

(No Model.)

F. O. BLACKWELL.

SLOT SWITCH FOR CONDUIT SYSTEMS OF RAILWAYS.

No. 442,475.

Patented Dec. 9, 1890.

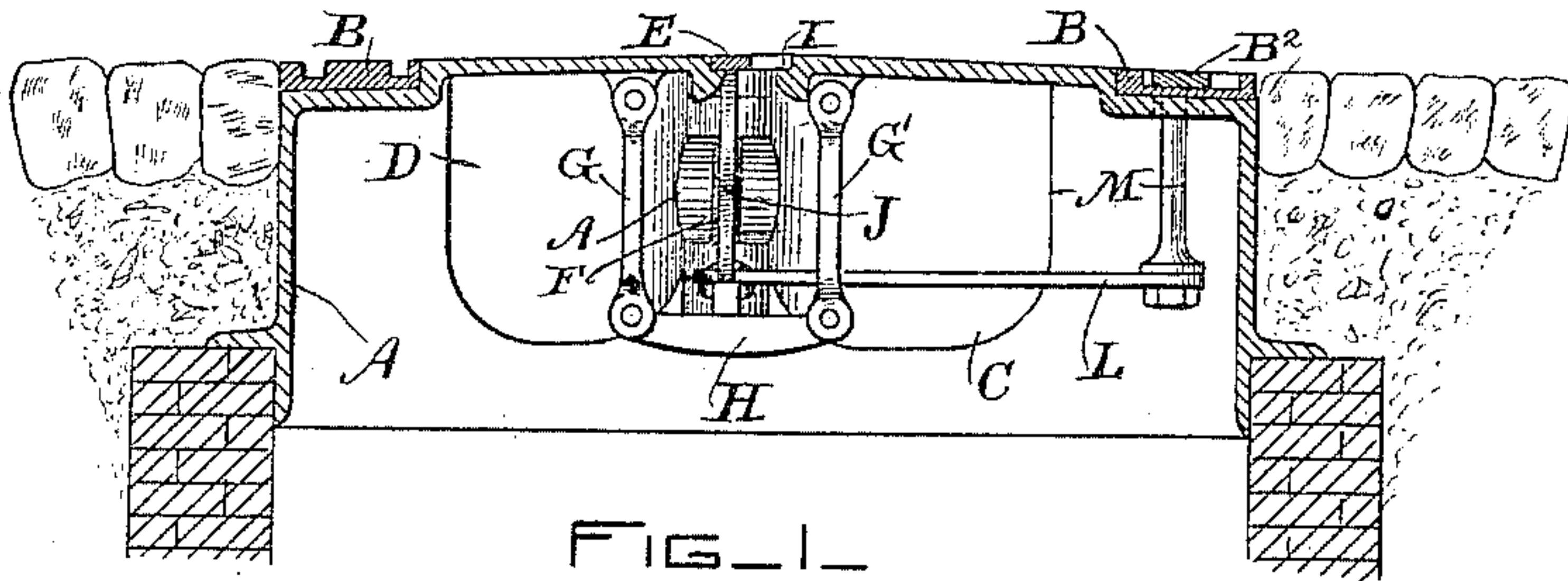


FIG. 1.

