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PATENTED FEB. 9, 1904.

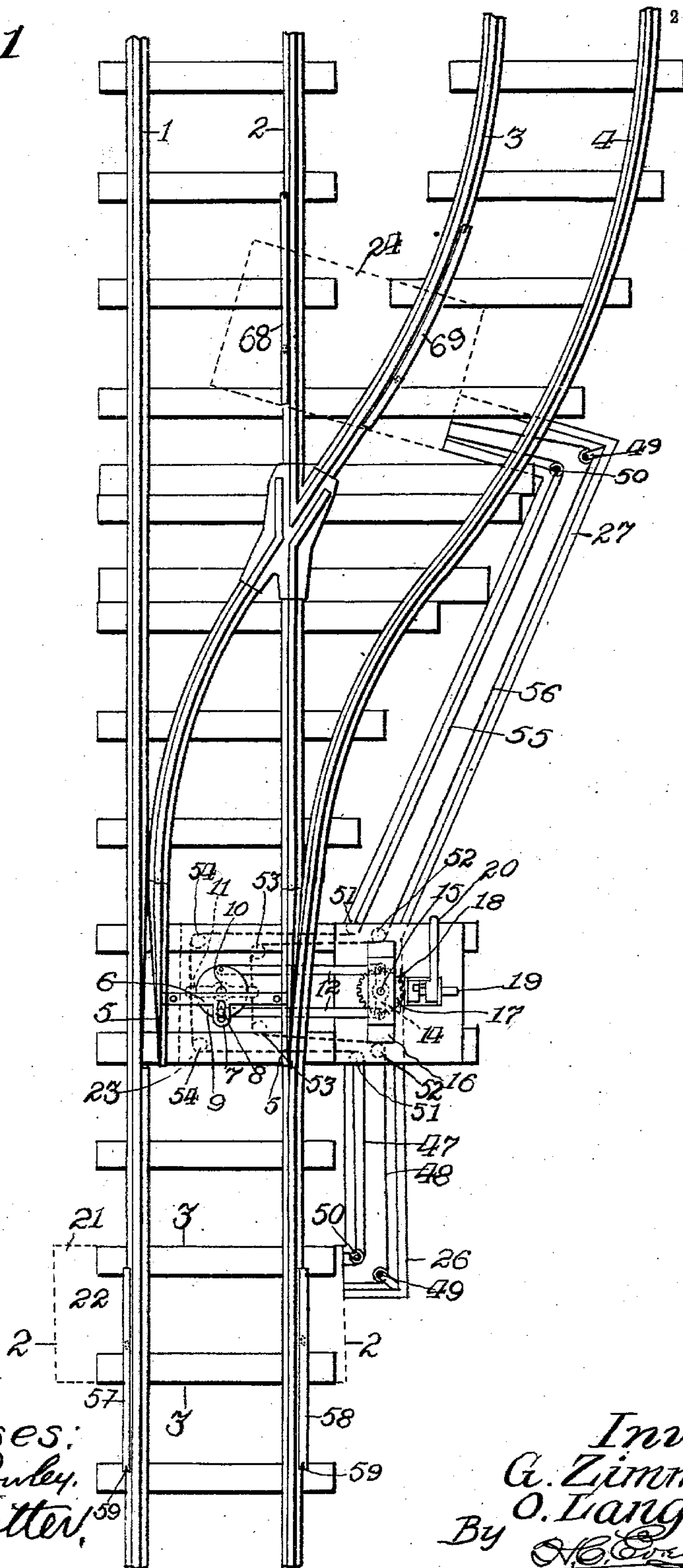
G. ZIMMERMANN & O. LANGOS.  
SWITCH.

APPLICATION FILED OCT. 5, 1903.

NO MODEL.

*Fig. 1*

2 SHEETS—SHEET 1.



Witnesses:  
Geo. B. Rowley,  
J. C. Patter,

Inventors  
G. Zimmermann  
O. Langos.  
By *[Signature]*  
Attorneys.

