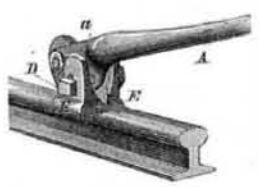
longitudinal grooves in the bolt, A, and at the same time pressing the lock upward on the bolt to lock the hasp on the staple, as shown.

Car Starter.

Mr. Charles B. Underhill, of Lancaster, Erie county, N. Y., has patented a very ingenious improvement in that class of devices that are designed to start and move cars on the rails, and is nicely illustrated by the annexed engraving.

A is a lever having in its slotted end a roller fixed on a transverse pin, the roller being designed to apply to a wheel of the car to be started. At *a* the lever is wedge-shaped in cross section, the point of the wedge being downward, and just above the end of the wedge the lever is transversely perforated to receive the fulcrum bolt, D. E E are like halves of the clamps of the starter, the lower parts of which are cut away on their insides to fit the rail. The inner faces of these halves slope upward and outward to their tips, and on their outer faces they are straight to the tops of their slotted holes, *f*, and thence to their tips are inclined outward. The fulcrum bolt passes through the holes, *f*, of the clamp, and a hole in the lever, the head of the bolt being in contact with one-half of the clamp, E, and the nut with the other. By throwing up the lever, A, to apply the starter, the broad part of the wedge is raised from between the halves of the clamp, E, and the fulcrum, D, is also raised to its utmost extent, thereby the clamp is loosened from the rail, and when thus loosened may be moved along the rail or wherever may be desired. When the starter is applied to move a car the lever is brought gradually down with its wedge portion between the clamp sections, the fulcrum bolt being at the same time pressed down in the holes, *f*, and thereby the clamps, E, are pressed outward and their jaws inward to grasp the rail, and the greater the pressure the more firmly the rail is grasped.

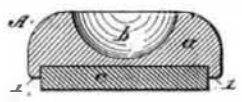


This starter is cheap, strong, durable, easily applied, and very effective.

A New Furniture Socket.

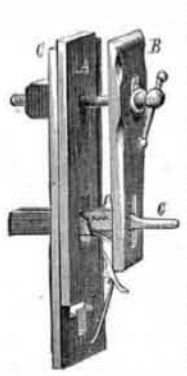
Casters placed upon the legs of furniture, by which it may be easily moved from place to place, are a great convenience, and they are sometimes also a source of annoyance, as they allow the furniture to move when it should remain stationary. This annoyance may be easily overcome by placing under each caster a device that has been lately patented by Charles Haring, of Watkins, Schuyler county, N. Y., and is illustrated by the annexed cut.

The device is a padded socket, composed of the body, that is made in circular form, with a recess in its upper surface, and a disk of rubber or other soft or elastic material, attached to the bottom by cement or other suitable means. The body is made of any durable material—such as wood, metal, or hard rubber—but iron is preferable, on account of cheapness and the weight assisting in holding the pad in place. The under side of the body is recessed to receive the disk, the annular shoulder of the recess setting down over the disk, protecting its edges and retaining it in place. The disk is made thick enough to prevent the contact of the body with the floor or carpet. In use the socket is placed beneath the furniture leg, with the caster wheel or end of the leg resting in the recess of the body. The recess prevents the leg from slipping from the socket, and the furniture is held from being accidentally moved.



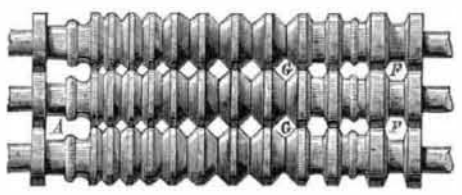
An Improved Bench Vise.

A cheap, convenient, and easily operated bench vise for carpenters' use has been lately patented by Mr. Jesse L. Parker, of Fountain City, Wayne Co., Ind. In the accompanying engraving, which illustrates the invention, A and B are the jaws of a vise, and C is a bench leg provided with a slot, to permit the up and down travel of the vise. A tenoned screw block is mortised into the jaw, B, its tenons moving in the bench leg, and its shoulders bearing against the inside of the leg. The upper screw passes into the block through the jaws, A, B, and draws them together. The screw block also serves to guide the vise up and down in the leg, C, and is held at any desired elevation by a lever, catch, and spring, upon the side of the leg. A notched treadle, G, designed for holding the lower ends of the jaws in any desired position, passes through and is pivoted to a longitudinally slotted block, F, which extends rearward through a corresponding opening in the jaw, B. The treadle extends outward from the jaw, A, for the convenience of the foot of the operator and is held in its desired position by a spring on its underside, and a catch plate on its upper side. It will be readily seen that this vise may be adjusted to any height and to any size with very little trouble to the operator.



A New Machine for Rolling Rectangular Bars from Old Rails.

