

### THE NEW 50-CALIBER RAPID-FIRE GUNS OF THE UNITED STATES NAVY.

By the courtesy of Rear-Admiral O'Neil, Chief of the Bureau of Ordnance, we present photographs and particulars of three of the new 50-caliber guns which are being constructed for the United States navy. The weapons here shown have been undergoing tests at the Navy Proving Grounds at Indian Head, and the results as communicated to us are very remarkable, and place the work of the Washington gun factory in the very front rank among the great gunshops of the world. In fact, the Krupp firm is the only one which outranks our navy guns on a single basis of comparison, some of the latest pieces turned out by that firm showing a slightly larger energy of shell per weight of gun than the United States weapons. The Brown wire gun, which was illustrated in a recent issue of the *SCIENTIFIC AMERICAN*, is expected to show as high, or even higher results than any gun yet constructed; but, as that weapon is at present in the experimental, or rather proving-ground, stage of its development, it can scarcely be classed with the standard accepted types, which are being manufactured, as navy guns are, in large numbers.

The new 6-inch, 50-caliber gun is shown on the latest type of mount, such as will be used on the battleship "Maine" and her class and on all subsequent vessels of the navy. The weight of the gun is 8.45 tons, and of the mount 5.43 tons. The shield will weigh 2.7 tons, making a total weight for the gun complete of 16.58 tons. The piece was designed for a chamber pressure of 17 tons to the square inch, and with a pressure of 16.7 tons it has imparted a muzzle velocity of 3,023 foot-seconds to its 100-pound projectile.

Another photograph shows the new 50-caliber, 5-inch gun, of which sixty are now being made at the Washington gun factory for the six cruisers of the "Denver" class. The weight of the gun is 3.3 tons, and of the mount 2.5 tons. With a charge of 26 pounds of smokeless powder a muzzle velocity of 2,990 foot-seconds was imparted to a 60-pound projectile, the

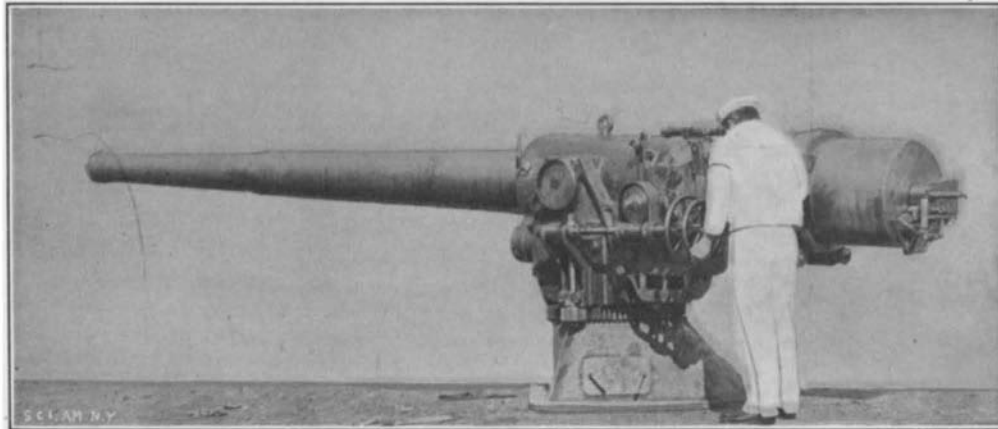
only on having produced a very effective piece, but also one of exceedingly handsome and well-balanced appearance.

The smallest gun is one of the new 14-pounder, 3-inch, 50-caliber rapid-fire guns, which will form a very important feature in the rapid-fire battery of our new cruisers and battleships. This piece is designed to throw a 14-pound projectile with a muzzle velocity of 3,000 feet per second and a muzzle energy of 874 foot-tons. At the muzzle it is capable of penetrating 13½ inches of wrought iron. All of our later battleships carry—in addition to the 14-pounders mounted in broadside—a pair of 14-pounders mounted on field mounts for use by landing parties. The accompanying illustration shows one of these guns as it will appear when in action.

