

(No Model.)

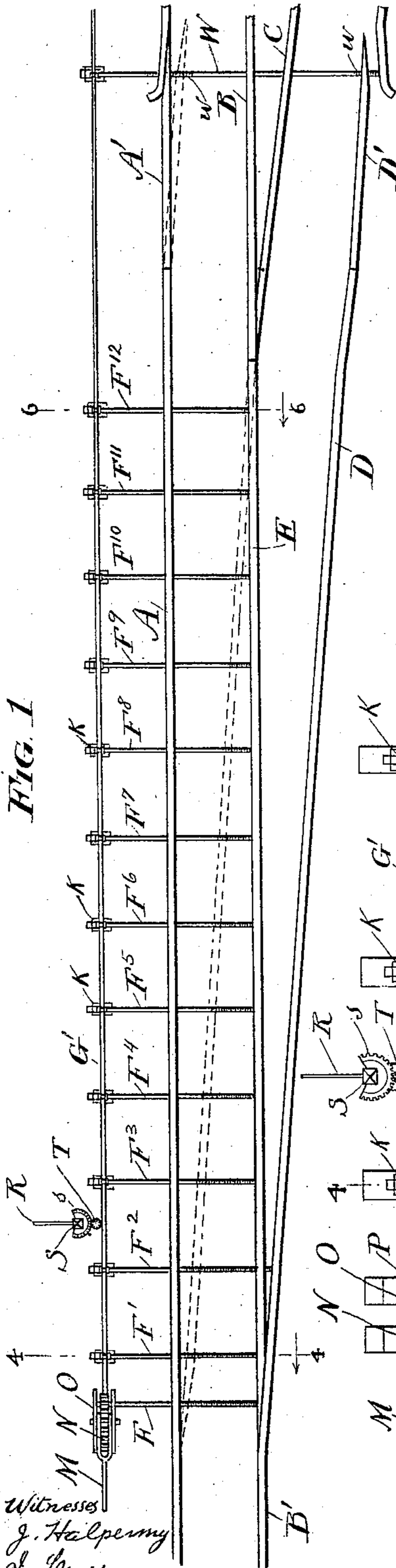
2 Sheets—Sheet 1.

F. FLANAGAN.
RAILWAY SWITCH.

No. 574,897.

Patented Jan. 12, 1897.

