

forehead rises a spiral tube, nearly three inches long. It is jet black, dotted all over with small white feathers. It has a communication with the palate, and when filled with air looks like a spire; when empty, it becomes pendulous. His note is loud and clear, like the sound of a bell, and may be heard at the distance of three miles. In the midst of Brazil's extensive wilds, almost out of gun reach, you will see the *campanero*. No sound or song from any of the winged inhabitants of the forest, not even the clearly pronounced "Whip-poor-Will" from the goatsucker, causes such astonishment as the toll of the *campanero*.

With many of the feathered race he pays the common tribute of a morning and evening song; and even when the meridian sun has shut in silence the mouths of almost the whole of animated nature, the *campanero* still cheers the forest. You hear his toll, and then a pause for a minute, then another toll, and then a pause again, and then a toll, and again a pause. Then he is silent for six or eight minutes, and then another toll, and so on. "Actæon would stop in the mid-chase," says Waterton, "Maria would defer her evening song, and Orpheus himself would drop his lute to listen to him, so sweet, so novel, and so romantic is the toll of the pretty snow-white *campanero*. He is never seen to feed with the other *cotingas*, nor is it known in what part of Guiana he makes his nest."

The second specimen is a relative of the bell bird, and is known to ornithologists as the *cotinga cincta*. Of these, in their natural state, even less is known than of the bell birds. The *cotingas* are distinguished by the brilliancy of the coloration of the males. In the species at present under notice, the under parts are of a deep plum color, while the upper parts, with the band or cinctus across the breast, are of a magnificent ultramarine blue. In size this *cotinga* equals a blackbird. Their food consists of fruits, which their wide gape enables them to swallow with ease. Like their allies the bell birds, they are solitary in their habits, keeping to the topmost branches of trees, and generally residing in the dense forest, though at times they approach the cultivated grounds in search of their food.

#### Useful Recipes for the Shop, the Household, and the Farm.

According to Niedling, a beautiful orange-yellow tone, much admired in a chest at the Vienna Exhibition, may be imparted to oak wood by rubbing it in a warm room with a certain mixture until it acquires a dull polish, and then coating it, after an hour, with thin polish, and repeating the coating of polish to improve the depth and brilliancy of the tone. The ingredients for the rubbing mixture are about 3 ozs. tallow,  $\frac{1}{2}$  oz. wax, and 1 pint turpentine, mixed by heating together and stirring.

The following is said to be all there is of the cook's secret for producing those world-renowned potatoes served at Moon's Lake House, Saratoga Springs, every summer: Peel good-sized potatoes, and slice them as evenly as possible; drop them into ice water. Have a kettle of lard, as for fried cakes, and very hot. Put a few at a time into a towel, shake them about to dry them, and then drop into the hot lard. Stir them occasionally; and when of a light brown, take them out with a skimmer. If properly done, they will not be at all greasy, but crisp without, and mealy within.

A French journal says that, of the score of fireproof compositions that have been brought forward within as many years past, there is scarcely one that possesses superior or even equal adaptation, to the purpose, to the following: Dissolve, in cold water, as much pearl ash as it is capable of holding in solution, and wash or daub with it all the boards, wainscoting, timber, etc.; then, diluting the same liquid with a little water, add to it such a portion of fine yellow clay as will make the mixture of the consistence of common paint, and then stir in a small quantity of paperhangers' flour paste to combine both the other substances. Give three coats of this mixture, and, when dry, apply the following composition: Put into a pot equal quantities of finely pulverized iron filings, brickdust, and ashes, pour over them size or glue water, set the whole near a fire, and, when warm, stir them well together. With this liquid composition, or size, give one coat, and, on its getting dry, give a second coat. It resists fire for five hours, and prevents the wood from ever bursting into flames; that is, it so resists the ravages of fire as, at most, only to be reduced to coals or embers, without spreading the conflagration by additional flames. It is found that a quantity equal to twenty pounds of finely sifted yellow clay, a pound and a half of flour for making the paste, and one pound of pearl ash is sufficient to prepare a square rood of deal boards.

