H. C. ROGERS.

AUTOMATIC HEADLIGHT ADJUSTER FOR LOCOMOTIVES.

APPLICATION FILED APR. 29, 1912.

1,056,942.

Patented Mar. 25, 1913.

2 SHEETS—SHEET 1.

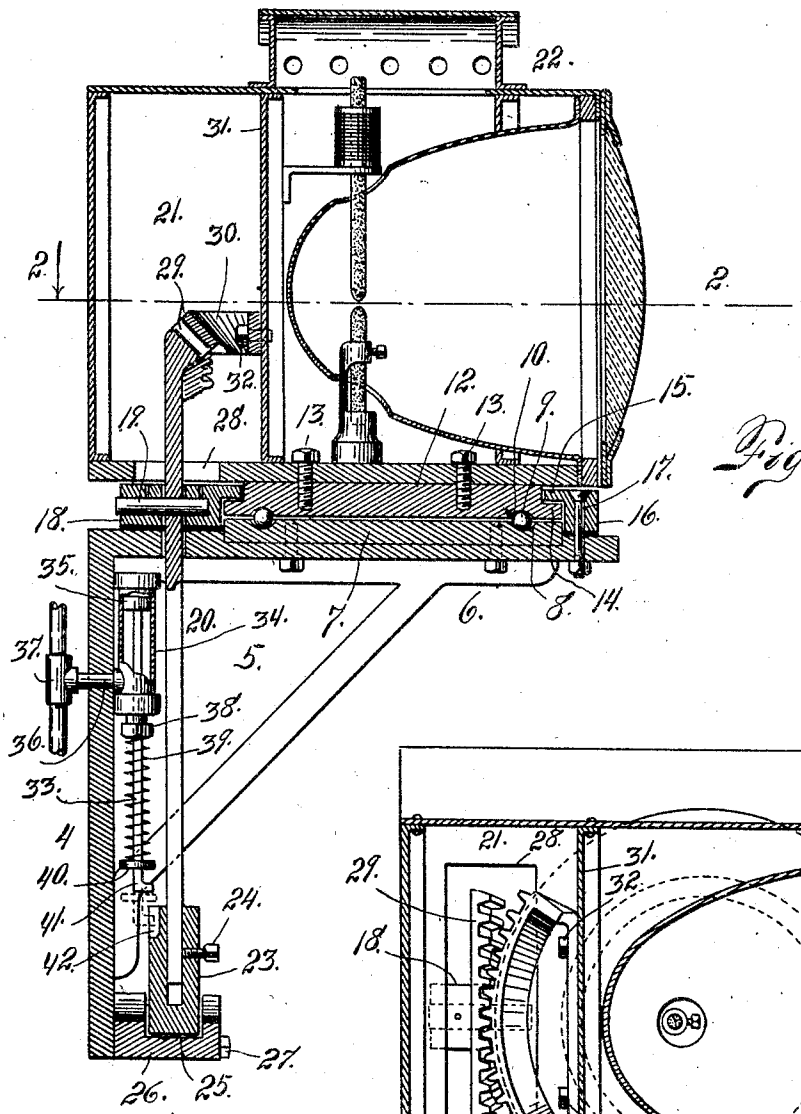

Fig. 1.

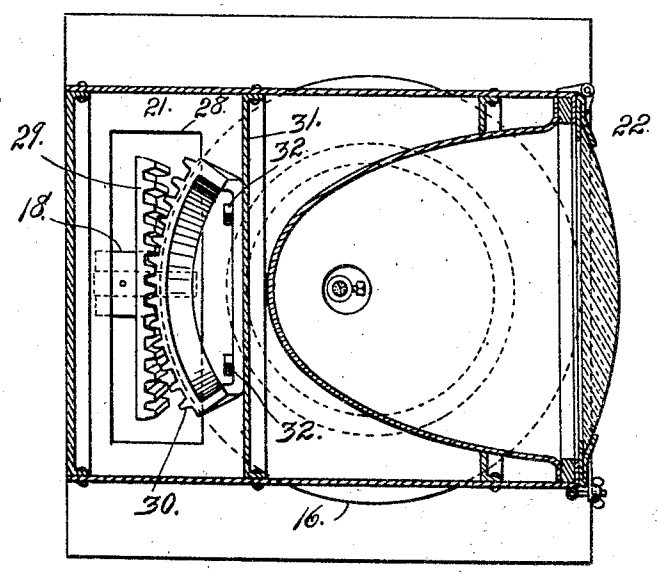

Fig. 2.