FIG. 1



Witnesses
J. Halpermy
S. Cross

FIG. 2

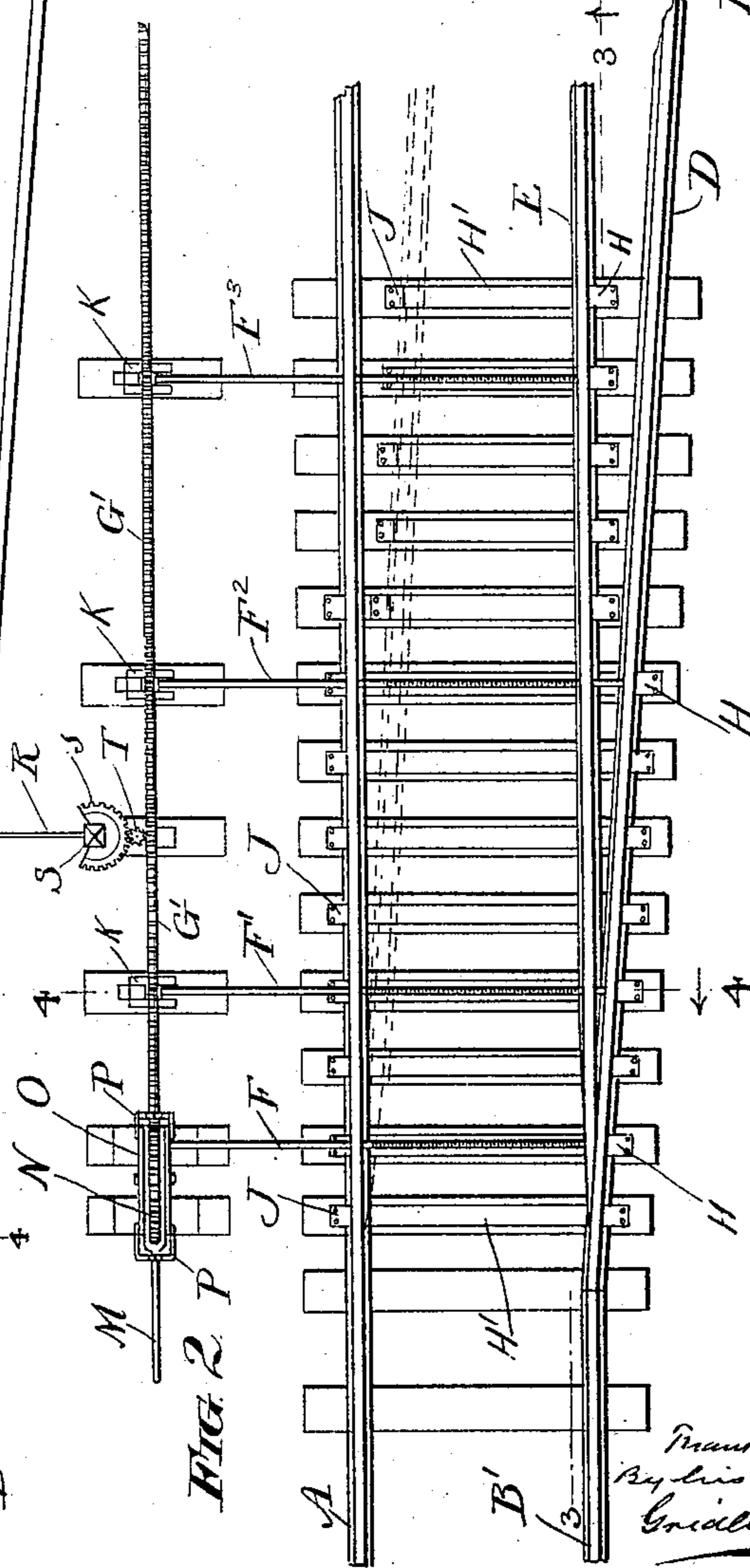
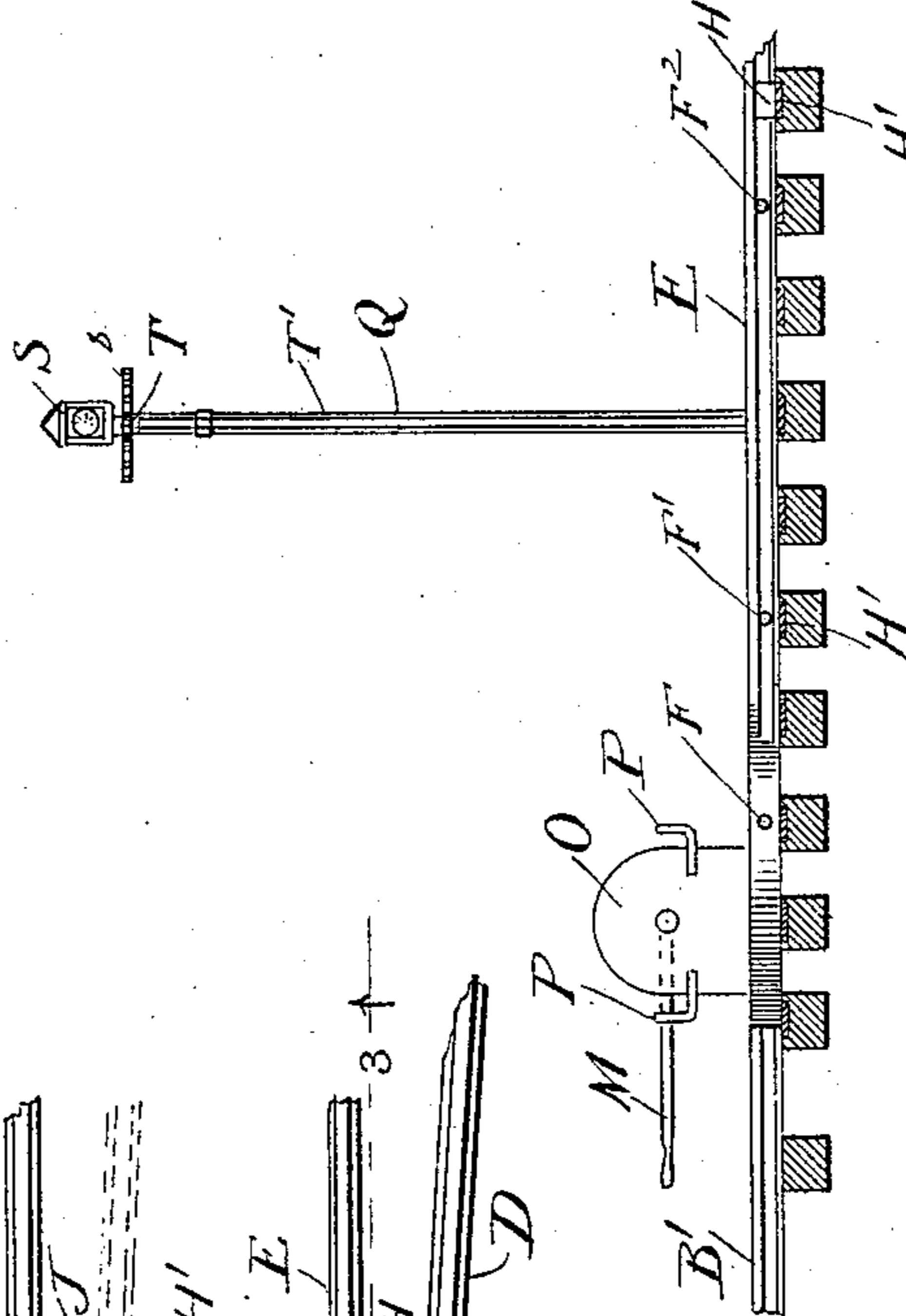


