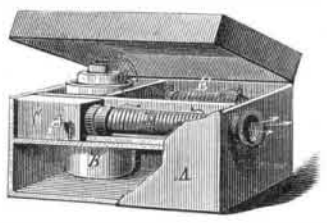
for their work. When the handle of the machine is turned a rapid vibratory motion is given to the files and the tooth of the saw is quickly and nicely filed.

ELECTRICAL INVENTION.

Apparatus for Continuous Production of Ozone.

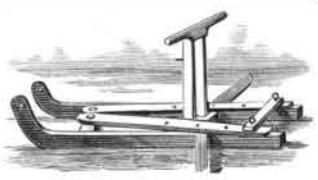
The engraving shows an improved apparatus for the continuous production of ozone, which has lately been patented by Theodore J. Yost, of Mahwah, Bergen county, N. J. In the engraving, B is a galvanic battery, and C a motor, consisting of spring power clockwork. D is the ozonizer, and E is an induction coil. The ozonizer is a glass tube attached at its inner end to a short metal tube, at its outer to the mouthpiece, *c*. A rod or wire is sustained centrally in the glass tube and covered by protecting material, put on in sections. The outer end of this wire connects with the induction coil, and a wire from the other end of the coil passes to the inner end of the glass tube, around which it is wound to near the outer end. Between the sections (before mentioned) are placed disks of metal foil having serrated edges that allow passage of air. The induction coil connects to the battery, E. A fan blower, run by the motor, C, being set in motion, a continuous current of air is forced through the ozonizer, and during its passage it is charged with ozone by the silent discharge of the electric current through the glass. The operations being automatic and continuous, a constant discharge of ozone takes place from the mouthpiece, *c*, and a comparatively small apparatus will answer all ordinary purposes.



AGRICULTURAL INVENTIONS.

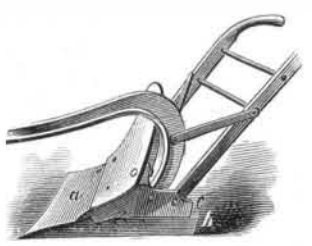
A New Cotton Stalk Cutter.

Among the new inventions we find a simple and ingenious device for cutting down cotton stalks, in preparing the ground for a new crop, that is patented by Mr. Francis M. Thompson, of McKinney, Collins county, Texas. It is clearly shown by the annexed engraving. A sled is constructed of such a width as to pass readily between the rows of stalks. And the lower parts of the runners are made thin, so that they will bed themselves in the ground to steady the sled against lateral movement. To the middle part of the front cross bar and at a little distance apart are hinged by bolts the forward ends of two adjustable bars, the rear ends of which are held at the desired distance apart by a cross bar located at the rear end of the sled and secured to it by pins or other suitable means. Several holes are formed in the adjustable bars and in the sled runners to receive pins, so that cutters can be adjusted to such a distance apart as the width of the rows may require. To the adjustable bars, a little in the rear of their centers, are securely attached the inner ends of two knives which incline to the rearward. They are also inclined downward, slightly, toward their outer ends, so that they will cut the stalks close to the ground as the machine is drawn forward between the rows. To the rear part of the sled is attached a platform for the driver while using the machine, and standards are provided to take hold of to give him more security. The device is intended to be drawn by one horse, or by two, driven tandem.



An Improved Plow.

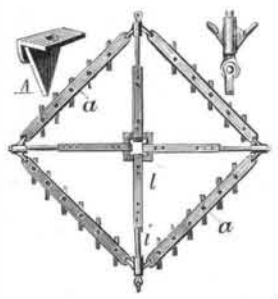
A novel arrangement of the parts of a plow is patented by Mr. Joseph George, of Fayetteville, Washington county, Ark. In the accompanying engraving *a* is the share and *b* the shaft bar of a plow, made in one piece. *c* is the land-side, having a lug secured to its inner face which projects below its lower edge and is bolted to the share bar, whereby the land-side and share bar are secured to each other. The forward end of the land-side is bent angularly to its plane, so as to form a wing through which a bolt passes, securing it to the mould board. The colter forms a continuation of the land-side, abuts against its front vertical edge, and projects beyond the mould board. It is provided with a front cutting edge and is bolted to the land-side and share bar. A brace having bent ends is attached at one end to the inner rear face of the share bar and at the other to the inner faces of the mould board and share. The handles are of usual construction, and bolted one to inner face of the land-side and the other to the mould board in the usual manner, and braces extend from the handles to the beam. The beam is curved near its end, so as to form a plow standard, and flattened out near its lower end and bolted to the land-side and share bar. It will be seen that by this construction the several parts of the plow are securely attached to each other, and the arrangement is compact.



