packing disk, and a screw passes through the disks and packing into the follower, holding all of the parts together. Above the shoulder the follower is reduced in diameter to permit the waste to escape through the passages when the valve rests on its seat. A rod is screwed into the valve for operating it. The part is connected with a supply pipe, and the casing with the upper portion of the hydrant by a pipe. When the valve is raised it closes the waste passages and allows the water to pass from the passage through the openings to the chamber, and thence through the pipe. When the valve is closed the water remaining in the pipe escapes through the waste passages, and should one of the passages become clogged the other is sufficient for the escape of the waste water. The valve casing may be made partly from pipe fittings, or it may be cast entire from steam metal or other suitable machinery.

IMPROVED MILLSTONE-DRESSING MACHINE.

Frank Miller, Lapeer, Mich.—The object of this invention is to furnish a device for dressing millstones which will keep a perfectly true surface upon a stone, and will feed the cutter forward automatically as each cut is made. The invention consists in a combined frame and slotted arm, a pivoting bolt, pivoted slotted lever, sliding crosshead, cutter, pawl, ratchet wheel, and a swiveled screw adapted for use in dressing millstones. A small rectangular frame is planed perfectly true, from the inner end of which an arm projects which is slotted longitudinally to receive a bolt, by which the inner end of the lever is pivoted. The inner end of the lever is slotted longitudinally to receive a pivoting bolt, so that the said bolt may be adjusted to cause the cuts to approach each other at a greater or less angle, as may be desired. The lever rests and vibrates upon the top of the frame and arm. The part of the lever that is over the frame has longitudinal flanges formed upon its upper and lower sides, to serves as ways for a crosshead to slide upon. To the crosshead is pivoted the end of a pawl, which rests upon the upper end of the cutter, or upon some other stop attached to the said crosshead. The cutter makes the cut as the crosshead is drawn inward, and as the said crosshead is pushed outward the engaging end of the pawl strikes against the teeth of the ratchet wheel and turns it. As the screw is turned by the outward movement of the crosshead the lever will be moved laterally to bring the cutter into the proper position for making another cut. With this construction the stone will be dressed from the eye to the skirt, just the same as a stone will wear, facing the stone at the eye or center, and cracking it at the skirt.

IMPROVED ADJUSTABLE GAUGE FOR SAWMILLS.

Franklin Wheeler, Berlin, N. H.—This invention has relation to gauges for circular-saw mills; and the nature of the invention consists in a gauge or guide applied to a bar which is adjustable between guides, and provided with a handle and a latching device. The bed plate of the gauge is secured upon a solid foundation, and arranged at right angles to the plane of the saw. On this bed plate are constructed two parallel guides, between which is a sliding gauge bar. A gauge roller is applied on a post, so as to rotate freely, which post is rigidly secured to one end of the bar, and stands perpendicular to it. A handle is secured to a bar at the end bearing the roller, and which is perpendicular to this bar. To this handle is pivoted a latch bar, to the free end of which a shouldered latch pin is loosely applied, which passes freely through the bar and enters one of a number of holes made through the bed plate between the guides. Rising from the pivoted end of the latch bar is a tongue, between which and the handle is a spring that acts to keep down the latch pin. By firmly grasping the handle and tongue the pin will be raised out of its hole, and the gauge bar can be adjusted endwise, according as it may be desired to edge the stuff to be sawed. The top of one of the guides is graduated by marks corresponding to the holes, and a pointer fixed to the bar opposite to the latch pin is used to indicate the position of the roller with respect to the saw.

IMPROVED TWISTING SPINDLE FOR MAKING CORDAGE.