Mr. John J. Thomas, of Zanesville, Muskingum county, O., has patented new and improved machinery for rolling old railroad rails into merchantable bars. This work is accomplished by a set of grooved rollers, forming passes in the shape of a pear-head rail with a thickened base, and a series of decreasing regular and irregular hexagon passes, and flat hexagon passes having recesses in the flat side, and



also a series of square reducing passes gradually decreasing in size. The accompanying engraving illustrates the series of rollers.

The rail, being thoroughly and uniformly heated, is passed through the passes, A, B, and F, and is formed into a billet, which can be passed through the grooves, G, which gradually reduce its cross-section to such an extent as may be desired.

By this means the pieces of rail are converted into bars at a single heat, as the decrease and change in cross-section takes place in such a manner and so rapidly that the iron or steel cannot cool before it has passed through the machine.

ELECTRICAL INVENTIONS.

A New System of Electrical Lighting.

An ingeniously devised combination of a voltaic arc electric lamp with an air exhauster, arranged so that a vacuum may be continually maintained about the carbons, has been patented by Mr. Amedee M. G. Sebillot, of Denver, Arapahoe county, Colorado, of which the annexed cut is an illustration.

The carbons, A A′, which are attached to carbon holders are contained in a globe, B, and are attached to pistons, D D′, fitting in the cylinders, E E′, between which the globe, B, is held, the ends of the cylinders fitting so closely against the globe as to form an airtight joint. The carbon-holding rods pass through packing boxes in the inner ends of the cylinders, E E′. Screw rods provided with milled buttons at the outer ends pass into threaded apertures in the pistons, D D′. By turning these screws the carbons may be adjusted. The screw rods are locked by screws, *a a′*. An air channel leads down through the wall of the cylinder, E′, to a tube provided with a stopcock which connects to the main chamber, M′, of the compound air pump, from which the air is continually pumped, so that when the globe and the tank are in communication there will be a vacuum in the globe, which will be maintained as the pumps operate continuously.

The lamp is contained within a parabolic mirror by which the rays of light are thrown horizontally and downward. This mirror is arranged in the form of an overhanging circular cornice on the top of a high tower, and a ring of the above described lamps is arranged within it and below the overhanging part. The globe of every lamp must be connected with the main tank of the air pump.

The compound air pump is composed of a series of air pumps which regularly and gradually decrease in size, so that the tank in which there is the most perfect vacuum will be the largest.

The carbon holders are connected to the poles of an electric generator of any suitable kind, and a derrick is provided for raising and lowering the device.

New Electric Arc Lamp.

We give an engraving of an improved electric arc lamp, lately patented by Mr. Henry B. Sheridan, of Cleveland, O. This lamp employs two or four carbon rods converging toward the point of combustion, and allowed to gravitate toward each other, by a friction escapement, controlled by a differential magnet placed in a shunt circuit, and affected by the fluctuations of the current.

The carbon rods are suspended by chains from drums of different diameters, the positive carbon being connected with the chain from the larger drum, and the negative carbon being connected with the chain from the smaller drum, so that notwithstanding the difference in the rate of the consumption of the two carbons, they always maintain the arc at the same point.

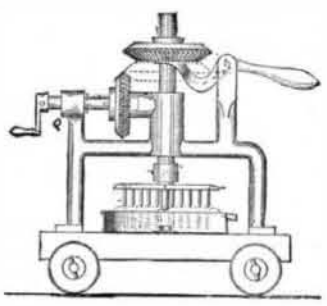
The construction is such that a strong current holds the carbons apart, and by means of a pawl and ratchet arrangement the feeding device separates them more or less, when the current is very strong; as, for example, when the carbons touch previous to lighting. In this case it separates them to form the arc, after which the regulation is accomplished for the greater part by releasing the arms as the current weakens, allowing the carbons to approach sufficiently to maintain the standard length of the arc.

METALLURGICAL INVENTION.

An Improved Amalgamator.

A novel machine for amalgamating ores for the separation of the precious metals from the waste mineral matter has been patented by Mr. Angus McKellar, of Fort Douglass, Utah, and is illustrated by the annexed engraving.

Upon a platform mounted on wheels, so that the machine may be moved about, is a double vertical standard, Q, supporting a central sleeve. Through this sleeve passes an upright vertically adjustable shaft, on the top of which is keyed a bevel gear wheel, and on the bottom of which is held by a set screw a rake consisting of cross bars having downward projecting teeth. In an upright arm of the standard is pivoted a lever, whose forked end embraces the upright shaft just below its bevel gear wheel, whereby the shaft and rake can be elevated and lowered. Into the upper portion of the standard, Q, is journaled a horizontal shaft, to the inner end of which is attached a bevel gear wheel, and to its outer a crank, through which power is applied for operating the rake. Set loosely upon the platform is a settling and amalgamating pan, having in its center a step to receive the lower end of the rake shaft when the rake is in operation. At the upper edge of the pan is a discharge spout, for the purpose of carrying off the muddy water and smaller particles, and having a screen at its inner end to prevent the escape of the sand and metal. In the bottom of the pan is from one-fourth to one-eighth of an inch of quicksilver, when ready for work, and to this chemicals may be added if desired. Powdered mineral earth then being delivered into the pan, a small jet of water is also introduced at the center, and the rake being lowered by the forked lever, so that the gear wheel of the crank shaft shall mesh with the gear wheel of its shaft, the crank is turned, and the rake is rotated until the material is mixed to the consistence of mud, when the supply of earth is shut off and a larger supply of water added, and the rake is rotated in the opposite direction until muddy water ceases to flow. The operator then skims off the upper layer of sand and ore that is free from gold. The washing and skimming are repeated several times, when the pan is removed and its contents submitted to the usual operations for separating the gold and quicksilver.



