

men and animals. This journey adds about 1½ cents to the cost of the borax per pound. From Wadsworth to San Francisco the expense of transportation is 1½ cents, and from the latter point to New York it is stated to be 1½ cents additional a pound. The total cost per pound in San Francisco is about 8½ cents. The monthly production of borax in California and Nevada is estimated at 200 tons.

FRAUDULENT USE OF BENZINE.—Benzine is frequently substituted for and mixed with turpentine by unprincipled dealers, but it is far inferior to turpentine for mixing paint.

NEW BOOKS AND PUBLICATIONS.

PERSONAL APPEARANCE AND THE CULTURE OF BEAUTY. By Dr. T. S. Sozinsky. Philadelphia: Allen, Lane, & Scott, Publishers, 233 South 5th street.

Contains chapters on types of male and female beauty which give measurements so that anybody in *puris naturalibus* posted before a mirror, tape line in hand, can soon discover whether his or her proportions come up to the standard here set forth. That done, the reader can compare each of his or her features in turn with the ideals described in the successive chapters devoted thereto, and at the same time he or she will get some probably useful ideas as to how to improve portions which are not strictly beautiful. The author offers some suggestions as to dress and in general labors to convince his readers that "the proper study of mankind is man."

THE METALLURGICAL REVIEW. Published by David Williams, 83 Reade street, New York city. \$5 per year.

No. 1 of this new magazine has recently been issued, and we are told that it is to be devoted exclusively to the literature of metallurgy. Professor R. H. Thurston begins the initial number with a treatise on the mechanical treatment of metals; then follows the first of a series of papers by Mr. E. C. Peabody on the New Iron District of Ohio; Siphon Tap in Lead Smelting, by C. Kerchhoff, Jr.; on Steel by W. Metcalf, C.E., besides other valuable articles. We can compliment the publisher on the very handsome dress in which the magazine is presented.

THE LOCUST PLAGUE IN THE UNITED STATES. By Charles V. Riley, Ph.D. State Entomologist of Missouri, etc. Illustrated. Published by Rand, McNally & Co., Chicago, Ill.

A number of Professor Riley's admirable papers on the grasshopper scourge have appeared in this journal, so that our readers are already familiar with the comprehensive and lucid manner in which this and other entomological subjects are treated by him. In the present work, the various articles which have been published by the author in Missouri entomological reports and elsewhere, relating to the Rocky Mountain locust, are collected in compact form, and as all are based upon an extensive personal experience and long study, the work may be pronounced as invaluable to agriculturists whose crops are yearly invaded. The book is copiously illustrated and colored maps are given, showing the territory devastated or visited by the locusts during different years. There is a full discussion of all the practical ways and means for the prevention of locust injuries; and also of the various legislative enactments calculated to encourage the extermination of the insect.

Inventions Patented in England by Americans.

From August 7 to August 21, inclusive.

- BALL VALVES.—B. C. Hay, Washington, D. C.
- BOXES FOR SHAFTING, ETC.—J. Tomlinson, Black Hawk, Cal.
- CIGAR HOLDER.—E. S. May, Campbelltown, N. Y.
- COMPRESSED AIR APPARATUS.—E. Barr, New York city.
- ENAMELLED IRON.—S. C. Quimby et al., St. Louis, Mo.
- ENVELOPES.—C. K. Marshall et al., Vicksburg, Miss.
- FASTENINGS TO ROPE, ETC.—J. K. Lake et al., Chicago, Ill.
- ICE-MAKING MACHINERY.—A. Albertson, Hudson, N. Y.
- LUBRICATING AXLES.—W. Y. Selleck, New York city.
- MUSIC STAND.—J. F. Walters, Boston, Mass.
- PAPER.—W. A. Miles, Copake, N. Y.
- POSTAL CARDS.—C. K. Marshall, Vicksburg, Miss.
- PREPARING FOOD.—C. Moritt (of Baltimore, Md.), London, Eng.
- PREPARING HAY.—J. B. Lafitte, New Orleans, La.
- PREVENTING INCrustATION IN BOILERS.—R. H. Harcourt, Chicago, Ill.
- PROPULSION OF CARS.—W. Eppelsheimer, San Francisco, Cal.
- REFRIGERATORS.—A. W. Zimmerman, Dayton, Ohio.
- STEAM MOTORS.—E. H. Angamar, New Orleans, La.
- STUFFING HORSE COLLARS.—B. F. Grayson, Jr., Luray, Va.
- TREATING HAIR, ETC.—J. F. Green, Brooklyn, N. Y.
- TREATING WOOD.—L. S. Robins, New York city.
- TREADSCREWS.—R. Boeklin, New York city.

Recent American and Foreign Patents.

Notice to Patentees.

Inventors who are desirous of disposing of their patents would find it greatly to their advantage to have them illustrated in the SCIENTIFIC AMERICAN. We are prepared to get up first-class WOOD ENGRAVINGS of inventions of merit, and publish them in the SCIENTIFIC AMERICAN on very reasonable terms.

