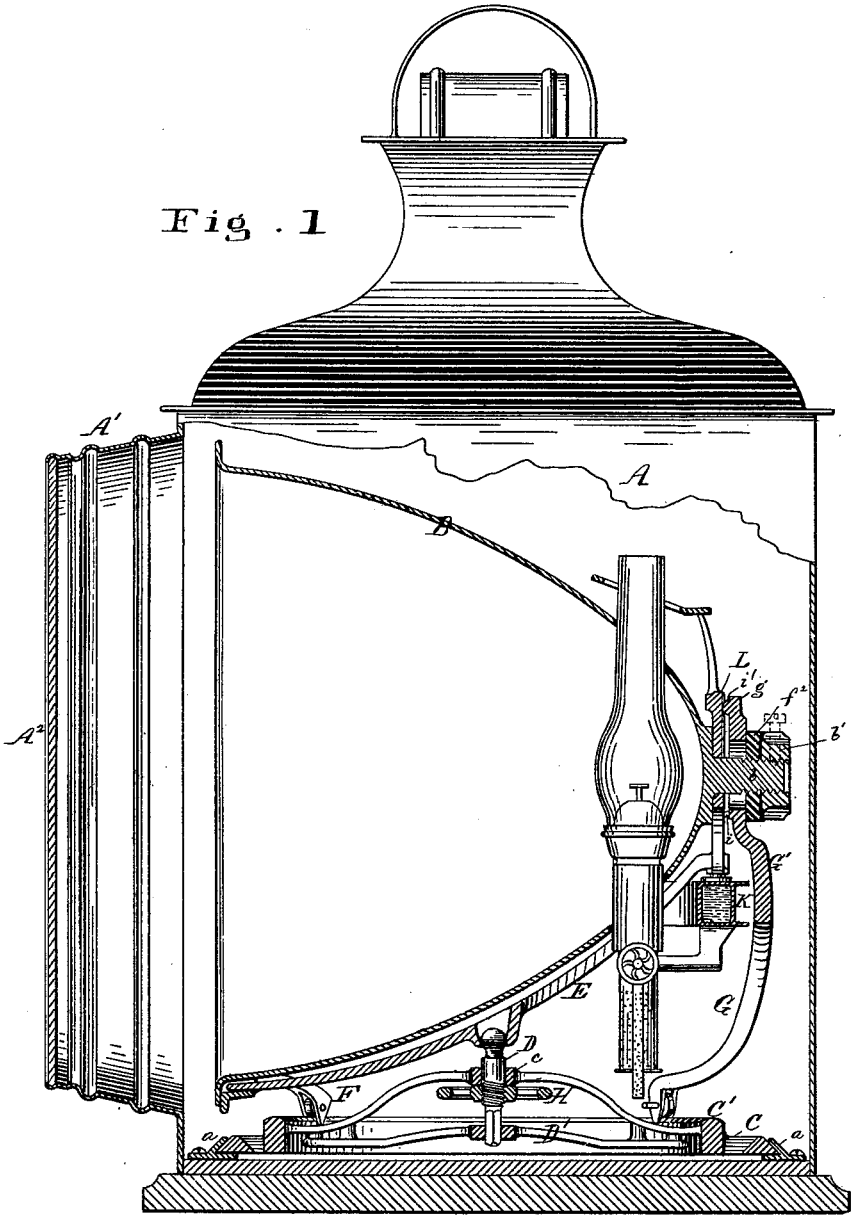
3 Sheets—Sheet 1.

J. KIRBY, Jr.

Locomotive Head-Light.

No. 204,580. **Patented June 4, 1878.**

Fig. 1



Attest

Chas. F. Gessert

John E. Jones

Inventor

John Kirby, Jr.

by his attorney

A. G. Litle

3 Sheets—Sheet 2.

J. KIRBY, Jr.

Locomotive Head-Light.

