

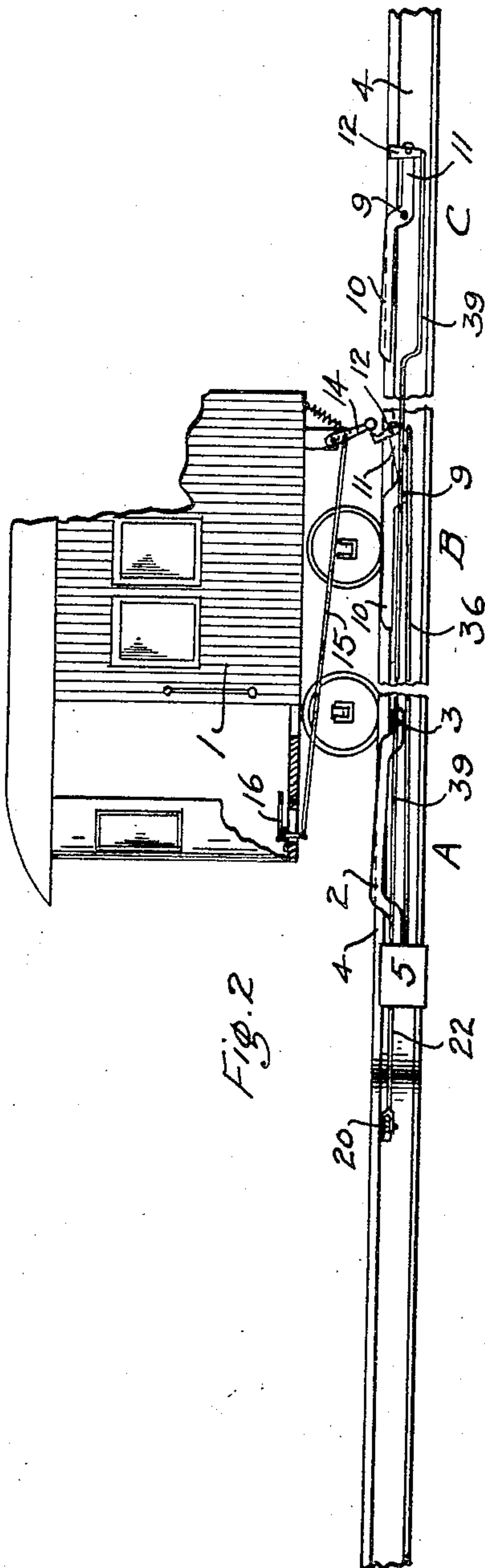
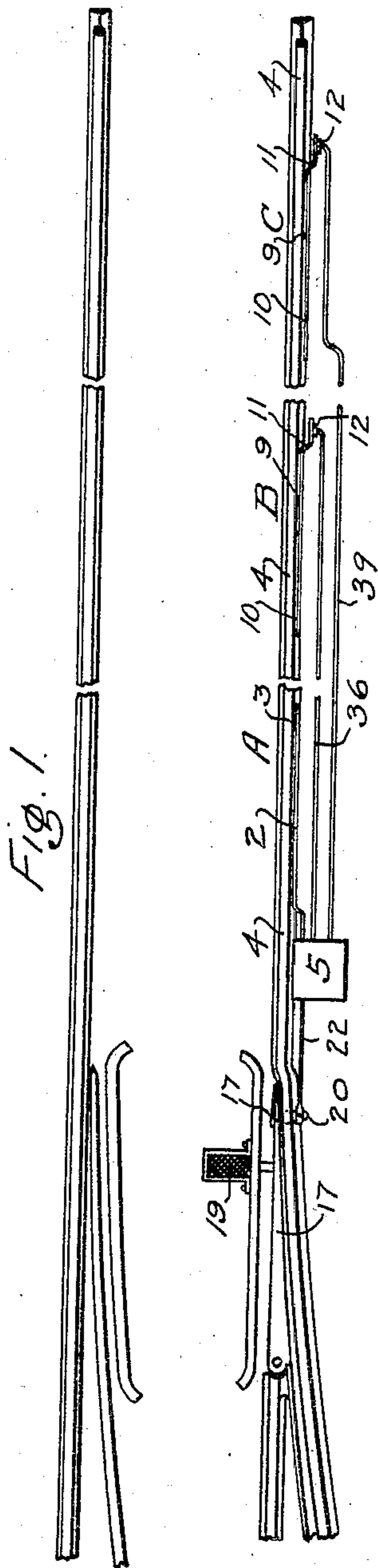
No. 894,297.

A. C. TUNISON.
SWITCH OPERATING MECHANISM.

APPLICATION FILED MAR. 8, 1906.

PATENTED JULY 28, 1908.

3 SHEETS—SHEET 1.



Witnesses.

