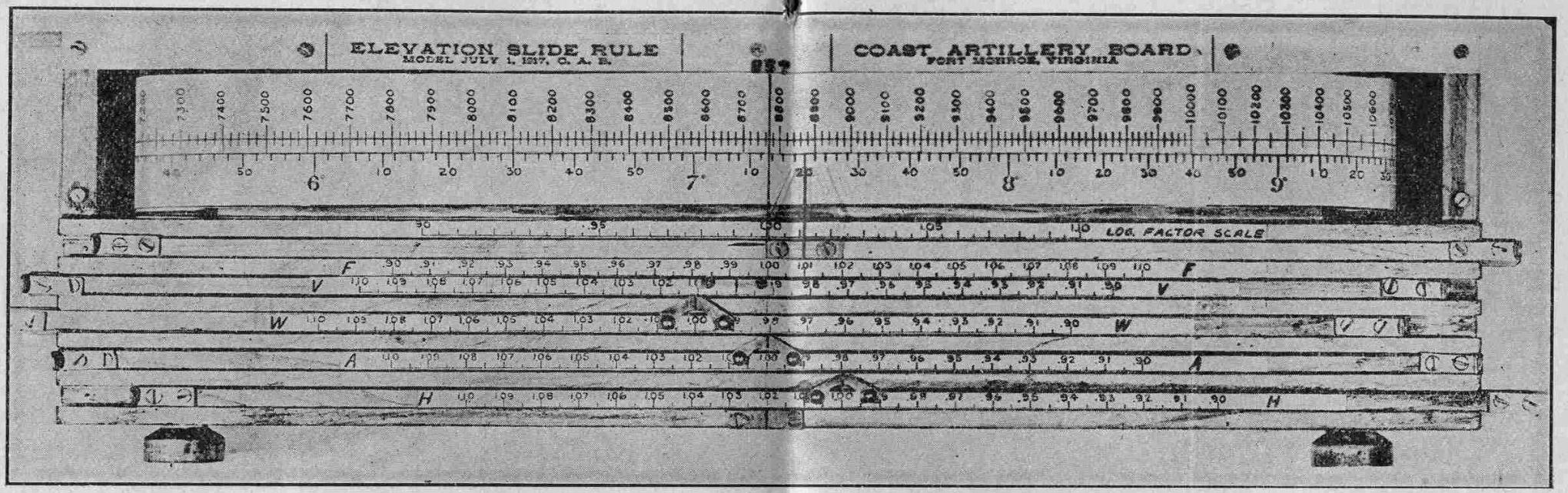


The Elevation Slide Rule.

In Figure 6, BT is the line of fire, azimuth 60° or 2 o'clock. S is the point of burst. Aerial Observers Signal 4E. Range deviation from the battery 200 yds. Over. Lateral deviation from the battery 340 yds. Right.

The T-A-B Clock consists of a deviation chart, an inverse azimuth circle, a target pivot, and a clock dial.

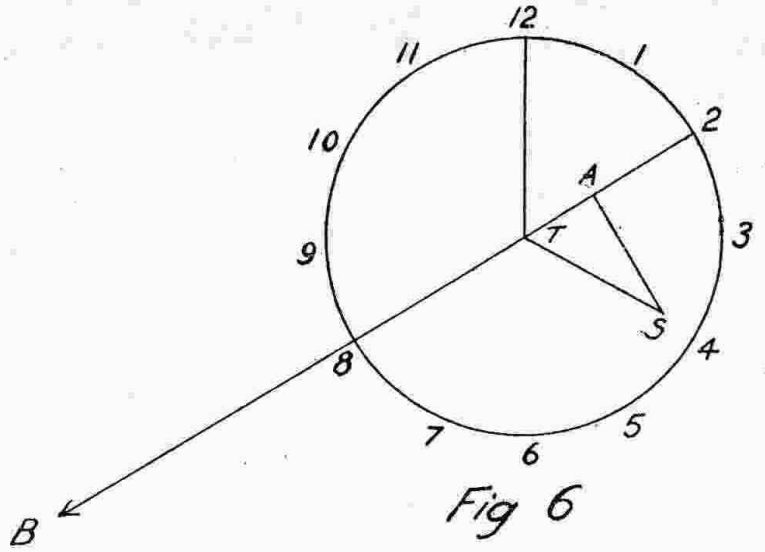


Fig 6

The deviation chart consists of a circle of four inches radius, with coördinate axes intersecting at the center. The surface of the chart is divided into 100 yard squares, by lines parallel to the coördinate axes, the scale being 100 yards to .8 of an inch. The intersection of the coördinate axes locates the target, the vertical axis representing the T line. Range deviations, Over and Short, are indicated along the vertical axis, and lateral deviations, Right and Left, are indicated on the horizontal axis.

