

### AN AUTOMATIC CARTRIDGE-COUNTER FOR MAGAZINE RIFLES.

BY DR. ALFRED GRADENWITZ.

Ever since magazine rifles were introduced into current practice there has been a need for a device enabling the number of cartridges left in the magazine to be ascertained readily without opening any part of the rifle. In fact, numerous instructions issued for infantry troops oblige both the riflemen and commanders to bear in mind at any moment the amount of ammunition remaining in the rifles. Now, if the magazine has to be emptied in order to ascertain the accurate number of cartridges left, there will be a loss of time and, under certain conditions, some danger, quite apart from the risk of losing some ammunition dropping out of the magazine. Moreover, the attention of the men will be diverted completely from the enemy, or from the commander.

An apparatus invented by Dr. Gottardi, of Innsbruck, will doubtless be welcomed in military circles. This cartridge-counter is an extremely simple device, causing a number of checking buttons corresponding to the number of cartridges left in the magazine to project in a readily visible and touchable manner from the right-hand wall of the magazine. This device is readily adapted to any kind of magazine rifles, as also to pistols.

Our illustrations show the cartridge-counter as adapted to type 95 of the Austrian rifles. The supporting spring of the magazine is somewhat modified, and is narrowed toward its end, while its cross-section is increased, so that the power of the spring is augmented. The counter is situated at that point on the rifle where the rifleman, in the "clear" position and in pointing, keeps his left hand, so as to enable him readily to ascertain the condition of the magazine without inspecting or touching the apparatus.

Special advantages will be derived from this device, not only by the men, but also by commanders, who will be able to watch either with the naked eye or with a field-glass the condition of the magazines of their men.

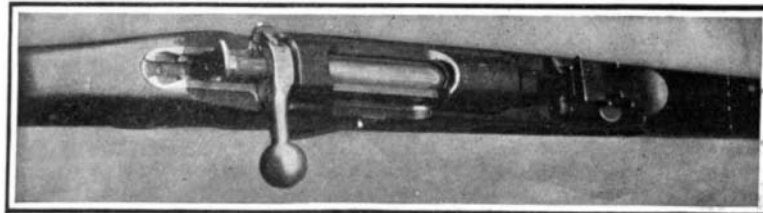
### A NEW TYPE OF ORE-UNLOADING BUCKET.

BY W. FRANK M'CLURE.

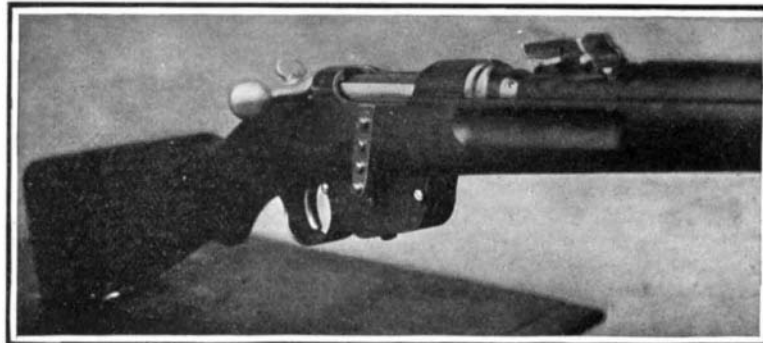
The ore-unloading machines most recently installed at the world-famous port of Conneaut, and known as "fast plants," are playing a most important part in the making of the marvelous unloading records which are being chronicled this season at that harbor. There are four of these machines, and in the making of the recent unloading records they have been used simultaneously with the giant Hulett clamshell machines, which were fully described some time ago in the SCIENTIFIC AMERICAN.

The Brown fast plant is an abbreviated Brown hoist, spanning two or more railroad tracks, with arms or cantilever extending beyond. The storage feature is limited or else eliminated entirely. As will be noted in the accompanying photograph, the machine is very compact in form. Loading, as it does, directly into

cars, the movements of the bucket are short and fast. While Brown fast plants have been installed at West Albany, N. Y., Jersey City, Port Richmond, Cleveland, and elsewhere, they are all of different styles and dimensions. None of them are duplicates of the ones at Conneaut, and none of as great capacity. Those at Conneaut and at Port Richmond are operated by electricity, and all others yet built by steam. The contract for the building of the four fast plants at Conneaut stipulate that each one shall be capable of unloading seventy-five per cent of the cargo of any modern steamer with hatches twenty-four feet center to center, without the aid of hand labor in the hold of the vessel, and at the continuous average rate of 150 tons per hour. The bucket in use on these machines is a patent two-



One Cartridge in the Magazine and One in the Barrel.