MISCELLANEOUS INVENTIONS.

New Picture Exhibitor.

An invention for exhibiting ornamental cards, and which gives more ornamental effect than is ordinarily furnished, has been lately patented by Mr. Augustus Lueckel, of Brooklyn, N. Y.

This is a combination of a folding card with a supporting frame or easel. The supporting frame is a sheet of cardboard having a portion cut out, to form a supporting leg, which holds the frame at a proper inclination.

The folding card consists of a main portion attached to the cardboard, and leaf portions attached to the main portions by flexible connection, so that they may be folded down upon the main portion, or opened out, as shown in the engraving.

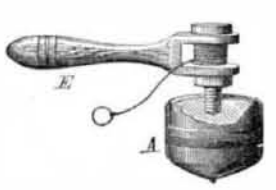
On the face of the main card is a picture, and both sides of the hinged portions are similarly ornamented, so that five separate pictures are given.

Around the edges of the body card is a bordering of ruffed or plain material, and fringe is added as a finish. The cards mounted in this way are highly ornamental, and are displayed to the best advantage.

A Novel Spinning Top.

Mr. Johnathan Hill, of New York city, has patented a novel spinning top, of which the accompanying engraving is a good illustration.

The top, A, is made of any suitable material, and is provided with the ordinary point, upon which it spins. In the center, at the top, is formed a screw hole, fitting loosely upon the screw-thread on the lower end of a spindle which passes through and runs freely in a hole formed in a slot at one end of the handle, E, and is retained in its place by a head formed above the handle, and a collar which fits tightly on the spindle under the handle.



The top is screwed to the spindle, and the spindle turned still further to wind a cord which is fastened to it in the recess of the handle. When the cord is drawn the spindle is turned in the direction to screw it into the top, and when it is wholly unwound it stops the spindle, and the momentum of the top causes it to run off the spindle and spin upon the surface, over which it is held until its momentum is exhausted.

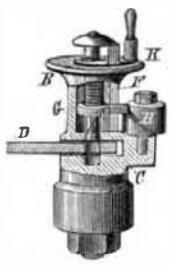
Metal Roofing Plate.

Mr. John Walter, of Nashville, Davidson Co., Tenn., has patented a new metal roofing plate for houses, that has novel features, illustrated by the annexed cut.

The plate, A, may be of any desirable size, and is formed with two parallel corrugations, *a a'*, near one of its lateral edges, so constructed that the inner corrugation, *a*, shall serve as a catch to hold another plate placed at its side, and the outer, *a'*, shall form with the inner one a gutter, *b*, for carrying off any water that may enter the seam. Adjacent to the outer corrugation is a flange, having perforations, through which the plate may be nailed to the roof. The opposite lateral edge of the plate is formed with a single broad corrugation, adapted to cover the corrugations and gutter of the adjacent plate, and its extreme edge is bent under to form a catch, which is to engage with the inner corrugation, *a*, of its adjacent plate, forming a waterproof seam. The plates are laid in horizontal layers, the upper layer overlapping the next lower one, and are provided with a horizontal corrugation, *e*, extending across nearly to the lateral corrugations, and at such a distance from the extreme top edge of the plate that the lower end of the plate overlapping it shall form a seam therewith, and by means of an upward inclination given to the upper edge of the plate, any water passing up between the plates is prevented from flooding the seam. Each plate is constructed with a central Y-shaped corrugation, and a corrugation having the shape of an arrow head located between the forks of the Y, the corrugations serving to guide the water to the right and left hand sides of the plate to the gutters, where flooding is less liable to ensue.

A New Horse Detacher.

