

D. M. GUNTHORPE & E. T. WADE.
 SWITCH CONTROLLER.
 APPLICATION FILED DEC. 30, 1909.

966,397.

Patented Aug. 2, 1910.

3 SHEETS—SHEET 1.

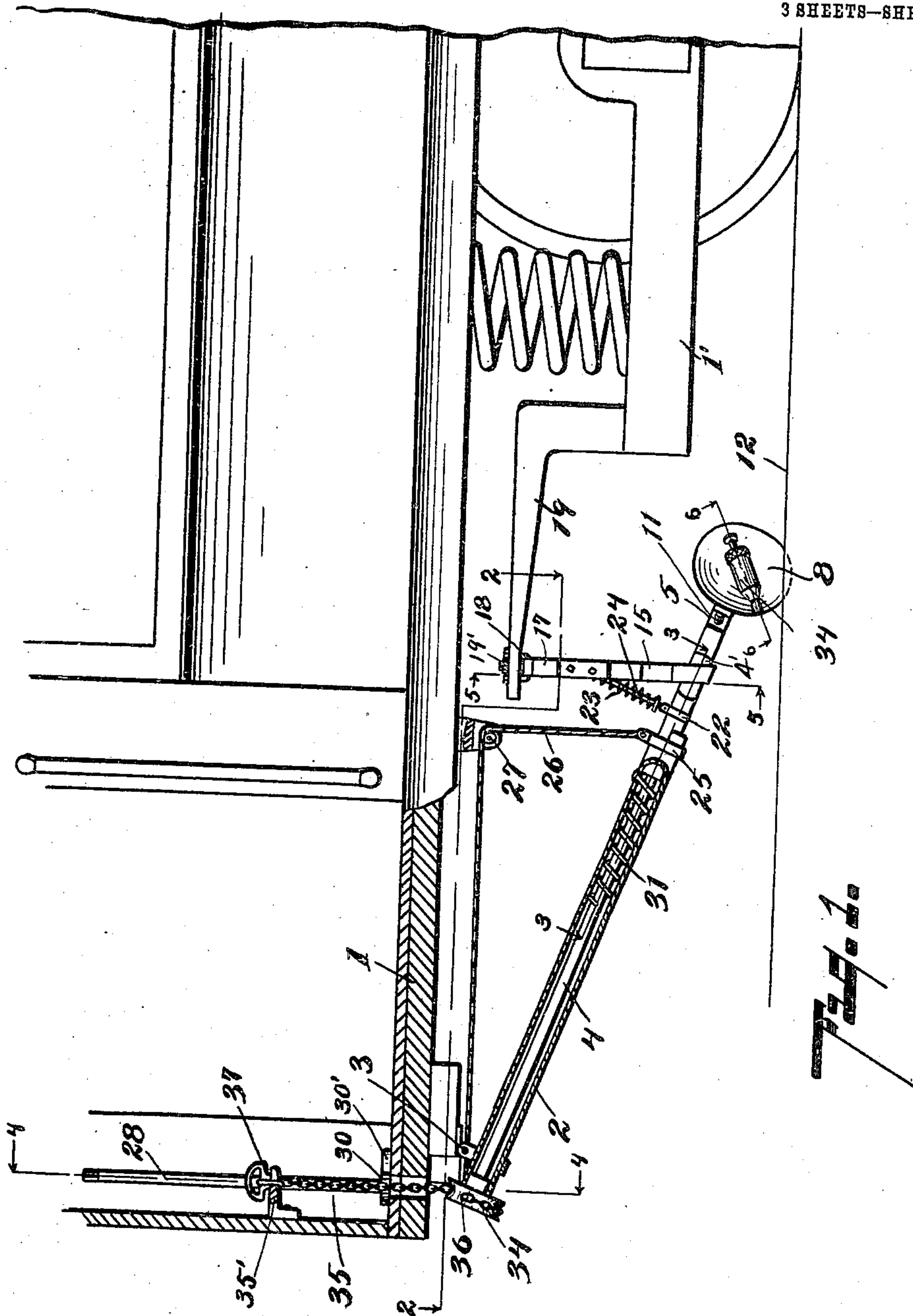


Fig. 1.