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Inventor

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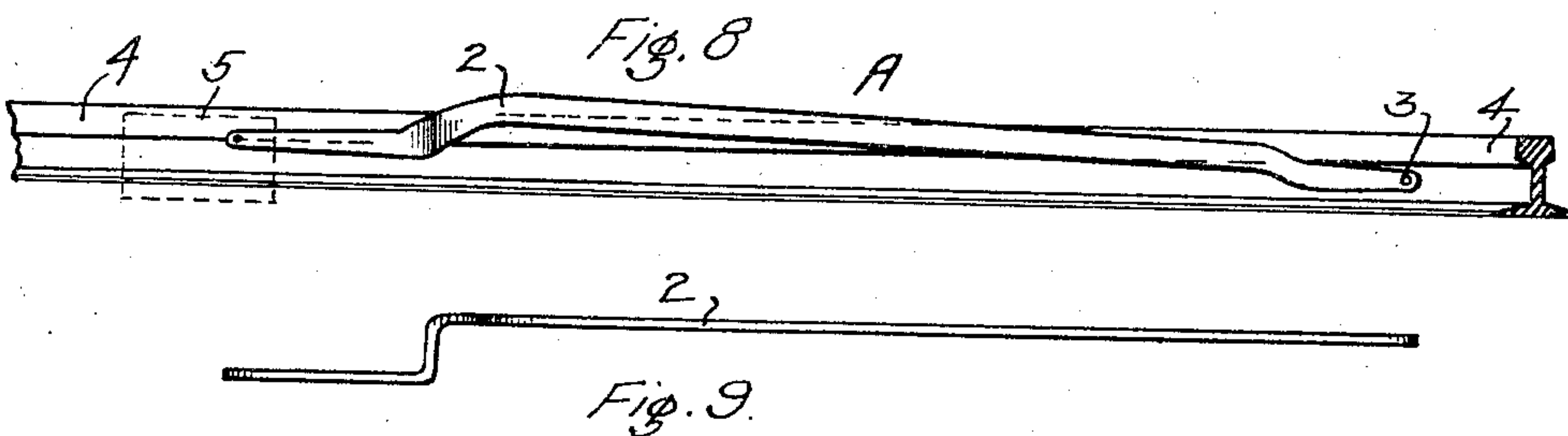
