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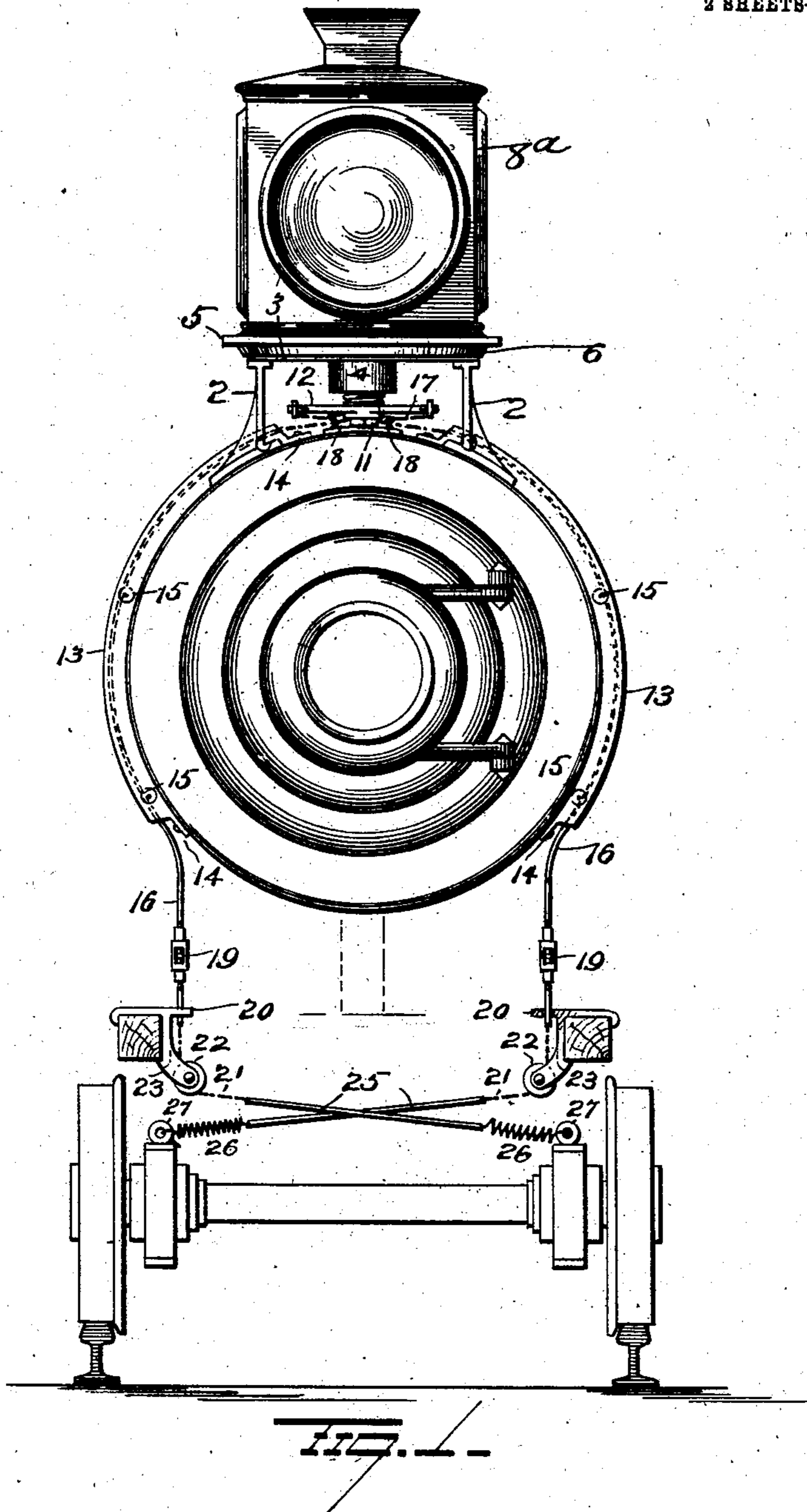
PATENTED FEB. 24, 1903.

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HEADLIGHT FOR LOCOMOTIVES.