Witnesses

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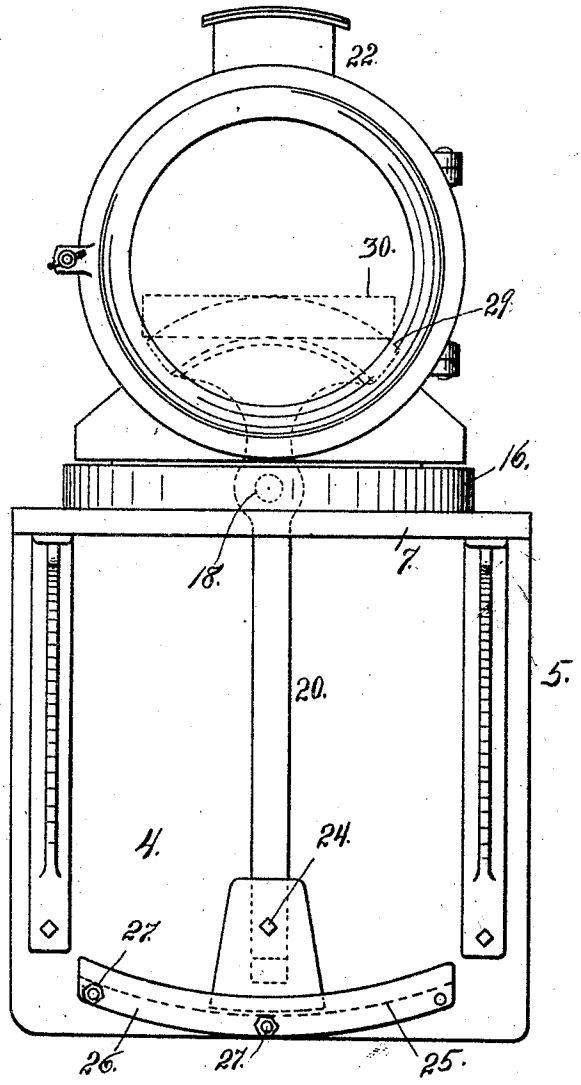

Fig. 3.

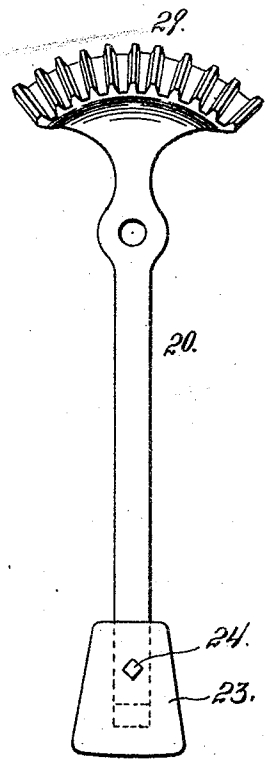

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

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AUTOMATIC HEADLIGHT-ADJUSTER FOR LOCOMOTIVES.

1,056,942. Specification of Letters Patent. **Patented Mar. 25, 1913.**

Application filed April 29, 1912. Serial No. 693,850.

To all whom it may concern:

Be it known that I, HENRY C. ROGERS, a citizen of the United States, residing at Kremmling, county of Grand, and State of Colorado, have invented certain new and useful Improvements in Automatic Headlight-Adjusters for Locomotives; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in means for automatically adjusting the headlights of locomotives whereby the rays of light shall accurately follow the curves of the track. It is well known that ordinarily where the track curves, the rays emitted by the headlight are thrown beyond the track, making it impossible for the engineer to see clearly the track itself or the obstructions thereon.

