No. 659,606. Patented Oct. 9, 1900.

J. FORMBY.

MEANS FOR SIGHTING RIFLED FIREARMS.

(Application filed Apr. 13, 1900.)

(No Model.)

Fig. 1.

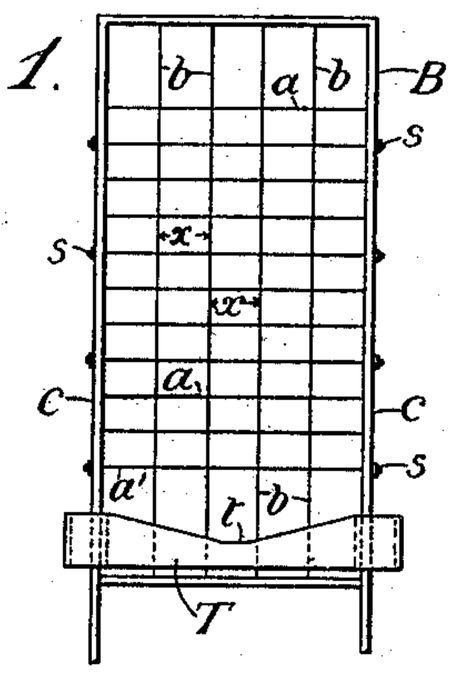


Fig. 1a

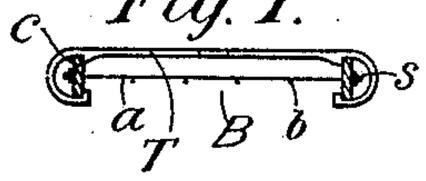


Fig. 2.

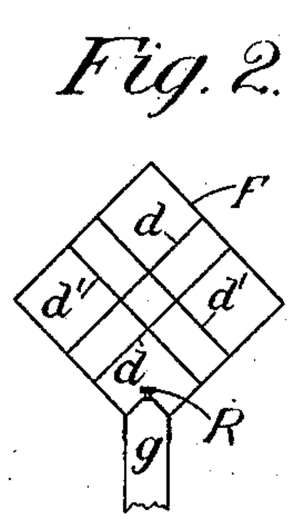


Fig. 2a

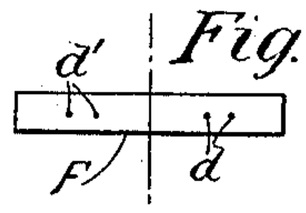


Fig. 3.

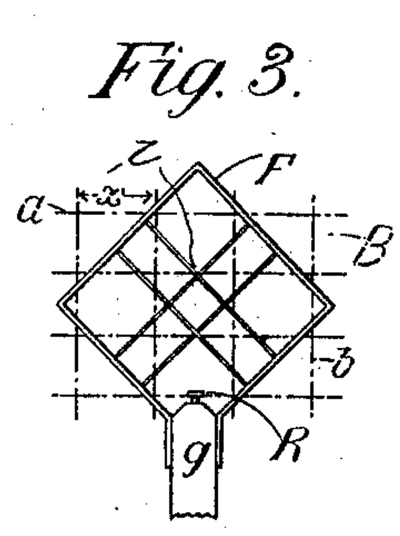


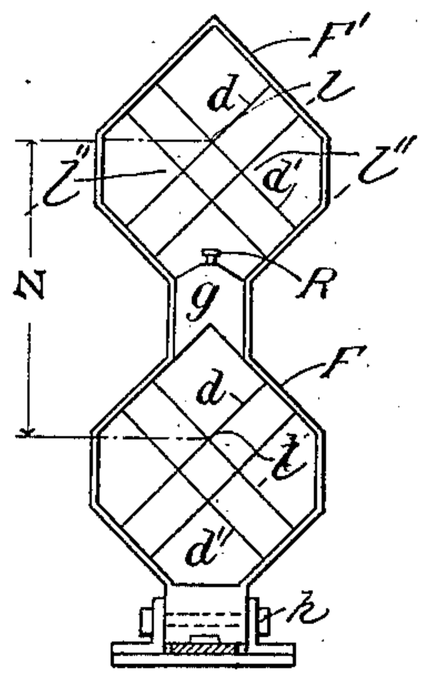
Fig. 4.

Range per crosswire in tens of yards.	
240	168
234	160
228	150
221	140
214	130
207	114
200	105
193	90
185	73
176	50
168	00
Lower	Upper

S S S

FORESIGHT

Fig. 5.



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UNITED STATES PATENT OFFICE.

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MEANS FOR SIGHTING RIFLED FIREARMS.

SPECIFICATION forming part of Letters Patent No. 659,606, dated October 9, 1900.

Application filed April 13, 1900. Serial No. 12,744. (No model.)