An Improved Harrow.

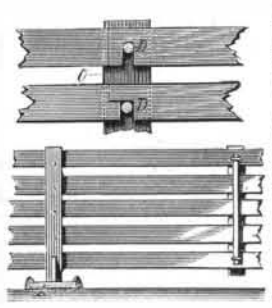
An ingeniously constructed harrow, in which all its parts in its movements in any direction will conform to the undulations of the ground, is patented by Messrs. Henry R. Burger and Joseph B. Simpson, of Fincastle, Botetourt county, Va., and is quite clearly shown in the accompanying engraving.

a a are the outer beams of the harrow to which the teeth are attached, and forming a square harrow. Each beam is formed of angle iron, the flange, *b*, of the iron projecting upward on the outer edge of the beam, thus making a harrow beam stronger and lighter than the ordinary construction. The ends of the beams are perforated to receive hooks that project upwardly from opposite corners of a triangular metallic block. This block has a central socket extending its entire length, into which is inserted an adjustable rod, *i*, which passes thence through a hole in a flange projecting downward from the metallic plate, *l* (provided with a series of adjustable holes), into any one of which the threaded inner end of the rod, *i*, may be inserted and secured by a nut. The inner end of these plates are formed into downward projecting books, each of which engages with the side of a central opening made in a metallic block placed at the center of the harrow. Clevises are secured to the outer ends of two of the rods, lying in line with each other. In the normal condition of the harrow the four beams form a square; but if it is desired to widen the harrow in one direction it may be readily accomplished by adjusting the inner ends of the rods, *i*, along the line in which the harrow is to be widened and placing them in boles nearer the outer ends of the plates, *l*. By this construction it will be seen that the outer harrow beams are pivoted to each other at the ends, and will conform to the undulations of the ground. The tooth of this harrow is triangular, the triangle being formed of sides of unequal length, and is attached to the side of the tooth holder by a bolt and nut passing through holes in the tooth that hold it at either of its angles, and the tooth holder is bolted to the frame of the harrow.



New Portable Fence.

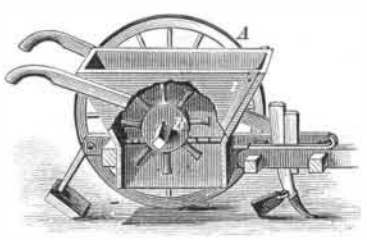
Mr. Oscar E. H. N. Reichling, of Marion, Grant county, Iowa, has patented an improved portable fence, that is easily erected or taken down and stands firmly when erected. The construction is shown by the accompanying cut. A base plate, A, is provided with a slot into which the lower end of the upright board, C, is placed. This board is provided with a series of apertures to receive the ends of transverse pins, D, which have a greater diameter in the middle than at the ends. The opposite ends of the pins are passed into an upright board corresponding with the first, but which rests on the base plate. The two uprights are then pressed together by means of wedges driven into the base plate through apertures provided for this purpose. The upright boards are prevented from coming together by the thickness of the middle part of the pin, D, and in the opening between the boards are placed the slats which have a shoulder formed at each end that rests upon the pin, D, and prevents swaying endwise. The upper slat is provided with notches in its under edge into which the pins, D, pass and thus serves to bind the several posts together. The slats are stiffened by means of a board, H, resting upon and crossing them on one side, and provided with a loop at the top and bottom, through which a bar is passed resting on the other side. The base plate is held to the ground by wooden spikes driven through it, or by pins having heads that catch on the plate.



The slats of any panel can be opened at any time, conveniently and rapidly, by removing the board, H, and the rod. This is easily done, as none of the parts are nailed together.

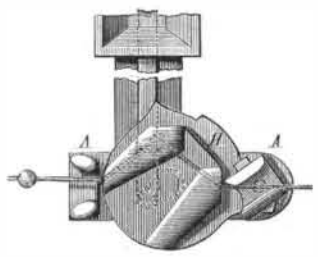
A Combined Cotton Planter and Fertilizer Distributer.