In my improved construction, provision is made for automatically turning the lamp while rounding curves, to cause the rays of light to be thrown constantly upon the track where they are needed.

In my improved construction, the lamp-casing is mounted on a sort of turn-table which is delicately arranged by means of ball-bearings to be shifted through the instrumentality of a pendulum having a gearing connection with the casing of the lamp, whereby, as the locomotive reaches a curve and the outer wheels are raised to conform to the greater elevation of the outer rail of the track on curves, the pendulum, which is suitably weighted for the purpose, swings or moves to maintain its vertical position, sufficiently, through the gearing connection with the lamp-casing, to turn the latter to keep the rays of light upon the track, as heretofore explained.

Provision is made for automatically locking the lamp against turning when the headlight is not in use, a spring, in this event, acting upon a rod to lock the pendulum against movement. This rod is connected with a piston located in a cylinder which is connected by means of a suitable pipe, with air under pressure, whereby, when the locomotive is in use, the air employed for braking purposes is in communication with the said cylinder and acts upon the piston to hold the locking rod in position to release the pendulum.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a vertical section taken through a locomotive headlight equipped with my horizontal construction. Fig. 2 is a horizontal section taken on the line 2—2 Fig. 1. Fig. 3 is a front elevation of the construction illustrated in Figs. 1 and 2. Fig. 4 is a detail view of the pendulum.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a bracket which is suitably positioned on a locomotive (not shown). This bracket is right-angled in shape, its top member 6 being in a horizontal position and its member 4 being in a vertical position. To the top of the member 6 of this bracket is secured a base-plate 7 containing a circular groove 8 forming part of a race-way in which are located bearing-balls 9, the other half 10 of the circular race-way being formed in a plate 12 secured to the bottom of the lamp-casing by means of bolts 13. This plate 12 constitutes a sort of turn-table which rotates freely on the plate-member 7 of the bracket. The turn-table plate 12 is provided circumferentially with a flange 14 which is overlapped by a flange 15 formed on a securing-ring 16, the said ring being secured to the top of the bracket by bolts 17.

The ring 16 is provided in the rear with a lug or extension 18 forming a reinforcement through which passes a pin or spindle 19 upon which a pendulum 20 is mounted to swing freely, the upper portion of the pendulum above the spindle extending into the rear compartment 21 of the lamp-casing 22, while the lower portion of the pendulum extends downwardly, its lower extremity being equipped with a weight 23 vertically adjustable thereon by means of a set-bolt 24. This weighted extremity of the pendulum is located in a groove 25 formed in a guide 26 secured to the lower part of the bracket by means of fastening devices 27.

The upper portion of the pendulum above the spindle 19 passes through an opening 28 formed in the bottom of the lamp-casing in

the rear of the turn-table plate 12, the upper extremity of the pendulum being provided with a segmental beveled gear 29, the said gear being vertically arranged to mesh with a similar segmental gear-member 30 horizontally arranged and secured to a partition 31 of the casing, by fastening devices 32. The curve of the gear 30 conforms to an arc struck from the center of the turn-table plate 12, while the curve of the gear 29 conforms to an arc struck from the axis of the spindle 19 as a center.

When the locomotive headlight is not in use and is traveling on a straight section of the track, the parts assume the relative positions illustrated in the drawing. That is to say, with the pendulum vertically disposed, and the weight 23 at its lower extremity in a central position in the guide 26. However, as soon as the locomotive reaches a curve where the outer rail is raised higher than the inner rail, whereby the locomotive is laterally tilted, the lamp-bracket and casing being rigidly secured to the locomotive, are tilted laterally therewith, causing the pendulum to swing inwardly with reference to the curve, in order to maintain its vertical position. This movement causes its gear 29 to act upon the gear 30 of the lamp-casing to turn the latter with its turn-table plate 12 to cause the rays of light from the lamp to be thrown constantly upon the track during the rounding of the curve.

