





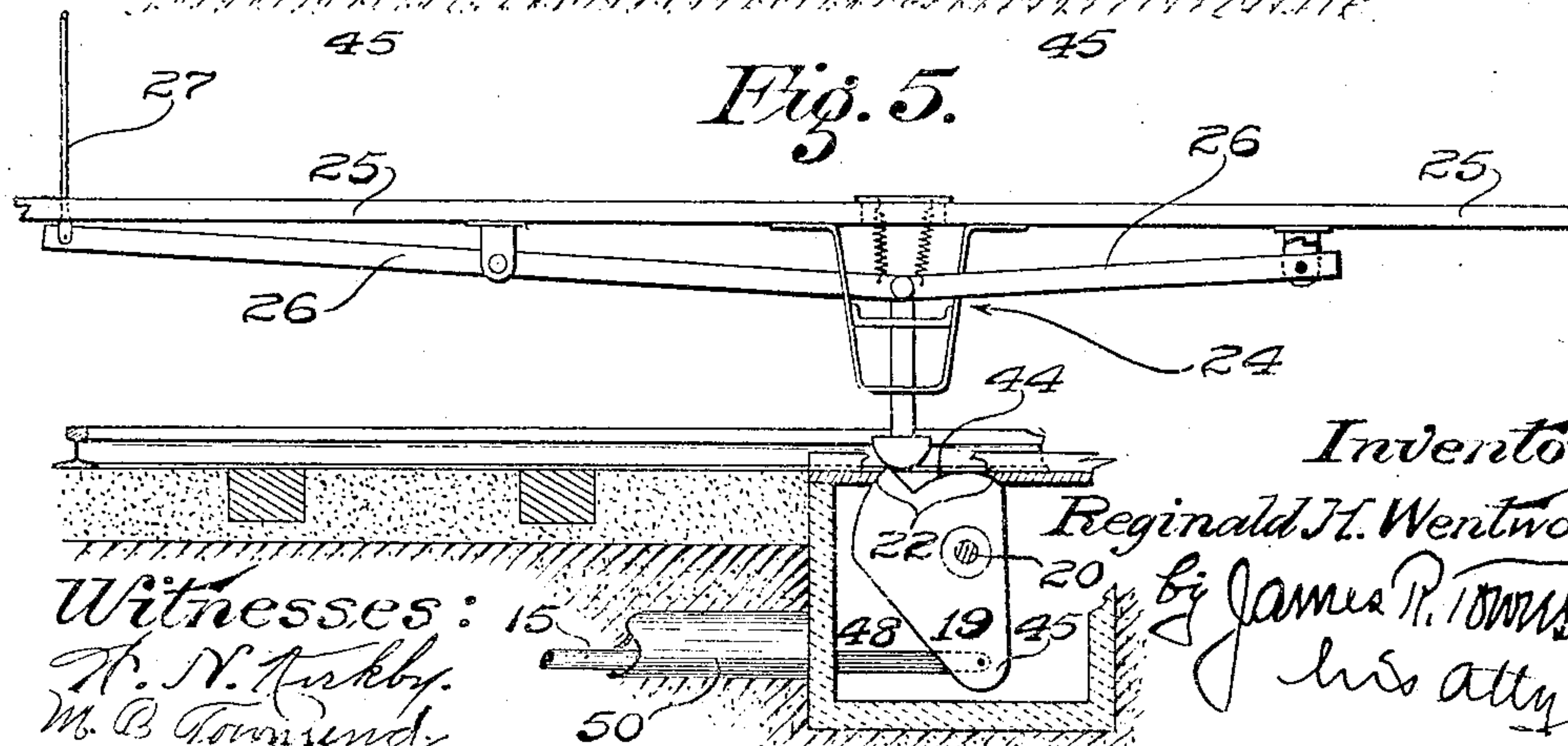
