

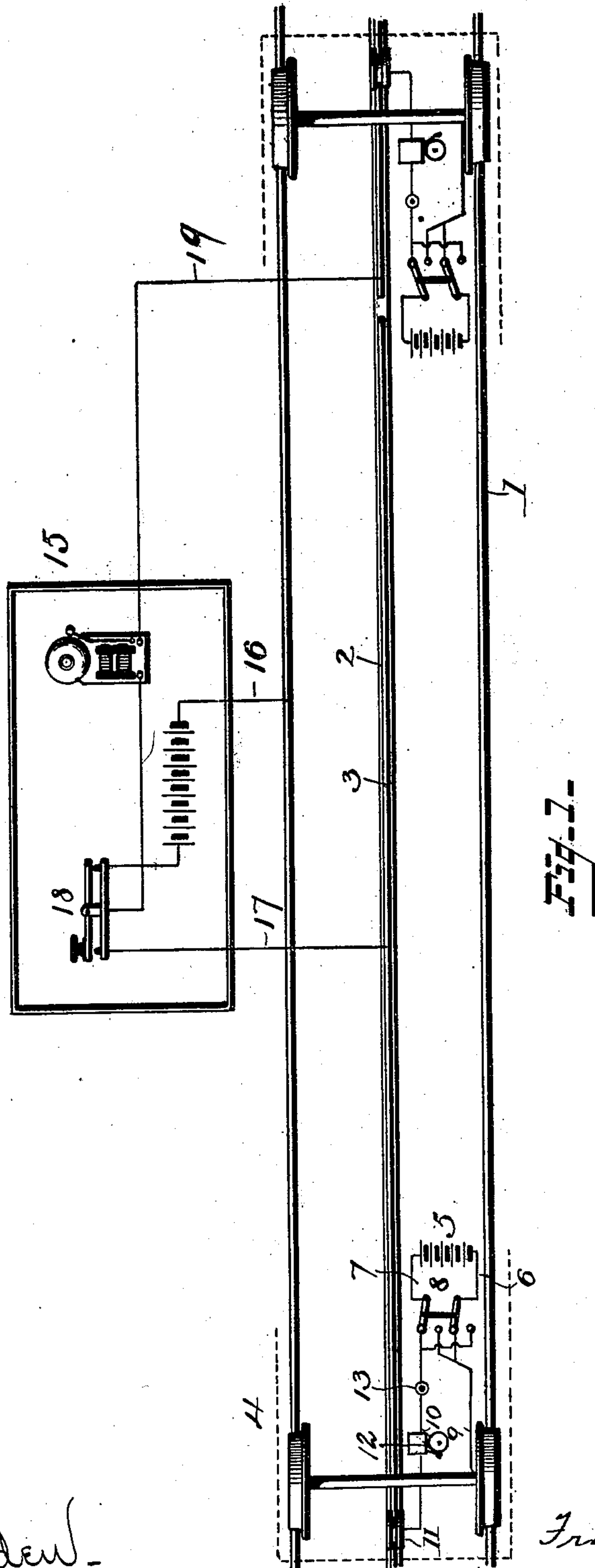
(No Model.)

3 Sheets—Sheet 1.

F. E. SEAGRAVE.
ELECTRIC RAILWAY SIGNAL.

No. 504,542.

Patented Sept. 5, 1893.



Witnesses
Albert Spinden.
R. H. Elliott.

Inventor
Frank E. Seagrave
By his Attorney
William Webster.