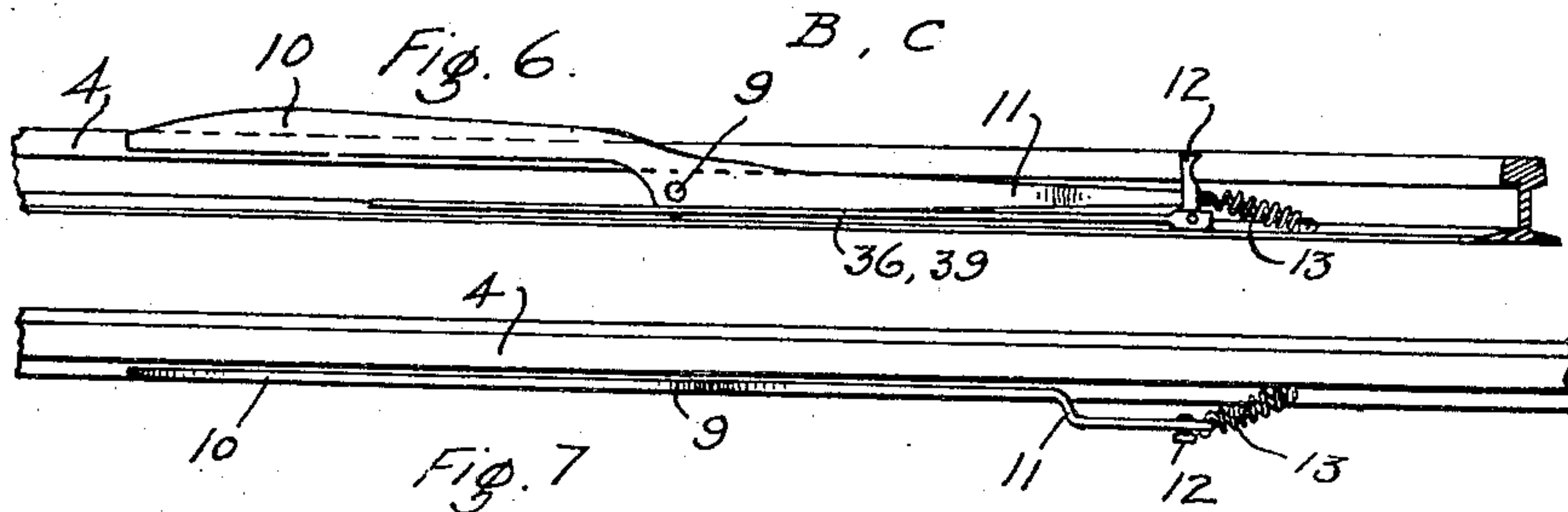
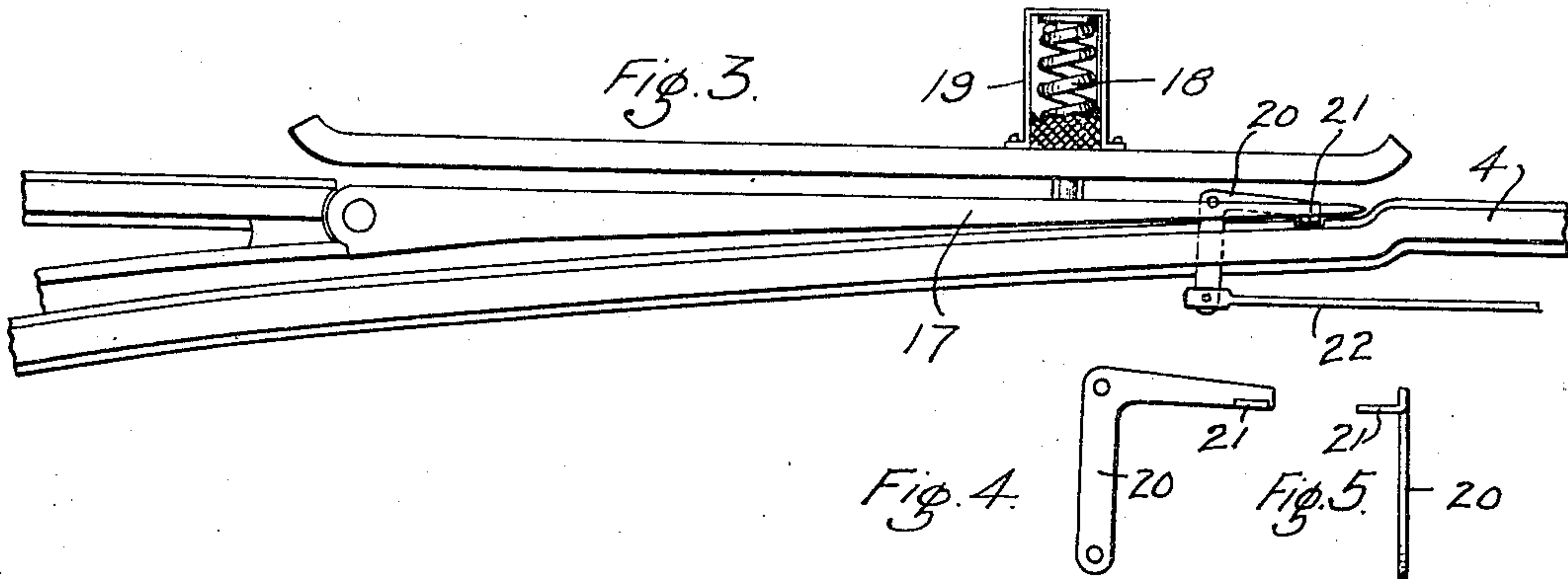
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