

A. JOBIN.
 SWITCH RAIL CONTROLLING DEVICE.
 APPLICATION FILED FEB. 16, 1909.
 943,974.
 Patented Dec. 21, 1909.
 3 SHEETS—SHEET 1.

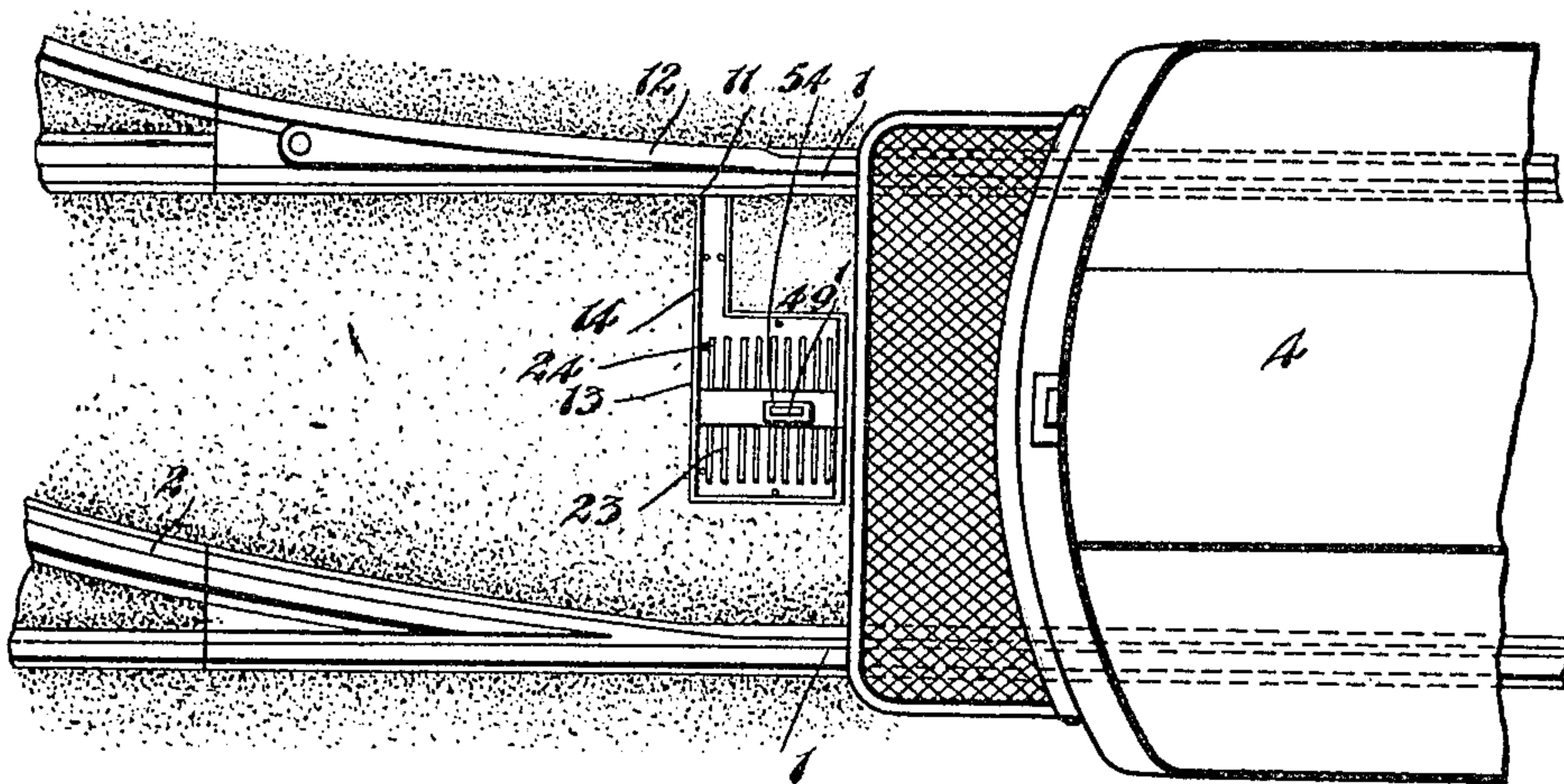


FIG. 1

