

(No Model.)

3 Sheets—Sheet 1.

I. H. CONGDON.

DEVICE FOR OPERATING REAR SIGNAL LIGHTS OF RAILWAY TRAINS.

No. 329,439.

Patented Nov. 3, 1885.

Fig. 1.

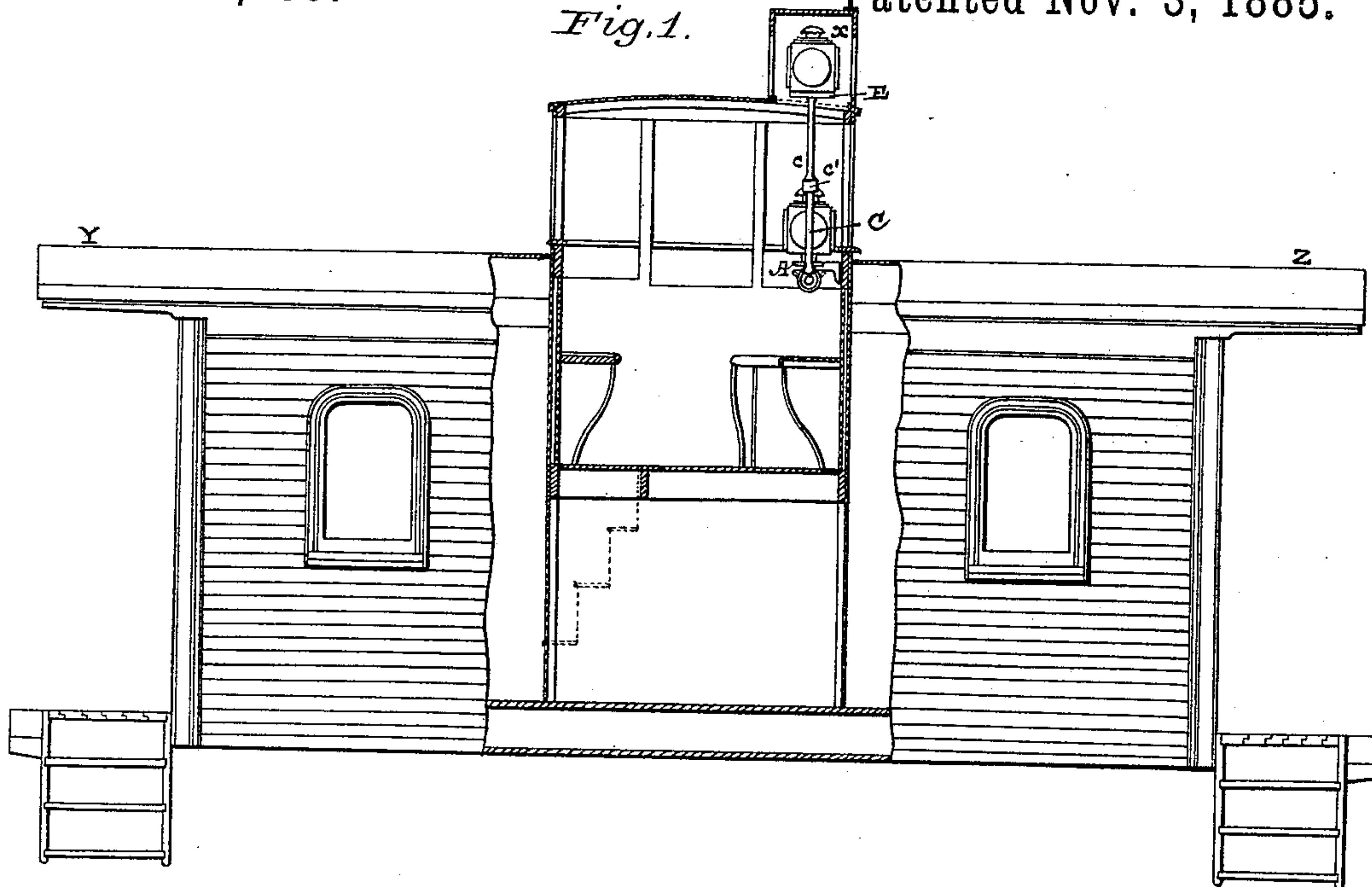
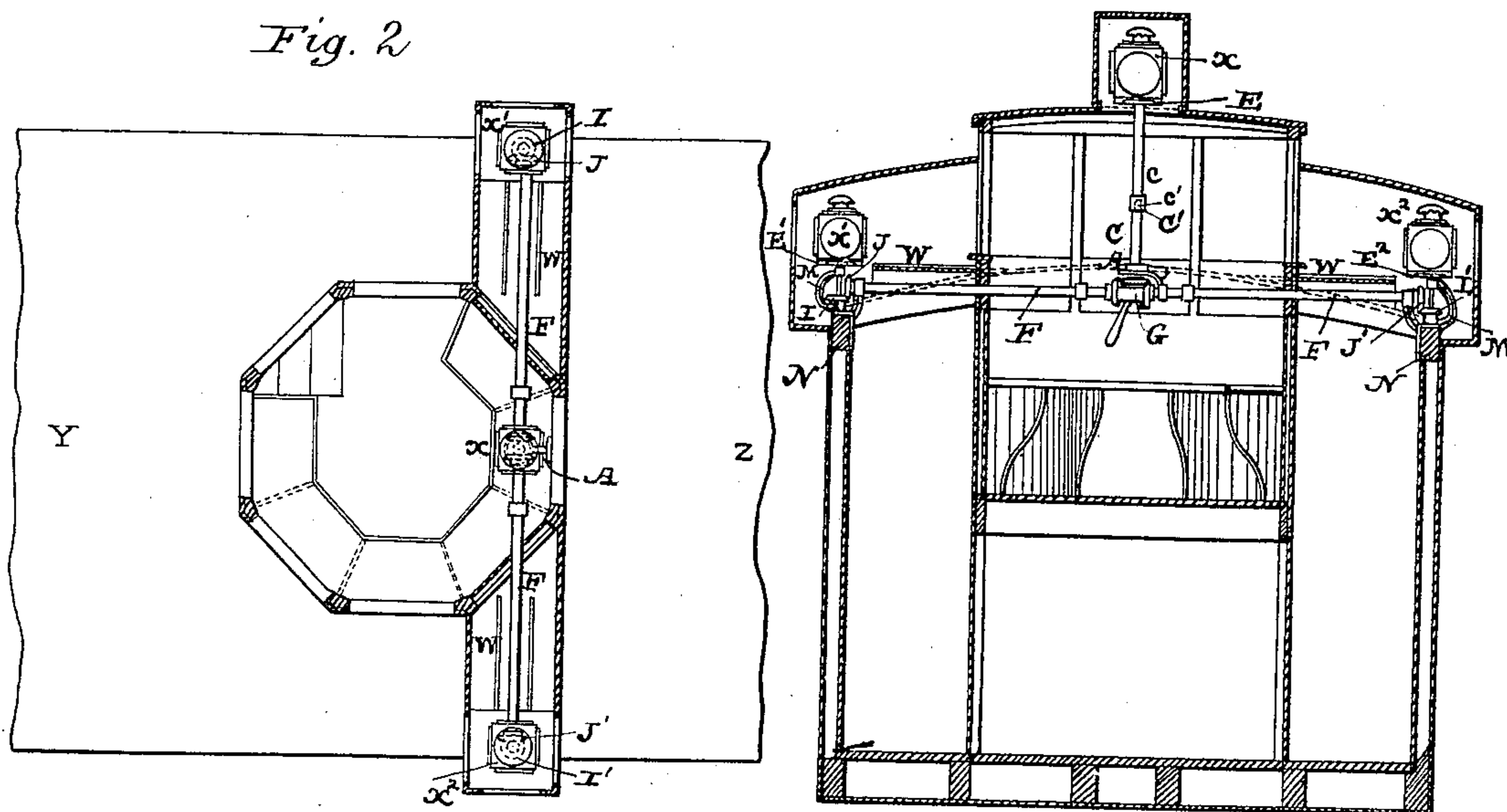


Fig. 3.

