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PATENTED MAR. 7, 1905.

J. W. CLARK.  
LOCOMOTIVE CAB SIGNALING DEVICE.

APPLICATION FILED JAN. 4, 1905.

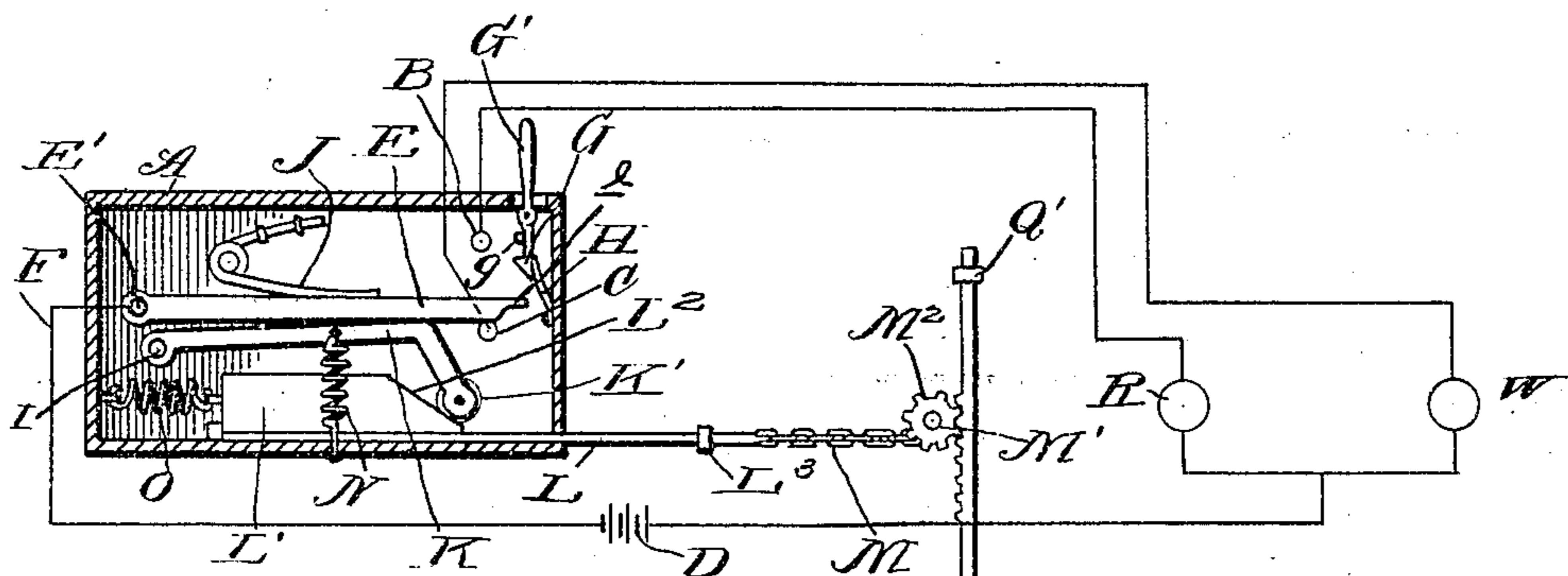


Fig. 2.

