(No Model.)

2 Sheets—Sheet 1.

F. NICHOLSON.

CAR SIGNAL.

No. 525,357. Patented Sept. 4, 1894.

Fig. 1.

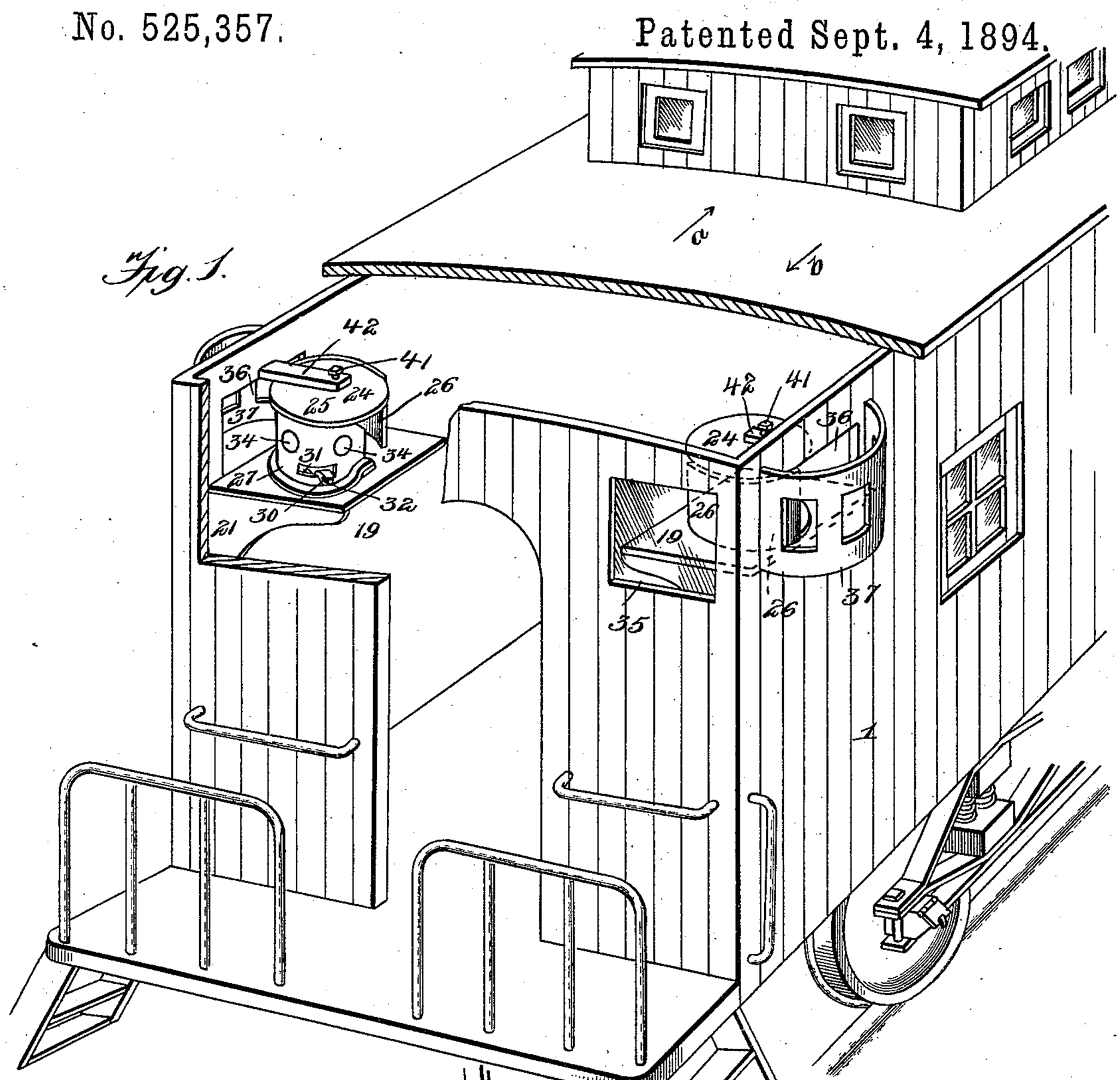


Fig. 3.

