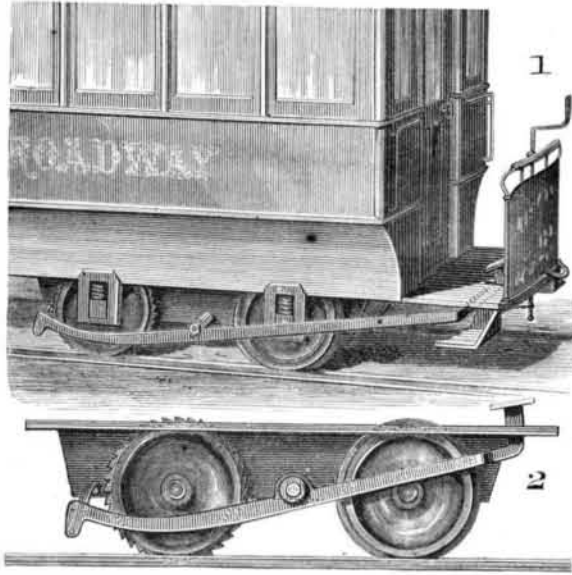


IMPROVED CAR STARTER.

The accompanying engraving represents an invention the object of which is to provide a simple and efficient device by means of which the driver may assist the horses in starting the car. Pivoted upon a stud projecting from the car truck is a lever, which extends forward, and is bent so as to come within convenient reach of the driver. Upon a stud projecting from the inner face of the widened opposite end is placed a pawl, adapted to engage ratchet teeth formed in the flange of one of the wheels, as represented in the engraving. The lever carries a stop pin, that prevents the pawl from being thrown over the center of the stud, and a pin pro-

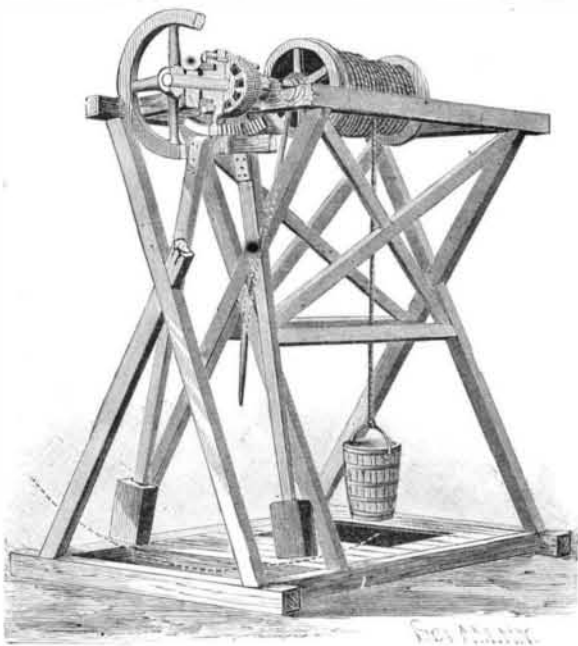
**GERCKE'S CAR STARTER.**

jecting from the side of the truck prevents the pawl from engaging the ratchet teeth when the pawl end of the lever—which is heavier than the other—drops down. When it is desired to bring the pawl into engagement with the teeth, the pressure of the driver's foot on the pedal carries that end of the lever down and raises the pawl end, bringing the pawl into engagement with the teeth and thereby exerting a pressure upon the periphery of the wheel, which tends to propel the wheel forward and assist the horses in starting the car.

This invention has been patented by Mr. Rudolf O. Gercke, of Augusta, Ga.

PENDULUM HOIST.

The object of the invention here illustrated is to provide a simple, cheap, and durable hoisting apparatus. Mounted upon the main frame is a shaft carrying a loosely mounted drum, a balance wheel, and a fixed collar, each vertical face of which is formed with ratchet teeth. Upon each side of the collar there is arranged a disk formed with a segmental rack and a downwardly extending arm to which a pendulum is attached. Meshing with each of the segments is a beveled pinion, mounted in a sleeve carried by a bracket fixed to the stationary frame. The disks are provided

**SATTES' PENDULUM HOIST.**

with pawls that are forced outward against the ratchet teeth of the collar by springs, the number of pawls being one less than the number of teeth. The motion of the shaft is imparted to the drum by a properly arranged clutch, which may be thrown into or out of gear by a lever. Attached to the drum is a brake, by means of which its motion may be regulated.