Mr. James Hinton, in his "Physiology," affirms that the passage of the ear does not require cleaning by us. Nature undertakes that task, and in the healthy state fulfils it perfectly. Her means for cleansing the ear is the wax, which dries up into thin scales, and peels off and falls away imperceptibly. In health the passage of the ear is never dirty, but an attempt to clean it will infallibly make it so. Washing the ear out with soap and water is bad; it keeps the wax moist when it ought to become dry and scaly, and makes it absorb dust. But the most hurtful thing is the introduction of the corner of a towel screwed up, and twisted around. This proceeding irritates the passage and presses down the wax and flakes of skin upon the membrane of the tympanum, producing pain and inflammation and deafness. Washing should only extend to the outer surface, as far as the finger can reach.

An ink composed of copper 1 part, dissolved in 10 parts nitric acid, 10 parts water being afterwards added, is useful for marking on tin or zinc plant labels.

A simple mode of keeping butter in warm weather is to set over the dish containing it a large flower pot or unglazed earthenware crock, inverted. Wrap a wet cloth around the covering vessel, and place the whole where there is a draft of air.

Rats detest chloride of lime and coal tar.

White horn buttons may be made to imitate mother-of-pearl by being boiled in a saturated solution of sugar of lead and then laid in very dilute hydrochloric acid.

The following is a simple way of obtaining copies of writing without the use of a copying press: Mix white sugar with the ink,  $1\frac{1}{2}$  drams sugar to 1 oz ink. Use this with an ordinary pen, and place over the writing a moistened sheet of unsized paper. Lay both leaves between two layers of carpet; put the whole under a piece of board large enough to cover. Then stand on the board for a few seconds. An excellent impression will be found on the copying paper.

To extract rust from steel, immerse the article to be cleaned in a solution of  $\frac{1}{2}$  oz. cyanide of potassium to a wine glass full of water until the dirt and rust disappear. Then clean by means of a tooth brush with a paste composed of cyanide of potassium, Castile soap, whitening, and water.

Awnings can be rendered waterproof by plunging the fabric into a solution containing 20 per cent of soap, and afterwards into another solution containing the same percentage of sulphate of copper. Wash, and the operation is finished.

The best pine wood evaporates 5 lbs. of water per lb. wood consumed in a steam boiler furnace. One cord of wood can be consumed per hour on 60 square feet of grate. One pound carbon burnt to carbonic acid requires the oxygen of 153 cubic feet of atmospheric air.

Iron filings in a weak solution of sal ammoniac, mixed with Portland cement, are said to double the strength of the latter.

The following compounds are useful for soldering or tinning: Tin, 1 part muriatic acid with as much zinc as it will dissolve; add 2 parts water and some sal ammoniac. Brass and copper, 1 lb. muriatic acid, 4 ozs. zinc, 5 ozs. sal ammoniac. Zinc, 1 lb. muriatic acid, 2 ozs. sal ammoniac with all the zinc it will dissolve, and 3 pints of water. Iron, 1 lb. muriatic acid, 6 ozs. sperm tallow, 4 ozs. sal ammoniac. Gold and silver, 1 lb. muriatic acid, 8 ozs. sperm tallow, and 8 ozs. sal ammoniac.

For silvering metals, 10 parts nitrate of silver, 10 parts common salt, and 30 parts cream of tartar may be used. Moisten the powder with water when ready to apply.

#### Hardening Glass.

This is a process that has been patented by Mr. Macintosh, of Westminster, a civil engineer who has devoted much time and attention to the hardening of iron, steel, and alloys. Starting on the broad ground that, the lower the degree of temperature of the liquid in which certain heated bodies were plunged, the harder such bodies became, Mr. Macintosh has found that glass, graphite, uncrystallized carbon, slag, and other analogous substances may be rendered exceedingly hard by means which are usually indicated for metals. Colored glass may, by this treatment, be rendered so hard as to be effectively used as a substitute for gems, and, what is curious, may be pulverized and used in the same way as diamond dust or emery powder.

In hardening the substance, the method pursued by the patentee is to place a small quantity of fused or nearly fused clear or colored glass in iron or other molds to shape the glass, and the substance is taken out of the molds and placed in platinum molds, and fused or nearly fused, and suddenly deprived of its caloric by frigorific mixtures of iced water and salt, or any of the freezing compounds that produce extreme cold; the sum and substance of which is that the glass is heated to a very high degree of temperature and then rapidly cooled in a very frigid fluid. A startling statement is made by Mr. Macintosh when he asserts that, when the component parts of gems are treated by the above process, he is enabled to produce thereby fictitious gems even harder than real diamonds.

