No. 704,877. Patented July 15, 1902.

W. L. HARPER.

AUTOMATIC RAILWAY SIGNAL.

(Application filed Feb. 25, 1902.)

(No Model.)

Fig. 4.

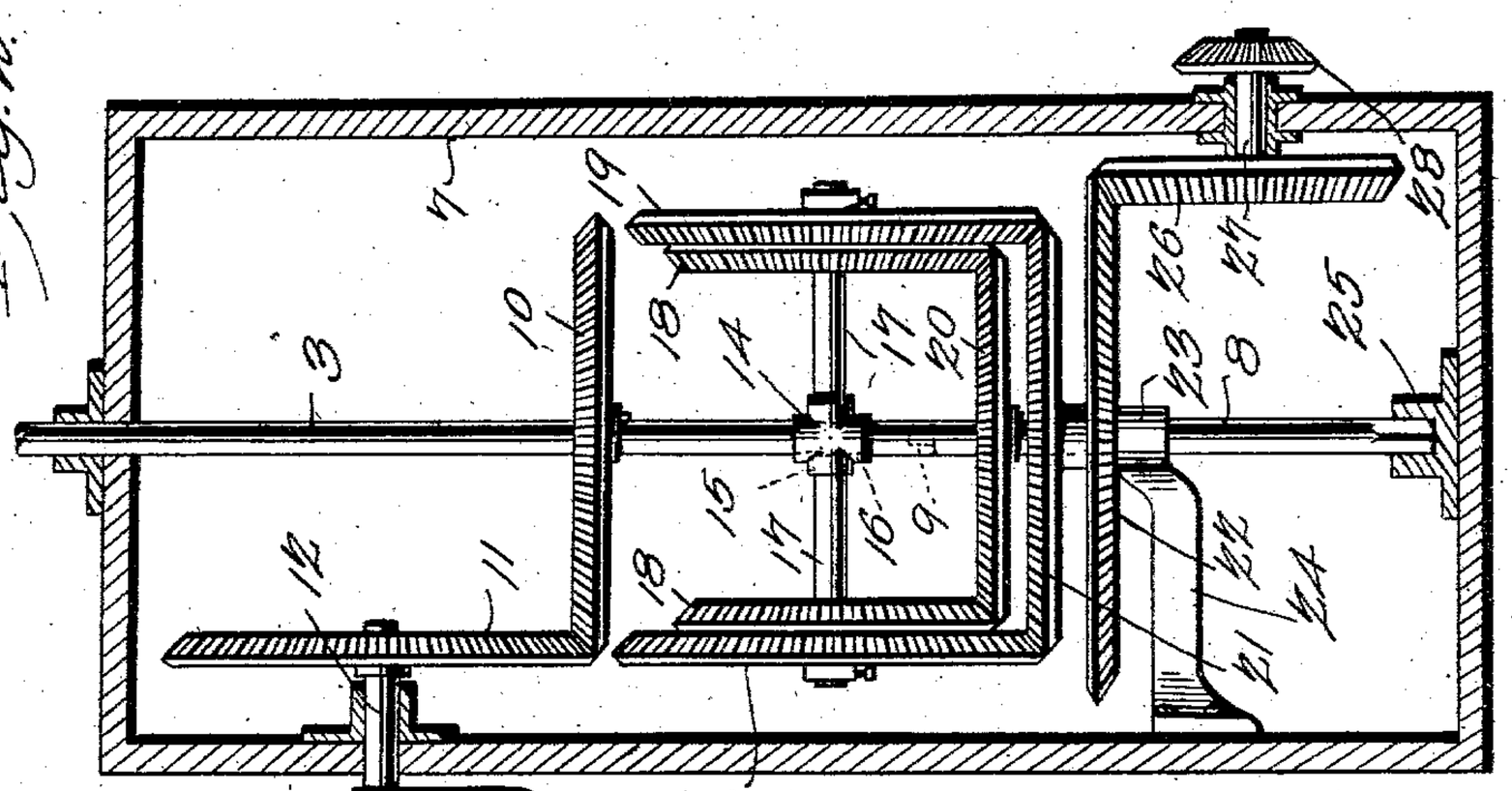

Fig. 3.

