J. CHIDLEY.

FOCUSING APPARATUS FOR HEADLIGHTS.

APPLICATION FILED SEPT. 23, 1915.

1,227,528. Patented May 22, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

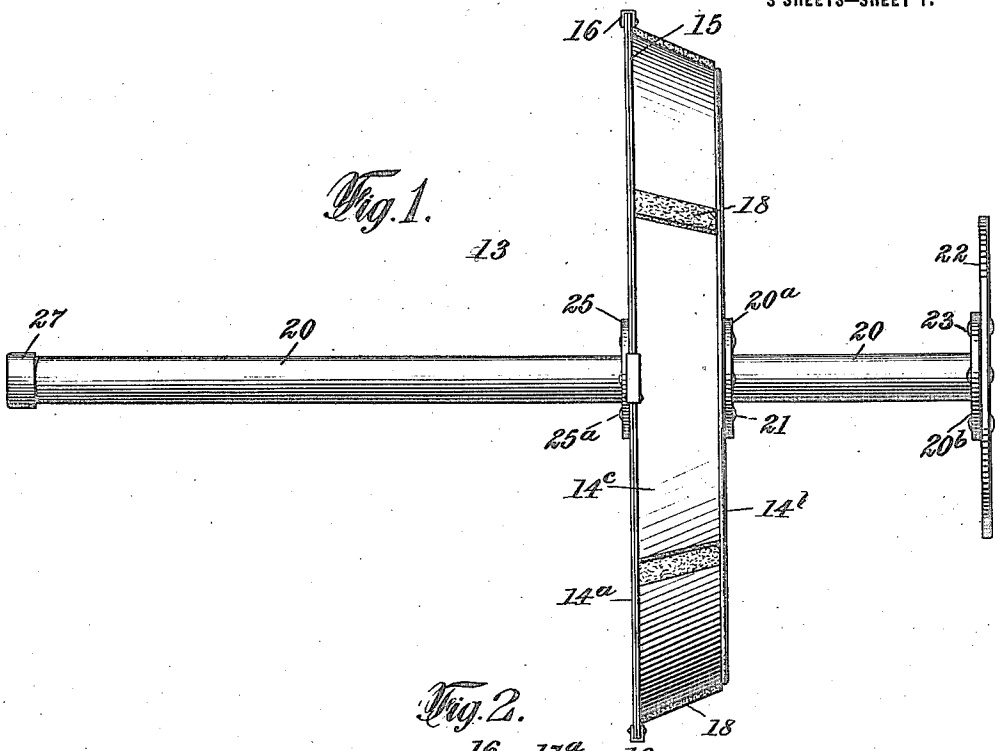
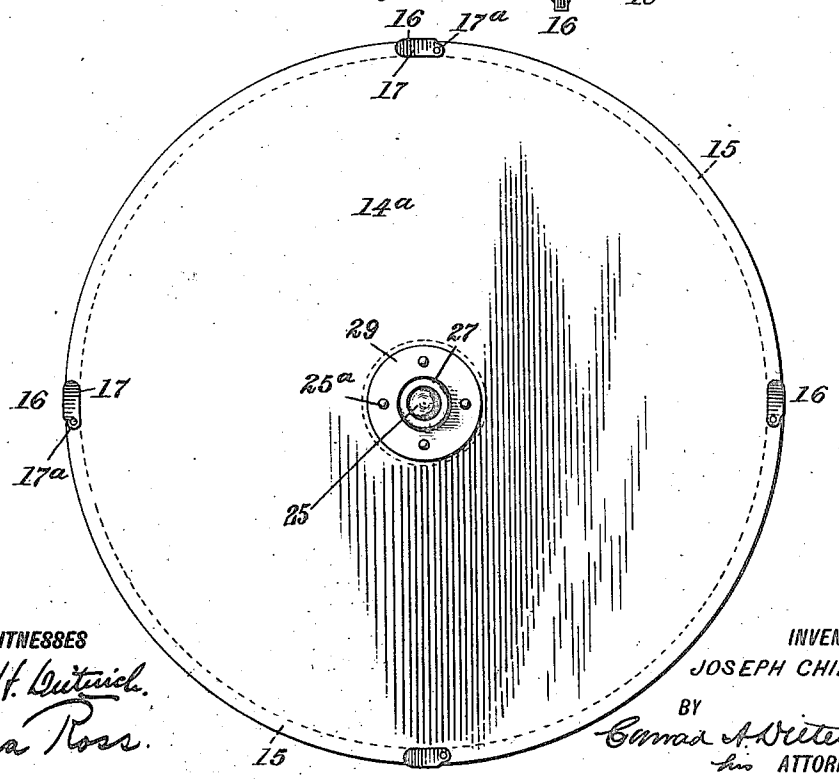


