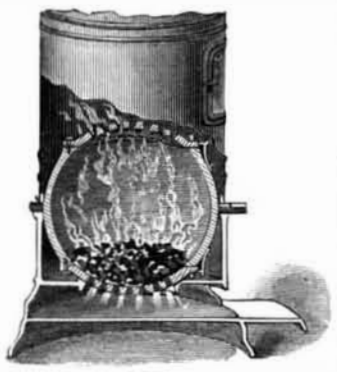
RECENT INVENTIONS.

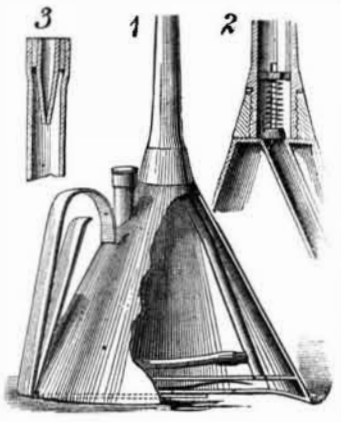
Novel Fire Box.

The engraving represents a reversible rotative fire box recently patented by Mr. C. K. Villas, of Alstead, N. H. This invention consists of a spherical or globe-shape chamber or box, provided with apertured or slotted covers covering opposite openings therein. The advantages claimed for it are the easy, clean, and economical method of freeing the fire box of ashes and clinkers, rocking the fire box to and fro with a crank generally being all that is required. By turning it over and over the coal will be loosened and the ashes entirely removed. The apertures may be so small that very little coal can escape with the ashes. It will be seen that by this improvement the objectionable process of dumping is entirely avoided. To remove the clinkers the fire box is filled with coal and reversed, bringing the clinkers at the top of the box, where they may be readily got at and removed. In this fire box a fire can be built. The fire box is filled nearly full of coal, and the fire is built on top. The firebox is then reversed, bringing the fire under the coal; and in the same way when the fire goes out, with the box nearly full of coal, the fire can be built on the top and the box reversed. With this fire box a fire can not only be readily built, but by opening a check draught and whirling the fire box rapidly around the fire can be easily extinguished, leaving the coal free of ashes and ready for another fire. With this arrangement a fire need not be kept burning longer than desirable at any time, as it can be rebuilt with very little trouble.



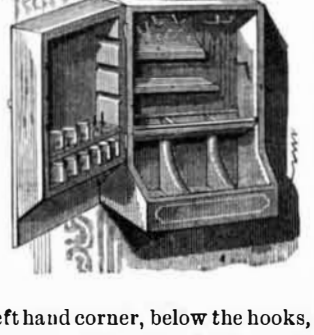
Spring Bottom Oil Can.

In the accompanying engraving is shown an improvement in spring bottom oil cans recently patented by Mr. Xavier St. Pierre, of Bullionville, Nev. A partition is placed a little above the bottom of a common spring bottom oil can, cutting off a space. A discharge pipe extends from the space along the interior of the can to the nozzle, into which it discharges through a small valve A flexible tube that will fall down with the oil when the can is inverted, and has a check valve at its free end, is attached to a branch of the discharge pipe near the partition. Between the partition and the bottom of the can is a spring to assist the bottom in its reaction for drawing oil from the can through the flexible tube. The cork of the filling opening has a check valve that allows air to pass into the can. When the bottom of the can is pressed the oil between the partition and the spring bottom passes out of the discharge pipe, and when it is released the reaction of the spring and bottom draws oil from the can through the flexible tube and fills the space. This can may be used where cans of ordinary construction cannot, as in places below the floor, and is more economical, the check valve in the nozzle preventing waste.



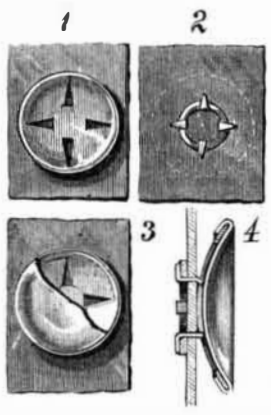
Lady's Work Box.