The inverse azimuth circle is graduated from 0° to 360° in a counter clock-wise direction. The 0 is on the upper end of the BT line. It is used to orient the clock dial on the deviation chart, as, when the index on the clock dial is set at the azimuth of the line of fire, on the inverse azimuth circle, the BT line on the deviation chart will be at its correct clock azimuth on the clock dial, in accordance with the principles illustrated in Figure 6.

The target pivot is a brass bolt and extends through the clock dial and deviation chart. It is fitted with a nut and serves to secure the clock dial to the deviation chart.

The clock dial is made of amberoid. It is a circular disk of 4 inches radius engraved as shown in Figure 5.

It carries an index at 12 o'clock for setting the dial on the inverse azimuth circle.

To operate, set the index on the clock dial to the azimuth of the line of fire on the inverse azimuth circle, and the range and lateral deviations will be indicated on the deviation chart under the point on the clock dial indicated by the aerial observers signal.

CORRECTION BOOK

The Correction Book contains the Wind Component Indicator, the Factor Charts for Difference of Level between Gun and Target, Atmosphere, Wind and Velocity, the Range 50% zone chart, and the Deflection Board.

The Wind Component Indicator, Fig. 7, consists of a fixed azimuth circle, a component chart, and a target arm. The component chart is ruled to give range and deflection component reference numbers, from 0 to 100, 50 being at the normal or zero value of each component.

The azimuth circle is fixed, and surrounds the com-

ponent chart. The chart rotates about its pivot, and carries an index by which it is set to the azimuth of the wind.

