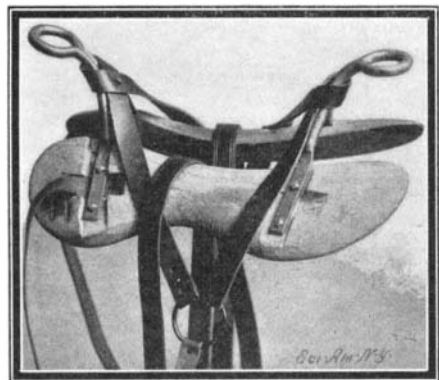


COMBINED PACK AND RIDING SADDLE.

The accompanying illustration shows an improved form of saddle which should be found very useful for prospecting purposes or for use in the army or for pack transportation of any kind. It combines all the advantages of a riding saddle with those of a pack



COMBINED PACK AND RIDING SADDLE.

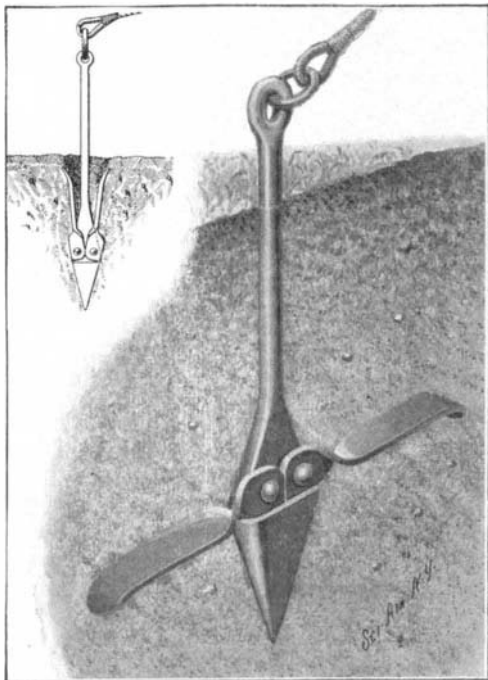
saddle, and the combination also affords other advantages not heretofore obtainable. The saddle consists of two opposing pads, preferably made of wood, which are spaced apart and placed at the customary angle to each other. The pads are held in position by means of two horns, the forward horn being practically the pommel of the saddle and the rear horn the cantle. These horns may each be made from one piece of round iron rod bent to the form shown in the illustration. The ends of these rods are flattened and fit against the pads, to which they are secured by screws.

Among the advantages urged for the improved saddle it may be stated that its superiority as an army saddle far outweighs its use as an ordinary pack saddle, as it is especially adapted for carrying the dead and wounded off the field, permitting the horse to be ridden back and enabling one man to do more of this work than at least four men on foot. The improved saddle is also well adapted for carrying light arms and ammunition to and from and on the field and light artillery through the mountains and on and off the field. A decided advantage is obtained by the use of the loop-knob for a horn, as it is easily grasped and held when mounting a fractious or bucking horse, and is particularly safe and advantageous where men mount upon the run and when horses are springing to their feet, having thrown themselves to dismount the rider.

The inventor of this combined pack and riding saddle is Mr. John T. Morgan, of Boise, Idaho.

LAND ANCHOR.

A recent invention provides an improved device adapted to secure to the ground a guy-rope, brace, or any similar form of supporting wire, and will be found particularly useful by telephone and telegraph linemen in place of the old style "dead man." The anchor comprises a central or main stem which, at the lower end, is enlarged, and is somewhat diamond shaped, with the free end tapering to a point, to facilitate driving the anchor into the ground. Two arms which are pivoted side by side to this head are each formed at the pivotal end with one edge round, concentric with the pivot, and the other left square. When