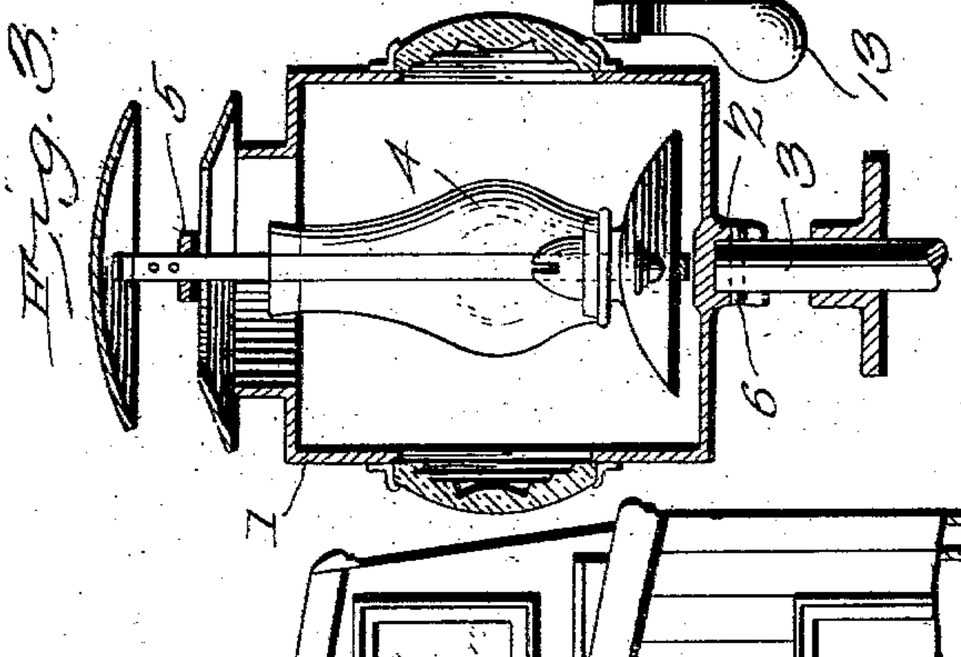

Fig. 2.

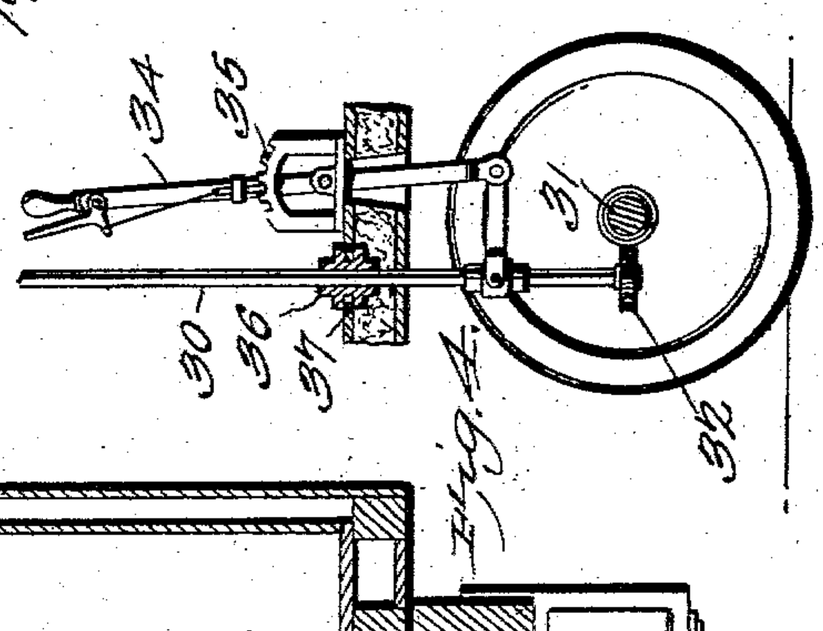

Fig. 1.

