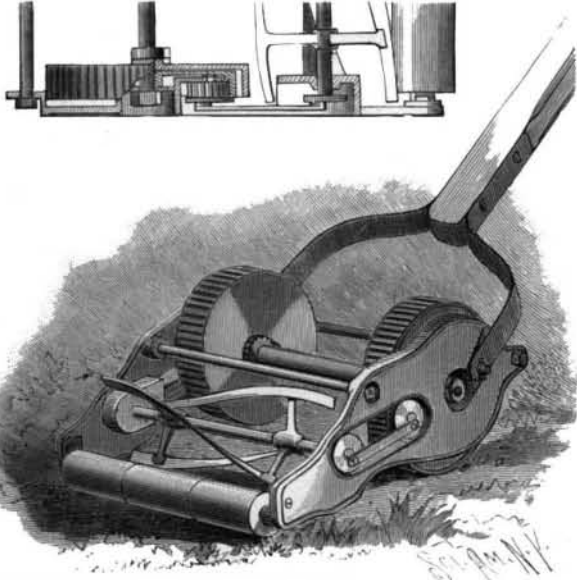


**AN IMPROVED LAWN MOWER.**

In the lawn mower shown in the illustration the knives are driven by crank and pitman connection with the ground wheels, the driving mechanism being located entirely within the outer face of the frame, and there being no projections to collect the cut grass. The improvement has been patented by Mr. Edward Ingleton, of Pottstown, Pa. The axle carrying the ground wheels is journaled in depressions of the side or cheek pieces of the frame, the wheels being cupped on their outer faces. The wheels are loosely mounted,



INGLETON'S LAWN MOWER.

and ratchet wheels on the axle adjacent to the hubs are adapted for engagement by a dog on each wheel, the dogs turning the axle when the mower is pushed ahead and slipping over the ratchets when the mower is drawn backward, the cutting mechanism being then inoperative. In each of the side pieces is a horizontal depression or well having near its center an opening. The shaft of the cutter is journaled in the inner walls of the wells, and on the shaft are spiders which carry the spiral cutting knives, extending from the inner face of one side piece to the inner face of the other side piece, the knives being thus protected from obstacles at the sides of the machine and adapted to cut a swath of nearly its full width. An internally toothed gear on each end of the axle, within the flanged portion of each ground wheel, as shown in the small sectional view, engages a pinion on a short spud axle, and each pinion has a crank disk connected by a pitman with a crank disk on each outer end of the knife shaft, the entire driving mechanism being thus inclosed and protected, permitting the machine to be run very close to trees, flower beds, etc. At the lower forward portion of the frame are rollers, and the handle is suitably pivoted to the rear portions of the side pieces.

**THE "HOME TRAINER" FOR TESTING BICYCLES.**

The delivery in perfect order of bicycles purchased by customers is, in the cycle trade, an occurrence that is unfortunately too rare. All cyclists who read these lines will recall the disagreeable surprises that a badly



THE "HOME TRAINER" FOR TESTING BICYCLES.

keyed crank, too taut a chain, etc., has caused them upon unpacking a machine shipped from the factory. It is because a bicycle, which seems at first sight a very simple machine, is in reality very complex. Even if it is put together with extreme care, there is no guarantee, before it has been tried, that all the parts of it are in perfect unison. The union of excellent pieces may form a detestable machine.

Now the testing of a bicycle at the factory presents inconveniences and difficulties. One of the first is the soiling of the pneumatic tires, which the customers like to receive with an aspect of absolute newness and which a trial in a factory begrimes beyond remedy.

On another hand, one of the principal difficulties of such trials consists in the want of sufficient space, especially at Paris, where considerations of rent have a genuine importance and where a hall thirty or forty yards in length by twenty in width devoted solely to the running of bicycles before sale would constitute a luxury.

In the manufacture of the Rochet bicycles, we have a happy application to the trial of machines of what is known as the "Home Trainer," an apparatus well known in cycling and that permits the bicyclist to train himself at home, even in his bed room.