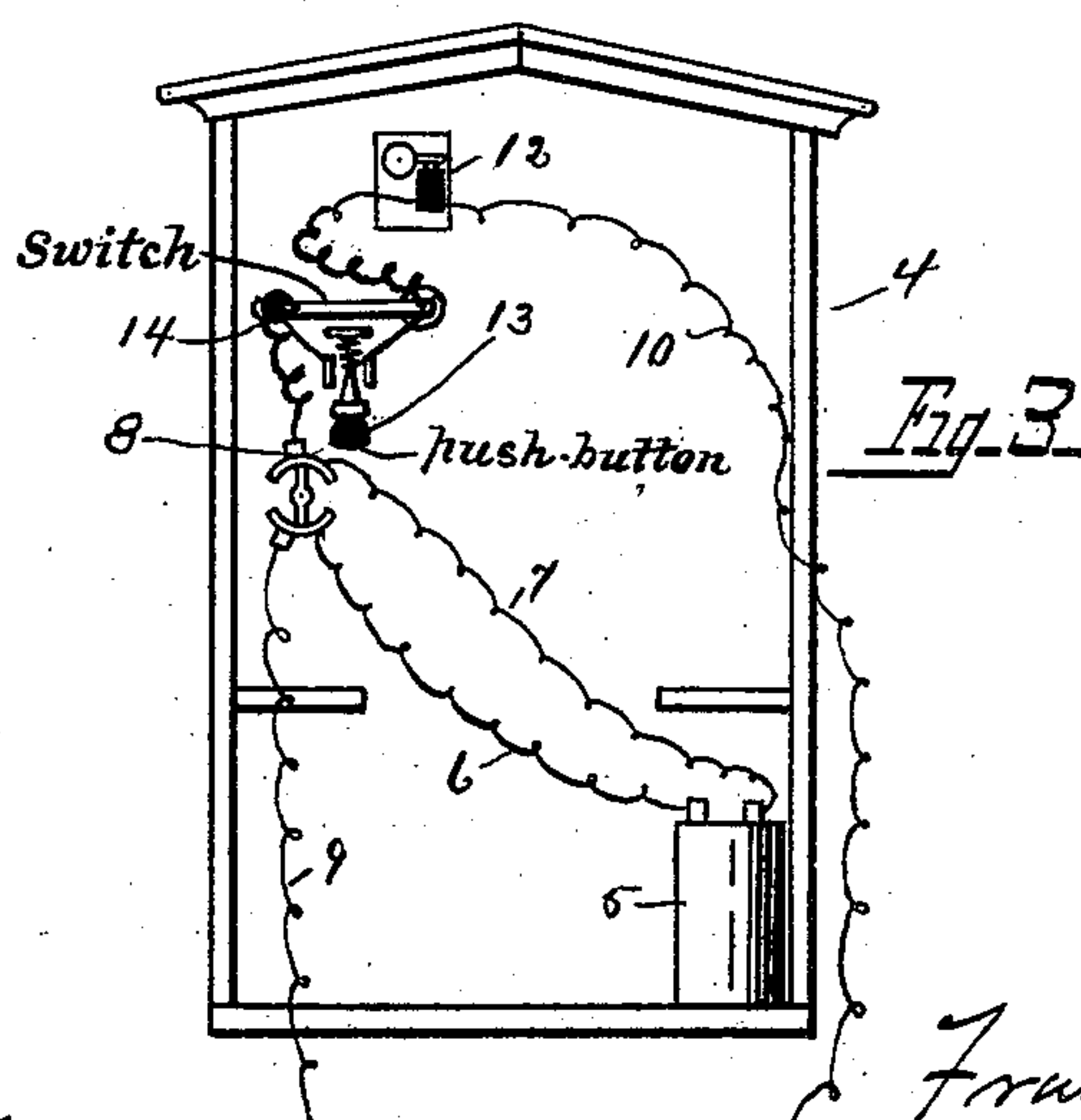
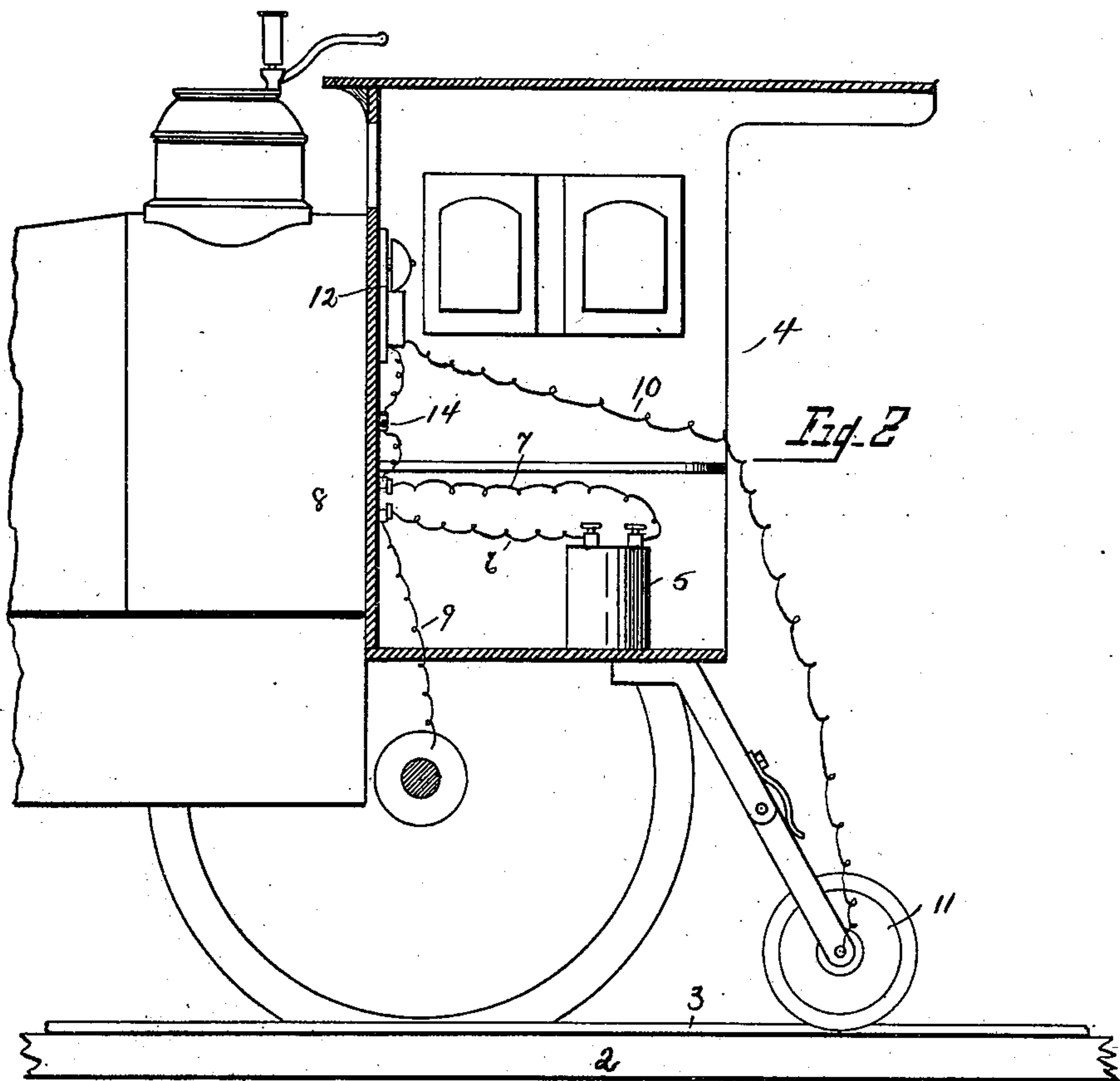
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WITNESSES