The device shown in the accompanying engraving is a peculiarly arranged and constructed cotton planter and fertilizer distributer combined. A A are wheels revolving on an axle B, and having on the inner ends of their hubs notched bands. The axle, B, is made square next to its journaled ends, and upon its squared parts are placed clutch bars, D, which may be moved upon the axle to enter or be withdrawn from the notches in the bands of the hubs of the wheels to cause the wheels to carry the axle with them in their revolution, or to revolve on their journals. The axle, B, is made round at its point of intersection with the frame, E, and its rounded parts revolve in bearings attached to the side bars of the frame, to the forward end of which is attached a tongue, and a hook to receive the draught. A hopper is placed over the middle part of the frame, E, and is attached at its corners to the upper end of four bars, I, the lower ends of which are attached to the frame. The ends of the hopper extend below the frame to serve as ends to the discharge chamber. The sides of the discharge chamber are hinged at their upper edges to the side bars of the frame, so that the opening may be larger or smaller for more or less seed or finer or coarser fertilizer to be distributed. To the square part of the axle within the hopper is attached a hub having radial arms, to force the seed or fertilizer into and out of the discharge chamber. To the middle forward part of the frame, E, is attached a plow to open a furrow to receive the seed, and to its rear is hinged a block to pack the sides of the furrow and prevent the soil from falling in. The furrow is filled and the seed is covered by a coverer attached to the rear part of the frame, E. By the above construction it will be seen that the machine may be used as a cart for carrying the fertilizer to the field by sliding the clutch bars along the axle so as not to engage with the hubs, and when the machine is at the field the clutch bars are made to engage with the hubs and the fertilizer distributed.



A Novel Check Row Corn Planter.

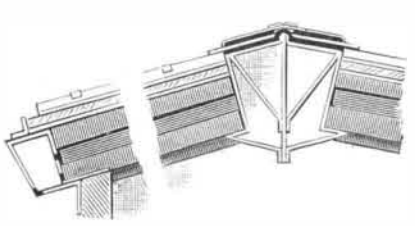
We find among the recent patents a novel device calculated to simplify and cheapen the construction, and insure accuracy in the operation of corn planters, of the class in which the seed dropping mechanism is operated by a cord or wire extending across the field. It is the invention of Mr. Lycurgus J. Bosworth, of Monmouth, Warren county, Ill., and is shown in the annexed cut. To the forward end of a frame, A, is attached a forked guide, to bring the cord into proper position for the balls attached to it at suitable distances to enter the guide channels attached to or formed upon the wheel, H. These channels allow the cords and balls to pass through freely, but have slots to their inner sides that will allow the cord, but not the balls, to pass through, and are made with an outward bend, near their rear ends, for the balls to draw against and turn the wheel, H. To the rear end of the frame, A, is pivoted a forked guide, the arms of which are made so that the pressure of the cord may have sufficient leverage to turn it, and to its base is attached a double pawl to engage with shoulders formed upon the rim of the wheel, H, to prevent the wheel from rebounding out of position. The channels in the wheel, H, are so arranged that when the rear end of either is opposite the rear guide, the forward end of the other will be opposite the forward guide. The wheel, H, is pivoted to a bearing attached to the frame, A, and to the lower end of the pivot is formed a crank to which is pivoted a seed dropping slide. With this construction the reciprocating motion of the wheel, H, will operate the slide and the seed will be dropped.



An Improved Skylight.

The accompanying engraving shows a peculiar construction, by which the metallic bars, curbs, and rafters of skylights are so adapted to each other that troublesome fitting is avoided, and strength, simplicity, and cheapness are secured. It is also formed so that the moisture resulting from condensation is amply provided for, and the glass securely held without the use of putty, at the same time allowing free contraction and expansion without permitting the glass to rattle.

This very desirable result is accomplished by the inventor by making the ridge bars of metallic plates, so bent as to form upper shelves and lower ledges when they are riveted to a central vertical plate. The ridge bar is strengthened by bracing plates reaching from the vertical plate to the upper shelves.