No. 204,580. **Patented June 4, 1878.**

Fig. 2

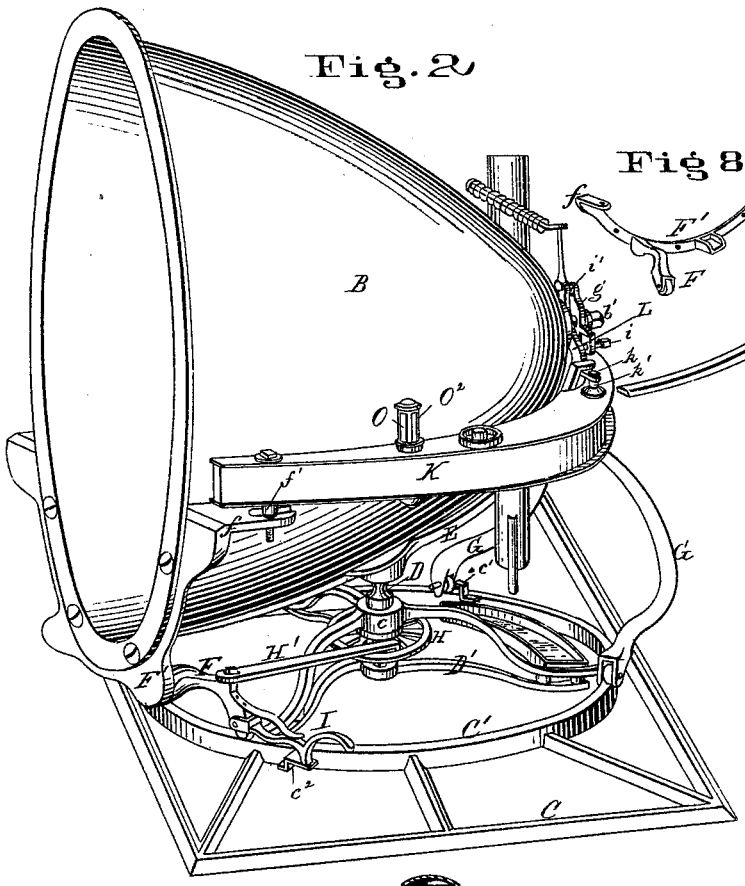


Fig 8

Fig. 4

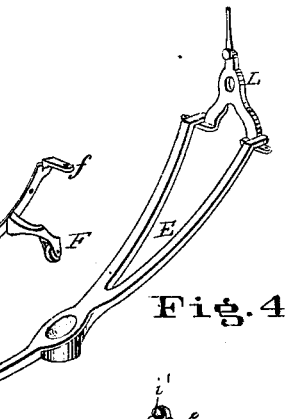


Fig. 5

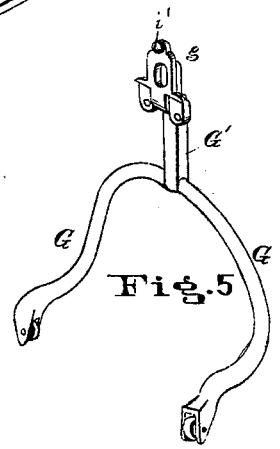


Fig. 6

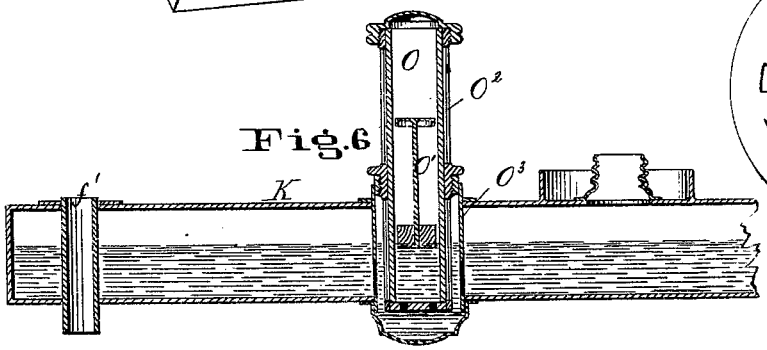
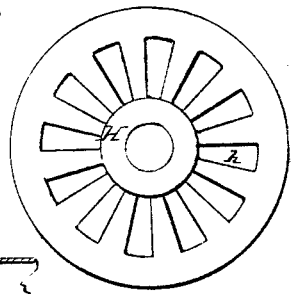


Fig. 7



Attest

Chas. F. Gessert

John E. Jones

Inventor

John Kirby, Jr.

by his attorney

A. H. Sibley

J. KIRBY, Jr.

Locomotive Head-Light.