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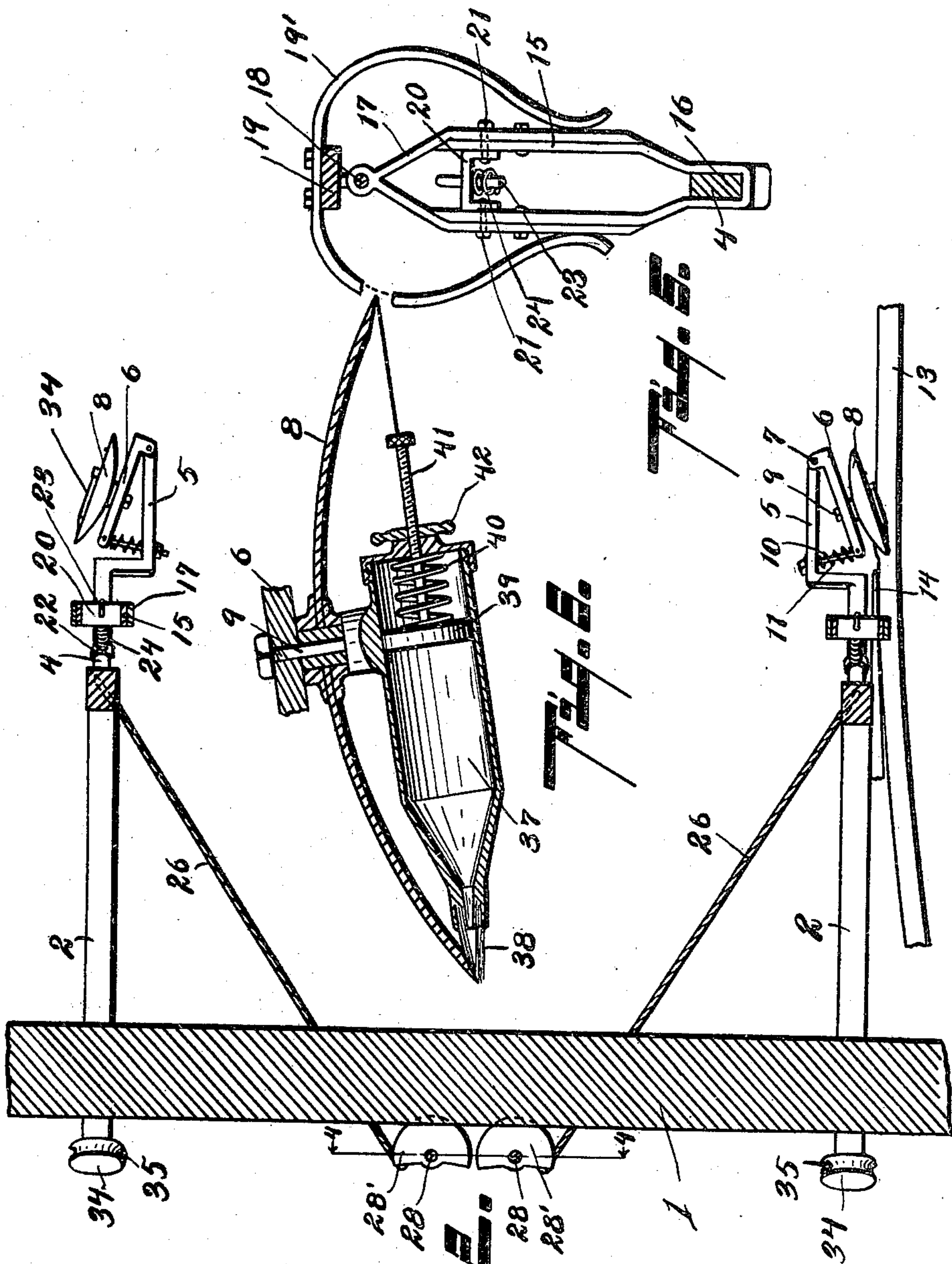
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