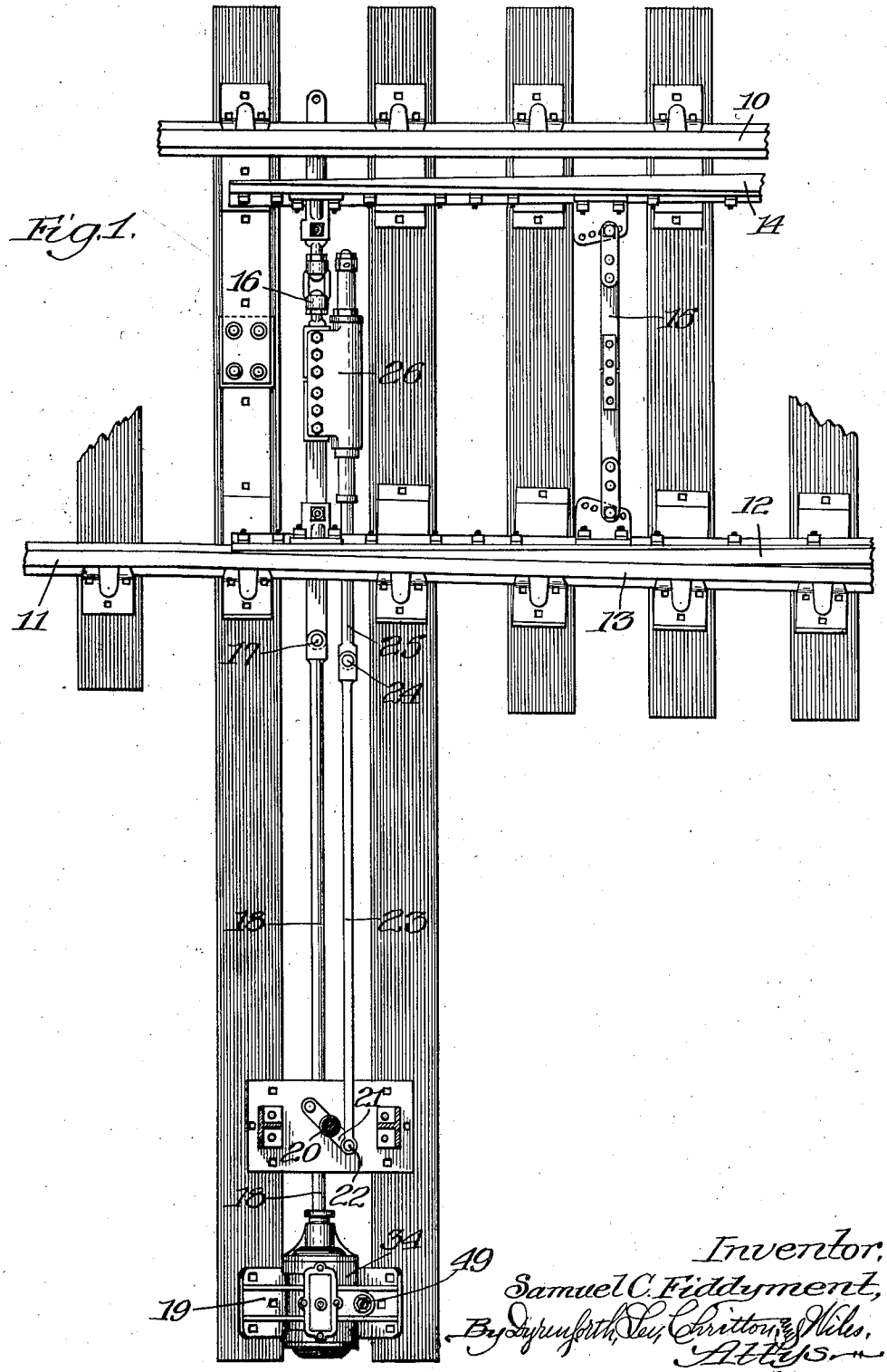
Aug. 13, 1929. S. C. FIDDYMENT 1,724,571

RAILWAY SWITCH

Filed March 26, 1928 3 Sheets-Sheet 1

Fig. 1.