We shall be pleased to make estimates as to cost of engravings on receipt of photographs, sketches, or copies of patents. After publication, the cuts become the property of the person ordering them, and will be found of value for circulars and for publication in other papers.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED CAR COUPLING.

James Rockwell, Penca, Neb.—This invention refers to an improved car coupling of that class of couplings which are self-coupling on the approach of the cars, without requiring any one to step in between the same for holding the link; and the invention consists of the arrow-shaped draft hook of one drawhead coupling with fulcrumed hook-shaped jaws of the opposite drawhead, the lower jaw being extended to the rear of the drawhead, and locked by a pivoted and weighted catch into open or uncoupled and closed or coupled position. A loop-shaped lever extends backward through the rear end of the drawhead to admit the throwing forward of the draft hook for coupling, or the drawing back of the same within the mouth of the drawhead whenever it is not desired that the cars should couple. When the draft hook is thrown forward the draft hook, link, and wire loop are securely retained in line and prevented from swinging back into the drawhead. The catch block retains the coupling jaw either in locked position, so as to produce the reliable interlocking of jaws and draft hook, or supports the lower jaw in open and uncoupled position, until, by the entrance of the draft hook, the catch block is released by the raising of the rear end of the lower jaw, and the weighted rear end dropped, and the heel of weighted catch block thrown into the recess of the rear end, so as to rigidly lock thereon.

IMPROVED SAFETY VALVE.

Erastus B. Kunkle, Fort Wayne, Ind.—This invention has relation to safety valves for steam generators, and especially to valves which have applied to them means for preventing them from being tampered with by improper persons. The tubular box or body of the instrument is enlarged above and contracted below, and constructed with a male thread cut on its lower end, and a number of holes in its largest end, to receive a spanner for screwing it into place on a boiler. A screw thread is also cut on the upper end of the body to receive a perforated cap, which is held fast by a small set screw. In the center of the cap is a tubular hub, which is

screw-tapped inside part of its length, and tapered outside below the top of the cap. Above the interior threaded portion of the hub is a chamber, into which a nut is applied, receiving inside of it a screw. A cone-pointed screw is screwed into the hub, so as to bear centrally on a flanged cup. This screw is grooved to receive the feather on the inside of the barrel of a key, by means of which key and a lever the screw can be turned, and a helical spring compressed more or less, as may be required. After this adjustment a soft metal cap or seal is stamped upon the perforated head of the screw, and the latter locked by means of the jam nut. The top of the cover is slotted for the escape of steam during an alarm, and concentrically cast on the bottom of the cover is another flange, which laps over the largest part or upper end of the valve, and shuts off communication between the interior of the cap and the long spring chamber of the valve, thus excluding everything injurious from the spring chamber.

IMPROVED GRAIN DISTRIBUTER.

Cornelius E. Drake, Avoca, Iowa, assignor to himself and John S. Murray, of same place.—This invention relates to an improved grain distributor for elevator heads, by which any scattering of grain is avoided and the same delivered to as many bins as desired. It consists of a distributor with radial spouts and of an interior revolving cylinder with fishing bottom, having exit apertures of a size corresponding with the spout openings. A cylindrical casing or receptacle is provided with any desired number of inclined bin spouts, radiating at the lower part from the same. The casing is secured to the elevator head, and leaves no room for scattering grain. To the interior of the casing is fitted a revolving cylinder, having inclined or fishing bottom, forming a spout-shaped aperture that registers with any one of the bin spouts. The bottom is operated by the ordinary index rod, that is attached to the center of the bottom. The connection of spouts and casing with the tightly fitting discharge cylinder prevents the scattering of the grain, and furnishes a stronger, more durable, and cheaper distributor than those at present in use. The spouts are secured to the grain-delivering tubes and the adjustable bottom set to any one of the spouts, as required. The distributor is secured by a top flange to the elevator box, and serves in effective manner for the purpose for which it is designed.

IMPROVED CIRCULAR SAW.

Donald B. McRae, Bay City, Mich.—The object of this invention is to provide for renewing the teeth of large saw plates in a manner not subject to the objections attending the use of what are known as "insertable teeth." The invention consists of a sectional or solid toothed ring attached to the periphery of a plate or disk forming the body of the saw, the ring being "halved" on to the plate when made solid, and tongued and grooved when made in sections, and being riveted in both cases. In practice, the saw plate will be the same thickness at the center as the toothed ring, but will taper or diminish slightly therefrom to the inner edge of the ring, so that the friction will be less than it is in other saws in which the plate is the same thickness from center to periphery. This is an advantage that is made possible by this arrangement of an attached toothed ring, and cannot be had in the common saws, as they cannot be ground in such forms.

IMPROVED TIDE WHEEL.