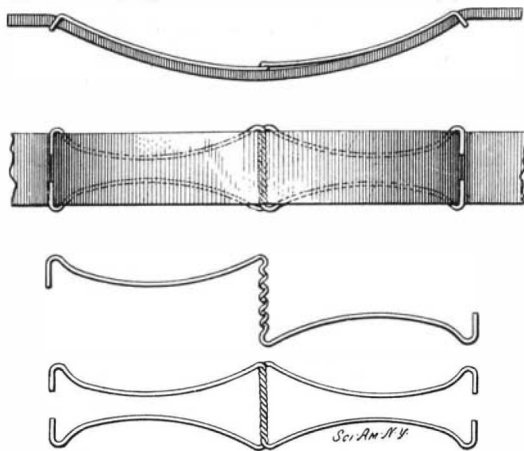
IMPROVED LAND ANCHOR.

the device is driven into the ground, these arms fold upward against the main stem and offer no obstruction, as they simply follow the hole made by the diamond-shaped head, the lower part of which is formed with an offset, which is in alignment with the pivotal portions of the arms. When the stem is drawn upward by the guy rope, the free ends of the arms will catch in the sides of the hole and diverge until they lie at right angles with the stem, when they are effectively prevented from swinging further by the squared edge of one arm engaging the corresponding edge of the other. Should either arm tend to swing downward before the other arm, it will be brought to rest in substantially the transverse position by engagement with the offset on the stem until the other arm is brought to the transverse position, and the squared shoulders are thus brought into engagement with each other. Heretofore in anchors of this type the strain has been made to come on an adjacent part of the support; but it will be seen that in this invention the strain on the arms is almost entirely taken by the supporting pivots, and not by the offset portion of the head.

The pivot pins can be made of tough material such as steel, while the main stem can be made of cheaper material, such as wrought iron, that is best adapted to resist strain of the arms. The inventor of this land anchor is Mr. William G. Beach, care of James J. Hayes, Vicksburg, Miss.

SPRING DRAFT ATTACHMENT.

The value of a spring tension in a draft attachment has long been recognized as relieving the jar or jerk of the pulling strain on the horses' shoulders, and enabling the team to steadily strain with the load in starting, as well as to avoid damaging strains on the harness and vehicle. As long ago as July, 1880, a patent was issued covering an invention of this char-



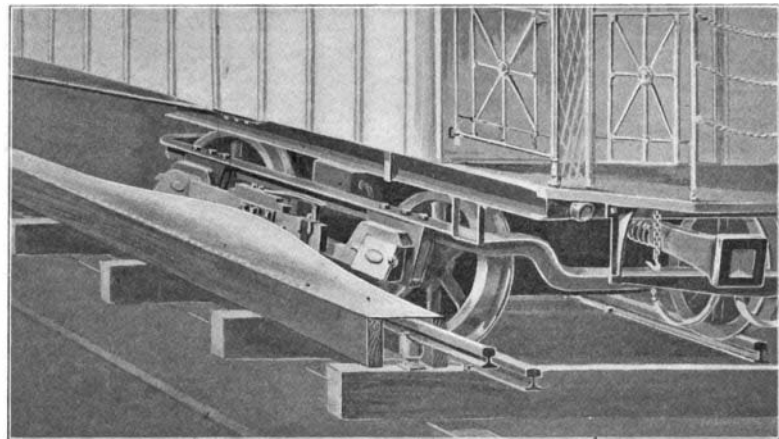
SPRING DRAFT ATTACHMENT.

acter. The invention comprises a bowed spring formed with eyelets or keepers at its ends, through which the trace was passed, so that the trace would lie upon the convex side of the bowed spring, and when the draft tension was applied to the trace, the trace would in straightening out flatten the bow spring, and thus maintain a tension in the draft attachment. Mr. George W. King, of 1325 Thirty-second Street, N. W., Washington, D. C., who invented this device, has just secured a patent on an improvement of the previous invention, which should bring the device into more general use. The improved attachment is so arranged that it will fit any size of trace, whereas the old attachment could not receive a trace that was wider than the eyelets, and a narrow trace would not occupy a middle position on the spring. Furthermore, it was difficult to thread a stiff trace through the eyelets, while in the improved form the attachment can be slipped into place without any trouble. The improved spring draft attachment, as clearly shown in the illustration, comprises two pieces of spring wire coiled about each other at the center, and formed at the ends with inwardly-projecting hooks. The device is applied laterally to the trace. The two arms at each end are sprung apart, and their hooked ends snapped over the edges of the trace. Owing to the spring pressure, these hooks will snugly fit over any width of trace and, moreover, the operation of applying the device to the trace, it will be readily seen, is very simple.

