THE GRUBB GUN-SIGHT.

A collimating telescopic gun-sight has been invented by Sir Howard Grubb, which departs so radically from the usual type of sight, that a brief description of its salient features may not be without interest.

As shown in Fig. 6 of the accompanying illustrations, the sight consists of a short metallic tube, the rear end of which is closed by a window of parallel plate glass, the lower portion of which is silvered on the inside, while the upper portion is left perfectly transparent. The front end of the tube is closed by a curved glass, the concave surface of which is coated with a chemically-deposited film, which is both semi-transparent and highly reflective. The curved glass, therefore, acts as a transmitter and a reflector of light. The tube is formed at the top into a hood containing a glass diaphragm covered with an opaque coating, on which is cut a cross.

no necessity for a back sight, which is a very important advantage in itself if the weapon is to be handled in a strained position.

That the virtual or ghost image of the cross is really formed at or near the plane of the object aimed at, is proved by the small photograph in the lower right-hand corner of Fig. 1. The photograph was obtained by placing the camera a few feet behind the sight, focusing on the framework of the sight, and exposing the plate. As shown in the picture, the sight body itself is quite indistinct, but the distant views of the dome and the cross are both quite clear, proving that this ghost image of the cross is practically in the plane of the distant dome. In looking through the sight, the object aimed at is seen as distinctly as with any open sight, except for the very slight loss of light occasioned by the semi-transparent film.

Much of the difficulty experienced by novices depends

respect it has an advantage over the ordinary telescopic sight, in which accuracy and constancy of adjustment are most essential.

In the accompanying illustrations, Figs. 1 and 2 show the Grubb sight adapted for use with a six-pounder naval mounting. The bracket for the sight is constructed so as to fit on the mounting after the removal of the ordinary tangent sight. The appliance is mounted on the top of a radial rack securely held by and capable of sliding in a socket formed in the sight bracket. A worm wheel and pinion gear serve to elevate the sight rack. Deflection of the sight is arranged for, and consists in training the sight around a center by milled head and screw in the usual manner.

Fig. 3 shows the instrument applied to a bar sight for a twelve-pounder rapid-fire mounting. In this case the sight is carried above the ordinary back sight, and may be easily and quickly removed, held as it is by a

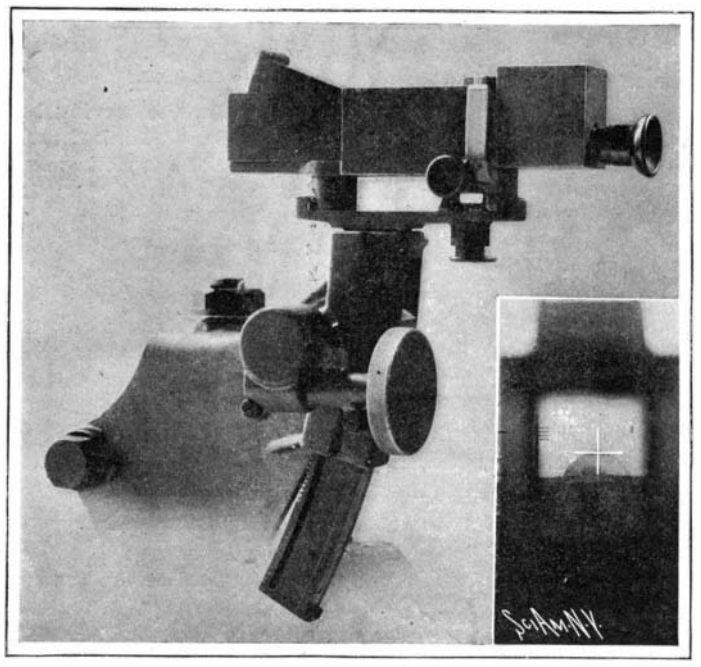

Photo. taken through a sight.

Fig. 1.—The Sight on a Six-Pounder Mounting.

