

(No Model.)

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C. A. & J. F. COX.  
ELECTRIC SIGNAL AND BRAKE DEVICE.

No. 414,295.

Patented Nov. 5, 1889.

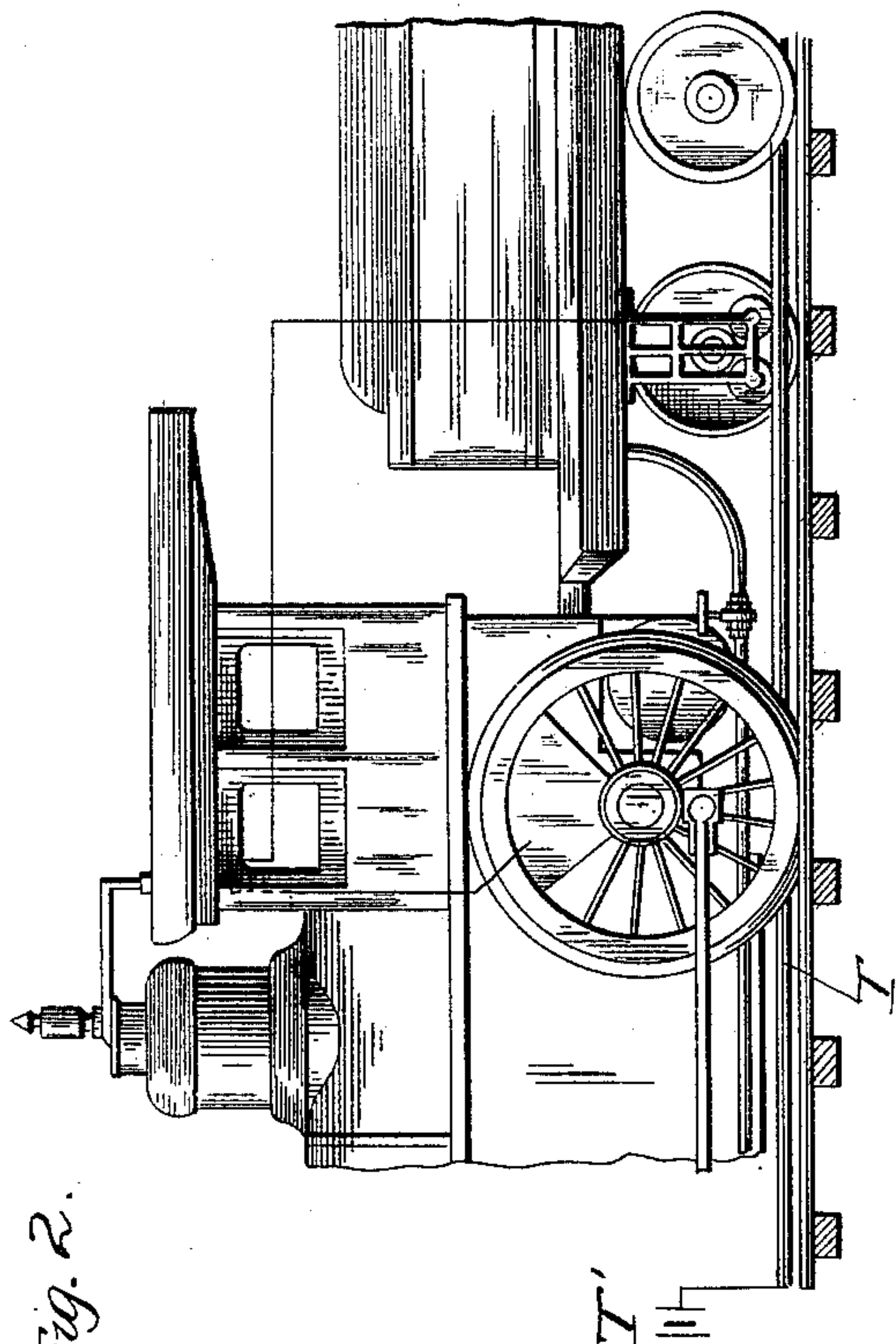


Fig. 2.