A NOVEL THIRD-RAIL PROTECTOR.

Winter time always brings with it a certain amount of difficulty for the third-rail railroad. Sleet, snow, and ice are only too apt to insulate the live rail so completely, that the contact shoes cannot perform their proper function of taking up the current. In summer time this difficulty naturally disappears. On the other hand, danger to human life is ever present.

No matter how cautious the track walker may be, there is always the possibility of grave danger with a naked live rail in close proximity to the track. In New York city the elevated railroad officials have sought to overcome the obstacles occasioned by the formation of ice and snow by the employment of scrapers, which make a wintry night hideous with their noise. For the protection of human life, abso-



NOVEL THIRD-RAIL PROTECTOR

lutely no means whatever have as yet been adopted.

To provide a guard for a third-rail, a guard which will protect the rail from sleet and snow, and which will likewise obviate danger to human life, is the purpose of an invention for which a patent has been granted to Mr. Jacob Martin, of 313 East 85th Street, New York city.

At the opposite sides of the rail are placed vertical guards which extend the full length of the rail and which are higher than the rail. To one of the rail-guards a supplemental guard or protector is secured which is composed of flexible material, such as canvas, canvas and rubber, or any other suitable material. The supplemental guard or protector is wide enough to cover the rail completely as well as the side guards, and whenever there is a curve in the track or whenever the rail is curved, the supplemental guard or protector is composed of sections, the guard or protector being divided transversely to form the section. One end of each of these separate sections is placed beneath the corresponding end of the next section. With the truck, a plow is connected which consists of a sheet of metal bent to represent one end of an ellipse. An opening is provided through which the contact shoe arms pass. The free end of the plow is bent downwardly at an abrupt angle, and the sides thereof are curved backwardly, and the end passes under the free edge of the flexible guard or protector.

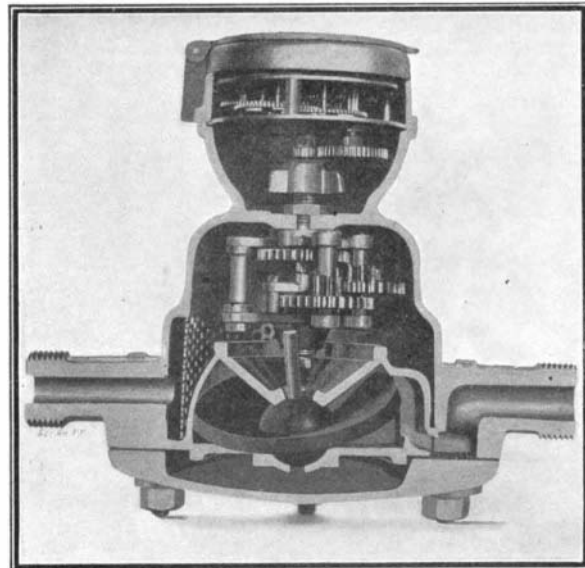
The free edge of the supplemental guard or protector is provided with a longitudinal strip of flexible metal, which is intended to give strength to the free edge of the flexible guard and to resist the friction and wear occasioned by the plow as it moves along.

Secured to the track near one end of the axles is an arm, having a foot-piece, which passes over the free edge of the supplemental guard or protector and serves to force it back into position after the shoe and plow have passed. This arm, however, is not essential.

As the car moves along the track the nose of the plow passes under the free edge of the flexible guard and raises it, and the shoe moves over the surface of the rail. As the car proceeds the free edge of the supplemental guard or protector drops into position and the rail is securely covered thereby at all times.