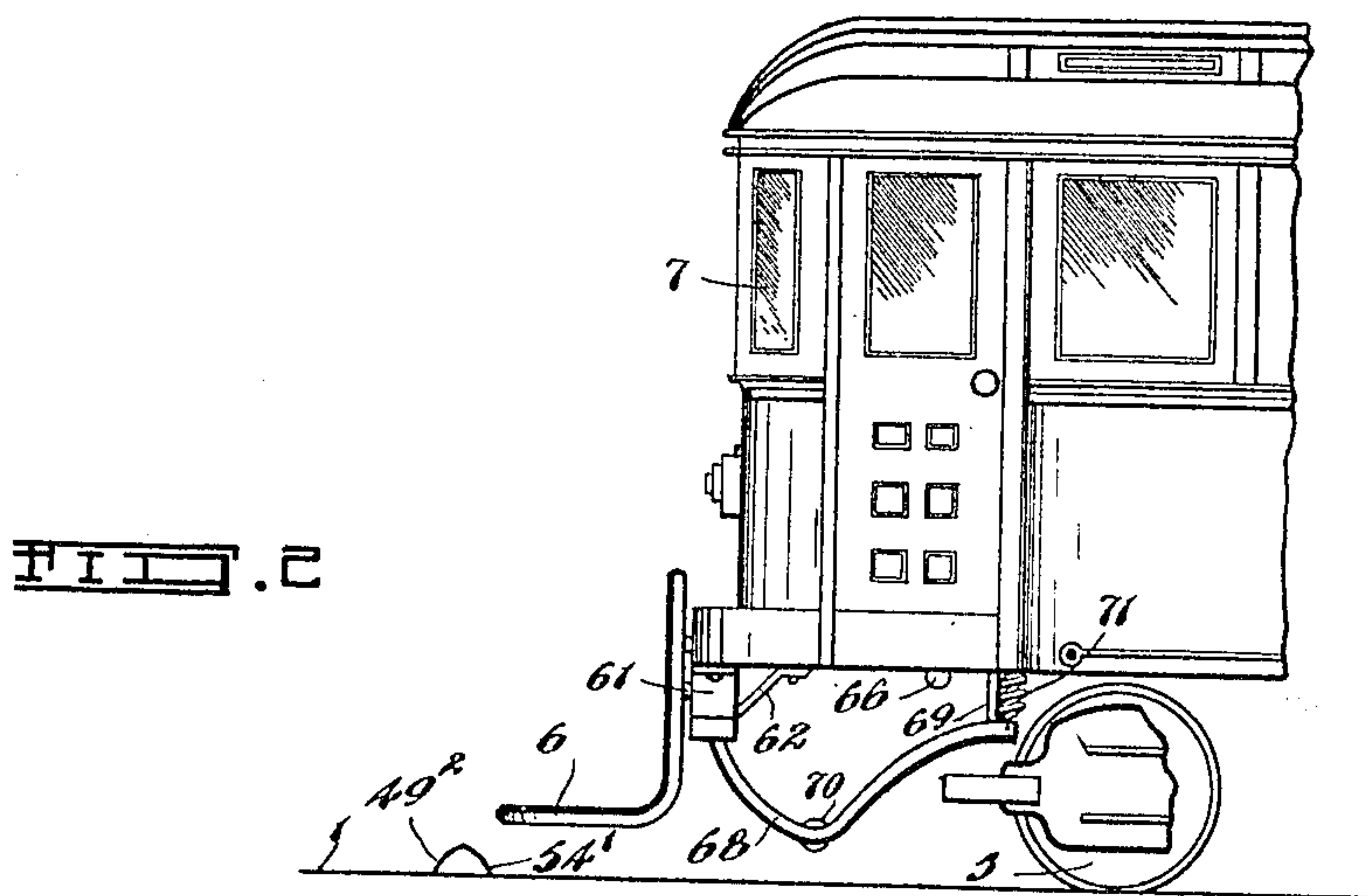


FIG. 2

WITNESSES

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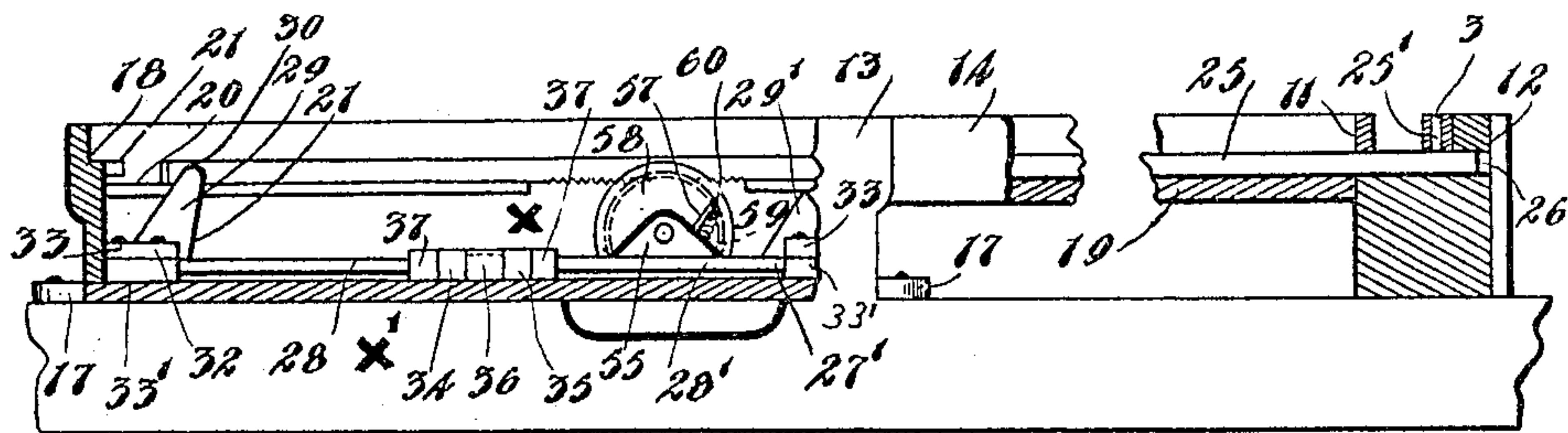
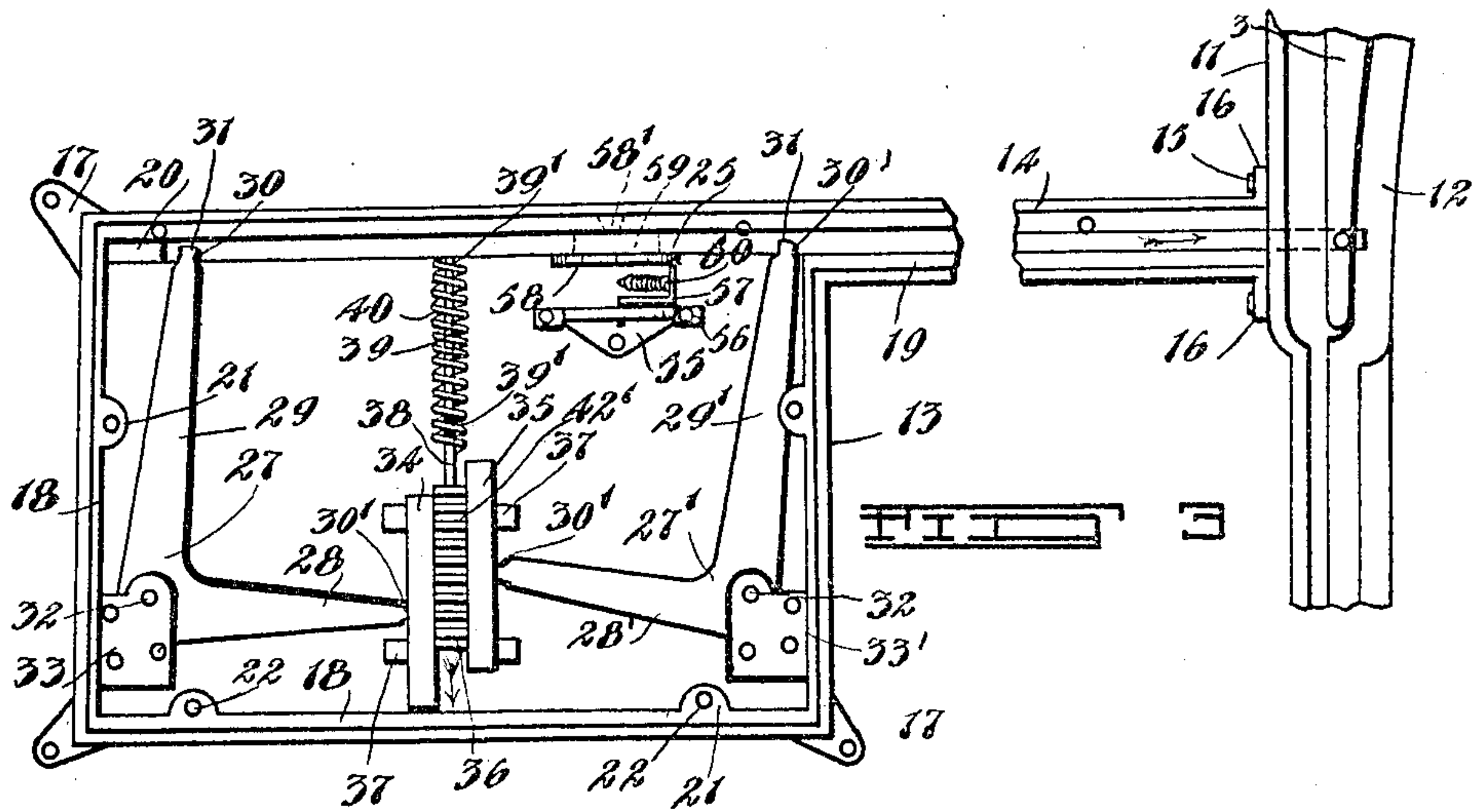