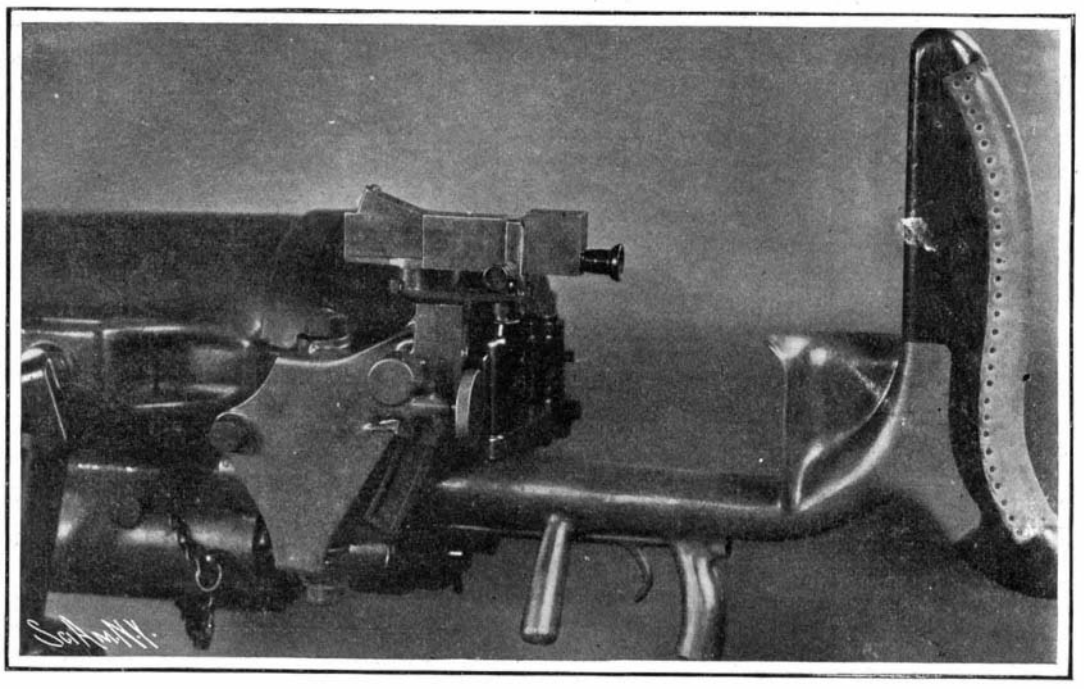

Fig. 2.—The Grubb Sight Applied to a Six-Pounder.

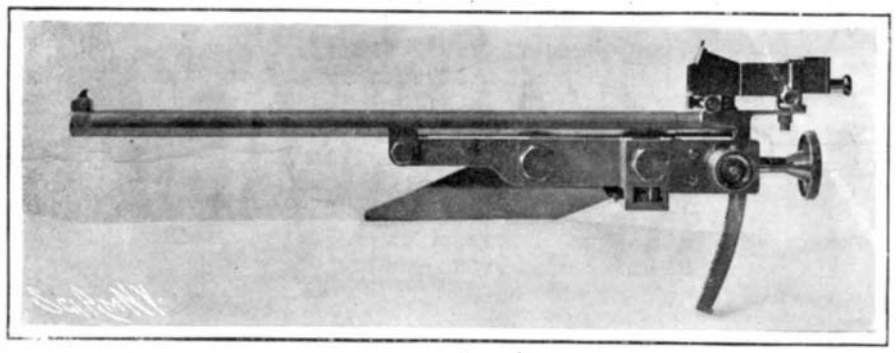

Fig. 3 —The Sight Applied to a Twelve-Pounder Rapid-Fire Mounting.

Fig. 4.- The Grubb Sight Applied to a British Service Weapon.