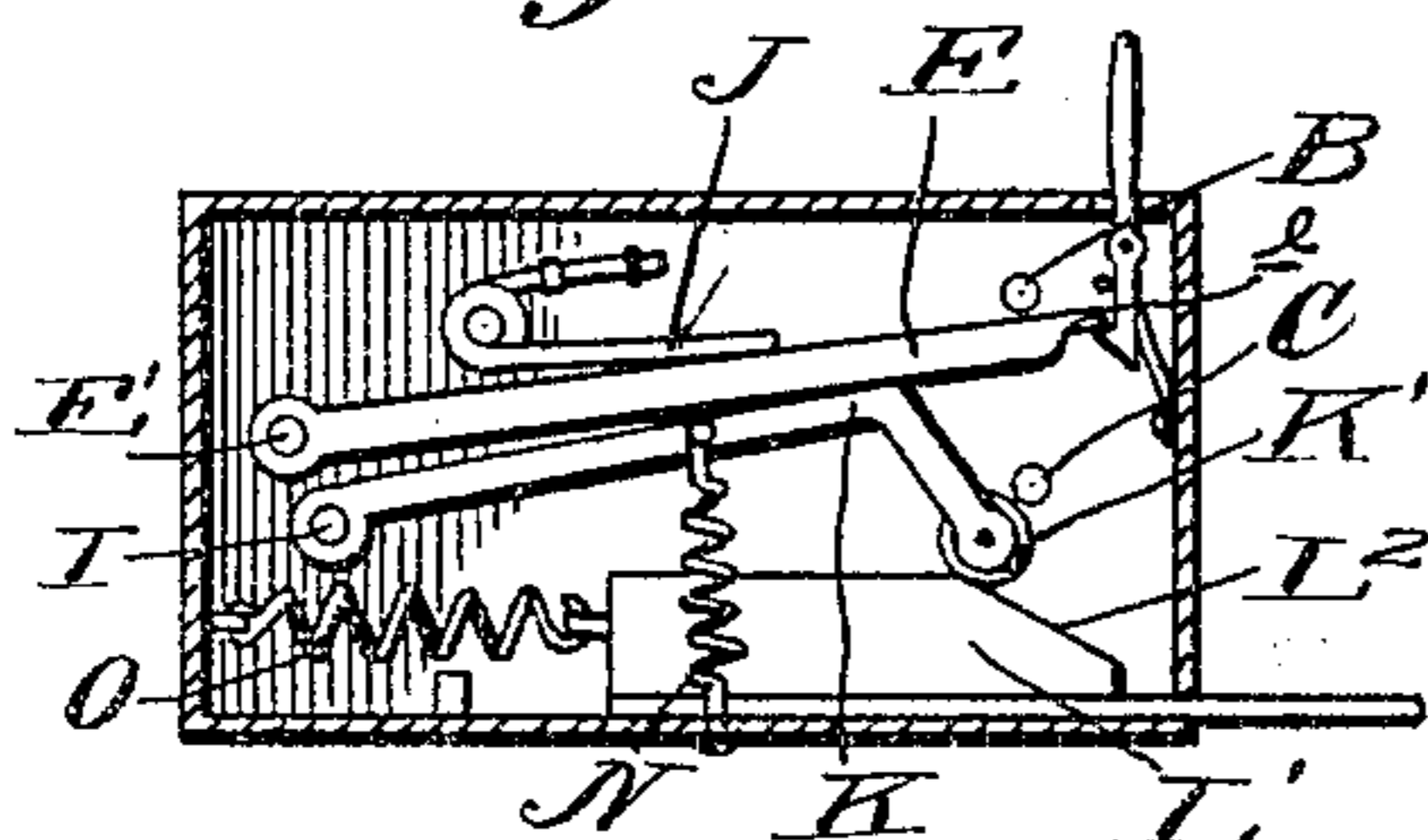


Fig. 3.

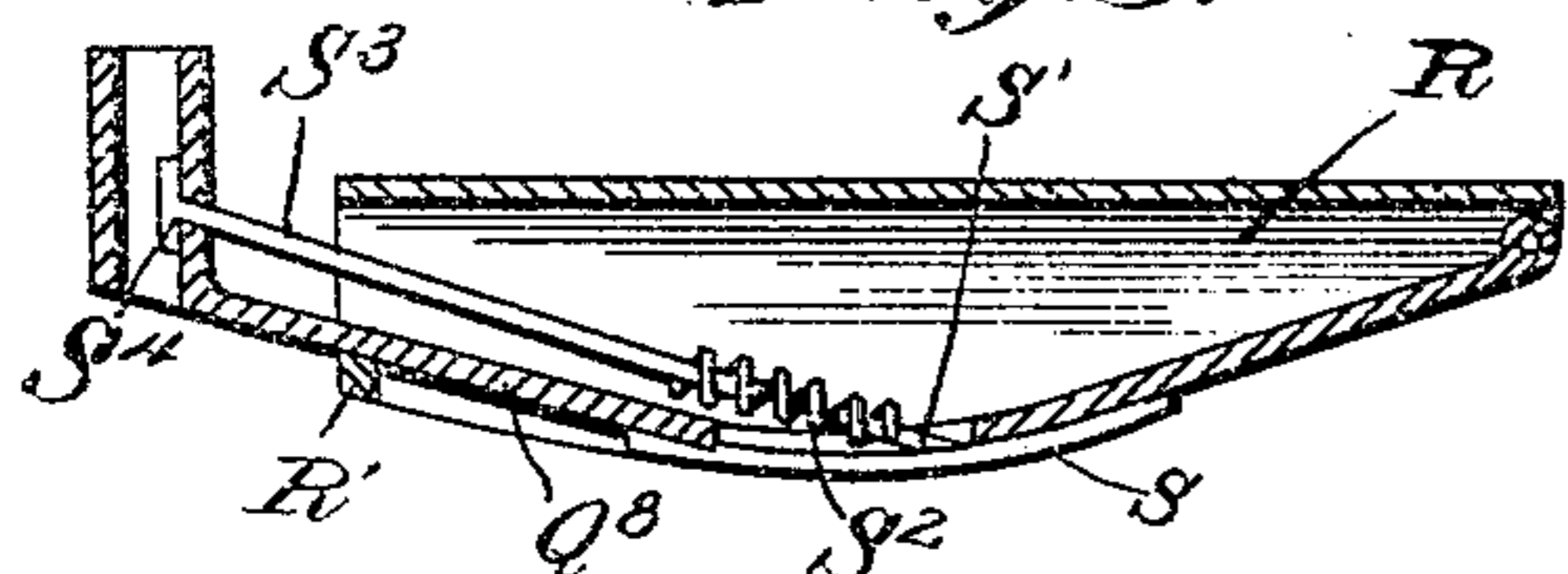


Fig. 4.