#### Velocity of Light.

Professor Cornu, of the *Ecole Polytechnique*, Paris, has put into successful use a new instrument for measuring the velocity of light between two stations, in which an electrical registering apparatus is used, giving, it is believed, more accurate measurements than the well known toothed wheel arrangement of Fizeau. Foucault fixed the velocity of light, by his instrument, at 185,157 miles per second. Professor Cornu, by his new instrument, fixes the velocity of light at 186,660 miles per second, or 1,503 miles faster per second than Foucault.

#### An Engineer on Boilers.

"Then there's the boiler; that takes a heap of watching all the time. We have steam enough ordinarily, might say, when we don't want it; but there are times when we can't get it to save our souls; no more than enough to get along with. She fires hard. I never saw a boat yet that had too much boiler; nor no other man. Yet tell the owners that, or the makers of the engines, and they will say: 'Oh, big boilers take up too much room;' and then they go and put in a little kettle with not enough fire surface in it, and burn coal enough in a year to pay for a decent boiler. The best made boilers in the world will bear a heap of watching. You know the engine pumps water into them all the while to keep up the supply. Well, the pumps will work all right for months at a time; first thing you know of, sometimes when you are in trouble about other things, the pumps will stop working, and you can't get a drop of water in her to

save you, then you have got to look sharp. What makes it act so? What makes everything go wrong in this world? That's what I want to know; when it's once set right, it ought to go right, but it don't. Sometimes the check valves get held up, and the water don't go down in the boiler at all, but just surges back and forth from the pump pressure and the boiler pressure alternately; sometimes dirt gets under them, chips and things; then, again, joints will blow out in the band hole plates, and make a heap of trouble. No matter how trifling a thing is to us, it is sure to make a disturbance with the passengers, and that's what we have to avoid as much as possible, for they are easily scared."—*New York Sun*.

#### The Coke-Manganese Galvanic Cell.

The well-known Leclanché's cell is now in use for many purposes, giving a very constant current, but which, however, is much decreased by the resistance of the tar covering the top of the porous cell, and by the decomposition of the manganese dioxide, which is transformed during the action of the cell into oxide; the latter oxide closes the pores of the cell. Sergius Kern's cell is a modification of Leclanché's one, and the experiments proved it to act very constantly.

Two parts of cleanly washed coke, and one part of manganese dioxide in the state of powder, are well mixed together with a small quantity of water acidulated with some drops of nitric acid; the mixture then is strongly pressed into brown paper cartridges 5 inches high and  $1\frac{1}{4}$  inches diameter. The resulting coke-manganese cylinders are dried in a warm place, but not over a fire, because the heat, as it is known, decomposes the manganese dioxide.

The dried cylinders are placed in glass jars containing concentrated solution of ammonium chloride, and surrounded with zinc plates curved in the usual manner. By this arrangement the use of porous cells is avoided, and a battery of such elements acts more constantly; besides this, the construction of it is cheaper. Instead of having glass jars, Kern uses wooden boxes, the size of the glass jars; the internal parts of the boxes are covered with the following mixture, melted in an iron cup:—2 parts of wax, 10 parts of common resin (colophony), 2 parts of red lead, and  $\frac{1}{2}$  part of gypsum.

The zinc of the element is the negative pole; the coke, the positive pole.

#### Recent American and Foreign Patents.

##### Improved Steam Boiler Furnace.

Walter Dawson and James Hughes, Scranton, Pa.—This invention consists in the formation of the side sheets of the furnace to protect the corner joints and flanges from the intense heat of the fire. In ordinary boilers, the side sheets, which lap on to the flanges of the front and tube sheets, are straight sheets, which leave the flanges and rivets exposed to the full heat of the fire. The furnace consequently fails at the corners from the heat and corrosion caused by the increased thickness of iron at those points. The object of the improvement is to prevent this, and to make the corner joints as durable as any portion of the furnace; and for this purpose the side sheets bulge inward throughout the entire width, where the central portion of the sheet is on the same plane as the joints, with bulges adjacent to the flanges to protect the joints. By this means the joints are protected from the intense heat of the fire, and are preserved and rendered as durable as any part of the furnace.