THE DISK TYPE OF WATER METER.

The design of a successful water meter is no simple task. The primary requisite, of course, is accuracy. At the same time this should not detract from the



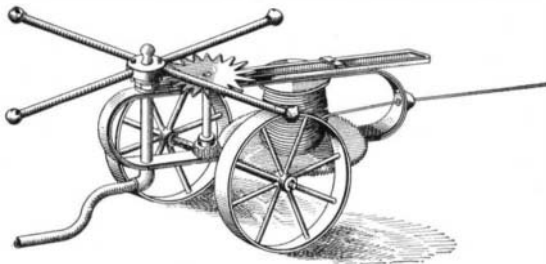
THE DISK TYPE OF WATER METER.

simplicity, durability, and low cost of construction, or the initial outlay for installation and subsequent expenses for repairs of the meter would overbalance the benefits which they would otherwise bring to the water supply company. The disk type of water meter has been found to fulfill these exactions more nearly than any other. This meter involves a mechanical motion which is very interesting. The principle was first applied to steam engines, and is said to have been invented in 1830. The invention was taken up by a number of persons, notably Bishop, an Englishman, who brought it more nearly to its present form. Although this mechanical movement is so old, we venture to say that few of our readers are familiar with it. The latest development of the invention is illustrated in section in the accompanying engraving. In this meter the water passes through a screened inlet at the left, enters the disk chamber through a port not shown in the illustration, and passing through this chamber flows out of the port shown at the right. In its passage through the chamber the water imparts to the disk a peculiar movement about its center, which may be described as a gyratory movement, with the exception that the disk does not rotate on its axis. The disk, it will be observed, is slightly dished, and at its center a ball is formed which finds bearings in the top and bottom walls of the disk chamber. The side walls of the chamber are curved so as to fit closely, but without friction, against the periphery of the disk throughout its entire cycle. The top and bottom walls are also so arranged as to provide a snug fit along the crest and trough respectively of the circular waves which the disk is constrained to describe. A vertical radial septum, formed at one side of the chamber, fits into a slit cut in the disk. This septum will be seen at the right, just back of the outlet port in our illustration, and serves to prevent the disk from rotating. It also separates the exhaust or outlet port from the inlet port, which opens into the chamber just behind the septum. A spindle projecting upward through a circular opening in the top wall of the cylinder, bears at its upper end against a conical block. This tips the disk to one side, so that its under surface at that side will come in contact with the bottom plate of the chamber, while the upper face on the opposite side will come in contact with the upper wall of the chamber. Now, by studying the illustration, it will be observed that the disk, no matter what its position, will at one point or another cut off the free passage between the inlet and outlet ports. With the disk in the position illustrated, water pours into the disk chamber against the under face of the disk, and as the water sweeps around the circular chamber in its course to the outlet port it exerts a forwardly-moving lifting or wedging force on the disk. The disk cannot be tipped to vertical position of its axis because of the conical control block against which the spindle bears. Therefore, it is constrained to follow the gyratory movement described above. That is, the upper end of the spindle describes a circle about the block while the upper and lower faces of the disk roll respectively along the top and bottom walls of the chamber. As the disk rolls around under the pressure of the water, its line of contact with the upper wall will pass the inlet port, whereupon water is admitted to the upper face of the disk, exerting a downward pressure thereon at points diametrically opposed to the upward pressure on the under surface of the disk and causing a continuous gyratory movement of the disk. The revolutions of the disk's spindle are communicated to the counter at the top of the meter through suitable step-down gearing. It will be observed that this form of mechanical movement is an ideal one for water meters, owing to its accuracy, and the simplicity of construction which it allows. The disk is made of hard rubber which has about the same specific gravity as water, and since the ball is exposed to the inlet pressure of the water through the openings in the top and bottom bearing sockets, a perfect water balance is secured, reducing wear to a minimum.

ODDITIES IN INVENTIONS.

