

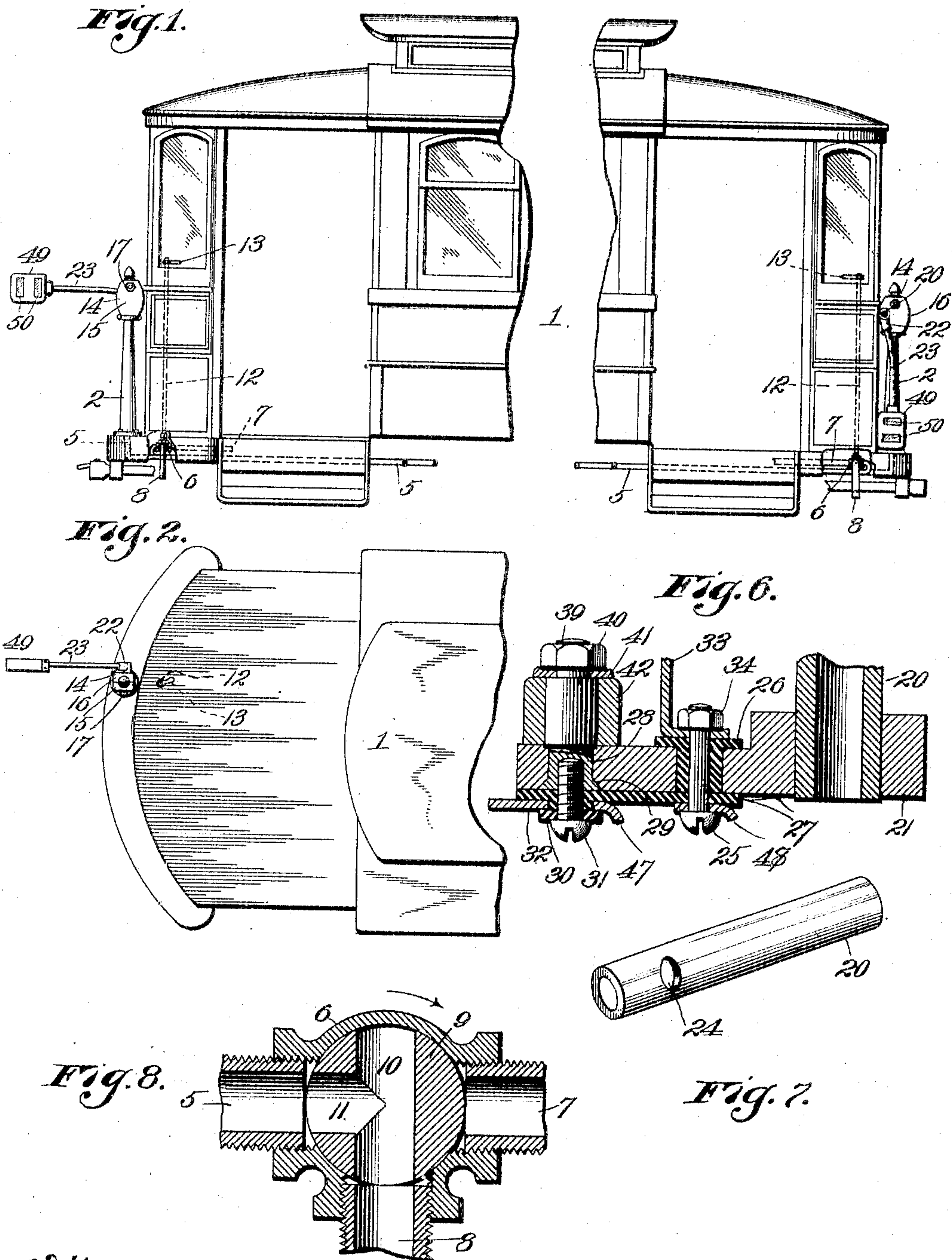
No. 776,843.

PATENTED DEC. 6, 1904.

