(No Model.) 2 Sheets—Sheet 1.

E. L. DUGAS.

CHANGEABLE TAIL LIGHT FOR RAILWAY CARS.

No. 307,272. Patented Oct. 28, 1884.

Fig. 1.

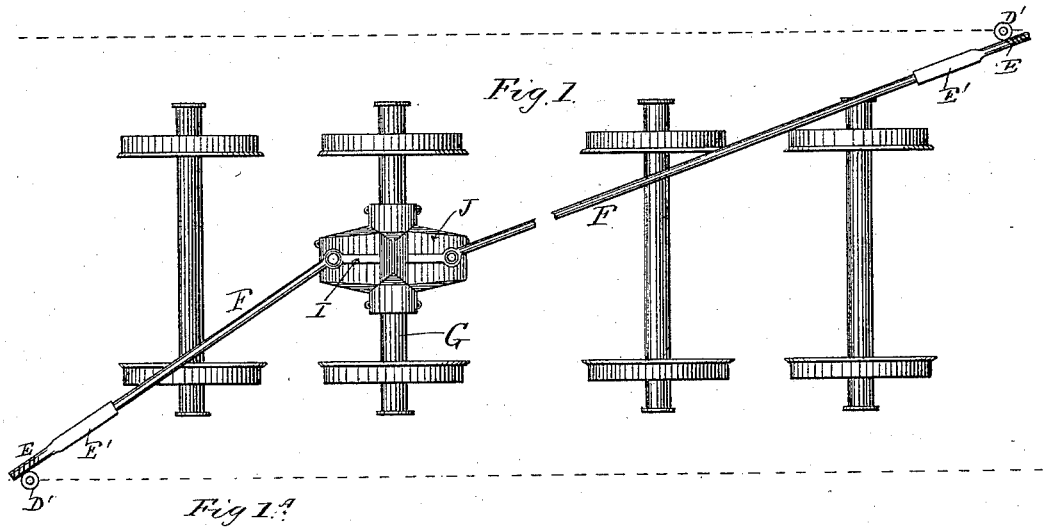


Fig. 1ª.

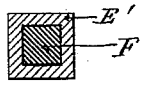
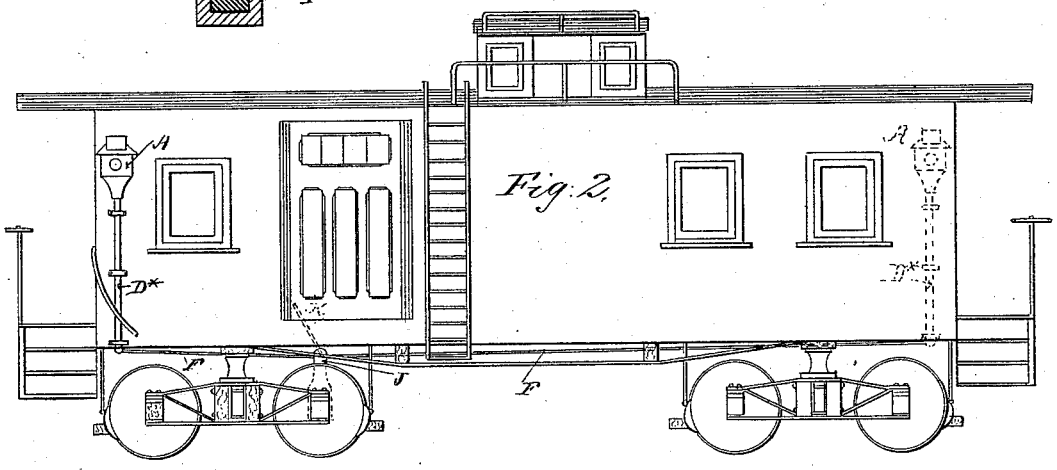


Fig. 2.



Witnesses.

Chas S. Kalb

Tom K. Strait

Inventor.

E. L. Dugas

Per Newton and Burrymand

Attorneys

By J. N. Kalb

Asso. Attorney.

(No Model.) 2 Sheets—Sheet 2.

E. L. DUGAS.

CHANGEABLE TAIL LIGHT FOR RAILWAY CARS.

No. 307,272. Patented Oct. 28, 1884.