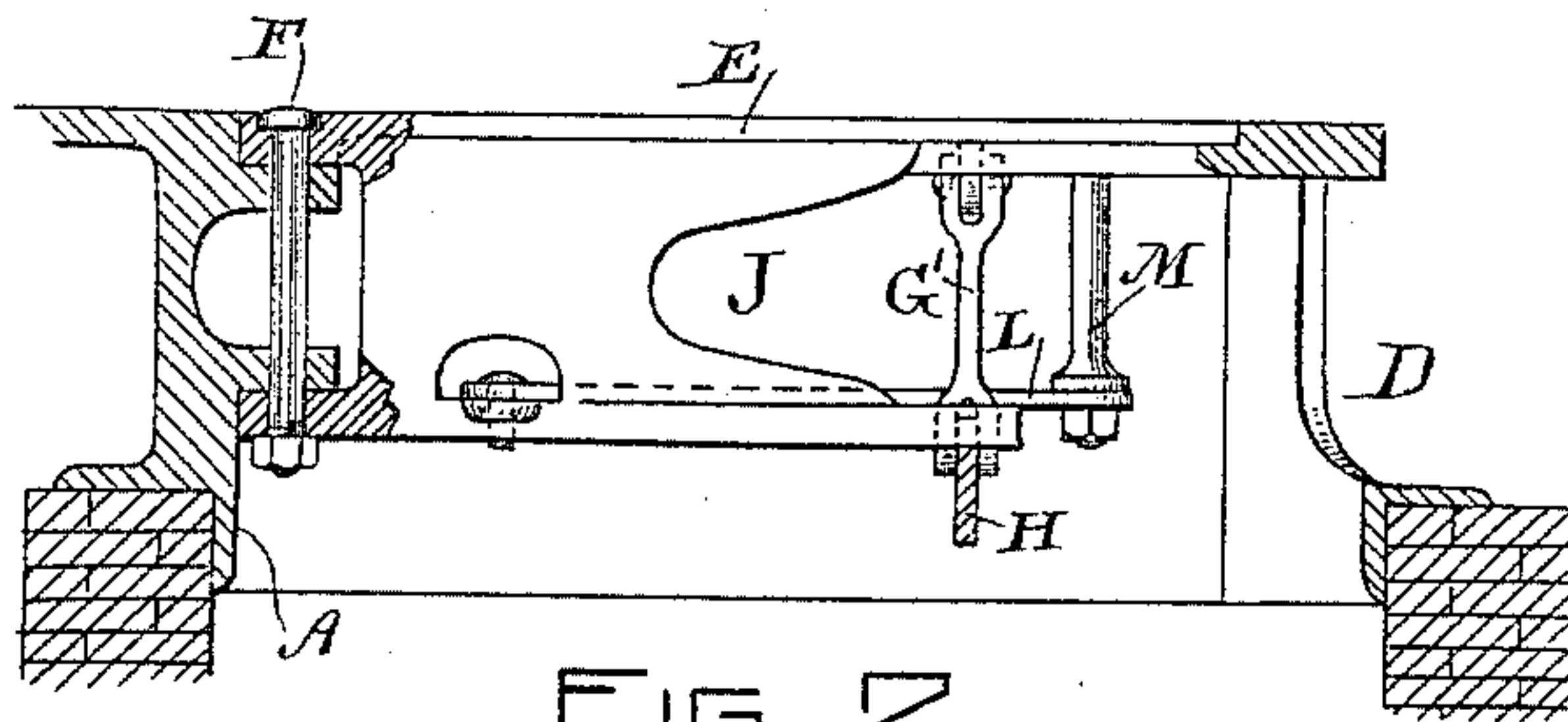


FIG. 2.