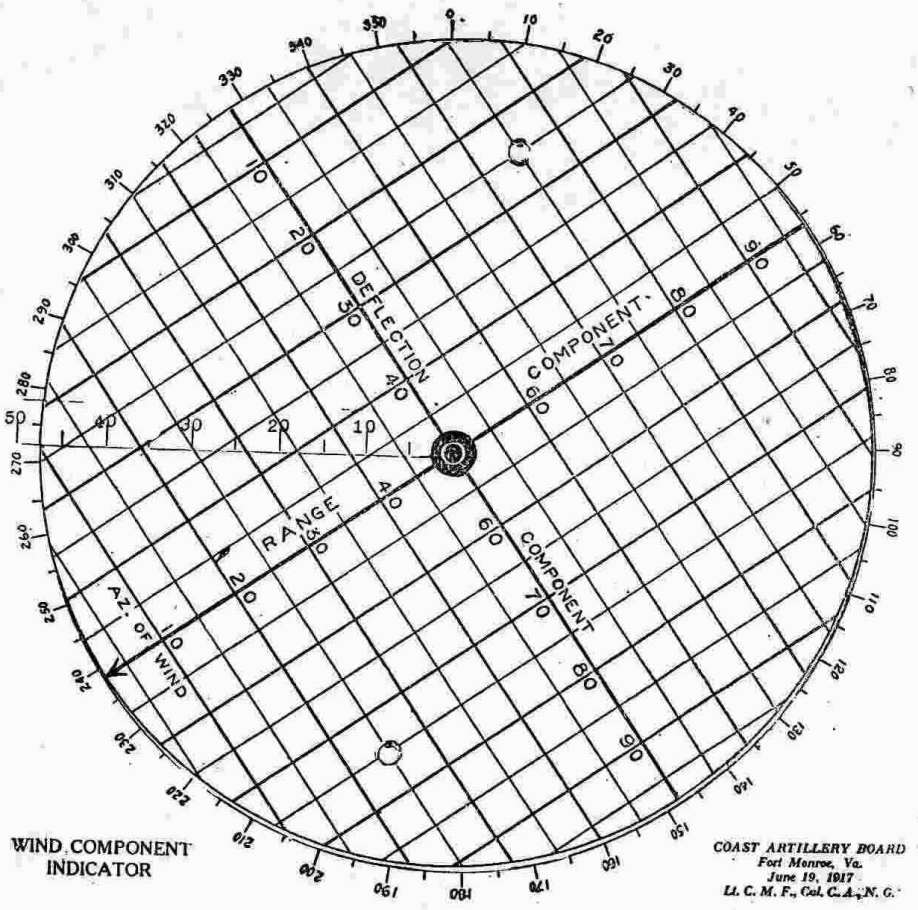


Fig. 7

The target arm is pivoted on the chart pivot, and rotates about it, so that it can be set to the azimuth of the target.

The arm is graduated for wind velocity in miles per hour, from 0 to 50.

To operate, set the component chart at the azimuth of the wind, and the target arm at the azimuth of the target.

The range and deflection component reference number will now be found under the reading edge of the target arm opposite the wind velocity.

The Factor charts are arranged so as to give the correction factor for each of the ballistic elements, as a function of the actual range of the target.

The charts are arranged, with the range lines vertical, the factor lines horizontal, and the ballistic lines inclined.

The entering arguments in each case are

Height (See Fig. 8)

Actual range to target.

Difference in level between gun and target extends from −400 feet to +400 feet. (+ for target higher than gun).

Atmosphere (See Fig. 9)

Actual range to target.

Atmosphere Reference Numbers, as obtained from Atmosphere Slide Rule, extending from 0 to 32, with 16 at normal.

Wind (See Fig. 10)

Actual range to target.