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(No Model.)

3 Sheets—Sheet 3.

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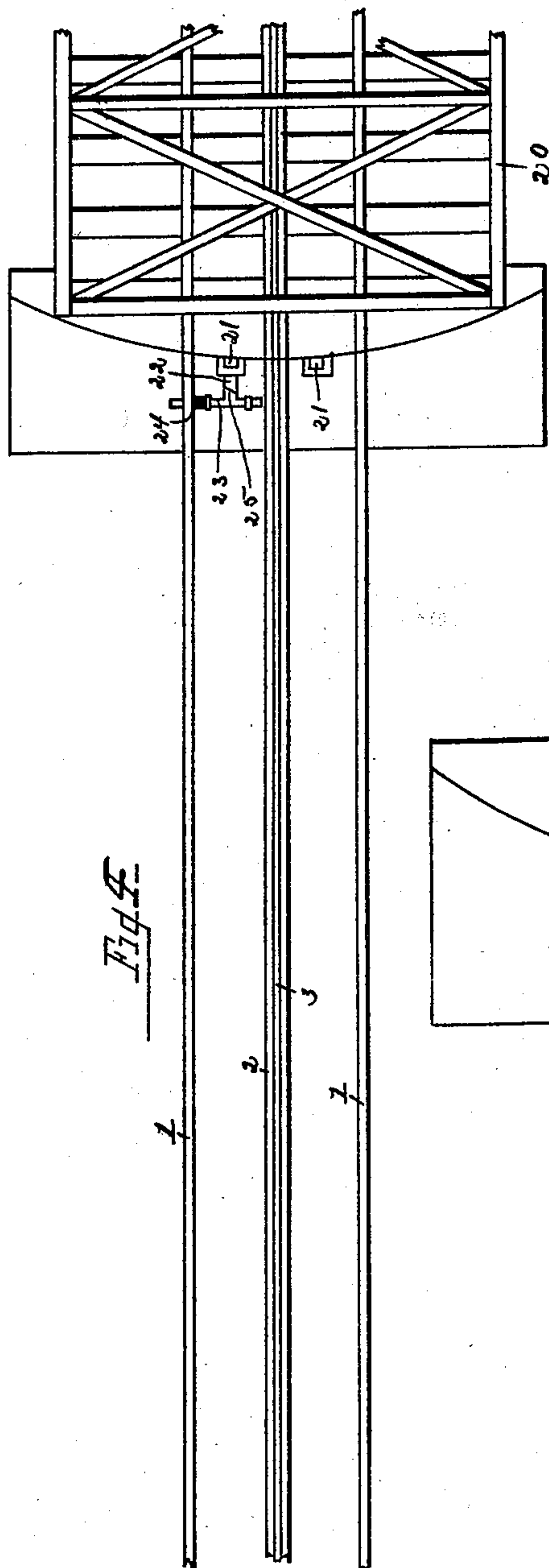


Fig. 4.