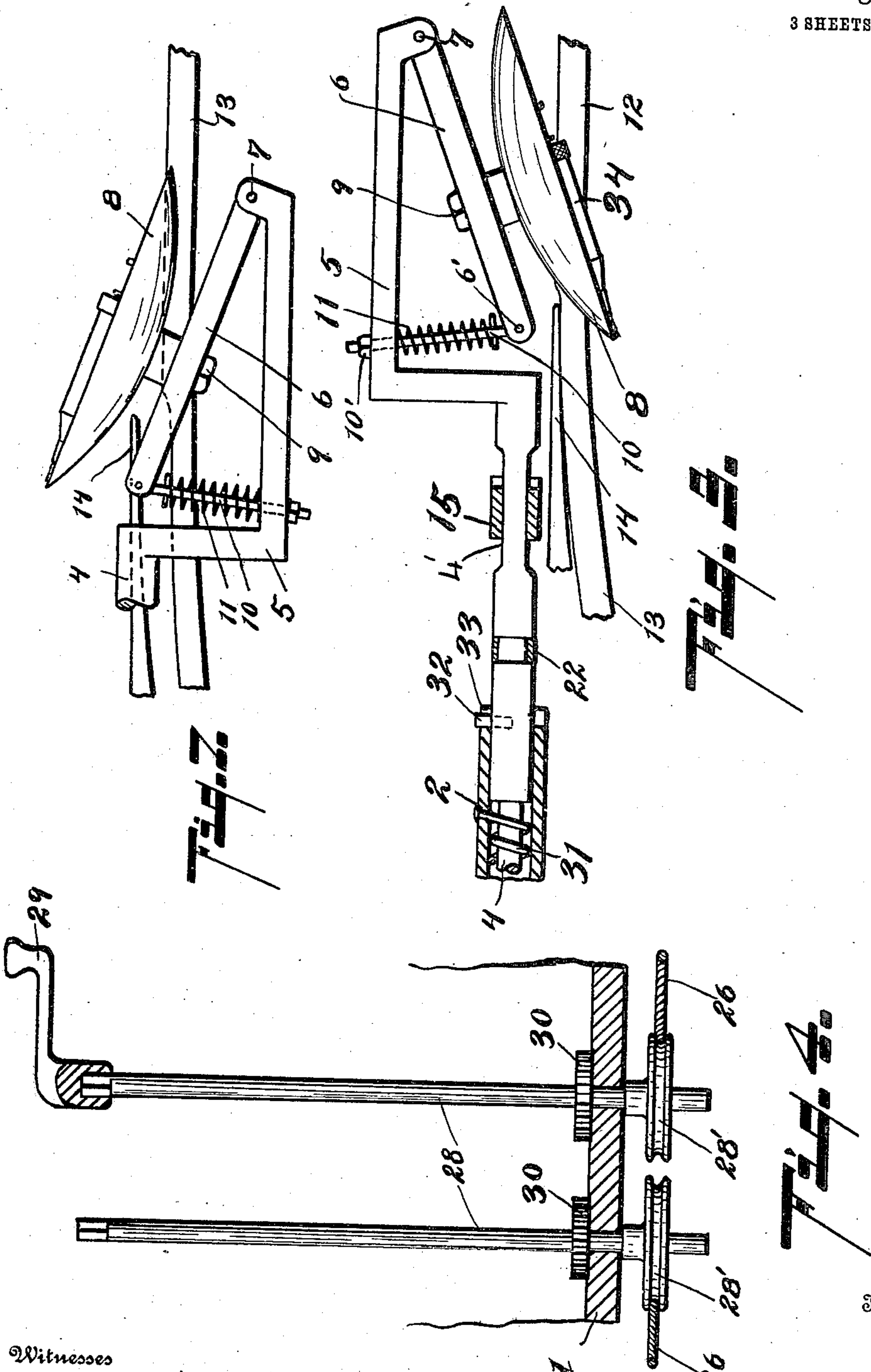
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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SWITCH-CONTROLLER.