J. H. HOWARD.  
STREET CAR SIGNAL.  
APPLICATION FILED SEPT. 27, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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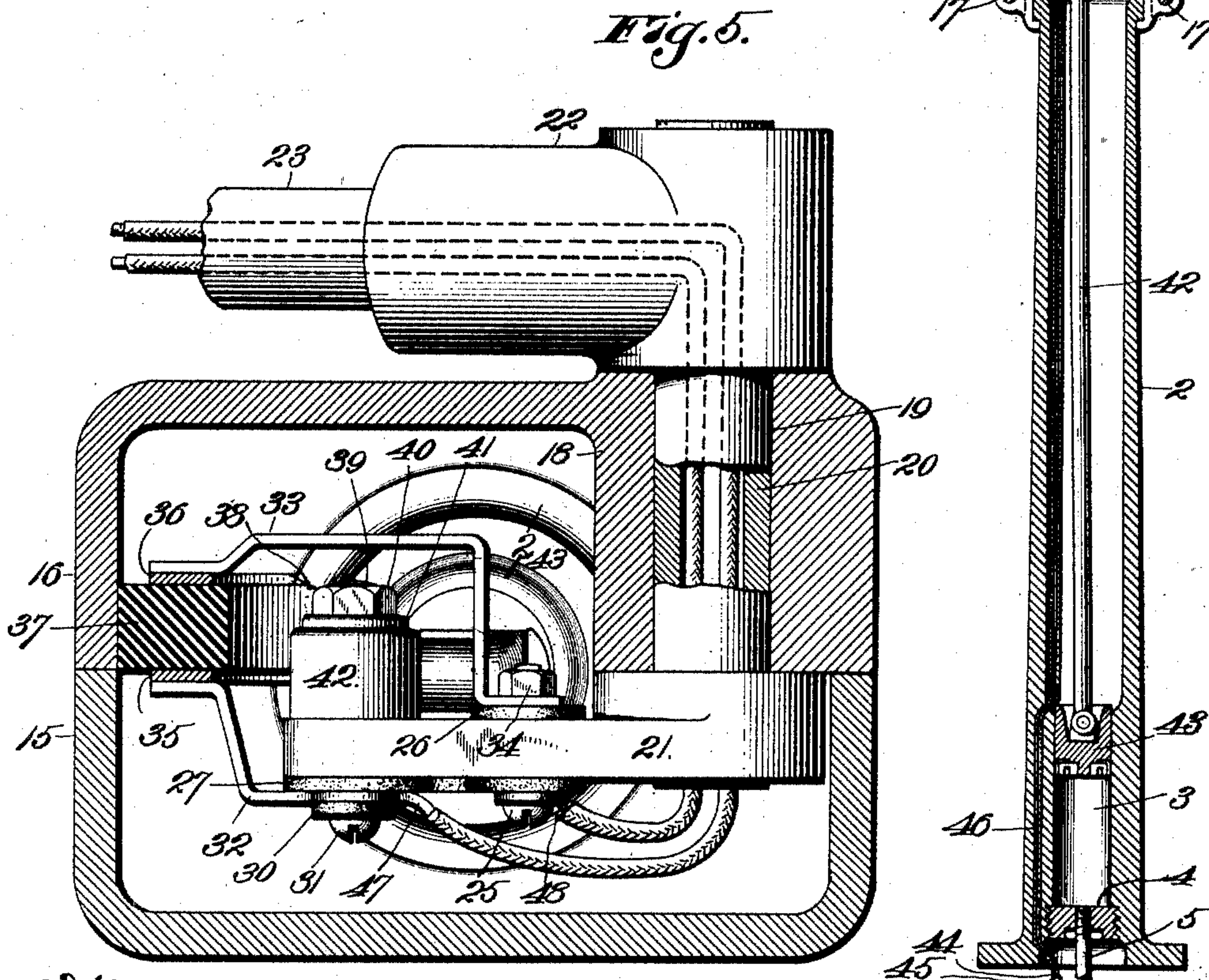