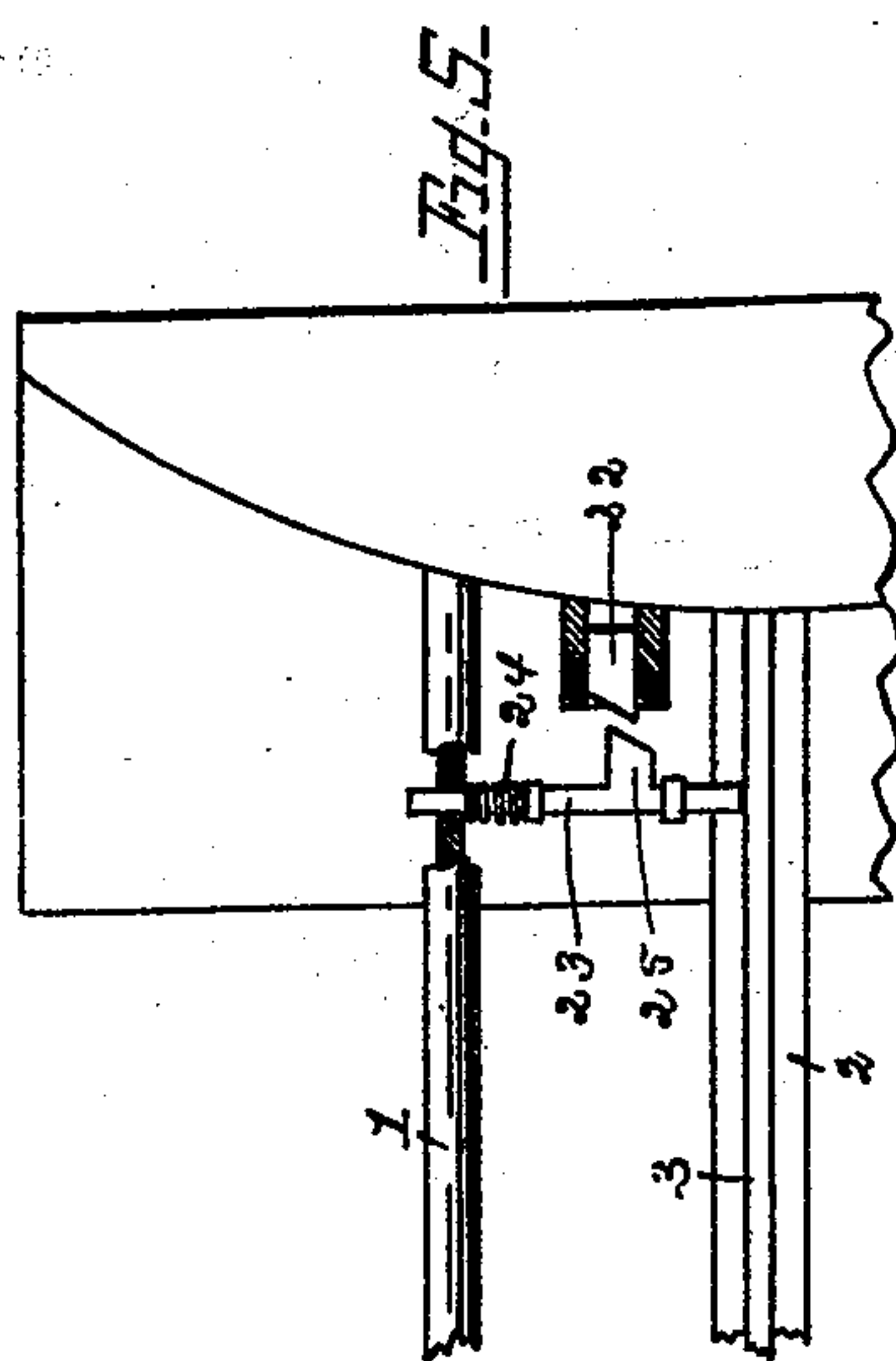


Fig. 5.