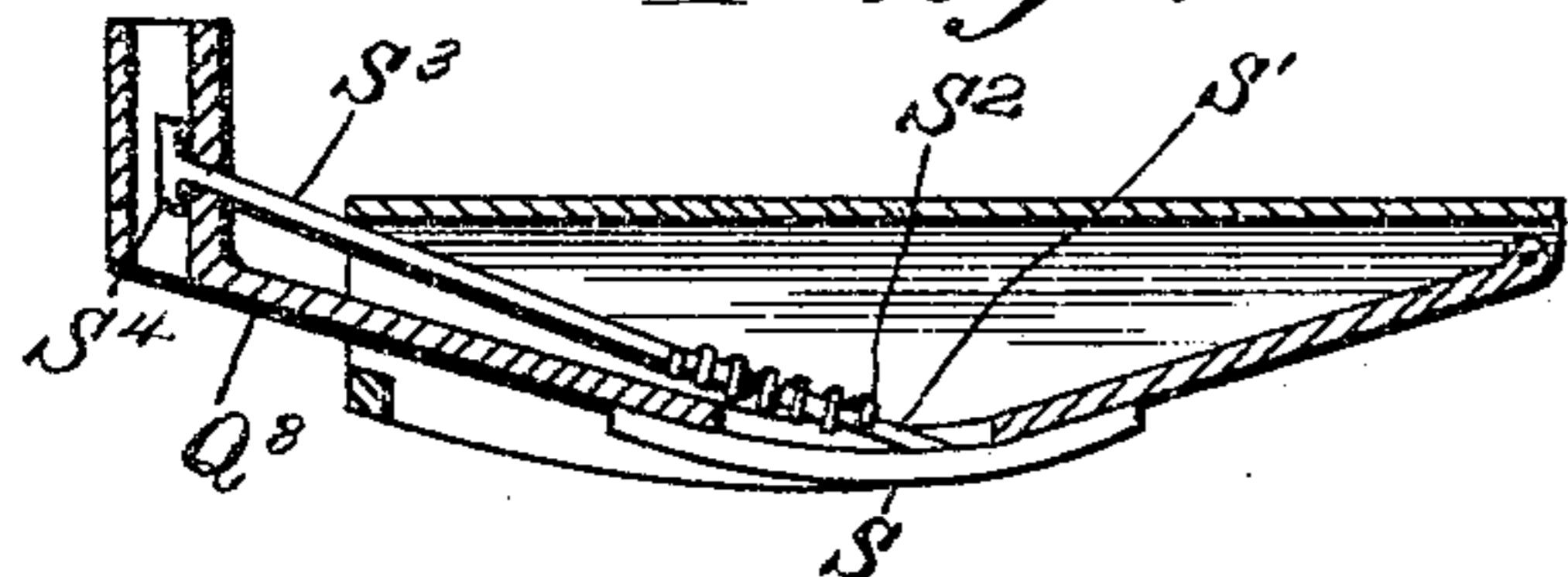


Fig. 5.