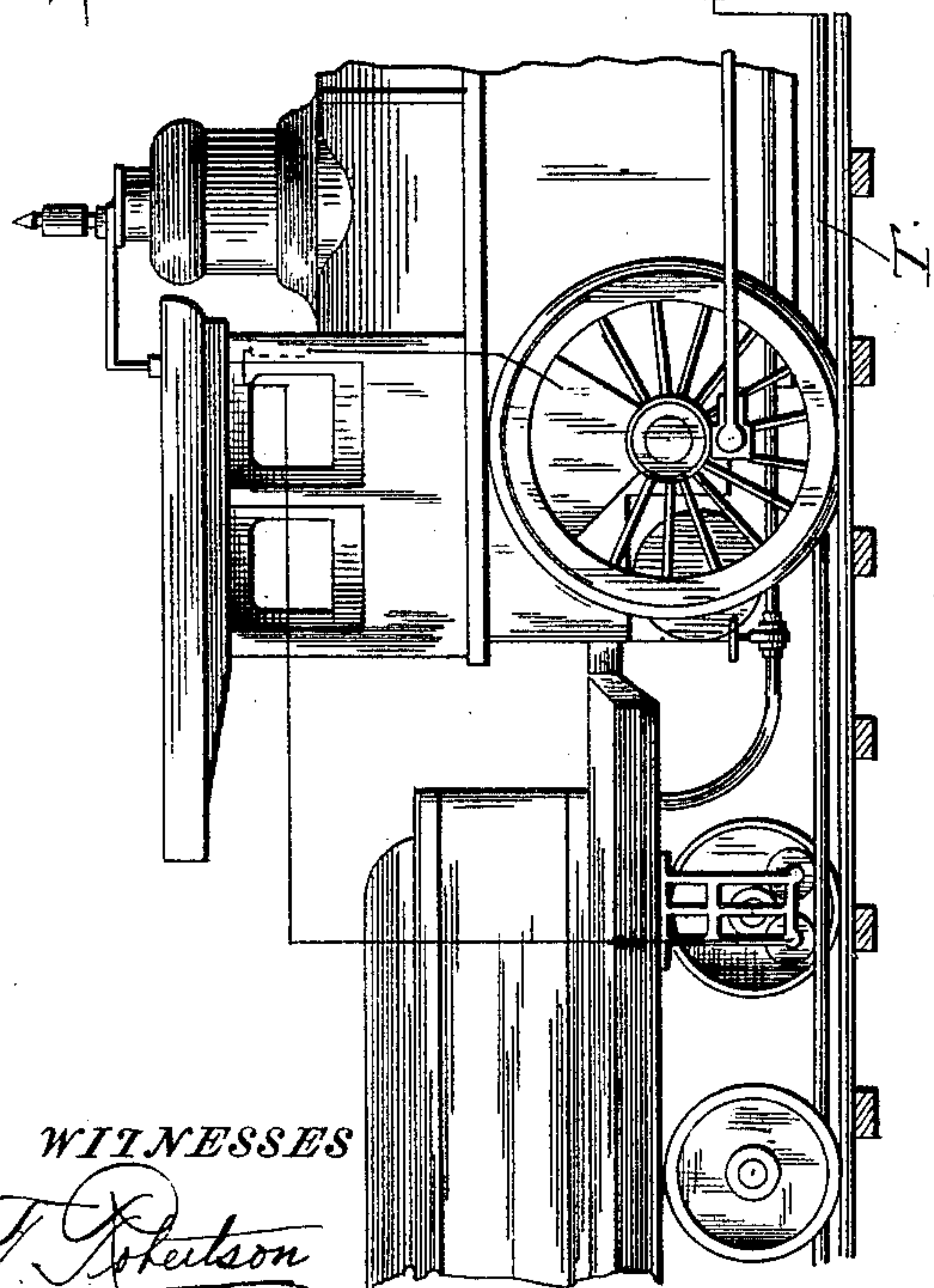
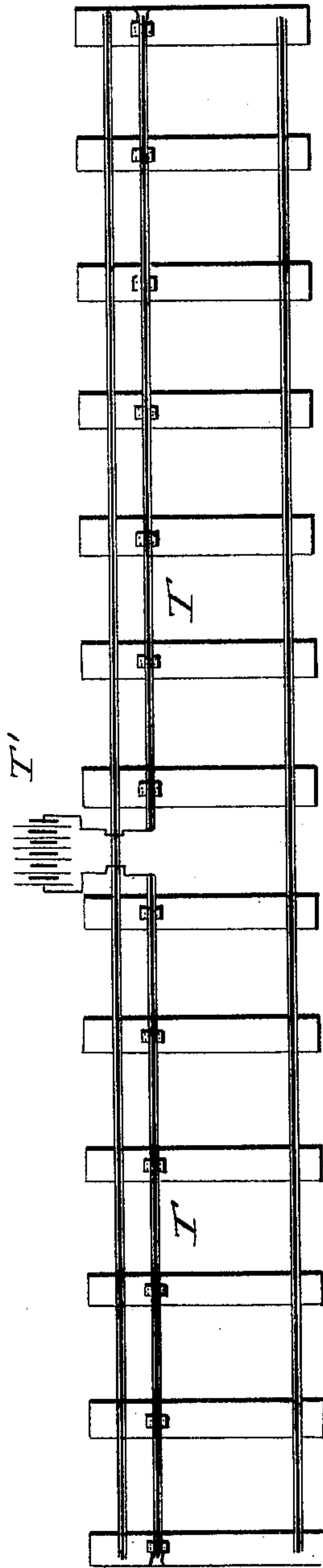