APPLICATION FILED FEB. 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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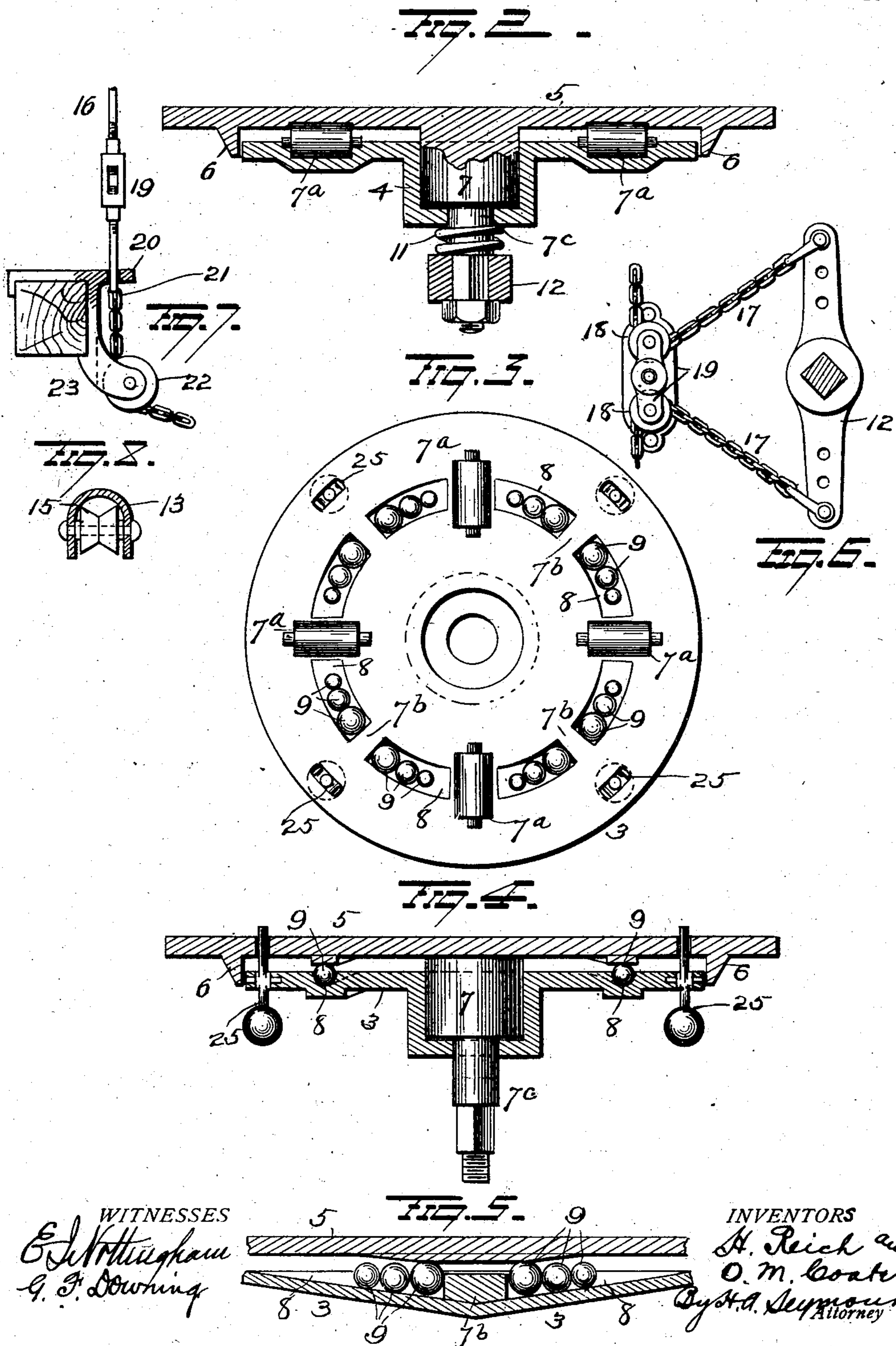
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UNITED STATES PATENT OFFICE.

HERMAN REICH AND ORIN M. COATE, OF DES MOINES, IOWA.

HEADLIGHT FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 721,235, dated February 24, 1903.

Application filed February 5, 1902. Serial No. 92,678. (No model.)

To all whom it may concern:

Be it known that we, HERMAN REICH and ORIN M. COATE, residents of Des Moines, in the county of Polk and State of Iowa, have
5 invented certain new and useful Improvements in Headlights for Locomotives; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art
10 to which it appertains to make and use the same.

Our invention relates to an improvement in headlights, and more particularly to headlights for locomotives and mechanism for operating the same to throw the light at all
15 times along the track whether the locomotive be rounding a curve or on a straight track, the object of the invention being to provide simple and efficient means of this character
20 which will insure the best results and at the same time withstand the exposure to the elements to which it is necessarily subjected.

With this object in view the invention consists in certain novel features of construction
25 and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, partly in section, illustrating our
30 improvements. Fig. 2 is an enlarged view in section; and Figs. 3, 4, 5, 6, and 7 are views of various details of construction.

1 represents the forward end of a locomotive-boiler, or, more correctly speaking, the
35 smoke-box, on which our improved headlight is mounted, as will now be explained.