Walter H. Andrews and Hiram Fuller, Deckerville, Mich.—This invention consists of a wheel placed on a vertical shaft and provided with buckets that open and close by the action of the current. The wheel is journaled in a frame that may be raised out of the water, and a gate is provided for regulating the motion of the wheel. The wheel consists of the heads that are secured to the shaft and the wings that are pivoted between the heads. The operation of the wheel is obvious. It is submerged in the stream and held in place by piles of timbers; and the gate being more or less open, the water spreads the wings and turns the bucket, so that all upon one side of the shaft are acted upon by the current, while upon the opposite side they automatically close or fold together, so as to offer no resistance to the current.

IMPROVED SAW.

Christopher J. Wilson, Macon, Ga.—The object of this invention is to furnish saws which will run easier, and cut faster and smoother than ordinary saws, which may be made of any desired size or kind, and will be applicable to any desired kind of work. The invention consists in constructing a saw with cutting teeth, each of which is beveled on one entire side or face from base to point, which are vertical on one edge and inclined on the other to the length or radii of the saw, according as it is a reciprocating or circular saw. The invention also consists in combining with these cutting teeth clearer teeth, which are of less length, but placed in line with the saw plate, and have a vertical and inclined side, similarly to the cutting teeth. In filing a cutting tooth, very little skill is required, since the file is laid flat against the beveled side, with its lower edge resting upon the inclined edge of the next tooth, which thus serves as a guide.

IMPROVED ROTARY VALVE FOR COMPOUND ENGINES.

Isaac Munden, Bradenville, Pa.—This invention consists in the arrangement of a hub carrying a circular valve that is made in three divisions. The casing of the said valve is provided with four ports, which admit steam into two cylinders, and with two ports connecting with a reversing valve. The object of the invention is to provide a valve that will admit steam to first cylinder in the engine at the boiler-pressure throughout its entire stroke, and conduct steam from this cylinder to the auxiliary cylinder, and from thence to the exhaust passage of the valve casing. The advantage claimed for this invention are, its economy in the use of steam, the facility with which the engine may be reversed, and its simplicity and compactness.

NEW HOUSEHOLD INVENTIONS.

IMPROVED BED BOTTOM.

Frederick P. Edmans, Troy, N. Y.—This invention consists in looped C-shaped springs fixed to and overhanging the head and foot crossrails, in combination with angular hooking blocks fixed to the slats. The free looped ends of the springs are adapted to receive and engage with the beveled ends of angular blocks, which are notched longitudinally and rigidly secured to the bottom of the slats near the ends thereof. The blocks are adjusted on their slats in such relation to the overhanging looped ends of the springs, when the rails are fixed in their places, that the blocks will firmly hold their places without rattling. This is a substantial and cheap bed bottom, which can be easily taken to pieces and put together, and which can be packed away in a very small space.

IMPROVED WASHING MACHINE.

Michael B. Naus, Goldsborough (Etters P. O.), Pa.—The object of this invention is to furnish an improved washing machine, which shall be simple in construction, convenient in use, and effective in operation, washing the clothes with a rolling, rubbing, and squeezing movement, which may be manufactured at small cost, and which may be used in an ordinary wash tub. The machine is designed to be attached to an ordinary wash tub, so that it will not be necessary for the purchaser of a machine to buy also a large tub or box to put it in. The invention consists in washing clothes between two corrugated boards or rubbers made in strips or sections, and the sections moving at different rates of speed and different distance, and the devices for so moving the several parts as set forth.

IMPROVED CARPET FASTENER.

Jesse Failing, Umatilla, Oregon.—This invention has reference to a simple and durable device for fastening carpets along the base board of the room, and taking them up with great facility, the carpet presenting, by the use of this fastener, a smoother and neater surface than when fastened by the common tacks; and the invention consists of a metallic rod running along the base board, and having the edge of the carpet placed around the same and pressed down on studs or pins driven into the floor in front of the rod, which is finally retained by grooved eccentric buttons or cams

bearing on the rod. An iron rod runs along the base board of the room to be carpeted. In front of the rod are driven, at suitable distances from each other, wire pins or studs that project nearly up to the level with the top of the rod. Buttons or eccentrics are screwed to the base board above the rod, two or three feet apart, the buttons being made in the shape of eccentric cams, with a grooved or concave circumference to fit over the metallic rod. The edge of the carpet is folded around the iron rod, pressed down over the pins, and the eccentric buttons are then brought down on the rod by pressing on the levers of the same until the rod and carpet are rigidly and evenly retained along the entire base board of the room. The carpet may be readily taken up by releasing the buttons from the rods and removing them, admitting thus the convenient laying down and taking up of carpets, and furnishing a superior and neater fastening than the common tacks in general use.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED WHIP.

Frank Hopkins, Helena, Montana Territory.—This invention has relation to whips, and the nature of the invention and improvement consists mainly in a snap ring linked to a swivel, which is applied to a ferrule on the end of the whip stock. The whip staff or handle, on which is screwed a ferrule, has a short tube rigidly secured into one end, so as to form a shoulder for the spherical head of a swivel. The swivel consists of a spherical head, a cylindrical spindle or stem, and a ring or link. A snap ring is linked to the swivel, and designed to receive the loop of the whip lash. This ring is constructed with a pivoted section or tongue, held shut by a spring, thus allowing the lash to be quickly applied to, or detached from, the ring. It will be observed that the swivel and snap ring afford a safe and durable attachment for the whip lash, and allow perfect freedom of motion thereto.