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2 SHEETS—SHEET 2.

NO MODEL.

Fig. 2

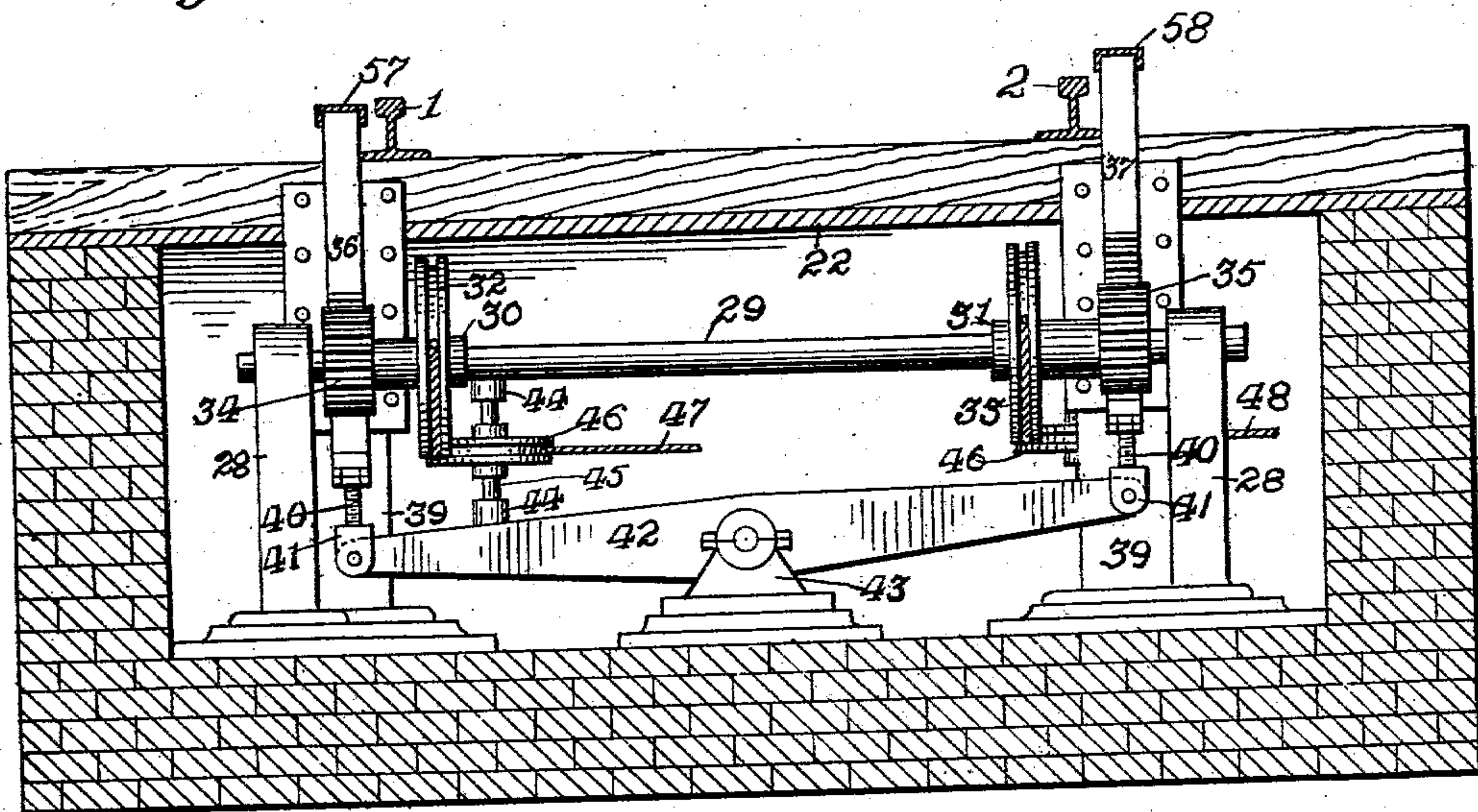
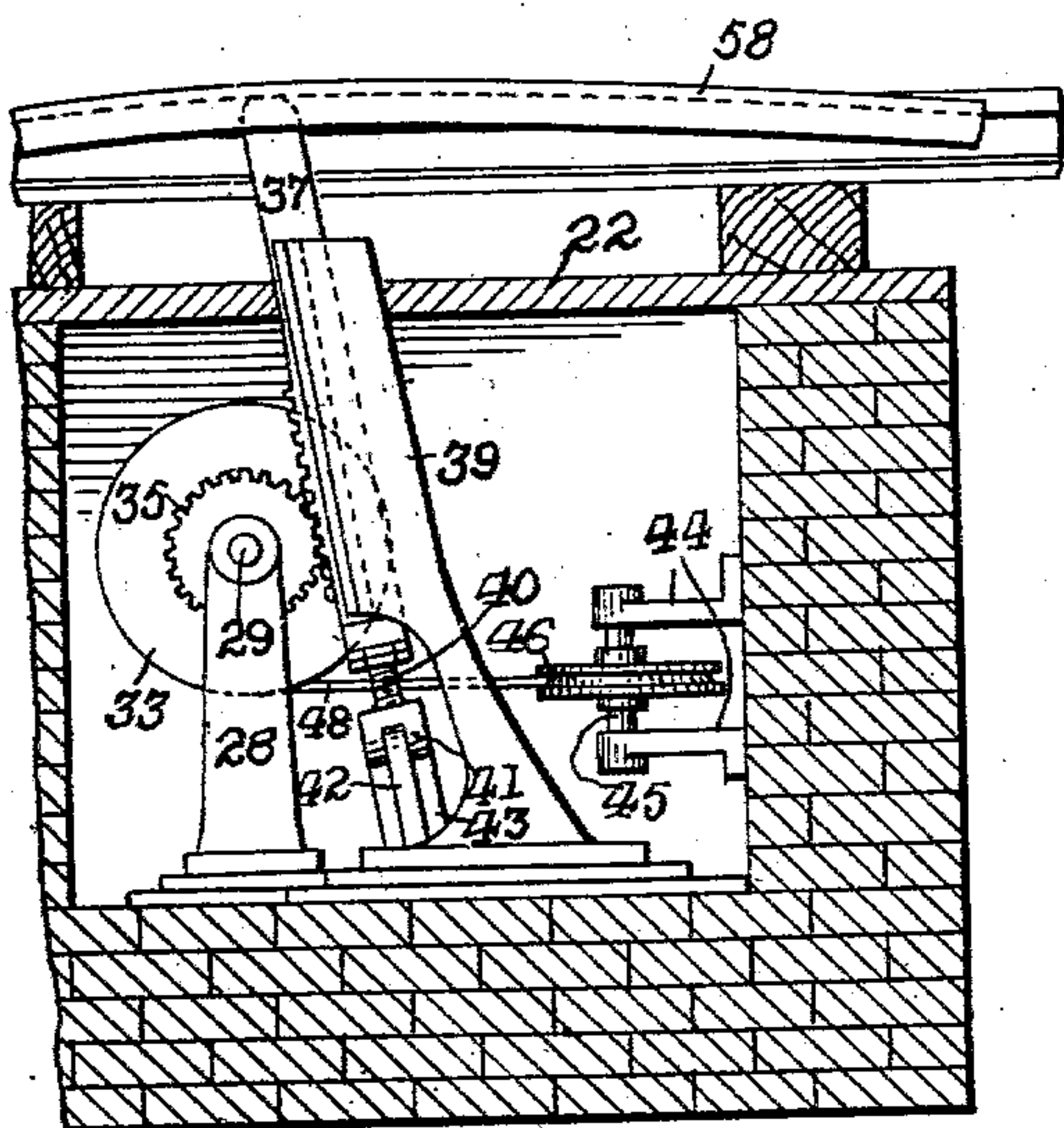