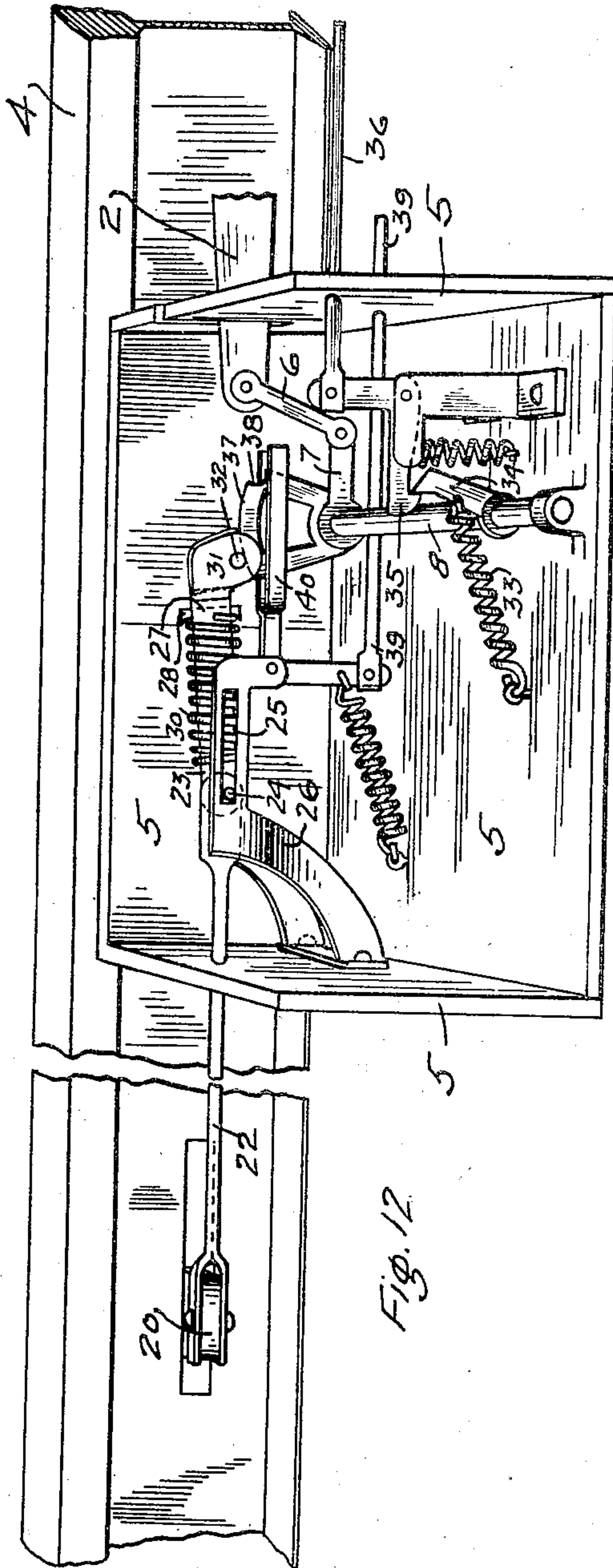
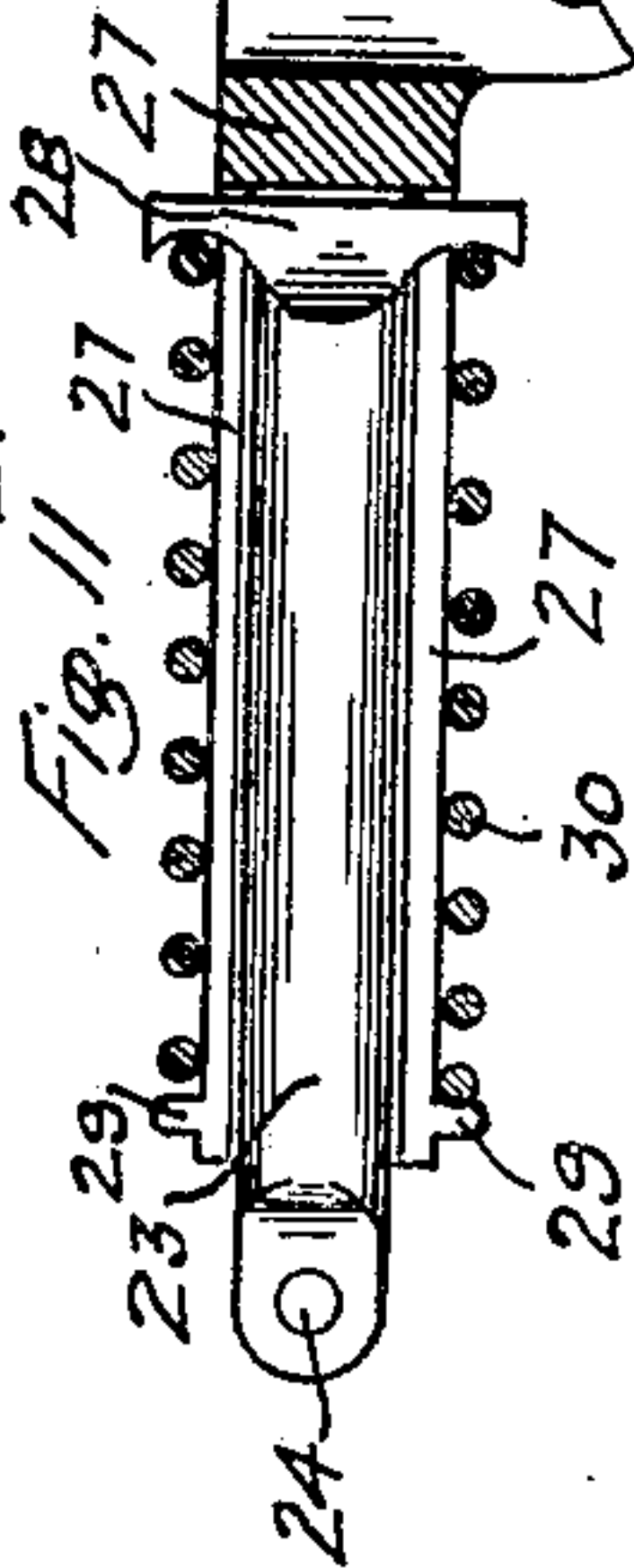
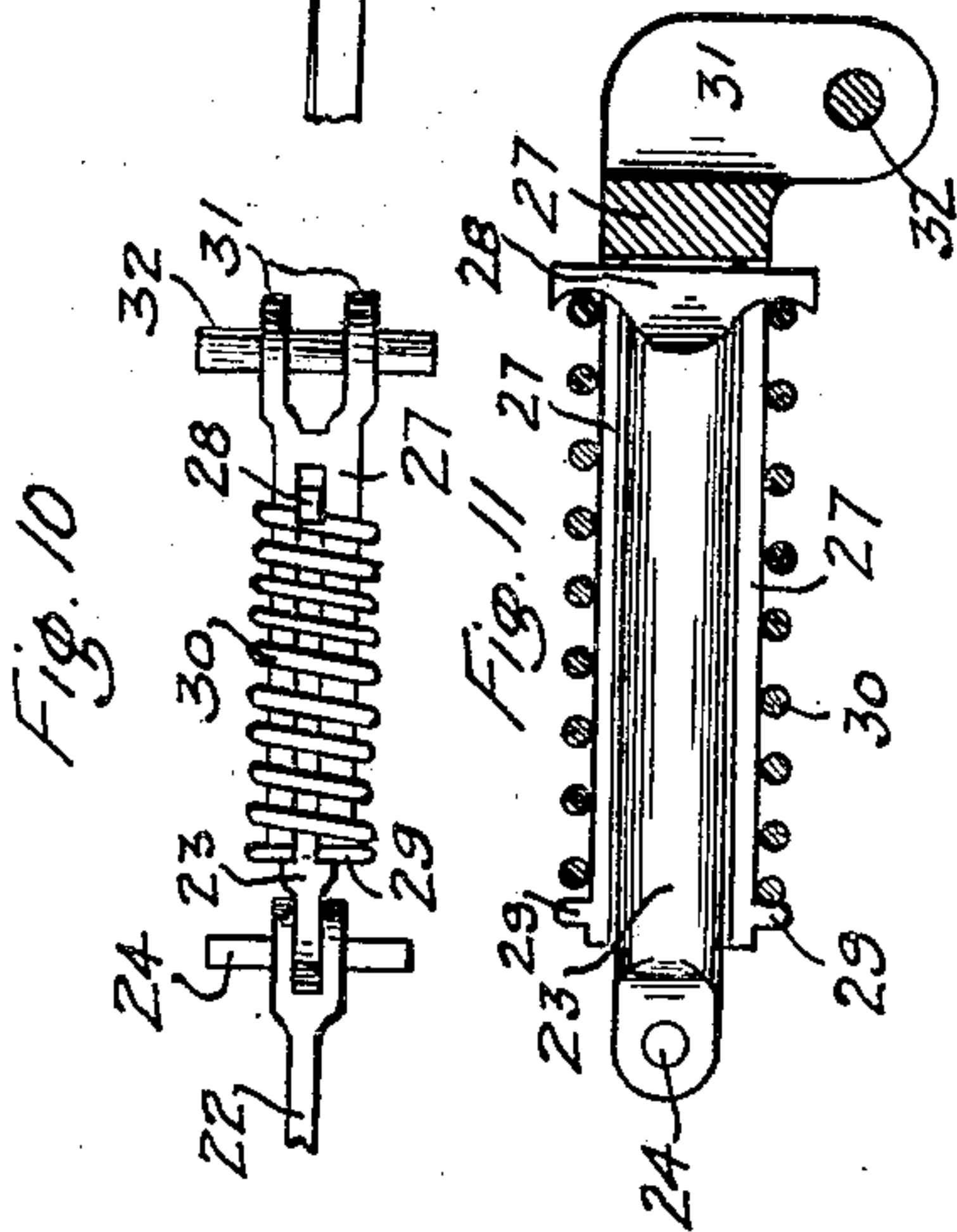
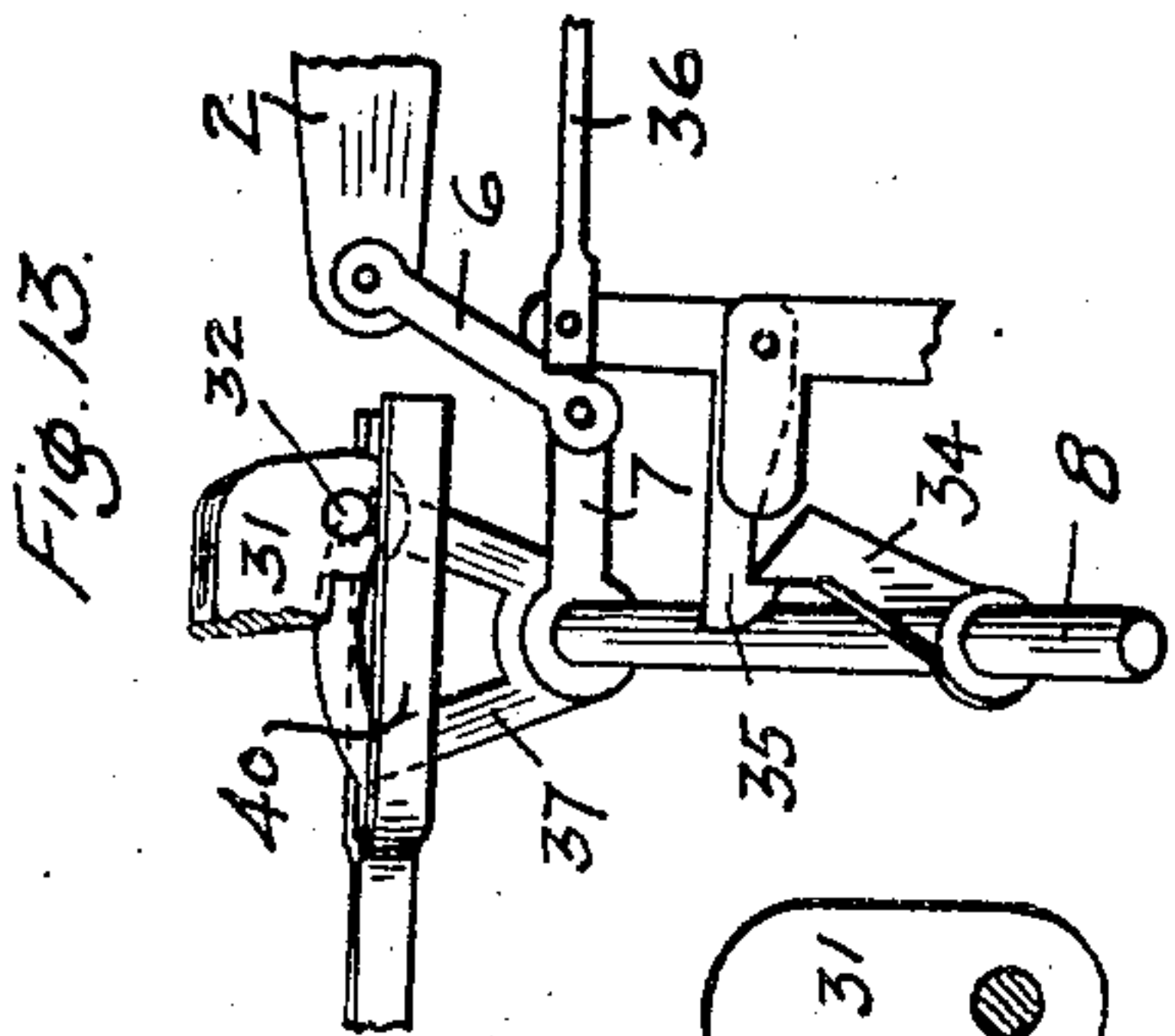
