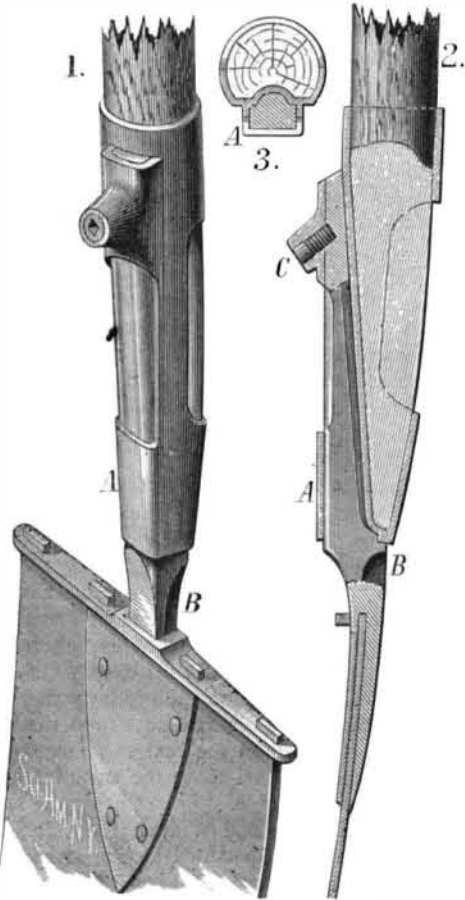


NOVEL TOOL HANDLE.

The annexed engraving shows an improvement in the class of tool sockets designed for application to wooden handles, and adapted for holding tools of various kinds, such as shovels, forks, spades, and other agricultural hand tools.

The socket is fitted to the lower end of the wooden handle, and has in its upper face a concave depression or groove for receiving the shank, B, of the shovel, spade, or other implement, in connection with which the handle is used. Over the groove in the socket there is at the upper end a keeper or loop, provided with a set screw, C, for holding the shank, and at the lower end of the socket there is a keeper or loop, A, that holds the larger part of the tool shank. The



IMPROVED TOOL HANDLE.

set screw is inclined at an angle to the shank, so that its tendency when tightened will be to draw the shank into the handle.

This handle may be readily applied to any tool having a shank adapted to it by simply inserting the shank and tightening the set screw.

This useful invention was recently patented by Messrs. J. H. Richardson and J. C. Calhoun, of Oakley, La., who may be addressed for further information.

NEW ROTARY ENGINE.

The annexed engraving represents an improved rotary engine recently patented by Mr. William N. De Groat, of Knoxville, Tenn., the patent being now owned by Messrs. W. N. De Groat and A. L. Maxwell, of same place.

The engine is shown in perspective in Fig. 1 and in section in Fig. 2. The revolving pistons are secured to a rotary disk, work in a stationary annular cylinder having three sliding abutments, C, which are operated at the proper instant by a cam, A, on the main shaft through a system of levers, B, and suitable connections. Steam and exhaust ports enter the disk at or near the center, and pass to its periphery in opposite directions, the steam supply port communicating with the cylinder through one face of the piston-head, and the exhaust port running through the opposite face. The exhaust ports are arranged so that the sliding abutments are relieved of steam pressure before it is moved, and it is restored to its place under a pressure which is balanced with the exception of the small area of the stem by which it is worked.

For convenience in reversing the engine there are steam ports on opposite sides of the piston, and a plug valve, D, in the disk is employed to change the direction of the steam supply and exhaust and thus reverse the engine. Steam is exhausted from the engine through the passage, a, and admitted through the central passage, b.

This engine has no dead points, and always works to its full power throughout its entire revolution. The inventor claims an advantage admitting and exhausting steam from the face of the piston, as the steam is not wiredrawn by passing through tortuous passages.

It is obvious that this engine requires no flywheel, as the motion is continuous, and not intermittent as in the case of reciprocating engines, and a great advantage in economy of steam is claimed, the power being applied directly and in the right place.

For marine engines the rotary form has many advantages that will be understood and appreciated by engineers. A study of the engraving, in connection with what has already been said, will be sufficient to make clear the construction and merits of this engine.

MECHANICAL INVENTIONS.