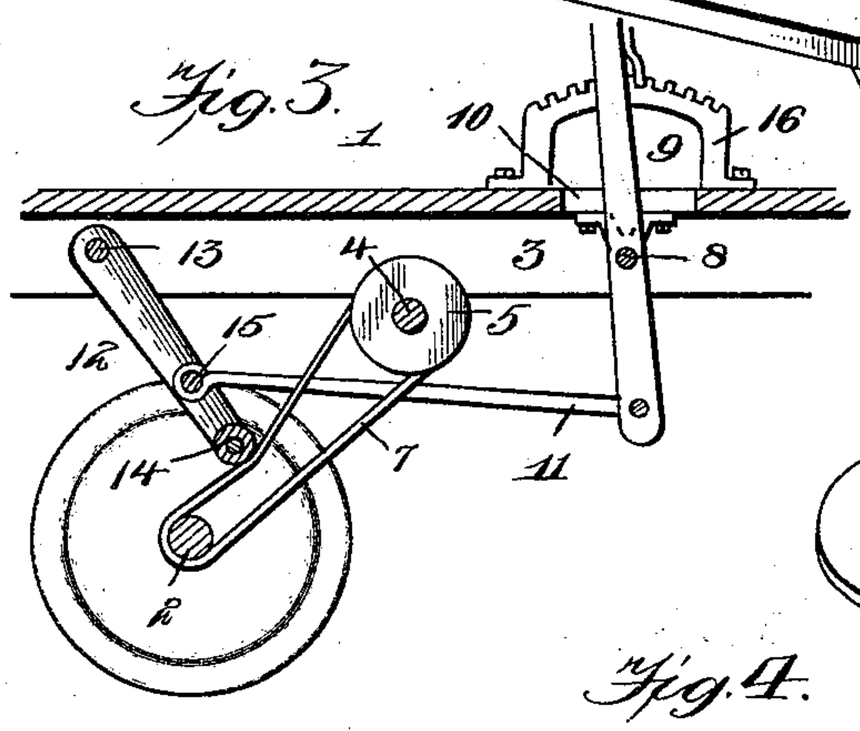


Fig. 8.

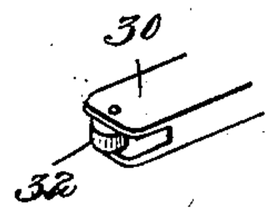
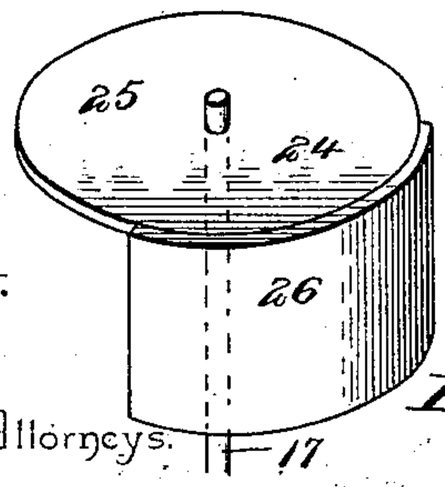


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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CAR SIGNAL.

No. 525,357. Patented Sept. 4, 1894.

Fig. 2.