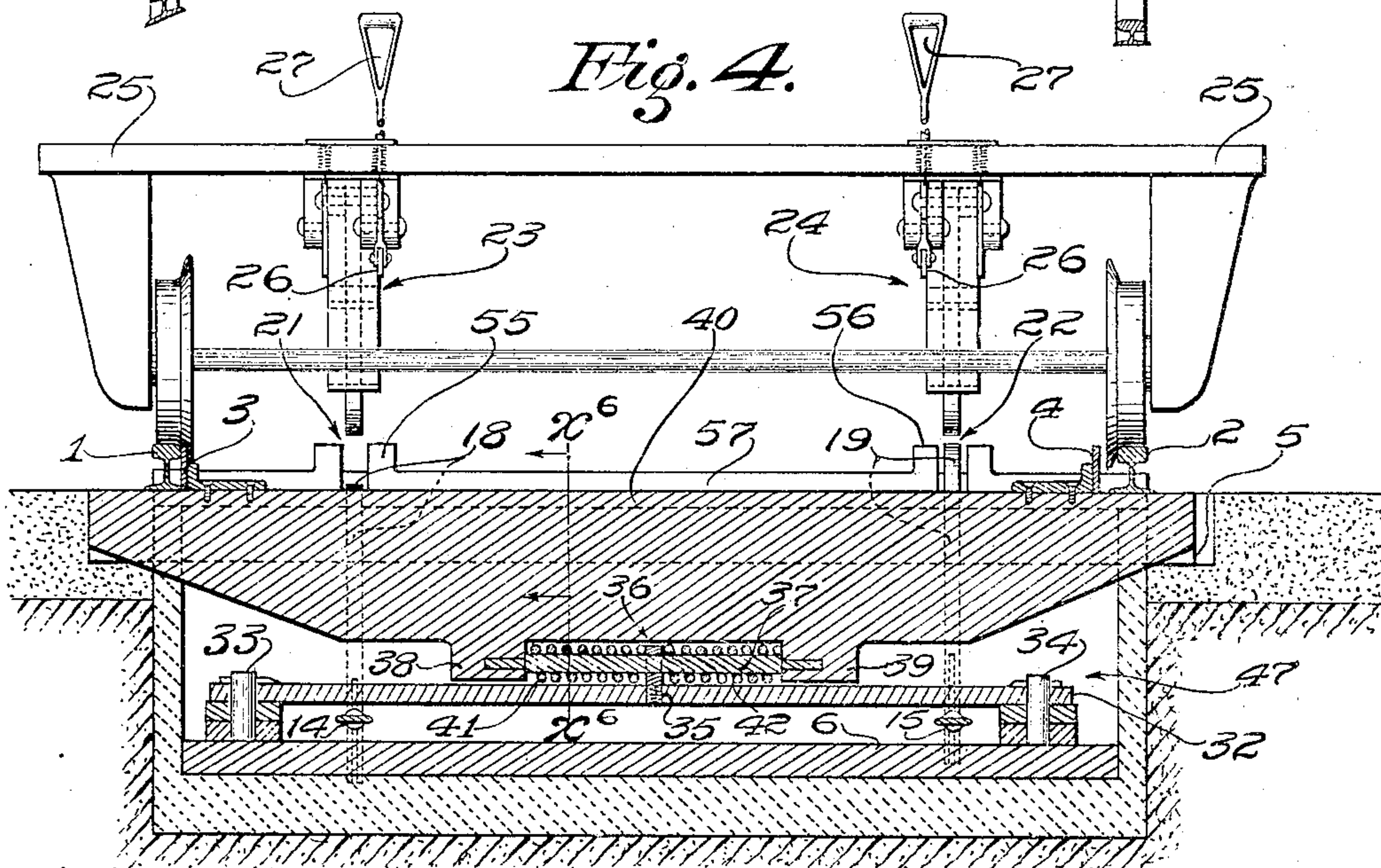