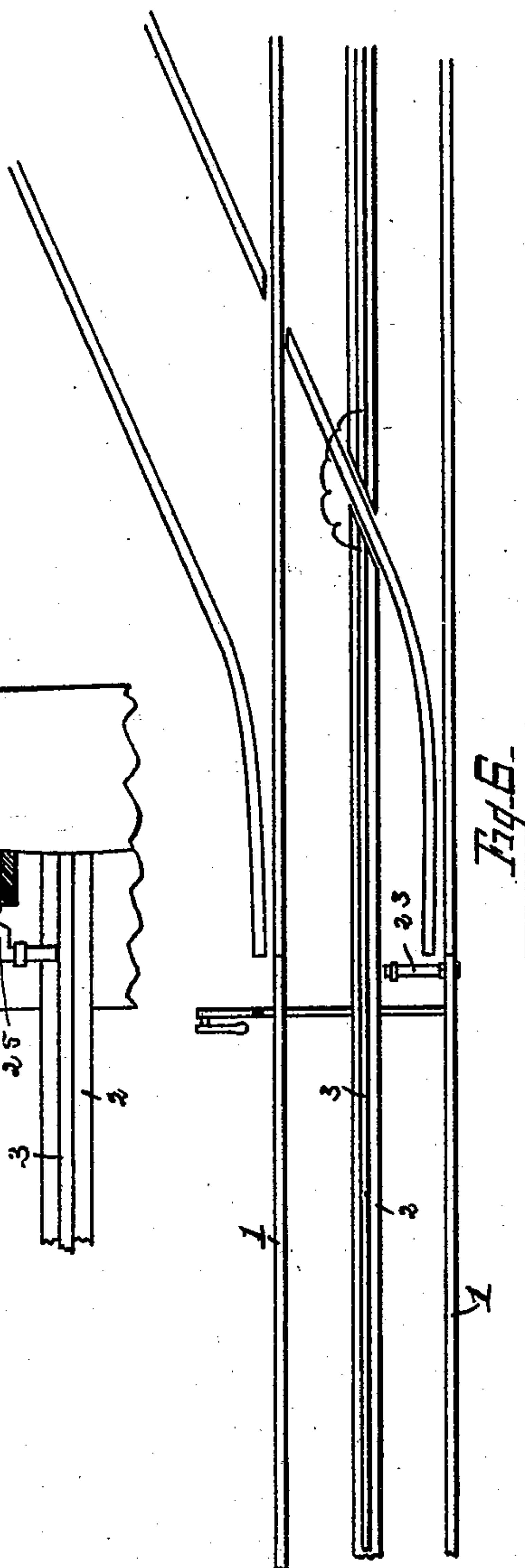


Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK E. SEAGRAVE, OF TOLEDO, OHIO.

ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 504,542, dated September 5, 1893.

Application filed January 26, 1892. Serial No. 419,310. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. SEAGRAVE, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Electric Railway-Signals; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 part of this specification.

My invention relates to an electric railway signal and has especial reference to the means employed in signaling between trains, stations, &c.

The invention consists in the parts and combination of parts, as hereinafter described and pointed out in the claims.

The object of the invention is to so construct an electric signaling system that trains moving on a single track going in the same or opposite direction when a distance apart, will signal to each other giving notice of their close proximity.

Another object is to provide means whereby trains on a section of track can communicate with each other while in motion.

Another object is to provide means for communicating from a station to a moving train, either on the section adjacent to the station or a section remote from the same.

Another object is to provide means whereby when a train approaches a switch or draw of a bridge, a signal will be given to the engineer if the switch or draw is open.

In the drawings:—Figure 1 is a plan view of the station, section of track, two engines and connections between the station, track and engines for carrying out my invention. Fig. 2 is a sectional elevation of the cab of a locomotive showing the central track, contact wheel, and main driving wheel, with the electric connection between the same to establish the circuit between the rail and central track. Fig. 3 is a rear view of the cab, said view being in further illustration of the matter shown in Fig. 3. Fig. 4 is a plan view of a section of railroad rail central track, the draw bridge and connection between the same to make a circuit on the section when the draw-bridge is unlocked or opened. Fig. 5 is a plan view of a portion of the same, partly in section,

illustrating the rod and connections for connecting the rail and central track. Fig. 6 illustrates my circuit closing device as applied to a switch.

The great majority of railroad accidents occur either in the engineer's ignorance of an approaching train, an open switch or an open drawbridge, and in this invention I have provided a mechanism operated electrically, whereby notice of either of these conditions is communicated to the proper persons, by means of an alarm in the engineer's cab which will ring either when a train is approaching another or when a train is approaching an open switch, or an unlocked or open drawbridge.

1 designates the railway-track, which is a continuous track as heretofore, or to make greater conductivity the ends of the rails may be connected by a wire if desired but this, being a matter of mechanical expediency, is not shown in detail or claimed.

2 designates a stringer composed of wood or some other non-conductor, on which is a central track 3 which is insulated from the ground by means of the stringer. Track 3 is divided into sections of any desired length preferably from one to five miles.

4 designates an engine, in the cab of which is a battery 5, of that strength to correspond to the distance the current is to be carried on the length of the sections of the central track as will be described, there being conducting wires 6 and 7 leading from the poles of the battery to a pole-changer 8 for changing the polarity of the current.

As it is readily seen that a train leaving a terminal point must have its battery set at relatively opposite polarity from that of a train ahead to cause a circuit between the rails, central track and two trains, as will be described farther on, therefore, it will be understood that all trains going in one direction must keep their batteries in opposite polarities to cause a circuit between the same when on the same section.

