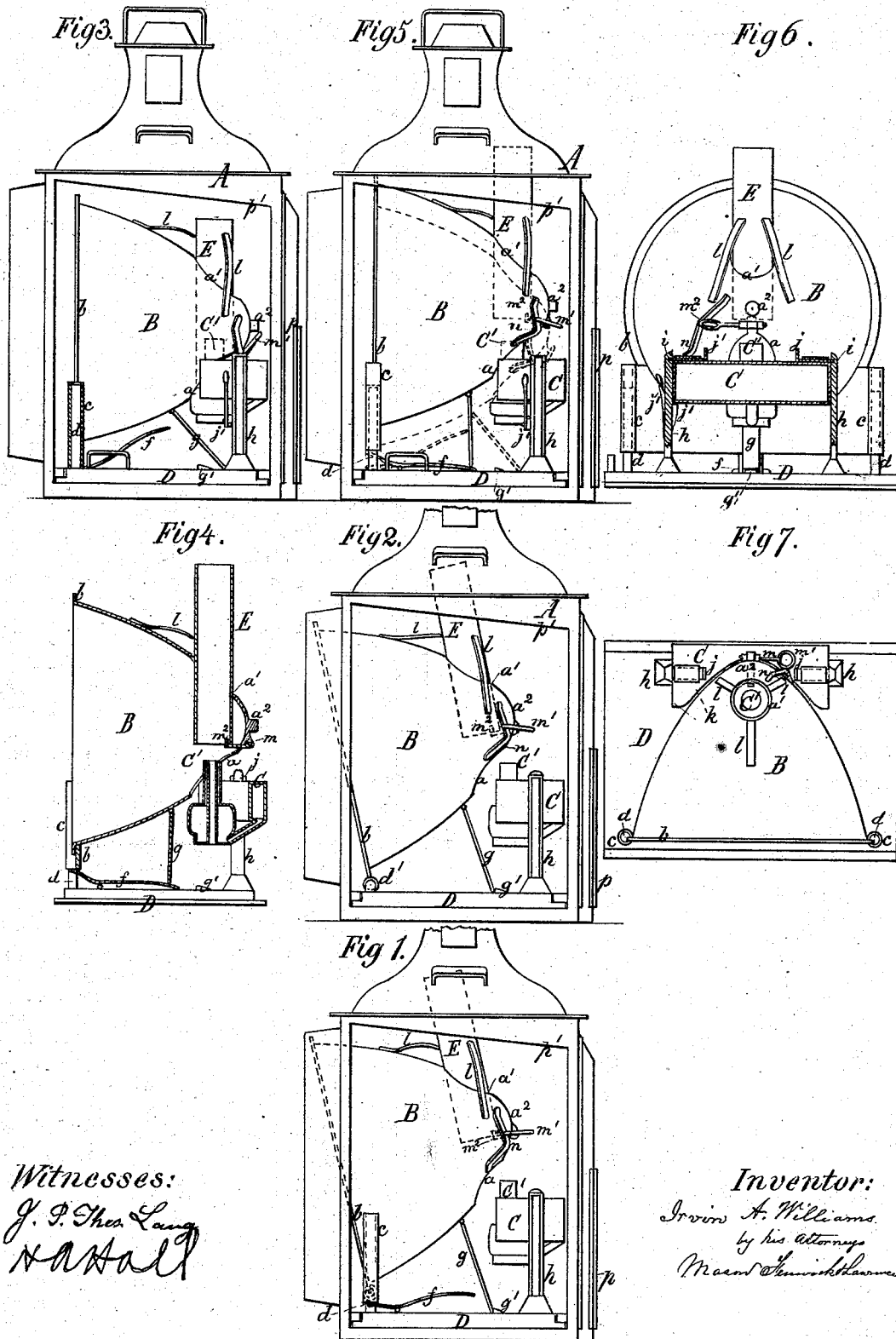


(Model.)

I. A. WILLIAMS.
Locomotive Head Light.

No. 240,797.

Patented April 26, 1881.



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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE HEAD-LIGHT.

SPECIFICATION forming part of Letters Patent No. 240,797, dated April 26, 1881.