Wind Reference Number, as obtained from Wind

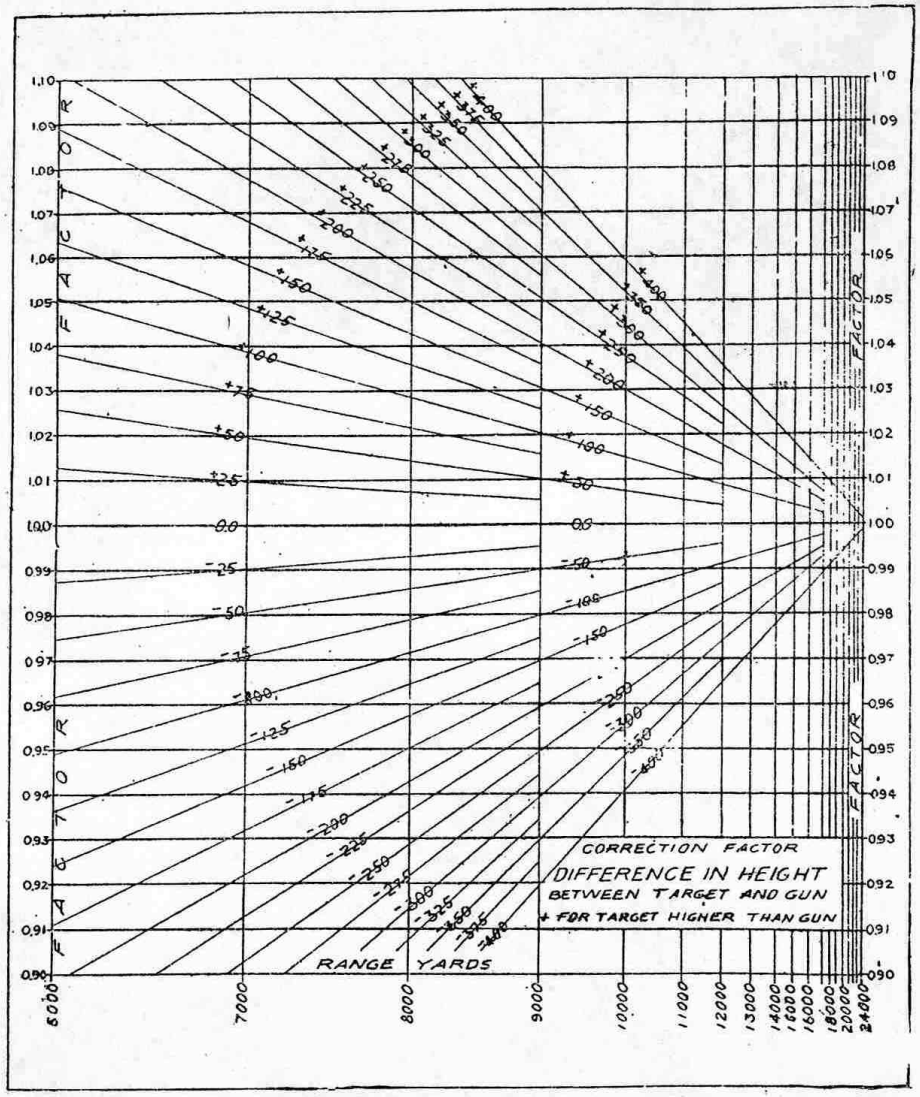
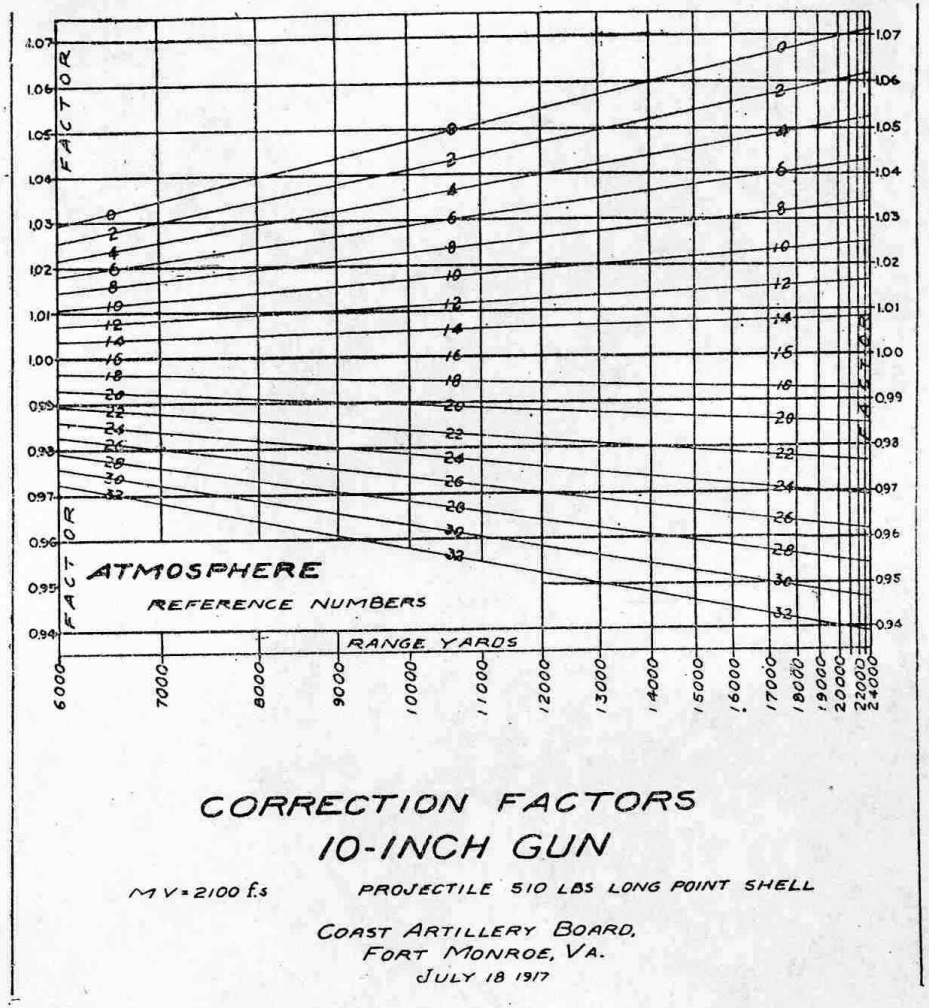


Fig. 8



CORRECTION FACTORS
10-INCH GUN

M V = 2100 f.s PROJECTILE 510 LBS LONG POINT SHELL

COAST ARTILLERY BOARD,
FORT MONROE, VA.
JULY 18 1917

Fig. 9

Component Indicator, extending from 0 to 100, with 50 for zero range component.

Velocity (See Fig. 10)

Actual range to target.