FIG. 3



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Frank Flanagan
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Grady & Hopkins

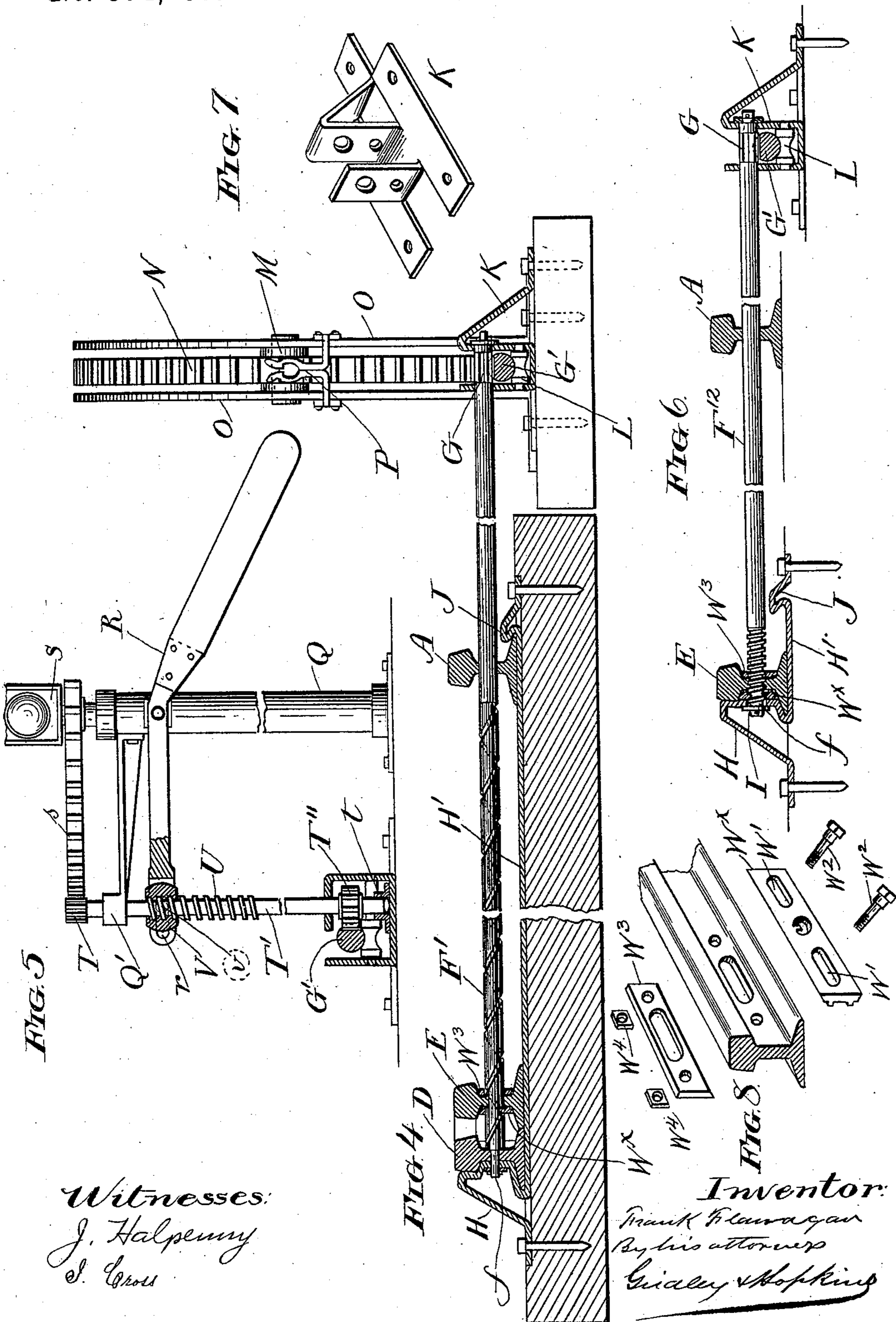
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2 Sheets—Sheet 2.

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RAILWAY SWITCH.

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Witnesses:
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Inventor:
Frank Flanagan
By his attorneys
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UNITED STATES PATENT OFFICE.

FRANK FLANAGAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO
THOMAS J. O'DONNELL, OF SAME PLACE.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 574,897, dated January 12, 1897.

Application filed June 18, 1896. Serial No. 596,065. (No model.)

To all whom it may concern:

Be it known that I, FRANK FLANAGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Switches, of which the following is a specification.

The invention relates in part to the construction of the switch, in part to the means for operating the switch-signal, and in part to means for derailing a train approaching the switch over the closed branch of the track.

So far as the invention relates to the switch itself, its object is to provide a switch of such construction that a frog may be dispensed with.

So far as the invention relates to the means for operating the switch-signal, its object is to provide improved mechanism for doing this work.

So far as the invention relates to the derailer, its object is to provide a derailer which is so constructed and connected with the switch mechanism that the switch-tongue and derailer are operated together and their proper relations at all times maintained.

The invention consists in the features of novelty that are particularly pointed out in the claims hereinafter, and in order that it may be fully understood I will describe it with reference to the accompanying drawings, which are made a part of this specification, and in which—

Figure 1 is a diagrammatic plan of a switch, a switch-signal, and a derailer embodying the invention. Fig. 2 is a plan view of a portion thereof on a larger scale. Fig. 3 is a sectional elevation of the parts shown in Fig. 2, the plane of the section being indicated by the line 3 3, Fig. 2, and the parts being viewed in the direction of the arrow. Fig. 4 is a vertical transverse section thereof on the line 4 4, Fig. 2, looking in the direction of the arrow. Fig. 5 is a sectional elevation of the switch-signal and the means for operating it, intermediate portions of the signal-post and signal-operating shaft being broken away. Fig. 6 is a vertical transverse section of a portion of the switch mechanism on the line 6 6, Fig. 1. Figs. 4, 5, and 6 are drawn to a uniform scale

somewhat larger than the scale of Figs. 2 and 3. Fig. 7 is a perspective view of a bracket hereinafter fully described. Fig. 8 is a detail view.