Supported on suitable legs 2 is a circular platform 3, having a central circular pocket 4 to receive a similarly-shaped enlargement
40 7 on a rectangular plate 5 of sufficiently greater diameter than the platform to entirely cover the latter, and is provided on its lower face with a circular flange 6, overlapping the edge of the platform 3 to prevent
45 the entrance of water and dirt between them to interfere with the perfect operation of the headlight. The enlargement 7 is revolvably mounted in pocket 4, and the latter and enlargement are of sufficient depth to prevent
50 lateral movement of plate 5, on which the lamp-casing 8^a is secured and which contains

a lamp or burner of any approved construction and operation.

On platform 3, arranged in circular formation, are tracks or runways 8 for roller-bearings 9, corresponding runways being provided
55 on the lower face of the upper plate 5, and said tracks or runways on platform 3 are in the form of a series of inclined planes. In other words, the lowest points of the tracks or runways are diametrically opposite to each other
60 on the plate or platform 3 and the highest points are midway between the lowest. The tracks on the upper plate 5 are all disposed in the same horizontal plane, so that when
65 the upper plate, with the lamp-casing thereon, is moved it will be slightly elevated, owing to the balls 9, which are of varying sizes, according to their positions on the inclines, thus moving the balls up the inclines
70 of the track, so that it will be seen the tendency of the lamp is always to return to its normal position and the resistance to its turning afforded by the inclines will serve to prevent vibration and jar. At the highest
75 points of the lower tracks rollers 7^a are mounted in recesses in platform 3 and are normally located in semicircular depressions in the upper plate 5 to assist in steadying the
80 lamp, and when the latter is turned the upper plate will revolve rollers 7^a while moving away from or back to its normal position, with the lamp throwing the light straight ahead. Stop-blocks 7^b are provided at the lowest points
85 of the tracks 8 to space balls 9 apart, and the upper track is enlarged, as at 7^d, just above this stop-block and inclines upward at each end, so that the lamp is during the greater portion of the time almost entirely supported
90 on the largest balls 9 and rollers 7^a, and the weight is only transferred to, or rather a portion of the weight is transferred to, the other balls when moving up or down the inclines of the track. To further insure the steadiness of the lamp and assist in returning it to a position
95 to throw the light along the straight track, we may provide a series of levers 25, pivoted between their ends, having weighted lower ends and their upper ends projecting through openings in top plate 5. The movement of the
100 plate 5 and lamp will therefore swing the levers, the weighted lower ends thereof serving

to steady the lamp and assist in preventing jar and vibration. The enlargement 7 on top plate 5 is made with an integral spindle 7^c or has the same secured thereto and projects through the center of pocket 4 and has a coiled spring 11 mounted thereon below the pocket to assist in holding the upper plate and lamp steady, and said spindle 7^c is made angular to enter an angular socket in the center of a cross-bar 12, secured on the spindle and disposed horizontally and located at a point between the lower lamp-platform and the locomotive-boiler or smoke-box.

Secured on opposite sides of the boiler and partially extending around the same are tubes 13, open on their inner faces and secured to the boiler by means of screws passed through ears 14 on the ends of the tubes and into the boiler. In both of these tubes 13 a series of grooved rollers 15 are supported to revolve and have mounted thereon flexible rods 16, the upper ends of which latter are connected by chains 17 with the ends of the cross-bar 13 and passed around pulleys 18, mounted between metal strips 19, secured to the boiler-top by screws and bolt, as shown. The lower portions of these rods 16 which project below tubes 13 are made in sections and connected by turn-buckles 19^a to permit adjustment of the rods and also serve as stops to protect the lamp from injury if the truck should leave the track, as will be hereinafter explained. Metal plates 20 are secured to the locomotive-frame and are perforated to permit the free passage of the rods 16, but not large enough to permit the turn-buckle to pass. To the lower ends of rods 16 below plates 20 chains 21 are secured and pass around pulleys 22, secured by brackets 23 to the locomotive-frame and are connected at their other ends to diagonally-disposed rods 25^a. These rods 25^a cross each other and are connected by strong coiled springs 26 with bolts or pins 27 on the forward part of the locomotive-truck, so that as the truck turns in rounding a curve motion will be transmitted to the headlight to turn the same. If the truck should leave the track, the plates 20 will permit the headlight to be moved only just so far, as the turn-buckles 19^a will strike against the plates 20 and limit the movement of the rods 16, hence compelling the springs 26 to compensate for the changed position of the truck.

The operation of our improvements is as follows: When the locomotive strikes a curve of the track, the truck will of course be turned, and this motion is transmitted through the medium of rods 16, as above explained, to turn the spindle 7^c, thus turning upper plate 5 and the lamp thereon to throw the light around the curve and holding and turning the lamp according to the radius of the curve. This turning of plate 5 and lamp causes the balls to be moved up the inclines of the track or runways, affording resistance to the movement of the lamp and preventing the sudden jars and vibrations, as above ex-

plained. When the locomotive has turned the curve and again emerges on the straight track, the righting of the truck will be communicated to the lamp and the latter will throw the light straight ahead, as before.