Velocity of Powder, as obtained from ballistic records, and corrected for temperature on the Powder Slide Rule.

The factors as obtained from the charts are set off on the factor scales of the adding device on the Elevation Slide Rule, so as to obtain the correct quadrant elevation at which to set the gun. These factor charts are about one-tenth the size of the range correction chart for a Pratt Range Board of equal accuracy and scope, and it is this feature that makes the use of these charts desirable for field work.

The range 50% zone chart shows the probable range deviation, over and short from the center of impact, and affords useful information in adjusting fire, and indicates how the center of impact should be placed when firing on enemy trenches near our own. For example:

50% zone chart shows probable deviation at 10,000 yards of 100 yards. Enemy's trench 300 yards in front of our own. The total deviation is 4 times the probable deviation and is therefor 400 yards in this case. For complete safety the center of impact should be placed at least 100 yards in rear of the enemy's trench.

The deflection board consists of a wind and drift chart, a conversion chart and a T-square. The wind and drift chart is constructed with a vertical scale of ranges and a horizontal scale of deflections. The drift line is laid off as the zero wind deflection component and marked 50, and lines for wind component reference numbers at intervals of 10 are laid off each side of the drift line, extending from 0 to 100.

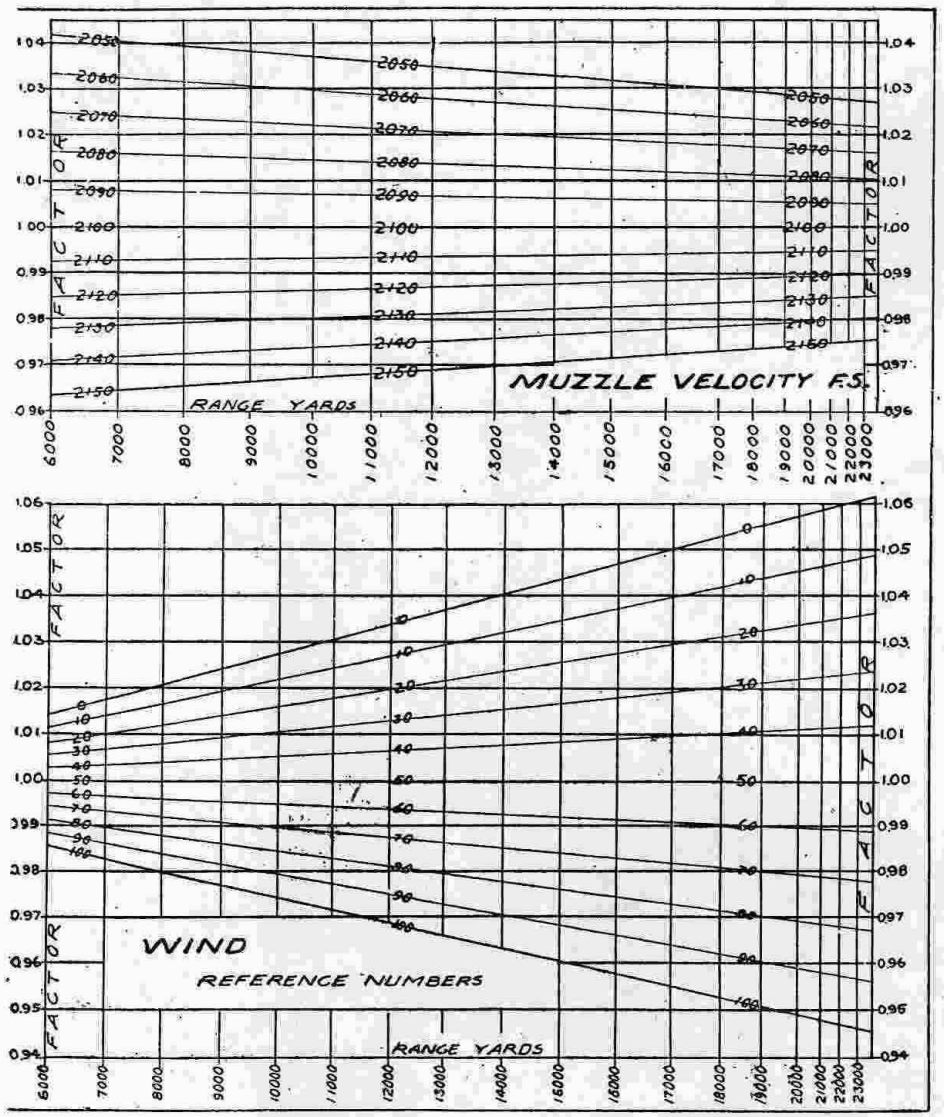


Fig. 10

The T-square is graduated to correspond to the deflection scale.