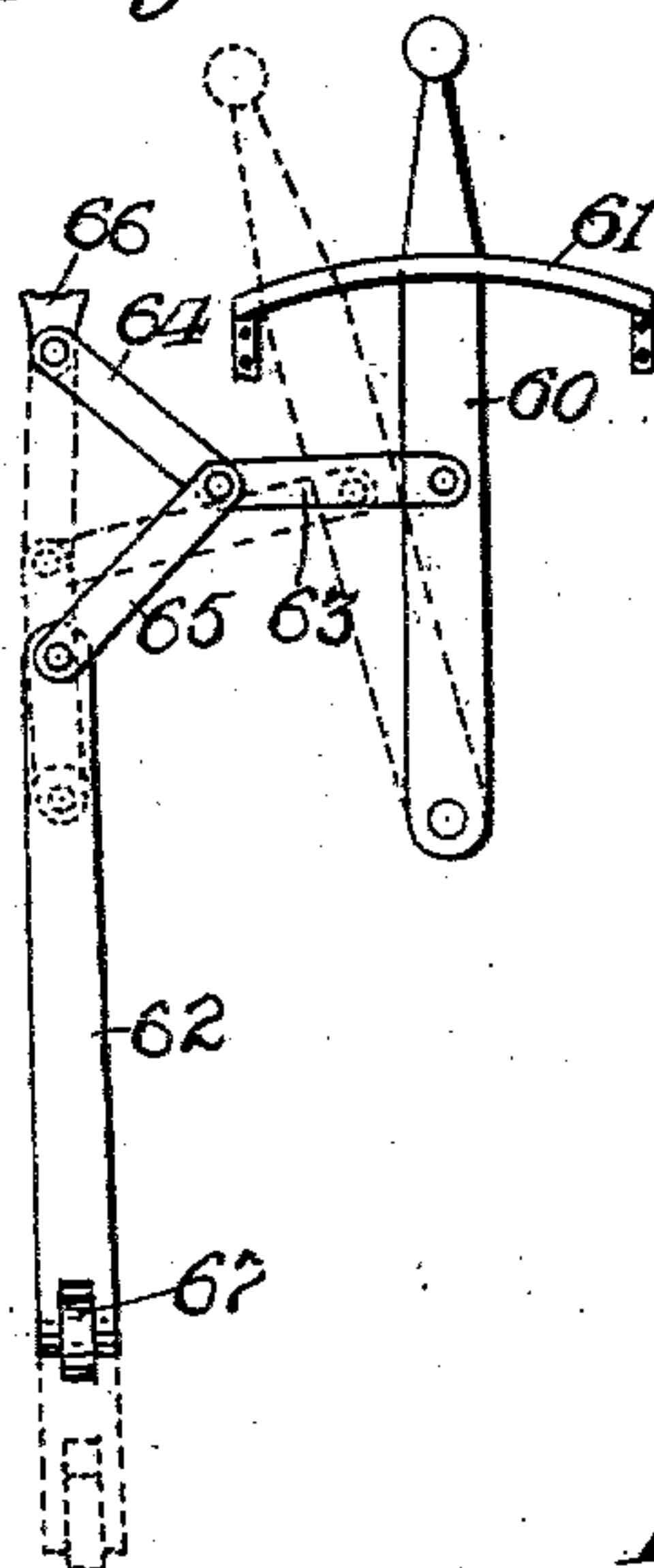
Fig. 3



Witnesses:

Geo B Rowley,  
A. E. Patten,

Fig. 4



Inventors  
G. Zimmermann,  
O. Langos,  
By *Hebert & Co.*  
Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE ZIMMERMANN, OF PITTSBURG, PENNSYLVANIA, AND OTTO LANGOS, OF ALLIANCE, OHIO, ASSIGNORS OF ONE-THIRD TO A. L. GVATSOVSKY, OF ALLEGHENY, PENNSYLVANIA.