Fig. 1



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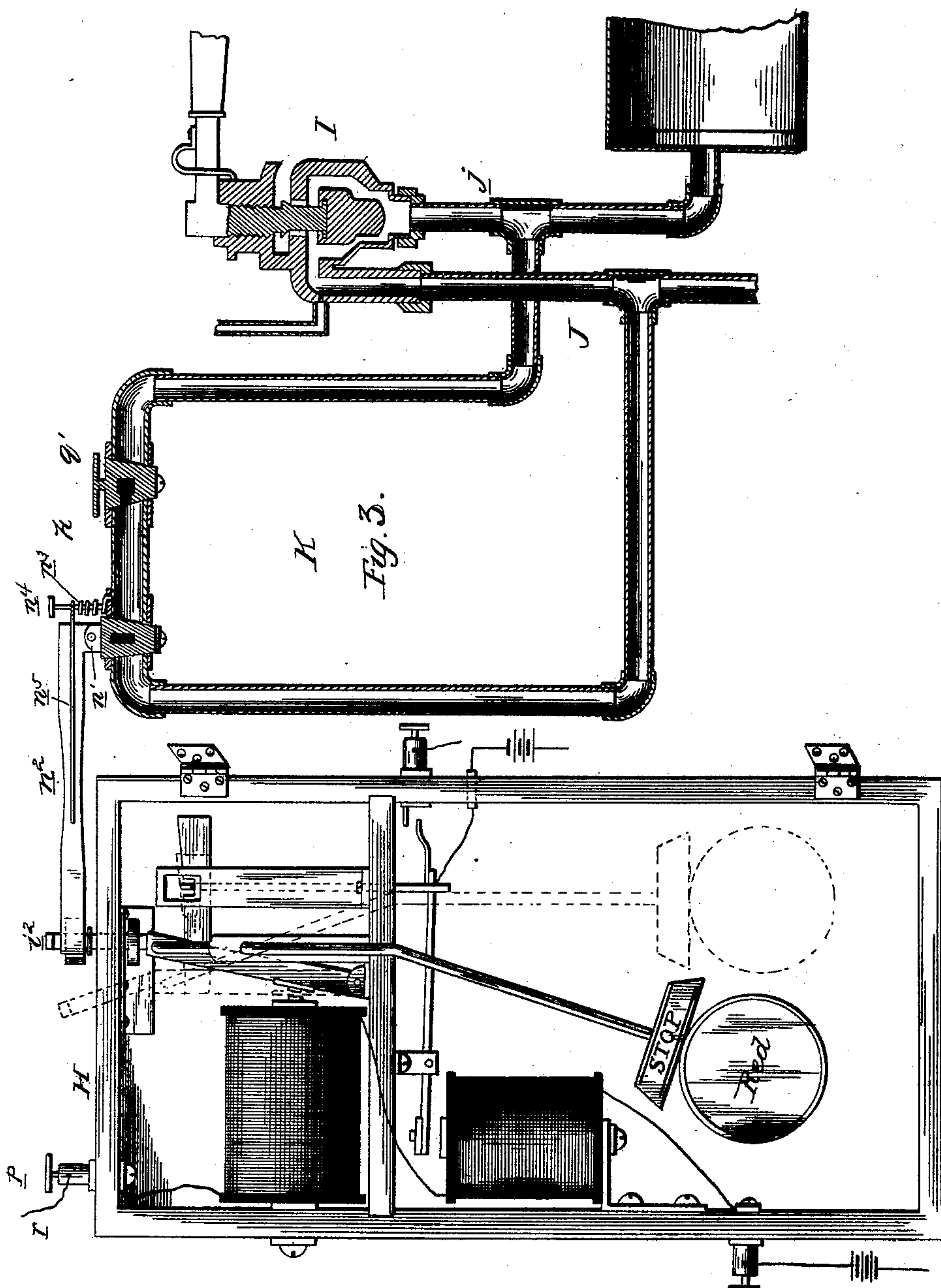
