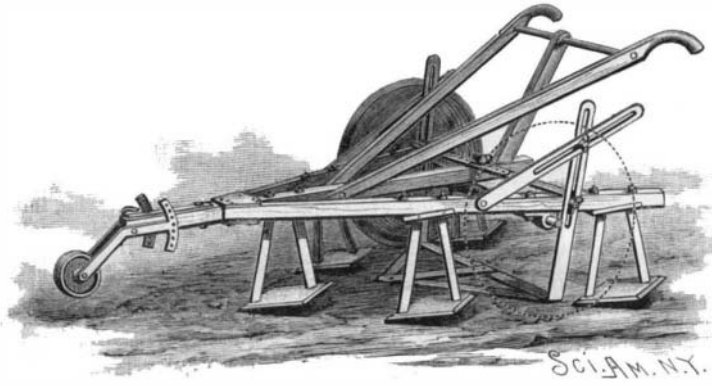


IMPROVED CULTIVATOR.

The accompanying illustration represents a one horse cultivator which is the invention of Mr. George E. Briggs, of Bowling Green, Mo.

The front ends of the side beams are pivoted to the center beam in such a way that their rear ends have a lateral movement. To the rear parts of the side beams are bolted the other ends of two bars, whose inner portions overlap each other, and have holes through which passes the bolt that secures them to

**BRIGGS' IMPROVED CULTIVATOR.**

each other and to the central beam. By adjusting this bolt, the distance between the side beams may be regulated according to the distance between the rows of plants. At the acute angles of diamond-shaped cutters are secured knife standards, whose upper ends are bolted to and between two bars having outwardly projecting lugs that rest against the lower sides of the beams. The extremities of the standards pass through the beams, and have nuts screwed upon them. In the lower sides of the beams are tapered recesses, to form inclined seats for bars which give a downward inclination to the forward ends of the cutters. These cutters are so arranged that their paths will slightly overlap, in order that all the grass, weeds, and vines will be cut off. The depth to which the cutters enter the ground is regulated by a front gauge wheel, which can be raised or lowered as required. Two rotary colters are attached to the outer ends of an extensible shaft, which can be adjusted to correspond with the adjustment of the side beams. To a wide V-shaped cutter are attached the ends of standards having longitudinal slots in the upper parts, to receive bolts that secure them to the side beams; the cutter can thus be arranged to work at a greater or less depth in the ground.

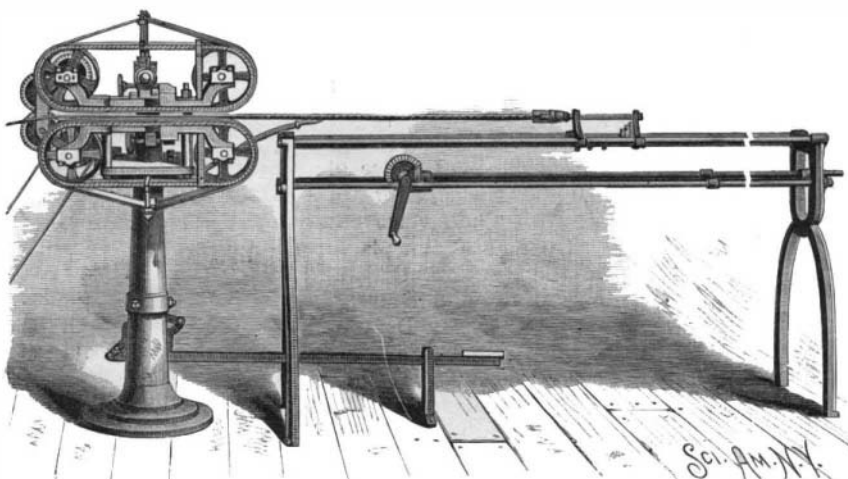
In the upper ends of the standards are bolts that pass through slots in braces, as shown; by this means the inclination of the cutters can be varied.

All parts of this cultivator can be worked together or, if desired, any part can be used alone. The knives are reversible. The machine is particularly designed for cultivating strawberries, but may be used for small fruit in general.

RUBBING MACHINE.