##### Improved Mechanical Movement.

James R. Devor, Goshen, Ind.—This invention relates to a new mechanical device, by means of which belt pulleys, cogged gearing, and other mechanisms may be made to run on shafts which are not parallel to each other. Balls are fastened tightly on the shafts. A portion of the ball sockets consists in two disks, having each a broad slot through which the shaft passes. These slots allow the shaft to turn in either direction. The inside pulleys form the box, and are made concave to fit the ball, having flanges which lap on the disks. The pulley is carried or revolved by the pins through the pulley, and the slots in the ball on opposite sides. Attached to the disks on each or opposite sides of the ball are yokes connected together by a rod, which support the belt guide. The spaces inside the disks are for allowing the box lateral play on the ball.

##### Improved Construction of Watch Movements.

James H. Flynt, Duluth, Minn.—This is a watch movement in which motion is communicated from the mainspring barrel to the escapement wheel through a single pinion and wheel, said wheel being of nearly the circumference of the pillar plate, and arranged between the face and the pillar plate.

##### Improved Milk Cooler.

Henry S. Murray, Andes, N. Y.—The outlet tube consists of an annular socket with a shoulder, which is soldered around a bottom perforation of the milk pan, and seated on a circumferential collar of an exit tube of the tank. A top flange of the exit tube extends into the socket, forming, in connection with the shoulder of the socket, the seat for the circumferential flange of a short tube, which screws into the threaded part of the exit tube so as to bind the socket, exit tube, and connecting tube firmly together. Intermediate packing rings produce the water and milk tight connection of the pan and tank, so that the milk may be drawn off without leaking, or mixing with water from the tank. A screw cap is screwed into the binding tube of the faucet, for closing (the same, in the same manner as in the water exit tube, and retained until it is necessary to draw off the milk, in which case the screw cap or plug is withdrawn.

##### Improved Seed Sower.

John W. Talley, Paxton, Ill., assignor to himself and Thomas W. Buell, of same place.—The invention consists of a vertical lever for working the slide, which is moved in one direction by a vertical lever at the end of the roller, so as to be operated by tappets thereon. It is connected to the slide lever by a rope going around a guide pulley at one corner of the machine. In the other direction the slide lever is worked by a spring, which is forced as the tappets escape from the lever. A stop cord is connected to the tappet lever to prevent the spring from throwing it and the slide lever too far. The machine is designed for sowing grass, flax, and other small seeds, and will generally be used with a roller for smoothing the ground at the same time; but it may be used with wheels.

##### Improved Milking Tube.

Sylvester A. Smith, Muscatine county, Iowa.—His invention consists in a tube provided with a grooved head in which is a slide valve, while the body is tapered to an open end that enters the teat and udder of the cow.

**Improved Hod Elevator.**

William Murphy, New York city.—This invention consists in rods attached to the framework of the elevator in such position as to be over the inner part of the side bars of the base of said elevator frame. These receive hooks attached to the handles of the hods. Hooks are attached to said handles to adapt the hods to be hung upon and supported by the rods attached to the frame work of the elevator.

**Improved Mode of Inlaying Jet with Metal.**

William Stephens, New York city.—This invention consists in a mode of inlaying jet with metal, by burning a recess of the proper size and form in the jet, by means of a recessed die and a sheet metal guard plate. In this way pieces of metal of any desired form, no matter how irregular or complex, may be easily and quickly inlaid in jet, and the work may be done without danger of cracking or chipping the jet. When the pieces are large, pins may also be applied to their ends to assist in securing them in place.

**Improved Cloth-Measuring Machine.**

Joseph S. Gold, Washington C. H., Ohio.—The cloth roll is turned by the cloth, which is drawn through the machine by winding it on cloth rollers with a crank, and the cloth is pressed on the cloth roll by a roll with sufficient force to cause it to turn the machine. A tape shows, by the marks upon it, the measure of the cloth.

**Improved Gang Plow.**

Thomas M. Nichol, Sparta, Ill.—By suitable construction, by operating levers, the axes may be adjusted to cause the machine to run level upon sliding ground, or when one of the wheels is running in a furrow. The points of attachment of the plow beams may be raised and lowered to adjust the plows to run deeper or shallower in the ground, as may be required. This manner of attaching the plow beams allows their rear parts to have a free vertical movement. The plows are held at the same distance apart, and each plow may be allowed to rise independently of the other.

