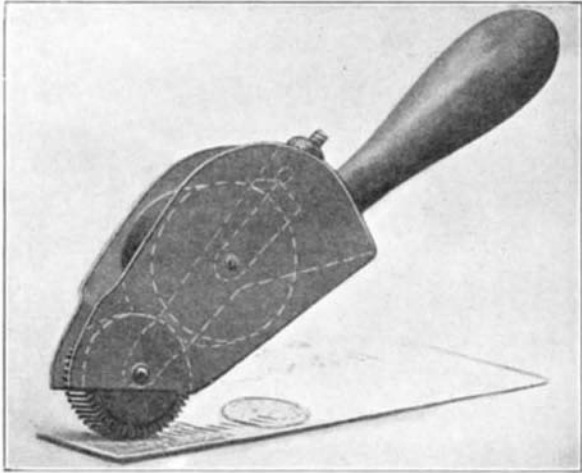


A SIMPLE CANCELING MACHINE.

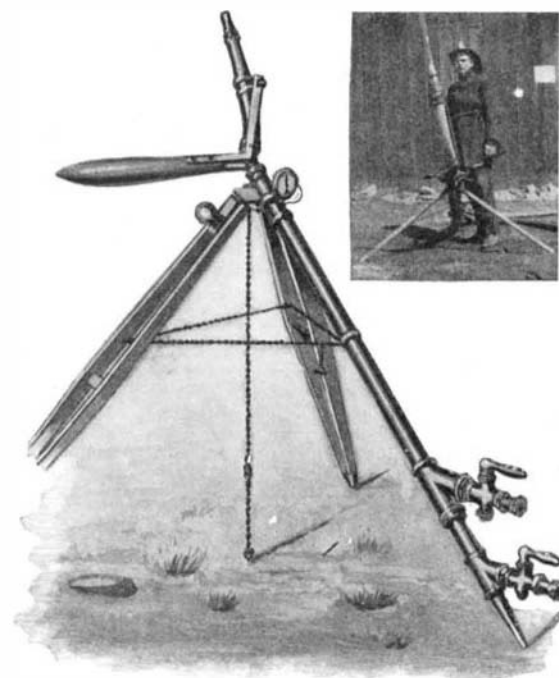
The accompanying engraving illustrates a novel canceling device for the use of postal authorities to cancel mail matter. It is not an automatic machine of the type used in the largest post offices, but it is designed to take the place of the usual hand stamp. The device is self-inking, and is provided with regulating means, whereby a clear impression can always be made. The usual hand stamp is not well adapted for use on uneven surfaces, because part of the cancelation is apt to be lost, and if the surface is not firm there is danger of breaking through the wrapper into the package itself. The new canceling machine avoids these difficul-

**A SIMPLE CANCELING MACHINE.**

ties by requiring a rolling instead of a stamping motion to produce the imprint. The simplicity of the device is apparent at a glance. It consists of two rollers supported in a U-shaped frame, which is provided with a handle. The lower one of the two rollers carries the rubber type representing the name of the post office where it is used. This roller is heavily weighted, so that it will automatically return to the starting position. The upper roller, which has a rim of felt, carries the canceling ink. This roller is mounted on a shaft, which is supported in slots in an inner U-shaped frame piece. The shaft carries a yoke, which is pressed by a coil spring tending to press the inking roller against the printing roller. A stud on this yoke projects through the outer frame near the handle, and is threaded to receive a thumb nut, whereby the pressure of the inking roller may be regulated. In use when the printing becomes faint, the thumb nut is turned to permit a greater pressure of the inking roller on the printing roller, and thereby more ink will be delivered. The inventor of this improved canceling machine is Mr. Arthur B. Pope, of 1408 I Street, Sacramento, Cal.

SUPPORT FOR FIRE HOSE.

