

No. 641,789.

Patented Jan. 23, 1900.

C. W. McCrone.
SWITCH MECHANISM.

(Application filed Mar. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.

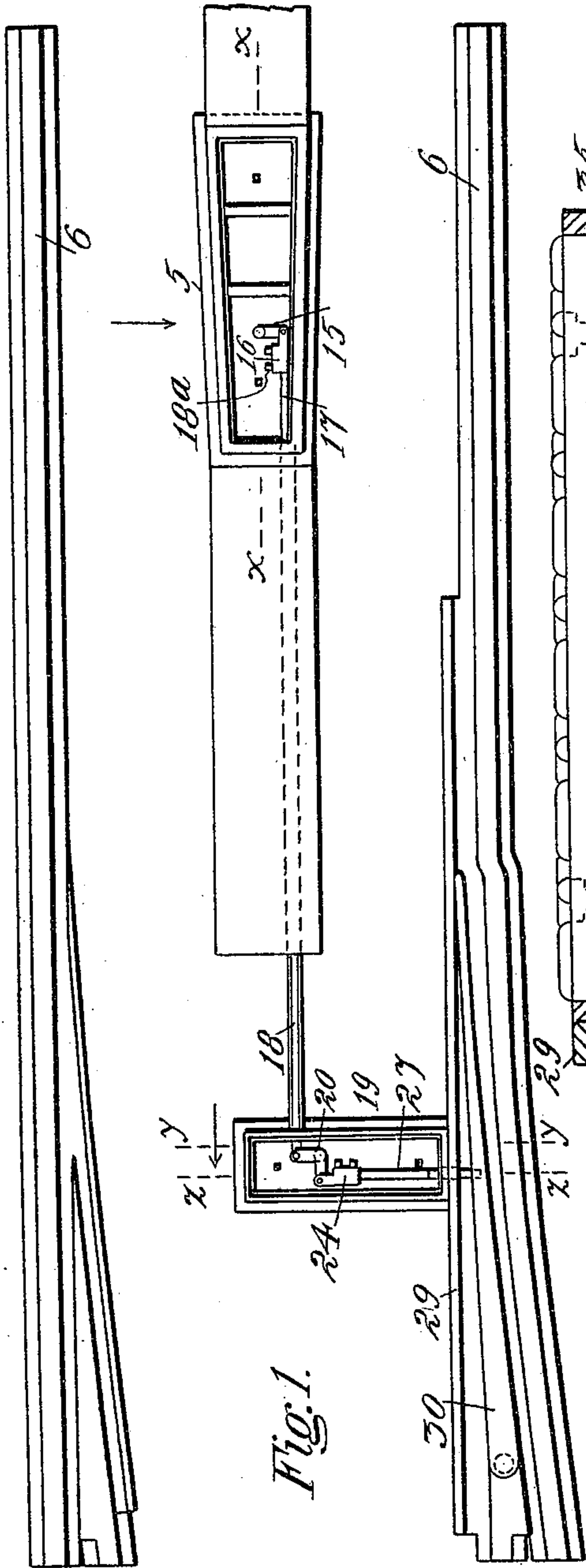


Fig. 1.

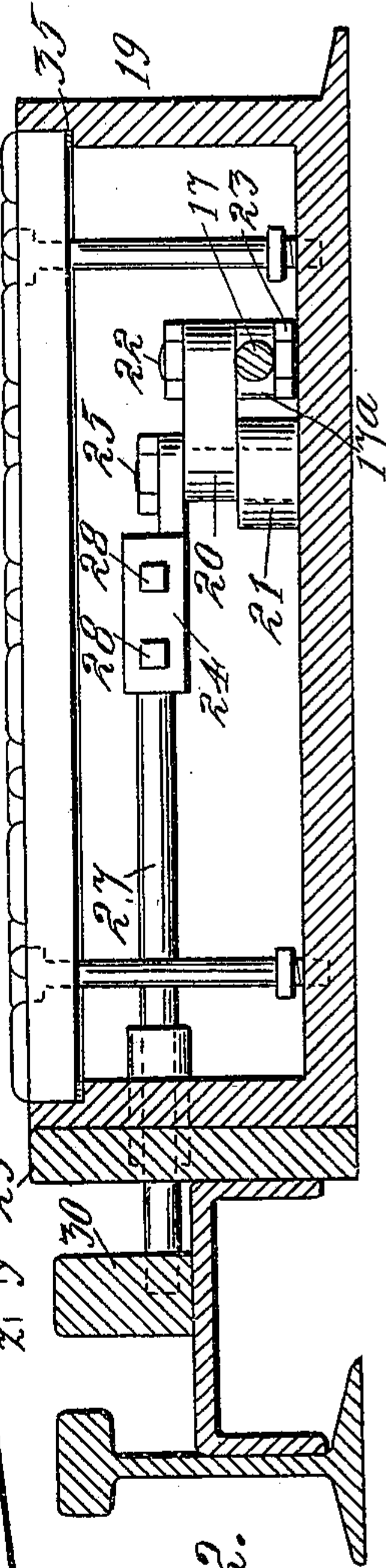


Fig. 2.