Fig. 2.



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Inventor:

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(No Model.)

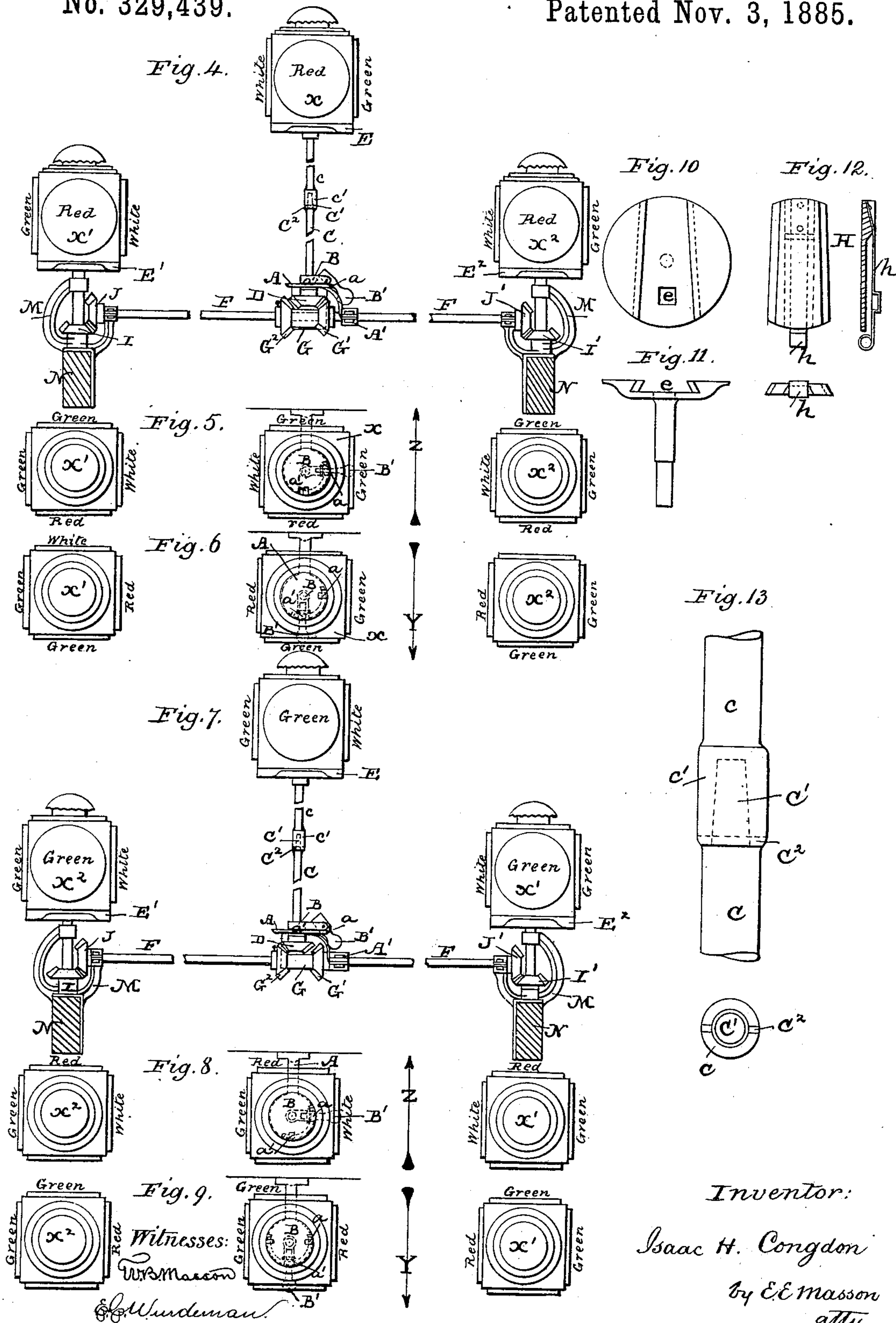