A and B B' represent the two rails of the main track, C and D the two rails of the branch track, and E the switch-tongue. Customarily the inside rails B and C of the two tracks are interrupted at their intersection to give place to a frog, beyond which the rails are continued to points where they meet the switch-tongues.

According to the present invention the frog is dispensed with, the inside rails B and C are terminated at their intersection, and at this point is secured the heel of the switch-tongue, which latter is of sufficient length to reach to the end of the outside rail D of the branch track. The switch-tongue may have its heel secured in customary manner, and from the point at which it is secured to its toe it is movable laterally, so that it may be placed in position to span the space between the extremities of the rail-sections B and B', as shown by full lines, and thereby complete the main track, or in position to span the space between the end of the inner rail C of the branch track and the inside of the rail A, as indicated by dotted lines, and thereby complete the branch track.

The switch-tongue is operated by means of a system of differential screws F F' F² F³, &c., all of which are operated simultaneously by means of pinions G, carried by them and engaging the teeth of an endwise-movable rack-bar G'. These screws all engage the web of the switch-tongue, and their pitch from one end of the system to the other is so graduated that, regard being had to its position in the system, each screw, moving through the same number of revolutions as the others, will move that part of the tongue with which it engages the proper distance to effect the desired lateral movement of the tongue. This difference in the pitch of the screws is plainly shown by Figs. 4 and 6, the former of which shows one of the screws which is located near one end of the system, while the latter shows one which is located near the other end of the system.

The screws are held against endwise move-

ment by some suitable means. For this purpose each of the screws may be provided with a reduced end *f*, fitting a corresponding opening or eye in a bracket H, one side of which engages the shoulder resulting from the reduction and the other side of which engages a nut or collar I, secured to the end of the screw, as shown in Fig. 6, or the reduced portion may be of sufficient length to pass through the bracket and also through the web of one of the fixed track-rails, as shown in Fig. 4. The arrangement shown in Fig. 6 is preferred, however, as it enables the use of shorter screws than are required for the arrangement shown in Fig. 4.

The brackets H are preferably integral with bed-plates H', which are secured to the ties and afford a seat for the tongue to rest and slide upon. The brackets are made to conform in shape to the base, web, and head of an ordinary T-rail, and where there is sufficient space to permit it they are arranged to engage the outside of the switch-tongue when the latter is in position to complete the main track, so that by turning the screws far enough to force the tongue firmly against them said tongue is given ample lateral support.

At the end of each of the bed-plates remote from the bracket H is a shoulder J, preferably integral with the bed-plate, and where there is sufficient space to permit it these shoulders are located in such positions that they will engage the tongue when the latter is in position to complete the branch track. When so used, they serve to brace the tongue, being so shaped that they project over its base. In the vicinity of the toe or point of the switch-tongue the brackets H are placed outside of and engage the rail D and the shoulders J are placed outside of and engage the rail A.

The stems of all of the screws pass through the web of the rail A, and near its extremity each of them is journaled in a bracket K, Fig. 7, in which is also journaled an antifriction-roller L, which supports the rack-bar G' and holds it in engagement with the pinion G.

The rack-bar may be operated by a hand-lever M through the medium of a segment N, which is journaled in a suitable housing O, spring-catches P being provided for engaging the lever at either extremity of its permitted movement and there securely holding it against accidental displacement.

Q represents a post to the side of which is pivoted a target R and to the top of which is pivoted a lamp S. The rotary stem or shaft which supports the lamp is disposed with its axis in vertical position and carries a segment *s*, which meshes with a pinion T, secured to an upright shaft T', which is adapted to receive rotary motion from the rack-bar G' through the medium of a pinion T''. At its lower end the shaft is journaled in a step-bearing T, and near its upper end it is journaled in a bracket Q', projecting from the post Q. The shaft is provided with a threaded portion U, on which fits a nut V, carrying

pins *v*, which occupy slots *r* in the perforated extremities of an arm of the target R. When the shaft T' is rotated, the nut V is caused to move up and down, and in doing so change the position of the target R, and at the same time the pinion T imparts motion to the segment *s*, and thereby turns the lamp S.

