

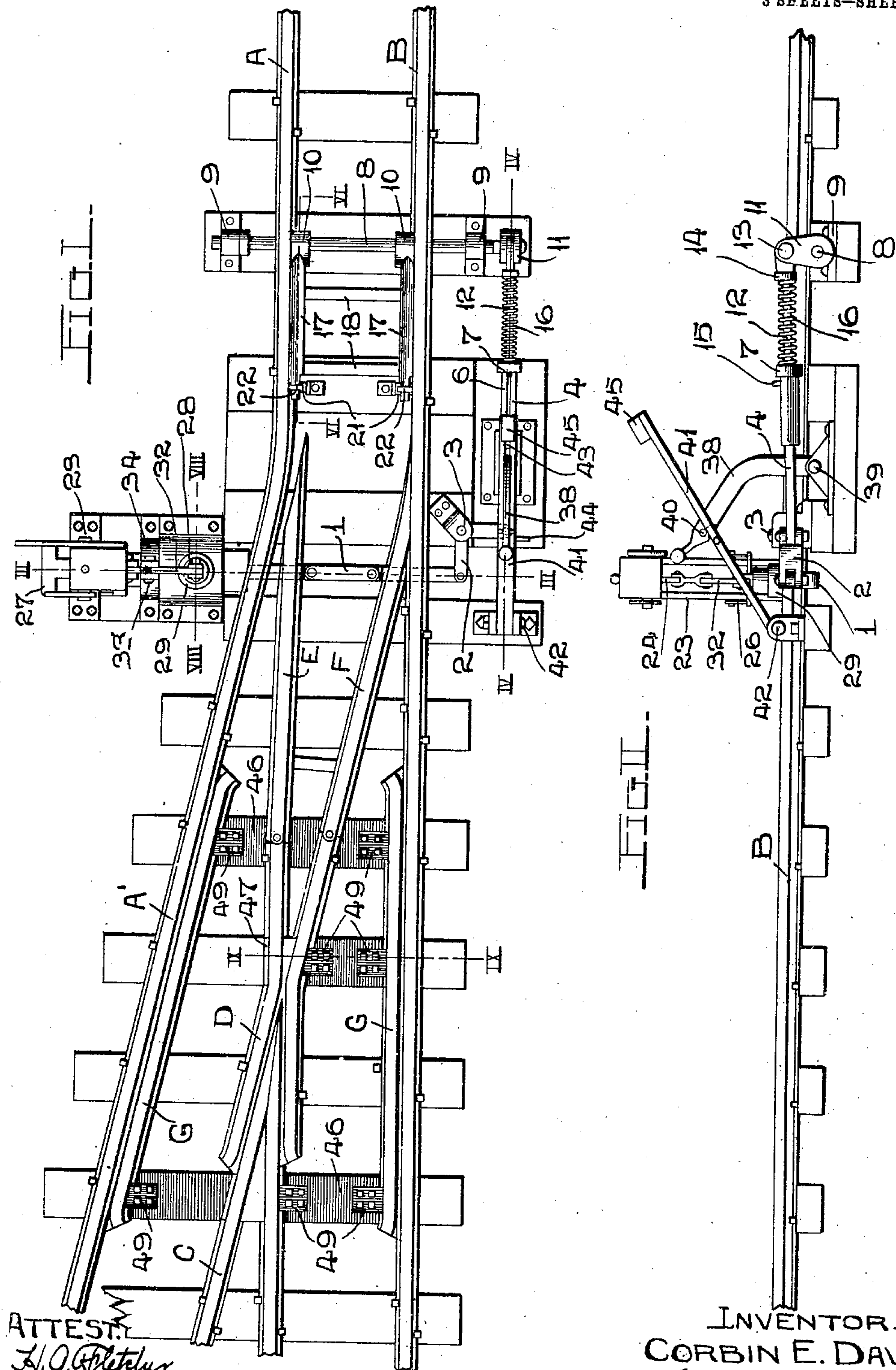
No. 868,414.

PATENTED OCT. 15, 1907.

C. E. DAVIS.
AUTOMATIC RAILWAY SWITCH.

APPLICATION FILED MAY 20, 1907.