## SWITCH.

SPECIFICATION forming part of Letters Patent No. 752,015, dated February 9, 1904.

Application filed October 5, 1903. Serial No. 175,772. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE ZIMMERMANN, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, and OTTO LANGOS, residing at Alliance, in the county of Stark and State of Ohio, both subjects of the Emperor of Austria-Hungary, have invented certain new and useful Improvements in Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in switches, and the object of the invention is to provide a switch capable of being actuated by means of a shoe suspended from a car or engine when said car or engine is moving in one direction on the track, capable of being manually operated from the side of the track, and also capable of being automatically operated by a car or engine moving in the opposite direction to that of the car or engine which actuates the switch by means of the shoe suspended from said car or engine.

Briefly described, the invention embodies ditches or subways located underneath the track, one underneath the switch tongue or tongues, and one at each side thereof, these ditches or subways being connected together by a conduit, through which extend flexible connections attached to the actuating means at the switch and to that at each side of said switch. The actuating means at one side of the switch embodies presser strips or bars located outside the rails of the track and adapted to be engaged by a suitable device carried by the car or engine, and which when depressed actuate means connected up by said flexible connections to the switch tongue or tongues to move the latter into the desired position. The actuating means at the other side of the switch also embodies presser strips or bars located on the inner side of the rails and connected up to the switch tongue or tongues, and so arranged that when in one position the wheels of the car or engine engage the same to depress them and actuate the switch tongue

or tongues, and when in another position permit the wheels of the engine, car, or train to pass over same without actuating the mechanism. Manual means is also provided whereby the switch tongue or tongues, as the case may be, may be operated by hand.

All of the above construction will be hereinafter more specifically described and then particularly pointed out in the appended claims, and in describing the invention in detail reference will be had to the accompanying drawings, forming a part of this application, and wherein like numerals of reference will be employed for indicating like parts throughout the different views of the drawings, in which—

Figure 1 is a top plan view of our improved switch, showing the switch-tongues in position to pass the engine or train onto the main track. Fig. 2 is a transverse vertical sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a longitudinal sectional view taken on line 3 3 of Fig. 1. Fig. 4 is a detail side elevation of a form of actuating mechanism that may be employed on the car or engine, showing its normal position in full lines and operative position in dotted lines.

Describing the invention in detail, 1 2 indicate the main rails of the track and 3 4 the rails of the side track and 5 the movable switch tongues or rails. These switch rails or tongues may be moved manually from the side of the track, adjacent the switch, and to accomplish this we connect the switch rails or tongues by a bar 6, having at or approximately the center of its length a slotted lug 7, which receives a pin 8, mounted eccentrically in the disk 9, pivoted in the bed of the track. The shaft 10, on which the disk 9 is mounted, carries on its lower end beneath the track a cross-head 11, to which the ends of actuating flexible connections leading to the actuating mechanism at each side of the switch are attached. The disk 9 is actuated so as to move the switch-tongues 5, by means of rods or links 12, having their one end pivoted to the disk 9 and their other ends pivoted to op-



posite ends of a cross-head 14, carried on a shaft 15, mounted in a switch-stand 16 at the side of the track.

On the shaft 15 is mounted a bevel-pinion 17, to be engaged by a bevel-pinion 18, carried on a shaft 19 and having integral therewith one member of a clutch, the other member of which is carried by the lever 20, mounted on said shaft 19. Thus when the lever is shifted on its shaft so as to engage the clutch members the movement of the lever in one direction or the other causes bevel-pinion 18 to actuate bevel-pinion 17, and through medium of rods or links 12 actuate disk 9 and move the switch-tongues into the desired position, the links or rods 12 in this actuation moving one in one direction and the other in the opposite direction. Ordinarily we employ a lamp at the switch-stand, so that the actuation of the switch turns the lamp to give the desired signal, this being, however, a principle well known and generally used, and hence we have not shown the same herein.