IMPROVED FIRE ESCAPE.

Benjamin F. Frank, Colfax, Cal.—The object of this invention is to utilize the slats of a bedstead for a ladder, by means of which persons can escape from the upper stories of a burning building should other means of escape be cut off. The nature of the invention consists in a ladder which is composed of slats connected together by strong ropes, and provided with crosspieces, which are secured at proper intervals apart, and adapted to serve as foot-rests and hand-holds. They should be made sufficiently strong to sustain the weight of several persons, and they may be made of any desired length. The ends of the slats are all connected together by ropes, which are, preferably, passed twice through the ends, and prepared by tarring, so that they will be very strong and durable. To increase the strength of the slats at their ends, and prevent them from splitting when subjected to strain, metal plates are inserted into the ends. For the purpose of affording foot and hand holds, crosspieces are secured to the slats at suitable distances apart. These crosspieces are not in the way when the slats are arranged in a bedstead. On the contrary, they serve to space the slats and hold them in their proper places. When the slats are used for a ladder they are suspended from a hook made fast in the building wall, just below a windowsill, and for this purpose a hole is made through the end of the topmost slat to receive the hook.

IMPROVED QUILTING MACHINE.

John J. Crall, Dry Ridge, Mo.—This invention has for its object to manufacture quilts in rapid and convenient manner by means of a sewing machine, running over the fabric stretched in suitable manner. The belt connecting the differential pulley shaft with drive shaft is transferred from a larger to a smaller part thereof, in order to produce a faster feed, and the reverse to get a slower feed. When the carriage has reached the end of its movement the differential pulley is unclutched from the shaft and the carriage run back by hand. For quilting with the machine, the fabric is first wound upon the back roller, the front roller being placed by hand levers close to the needle of the sewing machine. The upper nuts are then screwed down to hold the quilt and roller to the bed plate of the sewing machine, the latter being then passed over the fabric from right to left while the first line of stitches is being made. The fabric is then moved forward by the hand lever as far as required for the next line of stitching, and the sewing machine is run over the fabric as before. The quilted portion is then rolled up on the front roller by releasing the pawls of front and back rollers and moving the quilt forward. The quilt is then thrown back by the hand levers and slide pieces until the front roller comes again close to the needle to bring the next seam at the required distance from the one last made. The quilting is then continued as far as the arm of the sewing machine will admit the rolling up, which is generally one half or more of the quilt.

IMPROVED GAS BURNER.

William Bedell and Winfield S. Bedell, New York city.—This invention relates to gas burners, and the nature of the invention consists in combining a valve which has a guide stem or tail formed on it, with a square seat formed on the upper end of the lower section of a two-part burner, whereby there is a double check to the flow of gas into the upper section of the burner, and a uniform supply of gas, automatically regulated, is obtained. The lower tubular section of the burner receives the supply of gas through a suitable pipe, and is constructed with an external or male screw-threaded portion adapted to receive the upper section of the burner. A ball, which is of less diameter than the internal diameter of the gas chamber, is constructed with a cylindrical neck or guide stem, which is loosely applied inside of the male tubular portion of the lower burner section, and constructed with a flat bottom, although a slight concavity or convexity of the bottom will not be objectionable. This check valve may be made of lead, an alloy of lead and tin, or any other suitable metal. The spherical portion rests upon the angular edge of the flat top of section, and is held down by its own weight and the weight of guide stem. Gas rising through the lower section first impinges against the lower end of the stem and is uniformly spread outward. The gas then rises and is again spread outward all around the ball into the chamber. Thus we have two checks for the gas ascending through the burner, which will render the flow regular, even under varying pressures or heads.

IMPROVED FIRE ESCAPE.

George J. A. Taggart, Parsons, Kan.—This invention has relation to means for affording safe egress from the upper stories of a building which is on fire. A access is made in the wall of the building just below the sill of a window. If desired, this recess may be lined with metal, or a cast iron box maybe set into the wall flush with its surface. The bottom of the recess should be inclined downward and outward, so as to form a self-discharging chute for a chain ladder. A trapdoor is hinged at the bottom of the recess, and adapted for closing the same. On the inside of the door is an angular lever bolt, the upper end of which is designed to enter a recess made in the window sill, and to hold the door fast. The lower end of the lever bolt is extended outward through a hole made through the door, and has attached to it a block or blade, arranged so that a stream of water directed upward against it from a hose will unlatch the door and allow it to be forced open. In hotels and other large buildings it is contemplated establishing communication between each one of the trapdoors used and the office either by draw wires or by galvanic battery wires, so that an alarm will be sounded in the office when a trapdoor is opened. Means may be adopted for opening and shutting all of the trapdoors of a building from one fixed point, at the same time each trapdoor may be opened by a person in the room to which the fire escape is applied. A chain ladder, which is attached to the top wall of the recess, and made of sufficient length to reach the curbstone of the sidewalk, where its lower end can be attached to hooks or rings fixed thereto. The lower end of the ladder is attached to a flanged drum or reel, on which it is wound, and put into the receptacle. When the door is opened the reel will fall and unwind.