It will be understood that the target R and lamp S are of the construction customarily used for switch-signals.

The derailing device consists of a movable tongue A', incorporated in the outside rail A of the main track, and a movable tongue D', incorporated in the outside rail D of the branch track, both of these tongues being engaged by threaded portions *w* of a rod W, which derives its motion from the rack-bar G in precisely the same manner as does each of the differential screws already described.

The threads *w* are pitched in the same direction and engage the tongues A' D', so that when one of the tongues is in position to complete the rail in which it is incorporated the other is in such position that the rail is left open, and the arrangement is such that the position of the main switch-tongue E will determine which of the tongues A' or D' shall be open. The intention is that when the switch-tongue E is in position to complete one of the tracks the position of the derailing-tongue of the other track shall be such that it will derail a train approaching the switch over this latter track.

By reason of the fact that the switch-tongue moves about a center and its angle with relation to the screws is constantly changing while it is moving, it is necessary to make suitable provision therefor. To this end the switch-tongue is provided with longitudinal slots through which the screws pass freely, and the connection between the screws and tongue is made through the medium of plates W^x, with which the threads of the screws engage, said plates being secured to the side of the switch-tongue so as to be capable of a limited longitudinal movement relatively thereto. To this end each of the plates is provided with longitudinal slots W', through which pass bolts W², having shoulders which bear against the switch-tongue, the distance between the shoulders and the under side of the heads of the bolts being such that the plates are held in place, but are at the same time left free to move longitudinally.

In order to reduce the area of contact between the plates and the switch-tongue, and thereby reduce the friction, the plates are provided upon their under sides with longitudinal ribs. Upon the opposite side of the tongue are plates W³, which are immovably secured by the nuts W⁴ of the bolts W², these plates W³ being provided with longitudinal slots coinciding with the slots of the tongue.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a switch, the combination with branching tracks having inside rails terminating at their intersection, of a switch-tongue having its heel located at the termini of said inside rails whence it extends to a point opposite the end of the outside rail of the branch tracks, and means including a system of differential screws for operating the switch-tongue, substantially as set forth.

2. In a switch, the combination with branching tracks having inside rails terminating at their intersection, of a switch-tongue having its heel located at the termini of said inside rails whence it extends to a point opposite the end of the outside rail of the branch tracks, and means for operating said tongue said means including a system of differential screws engaging the tongue, pinions carried by the screws, an endwise-movable rack-bar engaging the pinions, and means for moving the rack-bar, substantially as set forth.

3. In a switch, the combination with the tongue, and means including an endwise-movable rack-bar for operating it of an upright shaft having a pinion engaging the rack-bar, an elevated signal, and means for transmitting movement from the shaft to the signal, substantially as set forth.

4. In a switch, the combination with the tongue, and means including an endwise-movable rack-bar for operating it, of an upright shaft having a pinion engaging said rack-bar, said shaft having a thread, a nut engaging the thread, a pivoted target, and means for

transmitting movement from the nut to the target, substantially as set forth.

5. The combination with branching tracks, each having a displaceable section in its outside rail, said sections being so related to each other that when one of them is in position to complete the rail in which it is incorporated the other rail is interrupted, and a switch common to both of said tracks, of means common to both of said displaceable sections and to the switch for simultaneously operating them, the arrangement being such that when the switch is in position to complete either of said branching tracks the displaceable section of the other of said branching tracks is in a position to leave it open, substantially as set forth.

6. The combination with branching tracks having displaceable sections A', D', in their outside rails, of a shaft having threaded portions engaging said displaceable sections, a switch-tongue, and means common to both of the displaceable sections and the switch-tongue for operating all of them simultaneously, said displaceable sections being so related to each other that when one of them is in position to complete the rail in which it is incorporated the other rail is interrupted, substantially as set forth.

FRANK FLANAGAN.

Witnesses:

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L. M. HOPKINS.