TRAVELING LAWN SPRINKLER.—In order to distribute water more generally over the entire lawn, a Minnesota inventor has devised a lawn sprinkler which is actuated by the pressure of the water to travel slowly over the lawn in any predetermined direction. The lawn sprinkler is mounted on wheels. The garden hose is coupled to a vertical pipe on the sprinkler. At the top of the pipe is a revoluble head provided with hollow radial arms formed with discharge nozzles at their ends set at an angle with the arms. Back pressure of the water on the arms in flowing out of the discharge nozzles tends to rotate the head in the usual manner. Pins on this head engage the teeth of a star wheel, which by means of suitable gearing communicates the motion to a reel at the front of the sprinkler. One end of the wire is fastened to this reel, and the other end is secured to a stake driven into the lawn at any desired point. As the reel rotates, this wire is coiled up, drawing the sprinkler forward. When the

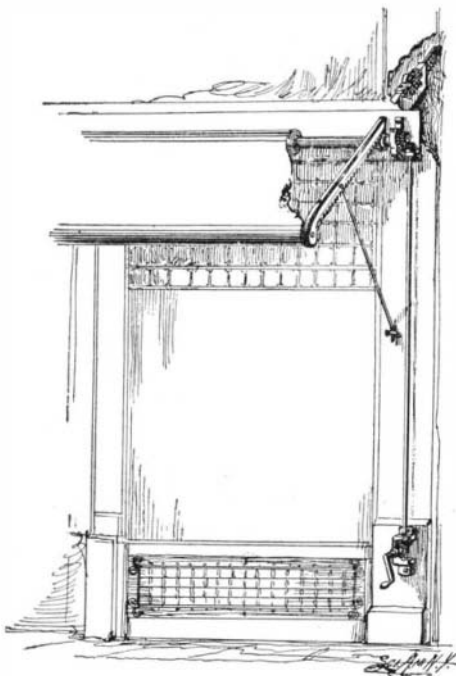
end of the wire is reached, a projecting plate on the sprinkler strikes the stake to which the wire is secured, and the plate is thus forced back. This motion is utilized to lift a small pinion out of mesh with the



TRAVELING LAWN SPRINKLER.

gearing mechanism, thus stopping the rotation of the reel. By varying the number of pins in the revoluble head of the sprinkler, its rate of travel over the lawn may be controlled.

AN IMPROVED AWNING.—The present slow and cumbersome manner of handling awnings has suggested to a Californian the need of an improved construction. The arrangement which he has devised is illustrated herewith, and may be described as follows: The awning frame comprises two bars, which project from openings in the wall of the building, where guides are provided to receive them. The projecting ends of the bars are connected by a cross bar, and stretched from this to a shaft or roller mounted above the door or window which is to be screened, is the fabric of the awning. The awning may be rolled up by means of



AN IMPROVED AWNING.

a crank lying within easy reach of the operator, and connected by suitable gearing with the roller. Each side bar of the awning frame is formed with a rack on its lower edge, and these racks are adapted to mesh with pinions on the roller, so that when the crank is operated, the bars are fed back in the openings in the wall, causing the awning to be evenly rolled up on the roller. The additional brace for the side bars, which is shown in our illustration, is not ordinarily necessary, but will be found useful under certain circumstances.

SHAVING MUG.—A Yankee inventor has devised a shaving mug, which is provided with a simple means for holding the cake of shaving soap normally out of contact with the water, but in such manner that it may readily be dipped into the water when desired.

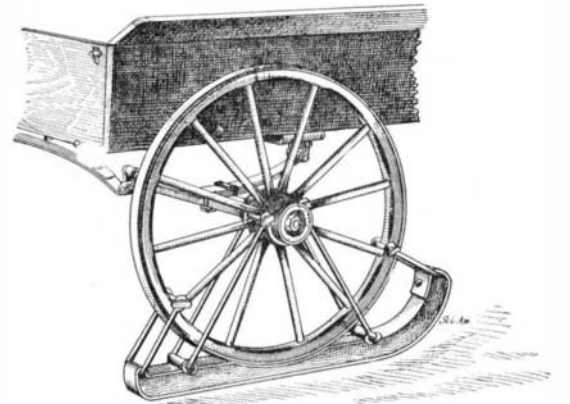


IMPROVED SHAVING MUG.