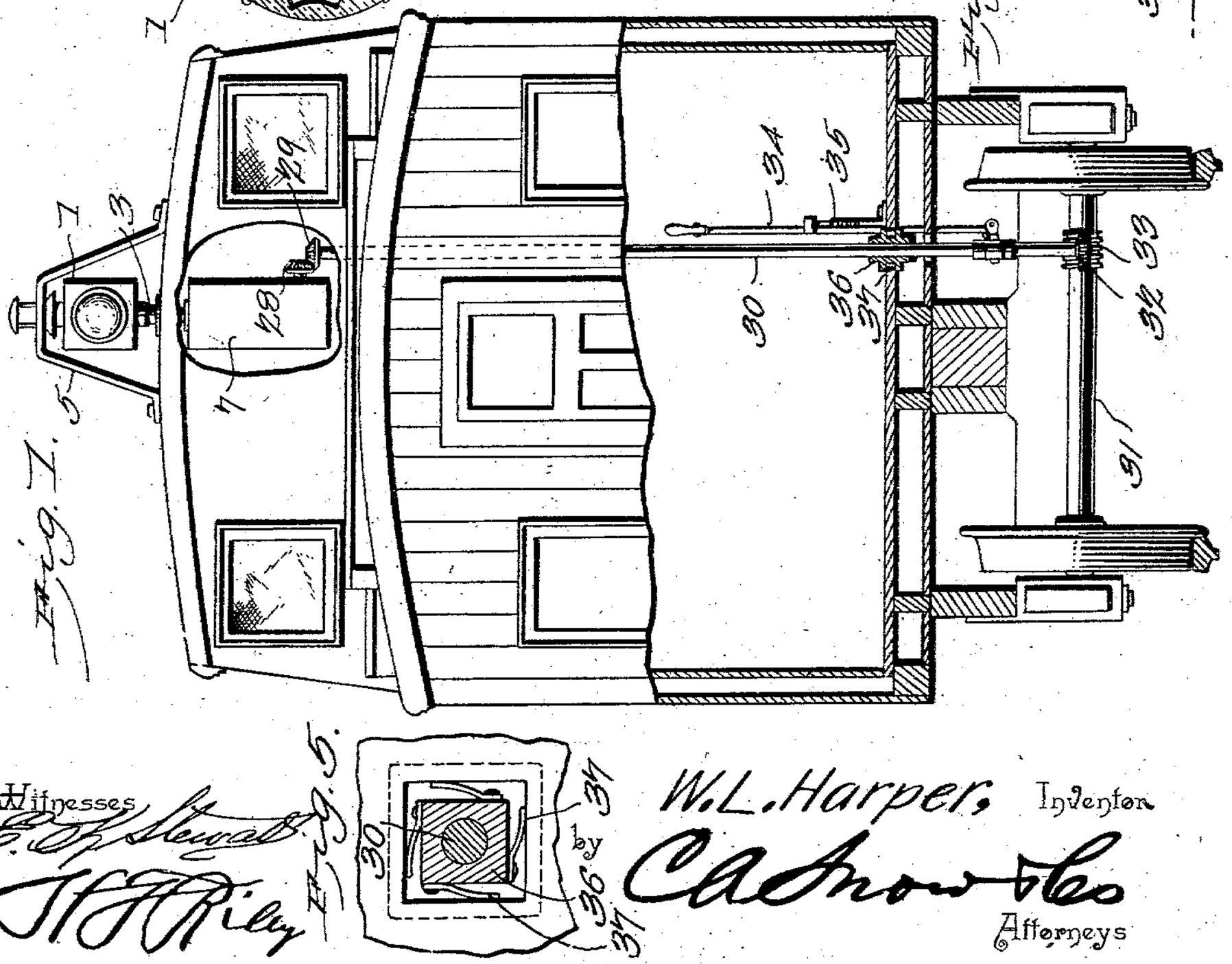

Fig. 5.

Witnesses
E. P. Stewart
J. F. Riley

W. L. Harper, Inventor
by Cashow & Co
Attorneys

UNITED STATES PATENT OFFICE.

WALTER L. HARPER, OF MENA, ARKANSAS.

AUTOMATIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 704,877, dated July 15, 1902.

Application filed February 25, 1902. Serial No. 95,567. (No model.)

To all whom it may concern:

Be it known that I, WALTER L. HARPER, a citizen of the United States, residing at Mena, in the county of Polk and State of Arkansas, have invented a new and useful Automatic Railway-Signal, of which the following is a specification.

The invention relates to improvements in automatic railway-signals.

The object of the present invention is to improve the construction of railway-signals and to provide a simple and comparatively inexpensive one designed to be mounted on the rear end of a passenger, freight, or other train and capable of indicating whether a train is standing still or in motion and the speed at which it is traveling, whereby all danger of rear-end collisions will be effectually prevented.