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RAILWAY SWITCH

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Fig. 2.

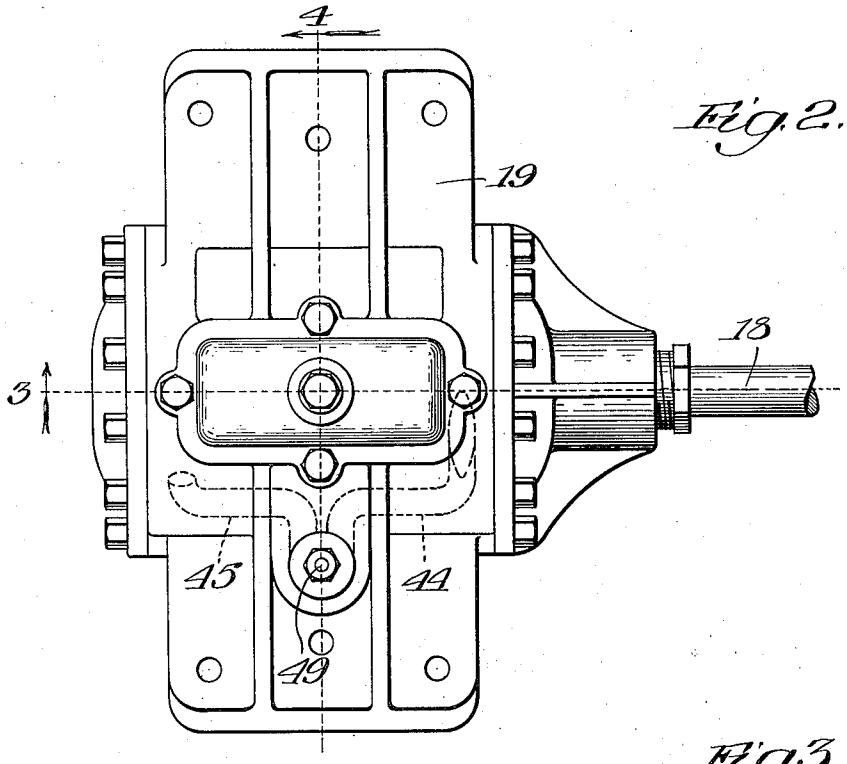
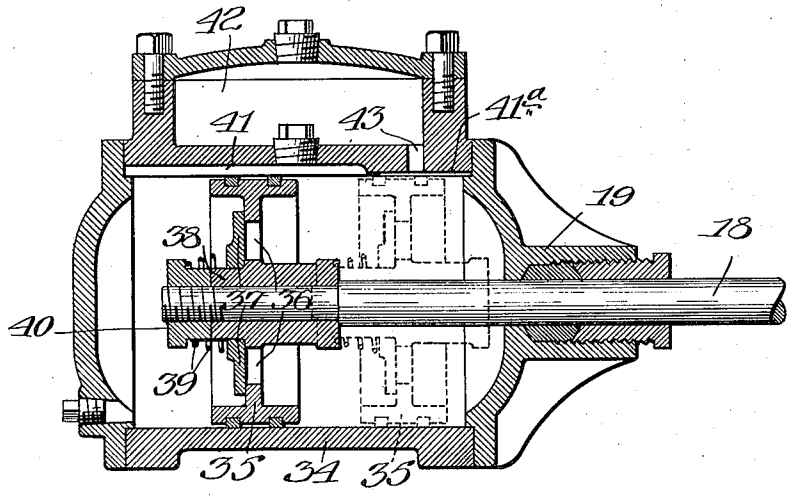


Fig. 3.



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RAILWAY SWITCH

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Fig. 6.