IMPROVED EGG CARRIER.

Martin A. Howell, Jr., Streater, Ill.—The object of this invention is to provide an improved egg crate or box which shall be adapted to contain and safely transport a large number of eggs than those of the same size in common use, and which may withal be cheaply constructed. The racks for holding the eggs are provided with perforations and coated with glue (or other adhesive substance), and then covered with hay chaff.

IMPROVED STOVEPIPE THIMBLES.

James Carhartt, Pontiac, Mich.—The object of this invention is to provide an improved stovepipe thimble which is securely retained in the wall, readily swung into open or closed position, and so arranged as to firmly retain the stovepipe in the thimble. The invention consists of a stovepipe thimble with swinging cover and ventilator, having cam below pivot, that binds on stovepipe when inserted. The thimble has an outwardly-bent flange at the inner end that locks the thimble, in connection with the face ring or moulding, rigidly to the wall. When the cover is held in position slightly sidewise of the vertical axis, the lug and cover clear entirely the hole and admit the ready inserting of the stovepipe. The cover is then allowed to assume a pendant position, so as to throw a cam, at end of the lug, to the inside of the circumference of the face ring and cause the same to bind tightly on the stovepipe, retaining the same in firm position in the thimble. For taking out the stovepipe, the cover is swung sidewise, so that the cam releases the pipe, which is then taken out and the cover replaced by being locked to the top hook. The thimble is provided at the inner end with an outer flange that binds on the wall of the chimney, while the face ring, which is riveted to the outer end of the thimble, binds on the outer surface of the wall, so as to secure the thimble in rigid position in the stovepipe hole.

IMPROVED SLED PROPELLER.

George F. Shaver, Moorheadville, Pa.—Two bars are connected by a crossbar with front of sled, and at the upper end by another crossbar. The ends of the latter are extended to form pivots on which the propelling bars and their rigidly attached handles are journaled. It will thus be seen that if the handles are worked through the radius of the upper third of the stroke, great speed can be obtained on ice, where there is little resistance, while if the levers are worked at an obtuse angle, or in the radius of the lower third of the stroke, sufficient power is obtained to travel on a level or uphill, where considerable resistance is to be overcome.

IMPROVED MUSIC SUPPORT.

Elan A. Marsh, Battle Creek, Mich.—The object of this invention is to so construct a walking cane that it may be readily and quickly adjusted to form a convenient and substantial music stand, and vice versa. The improvement consists in the construction and arrangement of the supporting legs with respect to a screw plug and the hollow tubular end of the cane forming a containing case, the construction of the rack for holding the music, and the means for securing the rack to the standard.

IMPROVED BOAT-LAUNCHING APPARATUS.

Martin Bourke, Youngstown, O.—The danger incurred by launching life and other boats—more especially during the prevalence of storms or high seas—by lowering them directly alongside the ship is obvious and well known. It is the object of the patentee to avoid such danger by providing a compact but efficient apparatus for launching boats at a distance from the ship's side. This he effects by suspending the boat in a swinging frame pivoted to long bars which are pivoted to the side of the vessel and stand vertical. These bars are lowered by tackle, and the boat then detaches itself and floats free of the swinging frame. The launch may be controlled by the occupants of the boat, or by persons remaining on the vessel. The inventor proposes to use the apparatus in connection with an improved life boat, for which he has also obtained letters patent.

IMPROVED TEMPORARY BINDER.

Paron England, Lincoln, Neb.—It is an improvement in that class of files which have two leaves connected by a flexible fullness of leather, so as to permit said leaves to fold like a book. The object of the improvement is to render the backs of the file automatically adjustable to the increasing contents of the same, and to provide means for removing and preserving the contents in their indexed order. To these ends the invention consists in arranging in one of the backs of the file a spring which is connected with, and exercises a tension upon, a set of cords which run through the index and connect the two backs, and is also connected with, and exercises a tension upon, a flexible strap running to the outer edge of the back and carrying a clasp for fastening the said backs. The invention also consists in the particular construction and arrangement of the index and the file whereby the said index is made easily removable with its orderly arranged contents, so that they may be preserved in this form and a second index substituted for the same in the file.

IMPROVED TAX RECKONER.

George E. Burnett, Harrisburg, Ill.—This computer is chiefly designed for the use of assessors and collectors of taxes. It consists mainly of a cylinder adapted to rotate, and having strips attached on which are inscribed numbers representing values or assessments, also the tax rates, the amounts of the several taxes on the given values or assessments, and the aggregates of the several taxes. The strips are adjustable and detachable, being secured by screw clamps. The cylinder is rotated by a finger wheel and arrested or held by a friction brake arranged in a peculiar manner.

IMPROVED FOLDING LADDER.