966,397.

Specification of Letters Patent.

Patented Aug. 2, 1910.

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To all whom it may concern:

Be it known that we, DENNIS M. GUNTHORPE and EDGAR T. WADE, citizens of the United States, residing at Battle Creek, Michigan, and Flint, Michigan, have invented certain new and useful Improvements in Switch-Controllers, of which the following is a specification.

This invention relates to improvements in devices for operating switches from a moving car.

The objects of this invention are, first, to provide an effective structure and mechanism which can be operated from the platform of a street car for throwing the point of a switch in either direction. Second, to provide an improved disk construction for actuating and throwing the point of a switch. Third, to provide improved means for reversing a switch throwing mechanism, whereby the point of the switch can be thrown in either direction, thus enabling the motorman to completely control the switch in the track. Fourth, to provide in connection with a switch operating device an effective track lubricator.

Further objects and objects relating to details will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The structure described constitutes one effective embodiment of our invention.

Other embodiments will readily suggest themselves to those skilled in the art.

The invention is clearly defined and pointed out in the claims.

Our invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail side elevation view of the end portion of a street car with one of our improved switch controllers in position, portions being broken away to show details of construction. Fig. 2 is a sectional plan view taken on a line corresponding to the irregular line 2—2 of Fig. 1, showing the position and the arrangement of the parts generally. Fig. 3 is an enlarged detail view partially in section on line 3—3 of Fig. 1, showing the position and arrangement of the reversible disk in proper position to actuate the switch point to open the same. Fig. 4 is a vertical transverse sectional eleva-

tion taken on a line corresponding to line 4—4 of Fig. 1, the controlling shaft and parts being shown in full lines. Fig. 5 is an enlarged detail sectional view taken on a line corresponding to line 5—5 of Fig. 1, showing the loop support for the carrying shaft. Fig. 6 is an enlarged detail sectional view taken on a line corresponding to line 6—6 of Fig. 1, through one of the disks and the lubricator means carried thereby. Fig. 7 is an enlarged detail view of the parts appearing in Fig. 3, which support and guide the actuating disk, showing them in operative position on the rail for closing the switch point.

In the drawing the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar numerals of reference refer to similar parts throughout the several views.

Considering the lettered parts of the drawing, the front platform 1 of the car is conventionally illustrated in about its usual relation to the car truck 1' underneath.

My improved switch controller consists of a tubular sleeve 2, which is supported by a suitable ear 3 pivoted to the under side of the front portion of the platform. Within this sleeve 2 is a rock shaft 4 which is controlled by means hereafter to be described. On the lower end of this shaft 4 is an offset portion 5 which carries a hinged bar 6 which is pivoted at the lower end at 7. This bar 6 carries a concavo-convex disk 8, which is supported on a suitable bearing 9, which bearing is carried by the hinged arm 6. This hinged arm 6 is held yieldingly in position by the spring 11 which surrounds the bolt 10. The bolt 10 is pivoted to the forward end of the arm 6 at 6' and extends loosely through a suitable perforation in the offset arm 5. The bolt 10 is retained from displacement by the nut 10' on its outer end.

As illustrated, the car is on the main track 12, 13 is the side track, and 14 the switch point. It will be noted that the concave side of the disk 8 is held obliquely to the rail of the track with the lower edge of the concave side hugging the inner side of the rail, when it is desired to open the point of the switch. This appears in Fig. 3. When the same is advanced the edge of the disk strikes and engages the switch point 14 and opens the same.