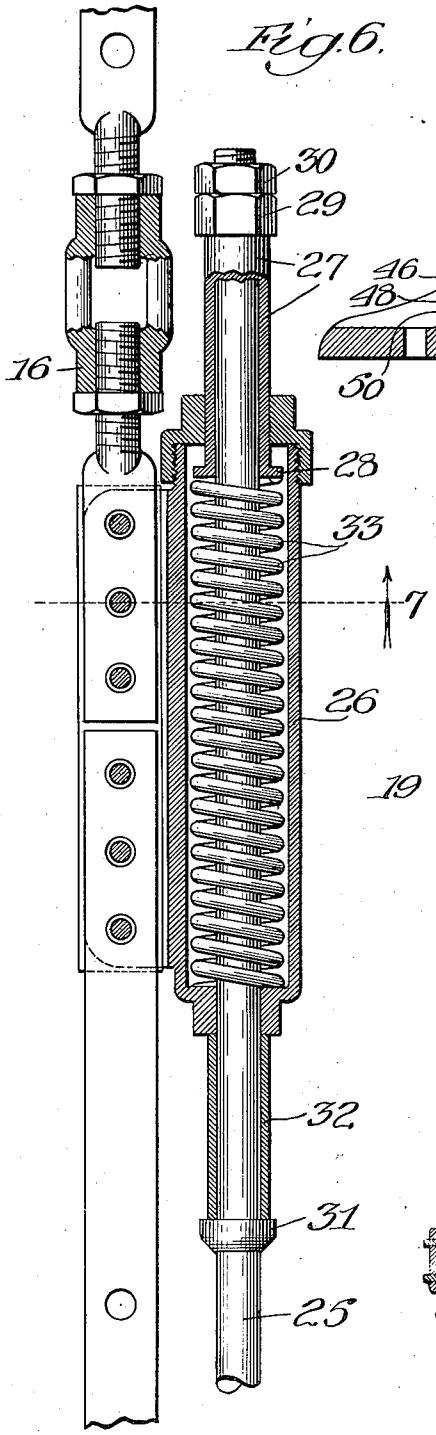


Fig. 4.

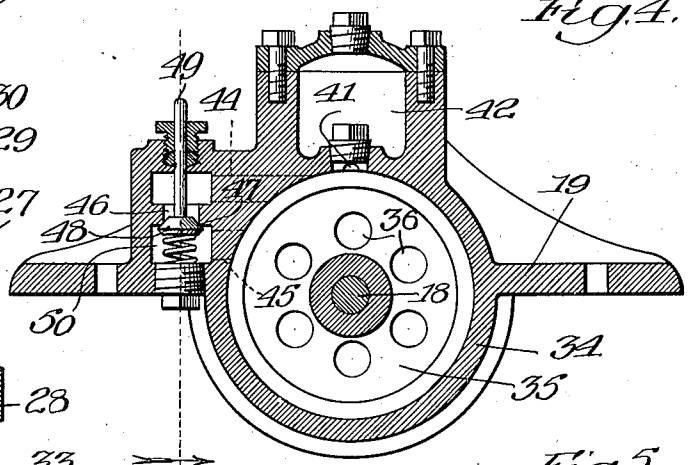


Fig. 5.

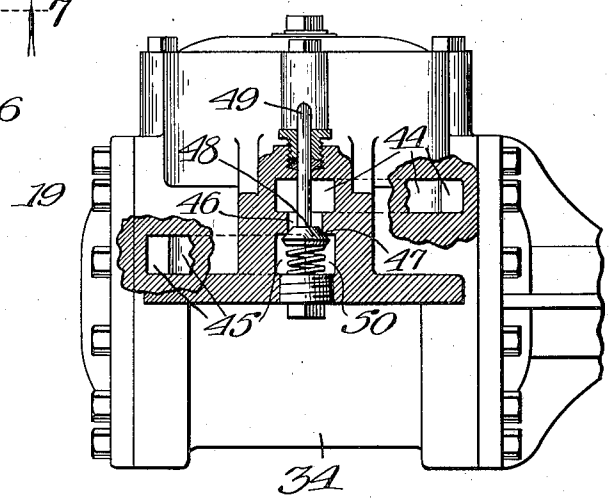
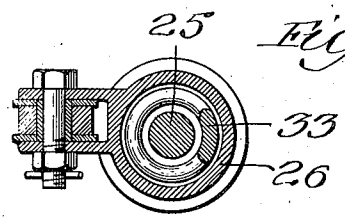


Fig. 7.