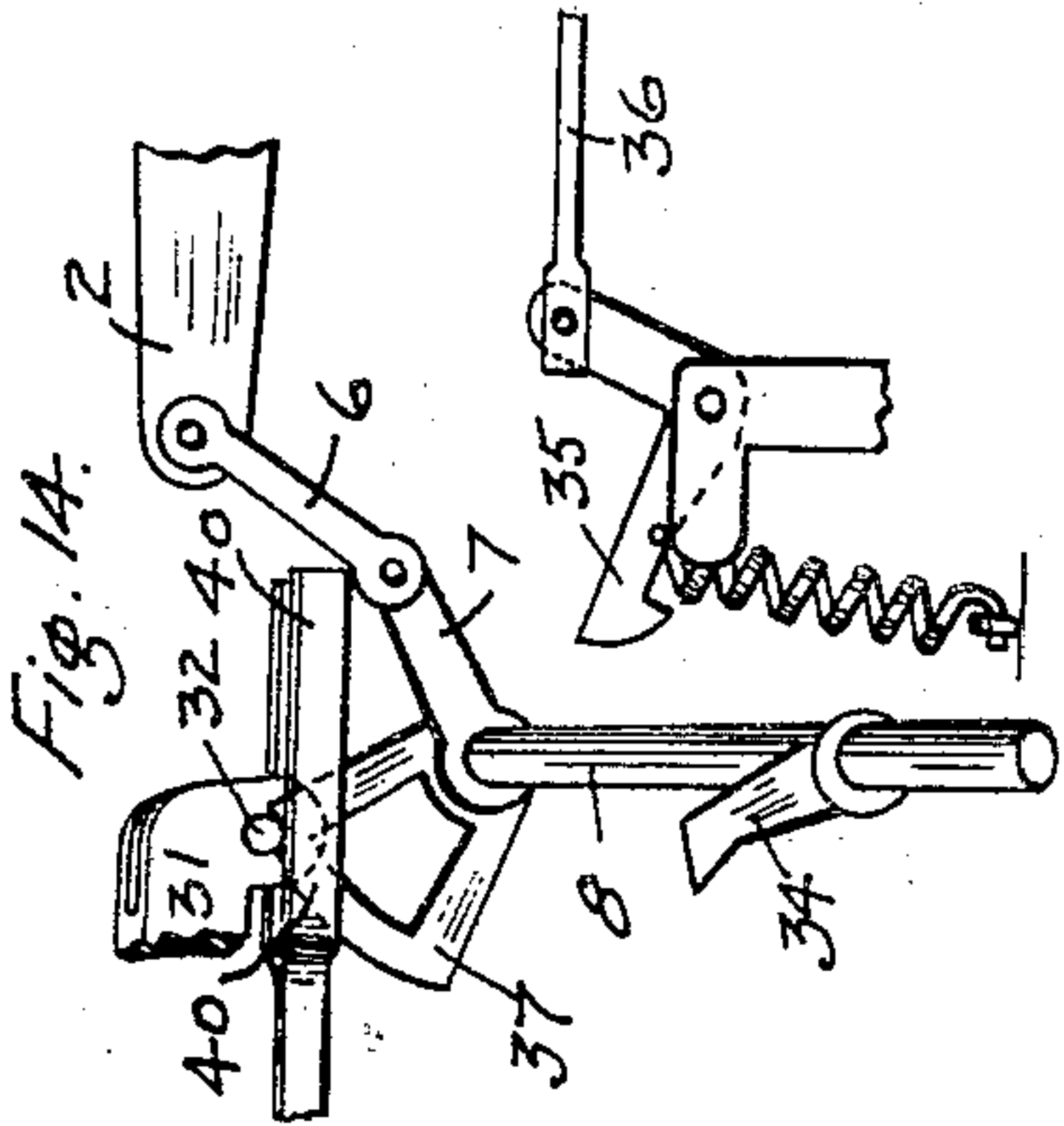
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ARTHUR C. TUNISON, OF TACOMA, WASHINGTON.