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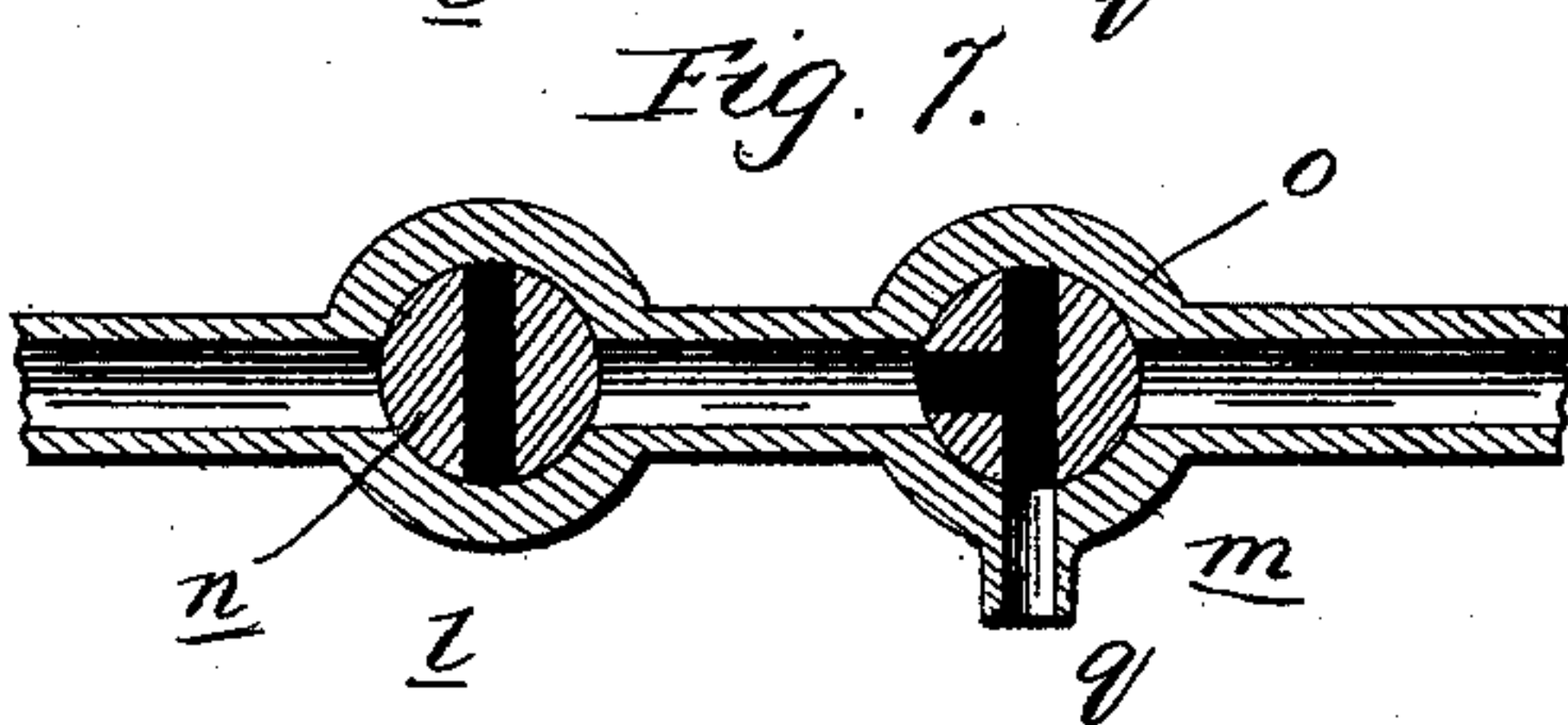
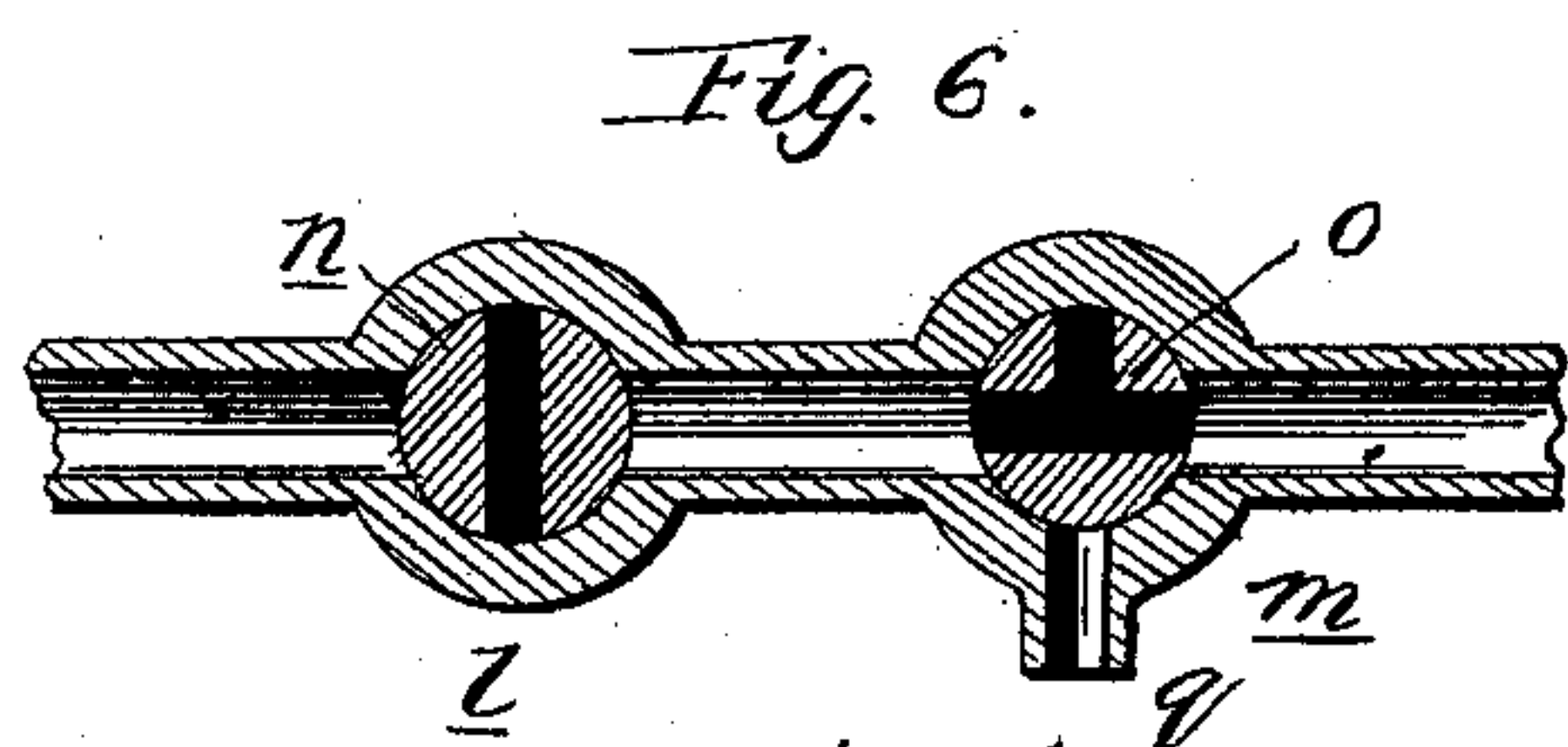