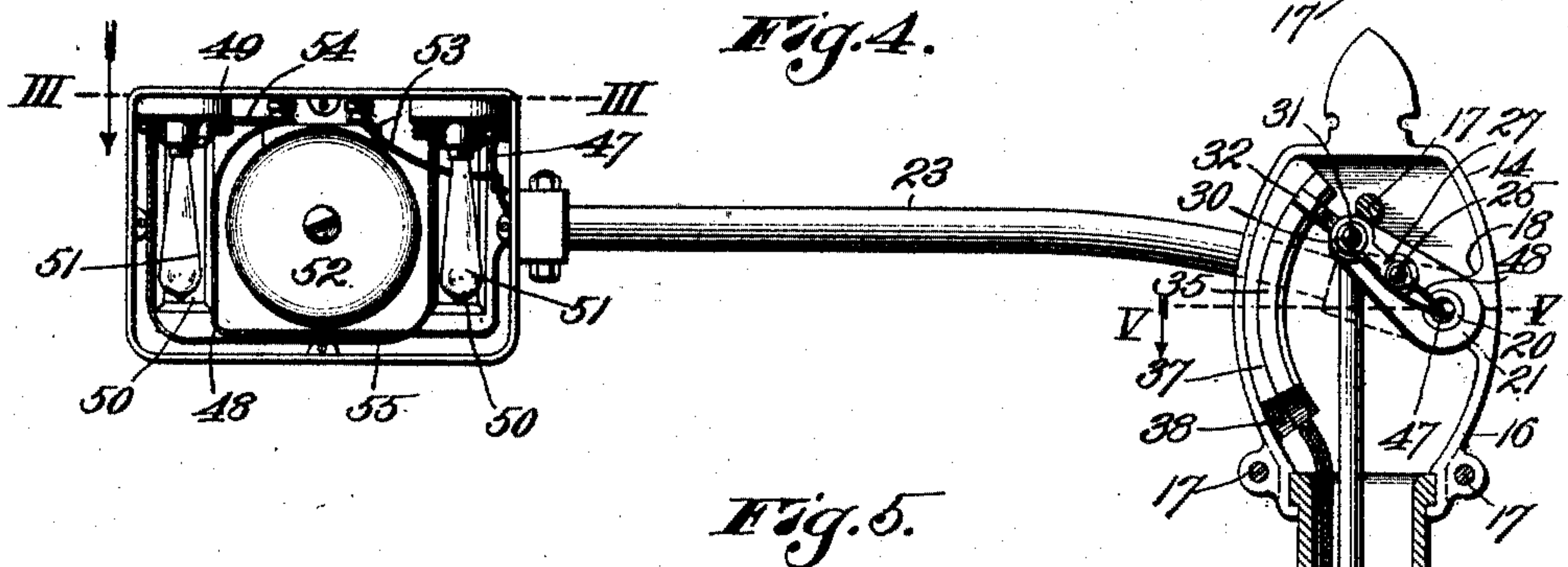
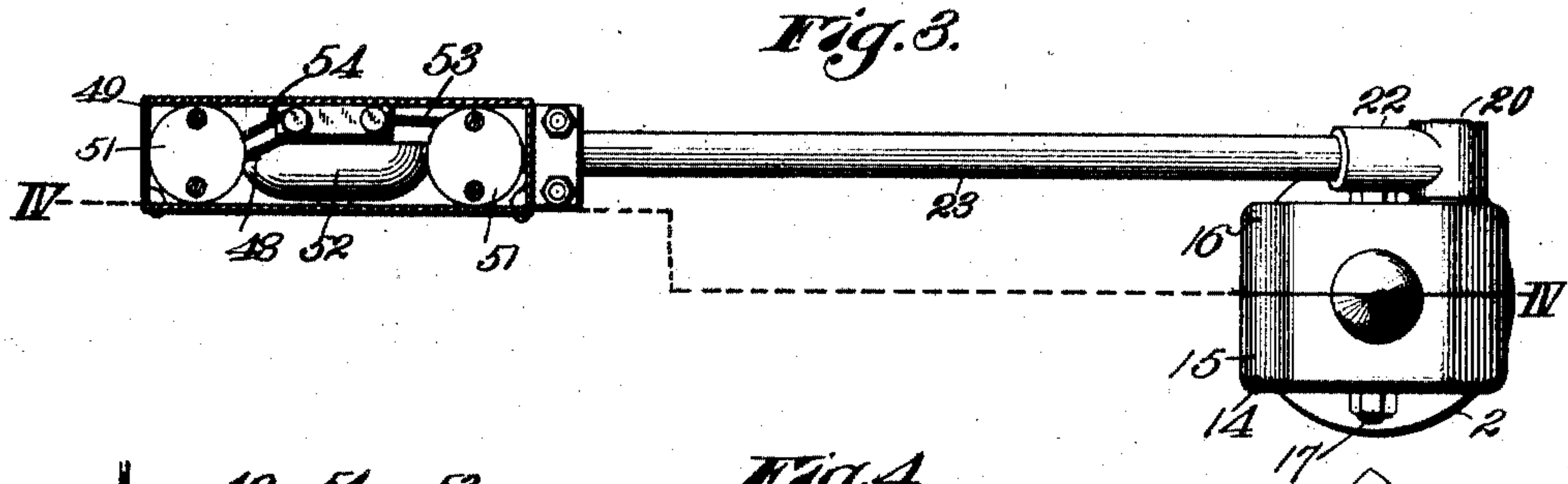
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Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES H. HOWARD, OF KANSAS CITY, KANSAS.