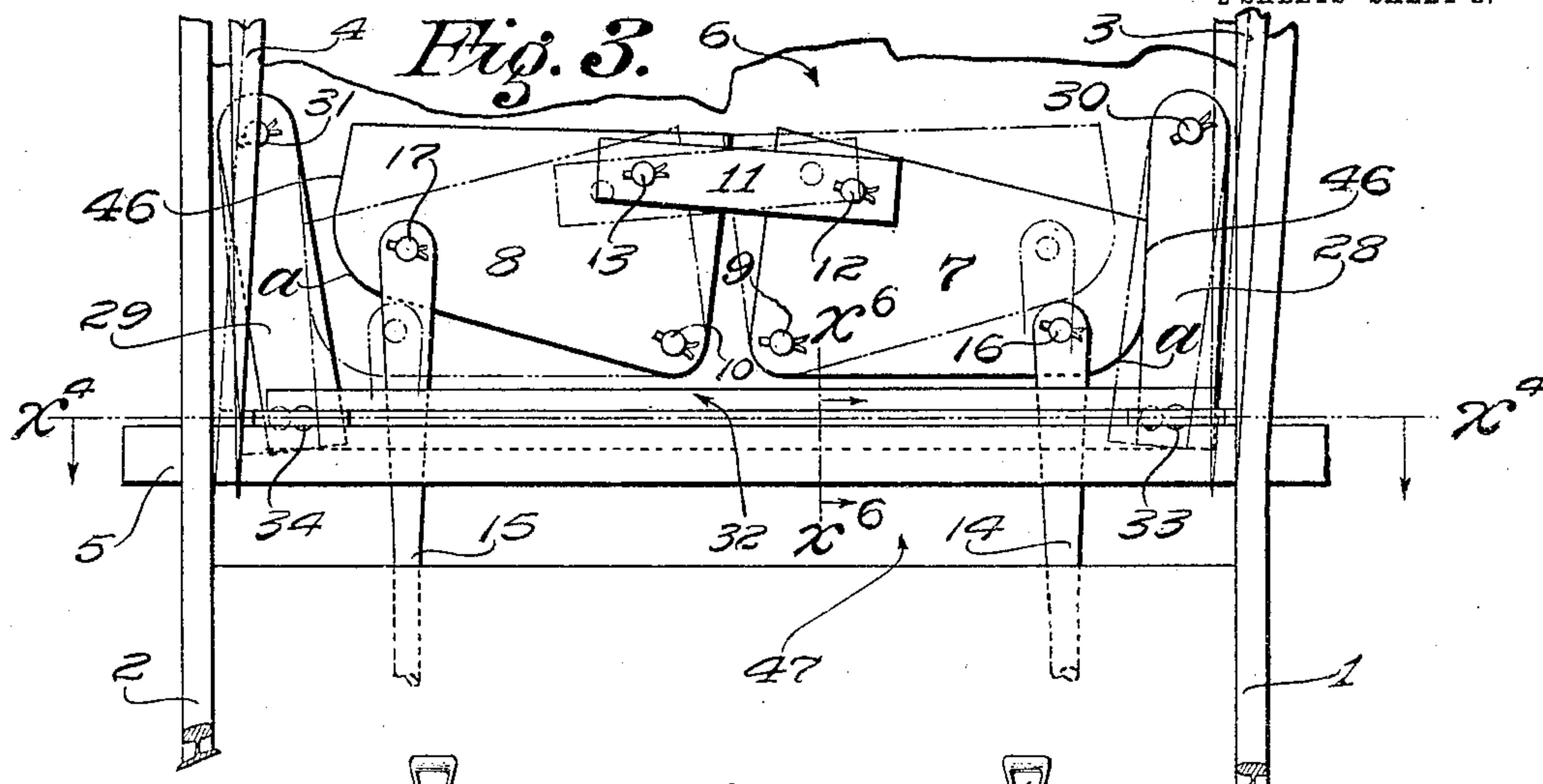
No. 865,552.