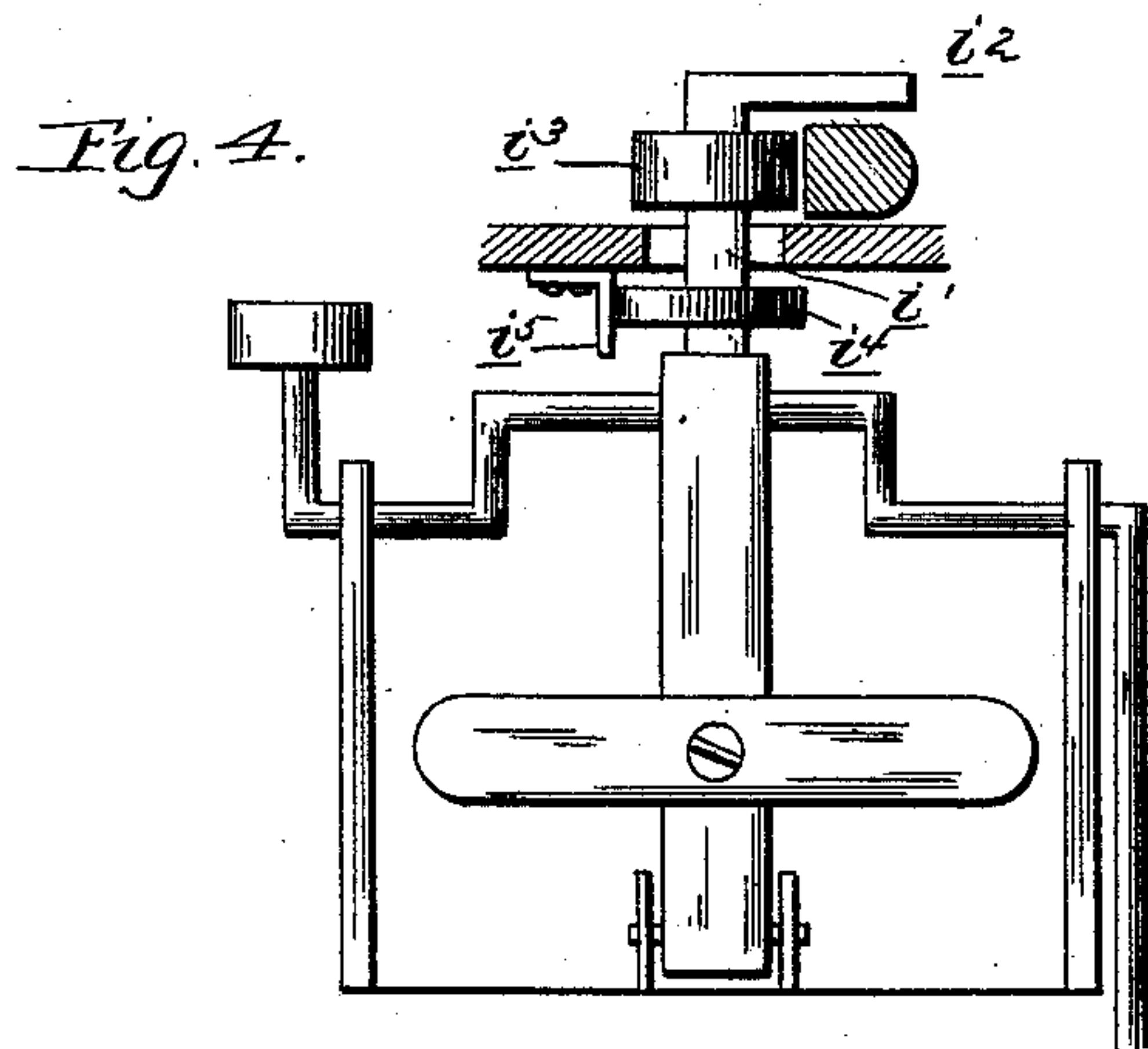
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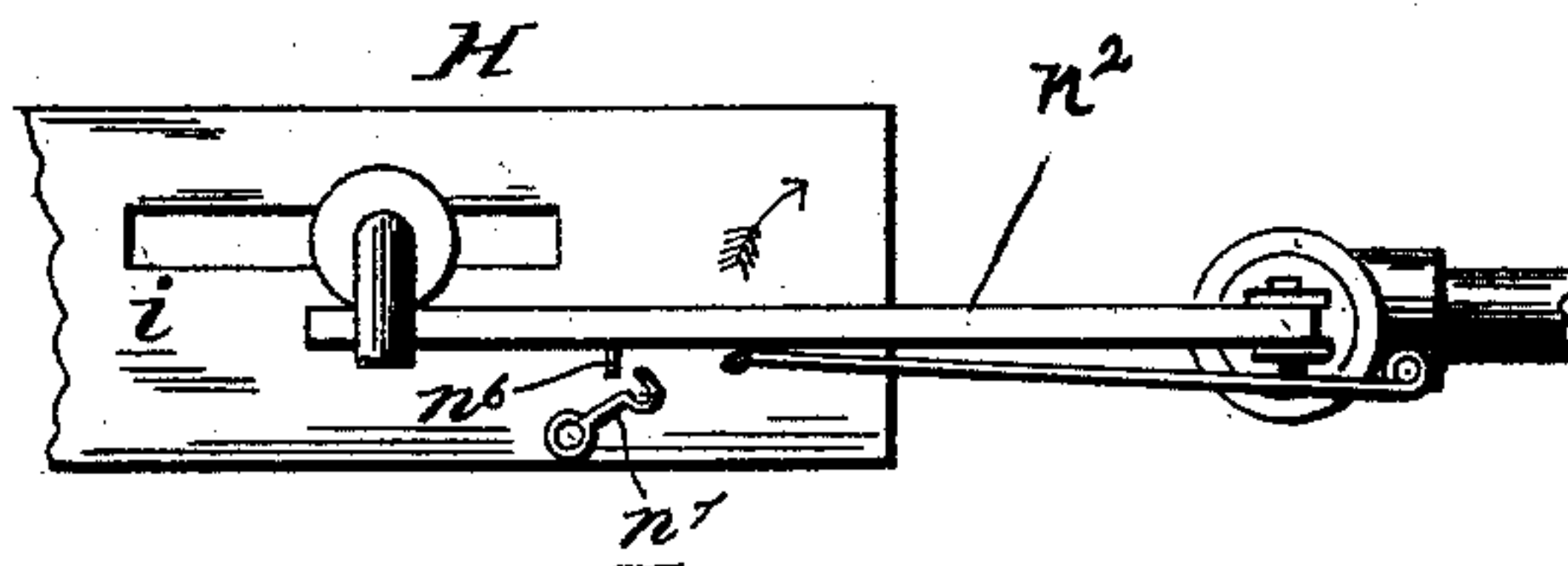
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*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