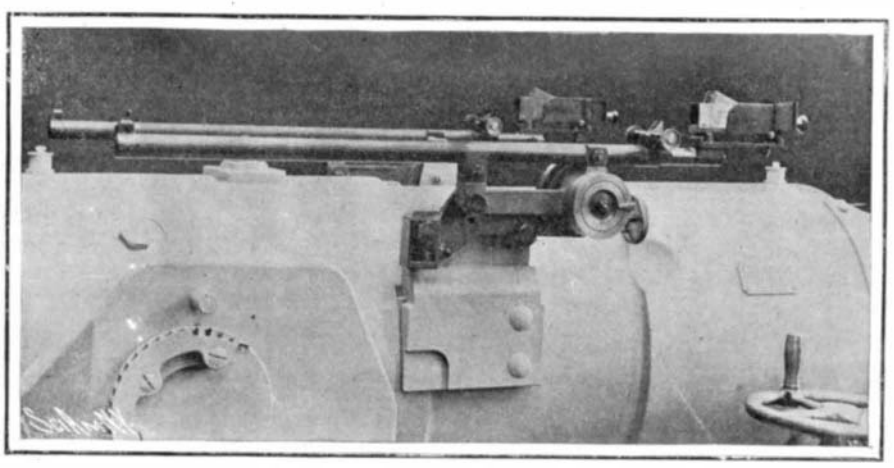

Fig. 5.—Grubb Sight on a Six-Inch Rapid-Fire Gun.

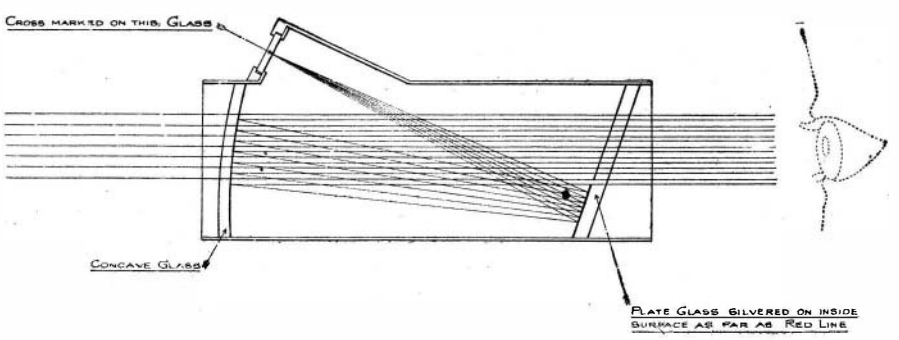

Fig. 6.—Optical Principle of the Grubb Sight.

A NEW GUN-SIGHT WHICH DOES AWAY WITH THE ORDINARY FORESIGHT.

The manner in which this optical system works is well shown in Fig. 6. The rays emanating from the target are transmitted both through the front and back windows without refraction, and enter the eye exactly as if there were no sight at all. On the other hand, the rays which enter the eye to form the image of the cross diverge, and are reflected from the silvered portion of the back window onto the concave surface of the front window which, being coated with a reflective film, diverts the rays in question through the transparent upper part of the back window, and thus to the observer's eye. Because of the peculiar curvature of the front window, the rays of the cross are parallelized after reflection, so that they enter the eye as if they had emanated from a large cross on the distant object itself. The cross is, therefore, optically superimposed on the target.

Since the observer's eye is absolutely fixed, there is upon the impossibility of seeing the ordinary foresight of the rifle simultaneously with the target. In the case of the instrument we have just described, the foresight can be completely discarded.

Although this sight is not a telescopic sight in the true sense of the word, it can be made to magnify, if desired, and that without some of the disadvantages of ordinary magnification. Just as it is possible to focus both object and cross on a photographic plate, so also is it possible to focus both in a field glass and a telescope. The larger patterns of the sight (used for field and naval guns and guns of position) are all supplied with attachments for monoculars and binoculars. The telescope, however, in this case is used simply as a means of magnification of both object and cross, and any error of adjustment or looseness in the lenses in no way affects the accuracy of the sighting, because it affects both the object and the cross equally. In this bayonet joint arrangement and a small spring catch.

Fig. 4 shows the sight fitted to a British 0.303 service rifle. The sight does not interfere at all with the ordinary sights, because it is mounted to slide on the face of an arc on the left-hand side of the rifle. The top of this arch is notched, and the notches are cut to correspond with given ranges engraved on the arc. A spring catch holds the sight at any of the notches, adjustment of range being effected by sliding the sight along the arc.

In Fig. 5 the Grubb sight is shown fitted in conjunction with a bar sight of a six-inch rapid-fire mounting, the Grubb sight being carried on an extension of the ordinary sight bar, so that it is to the rear and slightly above the ordinary back sight.

It is calculated that the mass of the solar corona is not necessarily greater than 25,000,000 tons.