Feb. 5, 1946. R. M. LYNN 2,394,521

GUN SIGHT

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Fig. 1.

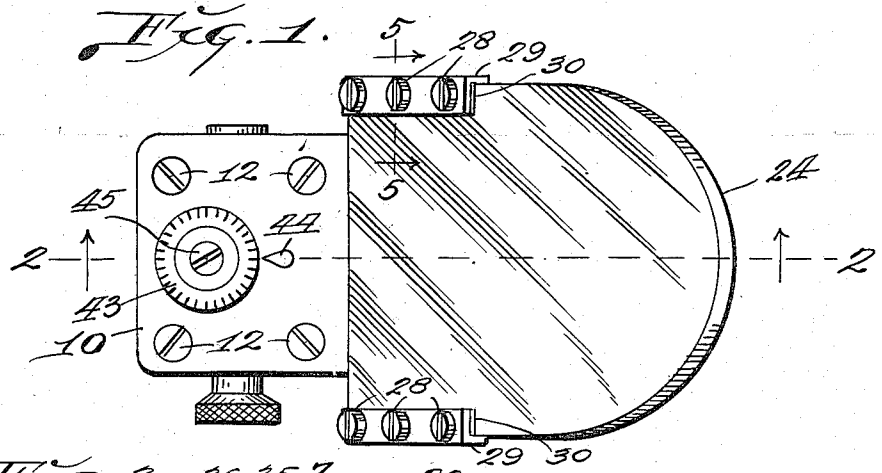

Fig. 3.

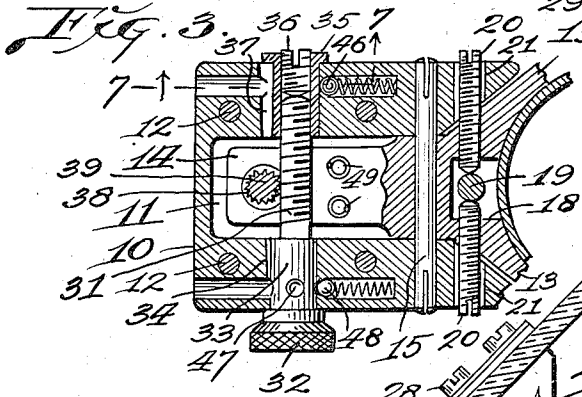

Fig. 2.

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Fig. 4.

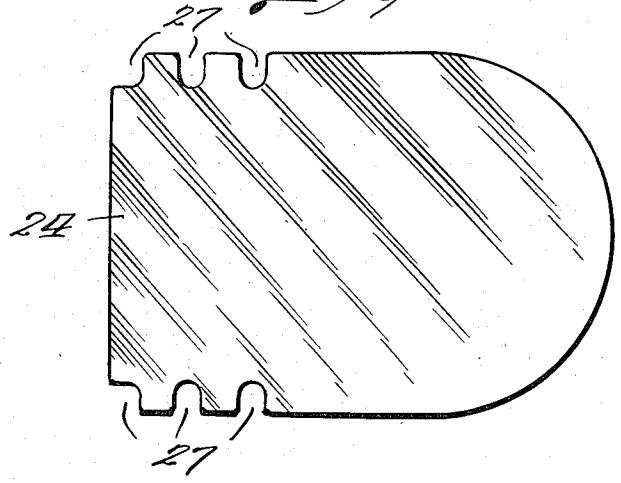


Fig. 5.

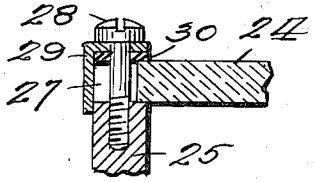


Fig. 6.

Fig. 7.

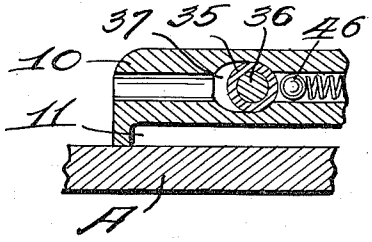
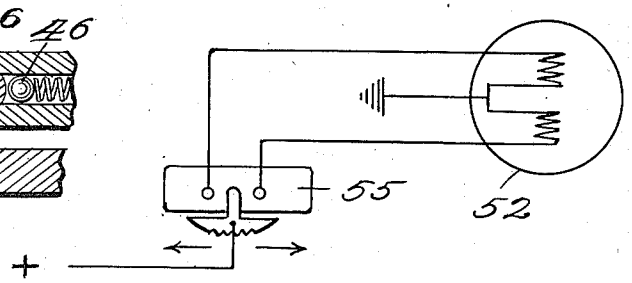


Fig. 8.



