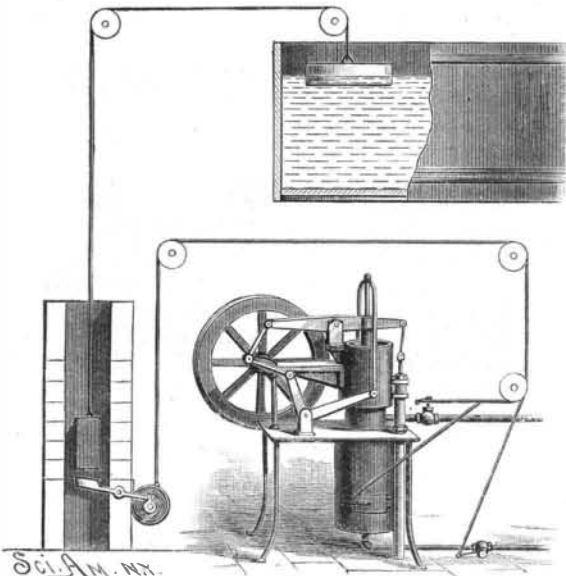


AUTOMATIC STOP FOR ENGINES.

The engraving represents a device for automatically stopping pumping engines, particularly hot air engines used for raising water to tanks. To the engine is fitted an escape pipe provided with a valve, the stem of which has a lever. Connected to this lever is a cord or wire that passes over pulleys and down to a wheel on a shaft journaled in bearings attached to a casing. The shaft is provided with a spring for turning it for winding up the cord to open the valve or other device for stopping the engine. The shaft is turned for wind-

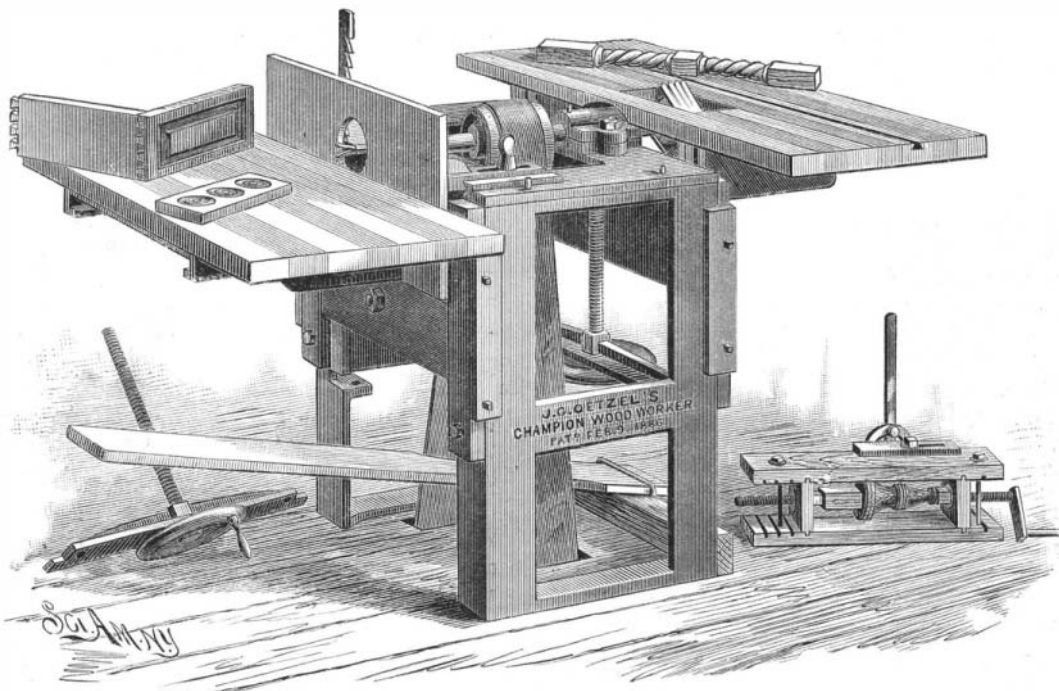
**ROBERTS' AUTOMATIC STOP FOR ENGINES.**

ing up the spring by a crank; it is locked by a pivoted trip lever engaging with a projection on the shaft. In the casing is a weight attached to a cord leading to a float in the tank. The cord is so arranged as to raise the weight when the float descends. As the tank fills the weight descends, trips the lever, when the spring turns the shaft to wind up the cord, thereby opening the valve and allowing the hot air to escape from the engine and cause it to stop. In some cases, instead of attaching the cord to the valve, it may be fastened to the furnace door, which will then be opened by the action of the spring. Where gas is used for fuel, the spring may be made to close the cock in the supply pipe. By thus automatically stopping the engine by the rising of the water in the tank, there is no danger of overflowing, and the engine requires no attention when in operation.