The invention illustrated by the annexed cut is a device to facilitate the attaching and detaching of the traces of horses from the whiffletree, especially for detaching in cases of danger when the horses run or fall, and is a spring actuated bolt for holding the traces, which can be withdrawn by devices operated from the driver's seat, and releasing the horse instantaneously. With this device many accidents of daily occurrence might be prevented and many lives saved. A bolt, A, slides in a casing, B, and is provided with a socket, C, for the trace, D, the end of which must be in a horizontal position. The bolt must be of such length as to cross the socket, and is provided with a removable head, which rests on the top of the casing when it is in its lowest position. A spiral spring, F, surrounds the bolt and rests against the underside of the top of the casing, and against an annular ridge, G, on the bolt, the spring pressing the bolt downward. The ridge has a stud projecting through a vertical slot in the casing, which rests on a spiral shoulder of a small cylinder, H, pivoted on a projection of the casing, and has an arm, J, extending backward from the whiffletree. A casing, B, is fastened to each end of the whiffletree. A latch lever, K, provided with a handle, and a vertical stud, M, is pivoted on the top of the casing, B. The casings at either end of the whiffletree are connected by a rod, N, through the levers, J, one of the levers having an extension, N'.



To fasten the traces to the holders, the cylinder, H, is rotated, by means not shown, carrying up the studs, G, thereby raising the bolts, under the head of which the stud, M, is thrown by the latch, K, and permitting the trace to be inserted in the socket, C. The latch is then reversed and the bolt is forced through the opening in the trace by the spring, F. All that is necessary in case of danger is to rotate the cylinder, H, as before, when the bolts will be raised and the traces released. The above device is patented by Heinrich Fleischhauer, of Berlin, Germany.

Improvement in Shirts.

This improvement relates to certain novel features applicable to dress and fancy shirts of flannel, in part or as a whole. This shirt is of the usual construction except as hereinafter described. As shown by the accompanying engraving, openings are formed in the lower part of the shirt body, front and back, instead of at the sides as usual. These openings extend from the bottom any desired distance upward, and by their position allow the shirt to open or give way sidewise, or in the direction most natural and convenient. By this construction the shirt may be made longer and still readily kept down to its place, and there will be no danger of the shirt being torn by strain. The shirt is also made with an open bosom formed to button by means of inner flaps (which do not show in the engraving) attached at the inside. The outer flaps, formed by the main body of the garment, are made with eyelets through which a lacing cord is strung, so that they may be drawn up as closely as desired. This lacing is more reliable and stronger than buttons, and gives an ornamental appearance to the bosom that is so desirable on fancy flannel shirts.

The shirt is provided with a collar or neck band of ordinary construction, and between the sides of the doubled strip forming the band a collar is attached, so that the collar, when turned inward, hangs straight below the band, and the band may be used with a separate collar as usual. The collar may also be turned outside for use in place of a separate collar.

With dress shirts this reversible collar avoids the necessity of changing the garment when the collar is slightly soiled, as the fixed collar can be turned in and another put on.

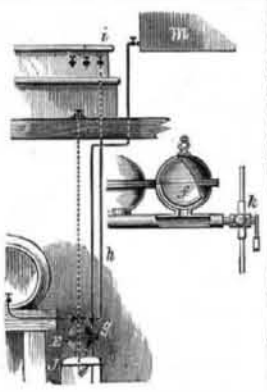
With flannel shirts it gives the advantage of a collar of the same material, which, with a lawn-tennis shirt, can be worn in the field and afterward readily replaced by another when the appearance of ordinary dress is desired.

The above novel improvement in shirts is the invention of Mr. Isaac Schneer, of New York city, for which he has obtained a patent.

Improved Apparatus for Raising Beer, etc.

Messrs. Peter J. Catterall and Edward Birch, both of Manchester, Lancaster county, England, have patented, both in this country and in England, an improved method and apparatus for raising liquids from vessels in a cellar to other parts of the building, without the exertion of hand labor. This object is attained by the device illustrated by the accompanying engraving.

The tap of a barrel containing liquid to be raised, is connected one end of a flexible tube, the other end of which is connected to a back pressure valve, communicating with the upper part of a chamber, E. This chamber is made in halves, and a diaphragm, *f*, of flexible material is placed between the two halves, which are then bolted together. The diaphragm effectually prevents any liquid in the upper part of the chamber from mingling with the water in the lower. The upper part of the chamber communicates through the valve, *g*, and pipe, *h*, with the tap, *i*. The lower part is fitted to a water chest, J, to which water is admitted through a three-way valve, *k*, and pipe from the cistern, *m*. The tap has a weighted lever, and to its lower part is screwed a waste pipe. To the lever is attached a cord, the other end of which is fastened to a treadle near the floor below the tap, *i*.



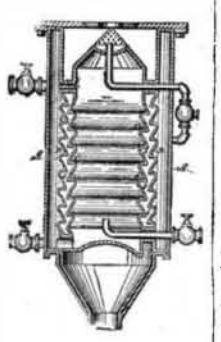
The liquid to be raised flows through the flexible tube and back pressure valve into the chamber, E, forcing the diaphragm, *f*, into the position shown in the engraving. When the liquid is to be drawn the tap, *i*, is opened, the treadle is operated so as to turn the three-way tap, and water is admitted into the lower part of the chamber, E, the pressure of the water forcing up the diaphragm, and the back pressure valve preventing the liquid from flowing back to the vessel, it is forced through the pipe, *h*, to the tap, *i*.