Fire hose is so heavy and cumbersome that it usually requires several men to handle a single line. However, there has recently been invented a device for supporting fire hose in such manner that a single man can control it and direct a stream wherever desirable,

**IMPROVED FIRE HOSE SUPPORT.**

or the hose can be anchored and set to deliver a stream of water without requiring any attendance. The value of this feature will be appreciated in places where accident might occur from a falling wall, or where the heat is too intense for a fireman to remain. The device comprises a tripod, one of the legs being hollow or in the form of a pipe. Near the lower end of this leg there are several couplings by which connec-

tion can be made with a line of hose. The couplings are provided with valves whereby the pressure of water may be regulated, as indicated by a pressure gage. At the upper end of the hollow leg is a short curved pipe which has a rotary connection therewith, while a flexible tube connects this pipe with an elbow. A bifurcated lever is fulcrumed to the pipe and at its upper end is secured to a collar on the flexible hose. By means of a handle on this lever the nozzle may be swung in any desired direction. The tripod legs are prevented from spreading too far apart by chains. A central chain is attached at one end to the tripod head, and is provided at the opposite end with a screw eye which can be driven into the ground or the floor to anchor the support. The tripod may be compactly folded and a hook on the tripod head provides for securing it to the rung of a ladder. A patent on this hose support has been secured by Mr. John E. Malnburg, of Sacramento, Cal.

Steel and Bronze in Valves and Pumps.

BY LOUIS WAGNER.

In valves and pumps, when water attains a considerable velocity under high pressure, it has been observed very generally that gray castings and steel are quite often attacked by a peculiar kind of corrosion.

According to the learned German scientist Falkenau such corrosion takes place a good deal quicker and with greater force if two unlike metals come in contact with one another. By using steel traps and bronze bodies together in valves he found after a year or two that the steel trap was eaten through, as if by some acid. Surmising a possibility of acid or grit being present in the water, he put in filters so as to obtain a flow of perfectly clean, pure water. But the new valves which he had set in place soon were corroded as badly as the previous ones. It might have been also that the leather washers dropped a minute amount of tannic acid; he consequently procured absolutely clean washers—but with no better result. Again, it was possible that this corrosion had some electrical cause. He therefore replaced the steel traps by bronze traps, in order that like metals should come in contact with one another; and now corrosion ceased. He studied the corroded parts closely and satisfied himself that the fretting out could not have come from the pressure of the water, as might be assumed by reason of the great velocity of the water pressing through the valves. No doubt, a good many engineers will have observed similar instances of corrosion, yet it seems that so far no plausible explanation of the true cause of this phenomenon has been given.

For smaller parts under high pressure, say from 200 to 550 atmospheres, one should resort to forging and turn away from castings altogether, "and"—to quote Falkenau—"I have found that bronze under such a high pressure is not giving satisfaction in so far as its elasticity is slight and uncertain; castings, however, seem to expand gradually and become loose-bodied."

In mining pumps, ammonia pumps, and the like, a selection of material, on account of the direct attack of chemicals such pumps and valves are subject to, is certainly of greatest importance. In many shafts of the anthracite region the water is so strongly sulphureous that in no case can gray castings give satisfaction for any length of time. Falkenau states that he broke a piece out of such a pump a few years ago and examined it. The pump had been used for four years, and the castings originally had a thickness of three-fourths of an inch. But the sample was no longer gray casting, for the iron was all gone and only the graphite remained. It wrote as nicely as any lead pencil.

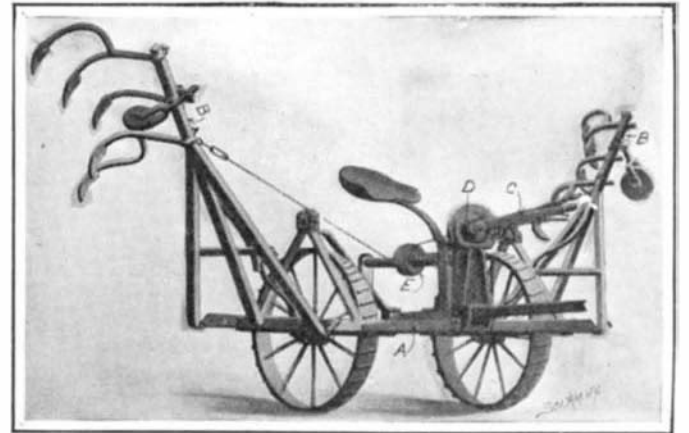
Experiments With Ties.

An interesting experiment on a large scale is about to be made by the Pennsylvania Lines, using screw spikes with the Thiollier special steel lining or sleeve. The purpose of the experiment is to determine the additional life which may be obtained from ties of inferior wood by the use of improved fastenings.