PATENTED SEPT. 10, 1907.

R. H. WENTWORTH.  
AUTOMATIC SWITCHING APPARATUS.

APPLICATION FILED MAR. 20, 1907.

2 SHEETS—SHEET 2.





# UNITED STATES PATENT OFFICE.

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## AUTOMATIC SWITCHING APPARATUS.

No. 865,552.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed March 20, 1907. Serial No. 363,486.

*To all whom it may concern:*

Be it known that I, REGINALD H. WENTWORTH, a citizen of the United States, residing at Santa Monica, in the county of Los Angeles and State of California, have invented a new and useful Automatic Switching Apparatus, of which the following is a specification.

It is of the objects of this invention to provide for tramways and other railways, a novel, cheap, strong, and simple apparatus by means of which the conductor or motorman while on the car can positively place the switch points in the desired position; to provide against liability of clogging; and to allow the switch points to be spring-set either for the main or shunt line.

The invention includes apparatus for the track and mechanism for the car which operate conjointly to set the switch, the mechanism on the car being adapted for adjustment by the attendant and to operate the track mechanism as the car passes toward the points of the switch.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmental plan view of a street railway and a car provided with my invention. Fig. 2 is a broken, longitudinal, mid-sectional elevation of the same on line  $x^2-x^2$ , Fig. 1. Fig. 3 is an enlarged fragmental plan of the railway, showing the shifting mechanism. Fig. 4 is an enlarged cross-sectional elevation cut through the switch-points on line indicated by  $x^4-x^4$ , Figs. 1, 2 and 3, looking toward the dogs and the car. Arrows in said figures indicate the direction of sight. Fig. 5 is an enlarged fragmental detail of one of the dogs and the dog-actuating mechanism of the car. Fig. 6 is an enlarged, sectional detail of the switch-bar, its carrier, and means for shifting the same. Line  $x^6$ , Figs. 3 and 4 indicate the line of section looking in the direction of the arrows.

1, 2, designate the fixed rails of a railway at a switching section.

3, 4, designate the usual pivoted switch-points.

5 designates a tie or sleeper for spacing the fixed rails.

6 is a bed or base-plate located beneath the level of the rails.

7 and 8 designate two cams pivoted to the bed or base-plate 6 by two pivot-posts 9 and 10 that are located near the middle of the track. Said cams are coupled together near the mid-line of the track at a distance from their pivots 9, 10, by a link 11 pivoted on pivots 12, 13, that are fixed to the cams, respectively.

14, 15 designate the connecting rods pivoted to the cams respectively, by pivots 16, 17, whereby the cams may be respectively operated by imparting longitudinal movement to said connecting rods by suitable means.

For this purpose 18, 19 designate two tripping dogs pivoted between the tracks on shaft 20, and being accessible from above through slots 21, 22, to be engaged by appropriate tripping devices 23, 24, carried by the car 25, and operable by an attendant on the car by any suitable means, as levers 26 and handles 27.

28, 29 designate cam-actuated levers respectively pivoted to the bed-plate 6 by pivots 30, 31, at one end of said levers, and being located adjacent the cams 7, 8, respectively, and embracing said cams between them.

32 designates a switch-bar carrier pivoted by pivots 33, 34, to the free ends of the cam-actuated levers 28, 29, and connecting said free ends together convergently; that is to say, so that said levers converge toward each other to alternately stand in the paths of their respective cams as the same are shifted from one to another position, and the endwise operation of the connecting rods is caused by the actuation of one or the other of the dogs for the purpose of shifting the switch.

35 is a swivel-lug or post swiveled to the switch-bar carrier and provided with a hole 36 through which a coupling-rod 37 extends, the same being fastened to lugs 38, 39, that extend downwardly from the underside of the switch-bar 40 which connects together the two switch-points 3 and 4.