Fig. 5.

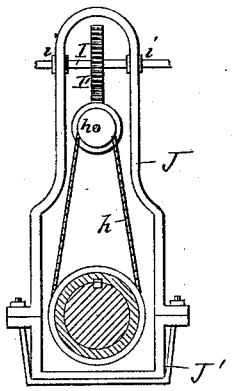


Fig. 6.

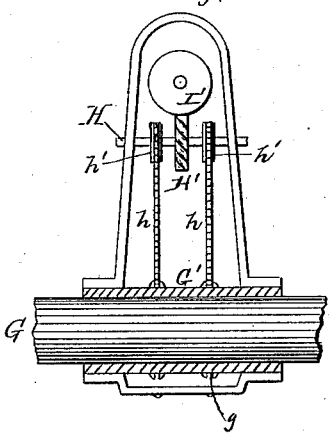


Fig. 7.

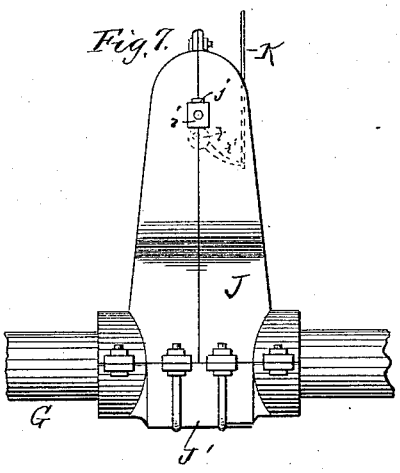


Fig. 3.

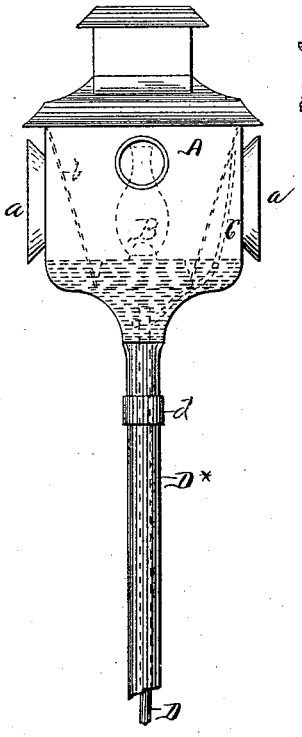


Fig. 8.

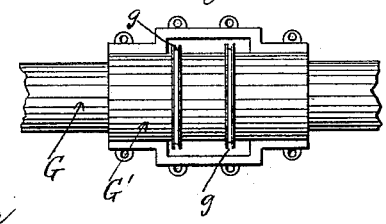


Fig. 4.

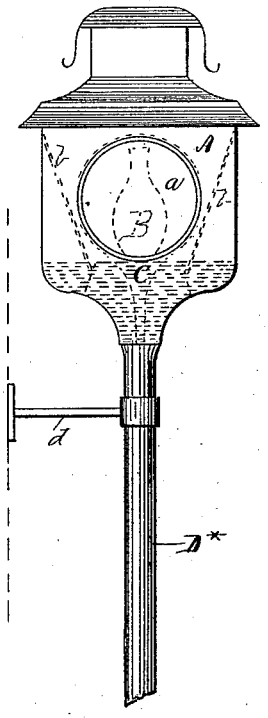


Fig. 9.

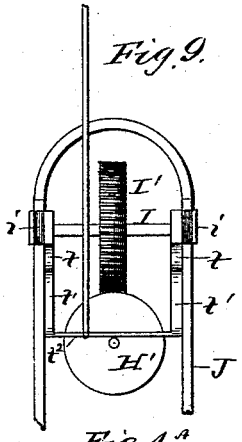
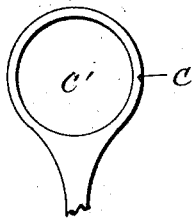


Fig. 4a.



Witnesses.
Chas. S. Kalb
Tom R. Stuart.

Inventor:
E. L. Dugas
Per Newton and Berryman
Attorneys
By J. N. Kalb
Asso. attorney.

UNITED STATES PATENT OFFICE.

ELI L. DUGAS, OF ST. PAUL, MINNESOTA.