Fig. 2.



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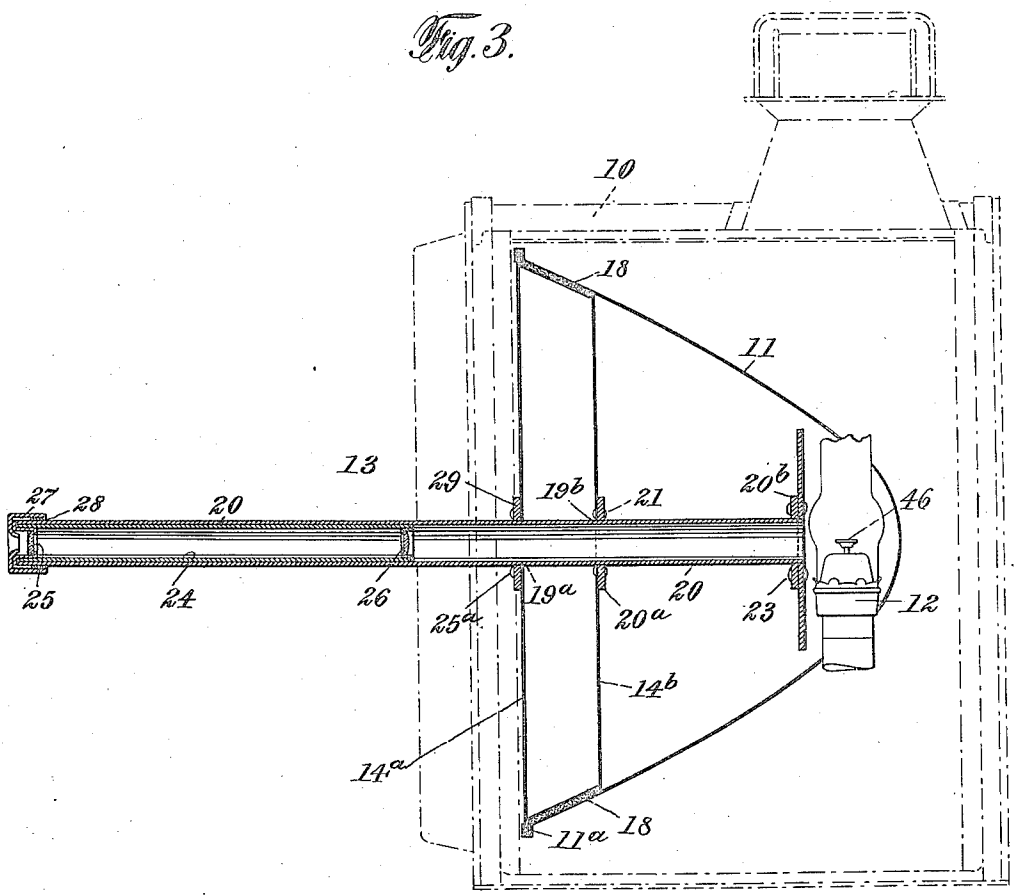
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3 SHEETS—SHEET 2.

Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

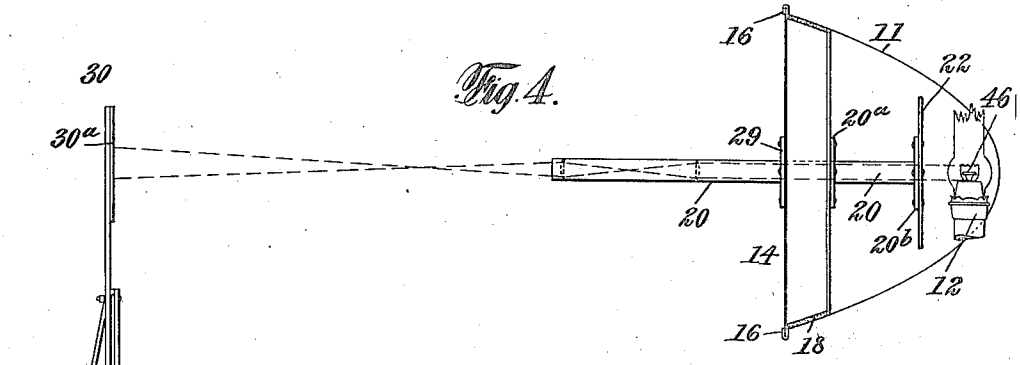
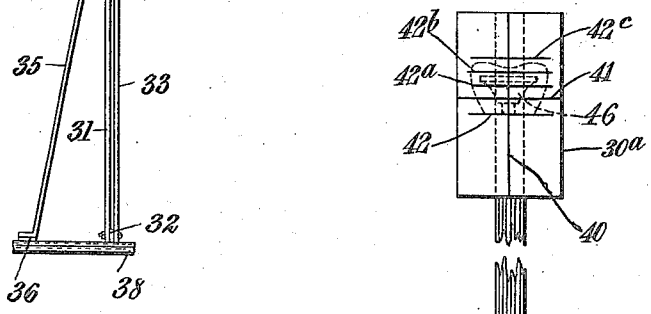
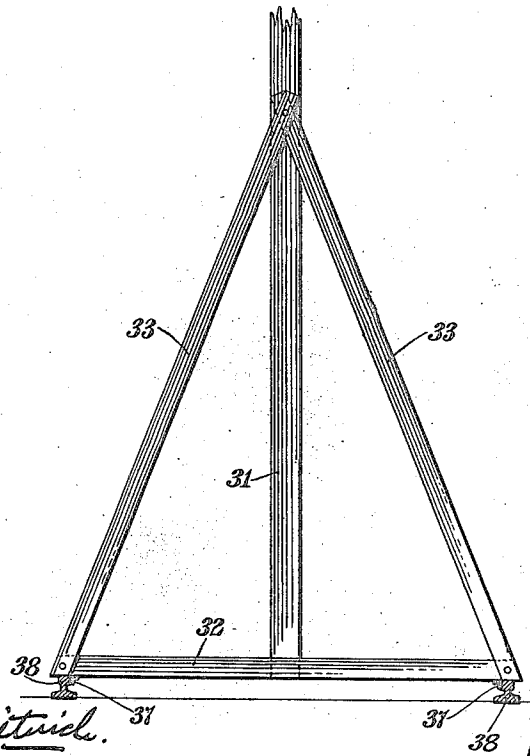


Fig. 5.





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UNITED STATES PATENT OFFICE.

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FOCUSING APPARATUS FOR HEADLIGHTS.

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To all whom it may concern:

Be it known that I, JOSEPH CHIDLEY, a citizen of the United States, residing at Cleveland, Cuyahoga county, in the State of Ohio, have invented certain new and useful Improvements in Focusing Apparatus for Headlights, of which the following is a full, clear, and exact specification.

My invention relates to improvements in means for adjusting headlights, and the same has for its object more particularly to provide a simple, efficient and positive apparatus whereby the beam of light projected thereby may be adjusted in a vertical plane, directly ahead of the locomotive and parallel with the track.