When it is desired to close the point of the

switch so that the car will remain on the main track, the switch controller and disk take the position indicated in Fig. 7, (where the switch is open) with the convex side of the disk toward the rail, when the point of the switch will be engaged toward its inner side by the convex side of the disk and forced into the closed position. The shaft 4 lays in a guiding loop support 15, the bottom part 16 of which is restricted to positively engage the shaft 4, which is flattened at 4' to be engaged and held against turning by said restricted part. The loop 15 is supported by the hanger 17 which is hinged at 18 to the bracket 19 which is carried by the car truck 1', as appears in Fig. 1, the pivotal supports and the connections of the parts just referred to appearing more clearly in Fig. 5. The blade spring 19' is in substantially U-form, and is carried by the bracket 19 and holds the loop 15 yieldingly in the central position, whereby, when the car travels along, there will be sufficient "give" to the apparatus to permit the same to conform to the slight irregularities that will occur on the rail. The same is held sufficiently rigid to throw the point of a switch, yet the structure yields at this point and if the switch point should be frozen tight or should be blocked by some non-yielding obstruction, the device will yield and swing out of the way and thus not be injured. This is of importance because it is only necessary or desirable that the disk exert sufficient force to throw the point of the switch under ordinary circumstances. When the switch is accidentally blocked, the apparatus must yield and get out of the way, else some portion will be broken.

We provide a cross piece 20 in the upper part of the loop 15, which is perforated to permit of the playing of a rod 23 there-through. This cross piece 20 is retained in position by rivets 21—21, which couple the hanger 17 to the loop 15. The rod 23 is connected to a collar 22 which surrounds the shaft 4 and permits the shaft to revolve freely therein. A coil spring 24 is on the rod 23 and this, by its action, urges the disk downward against the track. It will therefore be seen that the disk will readily rise and ride over any ordinary obstruction due to the yielding action of the spring 24, the action of the spring being merely sufficient to insure that the edge of the disk will take hold of and properly engage the switch point. A cable 26 is connected by the loop 25 to the sleeve 2 at its rear end. This cable extends over a pulley at 27, to a segmental drum 28' on the vertical shaft 28. The shaft 28 is controlled by the removable crank 29, as seen distinctly in Figs. 2 and 4.

A ratchet 30 is provided on the shaft 28 which is locked in position by a ratchet pawl 30' which is arranged on the platform 1 of

the car, so that in manipulating this device, the operation and motion are much the same as those for handling the brake or the controller of an electric car, and the parts are locked in position by the ratchet pawl 30'. Embracing the shaft 4 and connected thereto is a coil spring 31 which extends downwardly and rearwardly and is connected at its rear end to the sleeve 2, whereby tension is put upon the shaft to hold it always in the normal position. A stop pin 32 engages a stop 33 on the sleeve for that purpose. At the upper end of the shaft 4 is a pulley 34 to which is connected at 36 a cord or cable 35 which extends up through the platform of the car to a handle 37, whereby the same may be actuated. When the switch controller has been elevated by operating the crank 29 so that the shaft 4 comes up out of the restricted portion 16 of the loop 15, the motorman, by grasping the handle 37 and pulling the same, can turn the shaft half way over. The shaft may be held in this position as long as desired by engaging the chain in a suitable catch 35' provided therefor. This permits the disk to drop down into engagement again, when its rotation will be prevented in the reversed position by the flattened portion 4' of the shaft 4 again engaging in the restricted portion 16 of the loop 15. To permit the disk to return to its normal position, it is only necessary to raise the same so that the shaft 4 is lifted out of the restricted portion, when the tension of the spring will throw it to the normal position, when the same can be dropped down again and be in position for operation.