Charles E. Brownell, Moodus, Conn.—The object of this invention is to furnish an improved spindle for twisting twine and other three or more strand cordage, which shall be so constructed as to enable the twist to be made tight or loose, which shall be evenly balanced, and which will stop itself automatically should one of the strands break. To the spindle is attached two plates. In the plates are formed holes to receive the journals formed upon the end plates of the fliers. To the upper side of the upper plate are attached the ends of springs which have bends formed in them near the hollow journals of the fliers to receive the strands. The springs are so formed that when left free their bends will be upon the outer sides of the hollow journals, and their outer ends will project beyond the periphery of the plate. By this construction the tension of the strands will draw the free ends of the springs inward; and, should the said strands break, the elasticity of the said springs will throw their outer ends outward, to strike against the frame of the machine or against stops, attached to said frame to stop the device and prevent waste of material. The springs thus act as tension devices and as automatic stops. The tension upon the strands may be varied by regulating the force of the springs and increasing or diminishing the number of coils of the strands around the arms. The ring plate on the spindle can be driven at different velocities, thus imparting to the fliers any relative number of revolutions to one of the spindle. In this way the twist of the strands can be exactly adjusted to the last twist, so that the completed cork will not kink.

IMPROVED DREDGE BUCKET.

James McSpirit, Jersey City, N. J.—The object of this invention is to provide a device for operating dredge buckets and grapples by means of levers and connecting rods, and to dispense with the usual windlass and other objectionable devices. This arrangement of the lever and connecting rod forms a pair of toggle joints for each half of the bucket, which are capable of forcing them together against great resistance. A roller is journaled in the upper part of the frame for guiding the chains that operate the buckets. A chain is attached to the sheave, and winds partly around it when the buckets are closed, and extends upward to the crane that supports the buckets, and a chain is attached to the upper end of the lever, and passes under the roller and upward to the crane before mentioned. It is obvious that the levers and devices described in connection with dredge buckets may be employed with equal advantage to operate grapples.

IMPROVED INDICATOR FOR MINING SHAFTS.

Calvin O. Richardson, San Francisco, Cal.—This invention consists of a bell having a spring tongue or clapper that vibrates easily, so that when the bell is attached to the hoisting rope of a mining shaft, and the tub or cage descending, the clapper will strike the bell when there is a slight checking or variation in speed, which is caused by the momentum of the clapper overcoming the slight resistance of the spring tongue. Thus warning is given of the descent of the cage or tub. A more violent ringing is caused as the tub approaches the bottom, by the brakesman making a few sudden pressures upon the brake, thus warning the workmen to stand from under.

IMPROVED STEAM ENGINE.

William Walker, Bury, England.—This is a tri-cylinder engine of the vertical pattern. The pistons have reduced extensions, and a bored passage extends through both. When a piston recedes in its cylinder the extensions uncover the live ports and admit steam to the contiguous cylinder which thus acts on the contiguous piston and forces it down. When this last-named piston rises, an aperture in its extension registers with the live steam port and the exhaust of the contiguous piston then takes place down through its bored passage. Thus, as each piston descends, it opens the port of a contiguous piston, and, as it rises, it opens the exhaust for the piston on the other side. The engine is reversed by a suitable rotary valve.

IMPROVED HOISTING MACHINE.

Henry Batt, Kentish Town, London, Eng., assignor to Leonard G. Tabraham, Boston, Mass.—This invention consists in the combination of the fast and loose pulleys, short shafts, sliding gear wheels, large gear wheels, and clutches with each other. When certain wheels are in gear the machine works with great power and slow movement. When other wheels are in gear a faster movement is obtained, but less power. When other wheels are in gear it will work as a single purchase hoist and with medium power and speed. Brake straps are arranged for controlling the movement of the apparatus, which are attached at one end to the frame, passing over a drum wheel, and their outer ends are attached to the short arms of bent levers, which are pivoted at their angles to the frame, or to supports attached to said frame, and are provided with catch bars to hold them in place when adjusted.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED HORSE-DETACHING APPARATUS.

Warren Jones, Berlin, Wis.—The object of this invention is to provide an improved horse-detaching apparatus for vehicles, designed to enable the driver to entirely disconnect the team without getting out of the vehicle, either for convenience in practical every-day use, or for special emergencies in the event of a runaway or fall of the horse. To this end the improvement consists mainly in the particular construction and arrangement of a locking stud for the trace combined with the ferrules on the whiffletree, so as to be moved outwardly from the end thereof to release the tracer; and it also consists in the combination with the detaching devices of a peculiar form of brake designed for simultaneous and joint operation with the detaching devices, to stop the momentum of the vehicle and prevent accidents which might occur, after the horse is loose, in going down hill or over dangerous roads.