41, 42 designate two springs on opposite sides of the swivel-post between the same and the switch-bar lugs 38, 39, respectively, the same being spiral springs which encircle the coupling-rod 37. These springs are sufficiently tensioned to operate the switch and hold the switch-points firmly in position for either the shunt or main line, as the case may be, when the swivel-post is shifted in one or the other direction.

The tripping dogs 18, 19, have circular rims 43, 44, at their upper ends to close the slots 21, 22, through which said dogs protrude; and the connecting-rods 14, 15 are pivoted to downward extensions 45 of the dogs, which extend below the tripping dog-shaft 20.

The cams 7, 8, are preferably in the form of plates, as shown, each provided with an extended face 46 to engage the face of the link to be operated thereby, thus securing great strength and rigidity. Said face 46 has a curved portion  $a$  adjacent the rod pivoted thereto, thereby being adapted to slide along the face of its lever 28 or 29 until the connecting-rod pivot 16 or 17 of the cam, as the case may be, comes approximately into line with the cam-pivots; the object being to afford a firm and solid engagement with the lever to hold the switch in either closed or open position.

47 designates a box for the shifting mechanism at the switch intersection, and 48 a box for the dogs. Both of



these boxes extend below the level of the track and are connected by tubes 49, 50, which inclose the connecting rods 14 and 15. Chains 51, 52, may be connected directly or otherwise with the cams, and may be led  
5 around pulleys 53, 54, to the surface of the road for shifting the switch by hand in case this should at any time be desired.

55, 56, designate guards for the dogs, the same being preferably integral with parts of the cover 57 of the  
10 box 48.

In practice, the switch points may be set to either one or another position by turning the appropriate dog; the motion being transmitted through the dog and its connecting-rod to the appropriate cam and thereby  
15 swinging the appropriate lever sidewise, thereby moving the carrier toward the side of the track toward which the switch-point is to be closed. The motion is transmitted from the carrier-bar 32 through one of the springs 41 or 42, to the switch-bar 40, and thereby to  
20 the switch-points 3 and 4 that are fastened thereto, thus holding one of the switch points open and the other against the inside of its track-rail. It is evident that in case a car comes from a reverse direction, the switch points may yield from the pressure of the flanges of the  
25 car wheels, the springs engaging the swivel post being provided for that purpose. When a car comes toward the switch points and it is desired to go in a direction for which the switch is not set, the motorman or other attendant on the car may operate the appropriate one  
30 of the handles 27, thereby lowering the appropriate tripping device 23 or 24, so that the same will engage its dog 18 or 19 and will turn the same down, thus shifting the connecting rod, the cam lever, carrier switch bar and switch points in the appropriate direction;  
35 whereupon the car may proceed on to the desired track. All this may be performed without stopping or dismounting from the car. Whenever one cam is drawn in one direction by its connecting rod, motion is transmitted from the link 11 to the other cam, causing the  
40 same to move in a direction opposite to that of said first named cam, thus making way for the movement of the carrier bar.

It is to be understood that a like dog tripping device may be installed in the side track to close the switch  
45 and leave the main track always open. This can readily be understood without illustration as the construction and attachment of the dogs will be substantially that shown, only one dog being necessary on the side track to be engaged by the tripping device after the car  
50 has passed the switch.

What I claim is:—

1. The combination of a suitable support having guide-ways, a switch-bar, a shaft journaled in said support, dogs mounted on said shaft and extending through said guide-ways, means comprising rods and cams operatively connecting both of said dogs with said switch-bar to throw  
55 the same, and means for actuating said dogs.

2. The combination with a suitable support comprising an inclosure adapted to be placed between the rails, said  
60 inclosure being provided with guide-ways, of a switch-bar, a shaft journaled in said support, dogs mounted on said shaft and extending through said guide-ways in said inclosure, a base plate, a plurality of cams mounted on said base plate, a rod for connecting said cams with said dogs, and means for actuating said dogs whereby to cause move-  
65 ment of said cams and of the switch-rail.

