

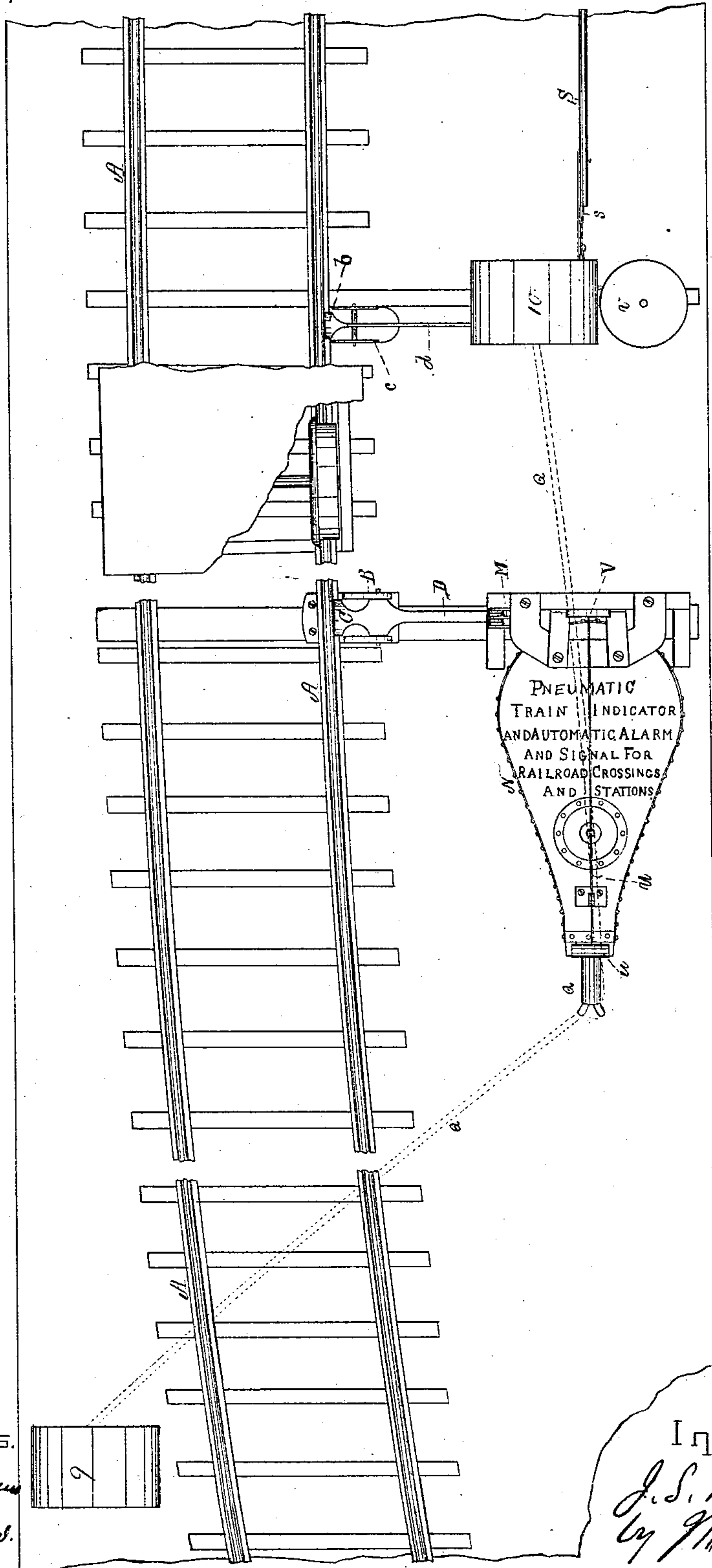
J. S. McLEOD.

PNEUMATIC RAILROAD SIGNAL.

No. 250,934.

Patented Dec. 13, 1881.