In front of the switch-tongues we provide a ditch or subway 21, which extends across the track transversely and is covered by a metallic cover-plate 22. Generally in practice we wall this ditch or subway with masonry or brickwork, as seen in Figs. 2 and 3. A similar walled-in ditch or subway 23 is provided transversely of the track underneath the switch-tongues and switch-stand heretofore described, and also a similar walled-in ditch or subway 24 is provided at the rear of the switch, extending underneath the one of the rails of the main track, and under the one rail of the side track, as outlined by dotted lines in Fig. 1. Both of these ditches or subways are covered over by a metallic plate, as shown and described for ditch or subway 21. A conduit 26 connects ditch or subway 21 with ditch or subway 23, and the latter is also connected to the ditch or subway 24 by conduit 27. These conduits 26 27 may be open or covered, as may be desired.

The mechanism contained in the walled-in ditches 21 24 is identical and is shown in detail in Figs. 2 and 3. It is also operated in the same manner, but in one instance is actuated by mechanism suspended from the car or engine and in the other instance is actuated by the wheels of the car or engine. This mechanism embodies standards 28, suitably mounted in the ditches and in which is mounted a shaft 29. Sleeves 30 31 are rotatably mounted on this shaft 29 and carry, respectively, sheaves 32 33 near one end and near their outer ends have pinions 34 35 to be engaged by rack-bars 36 37, respectively. These rack-bars operate in guides 39, mounted on the base or bottom of the ditch and extending through the metallic cover-plate 22. Threaded into the lower ends of the rack-bars 36 37, so as to be adjustable, are the stems 40 of clevises 41, which are pivotally attached to op-

posite ends of the beam 42, mounted centrally on a bearing or pillow block 43, supported on the bottom of the ditch. Attached to the side wall of the ditch is a pair of brackets 44, one pair near each end of the ditch, and in these pairs of brackets are journaled shafts 45, carrying sheaves 46. Flexible connections 47 48, such as cables, have their one end attached, respectively, to the sheaves 32 33 and pass around the sheaves 46, sheaves or pulleys 49 50 51 52, located in the conduit 26, and around sheaves or pulleys 53 54, located in the conduit or ditch 23, with their opposite ends attached to opposite ends of the cross-head 11. For the mechanism in ditch 24 (which, as stated, is the same as that just described) the flexible connections have been indicated by reference-numerals 55 56, these flexible connections passing around sheaves or pulleys in the conduit 27, similarly disposed to those in conduit 26, and the same reference-numerals have been applied thereto, the one end of said connections being attached to opposite ends of the cross-head 11, as described for connections 47 48.

The rack-bars 36 37 in ditch 21 extend up through the cover-plate 22 outside the rails 1 and 2 of the main track and are connected to presser strips or bars 57 58, respectively. These strips or bars are bowed, as seen in Fig. 3, so that the point where the rack-bars connect therewith may be elevated above the rails, the ends of the strips extending down onto the base-flanges of the rails and one end thereof being pivoted, as at 89, either to the rail base-flange or to the cross-tie, as may be desired. As shown in Figs. 1 and 2, the switch is closed, so as to permit a train passing from left to right to continue on the main track, and should it be desired to open the switch, so as to pass the engine or train onto the side track the operator drops the shoe carried by the engine or car into engagement with presser strip or bar 58 to depress the same, causing flexible connection 48 to actuate cross-head 11 and operate disk 9, so as to shift the switch-tongues through medium of bar 6 into the opposite position. As flexible connection 48 is wound on its sheave 33 flexible connection 47 is unwound from its sheave 32, rack-bar 37 in descending causing rack-bar 36 to be elevated, due to the connection at opposite ends of the beam 42. The clevises are made adjustable between the ends of the beam and the rack-bars 36 37, respectively, so that the throw imparted to the rack-bars may be varied as may be desired.