SWITCH-OPERATING MECHANISM.

No. 894,297.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed March 8, 1906. Serial No. 304,950.

To all whom it may concern:

Be it known that I, ARTHUR C. TUNISON, a citizen of the United States of America, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Switch-Operating Mechanism, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to switches and especially to those known as street-car or tongue switches and has for its object to provide a mechanism for throwing the switch which shall be controlled from and operated by a car; which will allow a car to pass over it from beyond the switch without disturbing the throw of the switch; which will remain thrown for either track until thrown to the other track; which is readily thrown to connect with either track; which has a single operating mechanism on the car; which has a separate mechanism for throwing it to the normal side, a separate mechanism for setting the mechanism which throws the switch to the switched or side-tracked side, and which has a separate mechanism for throwing it to said side; which is simple in construction and operation; which is difficult to operate by accident or by other means than a car; and which is not unsightly in the street. I attain these objects by the mechanisms illustrated in the accompanying drawings, in which

Figure 1 is a plan of a switch equipped with my operating mechanism. Fig. 2 is a side elevation thereof, showing a car having just operated the setting mechanism and passing forward to the throwing mechanism. Fig. 3 is a plan of the switch tongue. Fig. 4 and 5 are respectively plan and side view of the tongue operating crank. Figs. 6 and 7 are respectively side view and plan of the car engaging lever. Figs. 8 and 9 are respectively side view and plan of the switch throwing lever. Figs. 10 and 11 are respectively a plan and a vertical longitudinal section of the switch throwing head. Fig. 12 is a perspective view of the mechanism within the box showing the positions of the parts thereof in the normal position of the switch, and Figs. 13 and 14 are similar views showing portions of said mechanisms in positions assumed thereby respectively when the switch is thrown to side track, and when the mechanism is set to throw the switch to side track.

Similar numerals of reference refer to similar parts throughout the several views.

This invention consists of three separately operated mechanisms which are, first, a mechanism for throwing the tongue of the switch from the normal position to the side track; second, a mechanism for setting said first mechanism; and third, a mechanism for releasing said switch tongue and allowing it to return to its normal position. The parts of these mechanisms which are engaged by the moving car are arranged adjacent to the outer edge of the left rail of the track. The portion operating the third mechanism, as above, is located furthest from the switch; that portion which operates the second mechanism is located a little nearer to the switch; while that portion which operates the first mechanism is located comparatively close to the switch.