To all whom it may concern:

Be it known that I, JOHN FORMBY, a subject of the Queen of Great Britain and Ireland, residing at Formby Hall, Formby, in the county of Lancaster, England, have invented certain new and useful Improvements in Means for Sighting Rifled Firearms, (for which I have made application for patent in Great Britain, dated July 5, 1899, No. 13,887,) of which the following is a specification.

This invention relates to the means for sighting rifled firearms and has for its object to provide rapid and reliable means for sighting whereby the greatest facility is afforded for picking up a fresh aim with great rapidity and for maintaining the aim upon any rapidly-moving object—such, for example, as a small body of troops—especially when advancing toward or retiring from the gun.

One advantage of this invention is that mechanical adjustment is not necessary (as with the sliding leaf on ordinary sights) to take up or alter either range or sighting, but all measurements, even the most minute, can be accurately made by eye, which is an important simplification and effects in practice a great saving of time.

Though principally designed for firearms using small-arm ammunition, my invention is applicable to artillery which can be pointed by hand and is laid rather by sight than by scale.

My invention includes forming and using equal divisions or spaces of the back sight for elevation in shortening its scale, and in so constructing a single fore sight or a double fore sight for use in conjunction therewith as to allow of exact and minute subdivision of the said spaces of the back sight, both for elevation and for line.

In fully describing my invention I will refer to the accompanying drawings, in which—

Figure 1 is a front elevation, and Fig. 1ª a plan, of my improved back sight; and Fig. 2 is an elevation, and Fig. 2ª a plan, of my improved fore sight. Fig. 3 is a diagram showing the back sight in dotted lines projected upon the fore sight in full lines, as when seen by the eye of the user. Fig. 4 is a range-table which may be arranged in suitable position upon the gun. Fig. 5 is an elevation of a double fore sight, and Fig. 6 is a diagram illustrating the method of using the sights and the double fore sight for obtaining increased range without using sights of inconvenient dimensions.

The improvements consist in arranging the scale of the back sight B, Figs. 1 and 1ª, horizontally and vertically in equal and suitable divisions throughout, which divisions are made, preferably, by cross-wires or the like *a a b b*, fixed across the open frame *c* of the structure, and such horizontal and vertical distances are not necessarily of equal widths. I prefer to make the spaces *x x* (for lateral deviation for direction) between the vertical wires *b b* of the back sight B fifty per cent. larger than those between the horizontal wires *a a* thereof, as illustrated. It will be seen that the scale indicated in Fig. 4 represents two sets of graduations, one marked "lower" and one marked "upper." When the back sight is used in connection with the lowermost fore sight, (represented in Fig. 5,) the scale marked "lower" is used and the proper cross-wire *a* is selected by means of this scale, the lines of which correspond with the wires of the scale. When the range is such that the upper fore sight is used, then the proper cross-wire *a* of the back sight is selected by means of the scale marked "upper." Supposing that it is desired to sight to a half-distance between any two distances indicated on the scale and taking, for example, nine hundred and seventy-five yards, the half-distance between the cross-wires ranged at nine hundred and one thousand and fifty yards, respectively, would be found as follows: The gunner, with his eye on the fixed point *l* of the front sight, would adjust the gun until the cross-wire marked 90 on the scale was in line with said point *l*, which would give the range for nine hundred yards. He would then continue to adjust the gun, permitting the line of sight to drop on the fore sight until the wire 90 is in line with the crossing-points *l''* of the wires, which would give the proper position for the half-distance or range of nine hundred and seventy-five yards. This would be as small a subdivision as would be needed. The fact that this necessitates the referring of the eye to another point on the fore sight than the sighting-point is immaterial in practice, the points being so close together. I