A practical form of device for actuating the presser-bars 57 58 is shown in Fig. 4 and embodies a pivoted lever 60, adapted to be attached at any desired point on the engine or car, a suitable rack 61 being provided for holding the lever in each of its two positions. This lever is connected to the operating-bar 62 by means of link 63, pivoted to the lever



and to toggle-links 64 65, pivoted, respectively, to bracket 66 and to the bar 62. The bar 62 is provided in its lower end with a suitable roller or shoe 67 for engagement with the presser strips or bars.

As lever 60 is moved from position shown in full lines to that shown in dotted lines bar 62 will be forced down into position shown in dotted lines, so as to engage the shoe or roller with presser-strip 57 or 58, as the case may be, one of these devices being provided at each side of the car or engine.

In case of a train moving toward the rear of the switch, or, in other words, from right to left, as seen in Fig. 1, we aim to automatically operate the switch tongue or tongues, and to this end we provide a presser strip or bar 68, similar in construction to bars 57 58 and connected to rack-bar 36 in ditch 24. This rack-bar in this instance projects up through the cover-plate 22 inside of the rail 2, so that the presser bar or strip 68 is located inside said rail 2. The rack-bar 37 in ditch 24 projects up through cover-plate 22 inside of rail 3 of the side track and has a presser strip or bar 69 attached thereto. In case of a train passing from right to left on the main track, as seen in Fig. 1, and the switch is in the position shown in this view, then presser strip or bar 68 will be in its lower position and the wheels of the train will pass over same without actuating the switch; but in event of a train passing in the same direction and the switch being open then presser strip or bar 68 will be elevated, whereby it will be engaged by the wheels of the train and depressed, and this depression forces down the rack 36 attached thereto and automatically, through the connections aforescribed, closes switch, so as to permit train to pass over same and continue on the main track. Likewise in event of a train passing off the side track moving toward the switch and the switch-tongues set so as to conduct the train properly onto the main track the presser strip or bar 69 will in this event be in its lower position, so as not to be engaged and actuated by the wheels of the train; but in event of the switch being in the wrong position to pass the train onto the main track then the presser strip or bar will be in its elevated position and will be engaged by the wheels of the train and depressed, so as to actuate the switch and move the tongues thereof to the proper position to pass the train onto the side track, so as to pass a train moving from left to right on the main track onto said side track, then presser strip or bar 69 will be in its depressed or lowered position, so as not to be engaged by the wheels of the train.

While we have herein shown and described our invention as it is practiced by us, yet it will be observed that various changes may be made in the details of construction without departing from the general spirit of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a switch, the combination with the pivoted switch-tongue, of hand-actuated mechanism connected to the switch-tongue for actuating the latter, mechanism located in the bed of the track at one side of the switch adapted to be engaged by a projection on an engine and connected to the hand-actuated mechanism for actuating said switch-tongue, and like mechanism at the opposite side of the switch adapted to be engaged by the wheel of an engine and also connected to the hand-operating mechanism for actuating said switch, substantially as described.

2. In a switch, the combination with the pivoted switch-tongue, of means for actuating said switch-tongue manually, separate means located on one side of the rail for actuating said switch-tongue from the engine or car, and further separate means located on the other side of the switch and opposite side of the rail for actuating the switch-tongue by the passing of an engine or car over said last-named means, substantially as described.

3. In combination with a pivoted switch-tongue, an actuating mechanism connected thereto and adapted to be operated by hand, mechanism located in the bed of the track in advance of the switch and on one side of the rail, and flexible connections between the last-named mechanism and the first-named mechanism, means carried by the car or engine for actuating the last-named mechanism to operate the switch-tongue, and automatic mechanism located in the bed of the track at the opposite side of the switch and other side of the rail to the second-named mechanism and adapted to be actuated by the passing thereover of the wheel of a train or engine, and flexible connections between said last-named mechanism and the first-named mechanism, substantially as described.

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE ZIMMERMANN.

OTTO LANGOS.

Witnesses for Zimmermann:

H. C. EVERT,

A. M. WILSON.

Witnesses for Langos:

WILLIAM L. HART,

H. C. KOEHLER.