FIG. 4

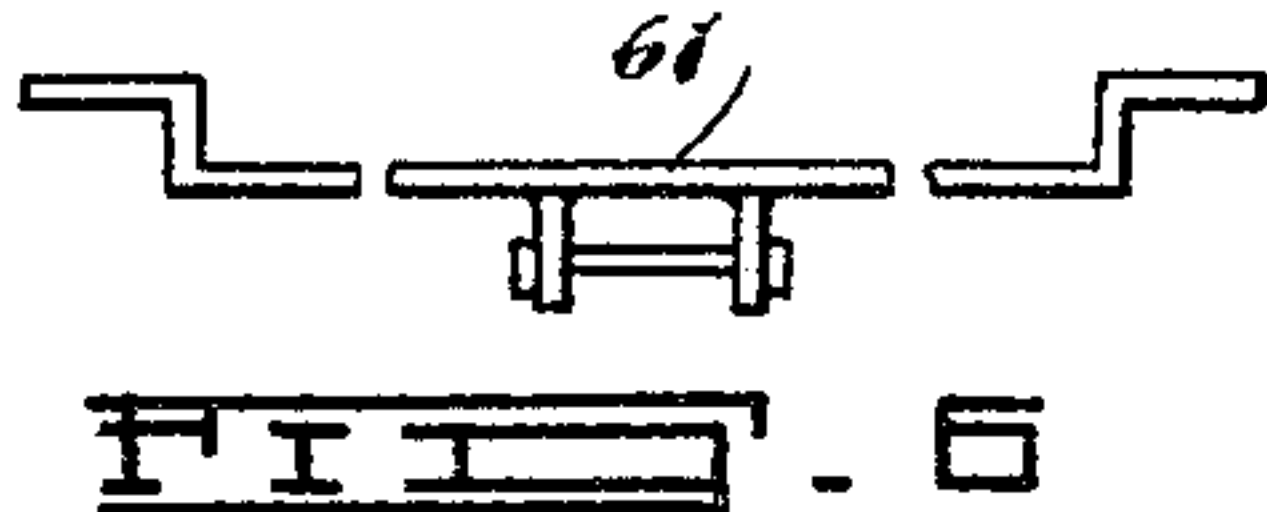


FIG. 6

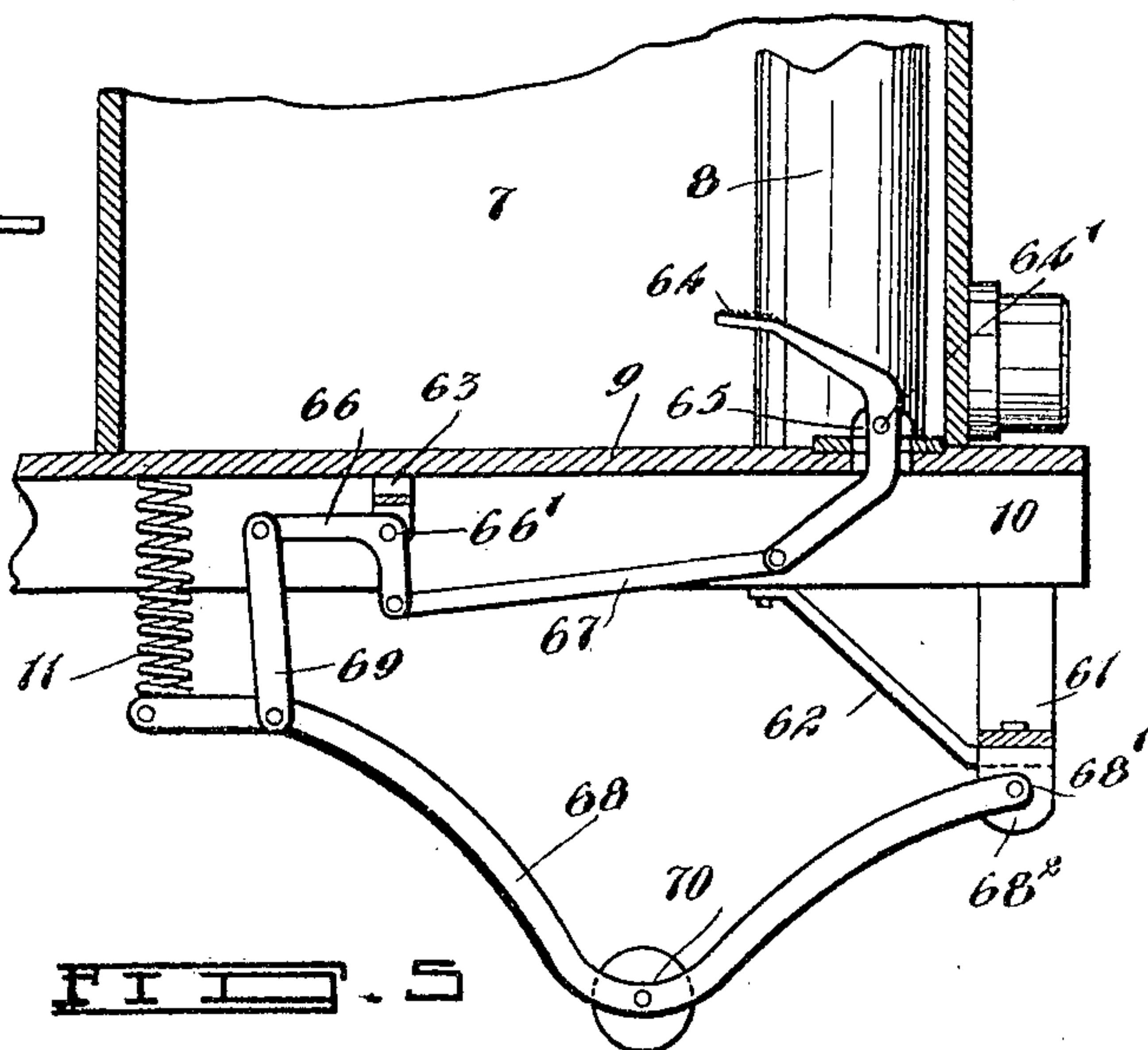


FIG. 5