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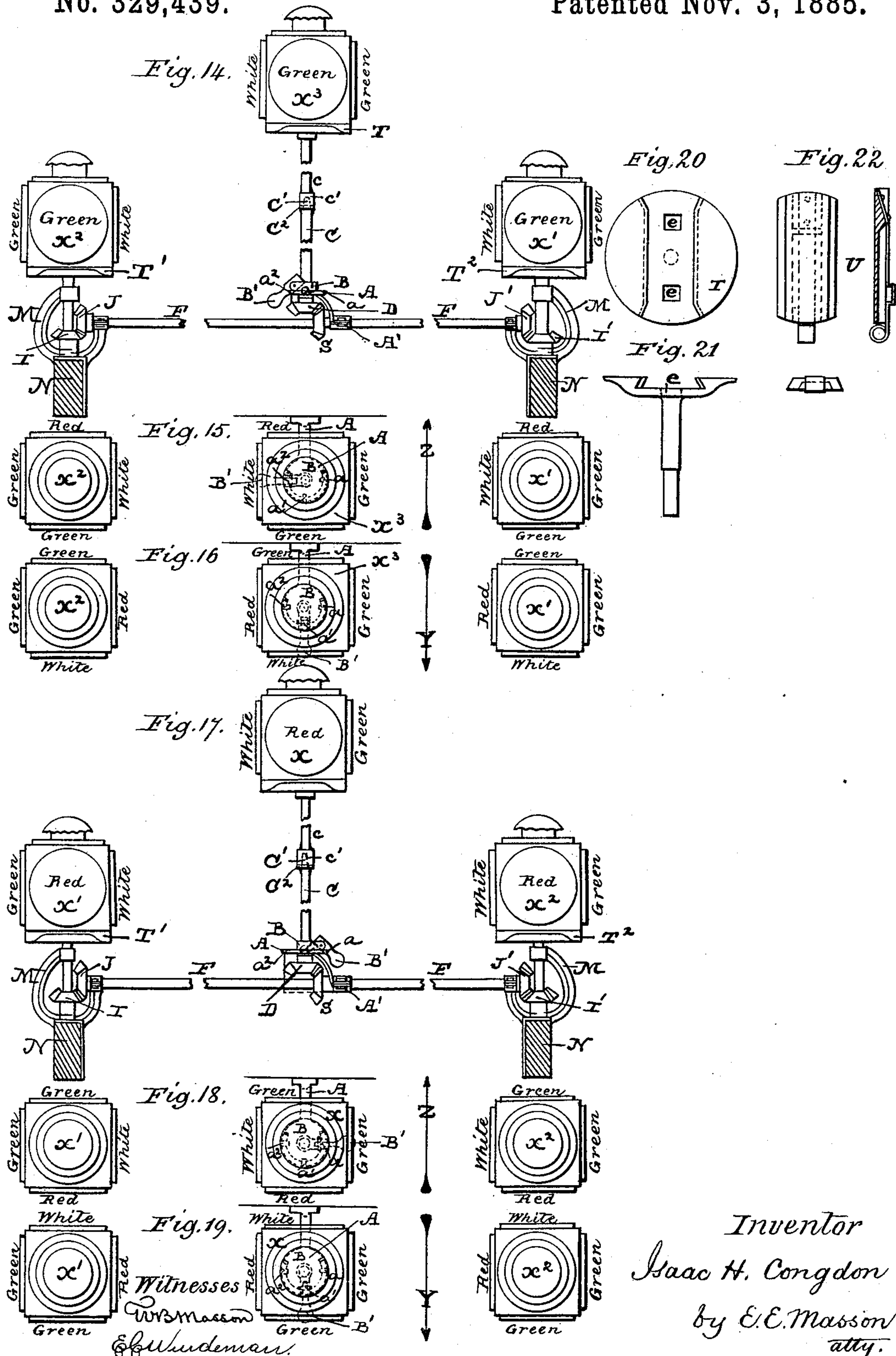
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UNITED STATES PATENT OFFICE.