3 SHEETS—SHEET 1.



ATTEST:
H. J. Fletcher,
Clerk

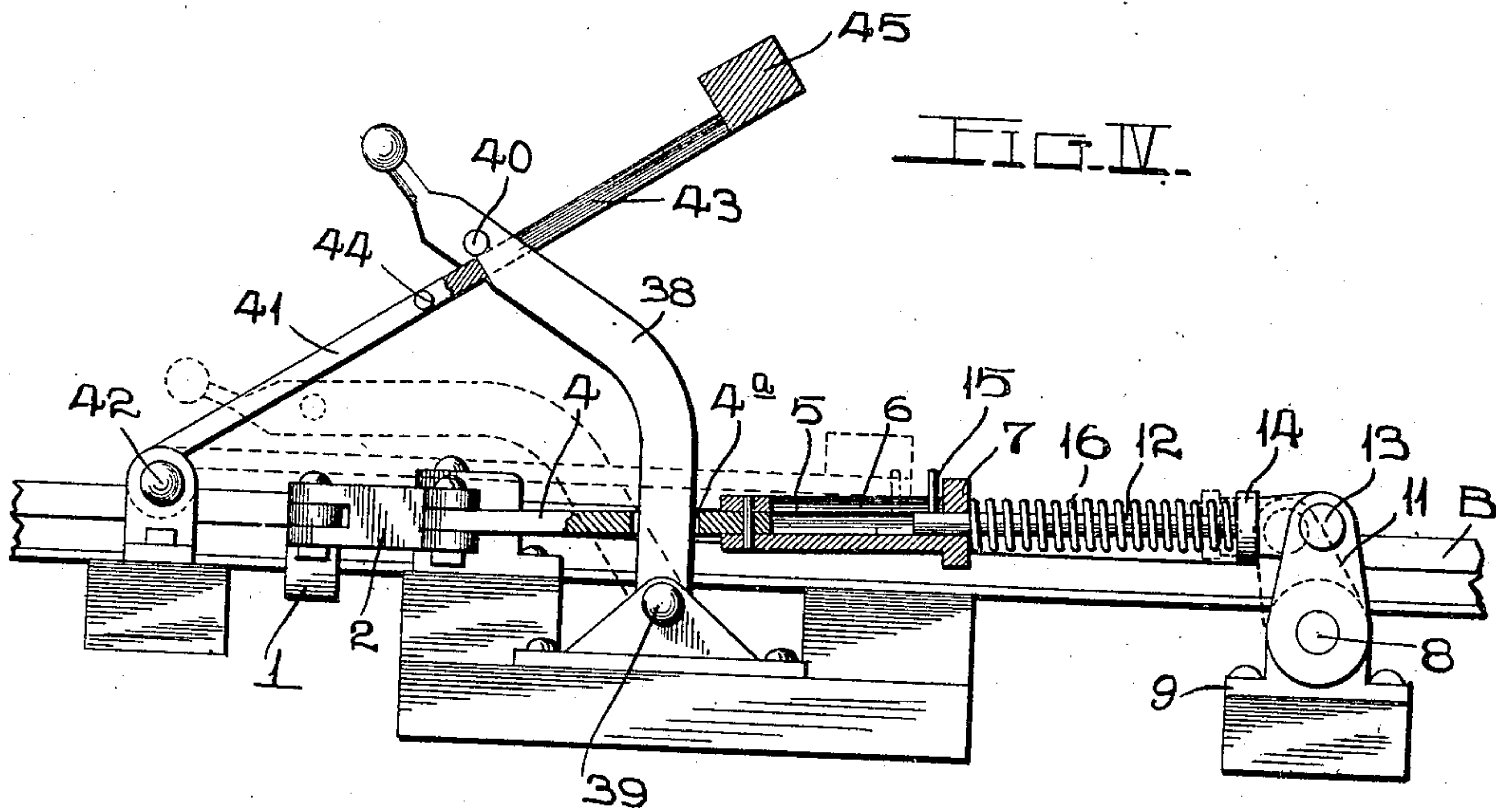
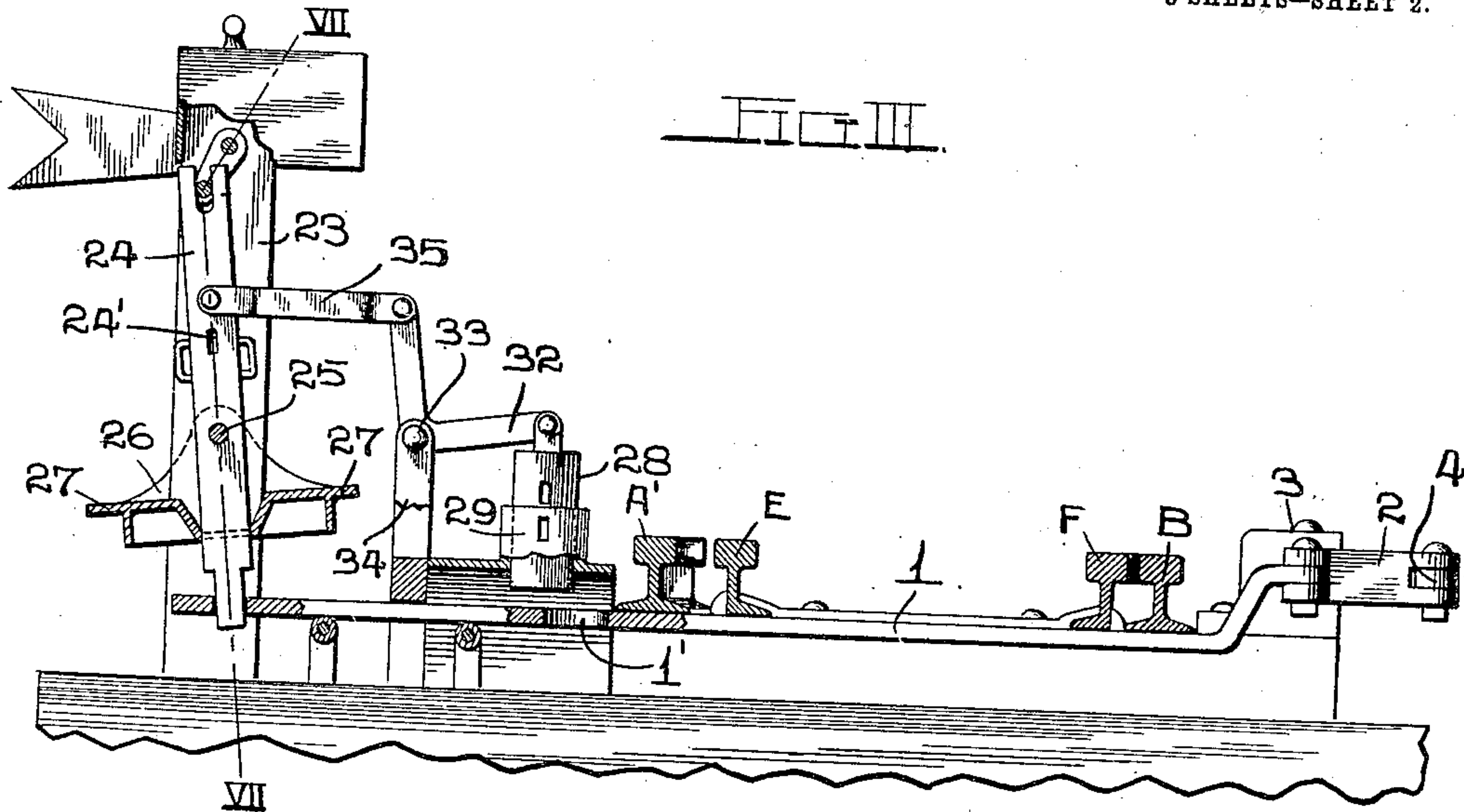
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CORBIN E. DAVIS.
BY *W. H. Wright* ATTY.