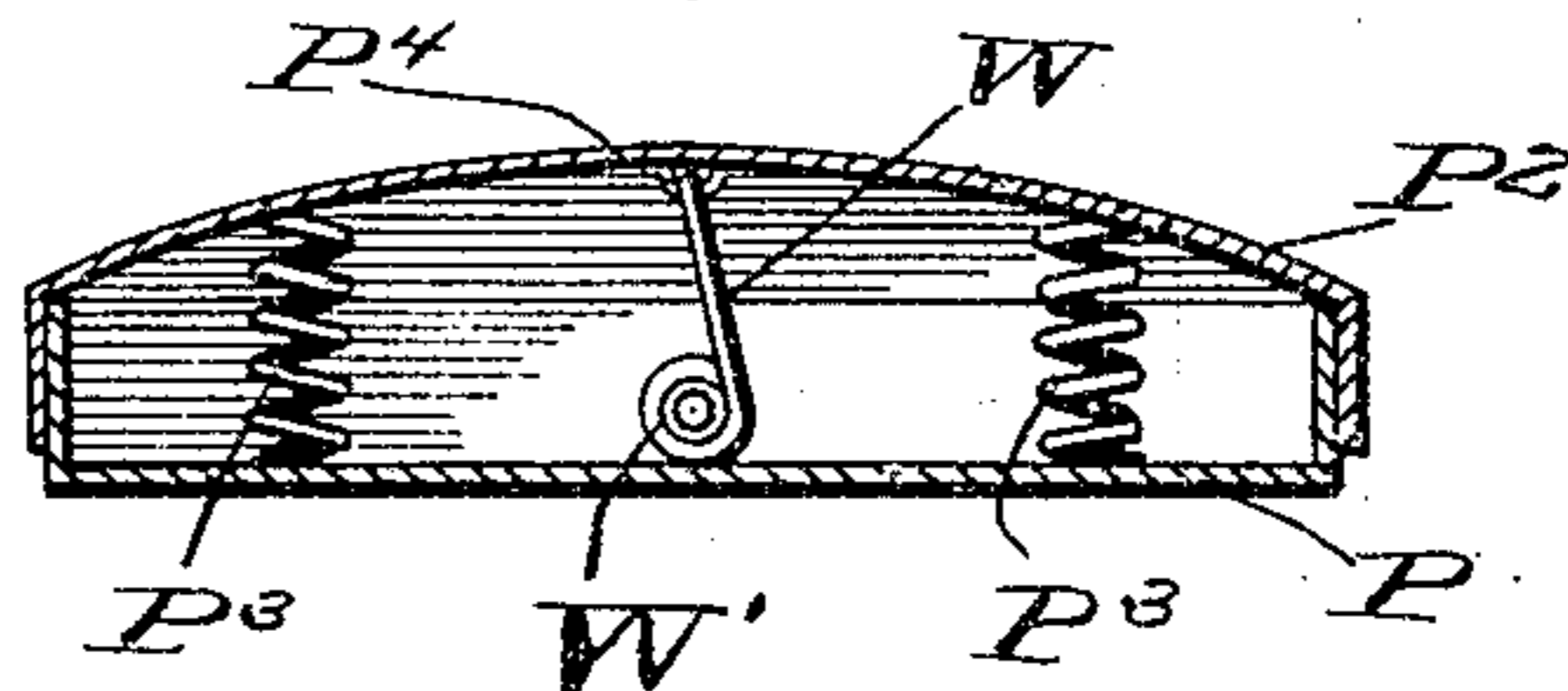
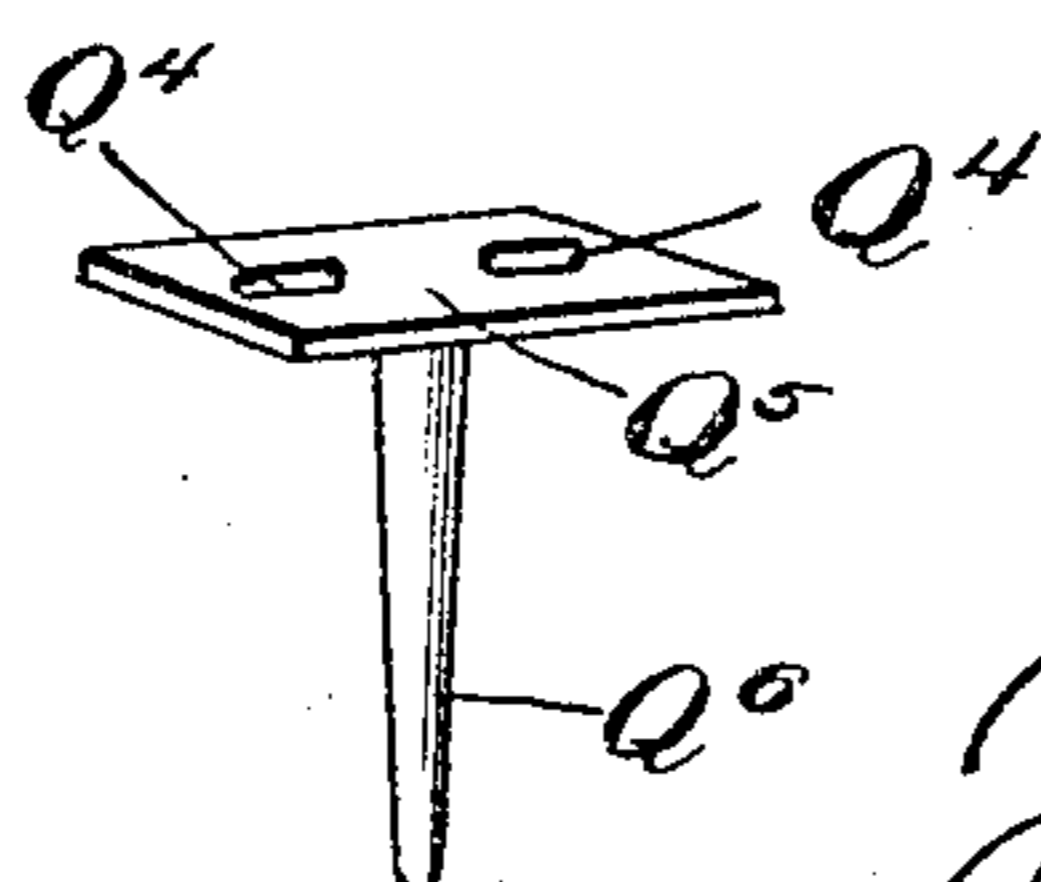