A further object of the invention is to provide a signal of this character having a single rotary lantern adapted to dispense with the numerous lights on a train and provided with a plurality of transparent panes or bull's-eyes to enable it to display lights or signals of different colors.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a rear elevation, partly in section, of a caboose provided with a rotary railway-signal constructed in accordance with this invention. Fig. 2 is a vertical sectional view of the casing and gearing for rotating the vertical signal-carrying shaft. Fig. 3 is a vertical sectional view of the lantern. Fig. 4 is a detail view of the shifting mechanism for throwing the signal into and out of operation. Fig. 5 is an enlarged detail view illustrating the manner of cushioning the shaft that extends to the car-axle.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a rotary lantern provided at its bottom with a socket 2 and removably mounted on the upper end of a rotary-signal-carrying shaft 3, and the said lantern, which is preferably rectangular in horizontal section, is designed to be provided at two of its sides with oppositely-disposed transparent panes for displaying white lights, and the other two opposite sides are designed to be provided with a green light and a red light. When a train is in motion, the lantern revolves and successively displays the said colored lights, and when the train stops the lantern ceases its rotation and is caused by the means hereinafter described to display the red light to the rear and the green light to the front, so that when the red light is displayed continuously from a train it will be apparent that the same is at a standstill. By this construction all danger of rear-end collisions will be effectually prevented, as an engineer can tell at a glance whether a train ahead is at a standstill or in motion, and the speed of the rotation of the lantern will indicate the speed at which the train is traveling. The lantern receives a lamp 4 or other lighting device, which is suspended within the lantern frame or casing by means of a suitable hanger depending from a bracket or support 5, secured to the top of the car, as clearly shown in Fig. 1. The lantern frame or casing, which forms a globe for the lamp or other lighting device, may be of any desired configuration, as will be readily apparent, and it is detachably interlocked with the upper end of the signal-carrying shaft 3 in order that it may be reversed when the car is reversed or changed end for end, whereby the said signal will display a red light to the rear. The socket 2 may be notched to receive projections of the upper end of the shaft 3, as clearly shown in Fig. 3 of the drawings, and either set of the notches may be engaged with the projections 6 of the shaft to hold the lantern globe or casing rigid with the same.

The upright rotary-signal-carrying shaft 3 is journaled in suitable bearings of a casing 7 and is located above a lower stationary shaft 8, being preferably provided at its lower end with a socket or bearing for the reception of a journal 9 of the said shaft 8. The shaft 3 carries a horizontal gear-wheel 10, which is keyed or otherwise secured to the shaft 3 and meshing with a vertical gear-wheel 11 of a short horizontal shaft 12. The short horizontal shaft 12, which is journaled, extends through one side of the casing and

is provided with a weighted arm 13, which rotates with the shaft 12 when the shaft 3 is rotated and which when the car stops is adapted to return the lantern to its proper position with its red light at the rear of the train, and it will hold the lantern in such position when the train is stationary in order to display a danger-signal.

The upper rotary-signal-carrying shaft 3 is provided near its lower end with a bracket or support 14, having horizontal sockets 15 and provided with a vertical opening 16, through which the shaft 3 passes, and horizontal shafts 17 are fixed by keys or other suitable fastening devices in the horizontal sockets of the support 14, which is keyed or otherwise secured to the shaft 3. Each of the horizontal shafts 17 carries a pair of gear-wheels 18 and 19, which are rigid with each other and which may consist of a single gear provided with two sets of teeth, and these gears mesh with a stationary horizontal gear 20 and with a rotary horizontal gear 21. The rotary horizontal gear 21, which is supported, as hereinafter described, on the lower stationary shaft or section 8, is driven by suitable gearing, which extends to one of the car-axles, and the said gear-wheel 21 rotates the gear-wheels 19 and the gears 18, which mesh with the horizontal stationary gear 20. The horizontal stationary gear 20 causes the gears of the horizontal shaft 17 to revolve around it, and thereby rotate the vertical shaft 3 and the lantern which is mounted on it. The gear-wheel 21 is connected by a sleeve with a gear-wheel 22, supported by a collar 23 of a bracket 24, which is mounted within the casing, as clearly shown in Fig. 2, and the lower end of the fixed shaft 8 is suitably secured in a bracket or stand 25. The lower gear-wheel 22 meshes with an upright gear 26 of a short lower horizontal shaft 27, and the latter is connected by bevel-pinions 28 and 29 with a long upright shaft 30, extending to the adjacent car-axle 31 and provided at its lower end with a gear-wheel 32. The gear-wheel 32 meshes with the worm 33 of the car-axle 31; but any other suitable form of gearing may be employed for connecting the upright shaft with the axle, and it will be clear that gears of various diameters may be employed for communicating motion from the axle to the signal to adapt the latter to various kinds of trains. When the signal is employed on a fast passenger-train, the gearing will be arranged so that the signal will be revolved at a slow rate of speed to enable it to be readily distinguishable, and when the signal is applied to slow freight-trains a different character of gearing will be employed to rotate the signal at the proper speed.