ISAAC H. CONGDON, OF OMAHA, NEBRASKA.

DEVICE FOR OPERATING REAR SIGNAL-LIGHTS OF RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 329,439, dated November 3, 1885.

Application filed April 20, 1885. Serial No. 162,889. (No model.)

To all whom it may concern:

Be it known that I, ISAAC H. CONGDON, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Devices for Operating Rear Signal-Lights of Railway-Trains, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The rapid development of our country calling for more numerous and swifter transportation, the number of trains necessarily run daily on railways, especially on single-track roads, is being greatly increased, their speed
15 much quickened, and the liability to accidents is also increased from the misunderstanding of signals or the unprompt rendering of the same or from other natural causes.

20 The necessity for more systematic and distinct signals to protect life and property has been felt by railway-managers, to meet which new and improved codes of signals have been brought forward and practiced, (at night by lamps affixed to the rear car of a train, showing different colors under different conditions,
25 &c.,) and their success depends upon the positiveness, simplicity, and quickness with which they can be changed at all times.

30 To operate in a most thorough manner the rear lights of freight-trains my device has been specially arranged, and it is applicable, by small change of detail, to nearly all of that class of train-signals where lamps containing glasses of different colors are required to show
35 a change of color in any or all directions; and my invention relates to the method and means for operating the signal-lights, as will be hereinafter described, and specifically set forth in the claims.

40 In the drawings, Figure 1 is an elevation, partly in section; Fig. 2, a plan; Fig. 3, a transverse section of a railway caboose-car, showing the application of my device. Fig. 4 shows the mechanism separate from the car
45 and upon a larger scale. Figs. 5, 6, 7, 8, and 9 show the position of the signal-lamps, operating-handle, &c., in the several positions required to fulfill the code. Figs. 10 and 11 are details of lamp-tables on larger scale. Fig.
50 12 is a top view, longitudinal section, and end view of the lamp-slide. Fig. 13 is an enlarged view of the coupling of the shaft carrying the

central lamp. Figs. 14, 15, 16, 17, 18, and 19 show a modification of the former arrangement and its several positions to accomplish
55 the same results. Figs. 20, 21, and 22 show the lamp-table and lamp-slide for this second arrangement.

The following gives the conditions that this particular arrangement is intended to accomplish:

Train Rear Lights.—Between sunset and sunrise, during fogs, snow-storms, or at other times, if necessary. Three red tail lights will be displayed on the rear of every freight-train.
65 The four sides of the movable tail lights will show one red, one white, and two green, and the proper position of such lights, when the train is on the main line, will be red to the rear, white to the center of car, green to front
70 and side. When the train goes on a siding to allow a train to pass, and when entirely clear of the main track, all the tail lights must be turned to show green to the rear and white to front, but the red must be turned to the rear
75 again before going on the main track.

From Figs. 1, 2, and 3 it will be seen that the center light projects above and is directly in line with the center of car, while the side lights are located at the extreme sides of car,
80 so that the engineer may better see them. An extension is built out from the sides and top of the cupola to cover the lamps and protect them from the elements, openings being left from the extensions to cupola, through which
85 handling of lamps is effected. Through the lamp-boxings at the front, back, and toward the outside of side lamps and at the front and back for center lamp, holes are cut and plain glass inserted, so that the light may be seen
90 from outside.