This apparatus, of which our figure gives a very exact representation, is formed of three large wooden cylinders, hollow in the center and rolling with slight friction upon the extremities of their central axis in a wooden frame. Above the cylinders there is a platform that permits the tester to mount upon the apparatus in order to place the machine, which a support holds in equilibrium at the moment of the starting or stoppage of the bicycle. After the operator has given the pedals a few kicks, he lets go of the supporting bar and rolls in place, keeping the same equilibrium as in the ordinary use of the bicycle.

It will be remarked that the driving wheel of the bicycle is here at the same time the motor of the three cylinders. It moves by friction the two upon which it rests, and, through the endless chain running over the toothed wheels seen at the bottom of the figure, likewise actuates the front cylinder and consequently carries along the steering wheel of the bicycle.

All the parts of the machine therefore operate as they would do in the hands of the purchaser. The tester rides it for about five minutes. Has one of the wheels too much play? If so, he remarks it at once and sends the machine back to the mounting shop. He sees whether the handle bar is well screwed in the head, and whether the pedal bracket, the pedals, the keys and the nuts need tightening, etc. Sometimes an air chamber pinched between the felly and the pneumatic tire bursts as soon as the machine begins to roll. Such an accident, happening on the first day of using the machine, sometimes at two or three hundred miles from the place of manufacture, would prove very embarrassing to the purchaser, besides making him very angry.

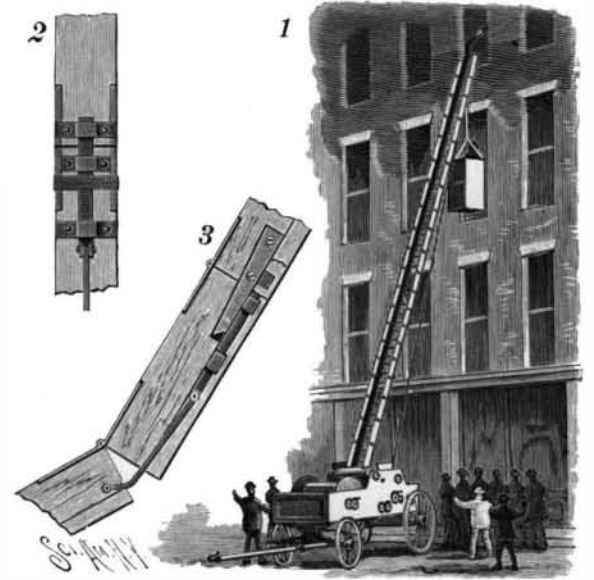
We would recommend the use of this machine, then, to all bicycle manufacturers.—La Nature.

**A HOSE TOWER AND FIRE ESCAPE.**

The illustration represents a fire department apparatus designed to serve as a hose tower, fire escape, geyser, and truck, and which has a collapsible ladder adapted to be coiled upon the truck or readily extended to any necessary height, the pitch of its inclination being easily regulated. The improvement has been patented by Mr. Francis M. Painter, of No. 609 Pine Street, St. Paul, Minn. Fig. 1 represents the apparatus with the ladder extended to the upper floor of a building, Fig. 2 being a bottom plan view showing the connection between the ladder sections, and Fig. 3 representing the sections partially opened. Mounted transversely on the truck is a drum whose body is faceted to facilitate folding on it the ladder sections, and the drum is on a shaft with end cog wheels engaging other cog wheels with squared shafts, to which a wrench is applied to turn the drum to wind up the ladder, pawls preventing the shaft and drum from turning back. To raise the ladder and unwind it from the drum, cables are secured to and adapted to be wound on the drum with the ladder and unwound as the ladder is raised. These cables extend over guide pulleys and are secured to a drum whose shaft is connected by gears with a squared shaft to receive a winding crank.