Fig 1



Witnesses.
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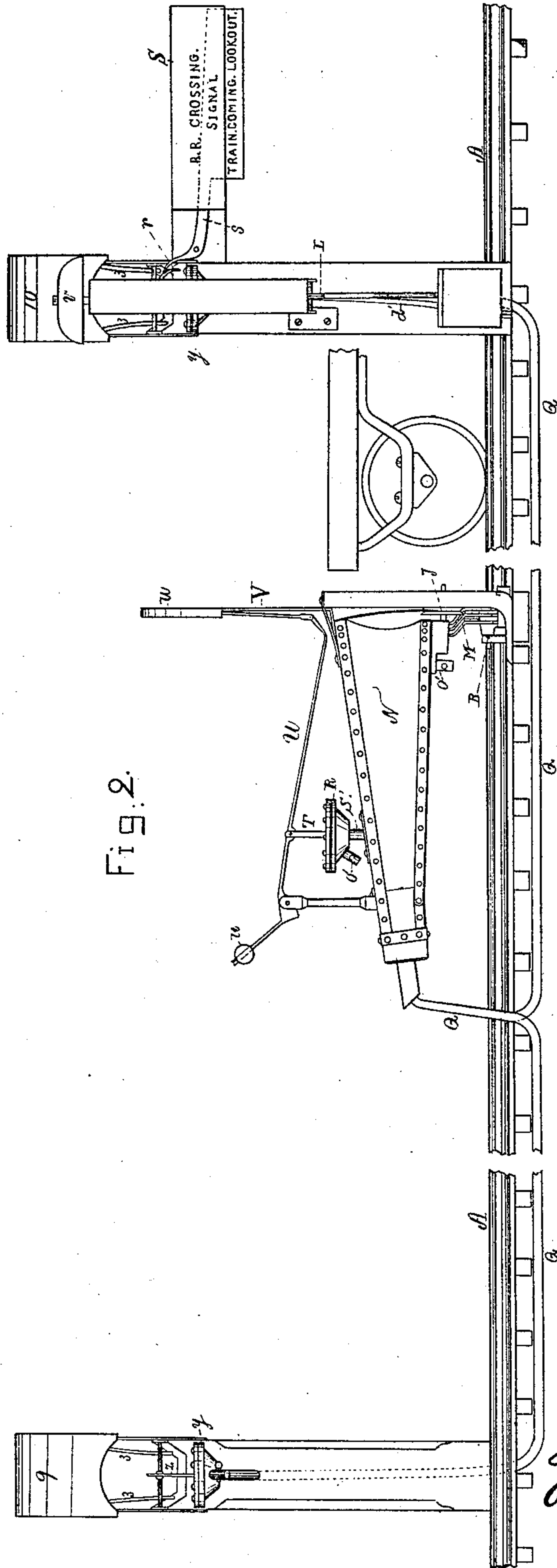


Fig. 2.

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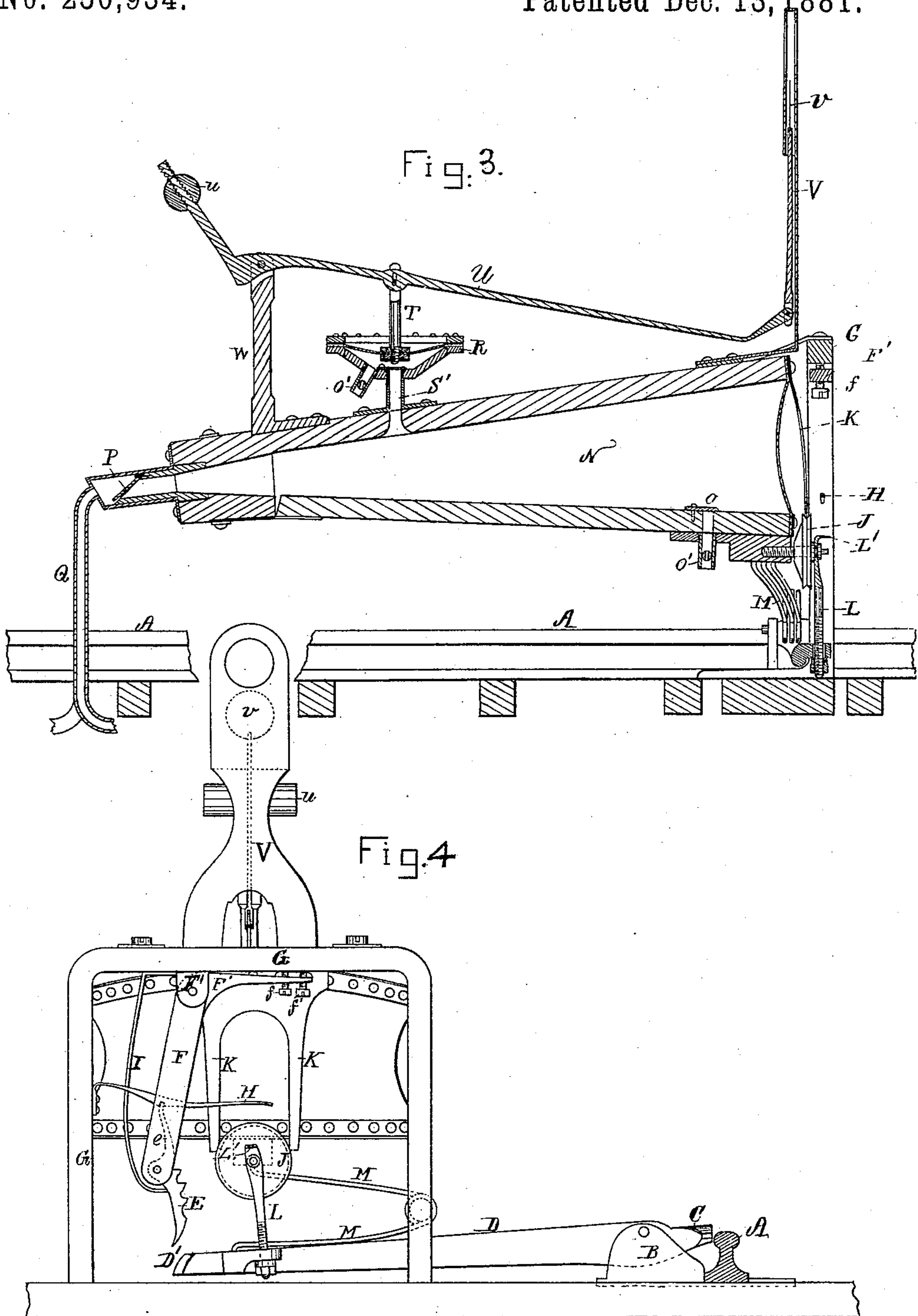
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UNITED STATES PATENT OFFICE.