No. 204,580. Patented June 4, 1878.

Fig.3

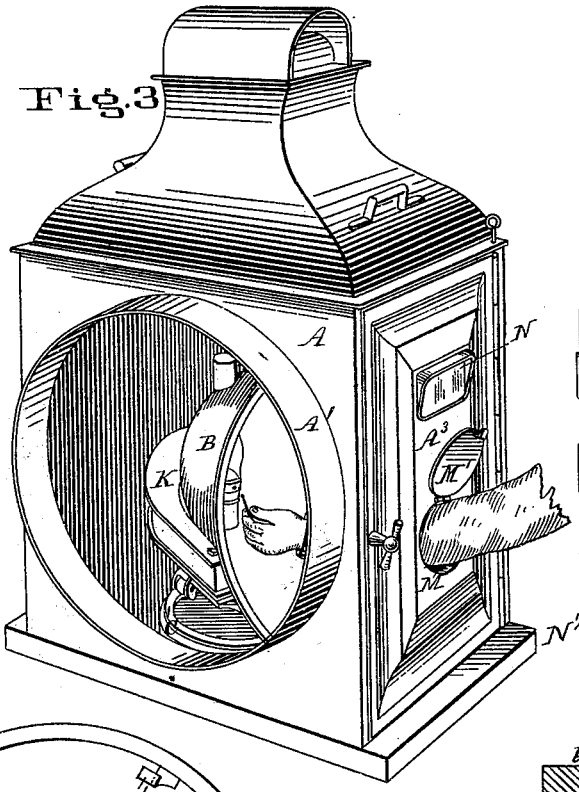
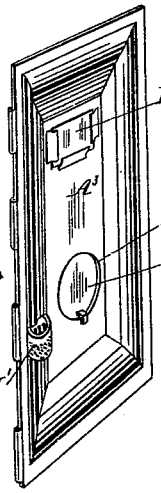


Fig.9



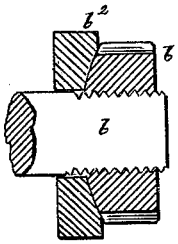


Fig.10

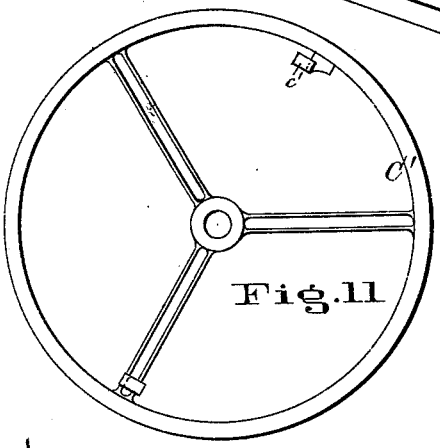


Fig.11

Attest.

Chas. F. Gessert.

John E. Jones

Inventor

John Kirby, Jr.

by his attorney

P. C. Dibb

UNITED STATES PATENT OFFICE.

JOHN KIRBY, JR., OF CINCINNATI, OHIO, ASSIGNOR TO POST & CO., OF SAME PLACE.

IMPROVEMENT IN LOCOMOTIVE HEAD-LIGHTS.

Specification forming part of Letters Patent No. **204,580**, dated June 4, 1878; application filed May 6, 1878.

To all whom it may concern:

Be it known that I, JOHN KIRBY, Jr., of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Locomotive Head-Lights, of which the following is a specification:

This invention, as regards some of its features, relates more especially to locomotive head-lights in which the reflector, with its attached lamp, is so mounted in the case that it may be turned from the position in which it faces the bull's-eye or glass front of the case to a position in which it will face either of the sides or back thereof, to afford ready access to the burner without sliding the reflector out of the case, as well as to provide for changing the direction of the rays of light.