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Patented Aug. 13, 1929. 1,724,571

UNITED STATES PATENT OFFICE.

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RAILWAY SWITCH.

Application filed March 26, 1928. Serial No. 264,632.

My invention relates to railway switches of the so-called spring return type and comprising point rails operatively connected with means for throwing the switch; spring means operating, when the switch points are in a certain set position, to yieldingly resist the shifting of the point rails by a train passing through the switch; and means whereby the return of the switch points to such position, under the action of the spring means, is sufficiently retarded to reduce, if not entirely eliminate, slapping of the switch against the track and also to reduce wear of the switch.

In practice these switches are often bodily moved by the switch-throwing mechanism to condition them reversely to the set position above referred to, and while it is possible, as such structures have hitherto been provided, to readily throw the switch out of "set" position, it is impossible to quickly throw the switch back to set position owing to the high resistance offered by the retarding means provided to ensure the slow return movement of the switch points when shifted by a train out of set position and against the resistance of the spring means. This is a disadvantage not only from the standpoint of delaying the progress of a train after passing the switch, but also because of possible danger to the one throwing the switch.

My primary object is to provide improvements in switches of the general type above referred to whereby the operator may freely throw the switch in both directions thereby avoiding the loss of time and possible danger resulting from the operation of this type of switch as hitherto provided; another object is to provide a novel, simple and economical construction for accomplishing the purpose above above stated and one which may be quickly positioned for such operation and quickly reconditioned to render the return-movement retarding means, operative; and other objects as will be manifest from the following description.

Referring to the accompanying drawings:—

Figure 1 is a plan view of the switch-equipped portion of a railway track and in which my invention is incorporated. Figure 2 is an enlarged plan view of a portion of the retarding means for the switch constructed to permit such means to be rendered inactive in the manual operation of throwing the switch. Figure 3 is a view in sectional elevation of the construction shown in Fig. 2, the section being taken at the line 3 on Fig. 2 and viewed in the direction of the arrow. Figure 4, is a section taken at the line 4 on Fig. 2 and viewed in the direction of the arrow. Figure 5 is a section taken at the line 5 on Fig. 4 and viewed in the direction of the arrow. Figure 6 is a plan view, partly sectional, of the spring-equipped portion of the switch structure; and Figure 7, a section taken at the line 7 on Fig. 6 and viewed in the direction of the arrow.

Referring to the particular switch-equipped track layout illustrated and in connection with which I have chosen to disclose my invention, 10 indicates one of the rails of the main track, the other portion thereof comprising the rail 11 and a point rail 12 of a switch device, the rail 11 continuing from the point rail 12 in deflected condition, as represented at 13, to form one of the rails of a switch track.

A point rail switch comprises the point rail 12 and a point rail 14 adjacent the main rail 10. These point rails are connected together by a tie rod 15 and also, adjacent the extremities of the points, by a spring head rod 16 connected at one end, as indicated at 17 to a connecting rod 18 forming a part of switch-retarding mechanism represented generally at 19 and hereinafter described. The relationship of the parts just described is such that the connecting rod 18 moves with the switch points in all movements of the latter.

The spring head rod 16 is operatively connected with switch-throwing mechanism which may be of any desirable construction, that shown being of the type comprising a vertically extending rock shaft 20 provided with a crank 21 pivotally connected at 22 to one end of a link 23 pivotally connected at 24 with a reciprocable rod 25. The spring head rod 16 comprises a cylinder member 26 in which the rod 25 slidingly extends, that end of the rod 25 which extends through the inner end of the cylinder member 26 being surrounded at its projecting

end by a sleeve 27 slidable in the end of the cylinder member 26 and held against outward displacement therein by a flange 28 on this sleeve adapted to engage the inner surface of this end of the cylinder.