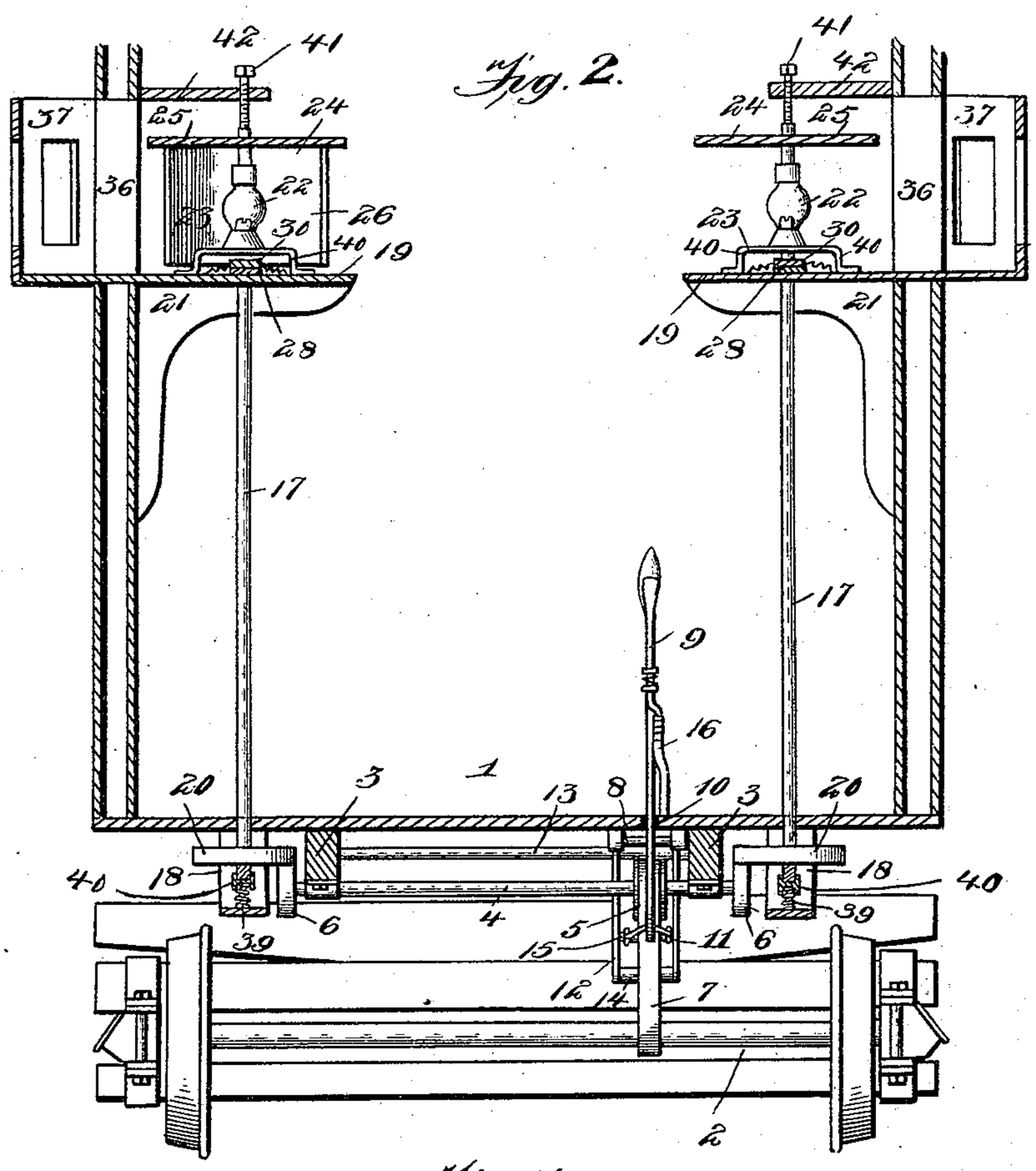
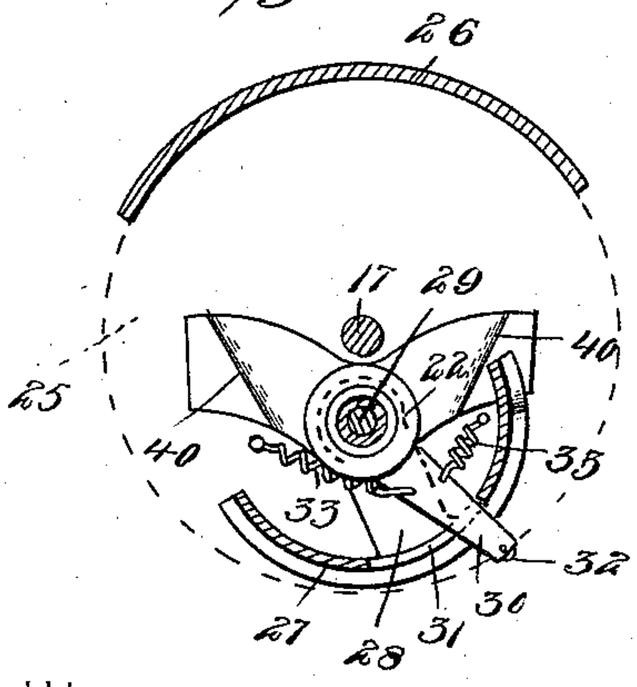
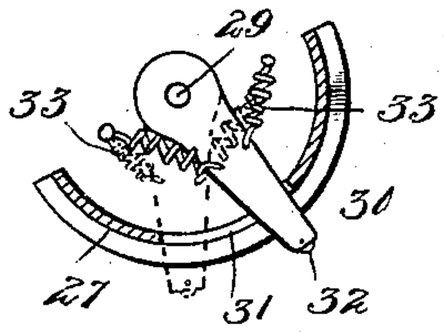