When sufficient liquid is drawn the treadle is released, the weighted lever turning the three-way valve, shutting off the water from the chamber, E, and allowing it to escape at the waste pipe.

A Wheat Steamer and Heater.

In the manufacture of flour of fine grade the great desideratum is to remove the hull of the wheat as completely as possible. In order to do this it has been found most expedient to toughen the hull so that it may be removed in comparatively large pieces. A device lately patented by Mr. Cyrus T. Hanna, of Pittsburg, Allegheny county, Pa., and shown in the accompanying engraving, seems admirably adapted to do this work.

A is an outside cylinder, and B C are inside cylinders of an apparatus for steaming and heating wheat for the purpose of toughening and expanding the hull preparatory to grinding. A pipe conducts steam into the center of the cylinder, C, from which it passes through tubes into the annular space between the cylinders, A B, insuring an even heat in both the inner and outer cylinders. The grain enters the apparatus at its top and passes through the annular space surrounding the inner cylinder, C, thus passing between two metal surfaces which are evenly heated. As a consequence the grain also becomes heated before reaching the conical discharge end of the apparatus. The grain is deflected alternately in opposite directions by circumferential corrugations, whose upper sides are long and inclined and undersides are short and abrupt, and alternate in positions, so that the wheat will slide from one on to the other as it descends through the apparatus.

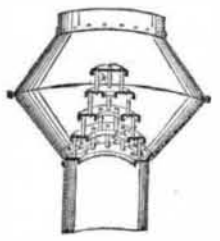


The wheat is first moistened by steam emitted from the perforated cone in the top of the device, and the hull is toughened, and the subsequent heating serves to dry out the surplus moisture and leave the hull expanded and in a condition to admit of its easy removal by the grinding stones.

Spark Arrester.

A novel spark arrester for locomotives, patented by Mr. George S. Cook, of Windsor, Nova Scotia, is very clearly shown in the engraving, which is a central vertical section of a smokestack containing the spark arrester.

As will be readily seen the device can be easily secured in smokestacks of ordinary construction, and easily removed for repairs or other purposes. The invention consists of a series of peculiarly shaped rings placed one above the other. The lower ring, A, is formed with a flange on its circumference, which is provided with holes for bolting or riveting it to the smokestack. The inner edge of this plate is formed with a downward flange, to form an annular chamber to collect the sparks on the under side of the plate.



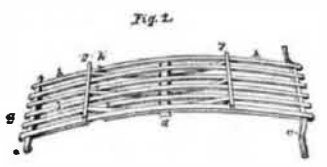
Supported by and above this ring there is an annular plate of smaller diameter, formed with outside and inside downward flanges. Above this plate and supported by posts is another similar plate, only smaller in diameter, and above this is still another of similar description, but still smaller. Above this last plate there is a solid plate formed with a downward flange on its circumference, which is placed above the central passage formed by the central openings through the rings, and arrests the sparks that pass the annular rings.

By this construction all the sparks are arrested and deflected back into the stack, while plenty of room is given for smoke, steam, and draught.

An Improved Stiffening Frame for Buckboard Wagons.

An improved buckboard for wagons is patented by Messrs. Israel Joubert and Sydney W. Yattau, of Port Henry, Essex county, N. Y., and is clearly shown in the annexed drawing.

This is a buckboard of the usual construction, composed of a series of parallel and upwardly curved spring slats, having openings between them and secured to transverse end bars and a middle cross bar. The transverse bars are secured to the fore and hind axles of a wagon, and the buckboard serves as a reach for connecting the axles and as a spring. An improved stiffening frame, composed of a series of parallel wooden slats that are curved downwardly or in an opposite direction to the spring slats of the buckboard, are secured at their ends to transverse bars to which the bottom of a wagon body is secured. The spring slats of the stiffening bar are inserted in the openings between the slats of the buckboard, and they are secured at their middles by the middle transverse bar of the buckboard, while the transverse bars of the stiffening frame rest on the slats of the buckboard.

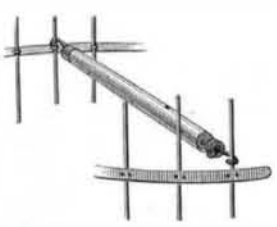


This construction materially strengthens and stiffens the spring of the buckboard and renders it more durable, and the wagon body can be elevated as desired by shortening the stiffening frame.

A New Bird Cage Perch.

Mr. Joseph Bagot, of Brooklyn, N. Y., has invented an improvement in perches for bird cages. The perch is formed of rubber, and has hooks attached to its ends for fastening the perch between the wires of the cage. Ferrules are placed upon the ends of the perch and catches inserted in the ends; by this construction the perch and catches are firmly connected. The catches have hook-shaped outer ends and wedge-shaped inner ends.