The portion of the first mechanism "A" (Figs. 1, 2, 8 and 9) which is engaged and actuated by the moving car "1" consists of a tread bar or lever "2" pivoted at "3" to the side of the rail "4" in such position that the portion thereof which extends above the level of the head of the rail will be between the pivot "3" and the operating end of the lever so that when a car wheel rolls on the lever "2" it forces the operating end thereof downward. The operating end of this lever "2" is slightly offset and enters into the mechanism box "5"; being connected therein by a link "6" to the crank "7" of the horizontal controlling shaft "8" mounted in said box "5". The portions "B" and "C" of the second and third mechanisms respectively, which are engaged by the moving car, are similar to each other but are connected by separate rods to different mechanisms within the box and are illustrated in Figs. 1, 2, 6 and 7. The tread bar of the second and third mechanisms, is pivoted beside the rail "4" at "9" and has the portion "10" nearest the switch normally raised a few inches above the level of the rail "4" so that when a car passes along the rail it will depress the part "10" to the level of the rail. The other end "11" of the bar is offset several inches away from the rail and carries an engaging trigger "12" pivoted to its end, to the lower end of which is secured the rod which leads into the mechanism box "5". The part "11" and trigger "12" are normally kept below the level of the rail by the spring "13". The trigger "12" is arranged so that

when the part "10" of the tread bar is depressed and the part "11" is raised, it will extend above the level of the rail "4", and several inches to one side thereof, in such position
 5 that the operator on the car may engage it, if he so desires, and thus cause the rod secured to its lower end to set in action the mechanism which it controls.

The engaging device secured to the car
 10 "1" consists of a pivoted arm "14" adapted, when lowered, to engage the trigger "12", a tension rod "15" joining the arm "14" to the foot operated crank "16" on the platform of the car. The parts are so arranged
 15 that when the crank "16" is stepped on it pulls down the arm "14" into position so that it will engage the trigger "12" as the car presses the part "10" of the tread bar down.

20 The switch tongue "17" is of the usual form and is kept pressed to the normal position by the spring "18" mounted in the box "19" beside the switch. The tongue "17" is thrown to the side track side of the switch
 25 by the bell crank lever "20", pivoted to the switch casting below the tongue "17", and having a lip or lug "21" engaging the tongue "17" on the rail side thereof near its point so that when the lever is actuated it will
 30 force the point of the tongue "17" over to the other side of the switch. The rod "22" leads from the bell crank lever "20" to the mechanism box "5" into which it passes. The end of the rod "22" which is within the
 35 box "5" is forked to receive the end of the part "23" of the spring link, the parts "22" and "23" being pivotally secured together by the horizontal pin "24" which is long enough to extend on each side of the forked end of
 40 rod "22" and to slide in the horizontal guide slots "25" in the supporting frame or bracket "26" secured in the box "5". The part "23" of the spring link slides within the part "27" and has lugs "28" at its end, extending through slots in the part "27". The
 45 part "27" is hollow for most of its length and is slotted as above indicated to allow the lugs "28" to slide freely along it and to extend through it to the outer surface thereof. It is also provided with an enlargement or ring
 50 "29" between which and the lugs "28" the spring "30" is wound in such manner as to keep said parts "28" and "29" as far apart as possible, in other words to keep the part
 55 "23" the full distance within the part "27". The part "27" is also provided with a forked head "31" extending downwards therefrom and having the pin "32" passing longitudinally through it and extending out on
 60 each side thereof.

It is evident that if the head "31" is pulled forward the spring "30" will be compressed between the parts "28" and "29" and will force the part "27" with the rod "22" forward, this action will cause the bell crank

lever "20" to move, by means of the engaging lug "21", the tongue "17" of the switch against the action of the spring "18". It is also evident that if the head "31" is held forward, so that the switch tongue is set for
 70 the sidetrack, and a car should pass on the main track over the switch from the opposite direction it would force the tongue over temporarily to its normal position and would cause the bell crank lever "20" to turn on
 75 its pivot and would pull the rod "22" so that the part "23" would slide within the part "27" and the parts "28" and "29" would compress the spring "30" therebetween.

The mechanism within the box "5" by
 80 means of which the position of the switch tongue "17" is controlled, consists of means for pulling the head "31" forward, means for releasing the head from the forward position, and means for locking or releasing
 85 said pulling means. This mechanism consists of a horizontal shaft "8" journaled in said box "5" and being provided with a crank arm "7" which is secured to the end of the lever "2", through the link "6",
 90 so that when said lever "2" is depressed the shaft "8" is rotated in its bearings against the action of the spring "33" which is connected between the box "5" and the latch arm "34". This latch arm "34" is secured to the shaft "8" in such position as to be engaged, when the spring "33" is tightened, by the hook end of the bell crank latch hook "35" the other end of which is connected by the rod "36" to the end of the trigger
 95 "12" of the second mechanism "B" above described. The shaft "8" has also a pulling crank or lug "37" which is secured thereto in such position as to enter between the forks of the head "31" of the spring link
 100 above described. This pulling crank is provided with a notch "38" adapted to receive the pin "32" and to hold it. Thus if the mechanism in the box "5" is in the positions shown in Fig. 12 and a car "1" acts on
 105 the trigger "12" of the mechanism "B", the rod "36" is pulled and the latch hook "35" releases the latch arm "34" and the shaft turns under the action of spring "33" to the position shown in Fig. 14, when the pin "32" falls into the notch "38" of the pulling crank
 110 "37". At the same time the rotation of the shaft "8" has caused the crank "7" to raise, through the link "6", the end of the lever "2" so that said lever is above the level of the rail. Now when the car "1" reaches the lever "2" it forces it down and causes it to rotate the shaft "8" with the pulling crank
 115 "37" and thus causes the switch tongue "17" to be thrown for the side track; and when the shaft has been thus rotated the latch hook "35" again engages the latch arm "34" and holds the mechanism in the positions shown in Fig. 13. The trigger "12" of the mechanism "C", which is adapted to release
 120 125 130

the mechanism so as to allow the switch "17" to return to its normal position under the action of the spring "18", is connected by the rod "39" to the pivoted fork "40" whose 5 tines are on each side of the pulling crank "37" and are wide enough for the tines of the forked head "31" to pass between them. This fork "40" is hung from the bracket "26" so as not to interfere with the actions 10 above described except when its operating mechanism "C" is being acted upon by a car and then its tines are forced upward and if the parts are in the positions shown in Fig. 13, it causes the pin "32" to be lifted from the notch "38" and thus allows the spring link, the rod "22", the lever "20", and the 15 tongue "17" to return to their normal positions as shown in Fig. 12. If the mechanism "C" should be operated when the parts are in the positions shown in Fig. "12" no effect is had on the switch.