Fig. 7.

Fig. 5.





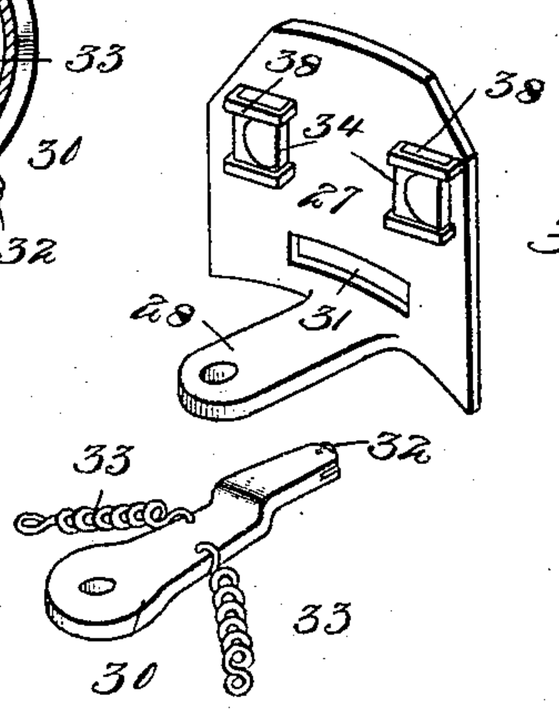


Fig. 6.

Witnesses

John C. Shaw.

[illegible]

Inventor

By his Attorneys. Frank. Nicholson,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

FRANK NICHOLSON, OF OAKFIELD, NEW YORK.

CAR-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 525,357, dated September 4, 1894.

Application filed March 26, 1894. Serial No. 505,159. (No model.)

To all whom it may concern:

Be it known that I, FRANK NICHOLSON, a citizen of the United States, residing at Oakfield, in the county of Genesee and State of New York, have invented a new and useful Improvement in Signal-Lights for Railway-Cars, of which the following is a specification.

My invention relates to an improvement in those signal lights which are provided with revoluble shields, whereby the light is made to flash as the train proceeds; and the principal feature of the invention lies in certain improved features of construction and combination of parts, by which the color of light is automatically reversed as the car to which it is attached changes its course.

Other points of novelty are present in my invention, and lie in various details of construction and subordinate combinations, through the medium of which the efficacy of appliance is increased; and all of these features will be more fully described hereinafter and finally embodied in the claims.