may state by way of direction that I have found by experience that fifteen one-hundredths of an inch between horizontal wires and twenty-two and one-half one-hundredths of an inch between vertical wires to be good proportions for the sight, though of course I do not limit myself to any specific widths. The fore sight may consist of an open frame, such as F, with diagonal pairs of cross-wires *d d d d'*, forming a lozenge in the center, as illustrated in Figs. 2 and 3, and it is so constructed that by its use the spaces *x x* on the back sight B, described, can be accurately and minutely subdivided by the observer, both vertically and horizontally—that is to say, both for elevation and for line. The wires *d d'* are somewhat thicker than those *a b* of the back sight B and are stretched diagonally across the frame F and so spaced to take up apparently slightly-less space than the horizontal wires of the back sight between the top and bottom of the lozenge when seen as shown in Fig. 3. It is evident that this spacing will vary according to the relative distances intended to be kept between the observer's eye and the sights. I prefer to fix the back sight B about half-way between the eye of the observer and the fore sight F, and the sights to be practically the same distance apart as in an ordinary rifle or firearm, in which case the diagonal pairs of wires *d d'* of the fore sight may be spaced at the same distance apart as the horizontal wires *a a* of the back sight. A nominal scale of yards for each cross-wire *a a* is conveniently arranged upon or in connection with the gun where it can be easily read. I have shown, for example, in Fig. 4 such a scale, the tens of yards marked thereon being calculated on the principle of the ordinary trajectory of the Lee-Metford rifle. This example is not, of course, arbitrary. To facilitate counting, small studs or projections, such as *s s*, are fixed outside the frame *c* opposite the ends of every third or fourth cross-wire *a a*, Figs. 1 and 1[a]. With this system of cross-wires I may combine an ordinary sliding shallow **V** back sight, which in its lowest position, in conjunction with the bead fore sight, forms an emergency short-range sight, but which in cases where the cross-wires are difficult to observe may be slid up or down the frame and used under conditions when it is difficult or impossible to define the cross-wires. This emergency-sight consists of a bead fore sight, such as R, Figs. 2, 3, and 5, mounted on the sloped shoulders of a solid block *g*. The additional back sight consists of a very broad and shallow **V**-shaped piece T, the bottom of which is made flat for a short breadth at *t*. Its arrangement on the back sight is shown in plan in Fig. 1[a]. These sights are preferably placed at the level of one or more exact subdivisions of the back sight below its lowest cross-wire *a'*, so that the bead fore sight R can be used with the cross-wires *a' a*, if desired.

In using my improved sights I prefer to sight over the top of the lozenge in the fore sight; but its center or lower angle may be used, if desired.

In machine-guns especially, which should be sighted accurately to extreme ranges in order to get full or increased range without necessitating an inconvenient height of back sight, I may employ two similar fore sights, as shown at F F', Fig. 5, carried in one frame. The vertical distance Z, Fig. 5, apart of these two sights should be equal to the length of scale of the back sight—*i. e.*, the distance between the top and bottom wire thereof—so that the sight from the top of the back sight and the uppermost fore sight F' should give the same range as that from the bottom of the back sight and the lowermost fore sight F. Thus I am able to obtain a practically-continuous scale on changing from the lower to the upper fore sight. The distance between the level of the lowest sight *t* and that of the upper part of the gun-barrel will of course vary with the construction of guns.

The vertical wires are arranged to coöperate with the intersecting wires of the front sight in order to allow for drifting or deviation of the projectile, the vertical wires being spaced to correspond with a known amount of deviation, so that by lateral adjustment of the arm one of the side spaces is brought into line with the intersecting point of the front sight.

A scale may be used to indicate the amount of deviation to which each vertical wire corresponds; but it is not deemed necessary to show this in the drawings.

In all cases I arrange the frames C of the sights with the thickness of the metal presented edgewise or endwise to the eye of the observer, the broad part being longitudinal of the barrel for better focusing and definition of distant objects, and especially in dull or hazy lights. I also hinge the front sight, as shown at *h* in Fig. 5, so that it can be folded down when not in use.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Means for sighting firearms by the eye alone comprising a back sight divided by vertical and horizontal wires, said horizontal wires being so spaced that each corresponds to a known range, and a fore sight comprising wires extending in a different direction relatively to those of the back sight and arranged to subdivide the spaces in said back sight, substantially as described.

2. Means for sighting firearms by the eye alone, comprising a back sight divided by vertical and horizontal wires, said horizontal wires being so spaced that each corresponds with a known range, and a double fore sight, each portion of which has wires extending in a different direction relatively to those of the back sight and arranged to subdivide the spaces in said back sight, the lower part of the said double fore sight serving as a means for enabling the scale of the back sight

to be used twice over and keeping the size of the back sight within reasonable limits, substantially as described.

3. The means for sighting rifled firearms by the eye alone comprising a framed back sight divided by vertical and horizontal wires into spaces, said horizontal wires being so spaced that each corresponds with a known range, for use in conjunction with a single or double fore sight consisting of a frame mounted on the barrel and having wires diagonally stretched therein in such manner as to divide up the spaces of the back sight, substantially as and for the purpose herein described.

4. For sighting rifled firearms a back sight consisting of a folding frame having wires stretched vertically and horizontally across same, said horizontal wires being so spaced that each corresponds with a known range, and a sliding sight across same in combination with a fore sight consisting of a single or double folding frame having wires stretched diagonally across it or them and a bead-sight below same, the thickness of the metal forming the frames being in all cases presented to the eye and the breadth of the said metal being disposed longitudinally of the gun, substantially as described for the purpose stated.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN FORMBY.

Witnesses:
ETHEL C. SMITH,
HENRY HART.