The rafter bars are also formed of bent plates having upper ledges, and in the center of the sides water gutters are formed. These plates are also riveted together. Upon the top of the rafter bars is placed a strip of felt, which has

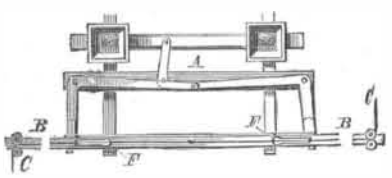
been dipped in lead and oil; upon this felt the glass is placed, and upon the glass another strip of felt. A hood is placed over the center of the rafters and ridge plates tha extends over the felting and glass, and is secured by any suitable means.

A curb is formed of a single piece of metal bent so as to inclose a chamber, and upon which the lower ends of the rafters rest. On its under side are formed angle shelves by which it is secured to the wall, and on its inner side are holes opposite the gutter on the side of the rafter through which the water of condensation escapes.

The patentee of this device is Mr. Frederick H. Leadley, of St. Louis, Mo.

A Novel Check Row Seed Planter.

A novel check row planter, in which the seed-dropping device is operated by means of a cord or rope that is staked across the field, is shown in the annexed engraving. A is a portion of the planter to which is attached the runners and seed boxes. B is a bar secured to the forward part of the planter, of such length as to reach half way to the nearest planted row on each side, and is provided at each end with two sheaves so arranged as to inclose the cord, C, and allow



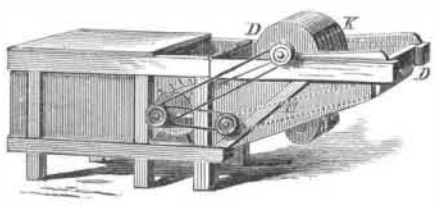
the knots on the cord to pass freely between them. At the rear of this bar are two crank levers, pivoted at their elbows to a suitable support, and having their adjacent ends pivoted together, and their opposite ends extended forward slightly beyond the bar, B. The forward ends of the crank levers are provided with journals on which are secured the loops of the guide arms, F, so that they shall be in line with the bar, B. These arms are constructed with loops at their upper ends, which are contracted at the bottom where friction rollers are placed, so that the cord, C, shall be allowed to pass freely through the contracted portions until one of its knots are drawn against the guide arm. The contracted portions obstruct the passage of the knots, so that as the planter moves forward they will be forcibly drawn against the guide arms, and the arms made to oscillate and allow the knots to pass through their loops at their larger portion. The lower ends of the guide arms are connected to the crank levers by rods that cross each other in the center, and are secured to the journaled end of the crank levers. For planting one row at a time, a dropping slide is connected to the crank levers so as to be moved back and forth on the longitudinal axis of the planter. For planting more than one row at a time, a third crank lever connected to a transverse dropping slide at one of its arms and to the former crank levers at the other is employed. By having two sheaves at each end of the bar, B, the necessity of changing the rope is avoided.

This ingenious and useful device is patented by Mr. Oliver L. Hall, of Parsons, Labette county, Kan.

A Band Cutting and Feeding Attachment for Thrashers.

Messrs. Samuel Caldwell and Jordan Burgess, of Greenfield, Highland county, Ohio, have patented a novel and ingenious improvement for cutting bands for and feeding thrashers. The accompanying engraving illustrates the device.

To the top bar of the frame, A, of a thrashing engine, and



in front of the cylinder, is hinged the inner end of a frame, D, which is supported in a horizontal position by inclined bars, E, that are attached at its outer end, and are in such position that their lower ends will rest in the angle between the front posts and the lower bars of the thrashing engine. The sides of the frames, D, have casing boards to prevent the grain from escaping laterally. Rollers are journaled to the outer end of the frame, D, and to the lower end of the inclined bars, E, over which passes an endless feed apron for carrying the grain to the thrashing cylinder. Beneath the inner part of the apron is placed a bottom to catch scattered grain, and also fan blowers, the discharge spout of which is of the same width of the endless apron, and is placed so as to direct the air blast beneath the apron and in the direction of the thrashing cylinder, thus preventing the grain from being carried back by the apron and clogging the machine. To the frame, D, at a little distance from its inner end, is journaled a shaft to which, at suitable distances, are secured circular cutters, K, made smooth or serrated, as may be desired. The cutters are driven by a belt connected with the shaft of the cylinder, and are covered by a curved plate to prevent accidents. In using, the bundles are laid upon the outer part of the endless belt, and as they are carried to the thrashing cylinder, their bands are cut by the rotating knives. The device is also hinged so as to be thrown upon the top of the thrasher for convenience in moving and to obtain access to the cylinder.