One of the devices should be located at each corner of the car, so that the switch point can be controlled wherever they may be found. As the device is very simple, it is seen that this can be very readily done, and the motorman can effectively control the same, because it is only necessary for him to manipulate one of the controllers at a time. To insure effective operation of this device, it is quite desirable that the same be effectively lubricated, otherwise its tendency is to engage some particles of scale or a rough surface on the side of the rail and climb up, when, if it is properly lubricated, the spring pressure on the same will be sufficient always to force the same down to the proper point for engagement with the switch point. It is also important that the car wheels, in turning the switch, encounter a lubricated rail to prevent the flanges climbing. We have therefore a double purpose in providing a lubricating means in this connection, one being to insure that the switch throwing disk will be more effectively in position, and the second being to properly lubricate the track to prevent the flange of the car wheels climbing. We accomplish this important result by means of a lubricating device, illus-

trated specifically in Fig. 6. We provide a cylindrical receptacle 37 for oil or thick grease, provided with a suitable outlet and a fountain brush 38 for distributing the lubricant on the concave side of the disk, whereby the same will be allowed to ooze and work gradually out to the edge of the disk and lubricate the rail whenever the car comes to make the turn.

10 Within the cylindrical receptacle 37 we provide a plunger 39, which is adjustable by the screw stem 41 on which is an adjustable stop 42. A spring 40 is provided to force the plunger 39 yieldingly against the contents of the receptacle, so that it will be gradually exuded as it is desired to be used. The disk is important in this behalf, as it tends to scrape the rail free from dust and mud, at the same time that the oil is deposited against it. It is therefore seen that the structure has double use, as stated. We desire to state, however, that where men are employed to keep the rails lubricated, such lubricating device will not be needed with our improved switch controlling means, and where the conditions are perfect and the rails are reasonably clean this provision will not be needed. We therefore wish it understood that we desire to claim our structure with the lubricating device and without it. It will be seen by this means that a very moderate amount of lubricant can be distributed at the point where it is needed on the rails, and that the structure will enable the motorman to completely and effectively control the switches, so that it will not be necessary for him to stop the car when he approaches a switch and delay while he pries the switch point over with a bar that is usually provided for this purpose.

40 We desire to state that we wish to claim the structures we have illustrated specifically, because we believe we have the same in the very best form for the purpose. We desire to remark, however, that we think the same could be considerably modified and secure very satisfactory results, and we therefore desire to present claims broadly that would embrace other embodiments of our invention.

50 Having thus described our invention, what we claim as new and desire to secure by Let-tern Patent is:

55 1. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for controlling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; a pulley at the end of the shaft; a cable connected thereto with a handle for controlling and locating the same; an arm pivoted at the rear end of said shaft and ar-

ranged obliquely to the direction of the said shaft and to the car track beneath; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that normally the concave side is toward the rail 70 and the convex side in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the same will be urged yieldingly against 75 the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against rotation either in its normal or adjusted position; a 80 collar on said shaft with an upwardly-extending rod extending into a guide carried by the said supporting loop; a spring on the said rod for holding the said rock shaft yieldingly downward, whereby the said disk 85 can be reversed and thrown into the opposite position for engaging a switch point for closing the same; a lubricant receptacle carried in the concave side of the said disk provided with a suitable fountain brush for 90 delivering the lubricant on the edge of the said disk; suitable yielding plungers with adjusting means within the said receptacle for delivering the lubricant gradually, all coacting substantially as described and for 95 the purpose specified.

2. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for con- 100 trolling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; a pulley at the end of the shaft; a 105 cable connected thereto with a handle for controlling and locating the same; an arm pivoted at the rear end of said shaft; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that nor- 110 mally the concave side is toward the rail and the convex side in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the 115 same will be urged yieldingly against the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against rotation either in its 120 normal or adjusted position; a collar on said shaft with an upwardly-extending rod extending into a guide carried by the said supporting loop; a spring on the said rod for holding the said rock shaft yieldingly down- 125 ward, whereby the said disk can be reversed and thrown into the opposite position for engaging a switch point for closing the same; and a lubricant receptacle carried in the concave side of the said disk provided 130

with a suitable fountain brush for delivering the lubricant on the edge of the said disk, all coacting substantially as described and for the purpose specified.

3. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for controlling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; a pulley at the end of the shaft; a cable connected thereto with a handle for controlling and locating the same; an arm pivoted at the rear end of said shaft; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that normally the concave side is toward the rail and the convex side in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the same will be urged yieldingly against the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against rotation either in its normal or adjusted position; a collar on said shaft with an upwardly-extending rod extending into a guide carried by the said supporting loop; a spring on the said rod for holding the said rock shaft yieldingly downward, whereby the said disk can be reversed and thrown into the opposite position for engaging a switch point for closing the same; and means to lubricate the side of said disk, all coacting substantially as described and for the purpose specified.

4. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for controlling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; a pulley at the end of the shaft; a cable connected thereto with a handle for controlling and locating the same; an arm pivoted at the rear end of said shaft; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that normally the concave side is toward the rail and the convex side is in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the same will be urged yieldingly against the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against rotation either in its normal or adjusted position; a collar on said shaft with an upwardly-ex-

tending rod extending into a guide carried by the said supporting loop; and a spring on the said rod for holding the said rock shaft yieldingly downward, whereby the said disk can be reversed and thrown into the opposite position for engaging a switch point for closing the same, all coacting substantially as described and for the purpose specified.

5. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for controlling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; means to control said shaft; an arm pivoted at the rear end of said shaft; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that normally the concave side is toward the rail and the convex side in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the same will be urged yieldingly against the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against rotation either in its normal or adjusted position; a collar on said shaft with an upwardly-extending rod extending into a guide carried by the said supporting loop; a spring on the said rod for holding the said rock shaft yieldingly downward, whereby the said disk can be reversed and thrown into the opposite position for engaging a switch point for closing the same; and a spring embracing said loop to hold it yieldingly against lateral motion, all coacting substantially as described and for the purpose specified.

6. In a switch-controlling device, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; a connection with a suitable handle for controlling the elevation of the same; a rock shaft carried within the sleeve offset at its lower rear end; a spring on the said rock shaft for holding the same yieldingly in position; means to control said shaft; an arm pivoted at the rear end of said shaft; a concavo-convex disk journaled on a journal on the said pivoted arm arranged so that normally the concave side is toward the rail and the convex side in the advance position for engaging back of a switch point to open the same; a yielding spring support for the forward end of said pivoted arm whereby the same will be urged yieldingly against the rail; a loop embracing the said shaft with a restricted portion at its bottom for embracing a flattened portion on the said shaft to hold the same against ro-

tation either in its normal or adjusted position; a collar on said shaft with an upwardly-extending rod extending into a guide carried by the said supporting loop; and a spring on the said rod for holding the said rock shaft yieldingly downward, whereby the said disk can be reversed and thrown into the opposite position for engaging a switch point for closing the same, all coacting substantially as described and for the purpose specified.

7. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; a loop embracing the said rock shaft having a restricted portion at its bottom for engaging a flattened portion of the said shaft to hold it against rotation either in its normal or adjusted position; a spring means for holding the said rock shaft yieldingly downward; and a spring means for holding the said loop yieldingly in its normal position; all coacting substantially as described and for the purpose specified.

8. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; a spring means for holding the said rock shaft yieldingly downward; and a spring means for holding the said loop yieldingly in its normal position, all coacting substantially as described and for the purpose specified.

9. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; means for locking said shaft in position; a spring means for holding the said rock shaft

yieldingly downward; and a spring means for holding the said loop yieldingly in its normal position, all coacting substantially as described and for the purpose specified.

10. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; a loop embracing the said rock shaft having a restricted portion at its bottom for engaging a flattened portion of the said shaft to hold it against rotation either in its normal or adjusted position; and a spring means for holding the said rock shaft yieldingly downward, all coacting substantially as described and for the purpose specified.

11. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; and a spring means for holding the said rock shaft yieldingly downward, all coacting substantially as described and for the purpose specified.

12. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support with springs for holding said rock shaft yieldingly in position; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; means for locking said shaft in position; and a spring means for holding the said rock shaft yieldingly downward, all coacting substantially as described and for the purpose specified.

13. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk

obliquely arranged on a suitable journal on said pivoted arm; means for locking said shaft in position; a spring means for holding the said rock shaft yieldingly downward; and a spring means for holding the said loop yieldingly in its normal position, all coacting substantially as described and for the purpose specified.

14. In a switch-controlling device, the combination of a suitable adjustable support with means for controlling the elevation of the same; a rock shaft arm carried within the said support; means for adjusting the said rock shaft to reverse its position; an arm pivoted to the rear of said rock shaft with a spring for holding the same yieldingly in position; a concavo-convex disk obliquely arranged on a suitable journal on said pivoted arm; means for locking said shaft in position; and a spring means for holding the said rock shaft yieldingly downward, all coacting substantially as described and for the purpose specified.

15. In a switch-controlling device, the combination with suitable yielding and adjustable support, of an arm; a concavo-convex disk yieldingly carried and journaled on the said arm, and obliquely arranged in relation to the rails of the track beneath with the convex side of the said disks in the advance, whereby the convex sides of the disks engage a switch point for actuating the same; means for reversing the said disks whereby the switch point can be opened or closed, as desired, coacting for the purpose specified.

16. In a switch controlling device, the combination with suitable yielding and adjustable support, of an arm; a concavo-convex disk yieldingly carried and journaled on the said arm and obliquely arranged in relation to the rails of the track beneath with the convex side of the said disks in the advance, whereby the convex sides of the disks engage a switch point for actuating the same, coacting for the purpose specified.

17. In a switch mechanism, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; means for adjusting the elevation thereof to throw apparatus into and out of operation; a rock shaft carried by the said sleeve; a spring for holding the said rock shaft yieldingly in its normal position; means for reversing the said shaft; a concavo-convex disk suitably journaled with its convex side toward the front and arranged to contact with the inner side of the rail; means for holding the said disk yieldingly in position; means

for locking the supporting means for said disk in the operative position, coacting for the purpose specified.

18. In a switch mechanism, the combination of a suitable supporting sleeve pivoted to the under side of a car platform; means for adjusting the elevation thereof to throw the apparatus into and out of operation; a rock shaft carried by the said sleeve; a spring for holding the said rock shaft yieldingly in its normal position; means for reversing the said shaft; a concavo-convex disk suitably journaled with its convex side toward the front and arranged to contact with the inner side of the rail; and means for holding the said disk yieldingly in position, coacting for the purpose specified.

19. In a switch-controlling device, the combination of a supporting sleeve; an adjustable rock shaft arm within the sleeve; an arm pivoted to the end of said rock shaft arm and obliquely arranged thereto; a concavo-convex disk carried by a suitable journal on the said pivoted arm with its convex side forward; a spring means for holding the said apparatus yieldingly downward, all coacting substantially as described and for the purpose specified.

20. In a switch-controlling device, the combination of a suitable rock shaft support; a concavo-convex disk suitably journaled on said support, with means for holding the same yieldingly in position; a lubricant receptacle carried in the concave side of the said disk, provided with a fountain brush for delivering the lubricant on the edge of the said disk; a suitable yielding plunger with adjusting means within the said receptacle for delivering the lubricant gradually, all coacting for the purpose specified.

21. In a switch-controlling device, the combination of a suitable rock shaft support; a concavo-convex disk suitably journaled on said support, with means for holding the same yieldingly in position; and a lubricant receptacle carried in the concave side of the said disk, provided with means for discharging the lubricant onto the edge of the disk, as specified.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

DENNIS M. GÜNTORPE. [L. s.]
EDGAR T. WADE. [L. s.]

Witnesses:

CLORA E. BRADEN,
F. GERTRUDE TALLMAN.