If a car is passing from the side track to the main track from beyond the switch, which is set for the main track, the wheels 25 thereof will force the tongue "17", against the action of the spring "18", to the side-track side of the switch as they pass and this will not affect in any manner the switch operating mechanism, since the lug "21" on the lever "20" is on the rail side of the tongue 30 "17", hence the tongue is simply moved away from the lug "21" by the wheels without disturbing the lever "20". If a car is passing towards the switch but does not desire to throw it, whichever track it may be set for, 35 the arm "14" on the car is not lowered, so that although, as the wheels pass over the portions "10" of the tread bars and the portions "11" with the triggers "12" are elevated, the rods "36" or "39" are not operated by this action of the wheels, and since 40 the lever "2" is not elevated above the rail, the car does not disturb the switch. If, however, the switch is thrown for the side track and it is desired to set it for the main 45 track, the arm "14" is lowered before the mechanism "C" is reached, and as the car passes over the part "10" of this mechanism it raises the trigger "12" thereof so that the arm "14" will engage the trigger and will 50 pull the rod "39" so that the fork "40" will disengage the head of the spring link from the pulling crank "37"; the spring "18" then forces the tongue "17" over to its normal or main track position and the lever 55 "20", rod "22", and spring link are returned to the position shown in Fig. 12. When the car has passed the mechanism "C" the arm "14" is raised again so as not to engage with the trigger of mechanism "B". If, however, 60 the switch is thrown for the main track and it is desired to set it for the side track, the arm "14" is lowered before the mechanism "B" is reached and it operates in the same manner on the trigger "12"

thereof, causing the rod "36" to raise the latch hook "35" from the arm "34" thus causing the shaft "8" to rotate and elevating the lever "2", of mechanism "A", above 70 the level of the rail, and causing the pulling crank "37" to engage the head of the spring link. The car then passes from mechanism "B" to "A" and its wheels force the lever "2" down to the level of the rail, and in 75 doing so it forces the shaft "8", through the link "6" and the crank "7" to rotate, and as the shaft rotates it causes the crank "37", the spring link, the rod "22", the lever "20", and the tongue "17" to move as already 80 described.

Having described my invention what I claim is:

1. In a car switching device, the combination of a switch tongue, a lever lying longitudinally beside the rail and adapted to be depressed by the car wheels on the rail, releasable means joining said lever with said tongue whereby said tongue is moved by the downward motion of said lever when said means is closed, and independent car operated mechanism for closing said releasable means. 85

2. In a car switching device, the combination of a switch tongue, a lever lying longitudinally beside the rail and normally out of 95 the path of the car wheels on the rail, a releasable latch whereby said lever is normally locked in said position, means for releasing said latch whereby said lever is placed in the path of the car wheels on the rail, and means 100 joining said tongue with said lever whereby said tongue is moved by the motion of said lever when acted on by the car wheels.

3. In a switching device, the combination of a switch tongue, a lever lying longitudinally beside the rail and normally depressed 105 out of the path of the car wheels on the rail, a releasable latch whereby said lever is normally locked in said depressed position, means for releasing said latch whereby said 110 lever is permitted to rise above the level of the rail and in the path of the wheels thereon, and releasable means joining said tongue with said lever whereby said tongue is moved by the downward motion of said lever under 115 the pressure of the car wheel.

4. In a car switching device, the combination of a switch tongue, a lever lying longitudinally beside the rail and normally depressed 120 out of the path of the car wheels thereon, a releasable latch whereby said lever is normally locked in said depressed position, means for releasing said latch whereby said lever is permitted to rise above the level of the rail and in the path of the wheels thereon, 125 releasable mechanism joining said tongue with said lever whereby said tongue is moved by the downward motion of said lever under pressure of the car wheels thereon when said mechanism is closed, and mechanism for clos- 130

ing said releasable mechanism when said lever is raised.

5 5. In a car switching device, the combination of a switch tongue; a spring holding said tongue in its normal position; a lever; and elastic mechanism containing a spring therein and joining said lever with said tongue, said contained spring being relatively stiffer than said holding spring, whereby said
10 tongue is moved from its normal position by said lever against the action of said holding spring but is permitted to move independent of said lever.

15 6. In a car switching device, the combination of a switch tongue; a spring holding said tongue in its normal position; a lever; elastic releasable mechanism containing a spring therein and joining said lever with said tongue, said contained spring being relatively stiffer than said holding spring, where-
20 by said tongue is moved from its normal position by said lever against the action of said holding spring but is permitted to move inde-

pendent of said lever; and independent mechanism for releasing said tongue from
25 said moving mechanism whereby said holding spring is free to return said tongue to its normal position.

7. In a switch controlling mechanism, the combination of a tread bar lying longitudi-
30 nally beside the rail in the path of the car wheels on the rail, an extension on said tread bar lying normally below the level of the rail but being raised above said level by
35 the downward motion of the tread bar under the action of the car wheels, a trigger pivoted to said extension and connected to switch operating mechanism, and means secured to the
car and adapted to act on said trigger.

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

ARTHUR C. TUNISON.

Witnesses:

M. H. COREY,

M. A. VAN HOUSE.