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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

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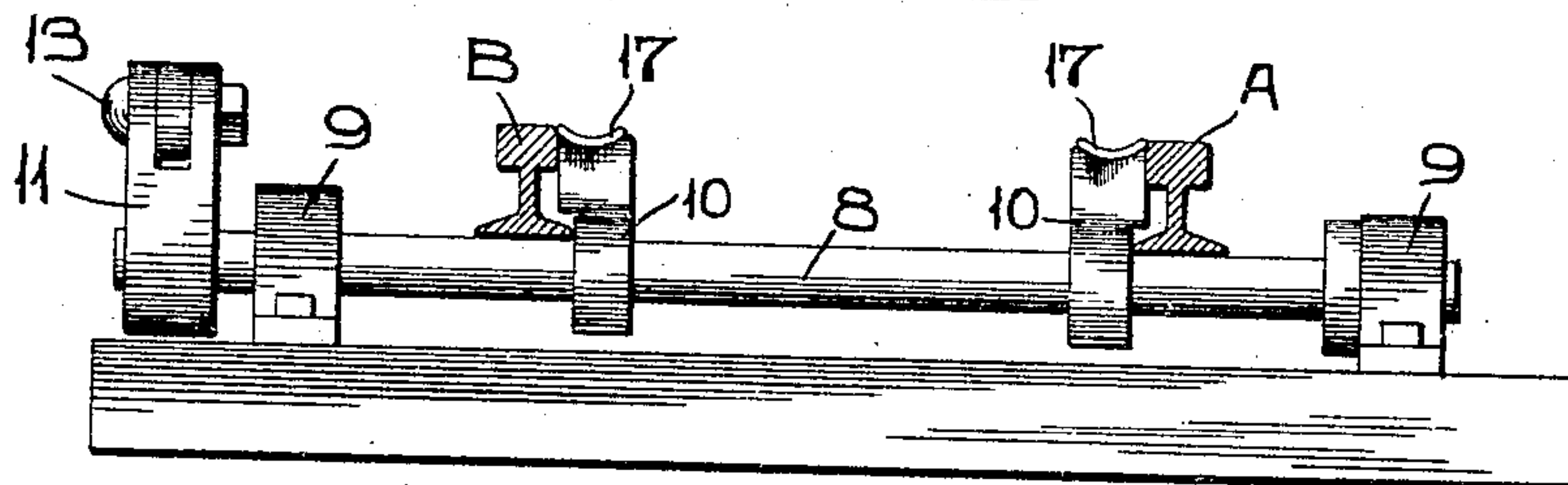


FIG. VI.