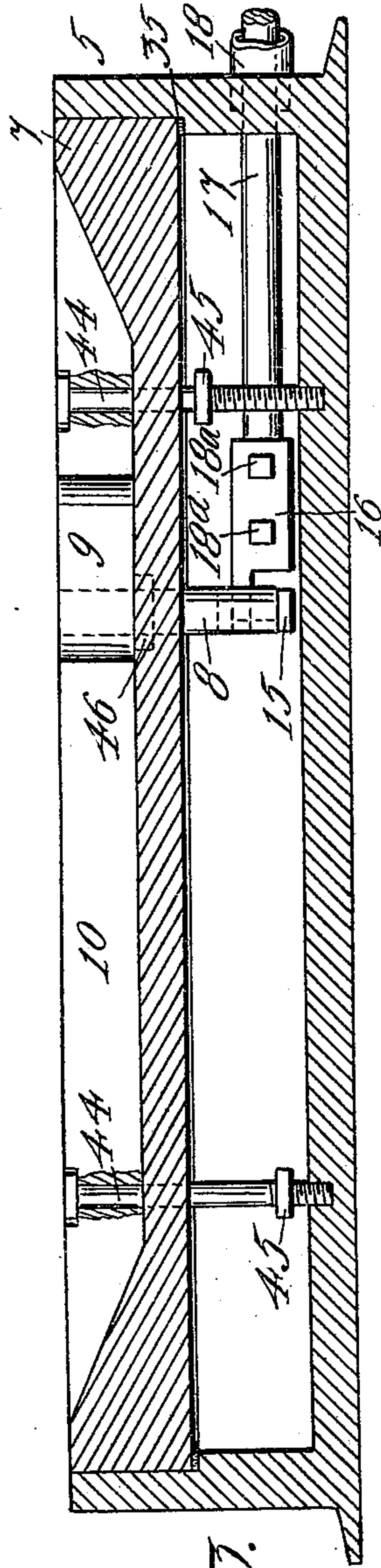


Fig. 3.