The accompanying engraving represents an improved machine for rubbing a paint mixture or other substance into the surface of whips, canes, or similar articles so as to produce a polished finish. Heretofore this operation, in the case of articles provided with a thread covering or having an even surface, has been performed by hand.

Attached to the column is a stationary frame, above

**VAN DEUSEN'S RUBBING MACHINE.**

which is a similar frame mounted to slide vertically. Cast on the column is a plate, which forms a support for a second plate carrying a pulley at each end. Over these pulleys and the upper side of the second plate passes an endless belt covered with felt or other similar soft material, and over a part of which passes an endless piece of canvas, held taut on the felt by being passed over a roller that may be adjusted up or down. The upper or movable frame is of like construction, and is pivoted to the top of a lug cast on an arm which sup-

ports its plate, and is attached to a hollow shaft mounted to slide vertically in the hollow column. The shaft of the lower left hand pulley has a cog wheel which meshes with a second wheel mounted on a stud fastened to a bent arm fulcrumed on the shaft. The second wheel meshes with a third one, also carried by the bent arm, and which meshes with a wheel carried by the upper shaft. To the upper end of the bent arm is pivoted a link fulcrumed on the shaft of the upper pulley. On the lower shaft are mounted the driving pulleys. By this means the pulleys carrying the endless belts are revolved.

The whip or other similar thread-covered article, prepared with a paint mixture which is to be rubbed into the surface, is placed between the canvas belts, when the operator, by pressing upon a suitably connected lever, causes the upper frame to slide downward. The article will be embraced between the endless moving belts, the soft material inclosing it completely, and as the whip is pulled in a direction contrary to that of the belts (to the right in the engraving), the paint mixture will be thoroughly rubbed into the surface. The canvas belt

prevents the mixture from coming in direct contact with the soft material. When the pressure on the treadle is removed, a coiled spring raises the shaft carrying the upper frame. This machine is the invention of Mr. C. R. Van Deusen, of firm I. S. Van Deusen & Son, Whip Manufacturers, Passaic, N. J.

PLATFORM SPRING FOR VEHICLES.

The object of the invention herewith illustrated is to provide a coupling for the adjoining ends of the several sets of springs constituting what is termed a platform spring, which will prevent all rattling and permit of an extension of any one spring without a corresponding movement of the others. The central block, A, is made with two T-shaped grooves running at right angles to each other. One end of each of the grooves is closed, and the closed end is toward the spring when the parts are assembled. The blocks, BB', to which the springs, D D, are united, are formed with T-shaped shanks that fit within the grooves as shown. When the platform is loaded, each spring will be free to move endwise without twisting the springs to which it is connected, and the springs being thus relieved of any undue twisting strain are not likely to break when heavily loaded.

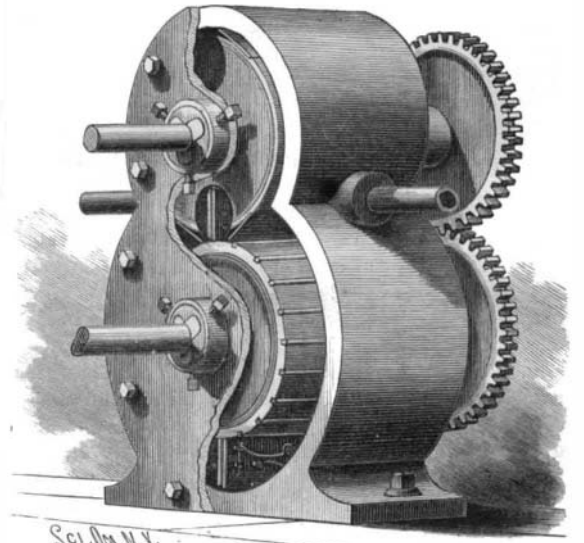
This invention has been patented by Mr. E. A. Hendricks, of Carpentersville, Ill.

ROTARY ENGINE.