JOSEPH FRANKLIN COX AND CHARLES A. COX, OF LOUISVILLE, KENTUCKY.

## ELECTRIC SIGNAL AND BRAKE DEVICE.

SPECIFICATION forming part of Letters Patent No. 414,295, dated November 5, 1889.

Original application filed May 11, 1889, Serial No. 310,405. Divided and this application filed May 18, 1889. Serial No. 311,214.  
(No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH FRANKLIN COX and CHARLES A. COX, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Electric Signal and Brake Operating Devices for Railways; and we 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 and figures of reference marked thereon, which form a part of this specification.

Our invention has reference to electric devices for operating and controlling railway air-brakes; and it consists in the improvements hereinafter described and set forth, whereby simple and efficient means are provided that will operate to stop the locomotive, or locomotive and its train, either from the signal-station or automatically when a similarly-equipped locomotive passes onto a certain point of the way, thereby controlling the movement of the locomotives or trains independent of the engineer or other persons on the same.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a section of track—as, for instance, a curve—showing an arrangement of contact rails and circuits adapted to operate in connection with our improvements. Fig. 2 is a side elevation of the same, representing the position of two locomotives thereon. Fig. 3 is a side elevation in section showing the arrangement of air-valve and electric device for operating the same. Figs. 4 and 5 are respectively front and top detail views of the features directly employed for releasing the valve-handle; and Figs. 6 and 7 are sectional plan views showing the different positions of the plug-valves employed in the loop-pipe of the brake system.

The general arrangement of track or way, contact-rails therein, and electric-circuit connections for operating the device from the signal-station, and contact-hangers depending from the tender or car, are substantially

the same as that shown and set forth in our application, Serial No. 310,405, filed May 11, 1889, to which reference may be had for a fuller understanding of the construction and purpose of the particular features.

The main portion of the brake-controlling mechanism is a case containing parts in most particulars like those in the signal-case described and shown in detail in said application, Serial No. 310,405. The difference consists, principally, in the fact that in the case of the brake mechanism but one pair of magnets is provided above the dividing-plate and other features are reduced to a basis only required to operate a single signal-rod and its disk. Of course this admits of the case being of reduced width, resulting in the inspection-opening in the front being located at one side. The top H of the case is provided with an extension-slot *i*, (see Fig. 5,) through which extends a stem *i'*, carried integrally by the armature-carrying bar below, and the upper end portion of this stem *i* is bent to form an engaging-ear 12. An anti-friction roller *i*<sup>3</sup> is supported in position by a shoulder formed on the stem.

As is generally well known, and particularly to those acquainted with the construction and operation of the "Westinghouse air-brake system," the brakes are automatically applied by exhausting air from the main brake-pipe either from a valve located in the engine-cab or from what is known as a "conductor's valve." The brakes are operated non-automatically only when the air from the main reservoir is liberated directly through the main brake-pipe and operates directly upon the pistons in the brake-cylinders. This being understood, it will only be necessary to specify those parts more immediately located and operated with the brake-controlling mechanism in conjunction with the signal device in order to secure a proper understanding of the relative importance of the construction.

I refers to the engineer's valve connected by pipe *j* to the main reservoir. As usual, the main brake-pipe J leads from the valve I, and the latter, as will be remembered, is so arranged that it can be operated to admit air direct to the pipe J from the main reservoir or cut off the supply from said reservoir and



then exhaust the air in the pipe J by discharging it into the atmosphere.

In order to adapt our improvements to existing requirements, we provide what may be termed a "loop" branch pipe K, one end of which taps the pipe j, while the other end connects with the main brake-pipe. The upper horizontal portion k of the loop contains two bosses l m, Figs. 6 and 7, designed to contain plug-valves n o. The arrangement of ports in said valves is best shown in the detail sectional plan views, Figs. 6 and 7, wherein it will be seen that the valve n has simply a transverse port, while the valve o has a T-shaped or three-way port. The boss m is provided with a discharge-opening q at one side. The valve o is simply provided with a thumb-nut or head q' to enable it to be turned. The valve n has on its upper side two ears n', in which is pivoted an angular handle n<sup>2</sup>, the extended portion of which is intended to extend beneath the ear i<sup>2</sup> and in contact with the anti-friction roller i<sup>3</sup>. The side of the handle n<sup>2</sup> is plane-faced in order that it may have a proper bearing against the roller. A torsion-spring n<sup>3</sup> embraces and is secured to a short standard n<sup>4</sup>, mounted on the boss l, and the free end n<sup>5</sup> of said spring is extended horizontally to bear against the handle n<sup>2</sup>, and tends to throw said handle in the direction indicated by the arrow, Fig. 5. An eye n<sup>6</sup> on the side of the handle enables a hook n<sup>7</sup> on the top of the case to engage the handle and retain it in the position it is represented in the several figures when the action of the valve is not desired. Of course but a single circuit is required to operate the brake-controlling mechanism, and this is secured by a wire r, leading from the switch device C (set forth in said application Serial No. 310,405) to post p, from this through the coils of signal and latch-magnets, and grounded from the latter through the metal of the engine, as fully set forth in said application referred to. The wire r, connecting with the post p of the brake-operating mechanism, is led from the track-contact through the switch C.