A lady's work box, in which a large number of small articles may be conveniently and handily arranged in a small space, has recently been patented by Mr. Hugh S. Dickson, of La Harpe, Ill. The main part of the box—as shown in the annexed engraving—is secured to the wall of a room, and to it is hinged a swinging cover. At its lower end the main part of the box is extended forward, and the side pieces of the cover are cut so as to close over the extension, the front board of the cover reaching to the bottom of and inclosing the extension when the box is closed. At the upper end of the box are hooks for knitting needles, scissors, etc. At the left hand corner, below the hooks, is a pincushion, and below this a shelf for thimbles, etc., and below this shelf there are three boxes for buttons and other articles, and in the lower part of the box there are three large compartments. Between the side pieces of the cover there are shelves provided with a series of pins for holding spools. The work box is very convenient, and when closed up occupies but little space, and keeps all the articles together and free from dust.



Button and Button Attachment.

Mr. John Wilde, of North Attleborough, Mass., has recently patented an improved button and means of attaching the same. The button is made of metal, and concavo-convex in form. It is stamped to form two or more radial prongs within the outer margin of its body and attached at their uncut ends to the body. These prongs constitute the fastening. To secure the button to the cloth the prongs, which taper and terminate in a point, are bent backward at right angles or thereabout to the face of the button, and projected through the cloth, after which they are turned or bent over against the inner side of the cloth, or over a ring or perforated disk, answering as a washer, around the outer edge portion of which the pointed ends of the prongs may be bent, if desired. This clinches the button securely to its place. The button may be made of a separate face and back piece, secured together to form a body, and with the fastening prongs struck up out of the back piece of the body.

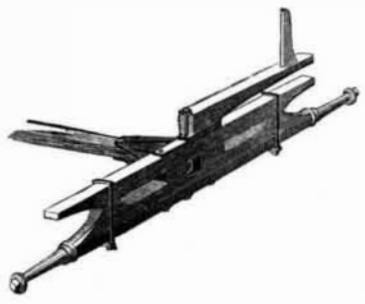


Improved Trace Carrier.

A trace carrier for harness, so constructed as to hold the side, back, and crupper straps without stitching the straps, and without the use of buckles or rivets, has recently been patented by Mr. Walter Downing, of Van Orin, Ill., and is shown in the annexed engraving. The carrier consists of an upper and a lower part, held together by a central screw, and between these parts the hip, back, and crupper straps are firmly clamped and held. The main portion of the upper part is made conical, and is cast with headed hooks for holding the cock-eyes of the traces, and also has an elevated guard to prevent the lines from catching on the hooks, and its under surface is a flat plane, except that a square recess is formed in the center. The lower part has formed on its upper surface a square stud, which fits in the recess of the upper part, and also radial recesses, in which the hip, back, and crupper straps are placed, and with extensions formed at their outer ends with loops for holding the strap from lateral movement. This device is cheap and durable, and may be applied to fastening rosettes, uniting the parts of a five-ring halter, breast piece for riding bridle and martingale, and various other places.

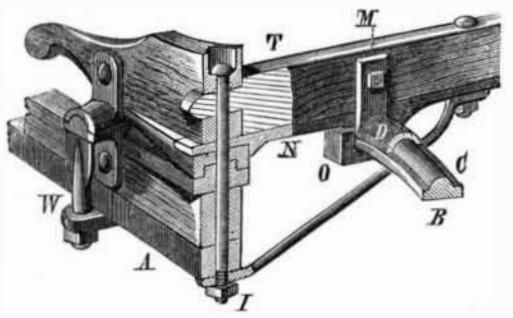
Gear Coupling for Wagons.

An improved device for coupling the reach to the forward axle of a wagon, recently patented by Mr. Reuben C. Lyon, of Centralia, Wis., is shown in the accompanying engraving. At the center of the forward axle, and between it and the sand-board, is placed a block, the sand-board, block, and axle being held together by bolts, which pass through them all. A U-shaped plate embraces the block, and extends to the rear, its rear end being perforated to receive a king bolt, which passes through the end of the reach, which is placed between the rear ends of the U plate. This plate is braced by rods which hold it firm against lateral movement. The bolster is pivoted upon the sand-board by a bolt which passes through the bolster and sand-board, and screws into a nut sunk into the under side of the sand-board. By this construction the necessity for boring and weakening the forward axle for the passage of the king bolt is avoided, and the sand-board is supported in the center.



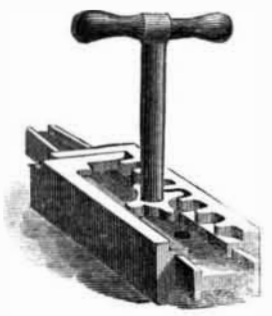
Fifth Wheel for Carriages.