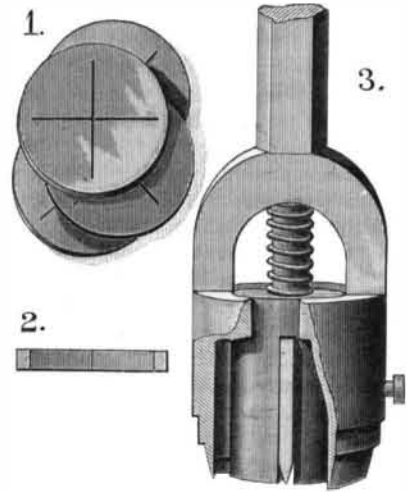
An improved device for use upon steam railroad cars, street railroad cars, at stations, and in other places, to indicate the name of the next station, street crossing, or other stopping place, the distance to it, and the time when due, and also, when used at stations, to indicate the next train and the time of departure or arrival, has been patented by Messrs. John B. Herbert and Charles Layton, of Old Bridge, N. J.

An improved pitman connection has been patented by William F. Rundell, of Genoa, N. Y. The invention consists in a wrist pin made of two diameters, a box having tangs or shanks to be bolted to the pitman, which box is arranged to bear in the plane of the larger diameter of the wrist pin, the pitman being prevented from slipping off by a flange on the inner sides of the box extending down to and fitting the smaller diameter of the wrist pin, while a gasket

and circular plate on the outside is screwed to the box to inclose the wrist pin and make an oil-tight bearing.

IMPROVED GUN WAD.

The annexed engraving represents a gun wad specially adapted for loading and discharging shot from a fowling-piece. Gun wads have been made of concavo-convex form in such a manner that when pushed into a gun barrel or cartridge shell by means of the square end of a ramrod or plunger they would expand under pressure to fit tightly upon the charge. Flat wads have also had their edges or perimeters scalloped or pinked, so that a wad larger than the bore of the gun or cartridge could be readily crowded in upon the charge, to be retained by the elasticity of the compressed serrated or pinked edge of the wad. In both instances the wad leaves the gun intact and impedes the flight of the shot and affects their direction and force. The invention shown in the engraving is intended to compress and pack a wad tightly upon a charge of shot in a gun barrel or cartridge shell, in such a way that it will remain intact until moved by the explosive force of the powder, when it will



NEIMEYER'S GUN WAD AND PUNCH.

open in its center and sever into quarter sections, and allow the charge of shot to virtually fly through the wad without being impeded or misdirected by the fragments of the wad. This is accomplished by forming a crosscut or a series of radial incisions in a wad by means of the combined hollow punch and a solid four-bladed cutter, shown in Fig. 1.

The wad is intended to be used only over the shot, and when the gun is discharged the parts of the wad will be found upon the ground from five to six feet ahead of the muzzle of the gun. By the use of this wad no obstruction to the direction or force of the shot is offered, and the pattern is thereby improved and the penetration increased.

Further information may be obtained by addressing Mr. Jacob Neimeyer, Atlantic, Ia.