In the accompanying drawings: Figure 1 represents a perspective view of a portion of a freight-train caboose having my improvements applied and shown with the roof broken away. Fig. 2 is a vertical section taken through the lanterns. Fig. 3 is a sectional view of the means for driving the revolving light shields, the said means being shown detached from the companion parts. Fig. 4 is a perspective view of the light shield. Fig. 5 is a horizontal section taken through the lanterns. Fig. 6 is a perspective of the bull's-eye frame and the means for operating it, said device being detached from the remaining parts. Fig. 7 is a view showing the mode of operation which attends the bull's-eye frame. Fig. 8 is a detail of the lens-frame lever.

The reference numeral 1 indicates the body of the car, which is here shown as a freight-train caboose, since my invention is best adapted for use on this class of car, though it may obviously be used in other relations.

2 indicates the car axles, and these are mounted on the usual wheels and attended by the trucks, as shown, all of which is well understood.

My improvements will be arranged at each end of the car, and since this will be understood, I will not describe them in duplicate. Mounted in the longitudinal beams 3, so as to be capable of rotary movement therein, is the transverse shaft 4, which has the belt-pulley 5 fixed thereto at a point near its middle, while its ends extend beyond beams 3 and are provided with the friction pinions or gear 6. The pulley 5 is flanged and adapted for the reception of the belt 7, which passes over its periphery and proceeds to the axle 2, over which it passes, as shown, and by which the motion of the axle is transferred to the shaft 4.

Fulcrumed on the pin 8 of the bottom of the car is the hand-lever 9, and this passes up vertically through the slot 10 in the car bottom, so that it may be easily reached by the occupants of the car. The lower end of lever 9 projects down to a point near the level of the axle 2, and is there connected to the wire or cord 11, which proceeds toward the middle of the car for a short distance and is connected to the swinging frame 12. Frame 12 consists of two parallel and vertical bars pivoted to the transverse rod 13, and depending downwardly to a point just above the axle, where they are joined to the roller 14, a cross-bar 15 being connected to them above the roller 14 and to which the wire or cord 11 is attached.

The roller 14 is arranged in the path of the belt 7, and when moved outwardly, with frame 12, will engage said belt and draw it taut, which will cause it to positively engage pulley 5 and axle 2, and communicate motion from one to another, the belt being normally slack enough to allow the axle movement independent of the pulley 5. Thus the mechanism may be operated at will, and in order to keep the belt at the proper tension, I provide the pawl-and-ratchet mechanism 16, whereby the lever 9 may be held with the roller 14 engaged with the belt 7.

Arranged in each corner of the car, and just to one side of the friction pinions 6, are the vertical shafts 17, which are duplicates of each other, and mounted in the cup-shaped bearings 40 supported by yokes 18 and in the horizontal platforms 19. The bearings 40 and

platforms 19 are one for each of the shafts 17, and the bearings are provided with springs 39 which give them, and consequently the shafts 17, a tendency upward. This tendency is overcome by the set-screws 41, of arms 42, and the shafts forced downward to engage the gears 6 and 20. By raising screws 41, the shafts with which they operate will move up, disengage gears 6 and 20, and cause the shield 24 to stop operating. Fixed to the lower end of each of the shafts 17, just above the yokes 18, are the friction disks 20, which project out so that their lower peripheries will engage with the periphery proper of the gears 6, and whereby the movements of the shaft 4 are transmitted to the shafts 17.

The platforms 19 are located in the upper corners of the car and are supported by brackets 21, a space being left between them and the car-roof which will be sufficient for the reception of the lantern mechanism. This consists principally of the lanterns 22 removably yet rigidly secured in the sockets 23, which are in turn immovably secured to the upper surface of the platforms 19, and which may be of any preferred construction. The upper ends of shafts 17 project above the platforms 19 and are provided with the light shields 24, which consist of the circular metallic plates 25, secured at their centers to the shafts and provided at their peripheries with the shields proper or wings 26. The wings 26 project down to the upper surface of the platforms 19, and are of a size equal to about one-third of the circumference of the disks or plates 25. These wings are adapted to move in a circular path around the lanterns 22, and to alternately cover and uncover the light at a predetermined point.