**Improved Reversing Pulley or Gear Wheel.**

Henry W. Sherrill, New York city.—This invention relates to an improvement in pulleys or gear wheels, whereby the same pulley or gear is used for reversing the motion of the shaft or arbor. The advantages of the arrangement are found in the small space occupied by the single pulley or gear, and in a single belt to serve in the place of a number of belts and pulleys for producing the same effect, and in the facility with which a greater speed can be obtained in the reverse motion.

**Improved Twister for Making Thread, Twine, etc.**

Lavancia M. Sutherland, Catskill, and Thomas Groves, Brooklyn, N. Y., administrators of James Sutherland, deceased.—This invention consists of a slitted bent pipe, binged or jointed to a water pipe, and interposed between the fliers and the tension rollers for wetting the strands while being twisted; also the combination of the cock of the water pipe that supplies water to wet the strands, with the ordinary belt shifter of the machine, so that the flow of the water through said pipe may be stopped and started, and by the same operation.

**Improved Locking Device for Machinery.**

Timothy D. Marsh and Franklin M. Crane, Jersey, Ohio.—A hub on the shaft carries a slotted arm which receives the pin of a reversing lever connected with the hub. Extending in opposite directions from it are two loose arms, the outer ends of which are fitted into slots of two friction shoes. In the cap plate are two pins for each of the arms, arranged to give the arms a little play and allow the shoes to bind against the frictional surface and hub. In reversing the action of the device, a lever is moved, by means of a pin, from one side to the other of the stud on the cap plate. When the lever is moved over the stud, the action is reversed; and when the lever is left on the stud, the arms bind when the shaft is turned in either direction and prevent all motion, from the fact that, when the shaft is turned either way, the movement of the square hub causes the arms to bind and the shoes to catch against the frictional surface.

**Improved Wagon Jack.**

William Henry Horn, Santa Cruz, Cal.—In using the jack a lever is turned up to lower the bar to its lowest position. A block is then adjusted to the height of the axle to be raised, and the jack is adjusted to bring the block beneath said axle. The lever is then turned down to rest upon a stop. This movement raises the bar and block raising the axle. As the lever is lowered, a loop or link passes back of the axis of the hinge of the said lever, and the various parts of the jack are locked, supporting the axle in its raised position.

**Improved Nursery Chair.**

Calvin A. Watson, New York city.—This is a nursery chair constructed of a seat board with central aperture, supported on hinged legs, and provided with hinged side boards held open by a removable brace piece. It may be readily folded into a small compass for packing, etc.

**Improved Draft Equalizer.**

William Snow, Waverly, Ill., assignor to himself and Joseph H. Challen, same place.—This is a draft equalizer, formed by connecting a single tree directly to a double tree by means of a clevis, and with its ends projecting past the inner ends of the single trees, which form part of the double tree proper.

**Improved Steam Boiler Furnace.**

Walter Dawson and James Hughes, Scranton, Pa.—This invention relates to the fire boxes or furnaces of steam boilers, and consists in the formation of the side sheets of the furnace to protect the corner joints and flanges from the intense heat of the fire. The side sheets are bulged or projected inward.

**Improved Milk Cooler.**

Daniel Gurnsey, Watertown, N. Y.—This invention is intended to remedy the unequal distribution and cooling capacity of the water in ordinary milk coolers, which enters at one side and is gradually warmed up on its passage through the cooler, so that the temperature at one end of the pan, where the cool water enters, is considerably lower than at the other end. The uneven temperature of the milk retards the progress of raising the cream and decreases the yield of butter. The apparatus consists of devices for admitting the cool water simultaneously at the end and at central points of the bottom of the cooler, and drawing it off by suitable channels and regulating devices at the opposite end.

**Improved Refrigerator.**

August F. Bronner, New York city.—This invention consists of an ice box with double unfilled walls, of which the side walls are employed for conveying the ice water from the central and upper part to the bottom part, for utilizing the cooling effect on the air passing in the same direction. The drip water is conveyed by inclined troughs of the side walls to a front channel, and then through perforations of the same over the inclined bottom to the rear exit aperture.

