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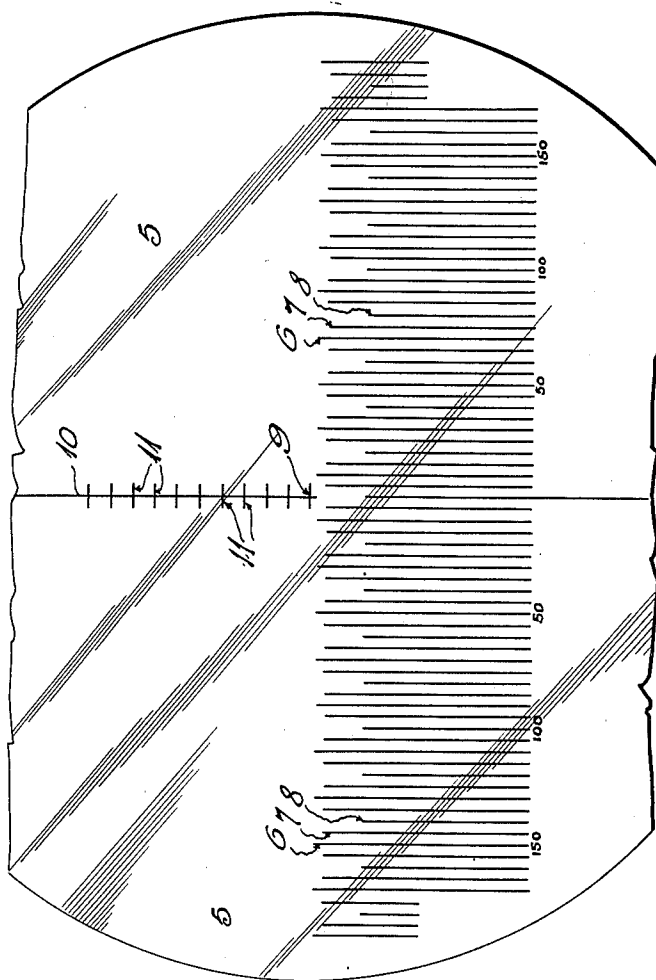
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TELESCOPIC GUN-SIGHT RETICULE

Filed Aug. 4, 1937

2 Sheets-Sheet 1

Fig. 1.



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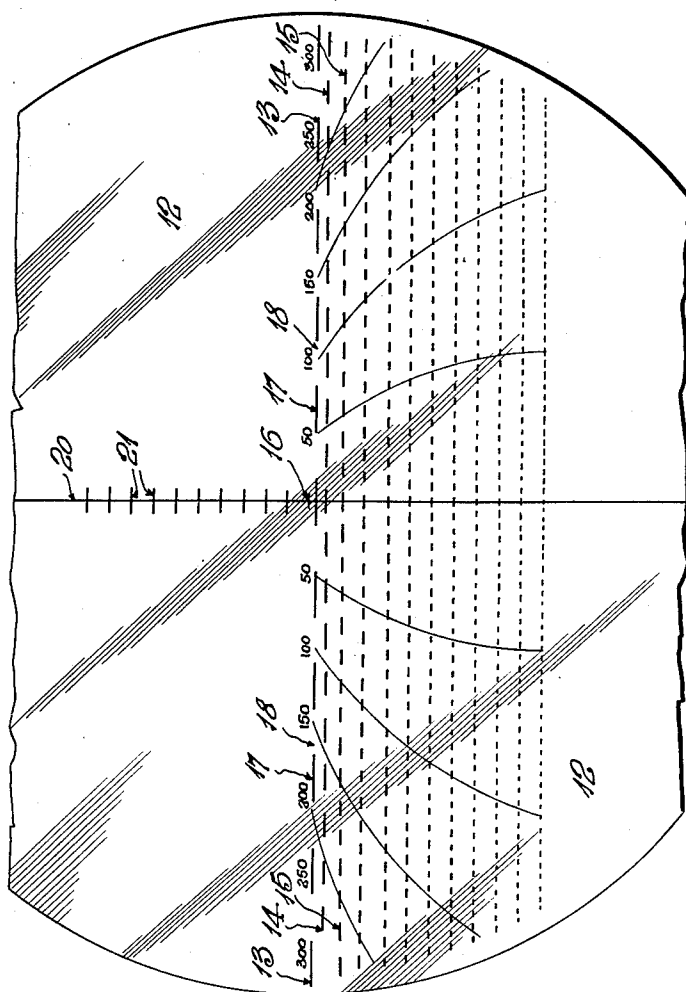
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2 Sheets-Sheet 2

Fig. 2.