The lower end of the ladder is hinged to the drum at one edge of one of its facets, the several sections of the ladder being hinged together on the inner side, as shown in Fig. 3, to enable them to fold compactly on the drum, and each ladder section having at one end and on each rail an arm overlapping the rail of the adjacent section and fitting in a side socket therein. On the side of one of the rails opposite the arm is a bolt sliding in keepers, as shown in Fig. 2, the bolts being automatically moved when the ladder is raised or lowered, each bolt being connected by a rod to the next ladder section below. A guide comprising opposite end frames and auxiliary mechanism straightens and adjusts the ladder as it is raised, and at the top of the ladder is an adjustable cross bar carrying the several nozzles and hose, the nozzles being held in place and the hose held to the

ladder by keepers. When the ladder is raised, the cross bar may be adjusted so that the nozzles will point as desired, and the hose are provided with couplings at frequent intervals, as many sections of hose as it is desired to use being connected with the engine supply pipe. The ladder is also provided with a speaking tube made up in sections and with a gong near each end. A car for use in rescuing people from a building, and adapted to be raised or lowered opposite the windows, is suspended from a guide pulley at the top of the ladder, the cable passing down over a drum

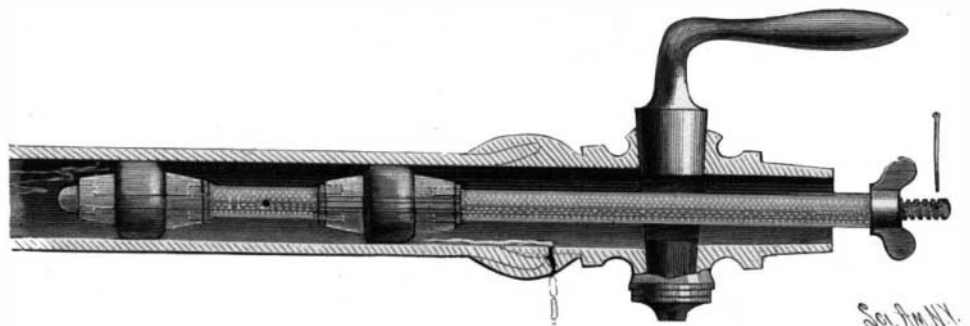


PAINTER'S HOSE TOWER AND FIRE ESCAPE.

journaled in the truck frame, the car being raised or lowered by winding or unwinding the cable by turning the drum. The car may also be used as a platform on which the firemen may stand, and in the front part of the truck frame is a hose reel on which extra hose may be wound.

**A TOOL FOR CLOSING WATER PIPES.**

When it is desired to close pipes where a stop cock cannot be used to shut off the water, in making repairs, the tool shown in the illustration is designed to facilitate the work. It has been patented by Mr. John J. Meyer, of No. 22 East One Hundred and Thirty-fourth Street, New York City. The hollow stem of the tool has at one end a head and its opposite end is screw threaded, and adjacent to the head are collars clamping between them an expansible washer. One of the outer collars is connected by a sleeve with inner collars clamping a second washer, the inside collar being engaged by a tube surrounding the stem, and there being on the outer end of the tube a wing nut engaging the screw-threaded outer end of the stem. To prevent the stem from rotating while the nut is being turned a pin may be passed through an opening in the outer end of the stem, and an opening in the sleeve connecting the washer clamping collars communicates with an opening into the bore of the stem, to allow the escape of any water which may leak past the first washer. When a pipe is cut or broken off, the tool is quickly inserted in its broken end, allowing only one gush of water to escape, when a few turns upon the wing nut force the washers into tight engagement with the inner walls of the pipe. This tool may also be used



MEYER'S PIPE CLOSER.

for closing gas pipes. To remove the tool without considerable loss of water, a stop cock of the ordinary construction may be employed, and its casing slid over the tool before or after its introduction into the pipe, a suitable connection being made between the casing of the stop cock and the pipe.

**The New Graving Dock at Southampton.**

The ceremonies of opening the new graving dock at Southampton, England, took place August 3. The Prince of Wales and great crowds celebrated the event. It is the largest single graving dock in the world, being 750 feet in length on the floor and is so constructed that it could be made 250 feet longer. The entrance has a width of 87½ feet at the sill level and 91 feet at cope, the dock width being 112½ feet.