**Improved Carbureting Gas Machine.**

Elon Foster, New York city.—This improved gas machine, for carbureting air or gas, is so constructed that it will operate equally well whether a large or small quantity of the hydrocarbon be in the tank. The air or gas is brought into contact with the hydrocarbon twice before it escapes through the outlet pipe.

**Improved Gas Burner for Heating Purposes.**

Anatole Ehret, San Francisco, Cal.—This consists of a chamber in the standard on which the burner is mounted, into which the gas pipe leading to the burner discharges, and into which there are air pipes entering from the base of the stand, so as to draw in an abundant supply of air to mix with the gas. The invention was described and illustrated on page 290 of our current volume.

**Improved Portable Toilet Waters and Extracts.**

A. Gibbs Campbell, Paterson, N. J.—This is a compound for the production of toilet waters or extracts by lixiviation with alcohol, the compound consisting of a mixture of carbonate of magnesia with one or more fragrant attars.

**Improved Pitman Connection for Pumps.**

James M. Langley, Double Bridges, Tenn., assignor of one third his right to James C. Sawyer, same place.—To the end of a piston rod is pivoted the end of a pitman, the other end of which is pivoted to the crank pin of the crank. To the pitman, at a little distance from the crank, is rigidly attached a short stud, to which is pivoted the end of another pitman. The outer end of the second pitman is pivoted to an arm rigidly attached to a rock shaft. To the rock shaft are attached one, two, or more cranks, to the pins of which are pivoted the ends of the piston rods of the pumps, so that the pumps may be operated by the rocking of the shaft.

**Improved Steam Pumping Engine.**

Charles H. Hudson, Chicago, Ill.—The valve is composed of three disks of like diameter, keyed on a stem. The steam which has acted on the piston and filled the cylinder space is allowed to act on the valve and move it into the alternate position necessary to cut off steam from the right hand end of the cylinder, and admit it, by the corresponding ports, to the left hand end of said cylinder, to move the piston in the reverse direction. Simultaneous with the above described action of the steam on the valve, it exhausts into the outer air. The regular exhaust from the cylinder into the valve chamber is always through the ports by which the steam entered the cylinder at the previous stroke of the piston. The openings between the passage and the valve chamber are closed alternately by the end disks forming part of the valve, the thickness of the disks exceeding the diameter of the openings, and the projecting ends of the valve stem governing the position of the valve, so that one of the disks always comes directly opposite, and thus covers, the nearest opening each time the valve is moved and comes to rest. By a suitable arrangement of water valves, the supplementary chamber, requisite in pumps whose valves close by gravity, is dispensed with, and space and material are economized.

**Improved Car Coupler.**

W. H. Adams, Mount Gilcat, Va.—This invention relates to automatic couplers where a spring catch is pushed aside by a link hook or arrow head, behind whose shoulders it then closes. The invention consists in four features of improvement whereby cars may be coupled and uncoupled with great facility, without complication or expensive mechanism, and is self-detachable when a car runs off the track.

**Improved Hydrant.**

James W. R. Fisher and William H. Fisher, Martinsburg, W. Va.—This invention consists of a case made in sections, a lever-held pipe, valve chamber, and chamber for the inlet pipe, together with an elastic cup, the whole so jointed together as to be readily separable without removing the inlet pipe chamber.

**Improved Furnace.**

Smith W. Kimble, Springfield, Ill.—This invention consists in connecting the combustion chamber and ash pit of a furnace by a throat, provided with a drop door, and also in flues that connect on one side of the combustion chamber, pass over it, and are attached on the other side to a pipe resting loosely in brackets.

**Improved Sash Fastener.**

Ira David Woolf, Oneonta, N. Y.—This consists of a spring bolt, which works through a hole in the sash and enters the casing, the bolt having a peculiar stop lug, which passes with the bolt through the slot in the plate. A spiral spring is attached to and surrounds the bolt, which spring bears against the plate and has a certain degree of tension, which serves to force the bolt inward with a constant pressure. When the bolt is withdrawn from the casing, the end of the stop lug may be made to rest on the outside of the plate by drawing the bolt downward, which renders the bolt inoperative. The bolt may be attached to either of the sashes of the window, and will hold them in any desired position, and fasten them so that they cannot be moved from the outside.