In the engraving shown, A is the rubber perch, of suitable diameter, preferably of tubular form, and of such length as the size of the cage may require. Upon the ends of the perch are placed ferrules, also catches, to engage with the bars of the cage. These catches are extended inside the ends of the perch and are made wedge-shaped, the small end of the wedge toward the catch.



The manner of uniting the perch and catch is so well shown in the accompanying engraving that it needs no further explanation.

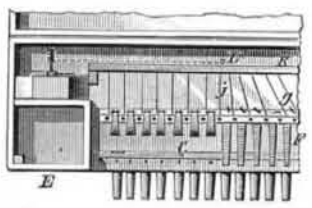
The perch should be made of such length that when applied to the cage the tension will prevent its sagging by the weight of the bird. This perch has important advantages over the ordinary perch, as any parasite that may infest the birds will crawl into the interior of the hollow perch and can be readily destroyed. The perches are easily removed and cleaned, and being soft do not injure the feet of the birds. The elasticity of the rubber allows the perches to be stretched so that they can be applied to different sized cages.

A Novel Automatic Alarm Signal.

A novel alarm operated automatically, to give a series of explosions at stated intervals of time, is patented by Hiram A. Eaton, of Manchester, Kennebec county, Me. The construction of the signal is shown in the accompanying cut.

In a box, E, there is a series of barrels that load at the muzzles and are discharged by means of percussion caps. They are secured in a cast metal breech block that is formed

with a series of nipples upon which caps are placed for explosion, the nipples being perforated to conduct the flame from the cap to the powder in the barrels. The block is so attached to the hinged board, C, that the barrels may be tipped up entirely within the box, which position they will occupy when not in use. When in use the barrels are tipped down, so that the muzzles will project out of the box, and the nipples are in position to be struck by the springs, F, formed on their under side with projections that act as exploders for the caps. These springs are clamped at their rear end to the board, C, and may be bent upward and backward to be held and released by proper devices.



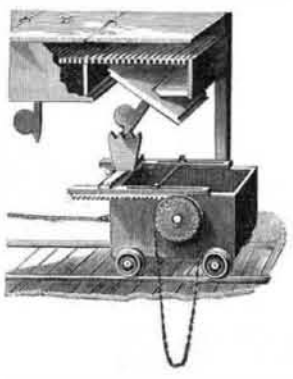
When they are cocked they are held in that position by the linked wires, *g*, and the pivoted arms, *j*, the wires being of such length that they will be retained under the rods, *j*, when they are at right angles with the wires, but will be released when the rods are moved to a greater angle, and thus the springs are released. The moving the rods for the release of the wires is accomplished by the waveling block, L, fitted in suitable ways, formed in the slotted plate, K. The block is moved by the clock, M, attached to it by a cord passing over the spindle, *l*, which is turned by the hour post of the clock. Attached to the spindle, *l*, is a cord and weight, which, when the traveling block is carried to the end of the slotted plate, will be wound up to assist in returning it.

The explosions will occur at regulated intervals, which may be varied by increasing or decreasing the speed of the spindle, and the device may be used as a fog or other signal, and is especially useful in frightening away mischievous birds from corn and rice fields, and requires no attention except to wind the clock and charge the barrels.

Trunk for Cotton Openers.

A simple and novel device for cleaning the trunks in which the dust and sand are collected that drop from cotton as it passes from the opening machine to the picker, is shown in the accompanying engraving.

The trunk of this cotton opening machine has a grating, and its bottom is composed of a series of pivoted boards, which have on their under sides projections to which are attached weights, which keep the sections in a horizontal position. A car runs on tracks or rails below the trunk. A cam provided on its outer end with a number of teeth is attached by a bar to two cogged end bars engaging with the cog wheels on the end of the shaft. A sprocket wheel is mounted on the shaft, and a chain passes over the wheel down to the floor of the room in which the trunk is located.

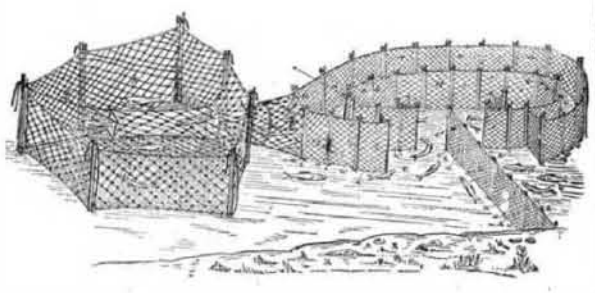


When the cotton passes through the trunk the sand and dust fall through the grating upon the tilting sections and accumulate. The car is drawn forward, causing the cam to strike the projection on the under side of the section, causing it to tilt, the sand and dust sliding down the section into the car. As the cam is toothed it will vibrate the sections, causing the sand and dust to slide off more rapidly. To prevent the dirt from accumulating at one end of the car the cam may be adjusted to different positions by rotating the sprocket wheel by means of the chain moving the racks and cam forward or backward more or less.

