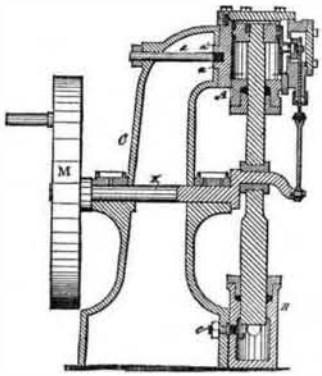


ENGINEERING INVENTIONS

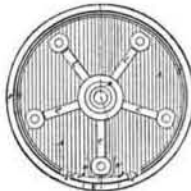
A Novel Steam Pump.

We find among the recent patents an improvement in steam pumps, by which the cylinders of the pump and engine are mounted in such a manner on a frame that they will automatically line themselves with each other. It is the invention of Mr. Campbell H. Osborn, of Clarksburg, Harrison county, W. Va., and is shown in the annexed engraving. C is the frame of the steam pump, A is the steam cylinder, the piston head and valves of which are of ordinary construction, and B is a pump cylinder, also of ordinary construction, except that it is provided with the screw-tapped hole, *b*, for receiving the screw bolt, *c*, by which the cylinder is pivotally secured to the lower face of the frame. The steam cylinder is cast with a hub, *a*, which is screw tapped in the center to receive the rod, *d*, by which the cylinder is likewise pivotally connected to the frame, the hub passing through a hole in the upper face of the frame, as shown. The piston rod of the engine and the plunger rod of the pump are formed with corresponding extensions or heads, the ends of which are perforated for the passage of the bolts that join the rods rigidly together, collars being placed upon the bolts between the extensions so as to leave a suitable space between the extensions to receive a cross head, through which the crank of the shaft, K, passes. By this arrangement, the cylinders being pivoted, and their rods joined together as one rigid rod, it will be seen that the whole are made universal in action, and that the cylinders will automatically accommodate themselves upon their pivots to the reciprocation of the rods, and will always be in exact line.



Engine Piston Packing.

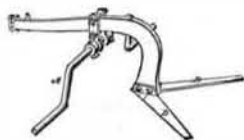
We give herewith an engraving illustrating an improved spring piston packing for engine pistons, that has been recently patented by Messrs. John Dykeman and Jason C. Corbin, both of Rondout, Ulster county, N. Y. The piston head is made with a hub to receive the piston rod, and with radial webs to support the face plate, D, the webs having screw holes in their enlarged outer ends to receive screw bolts that secure the face plate in place. The packing is made in the form of an open ring, and is held out, so as to bear against the inner surface of the cylinder, by one or more open ring springs, placed on the inner side of the packing ring. At its inner side upon the opposite sides of its joint and at a little distance from it are two cross ribs, between which is placed a short plate, J. This plate is curved upon the arc of the packing ring, and to the middle of its inner side is attached a U-shaped plate to receive the end of one of the radial webs. In horizontal cylinders when the packing wears the piston can be lined or centered by inserting thin wedges between the U-plate and the end of the web. The blowing of steam through the joint of packing ring is prevented by a tongue inserted in slots in the ends of the packing.



AGRICULTURAL INVENTION.

Cotton Stalk and Weed Cutter.

A new and useful invention for cutting cotton stalks, corn stalks, weeds, etc., has been lately patented by Mr. James H. Vannoy, of Farmington, Grayson county, Texas, and the accompanying engraving illustrates it. The device consists of an interchangeable cotton stalk cutter and sulky plow. A is the ordinary draw ball of a sulky plow, and to it is secured by hinged clamps an ordinary plow beam. In applying this improvement, the plow is detached from the beam, and in its place are secured the cutters, D. The inner ends of the cutters are formed with flanges through which are holes to receive bolts to secure them to the plow beam. The cutters project outward and rearward at an angle of about forty-five degrees with the line of the plow beam. When the plow beam is drawn forward the cutters cut off the stalks beneath the surface of the ground, and the beam and cutters may be raised and lowered by the same devices by which an ordinary plow is raised or lowered. The cutters may be of any desired length, and both or one of them may be used, as the character of the work to be done may require.



MISCELLANEOUS INVENTIONS.

New Plastic Compound.