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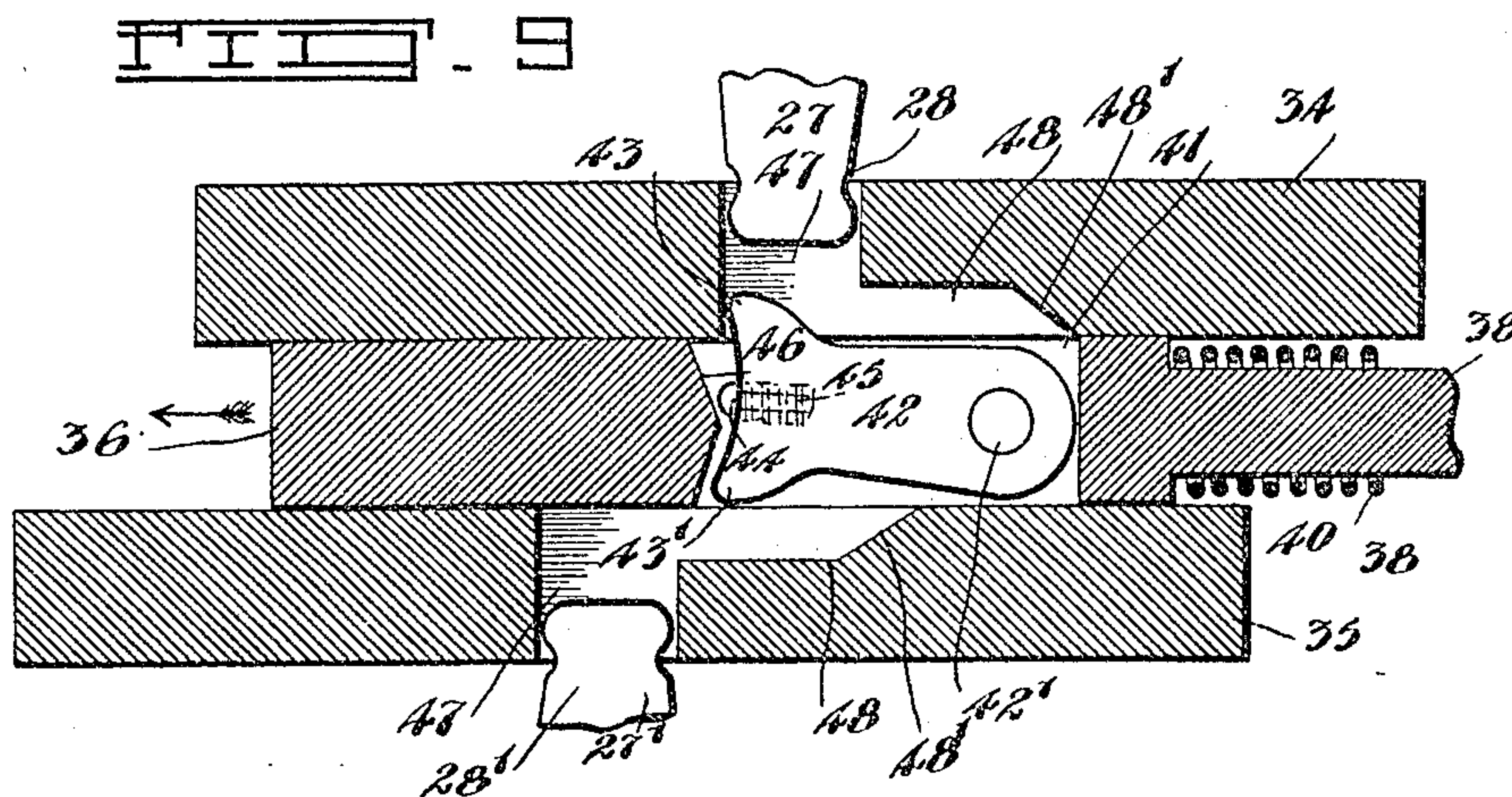
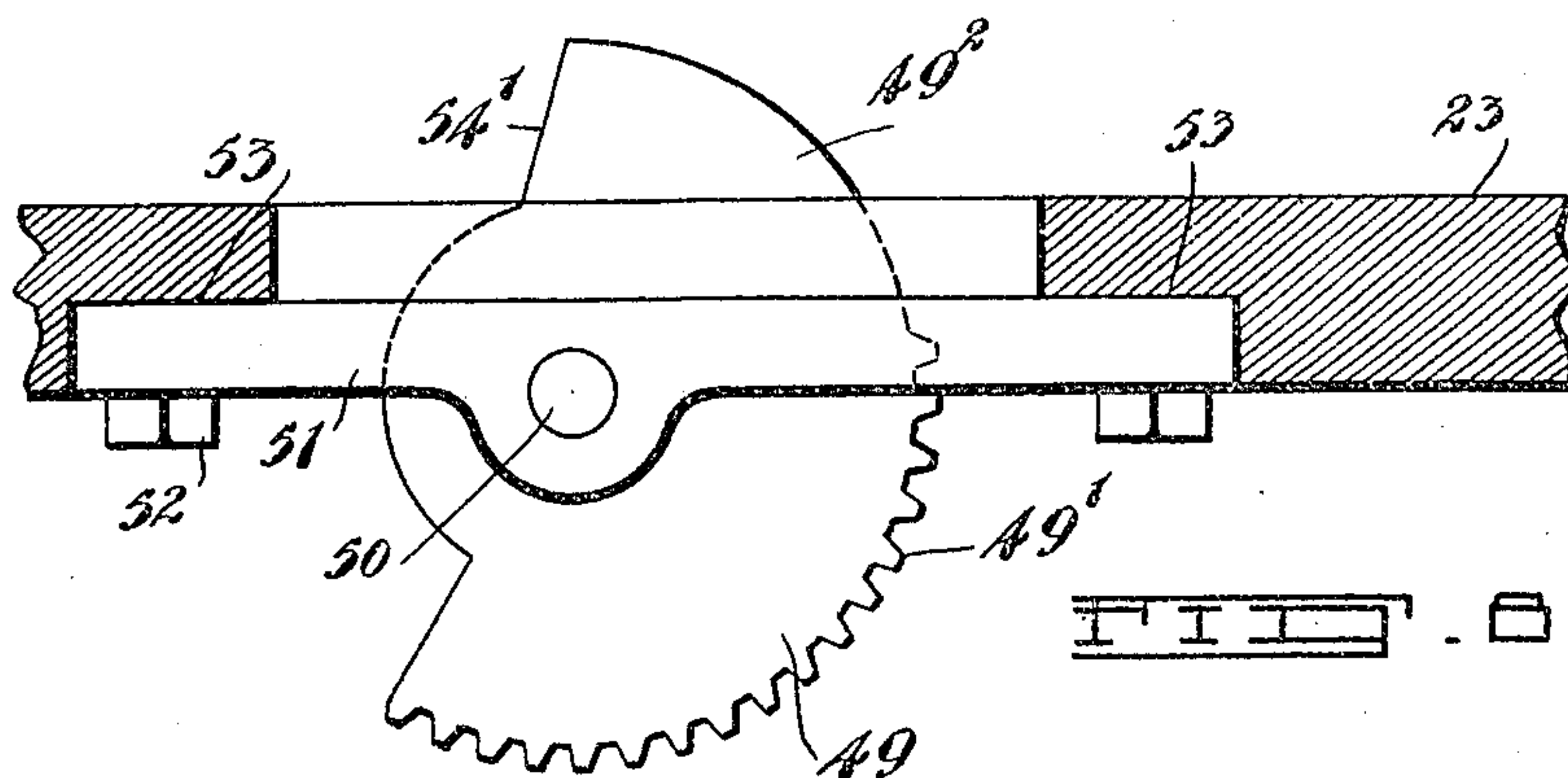