**Improved Magazine Fire Arm.**

Frederick M. Shinn, Leroy, Kan.—The gun has two magazines under the barrel, discharging into a revolving chambered cylinder, by which the cartridges behind the barrel are to be shoved out of the chambers of the cylinder into the barrel by a breech rod. When the breech rod is drawn back it pulls the shell back into the cylinder by its spring catch; and as soon as that takes place the ejector is forced up by a projection of the guard, which presses it up at the bottom. The ejector engages the shell under the rim of the base and lifts it out of the chamber of the cylinder. As soon as the shell has been lifted out, a pawl on the ejector engages the cylinder by a notch in the rear end, and turns it sufficiently to bring a cartridge into range with the barrel. Then the guard is pulled back and the breech rod thereby pushed forward to push the cartridge into the barrel. The ejector is at the same time pulled back by its spring, and the gun is then ready for firing again.

**Improved Horse Yoke.**

Rufus Stratton and George Olmsted, Hazardville, Conn.—The hames are fastened at the upper end by a screw, and have projecting ears, which are slotted horizontally to receive the outer ends of the yoke, where they are jointed by pins or screws. The yoke is made in two parts. Horizontal bars project from the side bows and lap past each other, and work on the draft pin, which pin passes through both bars. The ends of these bars play up and down to accommodate the position of the horses.

**Improved Umbrella Support for Vehicles.**

Alexander J. Hood, Warren, Ill.—This device is designed for supporting umbrellas in vehicles; and consists of a stand attached to the seat, having an adjustable grooved arm and band for holding the staff of the umbrella.

**Improved Clothes Pounder.**

Chauncey B. Hart, Fairport, N. Y., and George W. Hart, Medina, Mich.—This is a device for washing clothes by forcing the water out of them by atmospheric pressure, and then allowing them to be again saturated. There is a disk of wood or metal, to the outside of which is attached a handle. To the under side is attached the end of a coiled spring. The last coil at the other end of the spring is attached to a metallic ring. The head and the ring are also connected by a strip of canvas, the edges of which are attached to the edges of the said head and ring. In the head are formed holes which are covered by valves opening downward. In using the device, it is placed upon the clothes in a tub, and the head is forced downward by means of the handle. This compresses the air and forces it into and through the clothes, driving out the water. As the head is raised, the valves are opened by the pressure of the atmosphere, which enables the device to be raised and again operated upon some other part of the clothes.

**Improved Hat.**

John Case, Alexandria (Frenchtown P. O.), N. J.—This hat is composed of an outer conical portion attached to a hat of the ordinary shape, so that a space is left above the crown and at the sides between the two parts. The outer conical hat is supported on the crown of the inner hat, with its lower rim extending down to about a level with the brim of the inner hat. The two parts are joined or connected at the crown angle of the inner hat. The object is to leave an air space.

**Improved Horse Detacher.**

Amos Barker, Nebraska City, Neb.—This consists in the application, to the single trees, of an armed vibrating rod, operated by cord or chain, in connection with pivoted hooks for attachment of the traces. The traces are released by pulling a cord which withdraws curved arms for the pivoted half circle hooks. The neck yoke then moves forward upon the tongue, the cord will turn the rod, withdrawing the curved arms from the pivoted half circle hooks, and allowing the neck yoke to drop, and the horses will be entirely free from the vehicle.

**Improved Middlings Purifier.**

Simeon Crittenden and James Waters, Chatfield, Minn.—In the bottom of the hopper is placed a roller, which distributes the middlings and feeds them in a thin sheet to the bolt, which is hung in a slightly inclined position from the casing by pivoted arms. The bran escapes from the tail end of the bolt, and the flour passes through the bolt cloth and falls upon zigzag plates, the ends of which are inserted in grooves in the side bars of the frame, which last is agitated by a pitman. As the flour from the bolt falls upon the plates, it slides down upon said plates, passes through the narrow elits between their lower edges, and falls into the upper carrier trough. A number of plates are placed between the zigzag plates and the upper carrier trough. The upper edge of each successive plate rises above the preceding plate from the head end of the machine toward its tail end, to prevent the flour passing in that direction. In the head end of the machine, between the zigzag plates and the upper carrier trough, is placed a fan blower, the wind from which is discharged into the machine below the zigzag plates. The blast from the fan blower is directed upward by the inclined plates, and is divided by the graduated heights of said plates, so as to be about equally distributed from one end of the machine to the other.