When the brake system is to operate automatically, the valve-plugs are in the position shown in Fig. 7. The moment the latch and signal devices are operated within the case the stem, with its anti-friction roller, is thrown to the position represented by dotted lines, Fig. 3, clearing its contact with the handle n<sup>2</sup> and enabling the spring to throw the latter so as to shift the port of the valve n in line with the pipe, thus allowing the air from the main brake-pipe to be discharged out of the opening q in the side of the boss.

When operating upon the non-automatic principle, the valve o will be turned as shown in Fig. 6, so that its ports will afford a direct passage through to the pipe J, the opening q being closed, and the stem will be thrown as before to turn the handle and its valve n and open a direct passage to the brake-pipe

for the admission of air from the main reservoir. It will thus be seen that the operation of the valve n is automatic, whether the brakes are to be actuated on the automatic or non-automatic principles. The hinge feature of the handle enables it to be engaged at all times with the stem.

In Figs. 1 and 2 we have represented our improvements in connection with a railroad-curve. In such case contact-rails T T are located in the way forming the curve, and these said rails are connected with a local battery T', located adjacent to the track and suitably protected from the weather, &c. Now, as soon as a locomotive passes onto each contact-rail of the curve a circuit is completed through the rails T, and the battery T', locomotives, and one of the track-rails and the brake-operating mechanism in both locomotives simultaneously operated and the two locomotives brought to a full stop before they will have reached a point in the curve where a collision would have been imminent. It will be noticed that the two contact-rails T are so extended that the engineer of a locomotive will be assured a prolonged protection until the engine will have reached such a point in the curve that the balance can be passed over in safety. A second anti-friction roller l' is mounted on the stem i' below the slotted top of the case, and this said roller bears against a longitudinal plate l'', secured on the inner face of the top of the case. This arrangement not only serves to brace the stem in its relative position in the slot, but also greatly adds to the easy movement of the stem.

From the foregoing it will be apparent that the construction and arrangement of brake-controlling device and the connection are such that the brake can always be operated with quickness and certainty and entirely independent of any effort on the part of the engineer or other party on the locomotive or train.

We claim—

1. The combination, with the rails, of a section of track or way, contact-rails connected to a local battery, a locomotive or car provided with an electrically-operated brake device, substantially as described, and contact for completing the circuit through said device, contact, and track-rails, when said locomotive and a similarly-equipped locomotive are on two given points of the track or way, all as set forth.

2. The combination of a partial circuit, including contact and ground rails, a locomotive or car provided with contacts, and a loop or branch pipe forming part of the brake system, a controlling-valve located in said loop or branch, and electrically-actuated devices for operating said valve when said contacts complete the circuit through the contact and ground rails, substantially as set forth.

3. The combination, with the case slotted at its top and an electro-magnet arranged in said



case, of an armature-bar moved by said magnet and having a stem extending through said slot, a pipe (forming part of the brake system) arranged adjacent to said case and having a  
5 valve and a handle for said valve in contact with said stem and adapted to be released from contact to open the valve, substantially as set forth.

10 4. The combination, with the case slotted at its top and an electro-magnet arranged therein, of an armature moved by said magnet and having a stem extending through said slot, a pipe (forming part of the brake system) arranged adjacent to said case and having a  
15 valve provided with a spring-actuated handle bearing against said stem until it reaches the end of the slot, substantially as set forth.

20 5. The combination, with the operating devices and stem, of the pipe *k*, having the valve *n*, provided with the hinged handle bearing against said stem, substantially as set forth.

6. The combination, with the operating devices and stem having the horizontal ear and anti-friction roller, of a pipe *k*, containing the valve, having a handle provided with a beveled face bearing against said roller, substantially as set forth. 25

In testimony whereof I have hereunto signed this specification in the presence of two subscribing witnesses.

JOSEPH FRANKLIN COX.

Witnesses:

FRED SPRIGELHALDER,  
WM. W. DUZAN.

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

CHARLES A. COX.

Witnesses:

WILLIAM PAXTON,  
FRED. W. JONES.