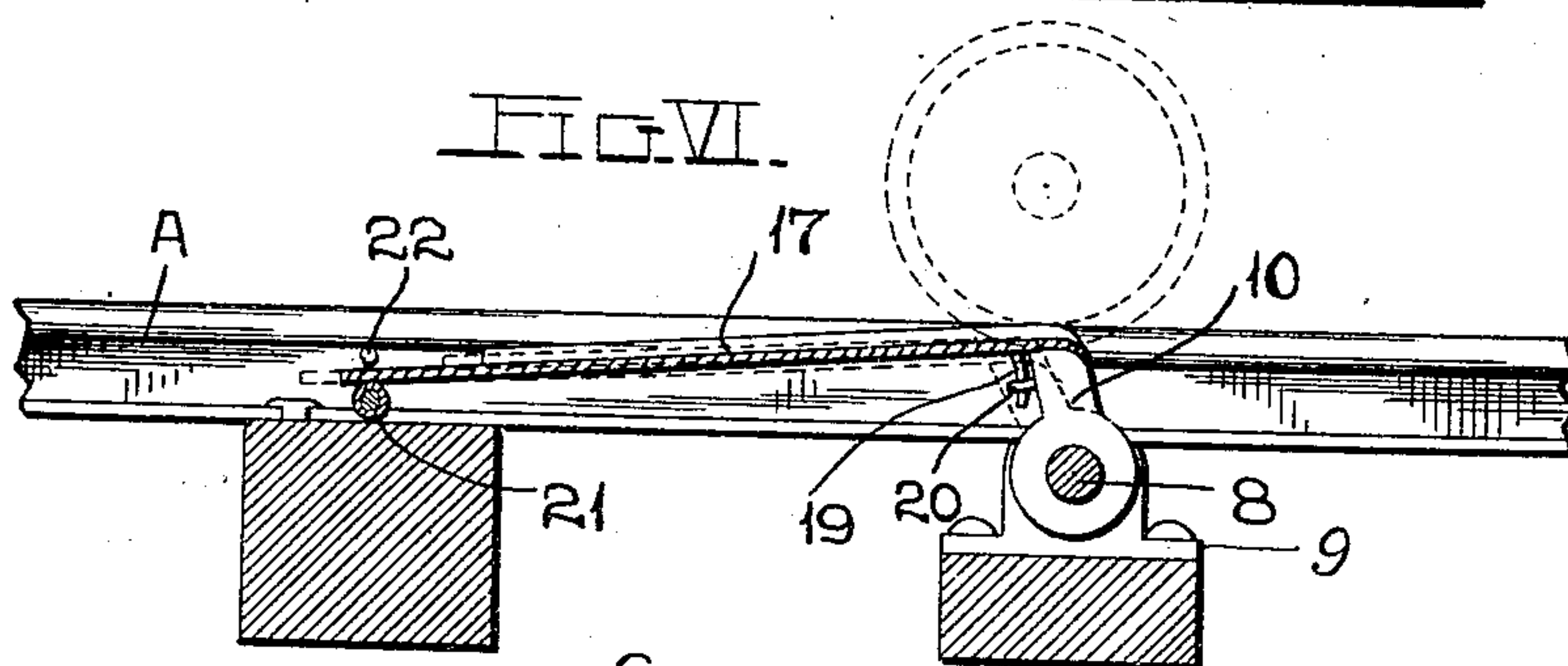
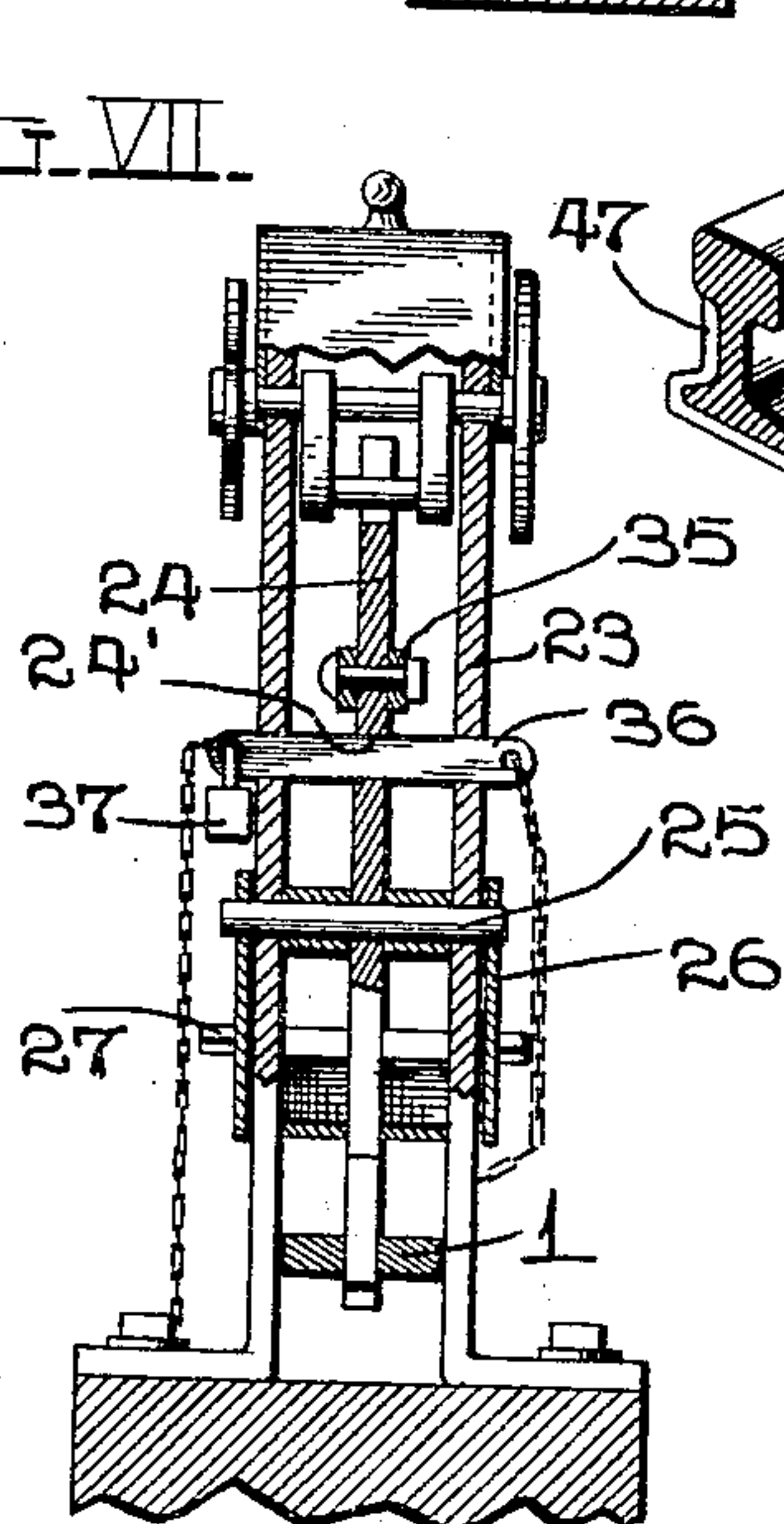