The mechanism and operation of arrangement in Figs. 1, 2, 3, 4, 5, 6, 7, 8, and 9 are as follows: To the frame of the cupola of the car is bolted an operating-table, A. Resting upon
95 the table A is the lever-collar B and lever B'. Passing through the collar B and table A is a vertical shaft, C, which is carried by and keyed to collar B. To the lower end of this shaft is fitted the bevel gear-wheel D, while
100 the upper end of the shaft has a taper bearing, C', turned on it with a key, C², passing through the same. Carried by and fitting over this taper bearing is a shaft, c, whose

lower end is a socket, c' . A groove is cut in this socket to fit over the ends of key C^2 , and thus prevents a circular movement of shaft C without a corresponding movement of shaft c , or vice versa. Fitted to the upper end of shaft C is a cast lamp-table, E , to carry the center lamp, X . The lamp-table E is a circular plate having a V-groove across its face and a hole, e , cut through it. (See Figs. 10 and 12.) Directly under the vertical shaft C is a horizontal shaft, F , extending from plate to plate of the car. On the ends of said shaft are bevel-gears J and J' , which mesh with gears I and I' , respectively, which are carried by the lamp-spindles and tables E' and E^2 , (see Figs. 10 and 11,) which carry the side lamps, X' and X^2 . The ends of shaft F and lamp-tables E' and E^2 are carried and held in place by the combined vertical and horizontal box-brackets M M , which are securely bolted to the plates N of the car. Extending from the operating-table A is a box, A' , made to support the shaft F near its center. In the center of the shaft F , and arranged to slide on a feather secured thereto, is a double gear-collar, G , having the bevel-gears G' and G^2 , which, as the case requires, are made to mesh from opposite sides with the gear D on shaft C . To the bottom of the lamps X , X' , and X^2 are riveted the slides H , Fig. 12, adapted to slide within the groove across the face of the lamp-table. The spring h on the slide H , falling into the hole e in the lamp-table, prevents movement of lamp.

From Fig. 10 it will be seen that the sides of the V-slot across the face of lamp-table are converging or tapering, and only suited to receive lamp-slides from the wide end of the groove, which in setting up is necessarily placed toward the inside of the car.

As required by rules, each lamp has one red, one white, and two green lenses, and the positions of these lenses in the several lamps are as shown by Fig. 5. When the end Y of the car is rear of train, and end Z is toward the engine, and the train is on the main line, the lever B' would be in the side position on the table at a . The gear G' meshing with gear D , and all the lamps showing red to the rear, green to the front and side, (see Figs. 1, 2, 3, 4, and 5,) when the train goes on a side track, the lever B is thrown from the side a to the center notch, a' , Figs. 5 and 6, of the table, causing the center lamp, X , and side lamp X^2 to move from right to left, while the side lamp X' will move from left to right, and lamps will then all show green to the rear and side and white to the engineer. (See Fig. 6.) When returning to the main line, the lever is thrown back in the side notch, and the lights appear as before. Now, if at any time the caboose should be turned round, or from any cause whatever the end Z of the car should be to the rear of the train and the end Y toward the engine, it would be necessary to change the lamps, as follows: First, with the lever B' in side notch, a , raise shaft c up from taper seat C' , revolve it a half-turn,

and replace it on taper seat in changed position, taking ends of key C^2 , as before. Then change lamp X' from table E' to table E^2 , lamp X^2 from table E^2 being placed on the table E' . Then throw the gear G' out of gear and gear G^2 in play with the gear D . (See Fig. 7.) The lamps will then be found in position for the main line. (See Figs. 7 and 8.) When the car goes on siding, as in the previous case, the lever B' is thrown into the center notch, a' , the center lamp, X , and side lamp X^2 moving from right to left, while side lamp X' moves from left to right. This brings the lamps in proper position for siding. (See Fig. 9.)

From Figs. 1, 2, and 3 it will be seen that the permanent slides W are built on the roof of car from cupola to side-lamp tables, so that the lamp can be slid in and out of place and change made from side to side without the necessity of holding the lamp at arm's length.

If desired, doors can be put on at the openings from cupola to side lamps to exclude their light from the cupola, as an excess of light in the same makes it difficult for the lookout to see objects on outside.