Further, said invention has for its object to provide an apparatus for adjusting headlights by means of which the direction of the beam thrown by the headlight may be accurately and positively determined with reference to the rails.

Further, said invention has for its object to provide an adjusting apparatus which may be readily and conveniently attached to a rigid part of the headlight when the same is in position upon a locomotive, and which will project the image of the flame and button of the burner upon a target or other suitable support or screen disposed upon the rails in advance of the headlight.

Further, said invention has for its object to provide a focusing apparatus which may be easily and readily attached to a headlight in order to indicate the errors or inaccuracies in the adjustment of the headlight as a whole upon the locomotive, which, if not corrected, ordinarily result in the beam of light being projected by the headlight in a direction which is not truly in the center of the track.

Other objects will in part be obvious, and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, my invention consists in the novel details of construction, and in the combination, connection and arrangement of parts hereinafter more fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification wherein like numerals of reference indicate like parts,—

Figure 1 is a side view showing one form of focusing apparatus constructed according to and embodying my said invention;

Fig. 2 is a front view thereof;

Fig. 3 is an enlarged central longitudinal section showing the focusing apparatus with reference to the headlight casing and reflector and burner thereof;

Fig. 4 is a diagrammatic view showing the manner of operating the apparatus, and

Fig. 5 is a front view of the target and support with the image of the flame shown upon said target.

In the accompanying drawings 10 designates the headlight which may be of any ordinary form or construction and provided with a parabolic reflector 11 having a flange 11^a at its forward edge, and 12 denotes a burner disposed within said reflector adjacent the apex thereof.

13 denotes the focusing apparatus which is shown as a hollow tapering support 14 of circular outline having a front 14^a, and back 14^b secured together by an inclined annular side wall 14^c. The support 14 is provided at its outer edge with a laterally extending flange 15 which is adapted to register with the flange 11^a of the reflector 11. The said flange 15 is provided with a plurality of attaching members 16, 16 each comprising a substantially U-shaped member 17 having a projecting portion 17^a at its rear edge whereby the same is pivotally secured to the flange 15 of said support. The tapering or inclined side wall of the support 14 is provided at regular intervals with cushions 18, 18 which are preferably made of felt or other suitable material, to prevent the focusing apparatus injuring the reflecting surface of the reflector when the same is secured in position within the reflector.

The support 14 is provided in its front and back portions 14^a, 14^b, with centrally disposed registering openings 19^a, 19^b through which extends a tubular member 20. The said tubular member 20 is provided adjacent to its inner end with a flange 20^a which is secured to the rear wall 14^b by rivets 21. 22

denotes a circular disk provided with an aperture at its center registering with the opening in the tubular member 20. The said disk 22 is secured by rivets 23 to the flange 20[b] at the rear end of the tubular member 20. The tubular member 20 is provided adjacent to its forward end with a flange 29 which is secured by rivets 25[a], 25[a] to the forward wall 14[a] of the support 14. Within the tubular member 20 is adjustably disposed a tubular member 24 which is provided at its opposite ends with plano-convex lenses 25, 26. The inner tubular member 24, with its lenses 25, 26 is secured in position in the tubular member 20 by a cap 27 provided upon its inner side with screw-threads engaging with the corresponding screw-threads arranged upon the collar 28 provided upon the forward end of the tubular member 20.

30 denotes a target comprising a rectangular member 30[a] secured upon a standard 31 which has its lower end secured to a horizontal member 32. From the opposite ends of the horizontal member 32 extend upwardly inclined side members or braces 33, 33, and from the rear side of said vertical member 31 extends rearwardly and downwardly a brace 35 having its lower end secured to a transverse bar 36 adapted to rest upon the rails. Upon the underside of the horizontal members 32, and the transverse bar 36 are secured angle irons 37, 37 which are adapted to engage with the inner faces of the rails 38, 38 when said target and its support are adjusted in position upon the rails.