JOHN S. McLEOD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE McLEOD
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PNEUMATIC RAILROAD-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 250,934, dated December 13, 1881.

Application filed January 3, 1880.

To all whom it may concern:

Be it known that I, JOHN S. McLEOD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Pneumatic Railroad-Signals, of which the following is a specification.

My invention relates to a means for operating signals upon a railroad-track for the purpose of indicating the approach of a train which may be signaled at any portion of the line and at any desired distance from the signal-post.

The invention consists in a method of operating the signal by air forced through the tubes connected with the signals and leading from an air-reservoir or bellows operated through the medium of a lever actuated by the wheels of the locomotive or cars in passing along the rails.

Referring to the drawings, Figure 1 represents a plan view of a railroad-track, showing the position of the air-reservoir or bellows and the signals. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal vertical section of the air-reservoir or bellows, and Fig. 4 is an end elevation of the same.

A represents the rails of a railroad-track. To the outside of one of the rails is connected a shoe, B, in which is fulcrumed a lever, D, one end, C, of which is so arranged as to be pressed down by the wheels of the locomotive or cars in passing along the rails and elevate the other or longer arm of the lever, as shown in Fig. 4.

To the lower end of a slotted arm, F, Fig. 4, is pivoted a toothed segment or rack, E, arranged over the end D' of the longer arm of lever D, to catch and hold the end D' when thrown up.

Forming a part of the segmental rack E, and extending upward, is an arm or lever, e, (shown in dotted lines,) and engaging at its upper end with a notch in the spring-arm H, attached to the frame G. The rack E is held in a position to engage with the end D' of lever D by means of the notched arm H and a spring, I, as shown.

The upper part of the arm F is pivoted to a bracket, F'', attached to the frame G, and is continued at right angles with the portion F, as shown by F'. Through the end of the arm

F' pass two screws, *f* and *f'*, into the frame G, the one, *f*, serving to limit the lateral movement of arm F', and the other, *f'*, acting as a guide to arm F'.

Passing through the lever D near its end, is an upright rod, L, which plays loosely in said lever, provided with a nut at its lower end for adjusting said rod higher or lower, as required.

To the lever D are attached the lower ends of the springs M, of which there may be one or more, and having their upper ends attached to and pressing against the under or movable portion of the bellows N, as shown in Fig. 4. As the lever D is thrown up by a passing train the spring or springs M are compressed, and act slowly in pressing upward the lower or movable portion of the bellows N, which is guided in its operation by means of a grooved wheel or disk, J, passing up and down between guides K K, thus avoiding any sudden strain or shock on the bellows.