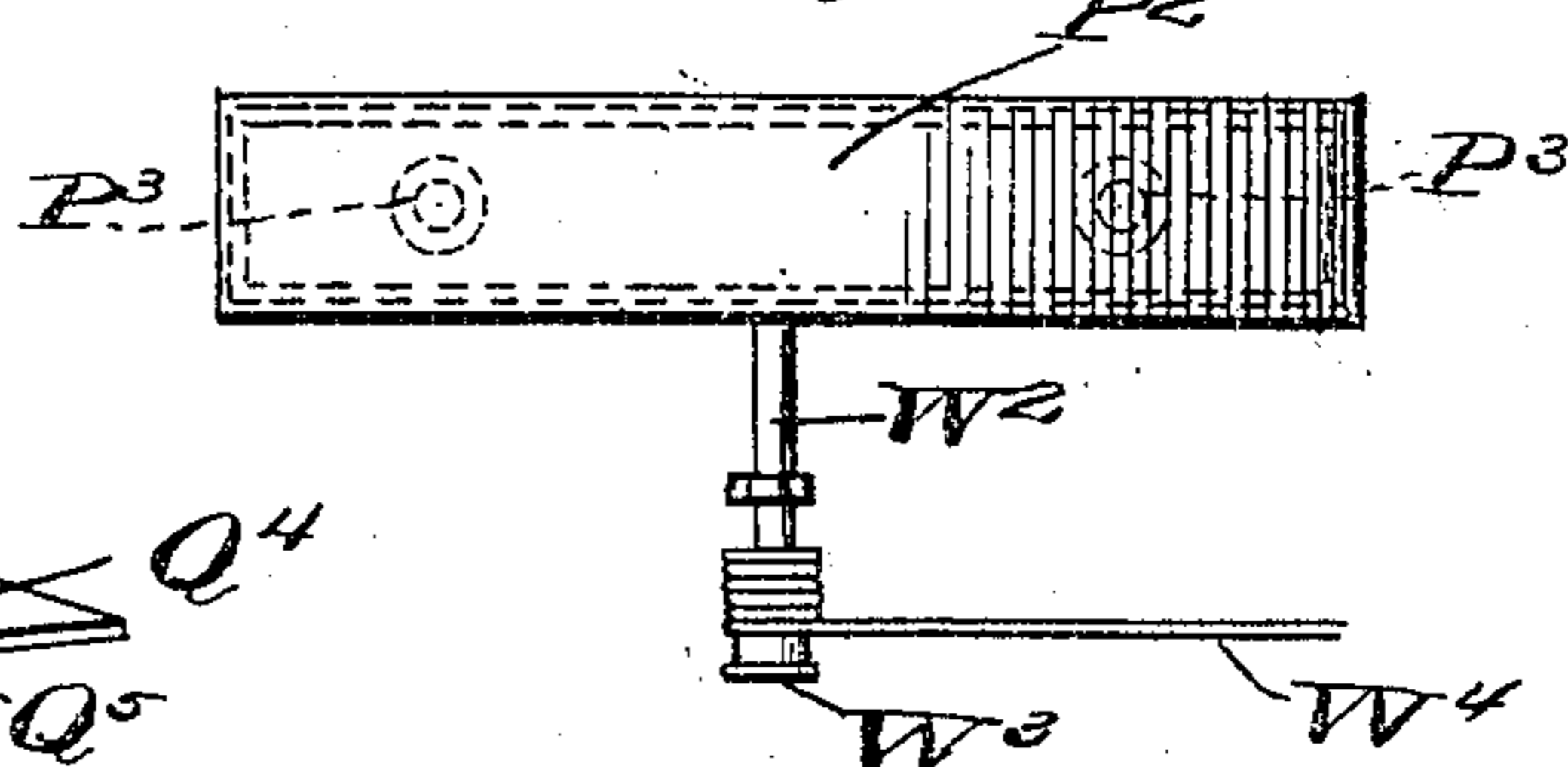