MISCELLANEOUS INVENTIONS.

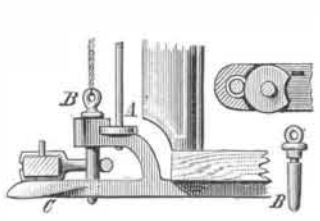
An Improved Sifter.

Mr. Augustus J. Frank, of Warsaw, Hancock county, Ill., has patented an ingenious and useful device for sifting flour or other comminuted substances. The device is shown in the accompanying engraving. A is a cup having in its lower part a sieve of curved form, the curve forming an arc of a circle, the radius of which is equal to the distance between the sieve and a slot, *a*, formed in the upper part of the cup. The cup has a handle, and a bottom below the sieve if preferred. The slot, *a*, in the cup is curved, and has its convex side down. In the opposite side of the cup, A, but near the sieve, is a slot longer than the slot, *a*, also having its convex side down. A funnel shaped vessel fits loosely into the cup, A, and

is supported by a stud and the shaker rod, that have bearings in the above described slots. A scraper is attached to the inside vessel for the purpose of sweeping the flour or other material over the sieve. When flour is poured into the inner vessel, it falls upon the sieve, and the shaker rod is moved with a reciprocating motion, causing the scraper to pass over the sieve and moving the flour, thereby distributing and sifting it.

A Novel Street Car Coupling.

A coupling of novel construction, for attaching horses to street cars and that is convenient and safe, has been lately patented by Mr. Ole A. A. Möldal, of Chicago, Cook county, Ill., and is illustrated by the annexed engraving. The engraving shows the platform, dashboard, and drawbar, C, of a street car. The forward end of the drawbar is widened and flattened to serve as a support for the double-tree, and in the bar just back of the widened part is a hole for the coupling pin. On the draw bar, at a little distance in the rear of the pin hole, is formed an arm which is curved upward and forward, and in its forward end has a hole to receive the coupling pin, the arm being of such length that the hole shall be directly over the pin hole of the draw bar. Between the curved arm and the draw bar is sufficient space to allow the double tree to have the necessary play. The forward end of the curved arm is thickened and has a recess formed in its rear side to receive the edge of a disk pivoted to it in the

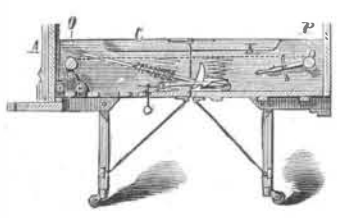


rear of the pin hole—the disk of such size as will enter an annular groove in the coupling pin, just below its head, and lock the pin securely in place. In one side of the disk is a recess of such size that when the disk is turned to bring the recess next the pin, the pin can be inserted or withdrawn freely. The rod to which the disk is attached passes up through a guide hole in an arm attached to top rail of the dash board, and has a handle hinged to its upper end in such position that when the handle is turned down upon one side of the bar, the recess in the disk will be turned away from the pin and the pin locked in place, and the handle turned in an opposite direction, the pin can be inserted and removed. The coupling pin is raised and lowered by a chain.

An Improved Folding Bed.

Messrs. Joseph Novak and Joseph Strobel, both of Chicago, Cook county, Ill., have patented certain novel and useful arrangements of parts of folding beds, which are shown in the accompanying engraving.

A is a bedstead which folds together at the center, the folding hinges of which are attached to the adjacent ends of the strip, C, hinged to the upper edges of the side-boards of the bedstead that are recessed to receive the said strips. When the bedstead is opened the strips, C, are turned down against the sides to lock it open. Latches are hinged to one part of the bottom of the bedstead in such a position that they will engage with catches attached to the bottom of the other part. The latches are held in gear with the catches by wire springs attached to them and to a hinging rod, with which the latches are rigidly attached. On the ends of the hinging rod are formed arms, which project in the opposite direction from the latches, so that the latches can be raised by operating the arms by cords attached to

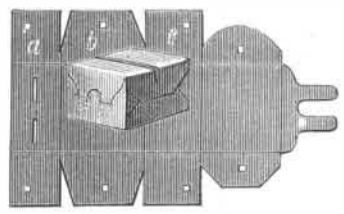


them, which pass out through the bottom of the bedstead. The bedstead is supported upon legs having casters attached to their lower ends, and are hinged at their upper ends to supports attached to the bottom of the bed.