CHANGEABLE TAIL-LIGHT FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 307,272, dated October 28, 1884.

Application filed May 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, ELI L. DUGAS, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Changeable Tail-Lights for Railway-Cars; and I 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 to which it appertains to make and use the same.

My invention relates to changeable tail-lights for use upon railway-cars, and has for its object the provision of means for constantly changing the color of a light when the car upon which it is placed is in motion. I attain this object by having a revoluble disk secured upon a spindle and adapted to be turned round a lamp or other light, inside of the frame and between the light and the bull's-eye. In practice I place one of such devices on each side of the rear car of a train, which in freight and burden trains will be a caboose, preferably in front and rear of said car or caboose, and connect the disk-spindles with the axle of the car, so that the disks shall be at rest when the car is not in motion and shall be revolved around the light when the car is in motion. By this means an engineer upon starting his engine can ascertain with certainty whether his whole train is following him or not. He can also tell by the rapidity of the revolutions of the disk upon a train following him how fast said train is coming, and speed his engine accordingly.

It often happens that a coupling is broken by the jerk occasioned in starting a train, and if there is no provision for notifying the engineer of this condition of affairs he may travel some distance without discovering it and let the detached portion of his train lie upon the track to impede the progress of or wreck a following train. With a light of the character of mine such accidents will be avoided and life and treasure conserved.

The following detailed description will explain the nature of my said invention fully and the manner in which I construct and apply the same.

The accompanying drawings illustrate what I consider the best means for carrying my invention into practice.

Figure 1 is an outline view of the wheels and axles of a caboose or car, showing the means by which I connect with the axle, and indicating in dotted lines the diagram of the car or caboose body with the disk-spindles in place on both sides, front and rear. Fig. 1^A is an enlarged section of shaft and sleeve. Fig. 2 is a side elevation of a caboose, showing the lamps in place. Fig. 3 is an elevation of the lamp, looking toward the edge of the bull's-eyes. Fig. 4 is a similar view looking into the face of the bull's-eye. Fig. 4^A is a detail of the disk. Figs. 5, 6, 7, and 8 are detail views of the mechanism by which I transmit motion from a car-axle for rotating the disks. Fig. 5 shows a cross-section of the axle with the collar and box in place. Fig. 6 is an elevation, the spindle or axle with the collar and a portion of the box in section, this view being taken at right angles to Fig. 5. Fig. 7 is a view similar to Fig. 6, but with the entire box in place; and Fig. 8 is an inverted plan of the axle with the lower half of the box removed. Fig. 9 is a view showing the details of construction of the pinion-shipper.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

I will first describe the tail light and the revolving disk which turns round the light, together with the means for mounting said disk, and will afterward explain the nature and construction of the means for obtaining power from the car-axle for rotating the said disk.

A is a fixed lantern or lamp frame having the bull's-eyes *a a*. B is the lamp, suspended from frame A by means of rods or hangers *b b*. It will be seen that the lower part of the frame A is not obstructed by the lamp or its supports, and that a space is afforded all around between the lamp and the frame to a point above the bull's-eyes. The hangers *b b* are attached to a ring or band, which rests upon flanges in the lantern-frame A. In the space furnished between the light and the frame the disk C revolves. This disk consists of a frame

or plate of any suitable material, preferably metal, provided with a colored glass, c', placed in position to come between the light and the bull's-eye when the disk is revolved. The disk is supported upon a curved neck, c^2, which is secured to the top of the spindle D, and is revolved thereby. The spindle D revolves in a tube or hollow lamp-post, D*, which supports the lantern-frame and protects the spindle. The tube or post D* is secured to the side of the car or caboose by means of brackets d, of any ordinary or suitable construction. As the disk C is revolved around the light B an alternate white and colored light is shown through the bull's-eye a, said bull's-eye itself giving a white light while the disk gives the colored light, as in the course of its revolution it is brought in front of the bull's-eye.