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UNITED STATES PATENT OFFICE

2,394,521

GUN SIGHT

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Application September 15, 1943, Serial No. 502,414

4 Claims. (Cl. 88—2.4)

My invention relates to a gun sight particularly designed for the accurate and effective training and sighting of guns, especially those carried by aircraft, for the orientation of airplanes and for bomb sighting purposes, and the principal objects of my invention are, to generally improve upon and simplify the construction of the existing forms of similar instruments and to provide a gun sight based on the collimating reflex light principle of compact, light-weight structure, having ample adjustability, and combined with a relatively simple and highly effective lens system that includes a readily removable electric plug, socket and lamp, which latter may have a plurality of filaments controlled by a selective switch.

A further object of my invention is, to provide a simple, practical and efficient gun sight of the character referred to, which includes a base, a housing mounted on said base and containing the optical elements and reticle, a reflector mounted on the base, means for effecting vertical adjustment of the housing, means for indicating the vertical deviation from a basic setting on the aircraft, means for readily effecting azimuth adjustment relative to the center line of the aircraft, and the electric lamp and associated parts mounted so as to be easily and quickly removed from the lower portion of the housing.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts which will be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which:

Fig. 1 is a plan view of a gun sight constructed in accordance with my invention.

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of the transparent reflector.

Fig. 5 is an enlarged detail section taken on the line 5—5 of Fig. 1.

Fig. 6 is an enlarged detail section taken on the line 6—6 of Fig. 2.

Fig. 7 is an enlarged detail section taken on the line 7—7 of Fig. 3.

Fig. 8 is a diagrammatic view of the dual filament electric lamp, its selective switch and electrical connections.

Referring by numerals to the accompanying drawings, which illustrate a preferred embodiment of my invention, 10 designates a base plate having a chamber 11 open at its rear end, said plate being mounted, preferably by means of screws 12, to the horizontal surface of a fixed part of the aircraft as at A. Base 10 is preferably mounted so as to occupy a plane parallel with the longitudinal axis of the aircraft.

A housing carrying ring 13 has a short arm 14 projecting into chamber 11 and a pin 15, removably seated in the end of base 10 to the sides of the open end of chamber 11, passes through arm 14 to provide a horizontal axis therefor and for said ring.

Positioned on ring 13 is a short housing 16, preferably cylindrical in form and projecting from the lower end of said housing downwardly through said ring is a short tubular extension 17.

Extending from housing 16 and positioned in a notch 18 formed in ring 13, in alignment with arm 14, is a stud 19, against which bears the inner ends of screws 20 which are seated in the ring 13 to the sides of notch 18 and said screws passing through openings 21, larger in diameter than said screws, that are formed in base 10, to the sides of the open end of chamber 11.

The construction just described provides for the lateral or azimuth adjustment of the housing on the supporting ring 13.

A plurality of lenses 22, constituting a collimator, all contained within said housing 16 and located below the lowermost lens of the lens group is a reticle 23.

Occupying an angular position of 45 degrees just above the open, upper end of housing 16, is a transparent reflector 24 and the lower portions of the sides of this reflector rest on brackets 25 which project upwardly from a ring 26 that is removably mounted on housing 16.

Formed in the edges of the reflector which rests on brackets 25, are notches 27 for the reception of screws 28, that are seated in said brackets and underlying the heads of said screws and extending downward over the edges of the reflector are angle strips 29, preferably of metal, with cushioning strips 30 of material such as rubber or leather positioned between the upper surface of said reflector and the overlying portions of said angle strips (see Fig. 5).

The construction just described enables reflectors of different thicknesses to be used on the sight.

For adjusting the vertical angularity of the housing and parts carried thereby upon its axis, the pin 15, a screw 31 provided on one end with a knob 32, has a cylindrical portion 33 journalled in a bearing 34 in one side of base 10, said screw extending transversely through chamber 11 above arm 14 with its end screw seated in a cylindrical nut 35, and locked therein by means of a set screw 36.

Nut 35 is mounted for rotation in a bearing 37 in the side of base 10 and this bearing as well as bearing 34 is slightly elongated horizontally, so as to permit slight horizontal tilting movement of screw 31.

The thread on screw 31 acting as a worm engages teeth 38 on a stud 39, which is journalled in

the top of base 10, and that portion of the stud below teeth 38 is threaded as designated by 41 and engages a nut 42 which is rigidly fixed in the arm 14. (See Fig. 2.)

Stud 39 carries on its upper end a dial 43 which rests on top of base 10, and the face of said dial, adjacent its edge, is provided with graduations in mils, and fixed on the face of base 10 adjacent said dial is a pointer 44.

A set screw 45 secures dial to stud, thus enabling said dial to be readily reset so as to determine the deviation from previous setting of the sight line elevation.