Various slight changes might be resorted to in the general form and arrangement of the several parts described without departing from the spirit and scope of our invention, and hence we would have it understood that we do not wish to limit ourselves to the precise details set forth, but consider ourselves at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with the truck of a car, a body thereon, and a headlight, of suitable connections between the headlight and the truck for turning said headlight, and means interposed in said connections for automatically varying their length in unison with the independent movements of the car-body and car-truck.

2. The combination with a vehicle-body, a truck for the same, and a headlight carried by said body, of suitable connections between said truck and headlight, and means interposed in said connections for automatically varying their length in unison with the independent movements of the vehicle-body and its truck.

3. The combination with a car-truck, a body thereon, and a headlight, of suitable connections between said truck and the headlight, springs interposed in said connections, and turn-buckles also interposed in said connections for the purpose of tensioning the same.

4. The combination with a car-truck, a body thereon, and a headlight, of suitable connections between the headlight and truck for turning said headlight, spring-tensioned connections, and turn-buckles therein, between the truck and headlight, and means for supporting said connections from the car-body.

5. In a headlight, the combination of a platform having a series of inclined runways for roller-bearings, a lamp-base having horizontally-disposed bearings for said roller-bearings, and means for turning the lamp.

6. In a headlight, the combination of a platform having a series of oppositely-inclined runways, antifriction-rollers resting therein, a lamp-casing the base of which rests on said rollers, and means for turning the lamp-casing.

7. In a headlight, the combination of a platform having a plurality of pairs of oppositely-inclined runways, antifriction-rollers in each runway, a lamp-casing, the base of which rests on said rollers, and means for turning the lamp-casing.

8. In a headlight, the combination of a platform having a plurality of pairs of oppositely-inclined grooves therein, antifriction-balls of

different sizes in each groove, a lamp-casing the base of which rests on said balls, and means for turning said casing.

9. In a headlight, the combination of a platform having a plurality of pairs of oppositely-inclined grooves therein, antifriction-balls of different sizes in each groove, a lamp-casing, the base of which rests on said balls, and is provided with depending enlargements each of which latter normally rests between the balls of its respective pair of oppositely-inclined grooves, and means for turning said lamp-casing.

10. In a headlight, the combination with a platform having inclined grooved runways, rollers mounted in said grooved runways, of a lamp-casing having runways on its base supported on said rollers, a central pocket in the platform, an enlargement depending from the base of the lamp-casing and mounted to revolve in the pocket, and means for turning said enlargement.

11. In a headlight, the combination with a platform having a central pocket, of inclined runways arranged in circular formation on the platform, rollers on the runways, a plate adapted to support a lamp and having runways on its lower face to rest on the balls or rollers, an enlargement located in the pocket in the platform, a spindle on said enlargement projecting through the bottom of the pocket, a spring for holding the enlargement down in the pocket, counterweighted levers to be moved by the upper plate and means for turning the spindle.

12. In a headlight, the combination with a platform having a series of inclined runways for balls thereon, of rollers mounted in recesses between said inclined runways, stops at the lower points of said runways, balls of varying sizes on the runways, and a lamp-supporting plate having horizontally-disposed runways located on the balls.

13. The combination with a locomotive and a headlight mounted to turn thereon, of a spindle projecting down from the headlight, a cross-bar secured thereon, tubular casings

secured on opposite sides of the boiler, rods passing through said casings, flexible means connecting the upper ends of said rods with respective ends of the cross-bar, and flexible connection between the lower ends of said rods and the respective sides of the locomotive-truck.

14. The combination with a locomotive and a headlight mounted to turn thereon, of a spindle projecting down from the headlight, a cross-bar secured on the spindle, tubular casings secured on opposite sides of the locomotive-boiler, rollers in said tubular casings, curved rods in the casings and mounted on the rollers, chains connecting the upper ends of the rods and ends of the cross-bar and passed around pulleys, means for limiting the downward movement of the rods and elastic connection between the lower ends of said rods and the locomotive-truck.

15. The combination with a locomotive and a headlight mounted to turn thereon, of a spindle depending from the headlight, a cross-bar on the spindle, rods connected at their upper ends with the respective ends of said cross-bar and extending around opposite sides of the locomotive-boiler, turn-buckles on said rods, plates secured on the locomotive-frame and perforated to receive the rods below the turn-buckles but limit the downward movement of the latter, pulleys also mounted on said frame, chains secured to said rods and passed around the pulleys, diagonally-disposed rods crossing each other and connected at one end to the last-mentioned chains, and coiled springs connecting the other ends of said last-mentioned rods with the locomotive-truck.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

HERMAN REICH.
ORIN M. COATE.

Witnesses:

J. C. TATE,
CALVIN HICKS.