FIG. VII.



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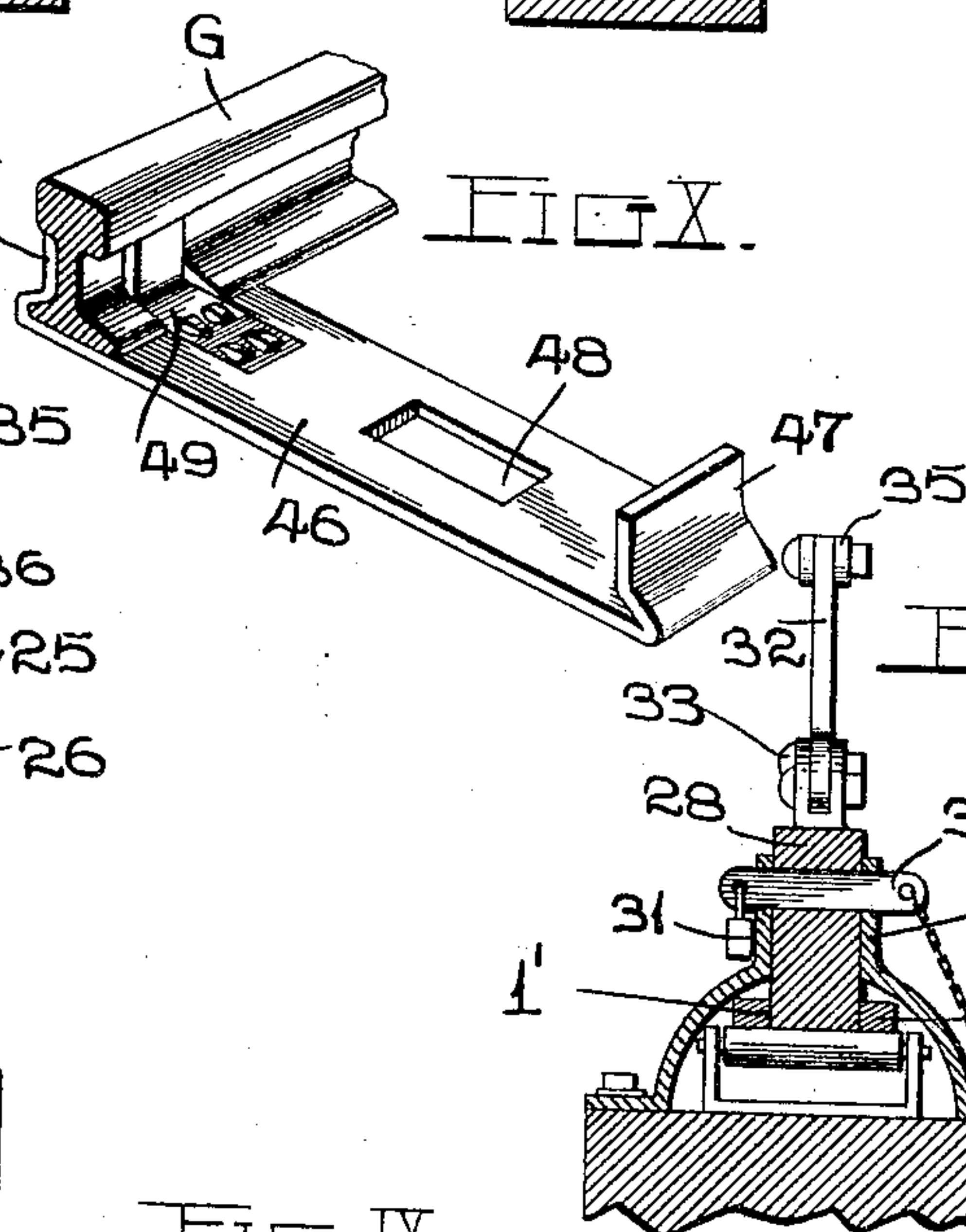
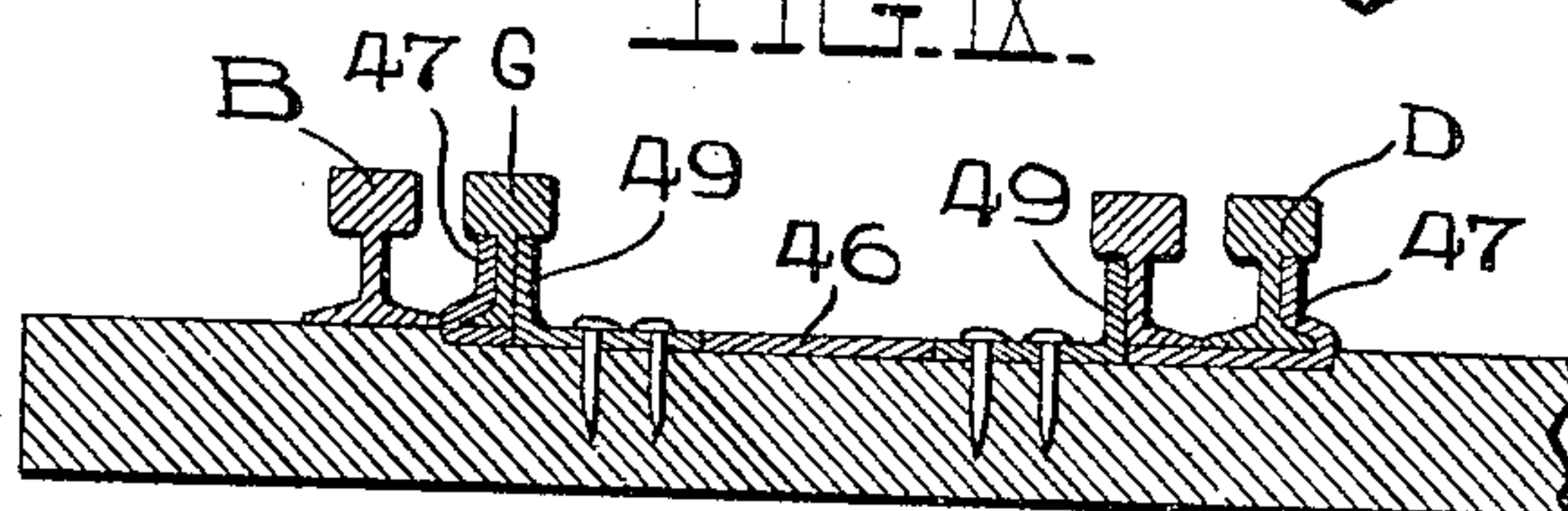


