gun there is a rocking-bar sight on one side and an automatic sight on the other. The automatic sight has, however, distinct limitations ; it depends for its accuracy on height of site, and at long ranges even from a high site it cannot compare for accuracy with indepen­dent range-finding and careful laying or accur­ately applied quadrant elevation; it is also use­less when the water line of the target is obscured, as may often be the case from the splashes caused by bursting shell. Im­proved communications between range - finder

and gun, range and training dials placed on the mountings where they can be read by the layers, and more accurate elevation indicators have made laying by quadrant elevation, and in certain cases giving direction by means of graduated arc and pointer, both accurate and rapid, so that once more this system of laying is coming into favour for long ranges.

*Naval Sights.*

In the navy the conditions of an unstable platform rendered quadrant elevation of little use, and necessitated a special pattern of tangent sight to facilitate firing the moment the roll of the ship brought the sights on the target. A diagram of the Foote-Arbuthnot, or H, or naval tangent sight, is given below (fig. 24).

The fore-sight was a small globe, and in the original patterns this was placed on a movable leaf on which deflection for speed of one’s own ship was given, while deflection for speed of enemy’s ship and wind were given on the tangent sight. The yard scales were on detachable strips, so that fresh strips could be inserted for variations in velocity. In subsequent patterns all the deflection was given on the tangent sight,\* which was provided with two scales, the upper one graduated in knots for speed of ship, and the lower one in degrees. Night sights were introduced by Captain McEvoy in 1884. They consist of an electric battery cable and lamp-holders and small glow lamps; that for the hind-sight is coloured.

*Turret Sights.—*In turrets or barbettes two sets of sights are provided, one for each gun. They are geared so as to work simultaneously and alike. Toothed gearing connected with the gun mountings actuates a rack attached to the standards carrying the sights, so that any move­ment of the gun mounting is communicated to the sights. The sights themselves fit into sockets cut at the proper angle for drift, and are raised in their sockets the requisite amount for the range by means of a small hand-wheel; they are thus non-recoiling sights. The layer has under his control the hand-wheel for setting the range on the sights, another hand-wheel for elevating the gun and the sights on to the target, and a third for traversing the turret.

The introduction of trunnionless guns was followed by that of rocking-bar sights (described above). Sighting telescopes were also introduced. In the navy one of the first essentials is rapidity of fire; to attain this the duties of laying are subdivided ; one man laying for elevation, elevating and firing, a second laying for line and traversing, and a third putting on the elevation ordered or communicated by electric dial. To ensure the sights on each side reading together they are connected by rods. To facilitate the setting of the range the ranges are shown on a dial which can be read from the side of the mounting, from where also the sight can be set. (R. Μ. B. F. K.)

*Military Rifle Sights.*

With smooth-bore arms of short range, the soldier needed little more, in the way of sights, than the rough equivalent of the dis­part of cannon, viz. patches at the breech and muzzle with notch and blade (fig. 25). But some form of sight was almost invariably employed with rifled firearms, even of early date, and when about 1780-1800 the rifle came into use as a military weapon, sights were introduced with it. The sights of the Baker, Brunswick, and other rifles did not differ in principle from the now common form of elevating back-sight (fig. 29), that is, the elevation was given on an upright adjustable back sight. But this refinement was long looked upon as a mere fad, both by the soldiers who used the smooth-bore (or converted rifle) musket, and by experienced short-range snap­shooters. In this connexion Major-General John Gibbon, U.S.A., records that in the American Civil War hunters and others who served in the. western regiments habitually knocked off the back­sights of the rifles that were issued to them, preferring to do without them. But, as rifles improved and came into general use for all troops, sights became indispensable, and to-day as much care is taken over the sighting as over the “ proof ” of a military rifle. The modern rifle has invariably a back-sight and a fore-sight. The latter is, as a general rule, fixed and unalterable, its size, position on the barrel, &c., being practically ascertained, as accurately as possible, for the lowest elevation on the back-sight. Some fore­sights have, however, a lateral motion giving within narrow limits the deflection found to be necessary for the variation of each rifle from the average. The shape of the part seen through the notch or aperture of the back-sight in aiming varies a good deal. Two of the commonest forms are shown in fig. 26, called the “ barleycorn,” and 27, called the “bead.” The fore-sight of the Krag-Jörgensen rifle, used in the United States army until 1906, consisted of a blade with parallel sides. The shape of the part seen when aiming indicates whether the proper amount of the fore-sight is taken up into the line of vision from the back-sight to the target. A "full ” sight is shown in fig. 8 above. The position of the fore-sight at or near the end of the barrel renders it peculiarly liable to injury, and in some rifles therefore it is provided with guards or ears; these, however, have the disadvantage that more or less of the light that would otherwise light up the sight is intercepted by the guards. The fore-sight of the British service "short" Lee-Enfield (1903) has guards and also a lateral adjustment of the barleycorn. Back­sights are of many different patterns, almost any two being