The cake of soap rests on a perforated plate, which is supported by coiled springs extending upward from the bottom of the mug. The side wall of the mug extends somewhat below the bottom, and fits snugly into a pan, thereby forming a closed chamber. Two ports

in the bottom of the shaving mug open into the chamber, but are normally closed by valve plates controlled by a rod extending outward through the wall of the cup. The valves are opened when it is desired to clean the mug, fresh water being poured in at the top until the parts are thoroughly clean. In use, when it is desired toampen or wet the soap, it may be forced downward into the water by pressure of the lather brush and, of course, upon releasing this pressure, the coil springs will move the soap upward out of the water.

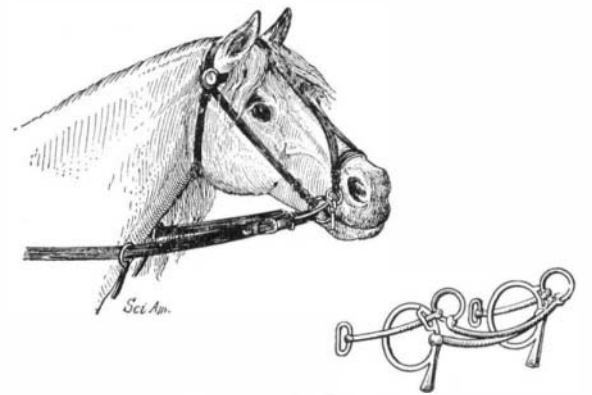
DETACHABLE SLEIGH-RUNNER.—In territories where the winter season brings only occasional snows it will be found very useful to have on hand a set of detachable sleigh-runners which can readily be applied to the wheels of a wagon, thus converting it tempor-



DETACHABLE SLEIGH RUNNER.

arily into a sleigh. Such an attachment we show herewith. It will be observed that the runner can be applied in an instant. The wheel is drawn up onto the runner and seated in a hollow therein. The runner is provided with hinged braces which are swung up against the wheel and secured by bolts passing through eyes formed in the ends of the braces. The bolts pass over spokes of the wheels and thus rigidly secure the wheel to the runner. Key-bolts are used instead of the usual threaded bolts. By this arrangement a driver can in a very short space of time convert his wagon into a sleigh without requiring any tools other than a hammer or bar with which to drive the keys in place.

BRIDLE BIT.—The accompanying illustration shows a bridle bit which may be used on such animals as have tender mouths or the reverse, and it affords means for the control of the animal in case it becomes fractious, which, however, will ordinarily serve to guide an animal without hurting the mouth. The improved bit really consists of two bits so connected that by a gentle pull on the lines the horse may be guided as usual, but when necessary hard pulling upon the bit will bring into service the check bit, which will put a severe strain on the animal's mouth and arrest the attempt to run away before injury is done to the ani-



COMBINATION DRIVING AND CHECK BIT.

mal or driver. A very advantageous feature of the improved bit consists in the safety afforded in case of the accidental breakage of the jointed driving-bit, as the check-bit will remain in the mouth of the animal and enable the driver to control the animal, which otherwise would be released from control if the two separate bits, both connected with the driving-lines, were not employed. The inventor of this combination driving and check bit is Mr. William T. Temple, of Trenton, N. J.

A single telegraph company has long enjoyed the monopoly of making the connections between the fire stations of the great English metropolis, and their demand made recently for a proposed connection of this character was regarded as exorbitant by the city officials, who circumvented the telegraph company by installing the Marconi system between the two points. This was done as an experiment, and was soon found to be so satisfactory that it will be extended, and it is proposed now to install instruments on some of the apparatus, so that the fire department officials on the fire grounds may be in direct and constant communication with those at headquarters.