My improvement consists, first, in mounting a turning reflector, by means of a number of standards or legs, upon a fixed circular track or way, for the purpose of giving to such reflector a broad, and consequently a firm, support without any central pivot, as heretofore used for connecting a reflector-carrying platform to the base on which it revolves, and for preventing its lateral displacement; second, in combining with a turning-reflector thus mounted on a circular track or way a vertically-adjustable screw or equivalent means, operating in such a way that on turning the reflector to face the glass front of the case it is automatically depressed slightly, so that its standards will be forcibly pressed down on the track or base on which they rest, and thus the reflector will obtain a more rigid support, preventing its wabbling under the vibrations of the locomotive, while on turning the reflector to face in a different direction the pressure on the standards will be relieved, so that it will move freely; third, in so connecting the lamp and oil-reservoir to the reflector that they may be readily detached therefrom for repairing or cleaning purposes; fourth, in combining the hand-hole in the case through which access may be had to the lamp with a glass-covered opening, so that the person in charge may look through this glass in lighting and manipulating the burner, avoiding the necessity of opening the large door of the case, which is very objectionable when the locomotive is running and in windy weather; fifth, in providing the oil-reservoir with a peculiar form of indicator, showing the level of the oil by which the reservoir may be properly filled; sixth, in certain other details of construction, which will be fully set forth in the ensuing description, and specifically pointed out by separate claims.

In the accompanying drawings, Figure 1 is a vertical section of my improved locomotive head-light, showing the reflector facing the glass front of the case. Fig. 2 is a perspective view of the reflector and its adjuncts. Fig. 3 is a perspective view of the locomotive head-light, showing the reflector turned so as to face the door in the side of the case. Figs. 4 to 11, respectively, illustrate certain details of my locomotive head-light, which will be more particularly referred to hereinafter.

Like letters of reference indicate corresponding parts in all the figures.

The case A may be constructed in the usual form, the front side having a protruding rim, A^1, in the end of which the glass plate A^2 is secured, while one of the sides is provided with a door, A^3, large enough to admit of the passage of the reflector B and its adjuncts. The base of the case is provided with fixed dovetailed ways *a a*, Fig. 1, which are preferably made of metal, to receive the base C, on which the reflector is mounted. The ways face the side door, so that the base C with the reflector may be slid in and out through the doorway of the case.

The back of the case may also be provided with an arm-hole, through which access can be had to the burner, the hole being covered by a slide.

Heretofore it has been customary to make the base-plate of the reflector of wood. This is an inferior mode of construction, because the wood is liable to warp out of shape, rendering it difficult to slide the reflector in and out.

To obviate this objection I make the base C of metal. In the example shown this base is an open frame-work, with a circular track, C′, of large diameter, which is connected by ribs with an elevated central hub, *c*.

The front or mouth of the reflector is supported upon the standards or legs F F, connected by a bar, F′, which is secured to the flange of the reflector, and terminates in laterally-projecting lugs *f f*, for the support of the extreme ends of the oil-reservoir. The rear end of the reflector is supported upon the legs G G, which branch off from the stem G′, the upper end of which terminates in a yoke, *g*, embracing the hub *b* of the reflector, which is secured thereto in the manner presently to be described. The legs F and G are provided with rollers, as shown, which rest upon the circular track C′ of the base C, and reduce the friction in turning the reflector.