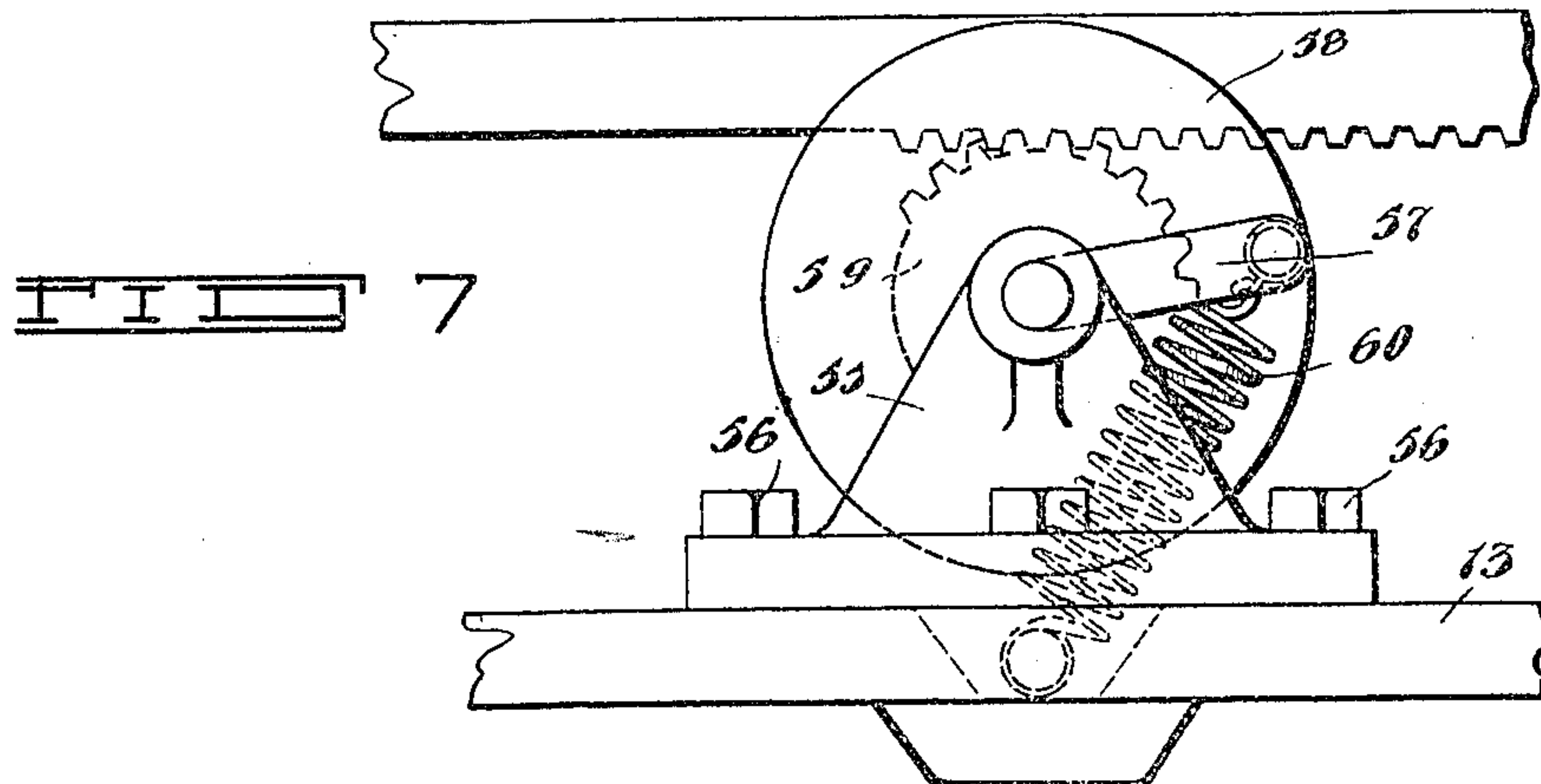
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UNITED STATES PATENT OFFICE.