To operate, set the T-square for the actual range to the target, and where the wind component reference number line intersects its edge, will be found the deflection correction.

The conversion chart is used to convert yards of deflection to angular units or the reverse. It is constructed with a vertical scale of ranges, and a horizontal scale of deflections.

The yard deflection lines are laid off as diagonals.

To operate, set the T-square for the actual range, and where the yard line, corresponding to the desired value, crosses the graduated edge of the T-square, will be found the corresponding angular deflection. It is used to convert the lateral corrections in yards obtained from the T-O-B or T-A-B Clock, to angular deflection corrections, and to obtain the angular deflection required when shifting fire laterally a given number of yards.

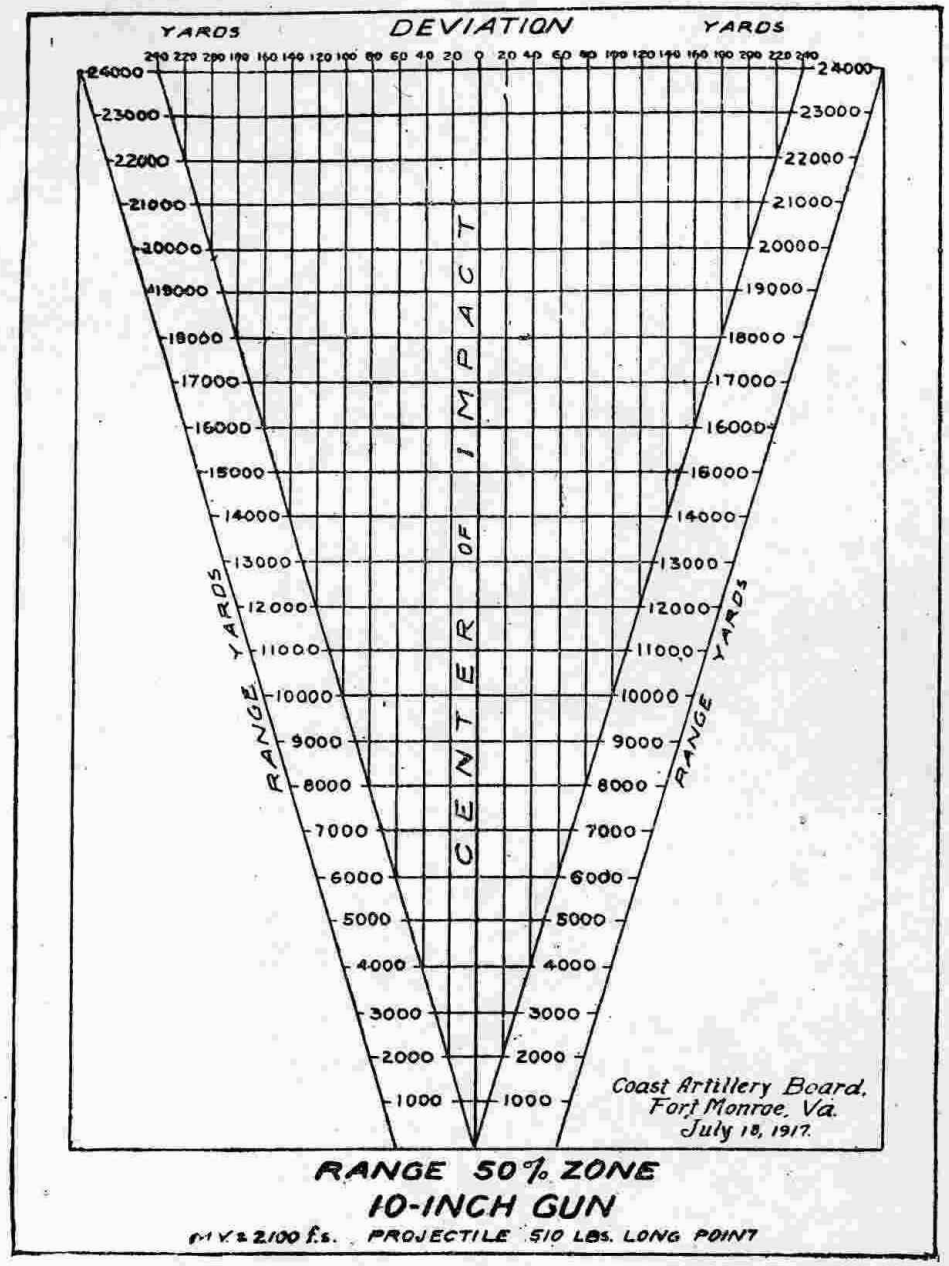


Fig. 11

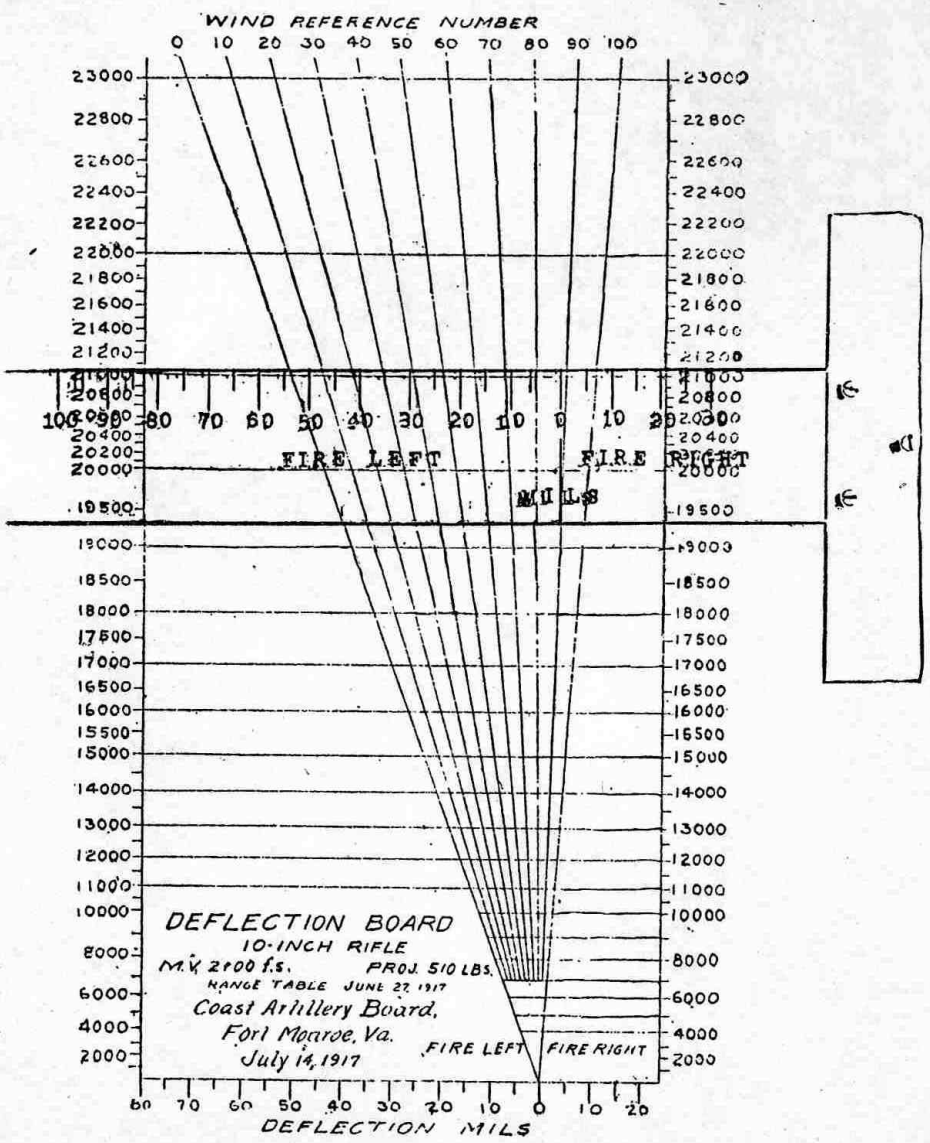

WIND REFERENCE NUMBER
0 10 20 30 40 50 60 70 80 90 100
FIRE LEFT
FIRE RIGHT
MILS
DEFLECTION BOARD
10-INCH RIFLE
M.V. 2700 f.s.
PROJ. 510 LBS.
RANGE TABLE JUNE 27 1917
Coast Artillery Board,
Fort Monroe, Va.
July 14, 1917
FIRE LEFT
FIRE RIGHT
DEFLECTION MILS