Algernon S. Riches, Gleubenah, Wis.—This invention relates to an improved folding ladder designed for easy transportation, convenient handling, and compact storage; and especially adapted, by reason of such qualities, to use in stores, shops or dwellings, where the ordinary form of ladder could not well be used. The improvements consist, first, in forming inclined recesses in the inner sides of the side rails, so as to receive the rounds when the ladder is folded, and allow the side bars to be immediately adjacent to, and flush with, each other and the rounds hidden from view, the recesses also forming supporting shoulders when the ladder is disposed for use; secondly, in slotting one of the side bars at its pivot connections with the rounds in order to permit the side bars to be arranged convergently at the top; and thirdly, in the combination with the side bars and the pivoted rounds of a locking brace for holding the ladder stiff and rigid when the same is in use.

IMPROVED FERMENTING VAT.

Christoph Klein, Brooklyn, N. Y.—This invention relates to a new construction of fermenting vat for breweries, distilleries, and similar works, and consists essentially of a vat having vertical walls, made of horizontal pieces, which are bound together by vertical bolts, the corners of the wall and bottom being connected by tongue and groove joints, and the walls firmly encircled by metallic bands or hoops, adjusted by right and left hand screw bolts. The vats may be readily manufactured and shipped in sections, being put up for use in perfectly tight manner by any one by bolting first the side pieces together, and connecting then the bottom and side walls by the outer bands. A fermenting vat of considerable strength, that is not liable to leak, and fully able to sustain the pressure of the large quantity of liquid, is thus furnished, which has the additional advantage that it takes up less room than the round vats, requiring only a small passage between two vats, and allowing, therefore, for a larger number of vats to be set up in a given space.

IMPROVED STREET CAR AWNING.

Frank P. McIntyre, Philadelphia, Pa.—The object of this invention is to provide an awning for street cars, designed to extend over the horses and protect them from the excessive and exhausting heat of summer. The invention consists in a horizontal longitudinal supporting rod arranged in or

upon the top of the car, extending the whole length of the same, and a sufficient distance in front to cover the horses, which rod is hooked at its outer end, and supports a U-shaped marginal rod, the inner arms or branches of which are detachably fastened to the car, which device, together with a transverse brace, constitutes the supporting frame of the awning.

IMPROVED MANUFACTURE OF BOOTS.

Henry Sauerbier, Newark, N. J.—This invention relates to a peculiar crimp, consisting of corrugations or creases formed at the junction of the upper proper with the front of the boot leg, the object being to increase the elasticity and flexibility of the boot at that point, and thereby render it easier to the wearer as well as enable it to be easily drawn on or off the foot.

NEW AGRICULTURAL INVENTIONS.

IMPROVED DITCHING PLOW.

Seth Furnas, Bridgeport, Ind.—This invention relates to certain improvements in ditching plows, and it consists, first, in the particular construction and arrangement of a scoop-shaped plow extended upwardly and rearwardly in the form of an inclined trough, and combined with the beam and handles; and secondly, in the particular construction and arrangement of devices for supporting and adjusting the handles upon the rear extension of the trough.

IMPROVED COLTER AND PLOW STOCK.

Andrew H. Farmer, Oak Level, Va.—This colter is curved slightly forward at its point, and has a serrated cutting edge. Its back edge lies in contact with a bent stock or standard. It is therefore supported by the latter, and is also held in place by its bent arm, which enters the beam, and by lugs or ears formed on the stock itself.

IMPROVED GATE.

Rev. Lewis T. Mason, Ellington, N. Y.—The object of this invention is to provide an improved device for unlatching and opening and for closing and latching a gate in a simple and convenient manner without descending from the vehicle. To this end the invention consists in the combination with the operating levers of two gates connected for simultaneous movement, and arranged to swing the one in and the other out to open the gate way for the vehicle, the said gates being also so geared as to open a single one of the gates a short distance for persons on foot or horseback, without moving the other.

IMPROVED HORSE HAY RAKE.

Edward Huber, Marion, O.—This invention is an improvement in the class of wooden rakes which are prevented from revolving by means of spring catches attached to the front ends of the handle bars and bearing on the front teeth. The improvement relates chiefly to the construction of the device by which the two parts of the rake are pivoted together.

IMPROVED PLOW.

Julius Hartmann, Louisville, Ky.—This invention relates to certain improvements in the construction of reversible or hillside plows, more particularly those in which a double mouldboard vibrates about a horizontal pivot. The objects aimed at are to reduce the weight and cost of such plows without lessening the strength, to increase their durability, and render them easier to handle, and also of lighter draft, by reason of being so constructed as to have a center draft.

IMPROVED HARROW.