ALFRED JOBIN, OF WINNIPEG, MANITOBA, CANADA.

SWITCH-RAIL-CONTROLLING DEVICE.

943,974.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed February 16, 1909. Serial No. 478,274.

To all whom it may concern:

Be it known that I, ALFRED JOBIN, of the city of Winnipeg, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Switch-Rail-Controlling Devices, of which the following is the specification.

My invention relates to devices for operating the usual switch point at the junction of a main and branch line of a car track, being particularly adaptable for use in connection with the operation of the street cars.

The object of the invention is to provide a device by which the switch rail or switch point can be thrown to its alternative positions, the device being under the control of the motorman within the car passing over the tracks, and also to have the device so constructed that the switch rail or switch point can be thrown to its respective positions regardless of the device if desired.

A further object is to provide a compact, simple, durable, and positive acting device, in which there is small possibility of the parts getting out of working order, and which can be installed permanently between the tracks.

My invention consists essentially in an inclosing casing, a longitudinally movable switch rail or switch point controlling bar, a set of similar opposing bell cranks pivoted within the casing, and having each an extending end attached to the controlling bar, means for controlling the movement of the bell cranks from the exterior of the casing, such means further allowing the switch point to be moved independently of such operating means, means for preventing the switch point from remaining in an intermediate position, and means carried by the car for operating the bell crank controlling means, the parts being arranged and constructed as hereinafter more particularly described.

Figure 1 is a plan view of a portion of a main line and branch track, and a car showing my device applied, and the switch point in a position to cause the car to keep on the main line. Fig. 2 is a side elevation as in Fig. 1. Fig. 3 is an enlarged plan view of the casing with the cover removed showing the controlling bar attached to the switch point and in its outer position. Fig. 4 is a side elevation of the device, as in Fig. 3, portions of the casing being broken away to expose construction. Fig. 5 is an enlarged

detailed side elevation of the means employed on the car by which the motorman operates the switch point, a portion of the car being shown in vertical section. Fig. 6 is a detailed front elevation of the bracket extending beneath the forward end of the car. Fig. 7 is an enlarged detailed front elevation of the means employed for giving positive action to the controlling bar. Fig. 8 is an enlarged detailed vertical sectional view through a portion of the cover of the casing showing the pinion rotatably mounted in the casing. Fig. 9 is a horizontal sectional view through the slidable blocks, in the plane denoted by the line X X', Fig. 4, showing the dog carried by the central one and its operation.

In the drawings like characters of reference indicate corresponding parts in each figure.

1 represents the main line rails, 2 the branch rails, and 3 the ordinary switch point which appears at present at the junction of the main and branch line rails.

4 represents a car carried on the wheels 5, provided with the usual fender 6.

7 represents the ordinary vestibule of the car, 8 the controller, and 9 the floor which is supported on the longitudinal beams 10.

11 and 12 represent the guard rails to either side of the frog.

A detailed description of the above parts is not given as they are all of the form usually employed.

13 represents the casing of my device which is substantially rectangular in form and has an extending end 14 which is secured at its outer end by bolts 15 passing through flanges 16 to the guard rail 11. The casing is provided at its lower corners with lugs 17 which are designed to rest on and be bolted to the sleepers of the track.

In the drawings I have shown the casing cemented in position by the usual cement or pavement between the tracks. The upper edge of the casing is fashioned so as to be on a level with the surface of the pavement. The inner wall of the casing is provided with a ledge 18 passing completely there-around and extending in the neck.

A longitudinal groove 19 is provided in the neck which extends in a second ledge 20 along the adjoining wall of the casing, the ledge being cast on the side when the casing is formed.

To the side of the ledge 18 and extending

inwardly are lugs 21 which have openings 22 therein, for a purpose later explained.