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To all whom it may concern:

Be it known that I, IRVIN A. WILLIAMS, of Utica, in the county of Oneida and State of New York, and a citizen of the United States, have invented certain new and useful Improvements in Locomotive Head-Lights, of which the following is a specification.

My present invention relates, first, to an improved or novel combination of a locomotive head-light case, a reflector, and a burner, whereby provision is made for effecting either a forward-tilting, a sliding-upward, or both a sliding-upward and forward-tilting movement of the reflector out of the range of the burner while the reflector and burner are within the head-light case, and thereby facilitating either the lighting or trimming or cleaning of the burner, or cleaning of the reflector, without removal of either the reflector or burner from the head-light case; second, to an improved or novel combination of a head-light case, a reflector, and a burner, whereby provision is made for confining the burner and its reservoir in proper relation to the reflector, and for permitting the burner and its reservoir to be removed away from the reflector, and whereby the burner can be detached from its supports and moved out of the reflector or out of the head-light case for the purpose of being either lighted, trimmed, or cleaned without removing the reflector from the head-light case; third, to an improved combination of a reflector having a chimney-supporting attachment, a head-light case, and a burner, whereby the chimney, after being raised, can be held elevated above the tip of the burner while the reflector or burner is being adjusted and the burner either lighted, trimmed, or cleaned; fourth, it relates to other constructions and combinations, as hereinafter specifically claimed.

Figure 1 of the accompanying drawings is a side elevation of a head-light embodying my invention, the side door being removed, the chimney raised, and the reflector raised and tilted forward out of the range of the burner. Fig. 2 is a view similar to Fig. 1; but the reflector is shown hinged directly to the ordinary base-slide of the head-light. The chimney is shown raised and held up by the supporting attachment of the reflector, and the reflector is shown tilted forward, to permit either the lighting or

trimming or cleaning of the burner from the rear of the reflector, or to permit the removal of the burner out of the reflector or out of the head-light case, either for lighting or trimming or cleaning it. Fig. 3 is a similar view to Fig. 1; but the reflector is shown fixedly attached to a vertical slide, instead of being hinged to such slide. The reflector is also shown in its normal position with respect to the burner. Fig. 4 is a partial vertical longitudinal section and side elevation of the base-slide, reflector, chimney, and the supporting attachment; also, of the burner and oil-reservoir. The reflector and chimney are shown raised out of range of the burner. Fig. 5 is a view similar to Fig. 3; but the reflector and chimney are shown raised, as in Figs. 4 and 6. Fig. 6 is a rear elevation and partial section of the parts shown in Fig. 4, and in the same relative position. Fig. 7 is a plan view of Fig. 6.

In carrying out my invention an ordinary head-light case, an ordinary parabolic reflector, B, an ordinary oil-reservoir, C, and burner C', and an ordinary base-slide, D, may generally be used; or the slide may sometimes be dispensed with.

The reflector has, as usual, chimney-apertures a , one of which is made available for receiving the burner and chimney through it, and also for admitting a match for lighting the burner or trimming or cleaning it under the construction of head-light shown in Fig. 2, as will be presently described. The apertures a are of elliptical form, with their major axes in a vertical plane of the reflector, and these apertures are cut into the reflector just forward of its apex or focal portion a^2 . The reflector B is connected to the base-slide D at its lower forward edge or flange portion, b , by means of vertical tubes c , formed on it or attached to it, and by vertical guide-stems d , formed on or attached to the slide D, said stems extending upward into the tubes c , as shown, or in any other equivalent way.

To the slide D a hand lifting-lever, f , a supporting-bar, g , and a suitable stop, g' , may be attached in the manner shown, or in any other suitable equivalent way. The devices f , g , and g' form no essential part of my invention, and they may or not be provided on the head-light.

The oil-reservoir C and the burner C' may,

as usual, be united together and mounted upon supports or standards *h* of the base-slide D; and the connection of the reservoir and burner with the supports may be effected by means of notches or slots *i* in the standards, and by sliding catches *j*, attached to the top of the reservoir, as shown in Figs. 6 and 7; and by thus making the connection a very ready means of attachment and detachment of the reservoir and burner can be effected when it is necessary to move the burner out of the range of the reflector or out of the head-light case A, for either trimming, cleaning, or lighting it, or for cleaning the reflector after it is moved sidewise or out of the case. The reservoir C may be curved, as at *k*, (see Fig. 7,) on its front side, or as usual, and opposite this curved portion the burner C' stands, its upper end passing through the elliptical hole *a* of the reflector, and its tip end terminating either above or below the highest portion of the binding margin of said aperture, accordingly as may be the diameter of the focal part of the reflector. In the drawings it is shown as standing above said highest portion of the aperture.