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TELESCOPIC GUN-SIGHT RETICULE

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13 Claims. (Cl. 33—51)

The invention relates to a reticule for a telescopic gun sight fixedly carried by a gun to move bodily with the gun barrel, and while said reticule is disclosed for an elbow sight of a 37 mm. anti-aircraft gun, the projectiles of which have a muzzle velocity of 2700 foot seconds, it could well be calibrated for sights other than elbow types and for guns other than anti-aircraft types regardless of calibre and projectile velocity. The sight in which the disclosed reticule is to be used, has a field of 24° and a magnification of 2, and as there are 6400 artillery mils in 360°, approximately 427 mils would be covered by the sight in question. However, the invention is not restricted to use with a sight having any particular magnification nor any particular field but may be calibrated for proper functioning in any telescopic sight.

The principal object of the invention is to provide a new and improved reticule which will permit the gunner to quickly, easily and accurately lay the gun on the target, which is of paramount importance for anti-aircraft and similar firing.

A further object is to provide a reticule on which the target may be simply spotted to visually determine the range of said target.

A still further object is to make novel provision for showing when the gun is properly elevated for the determined range.

Yet another object is to make novel provision for showing when the gun has been given approximately the proper lead on the target, the speed of which may be judged by the gunner or determined in the usual way.

The invention is calibrated for maximum accuracy when the target is traveling horizontally at right angles to the axis of the sight and gun barrel, and the experienced gunner may readily make allowances for targets not traveling in this precise manner.

With the above and other objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is an elevation on an enlarged scale showing one form of the reticule.

Fig. 2 is another elevation on an enlarged scale showing a different form of the reticule.

Both forms of the reticule will be specifically described, with the understanding however, that variations may be made within the scope of the invention as claimed.

In Fig. 1, the numeral 5 denotes the transparent disk or panel of the reticule for association with the other optical elements of a telescopic

sight in the same manner in which the usual reticule is associated with said elements.

The disk or panel 5 is inscribed with a plurality of equally spaced vertical sight lines 6, 7 and 8 all disposed below the reticule center or axis 9 and equally distributed to the right and left of said center or axis, said lines being spaced apart five artillery mils in the present disclosure. The lower ends of the lines 6, 7 and 8 preferably terminate as shown for use in laying the gun on a target at a range of 9,750 feet, and the locations of the upper ends of said lines are preferably as described below.

The lines 6 may be considered as one set. They extend to one height and are uniformly spaced from each other. The distance between any one of these lines 6 and the next line 6, is the length of the image which a target of known size will cast on the reticule at a known range. In the present disclosure, a target length of twenty-five feet is assumed and the lines 6 are so spaced that if the image of said target can be subtended between any one of these lines 6 and the next line 6, just spanning the space between these lines, this fact visually determines that the target is at a range of 1250 feet. The upper ends of the lines 6 are so located as to constitute sighting points which visually determine when the gun has been adjusted to the proper elevation for the range of 1250 feet. The lower ends of some of the lines 6 and 8 are numbered to indicate target speeds in miles per hour for use in determining lead. After determining the target speed, if said speed be 100 M. P. H. for example, the gun is so traversed that the line marked 100 (at the side of the sight axis on which the target is traveling) can be used as a sighting line to give the approximate lead for the 100 M. P. H. target and 1250 foot range. Thus when firing at a range of 1250 feet at a target traveling 100 M. P. H., the gun is so traversed and elevated that the target image appears over the 100 M. P. H. line and even with the upper ends of the 1250 foot range lines 6, thereby laying the gun properly in advance of and above the target to effect a hit.

The lines 7, constituting another set, are used in the same way as the lines 6 but they are uniformly spaced apart lesser distances and extend to lesser heights, for visually determining a range of 2500 feet and the necessary elevation for this range.