From the pole-changer 8 leads the wire 9 to the axle box to establish a current with the drive wheel of the engine, and 10 designates a wire connecting the pole-changer and box of the contact wheel 11. On the wire 10 is interposed the bell mechanism 12, which being of any preferred construction needs no detailed description. Therefore, from the fore-

going when a locomotive is on the track with the contact wheel on a section of the central track the electric connection is from the rail through the drive wheel, wires 9 and 6, battery 5, wires 7 and 10 through the wire, and to the central track, the circuit ending with the terminus of the central track, but as the circuit is completed by another engine with a similar arrangement between the rail and central track the circuit will be closed between the two engines and the bell 12, will ring in each cab, notifying the engineers of their close proximity, when if they desire to communicate with each other, press-button 13, which is in multiple with the switch, is pressed, closing the circuit, and by a code of signals the engineers may determine upon a course of action upon ascertaining the locality of the engine with which he is communicating and any irregularity existing.

14 designates a switch, which is open while the signaling is going on through the button 13 and when a train has been found on the same section by the ringing of the bell 12, is thrown over which breaks the circuit and discontinues the ringing until when the locomotive has passed the section or approaching train the switch is again thrown back to its original position.

15 designates a station, having communications with the rail by means of wire 16, and central track adjacent to the same by means of wire 17, both wires leading to a key or push button 18. By this arrangement the operator at the station may communicate with the engineer of the train while the same is on the section next to the station and by connecting the adjoining section of central track 3, with the key by means of wire 19 he may communicate with the engine on the section so connected.

20 designates a drawbridge, which is locked by bolts 21 or in any preferred manner, one of said bolts when locked abutting against a chuck or inclined end bolt 22.

23 designates a rod, contacting at one end with the rail 1 and the opposite end normally held against the central track 3, by means of spring 24, there being an inclined boss 25 on the rod against which the bolt 22 strikes when the bridge is locked and by means of the inclined end, the incline on the boss throwing back the rod 23.

In Fig. 6 is shown the rod 23 secured to the rail 1 in such position that when the rail is thrown by the switch the rod will contact with the central rail completing the circuit with an engine on the same section. It will thus be seen that two engines as they come on a section of the central track going in the same or opposite direction, will make communication between the same notifying each engineer of the close proximity of the other train. It will also be seen that the operator in the station may communicate with the engineer of a moving train or any section with which he may have communication, to either

stop the train or give any orders, it being understood that this is done by means of a code of signals that may be adopted. It is also apparent that an engineer is notified of an unlocked or open drawbridge, or switch by means of the circuit as soon as the engine comes on the section next to the bridge or switch. It will also be apparent that if for any reason such as a break down, a land slide, &c., it is necessary to signal an approaching train it can be done by means of a rod connecting the rail and central track, which will complete the circuit with the engine and ring the bell.

What I claim is—

1. In an electric railway signal, the combination with a track, of a conductor rail laid in sections, insulated from one another and extending the entire length of the track, two or more locomotives located upon the track and moving in the same or opposite directions forward or backward, a contact wheel attached to each locomotive, a manual pole changer located in each cab, and the wires connecting said changer and its adjacent battery, a wire leading from the pole changer to the contact wheel, a bell located on said wire, a push button, a switch and circuit connecting the button and switch by means of which the operator may manually change the polarity at any time and signal through a push button to an engine in front or behind him, and moving in the same or opposite directions.

2. In an electric railway signal, the two rails, a central conductor extending by sections the entire length of the rails, an engine provided with a revoluble wheel in contact with the conductor, an alarm mechanism within the cab, electrical communication with the conductor, and either rail and the alarm mechanism in the engine adapted to be actuated when the circuit is closed by a like engine or circuit closer upon the conductor and either rail upon the tracks, a station, and connections with a key or circuit breaker in the station to establish communication with adjacent sections of the conductor and with the rail and the alarm mechanism.

3. In an electric railway signal the two rails, a central conductor, extending in sections the entire length of the rails, an engine provided with a contacting conducting wheel bearing upon the sectional conductor, electrical communications with the engine in combination with a movable section of the track, a lock for securing the same in alignment and mechanism actuated by the lock for completing the circuit with the engine, when the movable section of track is moved out of alignment with the stationary tracks.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

FRANK E. SEAGRAVE.

Witnesses:

WILLIAM WEBSTER,
CARROLL J. WEBSTER.