IMPROVED HANDLE ATTACHMENT FOR CARPETBAGS, ETC.

Abraham Kaufmann, New York city.—The object of this invention is to provide for satchels, traveling-bags, pocketbooks, and similar articles an improved spring clasp for holding the jaws of the satchel frame rigidly in closed position, the spring clasp being used in connection with the handle or separately at the ends of the satchel frame, as desired, and forming a neat and reliable closing device in addition to the lock. The pivot clasps at present in use on satchels and bags bind sometimes too tightly on the jaws so as to chafe the leather of the same, or work too easily so as not to close the frame reliably, or get bent or broken, or present other objectionable features, which this clasp is intended to overcome, as it will always fit the frame, lock the same rigidly, and be operated especially when connected to the handle by the mere raising of the handle, without separately taking hold of the clasp for closing. The invention consists of a clasp, of angular or other shape, pivoted to posts of the outer jaw and binding over the other jaw. The clasp is retained in locked position by a spring pin entering a hole of one of the posts, and being pushed back for releasing the clasp by a sliding thumbpiece. The swing clasps are provided with sockets, into which ferrules at the ends of the satchel handles are inserted and locked by a kind of bayonet joint.

IMPROVED BOOKBINDING.

Oswald Routh and John S. Routh, New York city.—This invention relates to the binding of books; and it consists in fastening the leaves together by means of metallic clips which take the place of the usual tape. The invention is especially applicable to schoolbooks, but it may be applied with advantage to books of other descriptions. The common difficulty with tape-bound books is that the tape becomes torn or broken by the constant and usually careless opening of the book, and the leaves of the book become loose, and are soon lost or destroyed. Another difficulty with books bound in usual manner with tape is that the cover must be formed on the book; a finished cover cannot be applied. By this improvement these difficulties are avoided, and the book is made stronger and more durable, and may have applied to it an embossed or ornamental cover.

IMPROVED BALE TIE.

Robert G. Stewart, Augusta, Ga.—This invention relates to means for fastening bands around bales of all kinds of material; and the nature of the invention consists in a novel way of uniting the lapped ends of a bale band by means of a screw, whereby a substantial and safe fastening can be made with great facility. A screw is passed through one of the holes of the end of the band until the neck comes within the hole. The upset portions are then reset or pressed back, so that they will not allow the screw to be removed, but will allow it to turn freely. The screw thus permanently attached to the band will not get lost. When the ends of the band are lapped around a bale, the screw is set home into the end, and a firm fastening is made. By means of a wrench of a suitable kind, the ends of the hoop can be very forcibly drawn together and held fast.

IMPROVED COFFEE CLEANER.

Patrick McAuliffe, New York city.—This invention has reference to an improved machine for cleaning and polishing coffee in superior manner, the machine being of simple construction, run with comparatively small power, and producing a very satisfactory result, as all the skinny particles are screened off and the appearance of the coffee greatly improved. The invention consists of revolving scoop-shaped wings or stirrers, in connection with a drum or cylinder mounted loosely on the stirrer shaft, and following the motion of the stirrers, the drum being made of sheet metal, with laterally alternating perforated and not perforated sections. The weight of the coffee and the motion of the stirrers impart to the loosely mounted cylinder a motion in the same direction as the stirrers, but considerably slower than the same. This produces continuous changes in the position of the coffee in the cylinder, so as to exert an additional cleaning and polishing influence upon the same. The influence of the lifting and dropping of the coffee by the stirrers, in connection with the difference of the motions of the stirrers and cylinder, produces the effective polishing of the coffee by a machine of simple construction and operation.

IMPROVED COPYING PRESS.