The lines 8 are used for a range of 5000 feet and in determining this range, the target image is subtended between any one of these lines 8 and the next line 7.

As the required lead varies not only with target speed but with range and distance of the target from the gun axis, the target speed numbers at the lower ends of some of the lines 6 and 8 necessarily give only approximate leads, and the gunner with the aid of the tracers with which the projectiles are equipped, is enabled to make required corrections.

The vertical center of the reticule is marked by a line 10 and short horizontal lines 11 preferably extend across said line 10 for use when firing under diving targets.

In Fig. 2, the transparent panel or disk 12 has inscribed thereon a plurality of horizontal rows or sets of horizontally spaced lines, only the three uppermost rows or sets being given reference characters (13, 14 and 15). All of the rows of lines are below the reticule center or axis 16 and extend to the right and left of said center or axis. The lines 17 in the upper row 13 are of the same length as the image which a known-size target (twenty-five feet in the present disclosure) will cast upon the reticule at a range of 1250 feet, and the spaces 18 between these lines are of the same length. Thus, if the target image can be so located on the reticule as to match the length of any line 17, or the space between any line 17 and the next line 17, it is known that the target is at a range of 1250 feet. The row 13 is located at such a height that placing of the image on said row will attain proper elevation for the 1250 foot range.

The lines and spaces in the row 14 perform the same functions as the lines 17 and spaces 18 of row 13, but for a range of 2500 feet; the lines and spaces of the row 15 act in the same way for a range of 3750 feet; and the lines and spaces of the other rows are used for other ranges.

For determining approximate leads, for various target speeds, curved substantially vertical lines 19 are provided having numbers representing miles per hour.

A vertical line 20 extends through the axis 16 and short horizontal lines 21 preferably cross said line for use when firing under diving targets.

From the foregoing taken in connection with the accompanying drawings, it will be seen that I have made novel provision for attaining the desired end of permitting the gunner to quickly, easily and accurately lay the gun on the target, and while preferred details have been disclosed, attention is again invited to the possibility of making variations, within the scope of the invention as claimed.

While both reticules have been described for use against 25 foot targets, it is obvious that they may also be used in firing upon targets of other sizes. For example, either reticule could well be used against a 50 foot target, as said 50 foot target would span two spaces instead of one, and targets of varying sizes between 25 and 50 feet could be fired upon by taking into account the amount of space spanned thereby.

I claim:

1. A telescopic gun sight reticule comprising a transparent panel, and a plurality of sets of straight parallel sight lines on said panel below the reticule center, said sight lines having different spacings with respect to each other, said sets being spaced different distances below the reticule center, the spacings of said lines with respect to each other being such as to show the range of a known-size target when the target image subtends said spacings, the spacings of said sets below the reticule center being such that

use of the lines of any set for range determination will automatically lay the gun at the proper elevation for the determined range.

2. A telescopic gun sight reticule comprising a transparent panel having normally vertical sight lines spaced apart different distances horizontally and located below the reticule center, the horizontal spacings of said lines constituting means for visually determining various ranges of a known-size target when the target image is subtended between a pair of said lines, the distances of the ends of any said pair of lines below said center being such that said line ends constitute sighting points for properly elevating the gun for the range determined by the spacing of said pair.

3. A telescopic gun sight reticule comprising a transparent panel having a plurality of sets of sight lines, the lines of any set being uniformly spaced apart horizontally; the horizontal spacing of the lines of any one set being different from said spacing of the lines of any other set and visually determining one range of a known-size target when the target image is subtended between the lines, any one of said sets being spaced below the reticule center a distance different from that which any other set is spaced below said center, said distance being such that said lines of any set constitute sight lines for properly elevating the gun for the determined range.

4. A telescopic gun sight reticule comprising a transparent panel having a plurality of vertical sight lines of different heights, said lines being all disposed below the reticule center and being distributed to the right and left of said center; the distance between lines of equal height serving to visually determine the corresponding range of a known-size target when the target image is subtended between a pair of said lines, the upper ends of said lines constituting sighting points for use in giving the gun the proper elevation for any determined range, the lines to the right and left of the reticule center being numbered in terms of target speeds to permit use thereof in determining leads for different target speeds.