## STREET-CAR SIGNAL.

SPECIFICATION forming part of Letters Patent No. 776,843, dated December 6, 1904.

Application filed September 27, 1904. Serial No. 226,164. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. HOWARD, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Street-Car Signals, of which the following is a specification.

This invention relates to street-car signals, and more especially to a signal disposed at the rear end of a car and adapted when "set" by the motorman thereof to indicate to a person attempting to cross the track behind the car that a car is about to pass in the opposite direction on the adjacent track, a signal of this character being a desideratum because of the numerous accidents which occur owing to the thoughtlessness with which persons leaving a car attempt to immediately cross the track behind it.

A still further object is to produce a combined visual and audible signal of the character outlined.

To these ends the invention consists in certain novel and peculiar features of construction and organization, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a street-car equipped with signal mechanism embodying my invention, the car being broken away so as to disclose an inoperative signal at the front end of the car and a signal set at the rear end. Fig. 2 is a top plan view of the rear end of the car. Fig. 3 is an enlarged section on the line III III of Fig. 4. Fig. 4 is a section taken on the line IV IV of Fig. 3. Fig. 5 is a horizontal section taken on the line V V of Fig. 4, but with the crank-arm therein disposed horizontally, said section being on a much larger scale than Figs. 3 and 4. Fig. 6 is a horizontal section of said crank-arm and the end of the shaft on which it is mounted. Fig. 7 is a detail perspective view of said shaft. Fig. 8 is a horizontal section of a three-way valve for controlling the operation of the signal.

In the said drawings, 1 designates an electric street-car of the usual or any preferred type and adapted to be equipped with the cus-

tomary or any preferred air-brake mechanism. Mounted upon each bumper of the car (provided such car is of that type where the motorman changes his position from one end of the car to the other at the end of each trip) is a tubular standard 2, having its lower end formed with an air-cylinder 3, closed at its lower end by an apertured plug 4, said plug being connected by a pipe 5 with a valve-casing 6, connected also to an air-supply pipe 7 diametrically opposite pipe 5, and between the pipes the casing is also provided with an air-discharge pipe 8.

9 designates a valve mounted in said casing and having a diametric passage 10 normally registering with the discharge-pipe and a radial passage 11 communicating with said passage 10 and normally registering at its opposite end with pipe 5. This valve is mounted at the lower end of a suitably-supported rod 12, provided with a handle 13 at its upper end for manipulation by the motorman in order that he may operate the valve in the direction indicated by the arrow, Fig. 8, and thus synchronously dispose passage 10 in alignment with pipes 5 and 7, and thus establish communication between said pipes and cut out of communication with the first-named pipe the discharge-pipe 8 for a purpose which hereinafter appears.

Surmounting and communicating with the upper end of tubular standard 2 is a hollow casing or head 14, said head being preferably composed of two sections 15 and 16, bolted together, as at 17, section 16 being provided with an internal boss 18, having a horizontal cylindrical passage 19, wherein is journaled a short tubular shaft 20, and secured rigidly upon the inner end of said shaft in any suitable manner is a crank-arm 21 and upon the outer end of said shaft a T-coupling crank-arm 22, the stem of said crank-arm having a tubular extension 23 registering with a hole 24 in the tubular shaft 20.

25 is a bolt rigidly carried by the crank-arm 21 and insulated from the same by headed plug 26 and plate 27. 28 is a bolt carried by arm 21 and having its head countersunk in said arm, as at 29, and screwed into the headed end of said bolt and extending through the



insulated plate 27 and an insulating-washer 30 is a bolt 31, a contact-arm 32 being clamped rigidly between said insulating-plate and washer by bolt 31, as shown. A second contact-arm 33 is secured on bolt 25 against insulating-plug 26 by a clamping-nut 34 engaging said bolt, the ends of said contact-arms 32 and 33, respectively, being adapted for engagement with a pair of contact-strips 35 and 36, secured rigidly to opposite sides of an insulating-block 37, secured by preference to section 16 of the standard-head and with said strips 35 and 36 extending concentrically of the axis of shaft 20, the lower ends of said insulating-block 37 and strips 35 and 36 tapering inwardly, as at 38, in order that said contact-arms may at times be thrown out of engagement with said strips—that is to say, be out of engagement with said strips when the extension 23 occupies a pendent position, as shown at the front end of the car in Fig. 1, which position is its normal position.