The target member 30[a] is provided with a vertical center line 40 to indicate the center between the rails; a horizontal center line 41, and a plurality of horizontal indicating lines 42, 42[a], 42[b], 42[c], certain of which are arranged below, and others of which are arranged above the horizontal center line 41. The horizontal center line 41, and the horizontal indicating lines 42, 42[a], 42[b], 42[c] are intended to indicate the height at which the image of the flame of the headlight burner should appear, for different styles or sizes of locomotives.

In adjusting a headlight the operation is as follows:

The front door of the headlight is first opened whereupon the focusing apparatus is inserted into the parabolic reflector, and the securing clips 16, 16 at the outer edge of said support 14 are then brought into engagement with the registering flange 15 of the reflector 11 whereby said focusing apparatus will be held firmly secured in position within the reflector. Hereupon the target member 30[a] and its support are adjusted at a distance in front of the headlight. By preference I fix the focusing mechanism so that the target 30, if placed at ten feet from the headlight, will clearly show the reflection of the image of the flame of the burner therein. As soon as the target has been properly positioned the headlight is then bodily adjusted until the image of the flame, and the button 46 of the burner appear upon the target. In order that the light projected by the headlight shall be thrown directly along the center of the track it merely becomes necessary to so adjust the headlight bodily that the image of the flame, as reflected upon the target, together with the button 46 of the burner, will be above the appropriate horizontal guide line, and also register properly with the vertical center line 40 on said target. Hereupon it merely becomes necessary to secure the headlight permanently to its adjusted position upon the locomotive. The said guide lines 42, 42[a], 42[b], 42[c] are arranged to indicate the position at which the flame should appear when the headlight is secured upon locomotives of different styles or sizes.

It will be understood, of course, that for different sizes of locomotives and for different types of headlights the horizontal lines upon the target member 30[a] must be differently arranged. However, when once properly determined no further change is required in the graduating of the target except to meet new constructions of headlights or locomotives.

Further, it will be understood that while, for convenience, I prefer to use the apparatus with the focusing mechanism fixed for use in connection with a target located ten feet in front thereof, that the target may be set at a greater distance, and the focusing mechanism, which is adjustable, adjusted to reflect the image properly upon the target.

Having thus described my said invention, what I claim and desire to secure by Letters Patent is:—

1. The combination of a headlight adjustably mounted upon a locomotive, with an indicating member adapted to be positioned in front of said headlight, and means adapted to be supported by said headlight and movable therewith to direct a beam of light therefrom, whereby said headlight may be adjusted to cause the said beam of light to register with said indicating member to determine the direction of the beam of light, substantially as specified.

2. The combination of a headlight adjustably mounted upon a locomotive, with a member adapted to be supported above the rails of a railroad track and having indicating means thereon, and means adapted to be supported by said headlight and movable therewith to direct a beam of light therefrom, whereby said headlight may be adjusted to cause the said beam of light to register with the indicating means on said member to determine the direction of the beam of light relatively to the track, substantially as specified.

3. The combination of a headlight adjust-

ably mounted upon a locomotive, with a member adapted to be supported above the rails of a railroad track and having indicating means thereon to indicate the center of the track, and means adapted to be supported by said headlight and movable therewith to direct a beam of light therefrom, whereby said headlight may be adjusted to cause the said beam of light to register with the indicating means on said member to determine the direction of the beam of light relatively to the track, substantially as specified.

4. An apparatus of the character described comprising image projecting means adapted to be supported by a headlight, and means to receive the projected image, substantially as specified.

5. An apparatus of the character described comprising image projecting means adapted to be supported by a headlight, and means adapted to be supported above the rails of a railroad track to receive the projected image, substantially as specified.

6. An apparatus of the character described comprising image projecting means adapted to be supported by a headlight, and means adapted to be supported above the rails of a railroad track to receive the projected image, said receiving means being provided with means to indicate the center of the track, substantially as specified.

7. An apparatus of the character described comprising projecting means adapted to be supported by a headlight to project the image of the flame thereof, and means to receive the projected image, substantially as specified.