**Improved Binding Attachment for Sewing Machines.**

Hamilton C. Jones, Brooklyn, N. Y.—This is an improved binding attachment to sewing machines, by which the binding is fed in an even and regular manner with the material to the presser foot and needle, so that the upper and under folds are simultaneously stitched to the goods, and the binding laid neatly in proper width on turning angles or abrupt circles. The invention consists of a spiral adjustable rear guide, and a double tapering front guide, with extension arm or tongue at the lower guide scroll for the under fold, and a serrated spring arm at the upper scroll for the upper fold for feeding the double folded binding and intermediate material to the presser foot and needle.

**Improved Butter Package.**

Henry R. Scott and Dennis W. Granger, Franklin, N. Y., assignors to themselves and Andrew J. Dibble, of same place.—The body of the package is made rectangular, with slightly flaring sides and ends. To the ends are attached short upright bars, which are flush with bars attached to the cover. Tenons formed upon the ends of the latter bars enter mortises on the upright bars. Spring catches enter holes in the edge of the cover, and thus lock the cover in place upon the box. In the catch holes are placed small sliding bolts, which, when pushed outward, push the catches outward, and thus release the cover.

**Improved Plaster Sower.**

Frank Charles Moder, Hortonville, Wis.—The box is provided with a crooked stirrer and reciprocating distributor, the one keeping the plaster thoroughly stirred up and the other sprinkling it over the plants.

**Improved Thill Loop.**

Frank S. Berry and George F. Alexander, New Sharon, Me.—This is an improved thill loop for single harness for supporting the thills, which is so constructed as not to wear the thills or their patent leather covering, when covered.

**Improved Table.**

Louis Postawka, Cambridgeport, Mass.—This is a fastening for table standard legs. The stand consists of a headed and end-threaded bolt, and a tubular filling, which is let into and adhesively secured to a socket.

**Improved Device for Forging File Blanks.**

Theodore L. Grover, Brooklyn, E. D., N. Y., assignor to Bertrand Clover, N. Y. city.—The dies are made with reduced or contracted parts for drawing the bars down to form the blanks. There are also smoothing faces for smoothing and finishing the wide sides, and a recess in the upper corner of the stationary die, in which to taper or otherwise shape edges or narrow sides or the tang.

**Improved Cultivator.**

Amos B. Colver, Albany, Oregon.—This invention consists mainly in the mode of raising and lowering the entire plow frame and attaching it to the wheel frame. When a main lever is lifted by the driver from a seat on the rear axle, the whole plow frame is acted upon by the connecting front and rear links, and lowered toward the ground for the work of the plows. By pressing the main lever down, the plow frame is raised to sufficient length above the ground.

**Improved Churn.**

Benjamin F. Price, Mount Sterling, Ill., assignor to himself and A. A. Hill, of same place.—A coupling enables the dasher shafts to move up and down in vertical lines while the upper ends of the connecting rods move through the arcs of circles. The dasher shafts pass down side by side through the churn cover. The dashers, which are placed the one directly above the other, are attached eccentrically to the lower ends of the shafts. In the dashers are formed a number of holes, which flare upward and downward from the central plane, so that more milk may enter said holes than can pass through freely, which subjects the milk to great friction, and brings the butter very quickly.

**Improved Lamp Burner.**

James Pigot, Brooklyn, N. Y.—A prolongation of the lower portion of the air tube, in the form of a flat partition plate, separates the flat portion of the wick tube into two parts. Springs are employed in connection with the partition and ratchets, for pressing the wick into the ratchets with uniform effect for thick and thin ones.

**Improved Car for Elevated Railways.**

Roy Stone, Vandalia, N. Y.—This is an improved car for that class of elevated railways which are constructed on three rails supported on a longitudinal girder stretched from column to column, the car being placed thereon in the nature of a saddle bag, with symmetrical parts at both sides of the girder. The car is surrounded by platforms, and provided with end and central staircases, to give ready access to all the seats.

**Combined Blotter, Paper Cutter, and Ruler.**

Frank R. Angell, Los Angeles, Cal.—This is a paper cutter rule having two cross slots at one end and a single cross slot at the other to admit of receiving blotting paper.