Pivoted at its upper end to bolt 39 and held thereon by nut 40 and washer 41 is a rod 42, which depends into the standard 2 and is pivotally connected at its lower end to a piston 43, disposed in cylinder 3, so that when said piston is forced upward by air passing from supply-pipe 7 through passage 10 and pipe 5 into the cylinder said crank-arm 21 shall be swung upwardly to raise the extension-arm 23 to approximately a horizontal position, this upward movement being limited by one of the bolts 17, which is disposed in the path of said arm 21, as shown clearly in Fig. 4.

44 and 45 designate insulated conductors or wires extending up through passage 46 in standard 2 to a point above cylinder 3 and thence upward through the main passage of the standard to the lower ends, respectively, of contact-strips 35 and 36, the lower ends of said conductors being adapted to be in circuit with the current supplied for the propulsion of the car in any suitable or well-known manner.

47 and 48 designate insulated conductors electrically connected at one end respectively to contact-arms 32 and 33 and extending thence through the tubular shaft 20 and the hole 24 thereof and through the tubular extension 23 of crank-arm 22.

Mounted rigidly upon the outer end of said extension 23 is a substantially oblong casing 49, having in its sides and near its opposite ends mica-covered or other transparent windows 50, and between said windows are suitably-supported incandescent lamps 51 of any preferred type. Between the lamps is suitably supported an electromagnetic bell 52. Wire 47 leads to one of the lamps and by a branch wire 53 to the bell. Wire 48 leads to the other side of the bell and thence, as at 54, to the other lamp, a wire 55 connecting the opposite sides of the lamps together. It will thus be seen that the lamps are connected in

series and the bell in multiple, so that the breaking of a filament in either lamp or both will not interfere with the operation of the bell. Under ordinary conditions the current will pass through the lamps and the bell, though in the day-time the ignition of the lamps will hardly be apparent, the noise produced by the bell being depended upon chiefly to attract the attention of a person crossing in the rear of the car to the fact that the signal is set and that a car is about to pass on the other track. At night the light produced by the lamps will be a factor as important as the bell in notifying such persons that a car is about to pass on the other track, and the fact that the light is discernible from either side of the casing will serve to notify a person running for the car on which the signal is set from the off side of the street of the approach of a car on the other track, though, of course, an accident rarely occurs under such circumstances, because the approaching car is generally seen.

The practical operation is as follows: The motorman who has been signaled to stop his car and who is of course in a position to see an approaching car turns handle 13, so as to introduce air into cylinder 3, the handle being manipulated to set the signal slowly or quickly, as desired. Shortly after the extension-arm begins to move upward the contact-arms 32 and 33 come into engagement with contact-strips 35 and 36, respectively, so that the light is flashed and the bell begins to ring before the car is stopped, though, of course, this depends on the motorman, who may prefer to set his signal just as the car stops. After the motorman has been given the signal to proceed and starts his car he reverses the manipulation of handle 13, so as to restore valve 9 to the position shown in Fig. 8, and thus permit the weight of the elevated parts to effect the discharge of the air through pipe 8 to the atmosphere, it being understood, of course, that the extension 23 will not swing down and be arrested with any shock or jar because of the fact that the air is escaping at a slower proportionate speed from the cylinder than that with which the extension and arm tend to fall.

It will be understood, of course, that the valve disposed at the front end of the car is the one that is connected to the signal mechanism at the rear end, and consequently the signal mechanism at the front end of the car is not operated.

From the above description it will be apparent that I have produced a street-car signal to guard against danger from the causes mentioned which operates efficiently and reliably and which is obviously susceptible of modification in various particulars without departing from the spirit and scope of the invention. It will be furthermore apparent that any equivalent means, electrical or me-



chanical, for instance, may be used in lieu of the compressed air for throwing the signal to operative or permitting it to resume its in-operative position.

5 Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a street-car signal, a shaft, an arm carried thereby, a casing carried by said arm and provided with a window, an electric signal in the casing and electric conductors therefor, means for projecting said arm rearwardly from the car in substantially a horizontal position, contacts, contact-arms in circuit with the conductors and movable with said shaft, and means for operating said shaft and throwing said contact-arms in circuit with said contacts.

2. In a street-car signal, a shaft, an arm carried thereby, a casing carried by said arm and provided with a window, an electric signal in the casing and electric conductors therefor, means for projecting said arm rearwardly from the car in substantially a horizontal position, contacts, contact-arms in circuit with the conductors and movable with said shaft, means for operating said shaft and throwing said contact-arms in circuit with said contacts, and means for effecting the disengagement of said contact-arms with said contacts.