FIG. IX.



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UNITED STATES PATENT OFFICE.

CORBIN E. DAVIS, OF ST. LOUIS, MISSOURI.

AUTOMATIC RAILWAY-SWITCH.

No. 868,414.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed May 20, 1907. Serial No. 374,634.

To all whom it may concern:

Be it known that I, CORBIN E. DAVIS, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Automatic Railway-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a railway switch having means incorporated therein whereby the movable switch rails are automatically moved from an "open" to a "closed" position upon the passage of a train to the switch, due to the coöperation of the car wheels with movable members that serve to actuate mechanism associated with the movable switch rails.

My invention also relates to means for preventing the "creeping" of guard rails in railway switches.

Figure I is a top or plan view of my railway switch. Fig. II is a side elevation of the switch with the switch rail operating mechanism illustrated as it appears when it has been manually operated for the purpose of opening the switch. Fig. III is an enlarged vertical cross section taken on line III—III, Fig. I. Fig. IV is an enlarged vertical longitudinal section taken on line IV—IV, Fig. I. Fig. V is an enlarged elevation of the trip members in the switch operating mechanism. Fig. VI is an enlarged longitudinal section taken through one of the trip members on line VI—VI, Fig. I. Fig. VII is an enlarged vertical section taken on line VII—VII, Fig. III. Fig. VIII is a vertical cross section taken on line VIII—VIII, Fig. I. Fig. IX is a vertical cross section taken on line IX—IX, Fig. I through one of the guard rail holding appliances. Fig. X is a perspective view of one of the guard rail holding appliances.

A and B designate the main line rails of a railway track, the former of which leads to a siding rail A'.

C is a siding rail that is arranged parallel to the siding rail A' and leads from a frog D.

E and F are movable switch rails associated with the frog D and the former of which is movable to and away from the rails A and A' while the latter is movable to and away from the rail B.

1 designates a switch bar that extends transversely of the switch and is connected to the switch rails E and F in a manner to cause lateral movement to be imparted to said rails when the switch bar is shifted by the mechanism coöperating therewith and to be described.

2 is a bell-crank lever pivotally mounted at 3, see Fig. I, and to one of the arms of which the switch bar 1 is loosely connected. 4 is a throw bar pivoted to the other arm of the bell crank lever and provided with a longitudinal guide-way 5 and a longitudinal slot 6. The throw bar terminates at its forward end in a head 7.

8 designates a rock shaft journaled in suitable boxes 9

mounted upon one of the railway ties beneath the main rails at the switch and 10 are arms fixed to said shaft adjacent to the main rails A and B. 11 is a crank arm also fixed to the rock shaft 8 and located at one side of the railway track.