This invention has been patented by Mr. B. J. Roberts, of 126 East 19th Street, New York city.

IMPROVED WOODWORKING MACHINE.

This machine is designed for the cabinet shop, particularly where power and shop room are limited; it contains no complicated parts, and can with very few attachments and tools be successfully applied to almost every variety of woodwork. The cutter for forming dovetails is held in one end of a shaft mounted in bearings attached to the top of the frame. The cutter projects through an opening in a vertical guide plate so arranged that it can be adjusted out or in, to allow the cutter to make a shallower or deeper dovetail as may be desired. The feed table moves easily out and in, but has no lateral movement, and can be locked in the desired position. Upon the inner side of the middle part of the bracket supporting the feed table is formed a lug to which is secured a chain passing over a pulley and thence to a treadle hinged to the frame; by operating this treadle, the feed table can be raised to bring the work against the cutter. The timber to be dovetailed is placed with its edge upon the feed table and its side resting against the vertical guide plate, when it is moved forward until the tool has cut a recess to the desired depth. The timber is then drawn back, the feed table is lowered through a space equal to the distance between the dovetails, and is again shoved forward against the cutter. To form dovetail tongues, a number of pieces of timber are clamped together side by side, are placed edgewise upon the feed table, with their ends resting against the guide plate, and are moved laterally against the cutter, which forms a dovetailed groove across the ends. The table is then lowered and the opposite sides cut, and so on until the tongues have been finished on all sides.

**THE CHAMPION WOODWORKER.**

and the object of the invention became apparent at once. Every car uncoupled from its neighbor as if by magic. Some of them remained on the track and others toppled to the floor. He repeated this several times, and each time the mechanism completely demonstrated that the cars immediately become detached from each other. It was the most ingenious device I ever saw. The amount of gearing and mechanism necessary for each car simply made the in-

To the other end of the shaft is attached an extension to serve as a mandrel to receive a saw or cutter head. This feed table can be raised or lowered, to allow the tool to cut to the desired depth, by means of a hand screw, which is swiveled to a cross bar secured to the frame. By turning the hand screw, the table can be adjusted to permit of the work being placed above or below the cutter or saw, as the character of the work may render most convenient. When used for cutting grooves, a gauge and guide cleat is attached to the table.

By using suitable tools and properly adjusting the parts, this machine can also be used as a boring machine with sliding table; as a double-headed moulding cutter for straight, circular, or other shapes; as a paneling and rosette cutting machine; and as a dado and routing machine. It is also effective for squaring the heads of turned front legs of sofas and chairs, and it can be easily adapted for cutting "rope or spiral" turning.

This machine is the invention of Mr. John G. Oetzel, whose address is care of Messrs. M. & H. Schrenkeisen, of 160 to 166 Monroe St., New York city.

The Coupler Fiend.

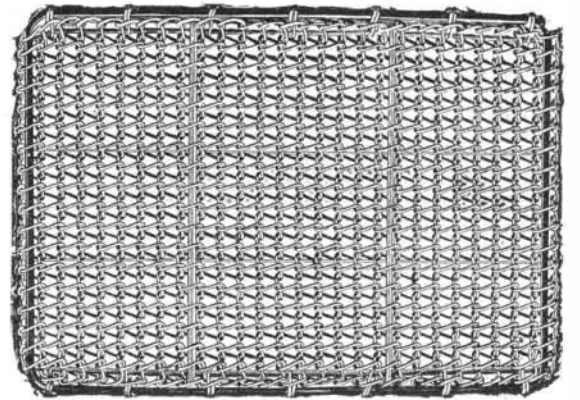
Since it became known that the Commissioners were interested in saving the lives and limbs of railroad employes by securing the application of automatic couplers, the inventors have forwarded them models of every conceivable kind of mechanical appliances for car coupling. Some of them are decidedly ingenious, others are cumbersome, while a few are constructed upon the principle that freight cars should be locked together as tightly as the jaws of a steel vise. Railroad men are agreed that there should be some play in couplings for freight cars, and they pass over models which do not recognize this principle. Some of the couplings are made to be operated by a lever projecting beyond the side of the car. Others seem to be constructed for operation solely from the tops of cars. One of the simplest of the collection now in the Railroad Commissioners' office was invented by a mechanic employed by the New York Central. Every inventor who forwards his model invariably accompanies it with the modest explanation that "this is the best thing ever yet invented."