To operate the hoist, one of the pendulums is started, the force applied to it being gradually increased until it swings in the arc required. Any force exerted upon one pendulum will be transmitted to the other, owing to the connection established between them by their

segments and the interposed pinion. As the pendulums swing, their pawls engage with the ratchet teeth of the collar—the pawls of course failing to engage during the return stroke—and impart a constant rotary motion to the shaft and, when necessary, to the drum. If desired, the balance wheel may be left off.

This invention has been patented by Mr. John Sattes, whose address is P. O. box 730, Butte City, Montana.

Jamison's Cream and Milk Radiator.

This is the name that has been given to a construction designed more especially for regulating the temperature of water in milk vats by introducing steam in such way that no noise is made. The vats or tanks are such as are usually employed in creameries, and within them are set tin milk vats, which are surrounded by water to the requisite height. Into the lower portions of these outer vats are inserted suction and discharge pipes, controlled by a connecting pipe and valves, and also in connection with a steam supply pipe, through an injector. By this means a perfect circulation of the water in the vats is obtained, the water being heated by the steam to any desired degree. At one end of the connecting pipe is a valve, by which the apparatus can be made to operate as a steam pump to throw either hot or cold water to any part of the building, or for use in cleaning the churns or other vessels. This invention has been patented by Mr. Samuel S. Jamison, of Saltsburg, Pa.

THE ALLARD SPIRAL SCREW DRIVER.

This screw driver is especially adapted for light and rapid work, and much time can be saved by its use where large quantities of small screws are to be driven. Placed upon the spirally threaded shank within the lower end of the hollow handle is a nut which is free to revolve within the handle. When the point is inserted in the nick of a screw and pressure is brought to bear upon the handle, this nut is raised slightly and brought into engagement with a clutch, which holds it so that continued pressure upon the handle revolves the shank and thus drives the screw. To draw a screw, the shank is pressed into the handle, when the tool can be used as a common screw driver. If desired, it may be used, when extended, as a common screw driver, by simply giving the shank a twisting jerk, causing the nut to recede and become locked.

It will be seen that the use of this tool does away with all tiresome turning of the hand and twisting of the wrist, all the work of driving the screw being accomplished by simply pushing.

The sole agents of this screw driver are the Alford & Berkele Co., of 77 Chambers Street, New York city.

Photos for Photo-Engraving.

Objects which are to be reproduced by means of the photo-engraving process are generally photographed, in an enlarged measure, and drawn upon with India ink. Then the photographic picture is removed by means of bleaching, so that only the drawing remains, and is reproduced by photographic means to the size desired.

As is known, one of the chief requisites for its proper chemical reproduction is that it should exhibit deep black lines and a pure white ground. By the usual method of bleaching photographic prints with chloride of quicksilver, it often happens that, in spite of every precaution, the whites of the picture appear yellow or brownish yellow, a circumstance which greatly increases the difficulty of making a proper negative. To overcome this fault, Mr. W. Bode recommends the following receipt:

Distilled water.....9 parts.
Nitrate of silver.....1 part.

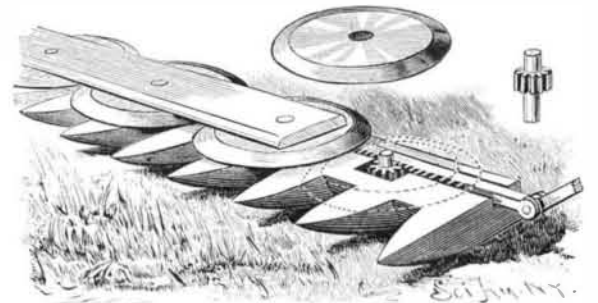
When the silver has dissolved, pour three parts of the whole into a glass, and add ammonia to it until the oxide of silver which has formed dissolves, and the solution becomes once more clear. Then pour this back into the other six parts. If oxide of silver forms again, it can be run off from the bottom of the vessel, or it can be poured out and filtered. Use only good salted paper. Print until all the details are out, yet not too deep, then wash the print with cold water until it is red. When the residue of silver is completely washed out by frequent changes of water, the print must be fixed in a solution of soda, say equal parts of hypo and of double carbonate of soda. Let it stay in this solution ten to twelve minutes, then wash it many times in clear water and then mount it.