#### Electroplated Doors.

An inventor of Bridgeport, Conn., has just devised a process of electroplating wooden doors with copper, brass and other metals so as to produce a door which is thoroughly inclosed in metal without any visible seams so as to give the appearance of a solid metal door, but which will be cheaper, lighter and generally more desirable than if made of solid metal or covered with sheets, as is now sometimes done. Doors of this class can be extensively used as entrance doors to flats or other large and expensive buildings where

smooth and coated with a varnish as shellac and is then dried. This operation is continued until the desired surface is obtained. The edges of the door are then trimmed with sheet metal strips corresponding to the width of the door. They are attached to the four edges by means of nails, screws, or cement. The material used for the strips is preferably copper,



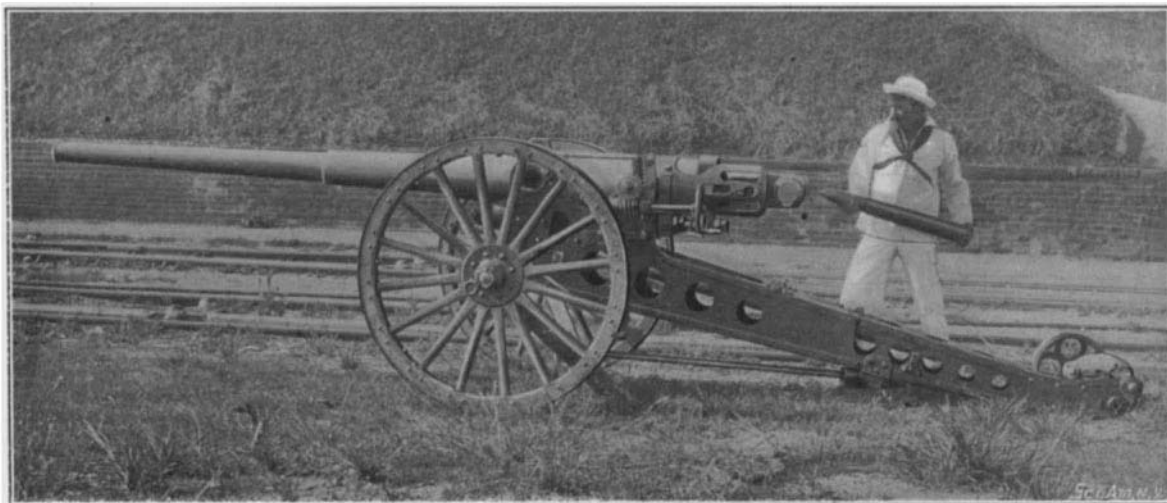
NEW NAVAL 50-CALIBER 5-INCH RAPID-FIRE GUN.

bronze, or brass. The face of the strip on the edge of the door is covered with a metallic insulating varnish, after which the entire door is coated with a metal substance, such as thin metallic leaf, metallic brass powder, or common varnishing wax with plumbago. When the coatings applied have become dry the door is rinsed and is ready to receive the electric deposit. The door is supported in a vertical position in the plating bath. One wire goes to the anode, and the second wire is preferably attached to the metal strip on one edge of the door; the current is then turned on, and the electrolytic action takes place until the surface is covered to any desired thickness. The advantage obtained by covering the edges of the door with a sheet metal strip is that its high conducting power makes a complete circuit around the door, and the width of the strip insures an even and unbroken surface between the two sides.

#### THE 1901 CONTEST FOR THE "AMERICA" CUP.

In all the half century during which contests have been waged for the "America" Cup there was never fought out such a close and exciting struggle as took place in the first race of Saturday, September 28, and the last race of October 3. On the former day, from the moment when the yachts crossed the starting-line practically abreast, to the boom of the finishing gun—4½ hours later—when the winner was only three or four lengths in the lead, there never was a time when the yachts were more than a stone's-throw apart, while there was more than one occasion when the proverbial biscuit could have been tossed from one yacht to the other; and in the last race the yachts finished practically abreast.

The conditions were more favorable to the "Shamrock" than on the previous Thursday, when there was not enough wind to finish. The sea was much quieter and the breeze stronger, although the latter was never over eight knots in force, and fell at times as low as four or five knots. After some exceedingly clever maneuvering by the rival skippers, they crossed the line practically abreast, with "Shamrock" in the weather berth and two seconds in the lead. It was confidently expected that on the 15-mile beat to the weather mark "Columbia" would pull out from under the lee of the challenger and widen the gap on every board that was sailed. She had hitherto shown herself to be invincible in beating, and most of her victories over "Constitution" had been made on this point of sailing. To the surprise no less of her people than of the great majority who believed "Columbia" to be invincible on this point of sailing, "Shamrock" appeared to point as high and foot as fast as the

