by a vertical partition, which also serves as a support and guide for all the movable parts of the meter except the floats. Each of these chambers contains a float attached to an oscillating lever that operates the valves and registering mechanisms. Below the meter casing and attached to it is a governing cylinder containing a float, whose action controls the induction of water into the distributing chamber. When the discharge of water from the governing cylinder is arrested the accumulation of water in this cylinder will cause the float to rise and cut off the supply to the measuring cylinders.

An improvement in traction engines that adapts them to passing over uneven earth roads has been patented by Mr. Abraham O. Frick, of Waynesboro, Pa. The engine has two traction wheels, one loose on the axle and the other rigidly connected to it. The countershaft receives its motion from a pinion on the crankshaft, and the outer end is so constructed as to move at right angles to its axis, and also to move vertically, and is connected by means of compensating gear to transmit motion to either one or both of the traction wheels, and enabling them to have an independent motion in turning. The compensating gear wheel has a laterally flexible rim of teeth that serves to compensate for variations caused from the pitching of the engine from side to side.

An improved automatic car coupling has recently been patented by Mr. Carl G. A. Alexander, of Aldin, Iowa. The drawhead of the car has the usual central opening. The inner end of a coupling hook is pivoted in the bottom of the opening by a pin, the hooked end projecting beyond the drawhead to engage with the ordinary coupling pin of the opposite drawhead. On the rear face of the hook is a horizontal rack bar, the teeth of which engage with a pinion that is fast on the end of a vertical shaft revolving in an opening in the drawhead, and extends to the top of the car, where it is provided with a hand wheel, and a ratchet wheel and pawl. A spring is secured in the opening that tends to move the coupling bar inwardly. When the cars are run together the ends of the hooks pass over the coupling pins and are coupled, and to uncouple, the hand wheel at top of the car is turned and the hook drawn back, leaving the cars free to separate.

A novel device for raising objects from the ground to a wagon has been patented by Mr. Adam Borns, of Grand Rapids, Mich. Two rack standards secured in a base frame are provided on their edges with upwardly projecting teeth and united at the top by a transverse beam. A load carrying platform is provided with pawls that engage with the racks, and also with guide boxes sliding on each of the rack standards and from the top of the guide boxes, ropes pass over pulleys at the tops of the standards, having attached to their outer ends weights a little heavier than the weight of the platform. The pawls are provided with arms that hold them in their place, and a rope secured below the platform releases the pawls. An object to be raised is placed on the platform, when the platform is rocked from one side to the other, the pawls engaging with the teeth on the rack bars and raising the load.

Mr. Henry M. Loud, of Oscoda, Mich., has patented a novel device for feeding and turning logs in sawmills. The logs are placed on inclined skids having stop projections, which prevent them from rolling on the saw carriage. Just below these projections is a horizontal shaft provided with arms that lift the lowest log over the projection and on to the carriage, when the shaft revolves. For the purpose of turning the log when necessary a cant bar is provided that is operated by a chain and pulley from the shaft that furnishes power for the log lifting device. These devices are controlled by a lever so placed that when it is thrown in one direction it operates the log lifting devices, and thrown in the opposite direction it operates the log turning device.

A device by which the handle of a pump may be easily changed from one side to another has been patented by Mr. James Preston, of New York city. The pump cylinder is held to a frame provided with concave projections on its face by means of a U-shaped band that passes around the cylinder under a collar on its surface, and is bolted at its ends to the frame. The cylinder is thus free to turn on its axis, so that the spout can project in any desired direction. A connecting rod is pivoted at its lower end at the center line of the frame, and at its upper end to the pump handle near the upper end. The upper end of the handle is pivoted to the piston rod. If the pump is to be reversed the upper end of the connecting rod is detached from the handle and the handle is turned to the other side of the cylinder, when the rod is again attached to it.

An improved platform elevator has been patented by Mr. Thomas Keith, of New York city. It has the usual side frame, top bar, and bottom platform. A rocking platform having a double inclined floor is pivoted to the side frames, and is provided with a latch piece and spring to hold it in position to receive freight, and a lever to move it from one position to another. Tripping dogs come in contact with the latch piece and the edge of the rocking platform, when the elevator reaches the floor for which they are set, and the platform is pressed down and the freight discharged. Suitable devices are provided for starting and stopping the elevator at such points as may be desired.