12 is a pusher rod that is pivoted at 13 to the crank arm 11 and is provided with a collar 14. This pusher rod is slidably fitted in the head 7 of the throw bar 4 and is adapted to operate in said head and in the guide-way 5 in said bar. The pusher rod is restrained from escape from said throw bar by a stop pin 15 that is operable in the slot in the bar.

16 is a resistance spring that surrounds the pusher rod and is located between the collar 14 thereon and the head of the throw bar.

Between the main rails A and B is a trip member that comprises a pair of longitudinal trip bars 17 united by transverse connecting bars 18 and which are preferably of channel shape, as seen in Figs. I, V, and VI. The forward ends of the trip bars 17 are seated upon the arms 10 of the rock shaft 8 to which they are preferably connected by spurs 19 at their lower sides that enter into keepers 20 carried by the arms 10, as seen in Fig. VI. The rear ends of the trip bars are positioned between rollers 21 on which the bars are adapted to ride when moved longitudinally of the switch and surmounting confining pins 22 seated in the rails A and B and overhanging the trip bars. The trip bars 17 are designed for service in the actuation of the rock shaft 8 to impart movement to the mechanism intervening between said rock shaft and the switch bar 1 for the purpose of moving the switch rails E and F from an "open" to a "closed" position—in other words, to move the switch rail F away from the main rail B when it is adjacent to said rail and the switch rail E to the siding rail A' when it is removed from said rail in order that a straight course on the main rails at the switch may be furnished for the passage of a train thereon in the event that the switch has been left open previous to the arrival of the train. The closing of the switch is accomplished, due to the wheels of a car riding onto the trip bars 17 and acting to depress them. As the trip bars move downwardly they exert a downward pressure upon the arms 10 with the result of rotating the rock shaft 8 and throwing the crank arm 11 carried by said rock shaft in a direction toward the switch bar 1. The crank arm 11 acts to impart movement to the pusher rod 12 and the resistance spring 16, which latter member, by acting upon the throw bar 4, causes said bar to operate the bell crank lever 2 and shift the switch bar sufficiently to move the switch rails to the desired extent.

23 designates a combined switch and semaphore stand that is located at the side of the switch opposite that at which the previously described switch rail operating mechanism is located.

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24 is a throw lever pivotally mounted at 25 in the stand 23 and having its lower end seated in the switch bar 1 in order that said switch bar may be shifted when the lever is moved upon its pivot.

- 5 26 is a treadle pivoted to the stand 23 in common with the throw lever 24 and fitted to said throw lever as seen in Fig. III. This treadle is provided with inner and outer foot pieces 27 upon which pressure may be exerted by the foot of an operator for the purpose of moving the treadle and imparting movement to the lower end of the throw lever to actuate the switch bar 1.

- To provide for the switch bar 1 being held from movement when the switch is in a closed condition I furnish a locking pin 28 that is loosely seated in a guide-box 29 mounted upon a suitable support and extending over the switch bar. This locking pin is adapted to enter an aperture 1' in the switch bar when said bar is thrown to a position to close the switch at which time the pin may be held in its lowered position, as seen in Fig. VIII, by the introduction of a locking key 30 through the guide-box and the locking pin and the application to said key of a suitable lock 31. In order that the locking pin may be withdrawn from the switch bar each time that the switch bar is to be operated and the locking key is not in place to restrain said pin from movement I connect the locking pin to the throw lever 24 by a bell crank 32 pivotally mounted at 33 in a post 34, see Figs. I and III, and a link 35, one arm of said bell crank being connected to the locking pin 28 while said link is connected to the throw lever 24. It will be seen that when the throw lever is rocked to move the switch bar in either direction the parts just described will act to impart vertical movement to the locking pin so that said pin will be elevated out of engagement with the switch bar when the switch is to be opened and lowered into engagement with said switch bar when the switch is to be closed. To provide for the locking of the throw lever 24 I furnish said lever with a key-hole 24' and provide key-holes in the stand 23 through which a key 36 may be passed, as seen in Fig. VII, and which may be securely placed by a suitable lock 37. The stand 23 preferably supports signal mechanism adapted to be operated upon the movement of the throw lever 24.

- For the purpose of providing for the operation of the switch bar and the switch rails to open the switch independent of the mechanism associated with the switch and signal stand in order that a train may pass from the main track to the siding at the switch, I employ the following mechanism. 38 is a lever pivotally mounted at 39 and extending through a slot 4^a in the throw bar 4. This lever is adapted to be moved vertically and is provided near its upper end with a stop 40. 41 is a lift lever pivotally mounted at 42 and provided with a slot 43 in which the lever 38 is operable. The lift lever is provided with a handle stem 44 that may be grasped for the purpose of lifting the lever and it is provided at its free end with a weight 45 that acts to depress the lever when it is freed after being elevated. Upon the lift lever being raised it acts by impingement upon the lever 38 to move said lever in a direction away from the bell crank 2 that is connected with the switch bar and said lever 38 in turn acts upon the throw bar 4 with the result of imparting movement thereto in a direction toward the rock shaft 8. As the throw bar moves in the direction stated, the switch

bar is moved to impart movement to the switch rails and open the switch in order that the train may pass from the main track onto the siding. While the parts are in the position just described, the trip member comprising the trip bars 17 may be depressed by the car wheels and the rock shaft 8 rotated without liability of injury to these parts or without their performing any office, such fact being due to the pusher rod 12 being permitted to move forwardly in the throw bar 4 by reason of the compression of the spring 16 surrounding said rod and resting against the rear end of the throw bar.