27 indicates a vertically-extending bull's-eye frame, which is curved in the arc of a circle and adapted to lie just within the wing 26. This frame is rigidly secured to the arm 28, which extends inwardly to the spindle 29, to which it is pivotally connected. The spindle 29 is rigidly secured to the platform 19, and at a point about midway the radius of the circle described by the plates 25, so that the frame 27 will swing in an arc of a circle having a radius, and consequent circumference, of one-half that of plate 25, and this for a reason which will hereinafter appear. The movements of frame 27 are limited by the arms 40 of the sockets 23.

Pivotally connected to the spindle 29, and projecting outwardly therefrom, is the arm 30, which extends through a horizontally-elongated slot 31 in the frame 27, and projects a distance beyond the same, which will make it possible for the wings 26 to engage with its ends as the wings travel in their characteristic line of movement. Revolubly mounted in the outer ends of the arms 30 are the friction-rollers 32, which are provided for engagement with the wings 26, whereby the wear upon the wings, which would otherwise result, is avoided.

Connected to each side of arm 30, and extending outwardly and inwardly therefrom, are the springs 33, which are two in number and which are employed to give the arm a normal tendency in a line parallel with the longitudinal disposition of the car. The slot 31 is of such a length that it will permit the arm 30 a short independent movement therein, and when the arm exceeds the limits of the slot 31 it will bind against its ends and cause the frame 27 to swing with it. Thus, as the arm 30 is engaged by the wing 26, when swinging under the influence of the car's movements, it will be swung, say to the left, and, after traversing the limit of slot 31, will positively engage the frame 27, and cause it to move with the arm, until the arm, swinging in a circle smaller than that which attends the wing 26, passes out the domain of the wing and returns under the influence of its spring 33.

Located in the frame 27 are the bull's-eyes, or lenses 34, which are preferably two in number, and which are formed of differently-colored glass. These lenses are so arranged on the frame 27 that they will be in turn in longitudinal alignment with their respective lanterns 22, when the frame 27 has been moved by the arm 30 and wing 26. Thus, supposing that it is desired to display a red light from the rear end of the train, and that the end of the car here shown is the rear end, the eye in the right-hand end of the frame will be provided with a red lens, so that the wing 26, on its attached disk, revolves from right to left it will, at each revolution, engage arm 30 and keep frame 27 in the proper position. When the car moves in an opposite direction the movement of wing 26 will be changed, so as to engage arm 30 and throw frame 27 in a position which will put the left-hand light in showing position, and this may be green, or any other color, which the system of railroad signaling employed may call for.

The arrangement and color of the signal, is, of course, immaterial to this invention, since they may be varied, and will, in practice, be constantly varied to suit the conditions under which it is used. Formed in the rear end of the car, and at each side thereof, are the openings 35, which are one for each lantern, and arranged in true longitudinal alignment therewith, so that the light, when exposed by the revolutions of wing 26, will shine therethrough and out the rear end of the train. The sides of the car, just opposite the lanterns, are also formed with openings 36 therein, and these are covered with the semi-circular shields 37, through which the light of the lanterns 22 may pass, subject, of course, to the wing 26.

In operation, the lanterns are lighted, and the parts adjusted, as explained, and the frame 27 equipped with properly-covered lenses. As the car starts the lever 9 is moved to cause belt 7 to positively engage the devices over which it travels. This will set shafts 17 to re

volving, and they will be followed by a corresponding revolution of the light-shields 24, and a consequent and alternate covering and uncovering of the lights through the lenses of frames 27. As the shields 24 revolve, their wings 26 will engage the respective arms 30, and cause the frame 27 to be adjusted so as to put the proper lens in longitudinal alignment with the lanterns.