The glass chimney E, which rests upon the burner in the usual manner, passes up through the apertures *a* and terminates above the outside of the reflector, and it is steadied and guided by spring-pieces *l*, attached to the outside of the reflector. Beneath the reflector, near its apex, a turning-rod, *m*, having a button or handle, *m'*, at one end and a supporting-hook, *m*², near its other end, is applied in suitable bearings of the reflector. The hook *m*² of this rod is arranged to enter the aperture *a* when turned up, and it takes under the lower edge of the glass chimney E when said chimney has been raised by hand, and it holds the chimney in the desired elevated position, as illustrated in Figs. 1, 2, 4, 5, and 6, while the burner is being either trimmed, cleaned, or lighted. The handle of the rod *m* is sprung upward past the apex of an angular spring-stop, *n*, of the reflector in the act of turning up the hook *m*², and it is by said stop held from turning back or downward until it is again sprung by the hand of the engineer past the apex of the spring-stop.

With the construction of head-light shown in Fig. 1 the operation is as follows: To raise the chimney, the engineer places one hand around its upper end, outside the reflector, and lifts it the proper height, and with his other hand he turns the handle *m'* of rod *m*, and thereby brings the hook *m*² under the lower edge of the chimney, the act of thus turning the hook causing its button or handle *m'* to spring past the angular stop, and to become thereby latched against a return movement until the pressure of the engineer's hand, applied in a reverse direction, causes it to move back. This done, the engineer presses with his hand down upon the lifting-lever *f*, and thereby raises the reflector on the guide-stems *d* from the position shown in Fig. 3 in full lines to the position shown in Fig. 1, and

thereupon the reflector is tilted forward by the engineer and the supporting-bar *g* adjusted, or it adjusts itself, so as to stand against the stop *g'*, and thereby hold the reflector in its raised and forward tilted position. The reflector B and chimney E being adjusted as just described, access is afforded to the tip of the burner for the purpose of either lighting, trimming, or cleaning it while the oil-reservoir C and burner C' and the reflector B remain within the head-light case. If desired, the burner and reservoir can be taken away from their supports *h* by slipping back the sliding catches *j*, and thus disconnected the burner and reservoir may be removed entirely from the head-light case either through a door, *p*, at the rear of said case, or through a doorway, *p'*, which is usually at the side of the case and closed by a hinged door. (Not shown in the drawings.)

Instead of arranging the reflector to be both slid up and down and tilted forward, as in Fig. 1, it may be hinged directly by its lower front portion to the base-slide D, as shown in Fig. 2 at *d'*, and thus applied the reflector can be tilted or swung forward away from over the tip of the burner, as shown in said Fig. 2 of the drawings; and when the reflector is thus swung forward the burner can be lighted with a match or other device held in the hand, or it can be either trimmed or cleaned or moved away out of the head-light case for the purpose of cleaning or trimming or lighting without removing the reflector from the head-light case.

The supporting-bar *g* and stop *g'* may be used for holding the reflector in its tilted position; but the lifting-lever *f* may be dispensed with, as shown, as the engineer can adjust the reflector by its flange or other portion.

When the reflector is hinged, as in Fig. 2, and not constructed to slide up and down, a parabolic reflector having a very greatly depressed curvature for its reflecting-surface is employed, and the aperture *a*, through which the burner is passed into the reflector, must have its highest binding margin as nearly on a level as practicable with the tip of the burner, in order that the reflector, while being swung or tilted forward, may pass the burner without striking it. This peculiar form of reflector is shown in all the figures of the drawings; but when the upward movement or both the upward and forward tilting movements are employed in the reflector, it is not material whether the more common style of head-light reflector or the improved style shown is used, provided the one used is adapted for giving a powerful reflection of the light; and again, instead of constructing the reflector to both slide up and down and to tilt or swing forward, as in Fig. 1, or to simply tilt forward or swing forward, as in Fig. 2, the reflector may be arranged to simply slide up and down on its guide-stems *d*, and when the reflector is simply slid upward and downward, as shown in Figs. 4 and 5, the lifting-lever *f* is employed, as in

said figure, and the supporting-bar *g* and stop *g'* may be provided upon the slide *D*, the supporting-bar, when adjusted, resting upon the lever *f*, as in Figs. 4 and 5, and holding the reflector in the position shown in full lines while either the lighting or trimming or cleaning of the burner is being performed.