Fig. 1

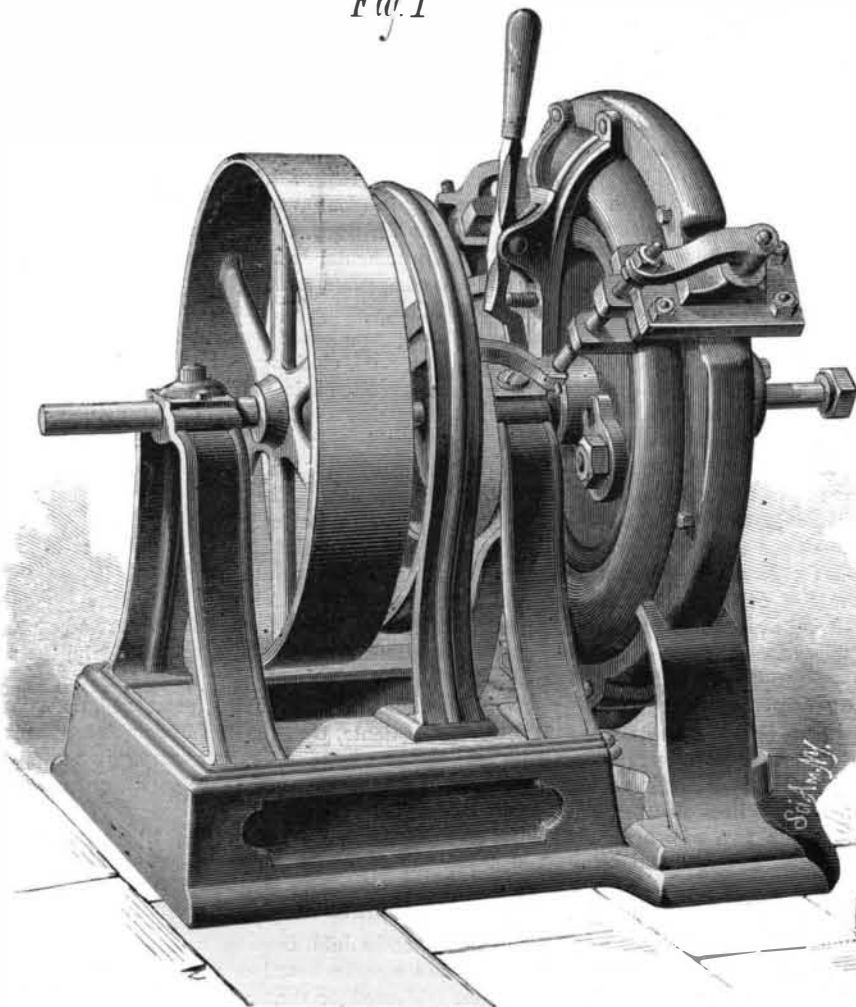
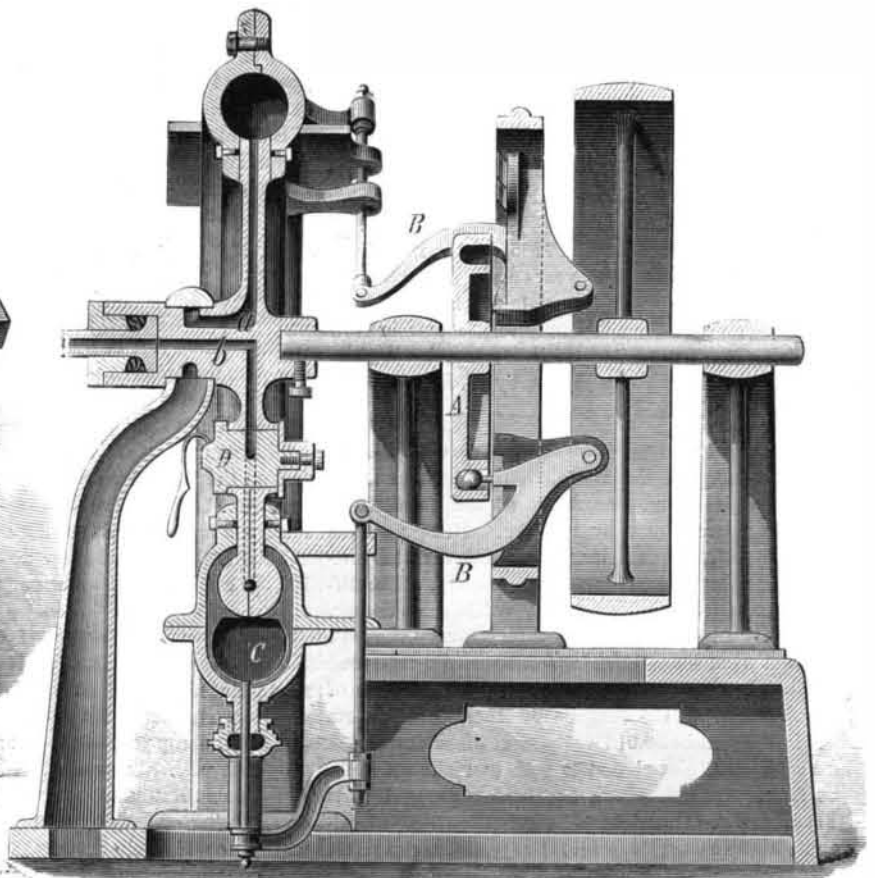


Fig. 2



DE GROAT'S ROTARY ENGINE.