The patentees of this device are Messrs. Patrick Rowe and James M. Scanlan, of Lowell, Middlesex county, Mass.

An Improved Fish Trap.

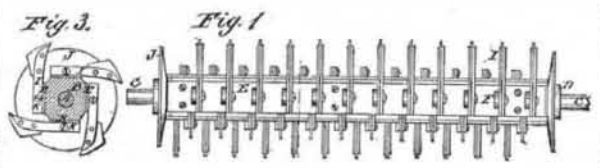
In the accompanying engraving is shown a new fish trap patented by Mr. Major B. Marshall, of Vienna, Dorchester county, Md. This trap is formed by driving a series of stationary poles in the bed of a stream near one of its banks,



so as to form an outline, preferably of spear-head shape, two concentric oblong figures provided with openings in their sides, lying opposite each other, and a wing leading from the bank of the stream to the openings, as shown in the engraving. Alongside and parallel to these stationary poles is set a series of runner poles in the bed of the stream. A net, closed at its sides and bottom and conforming to the form of the spear head, is provided at each of its angles, at the bottom of the net, with cords, *l*, which pass through holes in each of the runner poles near the bottom of the pole. The cords are then passed upward and secured to the stationary poles. The upper edge of the net is also secured to the stationary poles. By this construction the net can be drawn down into position by the cords, and when it becomes filled with fish the cords may be unlashed from the stationary posts and the net raised and the fish removed. The outer oblong figure formed by the stationary and runner poles is inclosed on its outer side by a net secured at its upper edge to the stationary poles, and at its lower edge to the runner poles. By the peculiar form of the oblong nets, and by the leader placed from these nets to the shore, the fish in the stream are turned into a series of channels that lead into the spear-head shaped net through a netted funnel which passes through an opening in the end toward the oblong nets.

An Improved Cylinder for Hominy Mills.

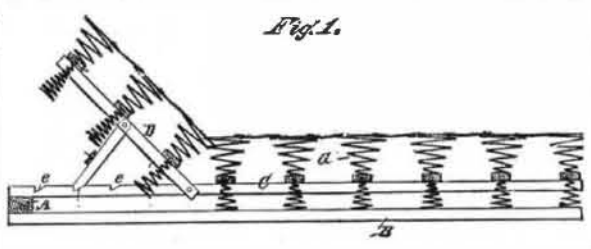
Mr. Theodore Hudnut, of Terre Haute, Vigo county, Ind., has patented an improved form of cutter carrying cylinder shafts, and modes of attaching cutters thereto, of which the accompanying engraving is an illustration. An iron or steel shaft, of suitable length and size for the purpose, has fitted upon it a wood shaft that is as much shorter than the iron shaft as is necessary to have the latter project to form journals, upon which it revolves and to receive gearing for turning it. The wood shaft is secured to the iron by means of collars at its ends that are keyed to the iron shaft and bolted to the wood, and has four or more plain sides, each side having a metal plate attached to it. These plates have lugs at intervals of the same distance apart it is required to have



the cutters, and are arranged transversely to the plates, and the lugs of one row are placed in such relation to those of the next row that they form broken spirals around the shaft. The cutters are steel plates the inner points of whose cutting edges project over a true circle struck from the center of the shaft, are bolted to arms between them, and the arms are bolted to the lugs on plates of the shaft, being laid across said plates, so that they are confined against turning on the bolts by the plates. The collars of the shafts have broad plano-convex plates attached that keep the grain away from the bearings and in contact with the cutters.

A Jointed Spring Bed.

Mr. Clinton S. Colgrove, of Winchester, Franklin county, Tenn., has patented an improvement in spring beds, of which the annexed engraving is an illustration. The frame is composed of end crossbars, A, at head and foot, side bars, B, and intermediate bars that are secured at their ends upon the upper side of the crossbars, A, the side bars, B, being secured to the under side of the same. At the head of the frame the intermediate bars, C, are formed with the notches, *e*, and to the outside of these bars are hinged arms, D, that are provided with hinged pawls, the lower ends of which engage in the notches, *e*, of the intermediate bars, for raising and supporting the head of the bed bottom. These

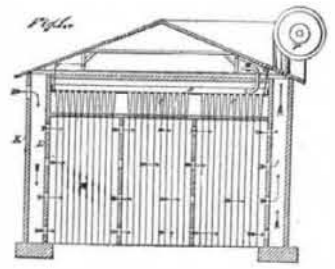


pawls are connected by a cross-piece to cause them to act together, as one pawl or brace. Across the bars, C, and the arms, D, are placed slats upon which the coiled cone springs, G, are placed. Between the ends of the slats and the side bars, B, are placed the series of side bottom springs which support the ends of the plate. After the coil springs, G, are secured upon the slats of the bed bottom, they are coupled together by wires which are bent to form a square and to interlace with the upper coils in such manner that four coils are bound together by each of the squares, which are united to the coils by twisting in the ordinary manner, making an effective, easily applied, cheap, and firm coupling. By means of the arms, D, and their pawls, the head portion of the bed bottom can be easily raised to any height to suit the occupant, or may be lowered on a level with the main portion, thus providing a bed bottom that is very complete and cheap.