The casing of the engine, one side plate of which is removable, is made with a lower circular chamber in which the piston drum works, and with an upper communicating chamber in which the valve works. The piston drum is mounted upon the main shaft, and is provided with rigid radial vanes. The valve is circular in shape, and is formed with opposite cavities, into which the vanes enter as the piston and valve revolve, proper registration of the vanes with the cavities being maintained by two cog wheels, mounted upon the two shafts, which mesh with each other. To insure steam tight contact of the valve with the piston, the outer surface of the latter is furnished with packing strips set in grooves in the drum; and to prevent the escape of steam at the time the vanes pass the valve, flat springs are placed upon each side of the cavity. The outer edges of the springs also run in contact

with the walls of the valve chamber, and prevent steam from blowing through the chamber from the induction pipe to the exhaust pipe. The vanes have adjustable steel packing strips, which are constantly pressed outward by springs, thereby constituting a yielding steam packing for the vanes. The steam supply and exhaust pipes are placed on opposite sides of the casing, and a little above the point of contact of the valve with the piston. By means of suitably arranged packing, all escape of steam at the journals is obviated.

In order that any wear on the outer surface of the packing rings of the piston may be compensated for, both shafts can be adjusted. The wear on the journals can be taken up, and the proper parallelism of the valve with the piston can always be maintained, which is essential to the satisfactory operation of the engine, and to avoid unnecessary friction. It will be perceived that the engine has no dead center, and that it may be reversed by simply changing the course of the steam.

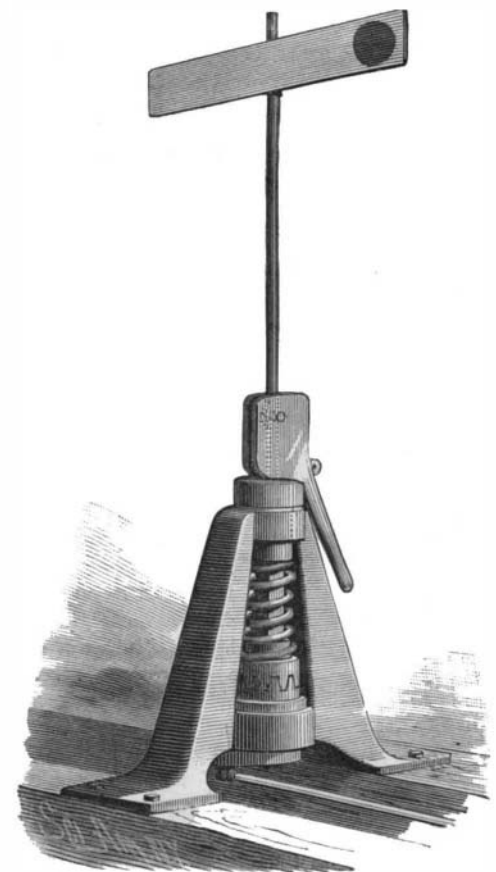
**BELT'S ROTARY ENGINE.**

This invention has been patented by Mr. P. P. Belt, of Columbus, Kas.

SWITCH STAND.

In the lower part of the stand, the shape of which is plainly shown in the engraving, is a squared aperture, through which is passed a squared neck projecting from the under side of a toothed clutch disk. Interlocking with this disk is a second one mounted on the squared part of a shaft passing through the stand. Surrounding the shaft is a spring, arranged so as to press the upper disk against the lower one. A continuation of the shaft carries the signal.

Pivoted to the shaft is a lever, which, when the switch is locked, occupies the position shown in the engraving, and is held in place by the shackle of a padlock passed through the eye. The lever then bears against a collar that passes through the opening in the top of the stand and rests on the spring, which, being under tension, presses the upper disk against the lower one. When the switch is to be thrown, the lever is swung to a position at right angles to the shaft, when, the pres-

**SINGISER'S SWITCH STAND.**

sure on the spring being relieved, the shaft may be turned by the lever, the teeth of the upper disk sliding over those of the lower. When the lever is swung down and locked, the shaft cannot be turned, as sufficient leverage cannot be obtained, the tension of the spring being so great as to make it impossible to cause the teeth of the upper disk to slide on those of the lower one.

This invention has been patented by Mr. Henry C. Singiser, of Mechanicsburg, Pa.