The rod 25 beyond the sleeve 27 is equipped with a nut 29 held in place by a lock nut 30, the rod 25 at the opposite end of the cylinder being provided with a flange 31 between which and the cylinder member 26, a spacer sleeve 32 surrounding the rod 25, is positioned.

The spring head rod also comprises a coil spring 33 located in the cylinder member 26 and confined between the flange portion 28 of the sleeve 27 and the opposite end of the cylinder member 26.

It will be understood from the foregoing that the spring 33 tends to shift the spring-head rod in a direction toward the switch stand 20, the various parts above described being so positioned in the track that when the switch stand is in the position shown in Fig. 1, the spring 33 will be compressed, as shown, and yieldingly press the switch point 12 against the side of the rail 13.

The switch is thus positioned to permit unobstructed travel of trains back and forth along the main track and also the entry onto the main track, of trains approaching the switch on the side track, from the right in Fig. 1, the wheels of the train operating to force the switch to open condition against the action of the spring 33 which latter operates to automatically return the switch to the position shown in Fig. 1.

The retarding means 19 which are provided for effecting delayed return movement of the switch under the action of the spring 33, to avoid slapping of the point rail 12 against the side of the rail 13, comprise a cylinder 34 rigidly secured to the railway road bed and containing a piston 35 rigidly connected with the inner end of the rod 18.

The piston 35 in the movement of the switch out of the set position shown in Fig. 1, either by the action of a train in passing through the switch or by the actuation of the switch-throw mechanism to position the switch for the deflection onto the switch track of trains approaching the switch from the left in Fig. 1, moves to the right in Fig. 3.

The retarding means 19 are in the nature of a dash-pot mechanism, the cylinder 35 being preferably filled with a liquid, as for example and preferably, oil. The piston 35 is apertured as for example by providing a plurality of openings 36 therethrough closed by a valve 37 shown as in the form of a disk surrounding, and slidable along, a hub portion 38 of the piston and backed by a coil spring 39 held in place by a nut 40 on the inner end of the rod 18. The valve 37 is positioned at the left-hand side of the piston viewing it in Fig. 3, whereby as the piston 35 moves to the right in this figure the valve 37 opens and permits of relatively free movement of the piston through the oil in the direction stated.

To effect the desired speed of the return movement of the piston, namely, the movement thereof under the action of the spring 33, the cylinder 34 is shown as provided with a by-pass 41 connecting the opposite ends thereof, this by-pass being shown as in the form of a groove located in the inner wall of the cylinder and extending lengthwise thereof, the right-hand end of this groove in Fig. 3 being restricted as represented at 41^a.

The return movement of the piston being dependent upon the displacement of the oil from the left-hand side thereof in Fig. 3 to the right-hand side thereof, and the by-pass referred to constituting the only passage through which the oil may be transferred, the speed of return movement of the piston is dependent upon the effective cross sectional area of the by-pass. The purpose of the restriction 41^a of the by-pass is to cause the piston to move very slowly during the initial portion of its return movement which is an advantage particularly from the standpoint of reducing the wear on the switch.

The retarding mechanism 19 also comprises a chamber 42 in communication at 43 with the interior of the cylinder 34 the purpose of which is to ensure the maintaining of the cylinder 34 completely filled with oil at all times.

As hereinbefore stated, it is oftentimes necessary that the switch be shifted from the normal set position shown in Fig. 1 to a position in which the point rail 14 flatwise engages the main rail 10 for switching a train from the main track to the switch track, this switch-throwing operation and the return of the switch to normal set position being usually performed by one of the crew of the train to be switched. The throwing of the switch structure out of the normal set position, by actuating the switch-throw mechanism, may be quickly effected because the piston of the retarding mechanism moves to the right in Fig. 3 in this movement and thus substantially without retardation.

The return of the switch mechanism to the position shown in Fig. 1 by reversely actuating the switch throw mechanism, after the train has passed through the switch, can be effected relatively slowly only by the operator due to the resistance to displacement of the oil in the cylinder 34 by the movement of the piston 35 to the left in Fig. 3, unless means are provided to eliminate such retardation.