Fig. 6.



WITNESSES:

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Fig. 7.

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# UNITED STATES PATENT OFFICE.

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## LOCOMOTIVE-CAB SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 784,250, dated March 7, 1905.

Application filed January 4, 1905. Serial No. 239,651.

*To all whom it may concern:*

Be it known that I, JOHN W. CLARK, a citizen of the United States, residing at Wyoming, in the county of Kent and State of Delaware, have invented certain new and useful Improvements in Locomotive-Cab Signaling Devices; 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in signal apparatus for locomotive engineers, and the object of the invention is to produce a simple and efficient means whereby a current of electricity normally showing one color, as a white light, may be changed to a different-colored light in the event of a switch being open or for the purpose of communicating a signal to an engineer for any other purpose while the locomotive is in motion, the signaling means being arranged so as to be operated through the ordinary mechanism of a tower, whereby as the locomotive approaches the tower the apparatus may be adjusted to cause the desired signal to be made.

The invention consists in various details of construction and combinations and arrangements of parts, which will be hereinafter fully described and then specifically defined in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of my improved apparatus. Fig. 2 is a detail sectional view through a portion of the apparatus. Fig. 3 is a longitudinal sectional view through the shoe which is actuated by the trip. Fig. 4 is a detail view showing a slightly-different position of the yielding member which locks mechanism for causing the breaking and closing of the circuits. Fig. 5 is a sectional view longitudinally through the apparatus which is actuated by mechanism of a tower to cause the circuit to be broken and closed. Fig. 6 is a top plan view of the

detail shown in Fig. 5, and Fig. 7 is a detail view of the lower portion of the movable part held to the lower end of the rack-bar shown in Fig. 1.

Reference now being had to the details of the drawings by letter, A designates a boxing which may be positioned within the cab of a locomotive at any suitable location and contains two contact-points B and C, which are electrically connected with the battery D through the wires shown in Fig. 1 of the drawings. A red light (designated by letter R) and a white light (designated by letter W) are connected to said wires and are adapted to be in one circuit or the other accordingly as the lever E is in contact with one point B or the other point C, said lever E being electrically connected by means of the wire F with the battery D. The lever E is pivotally connected upon a pin E' and has a projecting finger e at its free end adapted to rest upon the hook G, formed at the end of the lever G', which is pivotally mounted upon a pin in said boxing, the upper free end of said lever G extending through an aperture in the top of the boxing and serving as a handle adapted to tilt the lever.

A spring H is fixed to the inner end of the box, and its free end bears against said lever G below its pivotal point and normally holds the same in contact with a pin g in the position shown in Fig. 1 of the drawings. Pivotaly mounted upon a pin I within the boxing is an angle-lever K, the free end of which carries an antifriction-roller K'. A spring N is connected at one end to the box and its other end to the lever K and serves to hold the same normally at its lowest limit. Mounted within said box and adapted to have a longitudinal movement upon the bottom of the latter is a bar L, to which is fixed a block L', having a beveled portion L<sup>2</sup>, which as said block is moved forward is adapted to contact with the antifriction-wheel K' and raise the lever K, by which movement the lever E may be raised from contact with one point C into contact with the other point B for the purpose of throwing either the red or the white light into circuit.

A spring J is fixed to the box and bears

yieldingly against the upper edge of the lever E and is adapted to normally hold the latter in contact with the point C, which would cause the white light to be normally lighted in the cab. A spring O is fixed at one end to the end of the box and at its other end to the block L and is adapted to normally hold the same at its farthest inward throw within the box A. Said bar L projects through an aperture in the end of the box and has secured thereto a chain M, which winds about a reel M', mounted in any suitable bearings, (not shown,) and which reel carries a pinion-wheel M<sup>2</sup>, fixed thereto. L<sup>3</sup> designates a strap through which said bar L is guided in its longitudinal movements.

Q designates a rack-bar the teeth of which are in engagement with the pinion-wheel M<sup>2</sup>. Said rack-bar has a vertical movement and is guided by the straps Q', and its lower end is flanged, as at Q<sup>2</sup>, and carries headed bolts Q<sup>3</sup>, which pass through the apertures Q<sup>4</sup> in the plate Q<sup>5</sup>, a detail view of which is shown in Fig. 7 of the drawings, said apertures Q<sup>4</sup> being elongated to allow a slight play at right angles to the length of the rack-bar. Said plate Q<sup>5</sup> is formed at the upper end of the pin Q<sup>6</sup>, which passes through the slot Q<sup>7</sup>, formed in the end of the plate Q<sup>8</sup>. Said plate Q<sup>8</sup> is pivoted within the casing R, which is fastened in any suitable manner to the truck of a locomotive and has a tilting movement within the casing limited by the top of the casing and a cross-piece R', which connects the side walls thereof.

S designates a concaved shoe, which has a sliding movement in contact with the plate Q<sup>8</sup>, and S' is a rod which is fastened to said concaved plate at one side of its center, preferably at the inclination shown in the drawings. A spring S<sup>2</sup> is fastened at one end to said rod S' and its other end to a rod S<sup>3</sup>, which projects through an aperture in the slotted portion of the plate Q<sup>8</sup> and has a T-shaped end S<sup>4</sup>, which is adapted as the shoe S moves in the direction of the free end of the plate Q to frictionally engage the lower portion of the pin Q<sup>6</sup>, which is connected to the rack-bar. The manner in which said T-shaped end of the rod engages said pin Q<sup>6</sup> is illustrated in Fig. 1 of the drawings, in which said pin is held with sufficient friction to cause the rack-bar to be pushed up as the plate carrying the shoe S<sup>4</sup> is tilted up in a manner presently to be described.