In all the views of the drawings the chimney-supporting attachment *m*² and its adjuncts are represented applied to the reflector; but it is not deemed essential to apply this attachment to the reflector when it is arranged to simply slide up and down on its guide-stems *d*, as the engineer can hold the chimney in one hand and light the burner after the adjustment of the reflector and chimney has been effected.

In some other constructions of head-lights the tilting reflector may be hinged or applied to slide up and down within the head-light case without employing a base-slide. For instance, it may be hinged to the bottom of the head-light case, or it may be fitted to slide on stems *d*, which are fastened to said bottom, and when thus applied it may also both slide and tilt, as described. With these latter modifications of my invention the head-light case would have a front door which can be opened for the purpose of cleaning the reflector within the head-light case.

From my foregoing specification it will be seen that the invention which I have made has special reference to that description of head-light which is provided with a reflector of parabolic or other analogous form, and into the rear or apex portion of which the tip of a burner enters in order to have its flame stand in the focus of the reflector and in rear of the inclined forwardly-extended surface of the reflector, as shown in the drawings. It will also be seen that the combination of either a hinge or vertical slide mechanism, or of both a hinge and vertical slide mechanism, with a reflector of this character, and with a burner adjusted, as set forth, to the said hinged and forwardly-tilting or vertically-sliding reflector, is the invention in this regard which is mainly sought to be secured by me.

Previously to my said invention head-lights have been provided with a slide upon which both the reflector and burner have been mounted, and by which the reflector and burner have been together removed horizontally out of the head-light case. Reflectors have also been set opposite burners in head-light cases, and such reflectors have been made adjustable on hinge supports, and in various other ways, but not with the result of moving a reflector with respect to a burner which previously was inaccessible for the purposes of either trimming or lighting to a position which permits either of said operations to be conveniently performed without removing the reflector from the head-light case. The accomplishment of the said result with a reflector fitted to slide up and

down or to tilt forward, and also into the conical or focal portion of which the tip of a burner extends, as shown in my drawings, was never before effected, and the means employed by me for effecting the same are, I believe, new in the relations set forth. The means whereby the chimney-holding attachment is combined with the movable reflector are also new in the relations shown, as also is the combination of a burner provided with means whereby it is made removable and a reflector provided with means whereby it is allowed either to tilt or slide, or both slide and tilt, as set forth.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a reflector provided with means whereby it is connected to its support and is allowed to tilt out of the range of the burner, a burner, and a head-light case, substantially as and for the purpose described.

2. The combination of a reflector provided with means whereby it is connected to its support and is allowed to slide upward out of the range of the burner, a burner, and a head-light case, substantially as and for the purpose described.

3. The combination of a reflector provided with means whereby it is connected to its support and is allowed to slide and tilt out of the range of the burner, a burner, and a head-light case, substantially as and for the purpose described.

4. The combination of a reflector having a chimney attachment, and provided with means whereby it is made movable within the head-light case out of the range of the burner, a burner, and a head-light case, substantially as and for the purpose described.

5. The combination of a removable burner, a head-light case, and a reflector provided with means whereby it is connected to its support and is allowed to have a tilting movement out of the range of the burner, substantially as and for the purpose described.

6. The combination of a removable burner, a head-light case, and a reflector provided with means whereby it is connected to its support and is allowed to have an upward-sliding movement out of the range of the burner, substantially as and for the purpose described.

7. The combination of a removable burner, a head-light case, and a reflector provided with means whereby it is connected to its support and is allowed to have a tilting and a sliding movement out of the range of the burner, substantially as and for the purpose described.

8. A reflector provided with means whereby it is permanently supported and allowed a tilting forward movement out of the range of the burner while in the head-light case, substantially as and for the purpose described.

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Witnesses:

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