Lewis B. Coddington and William W. French, Westfield, N. J.—The object of this invention is to provide a harrow which will yield to inequalities of the ground, and which may be readily moved from place to place. The harrow bars are provided with ordinary harrow teeth, and are hinged on a rod that passes through the end pieces of the framers at its front side. The rear crossbar of the frame is supported a small distance above the end pieces by standards, and between the said bar and the harrow bars springs are placed on rods that project upward from the said bars through the bar. The center bar is arranged at right angles to the axle of the harrow, and the adjacent bars attached to it near its forward end, and extend backward diagonally in opposite directions. The bars, as well as the ends of the frame, are arranged parallel to the bars, so that bars on opposite sides of the center bar diverge. The forward side of the frame is provided with two uprights, that pass through a bar that is hinged to the axle which is supported by wheels. Springs are placed upon the uprights which press against the bar and hold the frame down. Chains are attached to the ends of the frame and are connected with a chain that runs over a pulley at the side of the tongue, and is attached to a sheave formed on the end of the lever, and pivoted to a standard that projects upward from the axle. The arrangement of the bars is such that all of the ground over which the harrow passes is operated upon by the harrow teeth, and, by means of the springs, the teeth are held to the ground with sufficient pressure for ordinary work, while they are permitted to yield to the inequalities of the surface, or to obstructions. By drawing the chains, by means of the lever, the harrow may be held to the ground with additional force.

IMPROVED CORN PLANTER.

William J. Nicholson, Paola, Kan.—The object of this invention is to furnish an improved corn planter, which shall be so constructed that the slide may be operated to drop the seed by the advance of the machine, and which shall be simple in construction and reliable in operation. To the inner side of one of the wheels that support the apparatus are attached arms or blocks, so that the distance apart of the hills may be regulated by varying the number of the said arms or blocks. As the wheel revolves, the arms or blocks strike against the teeth of a toothed wheel and revolve it. The upper end of the journal of this wheel revolves in a groove in the lower side of the axle, and its lower end revolves in a hole in a board which rests in stirrups. To the lower side of the toothed wheel is attached a cam wheel, made with several cams and which enters a recess in a plate placed upon the board, and is so made that the plate may be slid back and forth by the revolution of the cam wheel. To the sliding plate is pivoted the rear end of a lever, which is pivoted to a rod attached to the frame of the machine, and which serves as a fulcrum for the said lever. The forward end of this lever is pivoted to the dropping slide, so that the seed may be dropped by the vibration of the said lever.

IMPROVED FRUIT PICKER.

Jesse C. Stribling, Penleton, S. C.—This invention consists in a wire frame, which is hinged to a curved wire fork attached to a pole or handle, the said frame being provided with a bag for receiving the fruit and with a cord by which it may be moved, and the fork is provided with a curved pivoted knife, that is connected by a link with the bag frame, and moves across the fork whenever the frame is moved. The manner of using the instrument is as follows: The fork is placed astride the stem which supports the fruit, and the fruit is pulled from its stem and falls into the bag attached to the frame. If it should be desirable to cut the stem, the arm is moved by the spring attached, which moves the knife sufficiently to cut the stem of the fruit. The instrument is light and portable and is inexpensive in its manufacture.

IMPROVED CHECK-ROW ATTACHMENT FOR CORN PLANTERS.

Lewis S. Woodside, Riverton, Iowa, assignor to himself and Morris S. Sober, of same place.—The object of this invention is to furnish an improved attachment for corn planters, which shall be so constructed as to enable the seed to be planted in accurate check row without its being necessary to mark the ground in anyway. The invention consists in the combination of two chains, two pairs of hinged blocks, and wheels or rollers, with the lever that operates the seed-dropping slide, and with the driving wheels and their axles. The wheels are rigidly attached to the journals of the

axle, which revolves in bearings attached to the frame, and is made in two parts, coupled together at their inner ends by lugs and pins, to enable the machine to be turned around without one of the wheels having to slide upon the ground. The forward ends of the side bars of the frame project, and to their forward ends is hinged the frame, to which the tongue, runners, and seed hoppers are attached. The slide by which the seed is removed from the hoppers and dropped to the ground is provided with two dropping holes in each end, so that each end may drop a hill at each movement of the slide. Two rollers are placed upon the opposite sides of the axle, so that the dropping slide may be moved twice at each revolution of the wheels. The circumference of the wheels should be exactly equal to twice the required distance between the hills. To the rim of each of the wheels are attached two cross blocks in such positions as to mark the ground directly over each hill, to serve as guides to the driver and enable him to plant the field in accurate check rows.

IMPROVED TOBACCO AND CABBAGE PLANTER.

John C. Tennent, Aquasco P. O., Md.—The apparatus is mounted upon wheels, and two parallel plates are pivoted toward their forward parts to the side bars of the frame by a shaft. To the shaft, between the plates, is pivoted a wheel, formed of four solid arms and four hollow arms alternating with each other, and the outer ends of all of which are made wedge-shaped. The solid arms are simply designed to keep the wheel revolving by coming in contact with the ground. The hollow arms are designed to receive the plants, carry them to the ground, open holes in the ground, and drop the plants into them. To enable the arms to do this the plates that form the rear face of their wedge-shaped ends are made loose, and to the side edges, near their inner ends, are pivoted the ends of two bars. The bars cross the arms, and are pivoted to them near their forward edges and at a little distance from the inner ends of the forward inclines of their ends. The plants are inserted roots outward in the hollow arms while the said arms are upon the upper side of the wheel, and before the valves have been closed. The soil is pressed in around the roots of the plants by plates which are attached to the lower ends of the standards.