It will be understood that the lenses of frame 27 are so arranged that the color of the signal which it is desired to throw behind the train will be that of the lens which is so located in the frame 27 that it will be put in longitudinal alignment with the lantern according to the way in which the forward movement of the car causes the frame 24 to rotate. Hence, supposing red to be the signal in question; the red lens will be put in alignment with the lantern as the car moves in the direction of the arrow *a*, of Fig. 1, and, when the car moves in the direction of arrow *b*, this will be reversed and, say the green, light will be displayed in its stead. As the shield 24 revolves it alternately covers and uncovers the lens of frame 27 which is aligned with the lantern, and the wings 26 of such shield are disposed oppositely, so that one of the lenses will be always exposed. By means of the shields 37 the light of the lanterns will be allowed to shine laterally, and owing to its semi-circular shape, the train hands forward can see whether the caboose and, consequently the train, is in place. The lenses of frame 27 are arranged in the grooves 38, and removably so that they can be changed when the requirements of different systems of signaling necessitate.

It will be understood that the two lights with which the car is equipped shine alternately, and that the shield 26 of one light covers the same while the corresponding shield of the remaining light is arranged forward thereof, so as to permit the same to shine rearwardly. The shining of the light occurs whenever the shields are in position to permit it. It will be understood that the function of the bull's eye frame is not to hide in any way the shining of the lights, but to change the color thereof by changing the location of its lenses. Thus, as the shield 26 revolves, when the car is moving forwardly, the bull's eye frame will be held in one position and not reversed until the direction in which the car is moving is changed; it will then be reversed to change the color of the light.

By regulating the gearing which operates shields 24, the exact number of revolutions which will be given it by the varying speed of the trains can be ascertained. Thus, by counting the number of flashes, the hands of a rearwardly located train can tell the speed at which the train ahead is moving. In order that the train hands ahead of the caboose can tell whether it is in place by the light through the shield 37, it may be necessary to move the lanterns and their attending parts outwardly and partially into the shields, but since such arrangement is apparent, it is not thought necessary to show it in the drawings.

Having described my invention, what I claim is—

1. A flash signal for railway cars, and comprising the combination of a vertical revoluble shaft, an outwardly and downwardly extending shield connected thereto and revolving therewith, a lantern arranged within the path of the shield, a bull's-eye frame having two or more lenses therein and located within the path of the shield and capable of moving in a limited circular path, and an arm adapted to be engaged by the shield and pivoted to swing in a circle smaller than that of the shield and having a connection with the bull's-eye frame, whereby the said frame, upon engagement with the shield, is made to move so as to place one of its lenses in position to show, and, when engaged by the shield when moving in an opposite direction, to place a second lens in position to show, substantially as described.

2. A flash signal for railway cars, and consisting of a shaft connected with the car-axle and adapted to revolve in opposite directions according to the direction in which the car is moving, a screen on the shaft and revolving therewith a lantern located adjacent to the shaft, and a bull's-eye frame having two or more lenses therein and capable of being moved to display either of said lenses, the said movements being effected by engagement with the screen of the shaft, whereby the bull's-eye frame is moved to display one lens when the screen is moving in one direction and to display a different lens when the screen is moving in a second direction, substantially as described.

3. A flash signal for railway cars, and consisting of a shaft connected to the car-axle and adapted to revolve in opposite directions according to the direction in which the car is moving, a light-shield connected to and revolving with the shaft, a lantern located within the path of the shield so that its light may be cut off thereby, and a bull's-eye frame located adjacent to the lantern and having two or more lenses therein, the frame being capable of being moved to display either of the lenses, and adapted to be engaged by the light-shield and to be caused to show one lens when the shield is moving in one direction and a different lens when the shield is moving in a second direction, substantially as described.

4. A signal light for railway cars, and comprising the combination of a continuously-revolving friction disk, a revoluble and vertically-movable shaft, a friction disk fixed to the shaft above the first disk and engaging therewith, a spring co-operating with the shaft and giving it a tendency upward, a set-screw whereby the tendency of the spring is overcome and the gears made to engage, a

lantern, and a shield on the shaft and operating to move around the lantern, the shaft being capable, upon the removal of the set-screw, of raising so as to disengage the friction disks, whereby the movements of the shield are stopped, 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.

FRANK NICHOLSON.

Witnesses:

R. E. CHAPIN,

W. W. STEVENS.