The revolution of the disk C is effected through the medium of the spindle by the following mechanism: The lower end of the spindle D is provided with a small gear-wheel, D′, operated by a worm, E, which is attached to a sleeve, E′, which in turn engages with the tumbling-shaft F, reaching back to the axle from which the power is obtained. The said axle is marked G, and is provided with a collar, G′, feathered upon it in the ordinary manner. This collar is provided with annular grooves g g, in which chain-belts h h work. The belts run over the pulleys h' h', mounted upon the shaft H. On this shaft is mounted the gear or worm wheel H′, which meshes into the pinion I′ on the transverse shaft I. The ends of this transverse shaft I are connected by a universal-joint coupling to the inner ends of the diagonally-disposed shafts F F, one of which has already been referred to. The shafts H and I are mounted in bearings in the box J. The shaft H is rotatable, with stationary bearings, while the bearings for the shaft I are movable, the purpose and function of which will be hereinafter explained. The shafts F F reach out diagonally to the opposite corners of the caboose-body, front and rear, to turn the spindles D, as before stated.

To allow for the turning of the truck to which the axle G belongs, the shafts F must be made extensible, and for this purpose their outer ends enter the boxes or sleeves E′, which carry the threads or worms E. The ends of the shafts and the interior of the sleeves are made non-circular, so that the revolution of the shafts will turn the sleeves. Now, as axle G is rotated, motion will be transmitted through the following-named train of parts to revolve the disks C around the lights: collar G′, chains h h, pulleys h' h', shaft H, worm H′, pinion I′, shaft I, shafts F, sleeves E′ E, pinion D′, and spindle D. It is evident also that the rapidity of the revolutions of the axle will determine the rapidity of the revolutions of the disk C, thus enabling an observer—as the engineer—not only to tell whether his own or another car is in motion, but also to determine the speed with which it is moving, and thus advised to govern his own engine accordingly. The journal or shaft I is held in blocks i, which are movable in ways j in the box J, and in order that the connection between I′ and H′ may be broken at will and the revolution of the disk C stopped, the sides of the box J are provided with cams t, which work under the boxes j and are caused to raise or lower the same, according to the position in which the cams are thrown. Arms t', attached to the cams, extend out and have a connection, t^2, to which a lever, K, is joined or pivoted. The lever K extends into the caboose, as shown in Fig. 2, and is under control of any of the trainmen who may be there.

The box J is fitted upon the axle, over the collar G, and for this purpose is formed with a half-box, J′, which is bolted to main box J, after they have been placed over the other parts.

Having thus described my invention, what I desire to claim and secure by Letters Patent is—

1. A changeable tail-light for use on railway-cars, consisting of the bull's-eye a and light or lamp B, and the revoluble disk C, adapted to be turned round the light B, between it and the bull's-eye, as set forth.

2. The frame A, carrying the bull's-eyes a a, and the light or lamp B, provided with the frame b b', by which it is suspended in the frame A, in combination with the revoluble disk C, adapted to be turned round the light B, between it and the bull's-eyes, substantially as set forth.

3. The combination of the signal-light, the spindle D, and revoluble glass carried thereby, provided at its lower end with the pinion d, with the worm E, sleeve E′, shaft F, and connections to the axle, whereby the movement of the shaft F in the sleeve E′ compensates for the change in position of the axle caused by turning, as set forth.

4. The combination of the signal-light revoluble disk and connection with the axle G, shaft I, and connections between them, together with shafts F F, connected to said shaft I by universal-joint couplings, and extending diagonally out and connecting directly or indirectly with the spindles D, substantially as set forth.

5. The combination, with the signal-light revoluble disk and connections thereto, of the axle G, the collar G′, secured thereon, chains h h, and pulleys h' h', which are turned by having the chains pass over them, shaft H, worm H′ thereon, gear I′, and its shaft I, operated by the worm H′, and connections to a changeable tail-light, substantially as set forth.

6. The combination of the shaft H, having the worm H′, and connections to a car-axle, and the movable shaft I, having the pinion I′, signal-light revoluble disk and connections thereto, and means for throwing the pinion and worm into and out of connection with

each other, as described, and for the purpose set forth.

7. The combination of the shaft I and pinion I′, having the movable journal-boxes *i*, with the cams *t*, lever K, and connections between said cams and lever, a signal-light revoluble disk, and connections thereto, as shown, and for the purpose set forth.

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

E. L. DUGAS.

Witnesses:
JOHN M. LYNCH,
ROBT. G. MACKAY.