In order that the supporting legs or standards of the reflector may be pressed firmly down on the track or base-plate, and again relieved on turning the reflector from the position where it faces the glass front of the case, I provide the following means: D refers to a screw, adapted to freely slide up and down in the hub *c* of the circular track C′. Its upper end has a ball-shaped head, fitting a socket in bar E, while its lower end is square, fitting a square hole in fixed spider D′. A nut, H, is screwed on the threaded portion of screw D, below hub *c*. This nut may have the form of a wheel or disk, provided with a circular series of slots, *h*, any one of which may be engaged by a pawl, H, attached to one of the legs F of the reflector, so that on turning the latter the nut will turn with it and cause the screw D to either ascend or descend, according as the reflector is turned in one direction or the other. The slots in nut H admit of a proper adjustment, so that the reflector, when it faces the glass front of the case, will be pulled down by the ball-head of screw D, so as to forcibly press its legs down on the track. The screw D is connected by ball-and-socket joint with the bar E, to admit of proper adjustment of the reflector, and to provide against irregularities in mounting the parts. It should be clearly understood that this screw D does not serve as a pivot for the reflector, but merely as a means for forcing its standards or legs hard down on the circular track on its assuming a position facing the glass front; and that other means, not centrally disposed, might be substituted for it to accomplish this purpose, although the use of the centrally-disposed screw is the best means that I have devised so far. As the reflector reaches its proper position in front of the glass front of the case, one or more of its supporting-legs bring up against a stop or stops, c^1, on the track C′, and a spring-latch, I, pivoted on one of the legs, falls behind a fixed detent, c^2, on the side of the track, so that the reflector will be locked and prevented from moving in any direction. Where the case has a door in each side, and it is desirable to provide for turning the reflector to face either door, the fixed stop or stops c^1 are omitted, and a latch, like latch I, substituted therefor.

As already stated, the hub or stem *b* of the reflector passes through the slot in yoke *g* of the rear standard. The standard is secured by a nut, b^1, having a convex face fitting a concave seat in a washer, b^2, so that the nut may have a uniform bearing, even though the yoke of the standard does not stand at right angles to the stem of the reflector.

The burner requires to be very nicely adjusted with reference to the reflector to give the best results. To effect this, and at the same time to provide for a ready removal and reattachment of the lamp, I connect the oil-reservoir, to which the burner is rigidly fixed, as usual, to the reflector in the following manner: The ends of the oil-reservoir K are supported upon the forked lugs *f* of bar F′ of legs F, and are secured thereto by bolts and nuts, the bolts passing through tubes *f′* in the reservoir and the forks of the lugs, so that on simply loosening the nuts the reservoir may be detached from these lugs.

The rear or curved end of the reservoir is secured under the feet of plate L, suspended from the hub or stem *b* of the reflector, by means of bolts *k*, which pass through tubes *k′* in the reservoir. The position of the burner with relation to the reflector is determined by the respective bolt-tubes *f′* and *k′*, which are inserted and soldered fast in fitting the reservoir on the reflector, and which protrude more or less from the reservoir to bear with their protruding ends, respectively, against lugs *f* and against the feet of plate L.

Instead of fitting the reservoir on the reflector in the manner just described, it might be held between nuts on the bolts.

It will be observed that by removing the nuts of the bolts which secure the front ends of the reservoir, and then removing the nuts from bolts *k*, the reservoir can be easily removed by first moving it down at the rear end to free it from bolts *k* and the burner from the reflector, and then moving it sidewise to draw it off the lugs which support its front ends; also, that it can be as readily reattached without requiring readjustment, because the projecting bolt-tubes *k′* govern the position of the reservoir, and consequently of the burner, with reference to the reflector.

The bar E, through which the screw D acts on the reflector, is loosely connected with the latter. Its front end enters and rests in a socket on bar F′, while its rear end, which is bifurcated to pass around the burner, embraces the legs and rests upon the feet of plate L. It is curved to lie close against the curved surface of the reflector.

The pitch of the reflector can be regulated by loosening nut b^1 and then tilting it on its front standards or legs by moving its stem *b* up or down in the slotted yoke *g* of its rear standards or legs. Such adjustment might throw the rear standards off the track, to provide against which they are also adjustably secured, as follows: At the upper end the yoke *g* of these rear standards or legs has a small teat, *i′*, to bear against plate L, and in the

lower end of the yoke set-screws *i i* are tapped to bear, also, against plate L. By screwing the set-screws in or out the legs G can be readily adjusted to run true on the track, while the yoke of said legs can always be firmy clamped to plate L by nut b^1, to make a rigid connection.