Four Cartridges in the Magazine and One in the Barrel.  
AN AUTOMATIC CARTRIDGE-COUNTER FOR MAGAZINE RIFLES.

rope grab bucket. It is operated by two ropes, which work around sheaves in the top of the bucket, one operating the shell and the other the spades at the will of the operator. The bucket can thus be lifted and the spades remain open. The bucket can likewise be engaged in digging without being lifted. This style of bucket can be used in coal, limestone, and other materials as well as iron ore. The ones in use at Conneaut, and which are shown in the photographs, each have a capacity of five tons. The weight of each bucket is about 11,000 pounds. The total weight of the trolley and bucket is 59,400 pounds, and the weight of the crane 337,000 pounds.

During one of the tests of this machine, between the 19th of one month and the 27th of the month following, four machines handled 164,326 tons in 978 hours and 35 minutes, the average number of tons per hour being 167.92, and the per cent of the cargoes handled exceeding 75 per cent. The hoist on the machines at Conneaut is operated by two 150-horse-power motors and has a speed of 300 feet per minute, the trolley

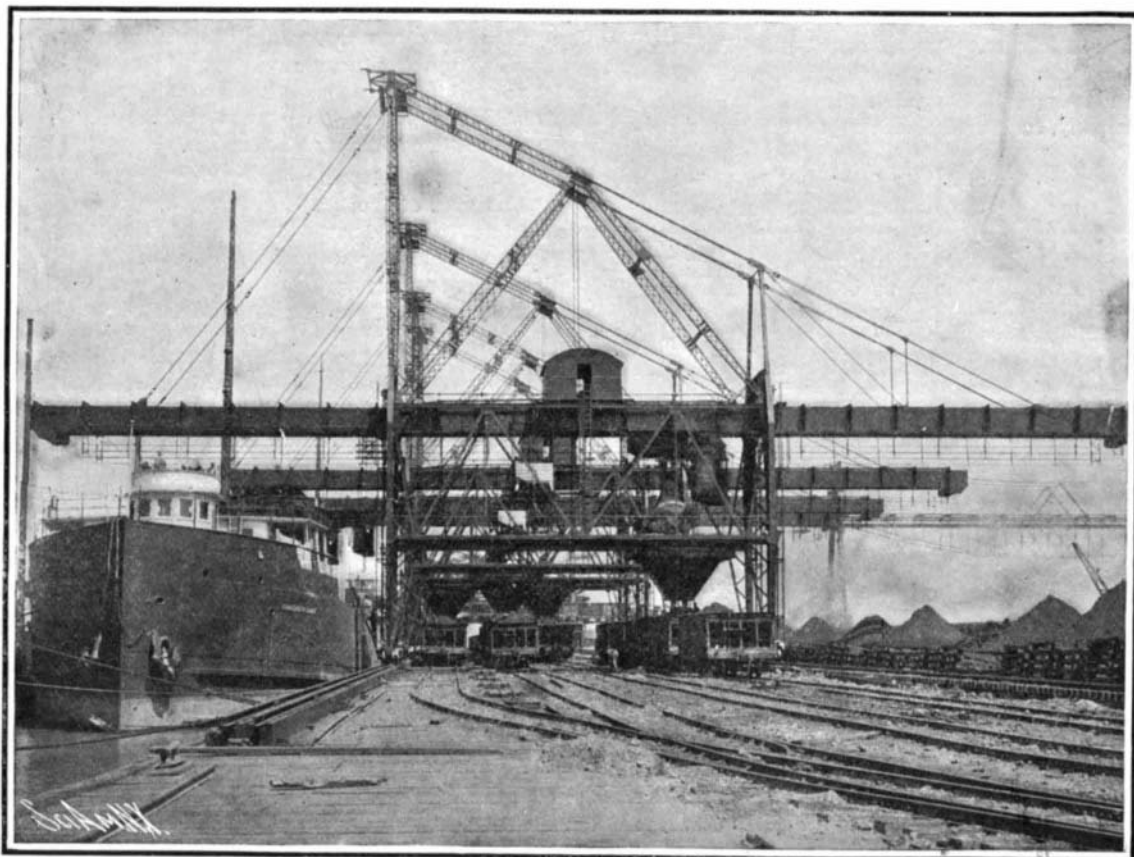
travel 100-horse-power motor and a speed of 1,000 feet, the bridge travel one 75-horse-power motor and a speed of 75 feet.