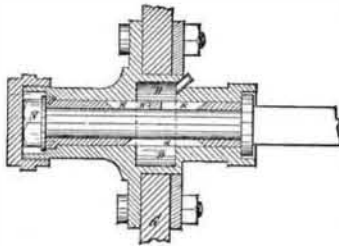
Mr. Bruno Harrass, of Böhlen, near Gross Breitenbach, Schwarzburg-Rudolstadt, Germany, has patented a new plastic compound that closely resembles wood, and is hard and

elastic, and may be cut by the same tools as wood, and may also be colored, polished, and glued. The compound is composed of about three parts, by weight, of paper pulp or cellulose; starch about one part, and flour about two parts. Cellulose, which is sold as paper sheets, is dissolved in water and disintegrated, and placed in a fine sieve to permit the water to drain off. This mixture of cellulose, starch, and flour with water is boiled in a suitable vessel in a water bath for an hour, and is then cooled to the ordinary temperature. By being boiled the mixture is converted into a fibrous paste, and is then mixed with a suitable quantity of sawdust, and rolled into sheets and dried, when it is ready for use. It may be also pressed in moulds of sufficient hardness and strength, but the press and moulds must be heated and a sufficient pressure exerted. If objects made are to be veneered, from one to six sheets of thin veneering (covered on one side with some adhesive substance) are placed into the warmed mould. Upon these veneers a layer of one thirty-second to one-eighth of an inch thick of wood mass, colored the same as the veneer, is laid, and the object then pressed, when the veneers become so firmly united to the wood that they cannot be separated. The wood mass is obtained by mixing two to five quarts of cellulose, six to thirty of dry dextrine, blood, rosin, or other binding material, powdered; one to five quarts of flour, one-eighth to two quarts of pipe-clay. Powdered color is added to give this mixture the desired tint.

Hub for Vehicle Wheels.

Mr. Francis T. Riegel, of Philadelphia, has patented a new device for lubricating the axles of carriage or wagon wheels, that is shown by the accompanying engraving.

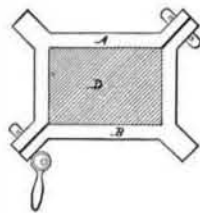
The hub of the wheel is made of metal, preferably cast iron, and has a longitudinal central aperture for the axle box fitting on the end of the axle. The central part of the hub is raised, and in it is formed an annular chamber around the axle box. Upon this raised part is an annular flange, against which the inner ends of the spokes are placed, resting at their ends on the raised part. They are held in their place by a flange composed of two semi-annular plates placed against the opposite sides of them and held firmly against them by screw bolts passing through the flange on the raised part of the hub and the semi-annular plates between the spokes. This flange, being made in two parts, permits either of them to be removed, to repair the wheel, without disturbing the other, or even removing the wheel from the axle.



The hub has a circular recess at its inner end for the collar of the axle, and at its outer end with a recess for the nut screwed on the end of the axle. The outer end of the hub is threaded externally to receive a screw cap on its outer end. The axle box has a longitudinal slot in its top and bottom, the one in the top being interrupted by a transverse piece near its center. The hub is also provided at the top and inner side of its enlarged part with a downwardly inclined tube, through which lubricants can be poured into the annular chamber, and the tube may be closed at its outer end by any suitable means, the chamber containing a considerable quantity of lubricant, and will last quite a long time.

Photo-Engraving Metallic Plates.

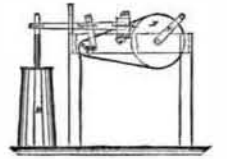
Mr. Alfred Michaud, of Paris, France, has patented a process and means of engraving metallic plates, to be used for printing and ornamental purposes, which he calls "galvano engraving." If it is desired to make an engraving, the inventor has prepared a suitable number of metallic plates, which have the smoothness and polish of glass, and having obtained a photographic negative of the subject to be engraved on a glass plate, he covers one of the polished plates with a bichromated gelatine film, and places the photographic negative upon it and exposes it to the light. The action of the light renders the gelatine insoluble, so that when the negative is removed and the gelatine plate washed, all the gelatine on the surface of the plate will be removed, except the duplicate of the lines of the photograph, which will remain in relief. The proof is placed for some hours in a damp place, when the lines are brought up in relief. The proof is then coated with plumbago, after which it is applied to a metal alloy placed in a special vessel hereinafter described. The alloy is then subjected to an ordinary pressure, and on cooling produces a hollow metallic plate ready to be printed. The fusible alloy that the inventor prefers to employ consists of bismuth, tin, lead, and mercury, the proportions varying according to the degree of hardness desired. A special vessel to contain the metal is constructed as shown in the engraving, the bottom being formed of a smooth, strong metallic plate. The liquid metal is poured into a vessel thus constructed, and the gelatine proof is immediately applied to the metal, and the whole is covered by a second smooth metallic plate which closes the vessel; it is put under momentary pressure. The mould thus obtained is quite ready for printing.