Fig. 12

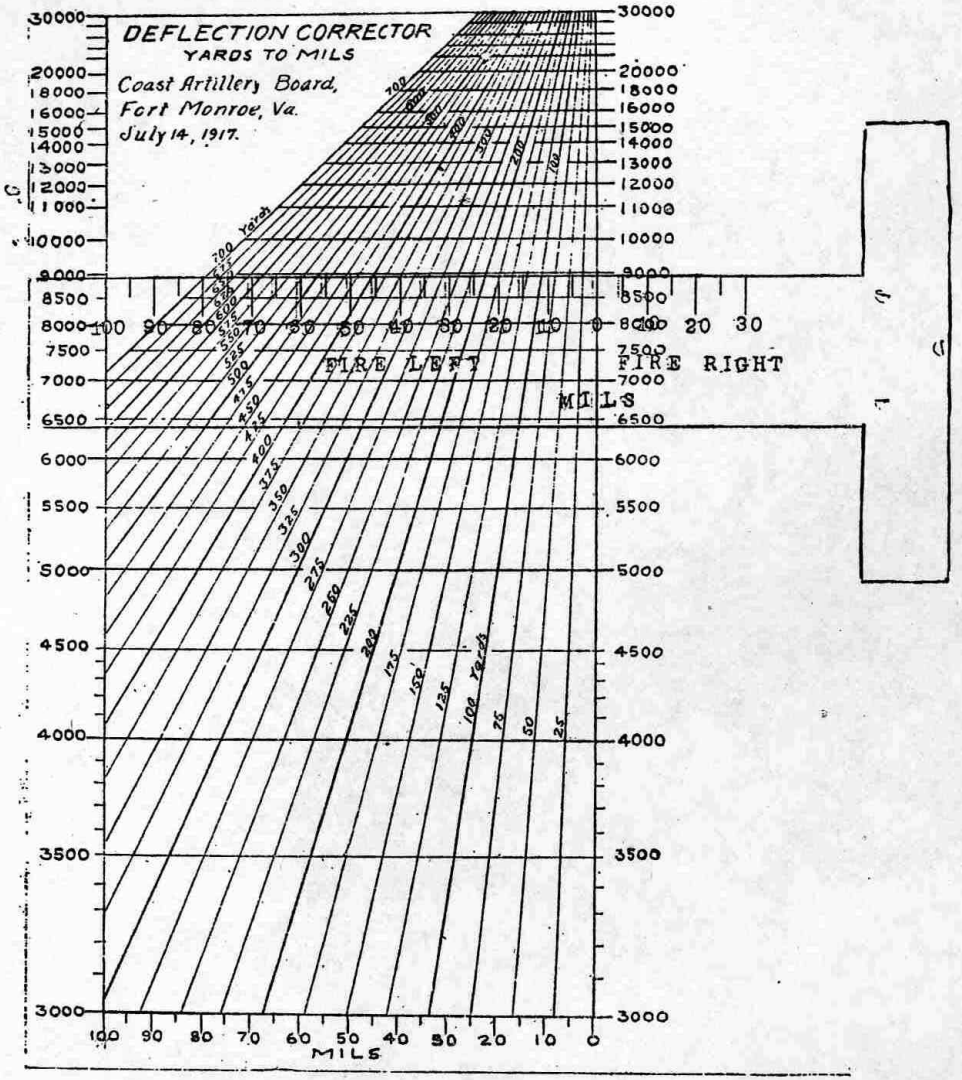

DEFLECTION CORRECTOR
YARDS TO MILS
Coast Artillery Board,
Fort Monroe, Va.
July 14, 1917.
FIRE LEFT
FIRE RIGHT
MILS

Fig. 13