When my improved construction is in use on a locomotive, the pendulum is free to swing as circumstances may require, but when the lamp is not in use, it is desirable to lock the pendulum against rotary movement. This may be accomplished by means of a rod 33 vertically disposed in the rear of the pendulum and projecting into a cylindrical casing 34, the extremity of the rod within the casing being equipped with a piston 35, the cylinder being in communication with a source of air under pressure by means of a branch pipe 36 connected with a main pipe member 37. The rod extends below the casing of the cylinder and through a stuffing-box 38 mounted on the lower extremity thereof. Below the stuffing-box a spiral spring 39 surrounds the rod, one extremity of the spring bearing against the stuffing-box while the other extremity engages a stop 40 formed on the rod. Below the stuffing-box the rod has an extension 41 angular in shape and adapted to enter a recess 42 formed in the weight 23 of the pendulum, the said recess being arranged to receive the rod extremity when the pendulum is in the vertical position and centrally arranged with reference to the bracket. The spring 39 normally acts upon the rod to hold it in the recess 42. When, however, the device is in use, the air pressure in the cylinder 34 acts on the piston 35 of the rod to hold the latter in the raised position whereby its lower extremity is disengaged from the pendulum weight.

In the drawing, my improvement is illustrated in connection with an arc lamp, but it must be understood that it may be employed with a lamp of any character so long as the latter is mounted to rotate freely in response to the action of the pendulum, which is geared to the lamp-casing, as heretofore explained.

Having thus described my invention, what I claim is:

1. The combination of a relatively stationary support, a lamp provided with a casing having a bottom-plate provided with a circular groove, the support having a similar groove arranged to coöperate with the groove of the lamp-casing to form a bearing-ball race-way, balls located in the said race-way, the lamp-casing being provided with a horizontally-disposed segmental gear curved to conform with an arc struck from the center of the bearing-ball race-way, a pendulum pivoted to swing on the said support, the pendulum having a segmental gear meshing with the gear of the lamp-casing, the pendulum gear being vertically disposed, its curve conforming to an arc struck from the axis of the pendulum's pivot, substantially as described.

2. The combination with a bracket having horizontally and vertically disposed members, a lamp mounted upon the horizontal member of the bracket, the lamp and bracket having circular grooves forming a bearing-ball race-way, bearing balls located in the said grooves, a retaining-ring secured to the bracket and engaging the bottom member of the lamp in securing relation, a segmental beveled gear horizontally disposed, the curve of the gear conforming to an arc struck from a point in a vertical line passing through the center of the circle formed by the ball race-way, a pendulum pivotally mounted on the support in the rear of the ball-bearing support for the lamp, the upper extremity of the pendulum having a vertically-disposed beveled segmental gear constructed to mesh and coöperate with the gear of the lamp, the lamp being provided with a housing for the two gears, the lower extremity of the pendulum being equipped with an adjustable weight, and suitable means for locking the weight in a central position on the bracket, substantially as described.

3. The combination with a locomotive headlight and a bracket support therefor, the headlight being mounted to rotate on a vertically disposed axis, a pendulum pivotally mounted on the bracket on a horizontal axis, an operative connection between the pendulum and the lamp to cause the latter to rotate as the bracket and lamp are tilted laterally, and means for locking the pendu-

lum against movement when the lamp is not in use, comprising a spring-actuated rod engaging a recess formed in a part of the pendulum, and means for restraining the locking-rod to allow the pendulum to move freely, substantially as described.

4. The combination with a relatively stationary support, of a lamp mounted to rotate on a vertical axis, a pendulum mounted on the support to swing on a horizontal axis, a horizontally arranged segmental gear secured to said lamp and a vertically arranged segmental gear secured to said pendulum, said gears being laid out in curves whose centers are in the axes of rotation of the lamp and pendulum respectively to impart a partial rotary movement to the lamp when the pendulum changes position with reference to the support.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. ROGERS.

Witnesses:
A. J. O'BRIEN,
A. E. ADAMS.