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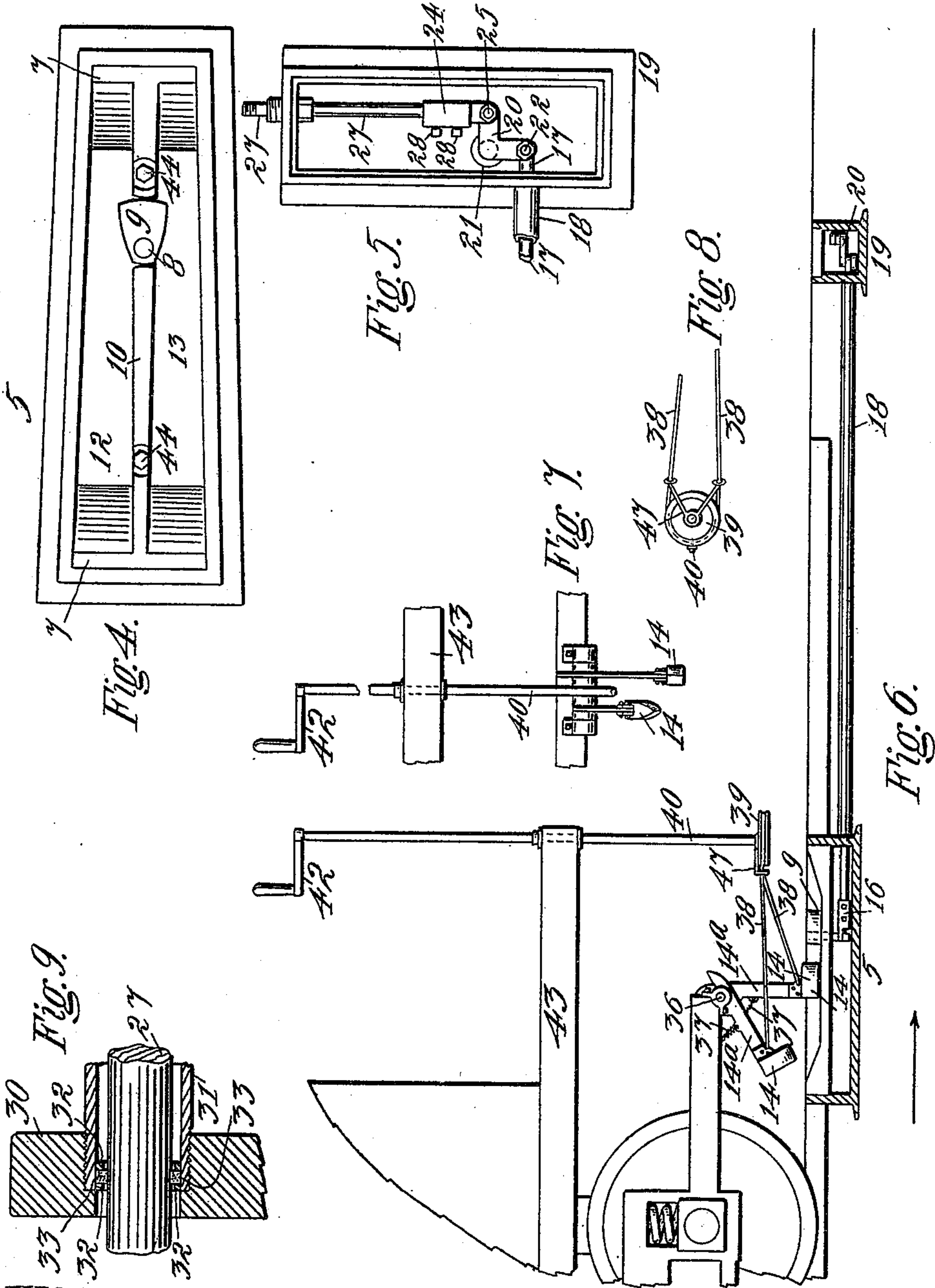
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UNITED STATES PATENT OFFICE.

CHARLES W. McCRONE, OF DENVER, COLORADO.

SWITCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 641,789, dated January 23, 1900.

Application filed March 27, 1899. Serial No. 710,563. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. McCRONE, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Switch Mechanism; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in switch mechanism arranged to be operated from the car at the will of the person in charge thereof, being specially intended for street-railway service. My object is to provide an apparatus of this class which shall be simple in construction, economical in cost, reliable, durable, and efficient in use; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be readily understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 illustrates the ground portion of my improved switch mechanism, the covers of the boxes concealing the operating parts being removed. Fig. 2 is a section taken through one of the switch-boxes on the line Y Y, Fig. 1, the parts being shown on a larger scale. Fig. 3 is a section taken through the other switch-box on the line X X, Fig. 1, shown on a larger scale and viewed in the direction of the arrow adjacent the said box in Fig. 1. In Figs. 2 and 3 the covers of the boxes are shown in place. Fig. 4 is a top view of the larger box, or that provided with the operating-cam, arranged to be actuated by the devices carried by the car. Fig. 5 is a top view of the smaller box, with the cover removed, and shown on a larger scale than in Fig. 1 and on a smaller scale than in Fig. 2. Fig. 6 is a side view of the apparatus shown in connection with a car, the boxes inclosing the operating parts being shown in section. Fig. 7 is a front view of the operating devices mounted on the car. Fig. 8 is a top view of

the pulley mounted on the lower extremity of the operating-shaft and in connection with the cable. Fig. 9 is a fragmentary section taken on the line Z Z, Fig. 1.

Similar reference characters indicating corresponding parts in the views, let the numeral 5 designate a box located between the rails 6 and whose top is supposed to lie in the same plane with the tops of the rails. This box is supported on the rail-supporting ties. (Not shown.) Journaled in the cover 7 of this box is a short vertical shaft 8, which projects both above and below the same. Its upper extremity passes through and is made fast to a cam 9, seated on the upper surface of the cover, which is cut away to form a sump or depression in the top of the box below its vertical walls. This cam is located in an opening formed in a longitudinal partition 10, dividing this depression or chamber into two compartments 12 and 13, forming ways in which the cam-operating shoes 14, mounted on the car, are adapted to travel. The shaft 8 passes through the smaller extremity of this cam, whose sides are inclined. The larger end of the cam is considerably wider than the partition 10, whereby the cam must occupy a position in the path of a shoe traveling in the way 12 or 13, as the case may be. The extremities of these ways have inclined bottoms to allow the shoes a gradual downward and upward movement as they enter and pass out of the ways. To the lower extremity of the shaft 8 is made fast a crank-arm 15, whose opposite extremity is pivotally connected with a block 16, provided with an opening to receive one extremity of a rod 17, which is connected with the block by means of set-bolts 18. This block and the set-bolts permit the longitudinal adjustment of the rod within certain limits, as circumstances may require. The rod 17 passes through an opening formed in one end of the box 5 and enters a tube 18, one extremity of which is screwed into an opening surrounding the rod. The extremity of the rod 17, remote from the box 5 passes through an opening in the side of a box 19 and is pivotally connected with one arm of a bell-crank lever 20, fulcrumed on a stud formed on a boss 21, cast integral with the bottom of the box. The rod 17 where it con-