P designates a boxing, which is adapted to be positioned between the rails of a railway and upon the ties P', as shown in Fig. 1 of the drawings, and P<sup>2</sup> designates a flanged cover to said boxing, which is adapted to have a vertical play, being mounted upon the springs P<sup>3</sup>, which rest upon the bottom of the boxing. The outer surface of said cover is convexed, as will be readily seen, and an eye P<sup>4</sup> is fastened to the under concaved surface of the

top, and a cable W is fastened to said eye P<sup>4</sup> and winds about a reel W', which is mounted between the side walls of the boxing. A shaft W<sup>2</sup> projects from said reel, as shown in Fig. 6 of the drawings, and a second reel W<sup>3</sup> is fastened to the outer end of the shaft. A cable W<sup>4</sup> is secured to and winds about the reel W<sup>3</sup> and its other end is adapted to be secured to and actuated by any mechanical apparatus commonly employed in connection with signaling towers, whereby when switches are thrown open the rope may be drawn for the purpose of rotating the reels and pulling down or allowing the concaved cover to the boxing to be raised to its highest limit accordingly as it may be desired to cause the signal apparatus to be actuated for displaying a white light or a red light. As any form of mechanism commonly employed upon signal-towers may be utilized to actuate the trip member, which constitutes the yielding cover referred to, it is not thought necessary to illustrate the same.

The operation of my apparatus is as follows: In the form shown in Fig. 1 of the drawings the lever E is in contact with the point C, which throws into circuit with the battery the white light, which normally is displayed. In the event of the locomotive equipped with my apparatus passing over a portion of a railway in which the switch is open the switch operator in a signal-tower will operate his mechanism so as to cause the trip member to be raised a sufficient distance so that as a locomotive passes over the same the shoe S will contact with the concaved top of said trip member and the shoe S will be moved slightly rearward sufficient to cause the T-shaped end of the rod S<sup>3</sup> to frictionally engage the pin Q<sup>6</sup>, after which the rear slotted end of the plate Q<sup>8</sup> will rise slightly and with it the rack-bar, and through the gear connection with the pinion-wheel M<sup>2</sup> the reel M' will be caused to rotate and a longitudinal movement imparted to the block L'. As the block L' moves forward the antifriction-wheel K', riding up the inclined portion of the block L', will cause the lever K to raise the lever E from contact with the point C and into contact with the point B, which will cause the circuit to be through the red light, thereby displaying the red light instead of the white one, which will indicate to the engineer that the switch is open. After the signal has been made and it is desired to return the apparatus to its normal position the engineer may tilt the lever G, which will allow the hook at the end thereof to disengage the lever E and the spring J will return said lever E to the position shown in Fig. 2 of the drawings, and as said lever E breaks the circuit disclosing the red light it will come in contact with the point C, and the normal white light will be again disclosed.

It will be observed on reference to Fig. 7 of

the drawings that the slots  $Q^4$  are somewhat elongated for the purpose of allowing a slight lateral play to the pin  $Q^6$  as the plate  $Q^8$  tilts upon its pivot. It will also be observed that

5 by the construction of the apparatus showing the coil-spring  $S^2$  all vibration incident to the movement of a locomotive over a railway when traveling at different speeds will be taken up by said spring.

10 While I have shown a particular form of apparatus illustrating my invention, it will be understood that I may vary the details of the same, if desired, without in any way departing from the spirit of the invention.

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

1. A signaling apparatus for engineers of locomotives comprising two contact-points, 20 a battery electrically connected with said points, a pivotal lever adapted to have a play between said points and electrically connected with the battery, lights of different colors adapted to be displayed when said lever is in 25 contact with one point or the other, a shoe adapted to be carried by a locomotive, a trip member for raising said shoe, connections intermediate the same and said lever for raising and lowering the same from one contact- 30 point to the other as set forth.

2. A signaling apparatus for engineers in cabs comprising contact-points, a battery and electrical connections between the same and said points, a lever electrically connected 35 with said battery and adapted to have a play intermediate said points, lights of different colors adapted to be displayed when said lever is in contact with one point or the other, a shoe and means for carrying the same upon 40 a locomotive, a trip adapted to contact with said shoe to raise the latter, connections intermediate said shoe and pivotal lever, whereby the latter may be raised from contact with one point to the other point, and means 45 for holding said lever in a raised position, as set forth.

3. An apparatus for signaling engineers in cabs comprising a pivotal lever, contact- 50 points between which said lever has a play, a battery and electrical connections between the same and said points, electrical connections between said lever and battery, a shoe, means secured to the locomotive for carrying said shoe, a trip member adapted to raise 55 said shoe, a rack-bar actuated by said shoe, a reel actuated by said rack-bar, mechanism intermediate said reel and lever for raising the latter from one contact-point to the other, and different-colored lights in the elec- 60 tric circuit, as set forth.