IMPLEMENT FOR PLOWING OR CULTIVATING AROUND TREES.

The accompanying engraving illustrates an improved agricultural implement, which can be used either as a plow or as a cultivator, and is especially adapted for operation in an orchard to produce irrigating furrows near the trees, or for cultivating ground around the trees. It will be observed that the beams are hinged to the body of the machine, so that they will fold up in a small space to avoid contact with the trees in turning, and also for convenience in coming and going from the orchard. These beams are spring-balanced, so that the task of elevating them is comparatively easy. The beams are also adjustable to accommodate the machine to different widths between rows of trees. In our illustration the main body of the machine is indicated at A, and the hinged beams are shown at

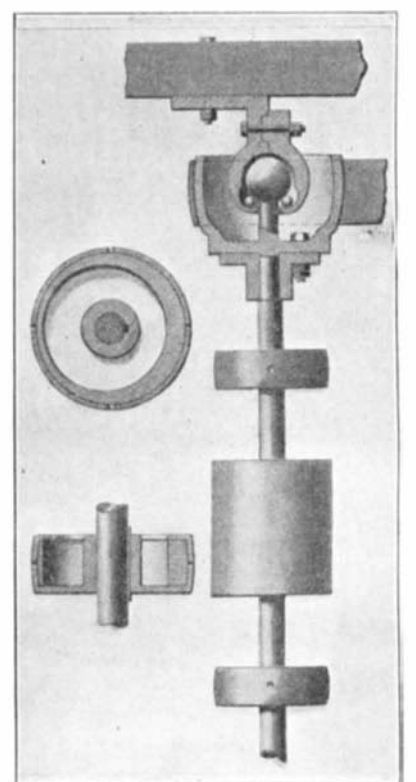
B. The beams may be lifted to their vertical position by operating the lever C, which carries a gear wheel D, meshing with a pinion on the shaft of the winding drum, E. The latter serves to wind up a pair of cables, whose outer ends are attached to the beams. The counterbalancing spring is wound about the drum shaft. The beams, when in their lowered position, are supported on casters, which are adjustable to regulate the depth to which the cultivator blades may sink into the ground. In addition to this, the tongue or pole of the implement is attached by means of a spring plate, so that by driving a wedge between the pole and the forward crossbeam of the main body, the implement will be tipped downward, causing the cultivator blades to dig deeper into the ground. The inventor of this

**IMPLEMENT FOR PLOWING OR CULTIVATING AROUND TREES.**

improved agricultural implement is Mr. W. L. Chase, of Banning, Cal.

MEANS FOR AUTOMATICALLY BALANCING ROTATING MASSES.

As is well known, all masses in rotation seek to revolve upon their center of gravity. If the body is forced to revolve in fixed journals upon an axis which does not coincide with the center of gravity, shocks, jars, and loss of energy follow. In practice the condition of a perfect balance is seldom accurately reached. Trifling differences become important factors when the number of revolutions is largely increased, and while the distance from the center of revolution is a controlling factor, even an unbalanced key on a shaft cannot be overlooked. In certain turbines which operate at extremely high speeds, it has been found necessary to use flexible shafts which would automatically adjust themselves to make their centers of gravity and revolution coincide. But this expedient is objectionable for many reasons. However, a method for obtaining this same result with a solid shaft has recently been invented by Mr. J. Van V. Booream, of 204 Lincoln Place, Brooklyn, N. Y. The accompanying engraving which illustrates the improved method represents the revolving portion of the machine to be balanced. Secured to the shaft are a couple of counterbalances in the form of hollow drums, one of which is shown in section. Through openings in the top of each drum a semi-fluid plastic material is poured in, preferably a mixture of hydraulic cement, water and sand. The shaft is now rotated at full speed so that the material is subjected to the action of centrifugal force while hardening, and moves against the rims of the drums. If the rotating mass is unbalanced, the material will automatically assume the form of an eccentric ring, bringing the center of gravity into line with the center of rotation. The rotation is continued until the ring hardens, when the rotating member will be perfectly balanced. Screws, lugs, or pockets in the drum may be used to lock the ring in place and prevent displacement.

**AN AUTOMATICALLY BALANCED ROTATING BODY.**