Motor for Churns.

Among the recently patented inventions is a motor for dash churns that is cheap, durable, and easily operated, and in which the length of the stroke can be varied to suit the size of the churn and the quantity of cream to be churned. It is shown in the accompanying engraving.

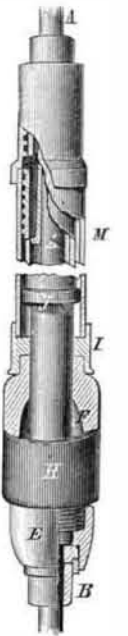
The frame of the motor is of suitable construction, having on its upper side a cross board, H, and at the front end of the frame projects upward guide arms. On the upper side of the crossbar is attached a short vertical board, I, perforated with holes. B is the drive wheel placed upon a shaft journaled in the sides of the frame, provided with a hand crank. A is a crank shaft provided with a pulley, over which the belt from the drive wheel passes and is connected to the dash lever by a connecting rod. The dash lever at its rear end is adjustably fulcrumed to the vertical board, I, and its outer end is adjustably attached to the upper end of the churn dasher. It will be readily seen that by this construction the motor is easily adjusted to its work, which it does effectively, and it occupies but little space when not in use.



This motor is patented by Mr. John L. Blackstock, of Stephenville, Erath county, Tex.

A New Packing for Oil Wells.

Mr. Jesse A. Heydrick, of Barnhart's Mills, Butler county, Pa., has patented an improved packing for oil wells. The annexed engraving is an illustration of the device. A is the tubing, two sections of which are connected by a screw threaded thimble, B. The lower end of the tubing extends to the bottom of the well, where it is provided with a plunger which works in a perforated barrel, X, that rests in the bottom of the well and is connected above to the outer casing by a reducer. The usual rubber collar, H, is used as a packer in connection with the following improved means, by which its efficiency is largely increased. The lower end of the rubber packing is screwed into a thimble, I, until it rests against an interior collar, and the thimble is screwed on to the upper end of the casing, M. The upper end of the packing is likewise held by means of a thimble, E, which screws on to it, and which by means of an interior threaded collar is secured to a cylindrical lining, F, to prevent the packer from coming in contact with the interior parts of the pump. The lower end of the lining, F, screws into a packer, J, consisting of a collar, which is inclosed by the walls of the casing, M. By an ingeniously constructed system of screw collars, packing rings, and thimbles, and of the nuts, B and C, by turning the tube, A, the packing, H, is expanded and made to fill the bore of the well, thereby thoroughly packing it.



Improvement in Firearms.

A useful improvement in the lock mechanism of firearms, and one that is particularly adapted to revolving arms, has been recently patented by Messrs. Edouard Bled, of Paris, France, and Jean Warnaut, of Liege, Belgium. In the accompanying drawing, *a* is the hammer of the lock, carried on a pivot, made in one piece with the frame of the revolver, and provided with a pawl that causes the cylinder to revolve. The trigger also has its pivot made in one piece with the frame, and has a projection which passes between the lower part of the hammer and a projection, *f*, under the pawl. The main spring is double branched, its lower branch acting directly upon the trigger and its upper branch upon the hammer. When the trigger is pressed back its projection catches the projection, *f*, on the pawl, which, being pivoted on the hammer, brings it up to full cock and the cylinder is caused to revolve. As the trigger is pressed fully back its projection escapes from the pawl projection, *f*, so that the pawl and the hammer become free and are brought down with the main spring, firing the cartridge. When the trigger is released it is brought down to its first position by the action of the lower part of the main spring, and the pawl assumes its first position. The lower branch of the spring has a catch, *k*, so that during its downward motion it presses against a projection, *l*, of the hammer and brings it back automatically.



New Portable Force Pump.

Mr. Samuel Bosner, of Dover, Strafford county, N. H., has patented an invention which improves the construction of the portable force pumps for which letters patent were granted him March 1, 1881, so as to make them more convenient in use and adapt them to be used for various pur-