nects with the lever 20 is provided with an eye 17^a, which engages a pin 22, passed through an opening in the lever-arm and held in place by a key 23, passed through an aperture 5 formed in each end thereof. The other arm of the lever 20 is pivotally connected, by means of a pin 25, with a block 24, bored to receive one extremity of a rod 27, which is connected with the block by set-bolts 28, where- 10 by the rod 27 has a limited longitudinal adjustment. The opposite extremity of this rod passes through registering openings formed in the end of the box and the guard-rail 29, its protruding extremity being connected with 15 the switch tongue or point 30. A sleeve 31 is passed through the end of the box and screwed into the guard-rail. This sleeve is provided with separated interior collars 32, between which is located a packing ring or 20 washer 33, which surrounds and engages the rod 27, making the box water-tight at this point. The cover 34 of this box, as well as the cover 7 of the box 5, rests on a strip of packing material 35, placed on the shoulder 25 of the box forming the support for the cover. Both covers are cemented in place, making them perfectly tight, whereby the entrance of dirt and moisture is prevented. The tube 18, whose extremities are respectively at- 30 tached to the boxes 5 and 19, forms a sheath for the rod between the boxes and prevents the entrance of moisture where the rod passes through the walls of the boxes.

Mounted on the front end of the car are two 35 shoes 14, provided with arms 14^a, pivotally attached to the car-truck at 36. These shoes are normally held in the raised position by means of springs 37. Each shoe is controlled by a cable 38, whose extremities are respec- 40 tively attached to the shoes. This cable passes around a grooved pulley or sheave 39 and is secured thereto at a point 40^a, permitting a partial rotation of the pulley in either direction, whereby one shoe or the other is 45 thrown to the plane of the cam 9. The sheave 39 is made fast to the lower extremity of a vertical shaft 40, journaled in the front end of the car-platform 43 and having a hand- 50 crank 42 on its upper extremity.

The shaft 8 where it passes through the 55 cover 7 of the box 5 is surrounded by a packing-washer 46, seated on a shoulder formed around the opening in the cover beneath the cam 9. The function of this packing-washer is to prevent the entrance of water or mois- 60 ture to the inside of the box. The prevention of the entrance of water to the working parts inclosed by the boxes 5 and 19 is very important, since if water is allowed to enter these receptacles it will freeze in cold weather and 65 absolutely prevent the operation of the mechanism until the ice is melted. The cover on each box is provided with two bolts 44, which pass through the cover and are screwed into threaded recesses formed part way through 70 the bottom of the boxes. Each of these bolts is provided with a nut 45, which when the

bolt is unscrewed and raised engages the cover on the inside, and thereby serves to facilitate the lifting of the cover out of the 70 box when for any reason it becomes necessary to gain access to the contents or operating parts inclosed thereby.

In describing the operation of the mechanism I will assume that the car is moving in 75 the direction indicated by the arrow in Fig. 6. As the car approaches the switch-point which it is desired to throw from the one position to the other, the man in charge of the 80 car turns the shaft 40 in such a direction as to act on the shoe 14 which it is desired to operate. The turning of this shaft 40 actuates the cable 38 and throws one of the shoes into its respective way 12 or 13 in the cover 85 of the box 5, whereby the shoe as it travels through the said way acts on the cam 9 and imparts a partial rotation to the shaft 8, which, through the instrumentality of the crank 15 90 and the rod 17, actuates the lever 20, which in turn operates the rod 27 and shifts the switch-point by virtue of the construction already described. When one shoe 14 is thrown to a position to operate the cam 9 and shift 95 the switch-point, the other shoe is drawn up out of the way through the action of its coil-spring 37. These springs keep the cable taut at all times and support both shoes above the ground when not in use. The shaft 40 100 is provided with a device 47, loosely mounted on the lower extremity of the shaft adjacent the pulley. This device consists of a collar surrounding the shaft and two arms terminating in eyes, through which the cable passes. The function of this device is to main- 105 tain the cable in place on the pulley.