3. In a street-car signal, a shaft, an arm carried thereby, a casing carried by said arm and provided with a window, conductors, a plurality of electric lamps in the casing and connected in series with said conductors, an electromagnetic bell in the casing and connected in multiple with said conductors and lamps, means for projecting said arm rearwardly from the car in substantially a horizontal position, contacts, contact-arms, in circuit with the conductors and movable with said shaft, and means for operating said shaft and throwing said contact-arms in circuit with said contacts.

4. In a street-car signal, a suitable support, insulated contact-strips carried thereby, a shaft journaled on said support and provided with a pair of crank-arms, insulated contact-arms carried by one crank-arm and each adapted to engage a contact-strip, a casing containing a sound-producing signal and one or more light-producing signals, conductors connecting said signals with said contact-arms, and means for operating said shaft and causing said contact-arms to engage said strips.

5. In a street-car signal, a suitable support, insulated contact-strips carried thereby, a shaft journaled on said support and provided with a pair of crank-arms, insulated contact-arms carried by one crank-arm and each adapted to engage a contact-strip, a casing containing a sound-producing signal and one or more light-producing signals, conductors connecting said signals with said contact-arms, an air-cylinder, a piston therein and linked to one

of said crank-arms, and means to operate said piston.

6. In a street-car signal, a suitable support, insulated contact-strips carried thereby, a shaft journaled on said support and provided with a pair of crank-arms, insulated contact-arms carried by one crank-arm and each adapted to engage a contact-strip, a casing containing a sound-producing signal and one or more light-producing signals, conductors connecting said signals with said contact-arms, an air-cylinder, a piston therein and linked to one of said crank-arms, an air-supply pipe, a valve-casing thereon and provided with a discharge-passage, a pipe connecting said casing with the air-cylinder, and a valve in such casing and adapted to open up communication between the supply-pipe and the cylinder or between the cylinder and the discharge-passage.

7. The combination of a car having an air-supply pipe, a valve-casing thereon and provided with an escape-passage, a tubular standard on the bumper at the rear end of the car and provided with an air-cylinder, a pipe connecting said cylinder with the valve-casing, a valve in the casing to open up communication between the last-named pipe and the supply-pipe or between the cylinder and the discharge-passage, a piston in said cylinder, a casing upon the upper end of the standard, a horizontal rock-shaft journaled in the casing, a crank-arm on the inner end of said shaft and linked to the piston, curved contact-strips within and insulated from the standard-casing, conductors leading from said contact-strips down through the standard, contact-arms carried by and insulated from said crank-arm and adapted for engagement with the contact-strips, a tubular crank-arm on the outer end of said shaft, a casing upon the outer end of said arm and provided with one or more windows, electric lamps in the casing, an electric bell in the casing, and conductors connected to said contact-arms and extending through said tubular crank-arm and electrically connected to said lamps and bell.

8. The combination with a car having an air-supply pipe, a valve-casing thereon and provided with an escape-passage, a tubular standard on the bumper at the rear end of the car and provided with an air-cylinder, a pipe connecting said cylinder with the valve-casing, a valve in the casing to open up communication between the last-named pipe and the supply-pipe or between the cylinder and the discharge-passage, a piston in said cylinder, a casing upon the upper end of the standard, a horizontal tubular rock-shaft journaled in the casing and provided with a hole externally of the casing, a tubular crank-arm on the outer end of said shaft and communicating with the hole of said shaft, a casing on the outer end of said tubular crank-arm and communicating with the passage thereof, electric lamps and an electric bell in said casing, a crank-arm on the inner



end of said shaft, contact-arms carried by and insulated from the said crank-arm, insulated contact-strips adapted for engagement with said casing and adapted to be engaged by the  
5 contact-arms, and electric conductors connected to said contact-arms and extending through said shaft and the hole thereof and through said tubular crank-arm into the casing thereof and electrically connected to said lamps and  
10 bell.

9. In a street-car signal, a shaft, an arm carried thereby, a casing carried by said arm and provided with a window, an electric signal in the casing and electric conductors therefor,

means for projecting said arm from the car in substantially a horizontal position, contacts, contact-arms in circuit with said conductors and movable with said shaft, and means for operating said shaft to cause said contact-arms to slide upwardly or downwardly on said con-  
15 tacts. 20

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

JAMES H. HOWARD.

Witnesses:

H. C. RODGERS,  
G. Y. THORPE.