Mr. Robert Weber, of Corsicana, Tex., has recently patented improvements in the construction of the fifth wheels of carriages, by which they are made more cheaply and are more readily removed and attached. The under half of the circle of the fifth wheel has on its upper side a half-round tongue, and the upper half of the wheel has a groove of corresponding shape on its under side. The wheel has center plates that connect the sides of the circle and rest upon the bedpiece of the axle and the head block of the gearing, and it is also provided with clips to secure it to the axle bed, head block, and reach. If the axle or other parts are to be taken off for repairs it is easily done by unscrewing the clips, and by this construction the wheel and its connecting parts are made very substantial and durable.



Printer's Quoin.

Mr. Otto C. Springer, of 588 Detroit St., Cleveland, O., has recently patented an improved printer's quoin, which is shown in the annexed engraving. The quoin consists of three wedges, one bearing on the inner side of the chase, another against the outer side of the furniture, and the third placed between the other two. The outer wedges are about the same height as an ordinary quoin. The middle wedge is opposite to, and about one-third as thick as, the outer wedges. On the inner sides of the outer wedges are grooves, and the central wedge has on it opposite sides ribs, that engage with the grooves of outer wedges. On the inner side of one of the outer wedges is a rack, and in the central wedge is a number of holes in which to place a key, that is provided near its lower end with a pinion to engage with the rack. By turning the key in one direction the inner wedge is driven between the outer ones, forcing them laterally from each other until the quoin is tight in its place, and by turning the key in the opposite direction the quoin is released. The quoin is simple, cheap, durable, and strong, and is not liable to get out of order.



Dyeing Glove Leather.

Hitherto kid and other kinds of glove leather have been dyed by hand, the dye being put on with a brush. The process is not only slow and tedious, but has the farther disadvantage that the leather has a broad ugly looking border on the flesh side, and that in spite of special care a perfectly uniform color is not obtained. To avoid both of these, Kristen, of Brunn, makes use of centrifugal force for dyeing leather uniformly. The skin that is to be dyed is fastened to the center of a rotating horizontal disk; the dye is poured on in the middle, and by a rapid rotation of the disk evenly distributed over the surface of the skin. The disk can be rotated by hand or by machinery, and the dye pumped on the skin, or allowed to run down on it from a higher reservoir. The excess of dye thrown off the edges of the disk run down into a reservoir beneath, and can be dipped up and poured on it again until the color is deep enough.

To carry the operation into practice Kristen makes use of a machine that consists essentially of a horizontal revolving table, that carries the hide in connection with a pump to put on the dye, which is evenly distributed by centrifugal force, the excess being caught in a funnel that carries it back to the receiver. The whole operation of dyeing each skin does not take over ten or fifteen minutes. One man can watch and attend to five machines placed together on the same shaft, and in twelve hours can easily dye 150 skins, which will be perfectly uniform and free from spots.—*D. I. Z.*

Weight of a Million Dollars.

Mr. E. B. Elliott, the Government Actuary, has computed the weight of a million dollars in gold and silver coin, as follows:

The standard gold dollar of the United States contains of gold of nine-tenths fineness, 25·8 grains, and the standard silver dollar contains of silver of nine-tenths of fineness, 412·5 grains. One million standard gold dollars, consequently, weigh 25,800,000 grains, or 53,750 ounces troy, or 4,479 1-6 pounds troy, of 5,760 grains each, or 3,685.71 pounds avoirdupois of 7,000 grains each, or 1 843-1,000 "short" tons of 2,000 pounds avoirdupois each, or 1 645-1,000 "long" tons of 2,240 pounds avoirdupois each. One million standard silver dollars weigh 412,500,000 grains, or 859,375 ounces troy, or 71,614.58 pounds troy, or 58,928.57 pounds avoirdupois, or 29 464-1,000 "short" tons of 2,000 pounds avoirdupois each, or 26 307-1,000 "long" tons of 2 240 pounds avoirdupois each. In round numbers the following table represents the weight of a million dollars in the coins named:

Description of coin.	*Tons.*
Standard gold coin	1⅞
Standard silver coin	26¾
Subsidiary silver coin	25
Minor coin, five-cent nickel	100