Brace rods are hinged to the lower ends of the legs and the bottom of the bedstead near its hinged joint. With this construction the legs are in a vertical position when the bed is opened, and are held against the bottom of the bedstead when it is folded. N is a woven wire mattress, the respective ends of which are attached to the bar, O, and roller, P, and to the bar and roller are connected levers and springs, by which the mattress is given proper tension when the bedstead is open. The middle part of the mattress is supported by spiral springs secured to the bottom of the bedstead.

Paper Box.

The invention shown in the annexed engraving is a new construction of a folding box having its body and cover in one piece, so that it can be set up without paste or other adhesive material. The blank, of which the body portion of the box is formed, is cut so as to form the flaps, *a*, *b*, *c*, and the cover portion so as to form the flap, *d*, and the fastening flap. The blank is then scored in such a manner that corresponding square portions form the bottom and cover, and other corresponding rectangular portions form two sides of the box, the other two sides being closed by the folding in of the flaps of the main body of

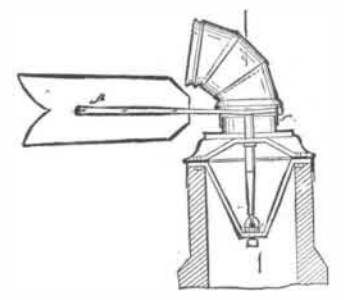


the box. The front side portion of the box has slots formed through it to receive the ends of the locking flaps. The flaps of the body and cover are perforated to receive a cord or tape to secure the box in a folded position. It will be seen that the box and cover are complete in one single piece, and that it can be cheaply made and easily set up for use without paste, and when unfolded lies in a perfectly flat condition, occupying very small space for shipping or storing.

Chimney Cowl.

Mr. Charles S. Hempstead, of Masontown, Fayette County, Pa., has patented a new and useful improvement in chimney cowls that is shown in the annexed cut.

A is a vane attached to a chimney cowl, the cowl being attached to a chimney cap, which has an ornamental outline, and is formed with a circular collar on its upper side, and from its under side extend right angled flanges, that surround the chimney on the outside and rest upon its top, as shown. To the under side of the right angle flange on the top of the chimney is attached a downwardly bent bar that extends down into the chimney, in the bottom portion of which is formed a step in which the vertical spindle of the cowl is journaled. Upon the upper side of the above mentioned flange is



placed an upwardly bent bar, which is perforated in its center and forms the journal for the upper part of the cowl spindle which extends above the collar of the chimney cap, where it is reduced in size and forms the pivot for the arm of the vane. Upon the vane arm is placed a collar, J, which surrounds the collar of the chimney top and turns with the vane. The cowl is mounted on the upper edge of the collar, J, and is secured to it so that the cowl is adapted to be turned upon the collar for setting it, so that its opening will be toward or from the vane, as desired.

An Improved Wardrobe Bedstead.

In the accompanying engraving a novel and conveniently operated wardrobe bedstead is shown, which has lately been patented by Mr. Townsend Saxton, of Brooklyn, Kings County, N. Y.

In the engraving A is a head board, the sides, B, of which are made wide at their lower parts and gradually decrease to their upper ends. To the lower part is attached a weight which rests upon blocks secured to the sides and designed to hold the head board in place while the bed is raised or lowered. To the forward edges of the lower part of the sides, B, is attached a front board, C, from the upper edge of which a top board extends inward to such a position that the bottom of the side boards, F, will stand near it when they have been raised to a vertical position, and the space between them is closed by a moulding. The sides, F, are pivoted to the sides of the headboard by a rod attached to its sides and to the bottom of the side boards at a little distance from their ends. The upper corners of the side boards are rounded to allow the end and bottom of the boards to come as close as possible to the headboard. The ends of the side-boards are attached to the ends of a rod, J, upon which is placed a spiral spring, K, which is coiled in opposite directions from the center toward its ends. A loop is formed in the middle of the spring, through which and under the rod, J, is passed a rod, L, which passes