A spring pressed ball 46 bears on nut 35, thus tending to force the screw forwardly through the elongated bearings 34 and 37 to maintain the screw in driving engagement with the teeth 38 of stud 39 and take up any slack or lost motion which might develop between the operating parts.

Bearing portion 33 of the screw has four recesses 47 disposed 90 degrees apart and adapted to enter said recesses as the screw is rotated, is a spring pressed detent ball 48.

The spacing of the recesses 47, the pitch of the thread of screw 31 and of teeth 38 bear direct relation to the mil graduations on dial 43, and position of shaft 15 relative to stud 39.

Interposed between the upper face of arm 14 and underface of base 10 between the screw 31 and axis 15, are expansive coil springs 49, which bias upward movement of said arm.

Secured to the lower portion of housing extension 17, below ring 13, is a lamp housing 50 in the wall of which is a removable plug 51, having a socket for a removable lamp bulb 52 having dual filaments. This plug is held in inserted position by spring pressed detent balls 53, which engage in apertures 54 in housing 50 (see Fig. 6).

Associated with plug 51 is a single pole, double throw type switch 55, having an "off" position and wired to permit selection of either filament of the lamp.

This electric assembly is capable of being easily and quickly removed and replaced, thereby facilitating and greatly expediting the change of lamp bulbs during flight.

After the base 10 is secured to a fixed part of the aircraft with said base parallel with the longitudinal axis (fore and aft) of said aircraft, the housing carrying the lens assembly and reflector is adjusted relative to the direction of fire from the guns, by manipulation of screw 31 and azimuth adjustment screws 20, as screw 31 is rotated the thread thereof engages teeth 38 on stud 39, thereby rotating same, and the threaded, lower end of said stud engaging nut 42 moves the arm 14 upwardly or downwardly as the case may be, thus swinging said arm on its axis 15 and changing the vertical angularity of ring 13, housing 16 and parts carried thereby.

Lateral adjustment of the device for alignment with the center line of the plane is accomplished by backing off one screw 20 and driving the other screw forwardly thus engaging and exerting pressure on stud 19 and thereby correspondingly rotating ring 13, housing 16 and parts carried thereby.

In sighting with the device, the operator looks through the inclined surface of the reflector 24, from which is reflected the image of the reticle and when the plane is guided to bring the target into the circle appearing on the reflector, with the dot of the reticle on said target, the gun or guns may be fired, with maximum chances of scoring a hit, as a result of accuracy of sighting.

Thus it will be seen that I have provided a gun sight which is simple and compact in structure, light in weight, capable of being easily and accurately adjusted to correspond with the line of fire from the guns, with a simple and readily controlled and manipulated lighting system including selective dual lamp filaments and which gun sight is very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved gun sight may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a gun sight, the combination with an inclined reflector supported on a housing, the housing holding a lens system and an illuminated reticle, of a mounting ring for supporting said housing, an arm extending from said mounting ring, a base member pivotally supporting said arm near said housing, an adjusting screw connecting said base member and said arm near the end thereof, said housing supporting a stud, and set screws carried by said ring and engageable with said stud for adjusting the rotary position of said housing with respect to said mounting ring.

2. In a gun sight of the type including an inclined reflector mounted upon a housing including a lens system and an illuminated reticle, the combination of a ring coaxial with the axis of the lens system of said housing for mounting said housing, said ring having an arm extending therefrom, a horizontal support for said arm, means for adjusting the pivotal position of said arm about said support, a stud extending from said housing, and adjusting members carried by said ring for contact with said stud for adjusting the relative rotary positions of said housing and said ring.

3. A gun sight of the class in which there is provided a reflector to receive an illuminated image of a reticle, a housing, a ring for supporting said housing so that the housing may rotate on a substantially vertical axis, said ring having an arm extending therefrom, a mounting member supporting said arm on a horizontal pivot, an adjusting means interconnecting said supporting member and arm for adjusting the pivoting of said arm about said horizontal axis, a stud carried by said housing and extending into a recess in said ring, and oppositely acting adjusting members carried by said ring and contacting said stud for adjusting the relative rotary positions between said housing and mounting ring.

4. A gun sight of the class in which there is provided a reflector to receive an illuminated image of a reticle, a housing, a ring for supporting said housing so that the housing may rotate on a substantially vertical axis, said ring having an arm extending therefrom, a mounting member supporting said arm on a horizontal pivot, an adjusting means interconnecting said supporting member and arm for adjusting the pivoting of said arm about said horizontal axis, a stud carried by said housing and extending into a recess in said ring, oppositely acting adjusting members carried by said ring and contacting said stud for adjusting the relative rotary positions between said housing and mounting ring, and scales for indicating the rotation about the horizontal axis.

ROBERT M. LYNN.