Elias Gill, San Francisco, Cal.—This invention relates to an improved copying press, of simple and effective construction, that combines economy, utility, and convenience with lightness and facility in handling, the same requiring no extra stand, but being placed, without fastening, on any table or support, and readily put away when not required for use. The press is readily operated by bringing the cam handles toward each other, allowing the top board to remain for a short time in this position, and then reversing the cams, so that the rubber springs raise the top board and admit the taking out of the copying book. The press may be furnished at less cost than any one of the common screw presses in use, while it furnishes just as good copies. It needs not to be screwed or fastened down to keep in place, as the pressure is exerted at the same time at both ends of the same. The press, when of wood, is light and easily handled or removed, but strong enough for all the purposes required.

IMPROVED CONCRETE PAVEMENT COMPOUND.

Edwin Jacques, Great Falls, N. H., assignor to himself and Raphael Gotier.—The object of this invention is to construct street pavements, sidewalks, and basement floors of a compound or concrete which will not be liable to crack, nor to be injuriously affected by frosts or extremes of temperature, and which will be cheap and require only ordinary skill to lay it down. Formula: For about twenty-seven square yards of pavement, mix together, in about the same proportions named, 1 barrel of gas tar, 20 lbs. of "gum" tar, 1 lb. of alum, 1 lb. of washing soda, ¼ lb. of brown potash, 19 ordinary sized wheelbarrow loads of sharp sand. The gas tar is boiled with the gum tar about one hour and a half. Then add the potash, alum, and soda, dissolved in about one gill of water. The sand is then added by making alternate layers of it with the first named ingredients. The concrete is then run through a machine suitably adapted to the purpose, which thoroughly mixes the ingredients. The bed or ballast for the pavement is composed of small stones, properly tamped down, and then the hot concrete is spread on the gravel to the thickness of about three inches, and rolled down solid. For gutters, add a finishing coating of boiled tar.

IMPROVED TOOL STOCK FOR DENTAL ENGINES.

Edwin Telle, New Orleans, La.—This stock is formed by coiling a wire spirally and then coiling another wire around it in the other direction. This construction makes the stock flexible, and prevents the wires from uncoiling when in use. The stock may be made of steel or other suitable metal, may be made of any desired flexibility, and may be made flexible for the entire length, or may be made partly flexible and partly solid, as may be desired. With this construction the various operation of smoothing rough surfaces upon teeth, and of shaping, smoothing, and polishing complicated gold filling, will be much more pleasant to the patient than when said operations are performed with the wheels, disks, and points mounted upon rigid stocks, and there will be much less liability to break thin and delicate corundum disks.

IMPROVED MEASURING DEVICE FOR FILLING CARTRIDGES.

John D. Wilkinson, Plattsburg, N. Y.—The object of this invention is to furnish to sportsmen and others an improved cartridge loading implement, by which the charges of powder of the required size are obtained in quick and accurate manner, and the loader consists of two cylinders, one sliding within the other and turning between top and bottom plates, to which they are pivoted. The top cylinder has an opening and changing tube, registering with an opening of top plate and funnel, and the lower cylinder a connecting tube and opening registering with exit opening and spout of bottom plate. When the loader is clamped to the table, adjusted to the charge desired, and the powder placed in the funnel, the drums or cylinders require only to be turned from the supply hole to the discharge hole and back, and a charge is furnished with each forward turning of the drum, so as to produce the rapid and accurate charging of the shells in uniform manner.

NEW AGRICULTURAL INVENTIONS.

IMPROVED RIDING PLOW.

James L. Florance, Plano, Texas.—The object of this invention is to furnish an improved riding or sulky plow which is so constructed that the plow may be readily lowered into, raised from, and adjusted to run at any desired depth in the ground, and which may be adjusted to take or leave land, and to hold the carriage level when both wheels are running upon unplowed land, and when one wheel is running in a furrow. To the rear part of the side bars of the frame are attached the upper ends of two bars, the lower ends of which are bent outward, or have hooks formed upon them, to catch upon a crank when the plow is raised out of the ground to pitch the plow forward and prevent the forward end of the beam from interfering with the tongue or its brace frame.

IMPROVED CORN HARVESTER.