"Probably a hundred models have been sent to the Commissioners, perhaps more," said Secretary Hudson. "Many of them are exceedingly ingenious. Some of them are so expensive that they are impracticable. I remember sitting here in the office one day when a chap came in, followed by five associates. Each of them had a bundle. The leader just cast one glance at me, and then without a word he undid his bundle, and commenced to lay a miniature railroad track all around the floor and into the Commissioners' private rooms. The fifth man produced a lot of cars, and the last man drew a locomotive out of his package. Then I began to get interested. The leader arranged the track so that it ran up and down heavy grades and around sharp curves. Then he lighted a match, touched it to the locomotive, and away went the miniature train at a great rate of speed. Then he purposely caused an accident to the train,

vention enormously costly, and of course impracticable. He thought he had fortune by the throat, and I could not convince him to the contrary. I yielded to his solicitations for letters of introduction to two practical railroad men, and away he went. I afterward received notice from these gentlemen that my life would be in danger if I ever sent any more inventors to them."—*Albany Corres. New York Times.*

STEEL WIRE DOOR MAT.

The accompanying engraving represents a door mat that is rapidly coming into favor, and is particularly adapted for railway and street car floors, steamboats, offices, stores, residences, etc. It is made of steel wire, with steel frame and steel braces, all perfectly galvanized. This gives it many decided advantages; it is serviceable, practically indestructible, is self-cleaning,

**STEEL WIRE DOOR MAT.**

requiring no shaking, and cheap. These mats are manufactured by the Hartman Steel Co. (Limited), of Beaver Falls, Pa., in six standard sizes, varying from 16 by 24 inches to 36 by 48 inches; special sizes and shapes are made when desired.

Ancient Condition of Egypt.

At the recent meeting of the Victoria Institute, Prof. Hull, F.R.S., Director of the Geological Survey of Ireland, delivered the address, in which he gave an account of the work, discoveries, and general results of the recent geological and geographical expedition to Arabia and Western Palestine, of which he had charge. Prof. Hull, having sketched the course taken by the scientific expedition (which to a considerable extent took the route ascribed to the Israelites), the physical features of the country, evidences of raised beaches, etc., showed that at one time an arm of the Mediterranean had occupied the valley of the Nile as far as the first cataract, the level of the land being 200 feet lower than at present (an opinion which had also been arrived at by another of the Institute's members, Sir W. Dawson), and that, at the time of the Exodus, the Red Sea ran up into the Bitter Lakes, and clearly must have formed a barrier to the travelers' progress at that time. He then alluded to the great changes of elevation in the land eastward of these lakes, mentioning that the waters of the Jordan valley once stood 1,300 feet above their present height. The various geological and geographical features of the country were so described as to make the address a condensed report of all that is now known of that part of the East.

Solidified Oxygen.

At the Royal Institution recently, Professor Dewar exhibited the method he employs for the production of solid oxygen. Last year the Professor gave a lecture on liquid air; but although he and other experimenters had made liquid oxygen in small quantity, yet no one had succeeded in getting oxygen into the solid condition. The successful device employed at the Royal Institution depends upon allowing liquid oxygen to expand into a partial vacuum, when the enormous absorption of heat which accompanies the expansion results in the production of

the solid substance. Oxygen in this condition resembles snow in appearance, and has a temperature about 200 degrees Centigrade below the freezing point of water.

A supply of this material will enable chemists to approach the absolute zero of temperature and to investigate many interesting changes in the physical properties of bodies under the primordial condition of the temperature of space.