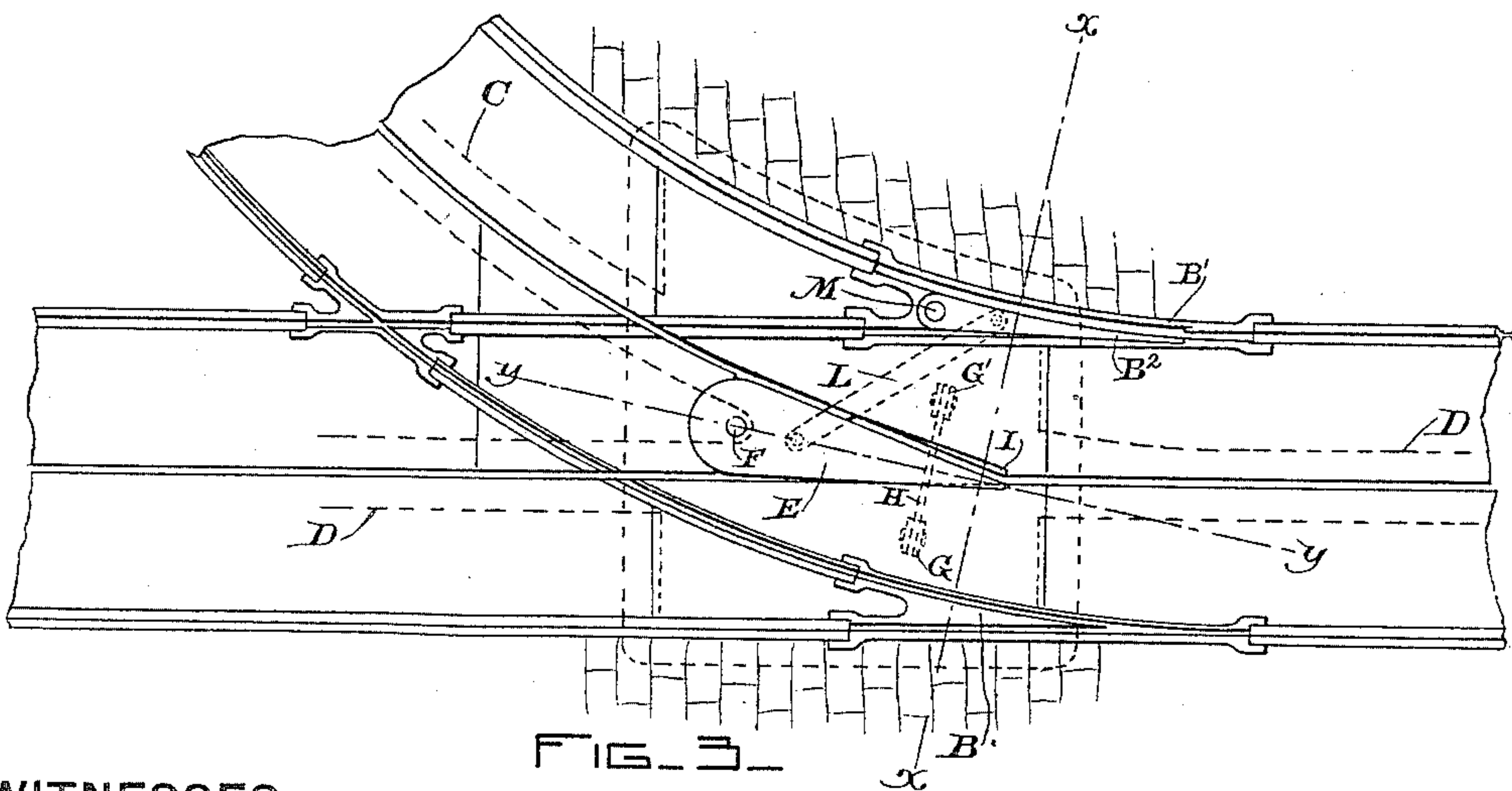


FIG. 3.

WITNESSES:

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ATTYS.



# UNITED STATES PATENT OFFICE.

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## SLOT-SWITCH FOR CONDUIT SYSTEMS OF RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 442,475, dated December 9, 1890.

Application filed October 27, 1890. Serial No. 369,474. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS O. BLACKWELL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Slot-Switches for Conduit Systems of Railway, of which the following is a specification.

My invention relates to a slot-switch for use in a railway system, whether cable or electric, of which an underground slotted conduit forms a part; and it aims to avoid largely the friction heretofore present in such switches by reason of their considerable weight, and to provide means for throwing the same with comparative ease.

It has heretofore been proposed to connect the slot-switch mechanically with the track-switch and thus operate them simultaneously; but as the slot-switch is necessarily a cumbersome heavy structure, it gives rise to a great amount of friction and can be thrown only by the expenditure of considerable force, a circumstance which has resulted in rendering the operation of all such switches uncertain and difficult. I overcome this objection by making the slot-switch deep enough to project some distance into the conduit and sustain its weight largely by swinging hangers. All sliding friction, therefore, is avoided when the switch is moved, and, on the contrary, it swings with such ease from one position to the other that the ordinary spring-actuated track-switch may be relied upon to control it.

In the accompanying drawings, illustrating my improvements, Figure 1 is a cross-section of a conduit construction taken on line  $x x$  of Fig. 3. Fig. 2 is a longitudinal section of the same on line  $y y$ , Fig. 3; and Fig. 3 is a plan view showing main and branching conduits and also the track and slot switches.