23 is the cover of the casing which is formed with an uneven face in order to give an effective gripping surface. The cover is of a form which will fit into the upper face of the casing and rest on the ledge 18 to which it is firmly held by any suitable form of bolts 24, the bolts being placed so that they will screw into the openings 22 in the lugs.

25 is the switch rail or frog controlling bar which is fastened at its outer end to the switch point by a pin 25', the bar entering an opening 26 formed in the base of the chair carrying the switch point. The body of the bar passes slidably within the channel 19 and rests on the base of the channel and on the ledge 20 continuous therewith.

27 27' are bell cranks having the arms 28 28' thereof horizontal, and the arms 29 and 29' thereof inclined slightly upwardly, both of the bell cranks having segmental wedge-shaped end pieces 30 and 30' formed at their extremities. The end pieces 30 are received within recesses 31 notched in the side of the controlling bar so that the movement of the bar is controlled by the action of the bell cranks.

32 are pivot pins passing through the bell cranks at the junction of the arms thereby securing them in the casing. The arms are elevated above the bottom of the casing by forming a shoulder on the under face of the bell cranks at the junction of the arms. The pins 32 pass downwardly into the bottom of the casing from horizontal plates 33 bolted through a spacing block 33' to the casing.

34, 35 and 36 are slidable blocks substantially square in cross section and with their faces smooth so that they can slide smoothly on the bottom of the casing and one against the other. The block 36 is interposed between the blocks 34 and 35 and has two of its faces slidably in engagement with the inner faces of the blocks 34 and 35.

37 are guides placed against the outer faces of the blocks 34 and 35 in pairs and against which such blocks slide. The upper face of the block 36 is toothed so that the block constitutes a rack, and 38 is a rod passing from the end of the block toward a second rod 39 supported from the side of the casing. A spiral spring 40 encircles both of the rods and is tied at its ends to them by any convenient form of pin 39'. The tendency of the spring is to keep the adjoining ends of the rods together which is to normally hold the block 36 in the position shown in Fig. 3 of the drawings.

Within the block 36 is a transverse opening 41 in which is pivoted a dog 42 by means of the vertically extending pin 42'. The dog is formed with two similar teeth 43 43' which pass in opposite directions and

when the dog is in the central position extend beyond the opposite faces of the block. The dog is recessed centrally at its free end and has inserted therein a pin 44 which is pressed outwardly by a spiral spring 45 within the recess. The pin plays continuously on the opposing wall 46 of the opening 41, which wall is constructed with two converging faces so that the dog is held positively in either of its limited positions by the action of the pin 44 on the converging faces.

47 are openings passing transversely across the blocks 34 and 35, such openings being in the same horizontal plane as the opening 41 and designed to register therewith in certain positions of the blocks. The openings 47 are continuous with recesses 48 formed in the inner faces of the blocks 34 and 35 and have their end walls 48' slanting from the interior of the recess outwardly toward the face of the block. The openings 47 receive the end pieces 30' of the arms 28 and 28', respectively, so that the motion of the blocks 34 and 35 is controlled by the bell cranks.

49 is a portion of a pinion centered on a cross pin 50 carried in suitable bearings formed in a plate 51 which is fastened by bolts 52 to the cover 23 which has an opening therein to receive the plate. It will be noticed that the plate has a shoulder formed thereon at 53 as has also the cover so that a very close joint is made between the parts thereby preventing water or such like from passing into the interior of the casing.

The teeth 49' of the partial pinion are designed so as to mesh with the teeth on the block 36. A portion 49² of the pinion extends normally above the level of the opening 54 formed in the plate 51. This portion is free of teeth and forms at 54' a shoulder by means of which the pinion can be rotated on its axis, as later explained.

55 is a standard bolted firmly at 56 to the bottom of the casing and 57 is a crank shaft mounted in suitable bearings formed in the standard and carried by a circular plate 58 which is in turn centered on a pin 58' mounted in the wall of the casing. The bearings for the pin and for the crank shaft are in axial alinement.

59 is a gear secured to the face of the circular plate 58 and directly beneath the bar 25, and the bar is provided with teeth meshing with the gear thereby forming a rack.

60 is a spiral spring secured to the crank shaft at its one end and to the bottom of the casing at the other.

61 is a bracket secured to the beams 10 at the front of the car and being reinforced by braces 62.

63 is a second bracket similar in form to the bracket 61 but considerably smaller and secured to the floor of the car.

64 is a foot lever located immediately to

the side of the controller 8 within convenient range of the Motorman. The foot lever is pivoted on a pin at 64' carried in lugs 65 and passes through the flooring of the car and extends rearwardly.

66 is a bell crank pivotally secured by a pin 66' to lugs extending from the bracket 63. The bell crank is connected through a bar or link 67 with the foot lever.

68 is a bar pivoted on a pin 68' passing between the lugs 68² of the brackets 61. The latter is connected to the free arm of the bell crank 66 by a link 69.

70 is a roller or wheel pivotally secured to the bar 68.

71 is a spring secured at its upper end to the floor of the car and at its lower extremity to the extending end of the bar 68.

In order to better understand my invention I will now describe its operation assuming the car to be approaching a switch rail or switch point, and the switch point in a position which would cause the car to pass to the branch line rails, and further assuming that the motorman desires his car to keep to the main line. As the motorman approaches the switch point or switch rail he places his foot on the lever 64 which through the links and bell crank forces the roller 70 downwardly. As the car progresses the roller engages with the shoulder 54' and turns the pinion on its shaft. The blocks prior to this movement are in the position as shown in Fig. 9. The teeth on the pinion acting on the block carries it in the direction indicated by the arrow in the above figure, and the tooth 43 on the dog 42 engages with the wall of the opening 47 thereby causing the block 34 to pass in the same direction as the block 36. The block 34 turns the bell crank through the arm 28 and slides the controlling bar 25 in the direction indicated by the arrow in Fig. 3, which places the switch point over against the guard rail 12 and in a position to allow the car to keep to the main line rails. The arm 29' of the bell crank 27' is moved by the controlling bar in the same direction as the arm 29, and consequently the block 35 is moved to its alternative position being free to slide against the adjoining face of the block 36. It is to be noticed that the tooth 43' is contained within the opening 41 and absolutely free of the block 35.