Near the end of lever D, and passing through a hole in a projection on lever D, is an upright rod, L, by which the said lever and the springs M are connected with the lower or movable portion of the bellows or air-chamber N. The upper end of the rod L, at its junction with the bellows N, is provided with a projection, L', to engage with the spring-arm H in its movement, when the end of the lever D' is thrown up and held by the toothed segment E, and the springs M cause the air to be forced out of the bellows N through the pipes Q, by which the chamber *y* is expanded to operate the signals 3 3, and through the pipe S to expand chamber R for operating the signal-disk *v*, as shown in Fig. 3.

When the air is forced out of the bellows N by the action of the springs M the projection L', in raising arm H, releases the arm *e* of segment E, and thus allows the lever end D' to drop to its normal position, and the spring I to reset segment E, and the bellows or chamber N to refill with air through the hole under the flap-valve O. The inlet to the bellows N is provided with an adjustable cock, O', to regulate the admission of air in refilling the bellows, and the lower end of the rod L is provided with a screw and nut to adjust the opening of the springs M and the distance desired

for the projection L to rise to engage with the arm H, in order to relieve segment E and allow lever D to drop to its normal position. Thus as the forward wheel of a passing train presses down the end C of lever D the end D' of the lever will be thrown up and caught and held by the segment E, the end C being kept down below level of the rail to prevent the following wheels from acting upon it, and thus protect the signal mechanism from any injury to which it might be subjected if operated upon and shaken by the constant action of all the wheels of a passing train. The length of time desired for the segment E to hold up the end of lever D can be regulated by the size of the air-chamber, outlet-valve P, pipe Q, inlet-valve O, tension of the springs M, and the adjustment of cock O' and rod L.

The air-reservoir is made in the shape of and to operate like a pair of bellows. On its under side is a valve, O, for the admission of air, provided with a cock, O'. On the upper side of the bellows N is a tube, S', communicating with an air-chamber, R, in which is arranged a flexible diaphragm, as shown. To the center of the upper surface of the said diaphragm is attached a rod, T, extending upward, and having pivoted to its upper end a lever, U, fulcrumed in an upright, W, which is attached to the upper portion of the bellows, as shown in Fig. 3, and having an adjustable counterpoise, *u*, for the purpose of adjusting the motion of the signal-disk *v*. The longer arm of lever U is jointed to a bar, V, sliding in guides, and bearing on its upper end a disk, *v*, which, as it is raised, covers the hole in the signal-standard, and thus gives the desired signal in the usual manner. The air-chamber R is provided with a regulating-cock, O', to govern the amount of air which it may be desired to allow to escape from the said chamber, so as to regulate the time desired for the disk *v* to cover or uncover the hole in the signal-standard.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the lever D, of the spring M, the rod L, held loosely in said lever near its end and adjustable by means of a nut

and screw-thread, the disk J and guides K K, substantially as and for the purpose set forth. 50

2. The combination of the springs M M, attached to the lever D and to the under part of the air-chamber N, with the toothed bar or sector E and its arm *e*, the spring I, and spring-bar H, substantially and for the purpose specified. 55

3. The combination of the pivoted arm F F', the toothed sector E, with its arm *e*, the spring I, and spring-arm H, the lever D, and upright rod L, provided with projection L', as and for the purpose set forth. 60

4. The toothed segment or catch E, in combination with the lever D, the spring M, and bellows N, substantially as and for the purpose set forth. 65

5. The combination, with the lever D and springs M, of an air-chamber or bellows, N, the grooved wheel or disk J, guides K K, flap-valves O P, and adjustable cock O', substantially as and for the purpose set forth. 70

6. The combination, with the air-chamber or bellows N and pipe S, of an expansion air-chamber, R, provided with an adjustable cock for the purpose of regulating the time desired for displaying the signal-disk *v*, substantially as specified. 75

7. The combination, with the air-chamber or bellows N and expansion-chamber R, of the rod T and fulcrumed lever U, provided with an adjustable counterpoise, *u*, for adjusting the motion of the disk *v*, substantially as set forth. 80

8. The combination of the lever D, segment E, spring M, and cocks O', for the purpose of insuring a steady and an adjustable force of air from air-chamber N through pipes Q and S, to operate the signals *s s* and *v*, regardless of the speed of the train, substantially as set forth. 85

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 90

J. S. McLEOD.

Witnesses:

J. H. ADAMS,
C. E. LITTLE.