In accordance with my invention I provide for the elimination of such retardation to the end that the operator may quickly return the switch mechanism to the normal set position shown in Fig. 1, this being accomplished in the particular construction illustrated by providing the cylinder with a second by-pass communicating at its opposite ends with the opposite ends of the cylinder and of such effective cross sectional area that the oil at the left-hand side of the piston 35 in Fig. 3 may freely flow therethrough to the opposite side of the piston, this by-pass being provided with means, under the control of the operator, for opening and closing it.

The by-pass referred to comprises passages 44 and 45 which open into the ends, respectively, of the cylinder 34 and communicate with each other at their inner ends through a passage 46 having a valve seat 47 for a check valve 48 which closes in the direction of the pressure produced on the oil in the movement of the piston from the dotted position shown in Fig. 3 to the full line position shown therein.

The valve 48 is shown as provided with a stem 49 which rises through the cylinder 34 to a position in which it is accessible to be depressed by the operator, as for example by his foot, the spring of this check valve and tending to urge it to closed position, being represented at 50.

It will be understood from the foregoing that the operator, preliminary to the actuation of the switch-throwing mechanism for returning the switch to the position shown in Fig. 1, depresses the stem 49 to open the valve 48 to relieve the pressure of the oil in front of the piston 35, and maintains this valve open until such switch-throwing movement has been effected, thereby permitting of the quick return of the switch to the set position shown in Fig. 1. Upon releasing downward pressure on the valve 48 it automatically closes and re-establishes the retarding means for normal functioning in opposition to the spring 33 following the actuation of the switch by a train passing therethrough.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as various changes and alterations may be made in the construction shown and the invention embodied in other forms of structure, without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent, is:

1. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, means retarding the movement of said points in the opposite direction, and means by which said retarding means are rendered inactive in the moving of said points in the last referred-to direction.

2. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism, means retarding the movement of said points in the opposite direction, and means by which said retarding means may be rendered inactive in the moving of said points by said switch-throwing mechanism in the last-referred-to direction.

3. In a railway track, the combination of the main track, a switch cooperating therewith and comprising switch points and spring means yieldingly holding one of said points against one of the rails of the main track, switch-throwing mechanism, means retarding the movement of said points to normal position, and means by which said retarding means may be rendered inactive in the movement of said points by said switch-throwing mechanism to normal position.

4. In a spring switch, the combination of a switch structure comprising switch points and spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively engaging said switch structure for shifting the latter as a unit, means retarding the movement of said switch points toward the position to which they are urged by said spring means, and means by which said retarding means may be rendered inactive in the movement of the switch points in the last-referred-to direction.

5. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, dash-pot mechanism retarding the movement of said points in the opposite direction, and means by which the retarding effect of said dash-pot on said points in the movement of the latter in the last-referred-to direction may be avoided.

6. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism, dash-pot mechanism for retarding the movement of said points in the opposite direction, and means by which the retarding effect of said dash-pot on said points in the movement of said points in the last-referred-to direction may be avoided.

7. In a railway track, the combination of the main track, a switch cooperating therewith and comprising switch points, spring means yieldingly holding one of said points against one of the rails of the main track, switch-throwing mechanism, dash-pot mechanism retarding the movement of said points to normal position, and means by which the

retarding effect of said dash-pot on said points in the movement of said points by said switch-throwing mechanism to normal position may be avoided.

8. In a spring switch, the combination of a switch structure comprising switch points, and spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively engaging said switch structure for shifting the latter as a unit, dash-pot mechanism retarding the movement of said switch points toward the position to which they are urged by said spring means, and means by which the retarding effect of said dash-pot on said points in the movement of said points in the last-referred-to direction may be avoided.

9. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a cylinder member for fluid, a piston member in said cylinder member, said members being relatively movable and one thereof operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder member at opposite sides of said piston member and through which the fluid becomes displaced by the return movement of the movable one of said members, and means operative to permit of relatively free displacement of the fluid by the movement of the movable one of said members in the movement of said points toward the position to which they are urged by said spring means.

10. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a cylinder for fluid, a piston movable in said cylinder and operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of said piston, and means operative to permit of relatively free displacement of the fluid by said piston in the movement of said points toward the position to which they are urged by said spring means.

11. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a stationary cylinder for fluid, a piston movable in said cylinder and operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of said piston, and means operative to permit of relatively free displacement of the fluid by said piston in the movement of said points toward the position to which they are urged by said spring means.

12. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively connected with said points, piston and cylinder mechanism for retarding return movement of said points by said spring comprising a cylinder member for fluid, a piston member in said cylinder member, said members being relatively movable and one thereof operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of the movable one of said members, and means operative to permit of relatively free displacement of the fluid by the movable one of said members in the movement of said points toward the position to which they are urged by said spring means.

13. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively connected with said points, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a cylinder for fluid, a piston movable in said cylinder and operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of said piston, and means operative to permit of relatively free displacement of the fluid by said piston in the movement of said points toward the position to which they are urged by said spring means.

14. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively connected with said points, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a stationary cylinder for fluid, a piston movable in said cylinder and operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of said piston, and means

operative to permit of relatively free displacement of the fluid by said piston in the movement of said points toward the position to which they are urged by said spring means.

15. In a spring switch, the combination of a switch structure comprising switch points and spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively connected with said switch structure for moving the latter as a unit, piston and cylinder mechanism for retarding return movement of said spring means comprising a cylinder member for fluid, a piston member in said cylinder member, said members being relatively movable and one thereof operatively connected with said points, said mechanism containing a passage for the fluid communicating with said cylinder at opposite sides of said piston and through which the fluid becomes displaced by the return movement of the movable one of said members, and means operative to permit relativly free displacement of the fluid by the movable one of said members in the movement of said switch structure toward the position to which said points are urged by said spring means.

16. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a cylinder member for fluid, a piston member in said cylinder, said members being relatively movable and one thereof operatively connected with said points, said cylinder containing a passage for the fluid communicating with the opposite ends thereof at opposite sides of said piston and through which the fluid becomes displaced by the return movement of the movable one of said members, and means operative to permit of relatively free displacement of the fluid by the movable one of said members in the movement of said points toward the position to which they are urged by said spring means.

17. In a spring switch, the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, piston and cylinder mechanism for retarding return movement of said points by said spring means comprising a cylinder member for fluid, a piston member in said cylinder, said members being relatively movable and one thereof operatively connected with said points, said cylinder containing a passage for the fluid communicating with the opposite ends thereof at opposite sides of said piston and through which the fluid becomes displaced by the return movement of the movable one of said members, said cylinder containing a second passage in communication with the ends thereof and of greater effective cross sectional area than said first-named passage, and closure means for said second-named passage adapted to be moved to open position for the purpose set forth.

18. In a spring switch the combination of its switch points, spring means yieldingly resisting movement of said points in one direction, means retarding movement of said points in the opposite direction, and means by which said retarding means may be rendered inactive in the moving of said points in the last-referred-to direction comprising a valve which is in closed position during the operation of said retarding means.

19. In a spring switch, the combination of its switchpoints, spring means yieldingly resisting movement of the points in one direction, means retarding the movement of said points in the opposite direction, switch-throwing means, and means whereby the points, after movement by said switch-throwing means out of normal set position, may be returned by said switch-throwing means to normal position without retard by said retarding means.

20. In a spring switch, the combination of a switch structure comprising switch points and spring means yieldingly resisting movement of said points in one direction, switch-throwing mechanism operatively engaging said switch structure for shifting the latter as a unit, means retarding the movement of said switch points toward the position to which they are urged by said spring means, and means whereby the switch structure, after movement by said switch-throwing means out of normal set position, may be returned by said switch-throwing means to normal position without retard by said retarding means.

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