As soon as the roller disengages with the shoulder in the progression of the car the block 36 returns to the original position on account of the spring 40, and in passing backwardly the dog is thrown over to the opposite position by the tooth 43 engaging with the wall 48'. The tooth 43' is then within the opening 47 in the block 35 being thus set for the next operation. When the next car approaches the switch rail and desires to pass to the branch rails instead of

the main line the motorman depresses the foot lever as in the former instance but in this case the block 36 carries with it the block 35 as the tooth 43' of the dog is engaged with the wall of the opening 47. The motion of the block 35 causes the bell crank 27' to move and throw the controlling bar 25 to a position which brings the switch point over against the guard rail 11. The bell crank 27 is carried by the controlling bar to the opposite position and in its movement it slides the block 34 in the opposite direction to that of the block 35. When the roller passes out of engagement with the shoulder the block 36 returns again to the original position due to the action of the spring and the tooth 43' of the dog engages with the wall 48' which forces the dog to a position in which the tooth 43 projects within the opening 47 in the block 34, thereby resetting it as in the former instance. The pin 44 operating on the wall 46 causes the dog to act positively and take a definite position each time it is operated.

If it be desired at any time to move the switch point without operating it by the roller it can be done. For example if the switch point be over against the guard rail 11 and be pressed to the opposite position by means of any form of bar inserted between the switch point and the guard rail 11 and operated by hand, the controlling bar will be carried in the direction indicated by the arrow in Fig. 3, and the arm 28 of the bell crank 27 will carry the block 34 away from the tooth 43 (Fig. 9). The opposite block 35 is free to move as the tooth 43 does not obstruct its passage in any way.

What I claim as my invention is:

1. In a device of the class described, the combination with the frog located at the juncture of the main and branch line rails, of an inclosing casing located between the tracks; a bar pivotally secured to the frog and slidably movable within the casing; means for moving the bar longitudinally and depressible self resetting means for actuating the latter means, said actuating means being designed to be operated from the exterior of the casing and permitting the frog to be moved without operating the depressible means, as and for the purpose specified.

2. In a device of the class described, the combination with the switch point located at the juncture of the main and branch line rails, of an inclosing casing located between the tracks; a bar pivotally secured to the switch point and entering the casing in which it is slidably supported; opposing bell cranks pivotally secured within the casing and having each an arm engaging with the bar; independent slidable means connected to the remaining ends of the bell cranks; engaging means slidably interposed between such latter means and designed to engage al-

ternately with said sliding means when passing in one direction and to be free of the same when passing in the opposite direction; and means for operating said engaging means, such latter means being designed to be actuated from the exterior of the casing, as and for the purpose specified.

3. In a device of the class described, the combination with the switch point located at the juncture of the main and branch line rails, of an inclosing casing interposed between the rails; a bar pivotally secured to the switch point and passing within the casing being longitudinally slidable therein; opposing bell cranks pivotally secured to the bottom of the casing and having each an arm engaging with the bar; a set of similar opposing slidable blocks having similar transverse openings therein with longitudinally extending recesses continuous with the openings, said openings receiving the free ends of the bell cranks; a slidable spring pressed block interposed between the former blocks and having a dog with a set of opposing teeth pivotally secured therein, the teeth of said dog in its central position within the block extending beyond the opposing faces thereof and entering the openings in the adjoining blocks; and means designed to be actuated from the exterior of the casing for moving the central block in one direction and against the pressure of the spring, as and for the purpose specified.

4. In a device of the class described, the combination with the switch point located at the juncture of the main and branch line rails, of an inclosing casing interposed between the rails; a bar pivotally secured to the switch point and passing within the casing being longitudinally slidable therein; opposing bell cranks pivotally secured to the bottom of the casing and having each an arm engaging with the bar; a set of similar opposing slidable blocks having similar transverse openings therein and recesses continuous with the openings, the recesses having an inclined end wall, and said openings receiving the free ends of the bell cranks; a slidable block interposed between said former blocks and having a rod extending therefrom and being provided with a transverse opening; a second rod extending from the casing and abutting at its end the former rod in the active position of the central block; a spring encircling the rods and se-

cured at its ends to each of them, said spring holding the rods normally in engagement; a dog pivotally secured within the opening in the central block and having opposing teeth formed at its free end, said teeth extending in the central position of the dog into the openings in the adjoining blocks, and being designed to engage with the walls of the openings alternately, the dog being reciprocated by the teeth engaging the inclined walls of the recesses alternately; and means for moving the central block in one direction and against the pressure of the spring, said means consisting in a pinion pivotally secured within the top of the casing and engaging with a rack formed on the central block, said pinion having a portion thereof extending above the top of the casing and formed with a shoulder thereon whereby the pinion can be rotated, as and for the purpose specified.

5. In a device of the class described, the combination with the switch point controlling bar, said bar having teeth thereon forming a rack, and the inclosing casing, of a gear engaging with the rack; a crank shaft extending from the gear and supported at its free end within a suitable bearing; and a spring secured to the crank shaft and to the bottom of the casing, as and for the purpose specified.

6. In a device of the class described, the combination with the switch point controlling bar, said bar having teeth thereon forming a rack, and the inclosing casing, of a gear pivotally supported on a shaft rotatably mounted in the side of the casing, said gear engaging with the rack and having a circular plate at the side thereof and secured thereto, the plate bearing against the side of the bar; a standard secured to the bottom of the casing; a crank shaft extending from the plate and mounted in a suitable bearing formed in the standard; and a spiral compression spring fastened at its one end to the crank shaft and at the opposite end to the bottom of the casing, as and for the purpose specified.

Signed at Winnipeg, in the Province of Manitoba, this 21st day of January 1909.

ALFRED JOBIN.

In the presence of—

GERALD S. ROXBURGH,
M. A. SOMERVILLE.