The long upright shaft which extends through the floor of the car is connected with a shifting lever 34, provided with a suitable spring-actuated detent for engaging a ratchet 35, and a suitable latch-lever is connected with the ratchet for enabling the operating-lever to be readily released. The said shaft 30 is mounted in a sliding bearing 36, arranged at the floor of the car and engaged by springs 37, which cushion the bearing on all sides and prevent the shaft from being bent or otherwise injured by the vibration of the car-body.

It will be seen that the car-signal is exceedingly simple and inexpensive in construction, that it is adapted while a train is in motion to display successively a series of lights of different colors, and that when a train stops a red or danger signal will be displayed at the rear of the train. It will also be apparent that the gearing for rotating the upright signal-carrying shaft is adapted when the train stops to permit the weight 13 to return or carry the lantern to a position for displaying the danger-signal at the rear of the train.

The frame or casing which receives the gearing is preferably mounted over the doorway at the top of the car, as indicated in Fig. 1 of the accompanying drawings; but it may be arranged in any other desired manner, and I desire it to be understood that various changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. A device of the class described comprising a rotary signal designed to be mounted on a train, gearing for connecting the signal with one of the axles, and means for automatically rotating the signal when the train stops, whereby the signal will display its lights in a predetermined manner, substantially as described.

2. A device of the class described comprising a rotary signal designed to be mounted on a train and to be rotated when the train is in motion, and means for automatically actuating the signal when the train stops to display a danger-signal in a predetermined direction, substantially as described.

3. A device of the class described comprising a rotary signal, a shaft carrying the signal, a stationary gear-wheel, upright revolving gears offset from the shaft and meshing with the stationary gear, a rotary gear also meshing with the revolving gears, means for connecting the rotating gear with a car-axle, and a rotary weight connected with the said shaft and adapted to return the same to its initial position, substantially as and for the purpose described.

4. A device of the class described comprising a rotary signal designed to be mounted on a train and provided with a plurality of lights of different colors, gearing for rotating the signal while the train is in motion, and a rotating weight connected with the signal and adapted to return the same to its initial position when the train stops, substantially as described.

5. A device of the class described compris-

ing a rotary signal having a plurality of different-colored lights, gearing for rotating the signal while a train is in motion, and a shaft having a weighted arm and connected with the said gearing, said weighted arm being adapted to return the signal to its initial position, substantially as described.

6. A device of the class described comprising a rotary globe or lantern-casing provided with a plurality of transparent panes or bull's-eyes of different colors, a stationary lighting device supported within the globe or casing, and means for rotating the globe or casing when a train is in motion, and for stopping the globe or lantern-casing in a predetermined position when the train stops, substantially as described.

7. A device of the class described comprising an upright signal-carrying shaft provided with arms, a stationary horizontal gear, a rotary horizontal gear designed to be connected with an axle of a train, whereby the device will be operated when the train is in motion, gears mounted on the arms, and meshing with the said horizontal gears, a horizontal shaft having a weighted arm, and gearing connecting the horizontal shaft with the upright shaft, substantially as described.

8. A device of the class described comprising an upright signal-carrying shaft carrying an arm, the stationary and rotary horizontal gears, gears mounted on the arm and meshing with the said gears, and means for returning the upright shaft to its initial position when the train stops, substantially as described.

9. A device of the class described comprising an upright shaft, a lantern globe or casing detachably interlocked with the shaft and provided with a plurality of transparent panes of different character, a bracket, a stationary lighting device supported by the bracket within the globe or casing, gearing for rotating the upright shaft when a train is in motion, and means for returning the globe or casing to its initial position when the train stops, substantially as described.

10. A device of the class described comprising an upright rotary-signal-carrying shaft, a signal mounted on the shaft, arms extending from the same, upright gears mounted on the arms, stationary and rotary horizontal gears meshing with the upright gears, a shaft 30 extending to the bottom of the car, gearing for connecting the shaft 30 with the rotary horizontal gear and with one of the axles, means for throwing the shaft 30 into and out of gear and means connected with the signal-carrying shaft for returning the signal to its initial position when the train stops, substantially as described.

11. A device of the class described comprising a signal-carrying shaft, a shaft 30 extending to the bottom of the car, gearing for connecting the shaft 30 with one of the axles and with the signal-carrying shaft, a bearing receiving the shaft and mounted on the car-body, and springs cushioning the bearing, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WALTER L. HARPER.

Witnesses:
FRED W. LEWIS,
H. J. RADCLIFFE.