The modified arrangement shown by Figs. 14, 15, 16, 17, 18, and 19 is as follows: The operating-table A , collar B , lever B' , vertical shafts C and c , with gear-wheel D , horizontal shaft F , with gears J and J' , and combination, vertical, and horizontal box-brackets M , and their arrangement and location are the same as in former description. On the shaft F , near its middle and keyed to it, is the gear S , which is meshing with the gear D on the vertical shaft C . The center T and side-light tables T' and T^2 are the same as tables E , E' , and E^2 , with the exception of the V-groove across the face, the sides of which in this case are parallel with the short angles or diverging curves at both ends, and have two square holes, e , cut through them, (see Fig. 20,) making them suitable to receive lamps from either end, the lamp-slides U , Fig. 22, taking the place of the slides H .

To operate the system of signals by this arrangement, when the end Y of the car is at the rear of train, and the end Z toward the engine, and the train is on the main line, the lever B' would be in the notch a , and the lamps as shown in Figs. 17 and 18. When the train goes on a side track, the lever B' is advanced to notch a' , and the lamps are revolved to show colors, as in Fig. 19. On the return of train to the main line the lever B' is replaced in notch a , and the lights appear as before. If the car carrying signals be changed so that the end Z is to the rear of train and end Y toward the engine, then a change of lamps would be required, as follows: With lever B' in the notch a , remove lamp X' from table T' ; and lamp X^2 from table T^2 ; change lever B' from a to notch a^2 , which causes the lamp-tables to revolve a half-revolution; then place the lamp X' on table T^2 and lamp X^2 on table T' ; then lift shaft c (with lamp, &c., in place) from the socket C' down into car; take lamp X from

table T and place it by an extra lamp, X³, (carried for this purpose,) in which the position of white and opposite green lens is the reverse of those in X; return the shaft *c* to
 5 socket C' of shaft C, so that red will show from end Z of car. Lights will now be in position for main line. For siding move lever B' from notch *a*² to *a*', and thus make the required movement of colors.

10 As will be seen from the description and drawings, or by performing the operations herein described, when the train starts upon its run, (the lamps being in proper position according to end of car to the rear,) all that
 15 is needed to meet the requirements is a throw of the operating-lever a quarter-revolution, which insures an instantaneous and positive performance of the required results at all times. Handling of lamps only takes place
 20 when it is required to clean them at ends of runs or when the relation of the car to the train may be changed, for which there are full allowances of time made. The change would then be made when the operator is perfectly
 25 cool and collected, it never being necessary for him to handle the lamps when on the road, and possibly under excitement from presence of danger, &c., when chances for mistake would be more numerous.

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

1. Signal-lanterns located in the center and on both sides of a car, and operated by a single lever, in combination with a railway-car
 35

and shaftings and gears therein, as described, whereby one or more signal-lights upon said car are revolved, substantially as and for the purpose described.

2. The shaft C, with taper seat C' and key C², in combination with shaft *c* and the lamp-tables, substantially as and for the purpose described.

3. The lamp-slide and spring secured thereto, in combination with the lamp-table having tapering grooved seat and supporting-shaft, substantially as and for the purpose described.

4. The combination of the shafts C and *c*, collar B and lever B', table A, gear D, shaft F, gears J and J', gears I and I', gear-collar G, lamp-tables, and lamps, with a railway-car, substantially as and for the purpose herein described.

5. Lamp-slides U, and spring *h* secured thereto, in combination with the lamp-tables T, T', and T² and their supporting-shafts, substantially as and for the purpose described.

6. The combination of the shafts C and *c*, lever-collar B, lever B', table A, shaft F, a central gear and gears at each end, lamp tables mounted upon each vertical shaft, lamps upon said tables, and box-brackets M, with a railway-car, substantially as and for the purpose herein described.

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

ISAAC H. CONGDON.

Witnesses:

JOS. R. CLARKSON,

ISAAC E. CONGDON.