Improved Ice House.

An ice house capable of freezing large blocks of ice without the use of artificially cooled air in the house itself, is patented by Arthur von Krause and Mathias Kuhnen, of Blauveltville, Rockland county, N. Y.

The device is illustrated by the accompanying engraving, in which is shown an ice house constructed with a water tank, B, in its upper part, the tank being provided with a series of slender downward projecting funnels, the centers of which are separated from eight to twelve inches each way. The lower ends of the funnels fit in apertures, in a horizontal partition arranged a short distance below the tank, and forming the top of the ice chamber, E. From each funnel a wire extends down to the bottom of the ice chamber, being supported by the funnels. The house is constructed with outer and inner walls, K, L, an air space being formed between them. The wall, K, has an opening near its top, and L has a series of openings from top to bottom. A suction fan, P, is provided to draw the air out from the building.



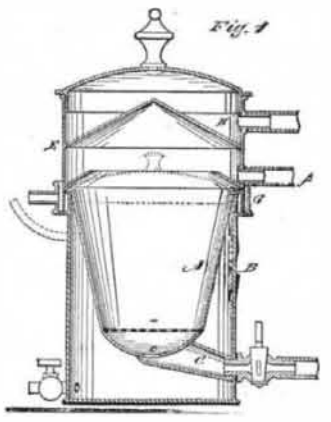
When the fan is operated it will draw the air out of the air chamber, E, and fresh cool air will enter through the openings, K, L, in the walls, circulating through the ice chamber. Water from the tank will flow through the funnels, only sufficient being admitted to the tank to cause the water to flow down the wires in thin layers. The cold air circulating in the chamber causes the water on the wires to congeal, and the layers gradually thicken until the space between them is filled. A solid block of ice eight feet square has been formed in this manner at 34° Fahrenheit.

Combined Percolator and Still.

The accompanying engraving shows a central vertical section of an improved combined percolator and still, which is the invention of Mr. Byron Fennor, of Westfield, Chautauqua County, N. Y., who has recently received letters patent for it.

It is often a great convenience for persons who are obliged to distill and make decoctions to have an apparatus that is not complicated that may be used for either purpose and still be effectual. The device shown is of this kind.

The percolator, A, in which is placed the material from which the strength is to be obtained, is cone shaped, and formed at the upper edge with a flange, by which it is suspended in the heating tank, B. The bottom of the percolator has an opening which communicates with the lateral tube, C. This tube registers with a hole in the tank, and a flanged stop cock is screwed into the end of it, which serves to keep the percolator in place, and make a tight joint over the hole in the tank.



A perforated diaphragm is placed in the bottom of the percolator which prevents the materials used from obstructing the flow of the menstruum from the bottom.

The still attachment, E, is of larger diameter than the tank, and when in place the bottom of it rests in the annular chamber which surrounds the top of the tank, and should be filled with water when the still is used to seal the joint between the two parts of the apparatus.

A short distance above the lower edge of the still attachment a cone-shaped flange is attached, which forms an annular gutter around the inside of the still, and conducts the distillate which flows from the condenser to the pipe, *f*.

The condenser is formed by securing a conical partition below the upper edge of the still and forming the receptacle, H, in which there is water or ice, and by which the vapors that arise from the percolator are condensed and flow into the gutter and out of the pipe, *f*.

When the device is used for any purpose where heat should be maintained, water is admitted to the tank, B, through the pipe, *f*, and heat applied to the tank, being communicated to the percolator only through the medium of the water.

When the still is removed a cover, shown by dotted lines, may be used.

While this invention is here shown as adapted to pharmaceutical uses, it is obvious that it may be built upon a large scale and used for other purposes.

A hair-pin which, when inserted in the hair, will so grasp and hold the lock or mass of hair inclosed within the prongs that the hair-pin will not be liable to drop or work out from the hair, has been patented by Mary T. Foote, of Boston, Mass. The ends of the hair-pin are first bent out and then in toward each other, so as to form at the point a clasp which seizes and holds a lock of hair, and the exterior shoulders of which bent portion also prevent the pin from slipping out.

Mr. Thomas A. Andrews, of Seagoville, Texas, has patented an improved coffee and spice mill. The invention consists in a coffee and spice mill having a hopper provided with arms for attaching the mill to a wall and for supporting the gear-wheel formed upon it, an inner cone-burr formed solid with the hopper, an outer shell-burr suspended from and swiveled to the inner burr by a cross-bar, rod, and handnut, and the gear-wheels and crank for rotating the outer burr