A metallic boxing A is set in the usual manner in the street at the branching point where the conduit C, following a branch line, diverges from the main line D. This will be properly roughened at the street-surface, and upon it are laid the rails B B' of the two tracks and a switch-rail, as B<sup>2</sup>. In the angle where the slots of these diverging conduits

come together there is situated a switch-tongue E for directing the grip or contact device along the proper line. This tongue is pivoted at one end to the casing by the bolt F, and its weight is largely supported by the swinging hangers G G', the switch-tongue being made deep enough to project within the conduit a considerable distance sufficient to allow the swinging movement to take place upon a long radius as compared with the throw of the switch, whereby binding at the pivot will be avoided. As illustrated in the drawings, two such hangers are used, one on either side of the switch-rail, and they consist of parallel links G G' pivoted at their upper ends to the casing and at their lower ends to a cross-piece H, extending laterally each way from the switch, the whole forming a sort of rocking cradle. The pivoted tongue will ordinarily rest upon this cross-piece by friction alone, as its weight is such as to cause the links to swing before the tongue will slide on the cross-piece. It may, however, be secured thereto or the cross-piece be replaced by arms projecting directly from the tongue itself. The top of the tongue is substantially flush with the outside surface of the casing and fits in grooves I cut therein, as shown, when at either end of its throw.

In order to allow the interior dimensions of the conduits to be maintained uniform without using very long and fine slot switch-tongues, which are easily broken, I place the conduit-switch at a point somewhat in the rear of the track-switch, so that the angle at which the slots diverge is considerably more obtuse than the corresponding angle made by the track-rails. The car will therefore turn off gradually and without swaying upon the branch track, and a moment later the grip or conduit plow will be deflected at a much sharper angle. To avoid striking that portion of the switch-tongue which projects into the conduit it is cut away, as at J, forming an opening through which the grip or contact device may pass.

As a convenient means for operating this switch, I connect it mechanically to the movable track-switch B<sup>2</sup> by a link L, pivoted to the slot-switch and to a stud M, which pro-



jects down from the track-switch. Whenever therefore the track-switch is thrown by the switch-tender or automatically by the wheels of the car, the slot-switch will also be moved in a corresponding direction, and in effecting this desired result I have found the suspending of the tongue, so that it can swing rather than slide, to be a matter of great importance.

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

1. In a conduit-switch, the combination of a movable slot-switch with a swinging hanger or hangers furnishing means of support therefor, for the purpose set forth.

2. In a conduit-switch, the combination of a switch-tongue pivoted at one end with a swinging hanger or hangers near its free end supporting largely the weight of the tongue, as set forth.

3. In a conduit-switch, the combination of a switch-tongue pivoted at one end in the angle between two meeting lines of conduit, with parallel swinging hangers on opposite sides, respectively, of the tongue and largely supporting its weight, as described.

4. The combination, in a conduit-switch, of the switch-tongue pivoted at one end with the swinging links pivoted to the boxing of the switch and to a cross-piece extending laterally each side of the tongue, as described.

5. The combination, in a conduit-switch, of the boxing at the branching point with a piv-

oted switch-tongue made deep enough to project a considerable distance within the conduit and swinging hangers near the free end of the tongue largely supporting its weight.

6. The combination, in a conduit-railway system, of a slot switch-tongue pivoted at one end and sustained by the swinging hangers with the track-switch and intermediate mechanical connections whereby both are thrown simultaneously.

7. The combination, in a conduit-switch, of the pivoted switch-tongue made deep enough to project a considerable distance within the conduit and cut away to allow the passage of the grip or contact plow without striking the same, with the swinging hangers sustaining largely the weight of the switch-tongue, for the purpose set forth.

8. The combination of the track-switch with a pivoted slot-switch at a point in the rear of the track-switch and forming an angle between the branching conduit-slots more obtuse than that at which the track-rails diverge, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 22d day of October, 1890.

FRANCIS O. BLACKWELL.

Witnesses:

GEO. R. BLODGETT,

WALTER M. TWOMBLY.