It is highly desirable in railway switches to prevent the guard rails associated with the track rails of the switch from creeping due to impingement of the car wheels therewith. To overcome this creeping action I have designed the device which will now be described. 46 designates a resistance plate that is adapted to be mounted upon a railway tie at the location of the switch guard rail and is provided at its ends with upturned lips 47 that are shaped to fit the flange and web of the guard rail G, seen in Figs. I, IX and X, and one of the track rails of the main line or of the siding at the switch. The resistance plate is cut out to provide apertures 48 in which are seated the bases of L-shaped braces 49 that extend upwardly from the restraining plate and bear against the webs of the rails to which the restraining plate is applied in positions opposite to those occupied by the up-turned lips of the plate. The braces 49 are secured to the tie on which the restraining plate is seated by spikes driven therethrough into the tie as seen in Figs. I, IX, and X, and the rails to which the restraining plate and the braces are fitted have their flanges notched as illustrated. As a consequence, the guard rails are securely held from movement upon the ties they are mounted upon and creeping action of such guard rails is obviated. Any desirable number of the restraining plates and braces seated therein may be utilized in connection with a guard rail, there being two of said plates illustrated in Fig. I.

Claims:

1. In a safety railway switch, the combination with movable switch rails, of a switch bar having connection with said rails, a trip member adapted to be actuated by a wheel of the car, comprising a transverse rock shaft having an arm fixed thereto, a longitudinal trip bar having its forward end seated upon the arm of the rock shaft, and a roller upon which the rear end of the trip bar is adapted to ride, and mechanism connecting said trip member to said switch bar, substantially as set forth.
2. In a safety railway switch, the combination with a pair of main track rails and a pair of movable switch rails, of a switch bar having connection with said switch rails, a trip member comprising a transverse rock shaft having arms fixed thereto, a pair of trip bars provided with transverse connecting bars and located adjacent to said track rails, and having their forward ends seated upon the arms of the rock shaft, and rollers upon which the rear ends of the trip bars are adapted to ride and mechanism connecting said trip bars to said switch bar, substantially as set forth.
3. In a safety railway switch, the combination with a pair of main track rails and a pair of movable switch rails, of a switch bar having connection with said switch rails, a trip member comprising a transverse rock shaft having arms fixed thereto, a pair of trip bars provided with transverse connecting bars and located adjacent to said track rails, and having their forward ends seated upon the arms of the rock shaft, and rollers upon which the rear ends of the trip bars are adapted to ride and mechanism

connecting said trip bars to said switch bar; said mechanism including a spring controlled member, substantially as set forth.

4. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft having an arm fixed thereto and extending transversely of said track rails, a movable trip bar having its forward end in engagement with the arm of said rock shaft, and mechanism actuated by said rock shaft, a roller upon which the rear end of the trip bar is adapted to ride, a confining pin for the trip bar for moving said switch bar, substantially as set forth.

5. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft having an arm fixed thereto and extending transversely of said track rails, a movable trip bar having its forward end in engagement with the arm of said rock shaft, a roller upon which the rear end of the trip bar is adapted to ride, and mechanism actuated by said rock shaft for moving said switch bar; said mechanism including a spring controlled member, substantially as set forth.

6. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip bar located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar having connection with said switch bar, and a pusher rod connected to said rock shaft and operable in said throw bar, substantially as set forth.

7. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip bar located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar having connection with said switch bar, and a spring controlled pusher rod connection to said rock shaft and operable in said throw bar, substantially as set forth.

8. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip bar located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar having connection with said switch bar, a pusher rod connected to said rock shaft and slidably fitted to said throw bar, and a spring surrounding said pusher rod and bearing against said throw bar, substantially as set forth.

9. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip member located adjacent to one of said track rails and having engagement with said rock shaft, means of connection between said rock shaft and said switch bar including a spring controlled member, and means for actuating said connection means independent of said trip member, substantially as set forth.

10. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip member located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar connected to said switch bar, a spring controlled pusher rod connected to said rock shaft and movably fitted to said throw bar, and means for operating said throw bar to move said switch bar independent of the movement of said trip member, substantially as set forth.

11. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip member located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar connected to said switch bar, a spring controlled pusher rod connected to said rock shaft and movably fitted to said throw bar, and means for operating said throw bar to move said switch bar independent of the movement of said trip member; said last named means comprising a lever having engagement with said throw bar, substantially as set forth.

12. In a safety railway switch, the combination of a pair of main track rails, a pair of movable switch rails, a switch bar having connection with said switch rails, a rock shaft extending transversely of said track rails, a trip member located adjacent to one of said track rails and having engagement with said rock shaft, a throw bar connected to said switch bar, a spring controlled pusher rod connected to said rock shaft and movably fitted to said throw bar, and means for operating said throw bar to move said switch bar independent of the movement of said trip member; said last named means comprising a lever fitted to said throw bar and a lift lever for moving said first named lever, substantially as set forth.

CORBIN E. DAVIS.

In presence of—
CHAS. L. FESLER,
ORTIE FESLER.