8. An apparatus of the character described comprising projecting means adapted to be supported by a headlight to project the image of the flame thereof, said projecting means having its optical axis coincident with an optical axis of the reflector and means to receive the projected image, substantially as specified.

9. An apparatus of the character described comprising a member adapted to be attached to a headlight, means upon said member adapted to project the image of the flame, and means adapted to receive the projected image, substantially as specified.

10. An apparatus of the character described comprising a member adapted to be attached to a headlight, means arranged centrally upon said member for projecting the image of the flame, and means adapted to receive the projected image, substantially as specified.

11. An apparatus of the character described comprising a member adapted to be fitted to a headlight, means for attaching said member to said headlight, means on said member for projecting the image of the flame, and means adapted to receive the projected image, substantially as specified.

12. An apparatus of the character described comprising a member adapted to be fitted into a headlight, means for securing said member to said headlight, a tubular member arranged centrally upon said member, means in said tubular member for projecting the image of the flame, and means for receiving said image, substantially as specified.

13. An apparatus of the character described comprising a member adapted to be fitted into the front of a headlight, means for attaching said member to said headlight, a tubular member arranged centrally upon said member and extending therethrough, lenses mounted in said tubular member for projecting the image of the flame, and means for receiving said projected image, substantially as specified.

14. An apparatus of the character described comprising a supporting member adapted to be fitted upon the front of the reflector of a headlight, means for securing said supporting member in position upon said reflector, a tubular member arranged at right angles to said supporting member and extending therethrough, lenses mounted in said tubular member for projecting the image of a flame, and a body adjustably supported in front of said headlight for receiving the projected image of the flame, substantially as specified.

15. An apparatus of the character described comprising a supporting member adapted to fit into the front of a headlight reflector, an annular flange upon said member adapted to register with a flange upon said reflector, means on said supporting member adapted to embrace said flanges for holding said supporting member within said reflector, a tubular member arranged centrally of said supporting member and in line with the top of the burner, a plurality of lenses mounted in said tubular member for projecting the image of the top of said burner and its flame, and a target disposed in front of said headlight adapted to receive the image projected by the lenses in said tubular member, substantially as specified.

16. An apparatus of the character described comprising a supporting member adapted to fit into the front of a headlight reflector, an annular flange upon said member adapted to register with a flange upon said reflector, means on said supporting member adapted to embrace said flanges for holding said supporting member within said reflector, a tubular member arranged centrally of said supporting member and in line with the top of the burner, a plurality of lenses mounted in said tubular member for receiving and projecting the image of the top of said burner and its flame, and a target disposed in front of said headlight adapted to receive the image projected by

the lenses in said tubular member, said target having means thereon to indicate the center of a railroad track, and the light of the burner of said headlight, substantially as specified.

17. An apparatus of the character described comprising a supporting member adapted to be fitted upon the front of a headlight, means for attaching said member to said headlight, a tubular member arranged centrally upon said member and extending therethrough, a second tubular member adjustably mounted in said first tubular member, and lenses mounted in said second tubular member for projecting the image of a flame upon a suitable body, substantially as specified.

18. An apparatus of the character described comprising a supporting member conforming to and adapted to be fitted into the front of the reflector of a headlight, securing means at the edge of said supporting member for securing the same in position upon said reflector, cushioning means upon the outer surface of said supporting member, a tubular member arranged at right angles to said supporting member and extending therethrough, a disk secured at the inner end of said tubular member having an opening therein registering with the opening in said tubular member, a second tubular member mounted in said first-named tubular member, and a plurality of lenses in said second-named tubular member for receiving and projecting the said image of a flame upon a suitable body, substantially as specified.

Signed at the city of Cleveland, in the county of Cuyahoga, and State of Ohio, this 30 day of April, one thousand nine hundred and fifteen.

JOSEPH CHIDLEY.

Witnesses:
D. G. JAEGER,
O. R. GAULT.