Washington B. Mayfield, Seneca, Mo.—The object of this invention is to furnish an improved machine for harvesting corn by stripping the ears from the stalks while standing in the field; and the invention consists in the combination of strippers, bales, levers, and a box made with an inclined bottom, a vertical flange or apron, and a detachable back, with the wheels and axle and the frame work of the machine. The strippers are formed of a number of parallel fingers, placed about an inch and a half apart, and made about an inch and a half wide upon their upper sides. The fingers are made thinner upon their lower sides, so that the stalks cannot wedge themselves while being drawn through. The ears, being thicker than the spaces between the fingers, will be stripped from the stalks and left upon the said fingers. The strippers are made to move up and down vertically by guide pins attached to their rear ends, and which pass through vertical slots in the apron or flange. The strippers are hung with their forward ends inclined upward so much that when the said strippers are raised above the level of the forward side of the box the ears will slide from them into the said box. When a sufficient quantity of ears has been collected the sliding back of the box is raised and the ears are allowed to slide out, and are left upon the ground in a heap.

IMPROVED DEVICE FOR DEPOSITING FEED IN TROUGHS.

Andrew J. Rush (Simpson's Store P. O.), Nineveh, Pa.—The object of this invention is to furnish an improved device for feeding grain to sheep in troughs, which is so constructed as to spread the grain evenly through the trough, and prevent the spilling and waste of the grain from the crowding around of the sheep. The invention consists in the combination of bars, wheels, sliding bottom, and lever with the feed box; in the combination of regulator and its lock with the feed box, the lever and the sliding bottom, and in the combination of the curved rods; and the sliding stroke board with the sliding bottom, the lever, and the feed box. To the outer corners of the sliding bottom are pivoted the ends of two rods, which pass through the guides attached to the forward parts of the sides of the box, and through the projecting ends of a bar attached to a board, that slides up and down upon the rear side of the lower part of the box. The rods are so curved that, when the sliding bottom is drawn outward to allow the grain to flow out, the sliding board will be lowered to stroke off or level the grain in the trough, so that it may be of uniform depth, giving all the sheep an equal chance at the feed.

IMPROVED MILK COOLER.

Charles W. Loller, Unionville, Pa.—This invention has reference to a milk cooler that admits the action of the cooling medium on the bottom and sides of the pan, together with an adjustment of the level of the water to the level of the milk in the pan. The invention consists of a milk pan with bottom inclined from the sides toward the center line. The pan is set into and connected to an inclosing water tank, having adjustable exit pipe to regulate level of water in the same. The cold water enters at one corner and passes around the pan in the surrounding space to an exit pipe at the opposite corner, its level being controlled by a vertically sliding pipe, to correspond to the level of the milk in the pan. The bottom of the pan is made dishing by being inclined at a suitable angle from the longer sides to the center line of the pan. This produces triangular spaces between the bottom of pan and vat, into which the cold water may enter, so that the bottom of the milk pan is cooled off in the same manner as the sides. The connection of pan and vat forms a connected cooler that is conveniently handled. The vat may be readily cleaned by taking out the sliding tube, and the milk drawn off from the pan by an exit pipe and suitable stopper, in the customary manner.

IMPROVED TOBACCO PLANT PLANTER.

Robert A. Knox, Ghent, assignor to himself and Darrall Brothers, Louisville, Ky.—This is a hand-machine for setting out tobacco plants, and is so constructed as to open a hole to receive the plant, guide the plant into the hole, and press the soil around it. In using the machine, it is carried by the handle, and is placed upon the spot where the plant is to be planted, and the other hand is pressed down upon the knob of a rod, which forces the head into the soil and opens a hole to receive the plant. The operator then removes his hand from the rod, allowing the head to be withdrawn from the ground by a spring, takes a plant from a sack that he carries around his neck, and drops it root downward into the spout, a semi-conical plate guiding it into the hole opened by the head. The operator then presses two handles together, which forces sliding bars downward and presses the soil around the plant. The two handles are then released, allowing the spring to raise the bars, and with the thumb of the hand that grasps the two handles the operator presses the rod, which swings the lower part of the plate back and allows the machine to be raised, leaving the plant standing in the ground.