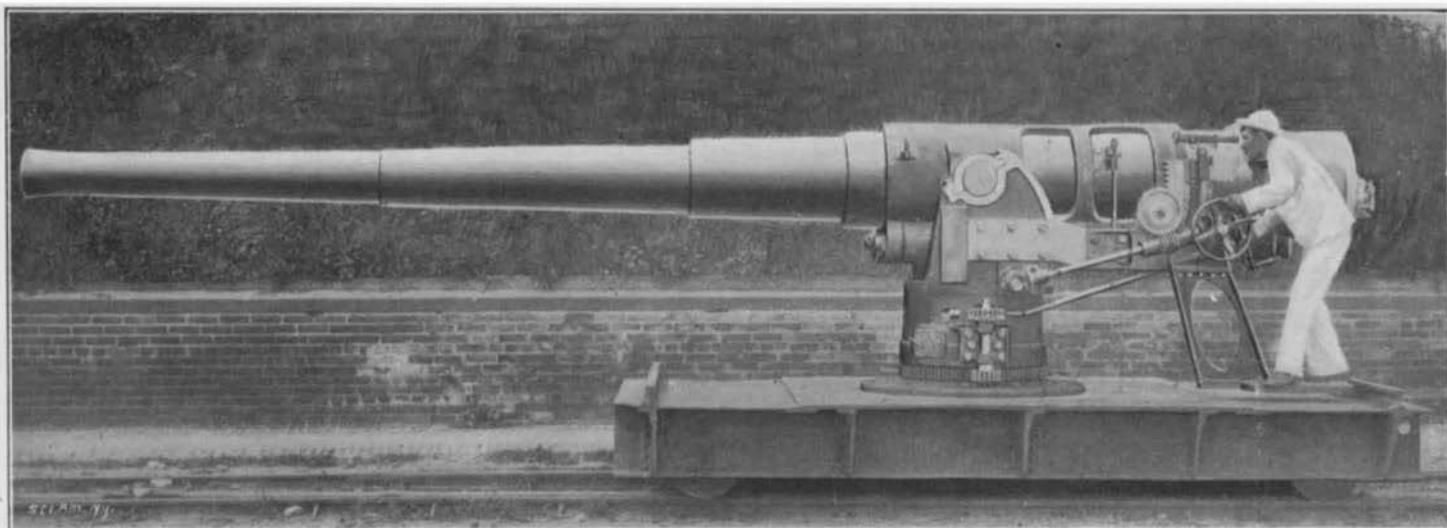


NEW NAVAL 50-CALIBER 14-POUNDER FIELD GUN.

chamber pressure being 16.4 tons, or 0.6 of a ton to the square inch less than the pressure of 17 tons per square inch, for which the gun was designed. With a pressure of 16.75 tons to the square inch in the powder chamber, a muzzle velocity of 3,330 foot-seconds was imparted to a 50-pound projectile.

Both of the above guns are fitted with the very latest improvements to facilitate rapidity of loading and secure accuracy of fire. These features are shown in the photographs of each gun, particularly in that of the 6-inch gun. In the case of the last-named piece the gunner stands on a platform which is bolted to the gun-carriage immediately to the left of the breech, and consequently, as the gun is traversed, the gunner moves with it and is always in the same relative position to the piece. Conveniently for manipulation are placed two hand-wheels, one operating the elevating gear and the other the traversing gear. In front of the gunner's eye is seen the telescopic sight—an important feature in all modern ordnance. The gun itself recoils in a sleeve in which are formed the trunnions and at the bottom of which, and cast in one piece with it, are the hydraulic recoil cylinders, the pistons of which are connected by piston rods to the breech of the gun. The guns are fitted with an improved and greatly simplified pattern of breech-block, which is unlocked and opened by a single swing of a lever. The Ordnance Department is to be congratulated not

massive and elaborate effects are sought. Such doors are considered a valuable adjunct in preventing the rapid progress of fire, and metal-protected doors are frequently used in theaters. There is no necessity of burning off the varnish in order to revarnish, as is necessary with the old methods of covering or protecting. The finished wooden doors are first filled with a wood filler as, for instance, a mixture of linseed oil and resinous gum, which is designed to waterproof and protect the wood thoroughly and prevent warping. The doors are placed in a tank filled with the heated filler which is kept hot by steam. After the filler has thoroughly penetrated the wood they are hoisted, permitted to drain off and laid upon a table for further applications. The door is then rubbed



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