3. In a device of the character described, the combination with a main and a branch line of tracks and a movable switch-bar, of a support, a shaft journaled in said support, a plurality of dogs rigidly mounted on said shaft, a carrier, means for connecting said carrier with said switch-bar, a plurality of cams mounted in operative relation to said carrier, connections between said cams and dogs, and means for operating said dogs. 70

4. The combination with a main and a branch line of tracks and a switch, of a support mounted between the tracks, a shaft journaled in said support, a plurality of dogs fixed to said shaft, a bar connected with the switch, a carrier for said bar and connected therewith, a plurality of cams for actuating said carrier, connections between said cams and dogs, and means for actuating said dogs from the car. 75

5. The combination with a main and a branch line of tracks and a switch, of a support mounted between the track, dogs mounted on opposite sides of said shaft, a bar connected with said switch, a carrier connected with said bar, and means for pivotally securing said carrier in the bed of the track, a plurality of cams pivoted in the bed of said track and in operable relation to said carrier, connections between said cams and dogs, and means for actuating said dogs. 80

6. The combination with a main and a branch line of tracks and a switch, of a support between the rails, a shaft journaled in said support, dogs on opposite sides of said support, a bar connected with the switch, a lever for actuating said bar, links pivotally mounted between the tracks and connected with said lever, a plurality of cams pivotally mounted between the tracks, connections between said cams and dogs, and means for actuating said dogs comprising tripping mechanism mounted beneath the car body, levers connected with said tripping mechanism, and means for actuating said tripping mechanism from the top of the car. 85

7. In a device of the character described, the combination with a main and a branch line of tracks, and a switch, of a support, a shaft journaled in said support, dogs on opposite sides of said shaft, a bar connected with said switch, a plurality of cams for actuating said bar to move said switch rail in one or the other direction and a connection between said dogs and cams. 90

8. The combination with a main and a branch line of tracks, and a switch, of a support mounted between the rail, a shaft journaled in said support, dogs on opposite sides of said shaft, a base plate, cams pivotally mounted on said base plate, a link pivotally connecting said cams, connections between said dogs and said cams, means operable by said cams for moving said switch, and means for actuating said dogs for moving said switch. 95

9. The combination with a main and a branch line of tracks and a switch, of a support, a shaft journaled in said support, dogs rigidly mounted on opposite sides of said shaft, a base plate, levers pivotally connected to said base plate, a bar connecting the switch points, a plurality of cams pivotally secured to said base plate and in operative relation to said levers, connections between said cams and dogs, and means for actuating said dogs from the car. 100

10. The combination with a main and a branch line of tracks and a switch, of a support, a shaft journaled in said support, a plurality of dogs rigidly mounted on said shaft, a bar mounted between the tracks and having connection with the switch rail, a base plate, a plurality of cams mounted on said base-plate and in operative relation to said bar and means for actuating said dogs, whereby to throw the switch points from one side to the other. 105

11. The combination with a main and a branch line of tracks and a switch, of a support having guards, a shaft in said support, dogs fixed to said shaft and extending between said guards, a base plate, a plurality of cams pivoted in said base plate, a link connecting said cams, connections between said cams and dogs, levers in operative relation to said cams, a carrier pivotally connected with said levers, said carrier being provided with a lug, a switch-bar mounted on said cross bar, a rod connected 110

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with said bar and said lug, springs on said rod and on opposite sides of said lug, and means for operating said dogs.

5 12. The combination with a main and a branch line of tracks and switch-points, of a base plate, a carrier on said base-plate, a bar connected with said switch-points and said carrier, levers connected with said carrier, means for actuating said levers comprising cams pivotally secured to said base-plate and having one portion rounded to en-

gage one of said levers at a time when the other cam 10 moves away from the opposite lever, and means for controlling said means.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 4th day of March, 1907.

REGINALD H. WENTWORTH.

In presence of—

JAMES R. TOWNSEND,  
M. BEULAH TOWNSEND.