4. An apparatus for signaling engineers in cabs comprising a pivotal lever, contact- 65 points between which said lever has a play, a battery and electrical connections between the same and said points, electrical connec-

tions between said lever and battery, a shoe, means secured to the locomotive for carrying said shoe, a trip member adapted to raise said shoe, a rack-bar actuated by said shoe, a 70 reel actuated by said rack-bar, a movable block actuated by said reel, and mechanism intermediate said block and lever for raising the latter from one contact-point to the other, and different-colored lights in the electric circuit, as set forth. 75

5. An apparatus for signaling engineers in cabs comprising a pivotal lever, contact- points between which said lever has a play, a battery and electrical connections between the same and said points, electrical connec- 80 tions between said lever and battery, a shoe, means secured to the locomotive for carrying said shoe, a trip member adapted to raise said shoe, a rack-bar actuated by said shoe, a reel actuated by said rack-bar, a movable 85 block actuated by said reel, a second lever, an antifriction-wheel carried thereby and adapted to be actuated by said block whereby said second lever may be raised to throw the first- mentioned lever from contact with one point 90 to the other, and different-colored lights in the electric circuit, as set forth.

6. A signaling apparatus for engineers in cabs of locomotives comprising a pivotal le- 95 ver, contact-points between which said lever is mounted, a battery and electrical connections between the same and said points, electrical connections between said lever and bat- tery, a movable block having an inclined por- 100 tion, a pivotal angle-lever, an antifriction-wheel journaled at the free end of said angle-lever and adapted to ride upon the inclined surface of said block, a shoe, means carried 105 by the locomotive for supporting said shoe, mechanism intermediate the shoe and said block for actuating the latter, whereby the levers may be raised, and lights of different colors adapted to be displayed as the lever having electrical connection with the battery 110 is raised or lowered, and trip mechanism for actuating the shoe, as set forth.

7. A signaling apparatus for engineers of locomotives comprising a battery, contact- 115 points electrically connected therewith, a lever pivotally mounted between said points and having electrical connection with the bat- tery, lights of different colors electrically con- 120 nected with the battery, a lever pivotally mounted between said points and electrically connected with the battery, a shoe, and means carrying the same secured to the loco- motive, said shoe adapted to have a longi- 125 tudinal movement, a rack-bar, means intermediate the same and said lever for raising the same as the rack-bar is raised, frictional- actuated mechanism intermediate said shoe and rack-bar for raising the latter, and trip mechanism for actuating the shoe, as set forth.

8. A signaling apparatus for engineers of 130

locomotives comprising a battery, contact-points electrically connected therewith, a lever pivotally mounted between said points and having electrical connection with the battery, lights of different colors electrically connected with the battery, a lever pivotally mounted between said points and electrically connected with the battery, a shoe, and means carrying the same secured to the locomotive, said shoe adapted to have a longitudinal movement, a rack-bar, means intermediate the same and said lever for raising the same as the rack-bar is raised, a casing adapted to be secured to a locomotive, a plate pivoted to said casing, a shoe adapted to have a sliding contact with said pivotal plate, a friction-rod actuated by said shoe and adapted to contact with said rack-bar to cause the latter to rise as the plate is tilted, and trip mechanism for actuating the shoe, as set forth.

9. A signaling apparatus for engineers of locomotives comprising a battery, contact-points electrically connected therewith, a lever pivotally mounted between said points and having electrical connection with the battery, lights of different colors electrically connected with the battery, a lever pivotally mounted between said points and electrically connected with the battery, a shoe, and means carrying the same secured to the locomotive, said shoe adapted to have a longitudinal movement, a rack-bar, means intermediate the same and said lever for raising the same as the rack-bar is raised, a casing adapted to be secured to a locomotive, a plate pivoted to said casing, a shoe adapted to have a sliding contact with said pivotal plate, a rod secured to said shoe, a spring secured at one end to said rod, a second rod fastened to said spring, and having a T-

shaped end, a movable pin secured to the rack-bar and entering a slot in said plate, and adapted to be frictionally engaged by the T-shaped end of said rod, and a trip for actuating the shoe, as set forth.

10. A signaling apparatus for engineers of locomotives comprising a battery, contact-points electrically connected therewith, a lever pivotally mounted between said points and having electrical connection with the battery, lights of different colors electrically connected with the battery, a lever pivotally mounted between said points and electrically connected with the battery, a shoe, and means carrying the same secured to the locomotive, said shoe adapted to have a longitudinal movement, a rack-bar, means intermediate the same and said lever for raising the same as the rack-bar is raised, a casing adapted to be secured to a locomotive, a plate pivoted to said casing, a shoe adapted to have a sliding contact with said pivotal plate, a rod secured to said shoe, a spring secured at one end to said rod, a second rod fastened to said spring, and having a T-shaped end, the lower end of said rack-bar having a flared portion, bolts carried in apertures in said flared portion, a plate having an elongated slot adapted to be slidingly connected to said bolts, a pin projecting from said slotted plate and engaging a slot in said pivotal plate and adapted to be engaged by the T-shaped end of said rod, and trip mechanism for actuating said shoe, as set forth.

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

JOHN W. CLARK.

Witnesses:

MYRA L. ALDRICH,  
C. S. FISHER.