As heretofore stated, a favorite way at Conneaut docks, in unloading the largest ore carriers, on which the world's records have been made, is to operate these machines in the vessel simultaneously with the big clamshell or Hulett automatic unloaders. It will be recalled that the Hulett machines are operated by hydraulic power, that the buckets have a capacity of 10 tons, and that the entire weight of each of these machines is 400 tons. The fast plant and the Hulett machines stand side by side on the docks of the Pittsburgh and Conneaut Dock Company, and the large dimensions and number of hatches in the modern lake freighter admit of both styles of machines being in use at once. The first of the recent great records for unloading one of these monsters was made soon after the installing of the fast plant at Conneaut, which made it possible for this dock to operate the two kinds of machines in one boat. This record was the unloading of 9,945 tons of ore from the steamer "Wolvin" in four hours and thirty minutes, which cut the former record at South Chicago square in two. Not long ago this latter record was broken, when the Hulett automatic unloaders and the fast plant unloaded the steamer "George W. Perkins" of 10,514 tons in four hours and fourteen minutes.

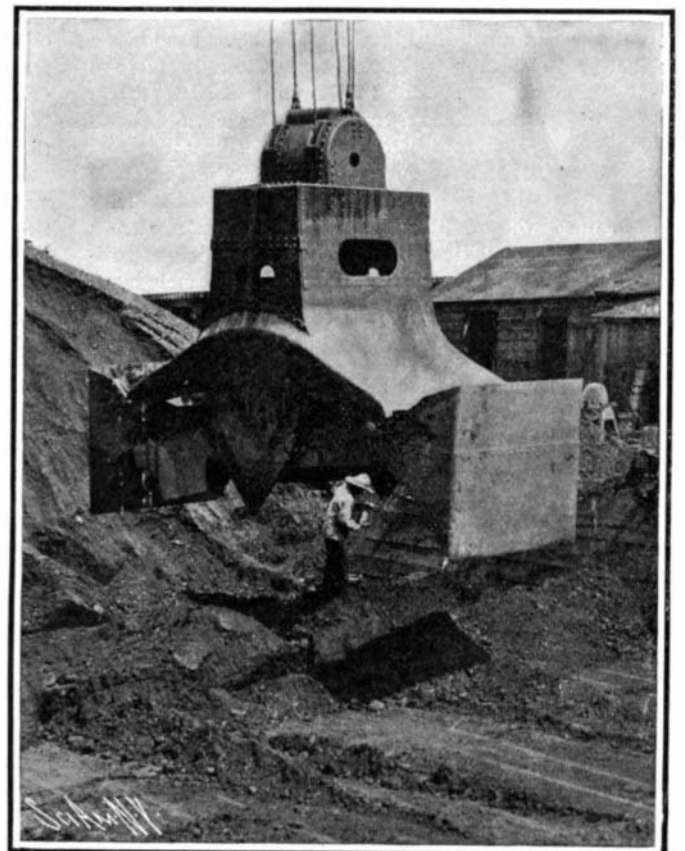
While some other ports are handling a larger volume of traffic this year than Conneaut, that harbor still holds all records for fast unloading, and most of the largest steamers still go there to be unloaded.

A fair estimate of the damage done annually by weevils to chestnuts grown in the United States would probably fall little short of 25 per cent, while in some years the percentage exceeds that figure, running as high as 40 or 50 per cent. Growers in some localities report no damage, others place losses as low as 5 or 10 per cent, while instances are cited of whole crops being destroyed. The amount of loss is dependent on locality, season, and to a more limited extent on the variety of nuts grown. The greatest damage is usually incurred in regions where chestnuts have grown wild for many years, and the least where there are no wild chestnuts or chinquapins and the nuts are grown only for market and are carefully gathered. The most extensive losses, judging from available sources of information, appear to be in Massachusetts, Pennsylvania, New Jersey, New York (in the vicinity of New York city), Delaware, Maryland, Virginia, Tennessee, and North Carolina.

In view of the many applications of timber and its growing scarcity, matches are now being made of paper, rolled spirally and dipped in wax or stearine, which prevents unrolling and gives rigidity. The roll is cut into lengths, which are then dipped in the phosphorus composition, and the matches are said to burn remarkably well.



The Fast Plant Unloading Ore at Conneaut, Ohio.



The Electrically-Operated Two-Rope Grab-Bucket of the Fast Plant at Conneaut, Ohio.

A NEW TYPE OF ORE-UNLOADING BUCKET.