Since the picture will only keep for a few days, the drawing should be made as soon as the print is dry. The bleaching material—a solution of thirty grains of chloride of quicksilver in one liter of alcohol—should be poured over the picture in the same way as collodion. In a quarter of an hour the drawing can be had on pure white paper, which does not show a vestige of a photographic picture.—*Archiv. Phil. Photographer.*

CUTTING APPARATUS FOR MOWERS AND REAPERS.

In this cutting apparatus for mowers and reapers the finger bar is substantially like that of the usual form, except that it is enlarged at intervals along its length to form chambers for receiving pinions, and is provided with a longitudinal groove for a rack which engages all the pinions. Secured to the top of the finger bar is a plate provided with bearings which receive the shafts of the pinions and cutters. This plate also confines the rack in its place. The guards formed on the finger bar project outward under the circular cutters to protect them from injury and to divide the grain stalks and hold them in position to be operated upon by the cutters.

The rack is reciprocated by a pinion attached to one end, the stroke being sufficient to cause the cutters, by the engagement of the rack with the pinions, to make a half revolution in each direction. When one-half the cutting edge has become dulled, the cutters may be removed and turned half way round to bring a new edge into use. When dulled, the cutters may be ground upon an ordinary grindstone, and when worn out may be easily replaced by new ones. The circular knives

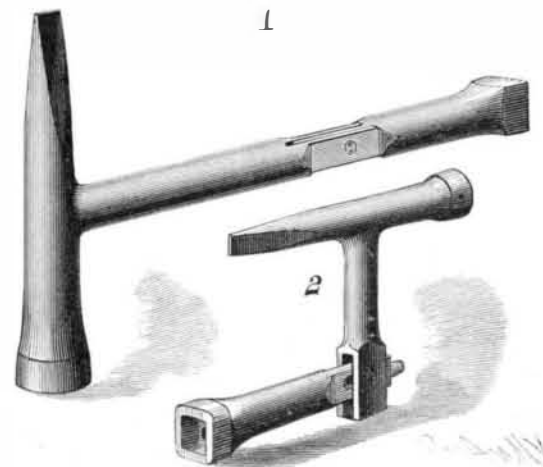
**KELLER'S CUTTING APPARATUS FOR MOWERS AND REAPERS.**

produce a true drawing cut, which readily severs the grain stalks with the smallest consumption of power and with but little wear upon the cutting edges.

This invention has been patented by Mr. David M. Keller, of Raphine, Va.

COMBINATION TOOL.

This tool consists of a socket-wrench, hammer, and screw driver, and is especially adapted for the use of stove assemblers and repairers. The body of the tool is formed with a T-head or handle portion, one extremity of which is in the shape of a screw driver, while the other forms a hammer head. The lower end of the body is forked and formed with a socket; between the forks is placed the wrench portion, the body of which is cut away to form a shank and shoulder, as shown in Fig. 2. The shank is provided with a long slot, through which and the forks passes a rivet, and the top of the shank is formed with a lug which enters the socket in the handle, thereby holding the wrench portion rigidly in the handle when used as a straight socket-wrench. The lower end of the wrench is formed with a square nut-receiving recess, and a cylindrical socket to receive the screw-threaded end of the bolt. When arranged as shown in Fig. 1, the tool may be used as a screw driver, a hammer, or a straight socket-wrench, and by drawing the wrench portion down and turning it one side or the other (Fig. 2), a wrench is formed for the purpose of getting at nuts up under flanges and other inconvenient places. To bring the tool to the first position, it is only necessary to swing the wrench in line with the body and push it up into the forks, the

**MANDEVILLE'S COMBINATION TOOL.**

lug then entering the socket. If desired, the lug may be formed and used as an ordinary punch for perforating sheet metal or for heading rivets.

This invention has been patented by Mr. Ira J. Mandeville, of Hazleton, Pa.

THE time which would be taken to discharge 500 gallons of water through a $1\frac{1}{2}$ inch pipe 700 yards long, with a fall of 100 yards from inlet to outlet, is theoretically 16 minutes; but any inequality in the inside of the pipes, or minute obstructions, would increase the time.