Having thus described my invention, what I claim is—

1. In switch-operating mechanism, the combination of a box located between the rails of the track and having a depression in its cover, 110 separated by a central partition into ways, a cam located between these ways, and adapted to project into one or the other according to the position of the switch point or tongue, a shaft to which the cam is made fast, the 115 said shaft projecting through an opening in the cover into the closed chamber of the box, a packing-washer seated in said cover and surrounding the shaft-opening therein to make the cover water-tight around this shaft, 120 a crank attached to the lower extremity of the shaft, a rod connected with said crank and passing through the slot of the box, another box located between the track-rails, adjacent the switch-point, a bell-crank lever lo- 125 cated therein, one arm of the lever being connected with the said rod which passes through the walls of the last-named box, a tube connecting the two boxes and forming a water-tight sheath around said rod, a second rod 130 connected with the other arm of the lever at one extremity, passing through a water-tight opening formed in the wall of the box, and connected with the switch-point at the oppo-

site extremity, two spring-held shoes mounted on the car and adapted to actuate the cam mounted on the first-named box, a cable whose extremities are respectively connected with said shoes, a pulley to which said cable is made fast, a shaft mounted on the car for imparting to the pulley partial rotations in reverse directions, whereby the shoes may be alternately thrown into position to operate the cam and shift the switch-point as the car is passing, and a cable-retaining device pivotally mounted on the shaft adjacent the pulley and comprising a collar, and two arms terminating in eyes, through which the cable passes.

2. The combination of two boxes located between the track-rails and provided with covers seated on packing material and cemented in place to prevent the entrance of water, one box being placed adjacent the switch-point, operating parts located in each box, an exposed cam mounted on the first box, a connection between said cam and the operating parts of the box, a water-tight packing seated in the cover and surrounding the opening through which the said connection passes, a rod leading from the operating device of one box to the operating device of the other box, a tube surrounding said rod and having its extremities attached to the boxes, said tube forming a water-tight sheath for the rod and preventing the entrance of water to the boxes at the rod-openings, another rod leading from the device in the box adjacent the switch-point, the opposite extremity of said rod being connected with the switch-point, a water-tight packing located in the wall of the box and surrounding the opening through which the last-named rod passes, and means mounted on the car for shifting the cam mounted on the box remote from the switch-point, said means comprising two spring-held shoes, a cable whose extremities are respectively connected with said shoes, a pulley to which said cable is made fast, a shaft mounted on the car for imparting to the pulley partial rotations in reverse directions, whereby the shoes may be alternately thrown into position to operate the cam and shift the switch-point as the car is passing, and a cable-retaining device pivotally mounted on the shaft adjacent the pulley, and comprising a collar, and two

arms terminating in eyes, through which the cable passes.

3. The combination of two boxes, one being located adjacent and the other comparatively remote from the switch-point, a cam mounted on the remote box, an operating device located in each box, a connection between said cam and the operating device in the box, a rod leading from the operating device of this box to the operating device of the other box, another rod leading from the operating device of the adjacent box, its opposite extremity being connected with the switch-point, suitable means for preventing the entrance of water at the tops of these boxes, and where the rods pass through their walls, and suitable means mounted on the car for actuating the operating-cam, said means comprising two spring-held shoes, a cable whose extremities are respectively connected with said shoes, a pulley to which said cable is made fast, a shaft mounted on the car for imparting to the pulley partial rotations in reverse directions, whereby the shoes may be alternately thrown into position to operate the cam and shift the switch-point as the car is passing, and a cable-retaining device pivotally mounted on the shaft adjacent the pulley, and comprising a collar, and two arms terminating in eyes, through which the cable passes.

4. The combination with the switch-point-operating mechanism, provided with a cam, of means mounted on the car for actuating the said cam, said means comprising two spring-held shoes, a cable, whose extremities are respectively connected with said shoes, a pulley, to which said cable is made fast, a shaft mounted on the car for imparting to the pulley partial rotations in reverse directions, whereby the shoes may be alternately thrown into position to operate the cam and shift the switch-point as the car is passing, and a cable-retaining device pivotally mounted on the shaft adjacent the pulley and comprising a collar, and two arms terminating in eyes, through which the cable passes.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. MCCRONE.

Witnesses:

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