5. A telescopic gun sight reticule comprising a transparent panel having a plurality of vertical sight lines all disposed below the reticule center and distributed to the right and left of said center, said lines being uniformly spaced apart horizontally; some of said lines at equally spaced intervals extending to one uniform height and the distances between these lines serving to determine one range of a known-size target when the target image is subtended between the lines; others of said lines at lesser equally spaced intervals extending to a lesser uniform height and the distances between these lines serving to similarly determine a second and greater range of the known-size target; the upper ends of said some and said others of said lines being so located as to be useable as sighting points in giving the gun the proper elevation for the range determined thereby.

6. A telescopic gun sight reticule having differently spaced vertical sight lines, the distances between said lines constituting means for determining the range of a known-size target when the target image is subtended between the lines, said lines having ends located at different elevations and constituting sighting points to give the gun the proper elevation for the range determined thereby.

7. A structure as specified in claim 6; some of said vertical lines being numbered in terms of tar-

get speeds and constituting sighting lines useable in traversing the gun for various leads.

8. A telescopic gun sight reticule comprising a transparent panel having vertically spaced horizontal rows of horizontally spaced horizontal lines below the reticule center, the lengths of the lines decreasing downwardly from the reticule center and the lines of any row being of uniform length, the various line lengths corresponding to the lengths of the images which a known-size target will cast on the reticule at different ranges and being therefore useable to determine the range of the target, the vertical spacing of said rows below the reticule center being such that locating the target image in the row having lines matching the image length will serve to give the gun the proper elevation for the range determined by said lines.

9. A telescopic gun sight reticule comprising a transparent panel having vertically spaced horizontal rows of horizontally spaced horizontal lines below the reticule center, the spaces between the lines decreasing downwardly from the reticule center and the spaces between the lines of any row being uniform, said spaces corresponding to the lengths of the images which a known-size target will cast on the reticule at different ranges and being therefore useable to determine the range of the target, the vertical spacing of said rows below the reticule center being such that locating the target image in the row having spaces matching the image length will serve to give the gun the proper elevation for the range determined by said spaces.

10. A telescopic gun sight reticule comprising a transparent panel having vertically spaced horizontal rows of horizontally spaced horizontal lines below the reticule center, the spaces between the lines and the lengths of said lines decreasing downwardly from the reticule center, the spaces between the lines of any row and the lengths of the lines in said row being all uniform, said spaces and lengths corresponding to the lengths of the images which a known-size target will cast on the reticule at different ranges and being therefore useable to determine the range of the target, the vertical spacing of said rows below the reticule center being such that locating the target image in the row having spaces and line

lengths matching the image length will serve to give the gun the proper elevation for the range determined by said spaces and line lengths.

11. A telescopic optical instrument reticule comprising a transparent panel having a row of spaced lines, said lines extending longitudinally of said row, and being spaced apart longitudinally of said row, the spaces between said lines being uniform and corresponding to the length of the image which a known size target will cast on the reticule at one range, whereby it may be determined if the target be at said range by attempting to match the target image length with the length of any of the spaces between said lines.

12. A telescopic optical instrument reticule comprising a transparent panel having a row of spaced lines, said lines extending longitudinally of said row, said lines being of uniform length corresponding to the length of the image which a known size target will cast upon the reticule at one range, whereby it may be determined if the target be at said range by attempting to match the target image length with the length of any of said lines.

13. A telescopic optical instrument reticule comprising a transparent panel having a plurality of pairs of substantially parallel lines spaced apart uniformly to correspond to the length of the image which a known-size target will cast on the reticule at one range, and being therefore useable to visually determine whether the target be at said one range by subtending the target image between a pair of lines; additional plurality of pairs of parallel lines between and parallel with the first mentioned lines and uniformly spaced apart to correspond to the length of the image which said known-size target will cast upon the reticule at another range, the lines of said additional pairs being therefore useable to visually determine whether the target be at said other range by subtending the target image between a pair of these lines; the lines of one of said pluralities projecting beyond those of the other of said pluralities to differentiate the lines of the two pluralities from each other.

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