The door A^3 of the case has the usual hand-hole M, covered by a suitable lid, M′. Through this hole access may be had to the lamp without the necessity of opening the large door, the hole being made of such a size that the operator's arm will about close it when inserted, so as to exclude air-drafts. Through this hole the lamp may be lighted, and the burner manipulated through the opening in the back of the case after the reflector has been turned to face this side of the case. In order that the operator may see into the case from the most favorable direction during these manipulations, I form a small window or peep-hole, N, in door A^3 above the hand-hole. For convenience, a match-safe, N′, may also be attached to the interior face of door A^3.

The reservoir K is supplied with oil through a suitable neck, near which it is provided with a device for indicating the level of the oil in it. This indicator consists of a glass tube, O, fitted to enter a well in the reservoir, and containing a float, O^1, having a stem terminating in a head distinctly visible through the glass tube above the reservoir. The glass tube is confined in a metal cage, O^2, the lower head of which is perforated to admit the oil into the glass tube. That portion of the caged tube which dips into the reservoir is encircled by a slotted sleeve, O^3, to prevent the splash of the oil due to the motions of the locomotive from seriously affecting the float.

The foregoing describes what I consider the best modes of giving effect to the various features of my invention; but these modes may be modified in various ways not heretofore alluded to without departing from the principle of my invention, and I do not, therefore, confine myself to the specific details set forth.

It is also apparent that some features may be used without others and in other connections. For example, the feature of forcing the reflector hard down on a fixed support to give it great rigidity and steadiness may be applied to a turning reflector not mounted on a track.

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

1. A locomotive head-light the reflector of which is supported upon a circular track or way, substantially as and for the purposes specified.

2. In a locomotive head-light, the combination, substantially as specified, of the reflector, the standards or legs thereof, and a circular track or way, forming the support and guide for said legs.

3. In a locomotive head-light, the combination, substantially as specified, of a turning reflector and a screw or equivalent means for forcing the reflector hard down upon its fixed support on assuming the position in which it faces front.

4. In a locomotive head-light, the combination, substantially as specified, of a turning reflector, the circular track for supporting it, the traveling screw loosely connected with the reflector, and the nut connected to turn with the reflector to traverse and move the said screw.

5. In a locomotive head-light, the combination, substantially as specified, of a turning reflector, the circular track for supporting it, the traveling screw loosely connected with the reflector, the nut on said screw, and a pawl for connecting the nut with the reflector.

6. The sliding base of the reflector, composed of a metallic frame provided with a circular track, substantially as and for the purposes specified.

7. In a locomotive head-light, the combination, substantially as specified, of the turning reflector, the circular track, the stop or stops thereon, and the latch for locking the reflector.

8. The oil-reservoir detachably secured to a reflector for ready removal and replacement, substantially as and for the purposes specified.

9. The oil-reservoir fitted around the reflector, with its ends bolted to forked brackets thereof, and its curved rear part bolted to a suspension-plate, substantially as and for the purpose specified.

10. A locomotive head-light the reflector of which is adjustably secured to its support at the rear end, substantially as specified, so that its pitch can be regulated by moving its rear end up or down.

11. In a locomotive head-light, the combination, substantially as specified, of the reflector mounted on a circular track, the rigidly-secured front standards or legs thereof, the rear standards or legs, to which the reflector is adjustably secured, and the set-screws for adjusting said rear legs to the track.

12. In a locomotive head-light having a turning reflector, the window in the door or side of the case, arranged with reference to a hand-hole therein, substantially as and for the purpose specified.

13. In a locomotive head-light, the combination, substantially as specified, of the oil-reservoir, the covered glass tube dipping into and projecting above the same, and the float in said tube.

In testimony of which invention I hereunto set my hand.

JOHN KIRBY, JR.

Witnesses:
JOHN E. JONES,
EDGAR J. GROSS.