IMPROVED GRAIN TALLY, BAG HOLDER, AND WEIGHER.

Adam C. Lintz, Sweet Air, Md.—The operation of this improved apparatus is as follows: The support is adjusted on the standard to the proper height for the bags to be filled and weighed. A bag is then clasped between curved pieces. Grain is poured into the bag until the required weight is indicated by an index. The curved piece is then raised to release the bag, and at the same time the pawl is carried upward, moving a wheel one notch. The wheel makes a revolution for every fifty bags removed from the apparatus, and every revolution of the wheel is registered by a register wheel. This improvement is designed more particularly for the use of thrashers in measuring grain; but it may be employed for other purposes.

IMPROVED SULKY STALK CUTTER.

Michael E. Roach, Rolling Prairie, Ind.—The object of this invention is to furnish an improved machine for cutting corn stalks into pieces in the field, so that they may be turned under by the plow, and will not impede or clog it, and which shall be simple in construction, convenient and effective in use, and may be readily drawn from place to place. The cutting plates are inserted in radial slots in the wheels, and are secured in place by pins passed through their inner corners beneath shoulders formed upon the outer sides of said wheels, so that they may be readily detached to be sharpened. To the opposite sides of the tongue are pivoted the upper ends of two rods, the lower ends of which drag upon the ground, and have hooks formed upon them to straighten the stalks, so that they will be cut by the cutter. As the tendency of the draft is to tilt the cutter frame forward, which tendency is resisted by the draft of the sulky, and is made to press the cutters into the ground. The machine is adjusted for being drawn from place to place by detaching the reach and running the sulky forward until the rear crossbar can be raised and hooked upon the hooks. The forward end of the reach is then placed upon the rear end of the tongue, and the lower arm of the U-bolt is passed through the socket and tongue, and its upper arm is passed above the reach, so as to make the tongue rigid and secure the reach at the same time.

IMPROVED APPARATUS FOR BENDING AND TEMPERING MOULDBOARDS.

Dan Franklin, Tama, Iowa.—The hot mouldboard receives its intended form between dies, its position between them, by which its "twist" is determined, being governed by the position of guide pins which are set in the lower die and enter the bolt holes of the mouldboard. The guide pins may be interchanged to vary such position, or set in new holes, as required. When the mouldboard has been shaped by the dies it is removed therefrom (while still red-hot), and quickly clamped in a two-part tempering form, through which water or other tempering mixture is then forced under pressure. The form preserves or restores the curvature previously imparted by the dies, and the mouldboard is tempered in the desired manner. It will, therefore, when removed from the form, retain the exact shape desired, so that it may be applied to a plow frame without the labor, delay, and expense ordinarily attending such operation.

IMPROVED CHURN.

Jacob Weider and John S. Weider, Burlington, Iowa.—This invention relates to rotary churns, and it consists mainly in a dasher of peculiar form, in which fingers projecting downward from a horizontal centrally pivoted bar are employed to stir the cream and to break the oil globules. The cover is made in two parts. The smaller one is provided with a window, and may be removed without disturbing the gearing. The larger part supports the gearing, and may be removed when the churn is cleaned. Both parts are provided with pins that project over the edge of the cover and engage eyes attached to the body of the churn. An aperture for drawing off the milk is made in the side of the churn just above the bottom, and a spout is placed below it. In this improved churn the cream is thoroughly acted upon by the fingers as they are rotated by means of the gearing, so that the greatest possible percentage of butter is produced. By observing the condition of the cream as it is thrown against the window the progress of the churning may be known. After churning, the butter may be washed and worked without removing it from the churn.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED THILL COUPLING.

Alonzo Gandy and Henry W. Wilson, Freeport, O.—This invention relates to an improved thill coupling that admits the ready removing and replacing of the shafts, and also the support of the same in raised position, which forms an important feature of this thill coupling, the same combining, furthermore, neatness, lightness, and durability. The invention consists of parallel supports or lugs of the axle clip, of which one support has an eye and extension recess or notch; the other a rigid pivot pin, extending centrally into the eye, and carrying the sleeve attached to the shaft end. The sleeve has a shoulder and fits into the eye, turning on the pivot when inserted into the supporting plates. By allowing the shoulder to rest in the notch the thill is supported in raised position, which forms a very convenient feature of the same, as the shafts may be retained in raised position, and lowered when the horse or horses are harnessed. By pushing the sleeve in so that the shoulder is between the supporting plates, the shaft may be lowered, and is thereby securely coupled. The sleeve turns in the eye around the pivot, which facilitates the coupling, while the front part of the recessed support secures the desired resistance to the draft. The shafts are, by the use of this coupling, easily coupled and uncoupled, and also supported in raised positions when required.