A. CORTS.

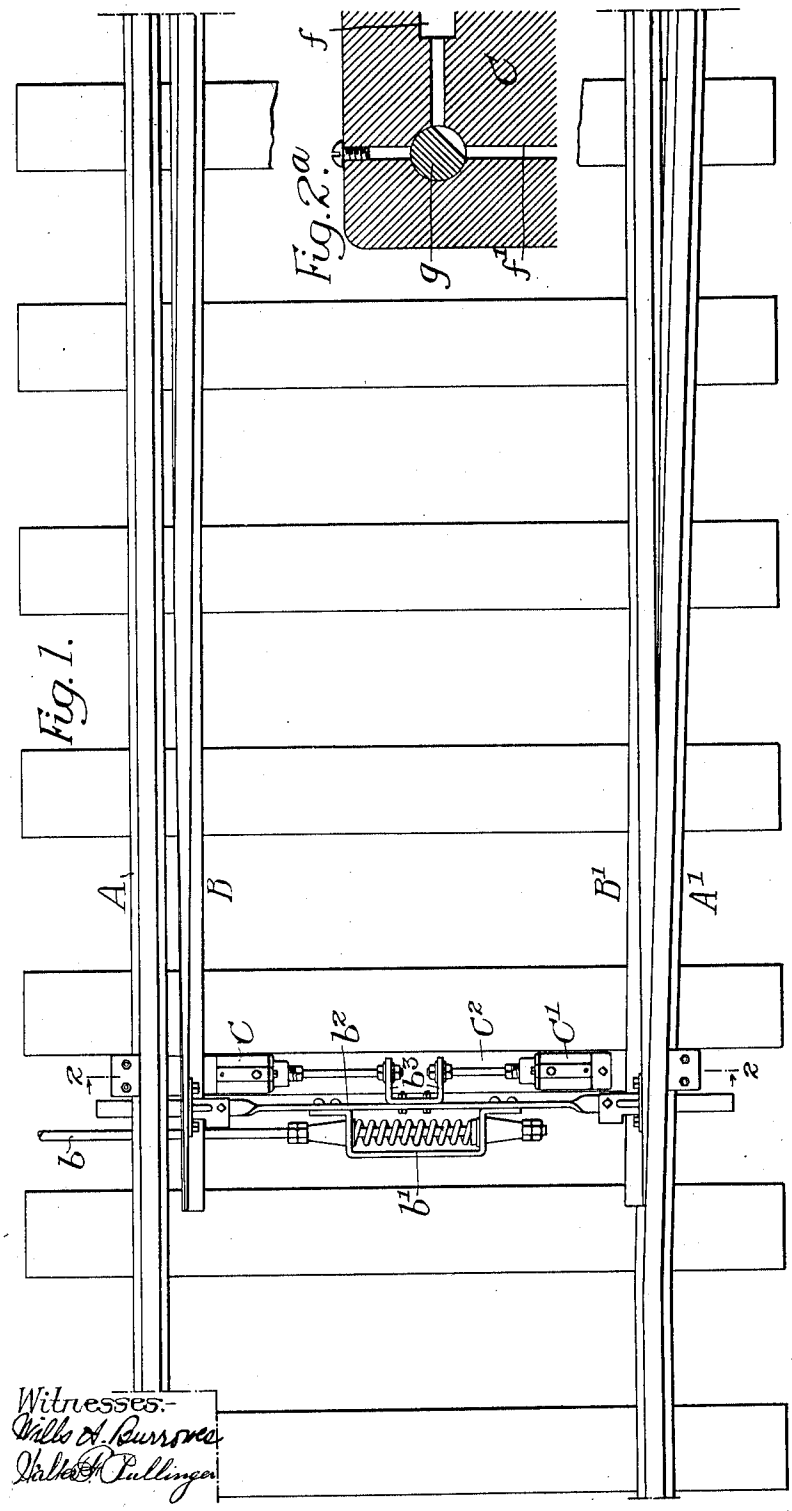
MOVEMENT RETARDING DEVICE FOR RAILS.

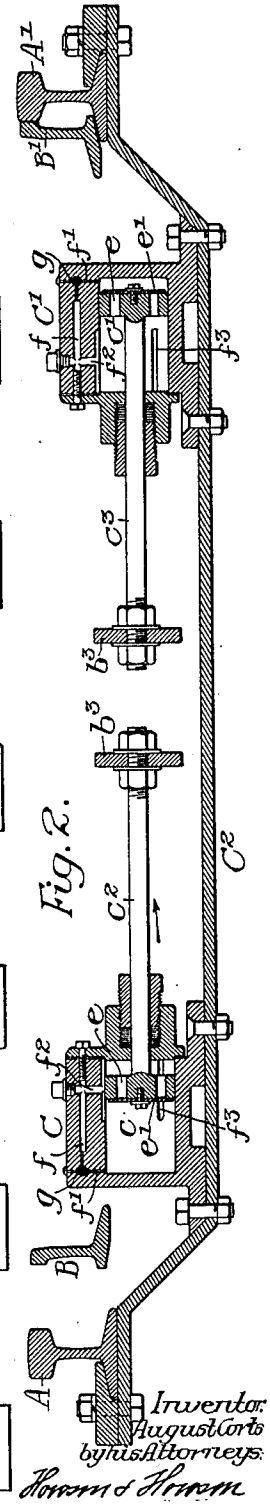
APPLICATION FILED NOV. 23, 1908.

1,020,802.

Patented Mar. 19, 1912.

3 SHEETS—SHEET 1.





Witnesses:-
Wills A. Burrows
Walter A. Bullinger

Inventor:
August Corts
by his Attorneys:
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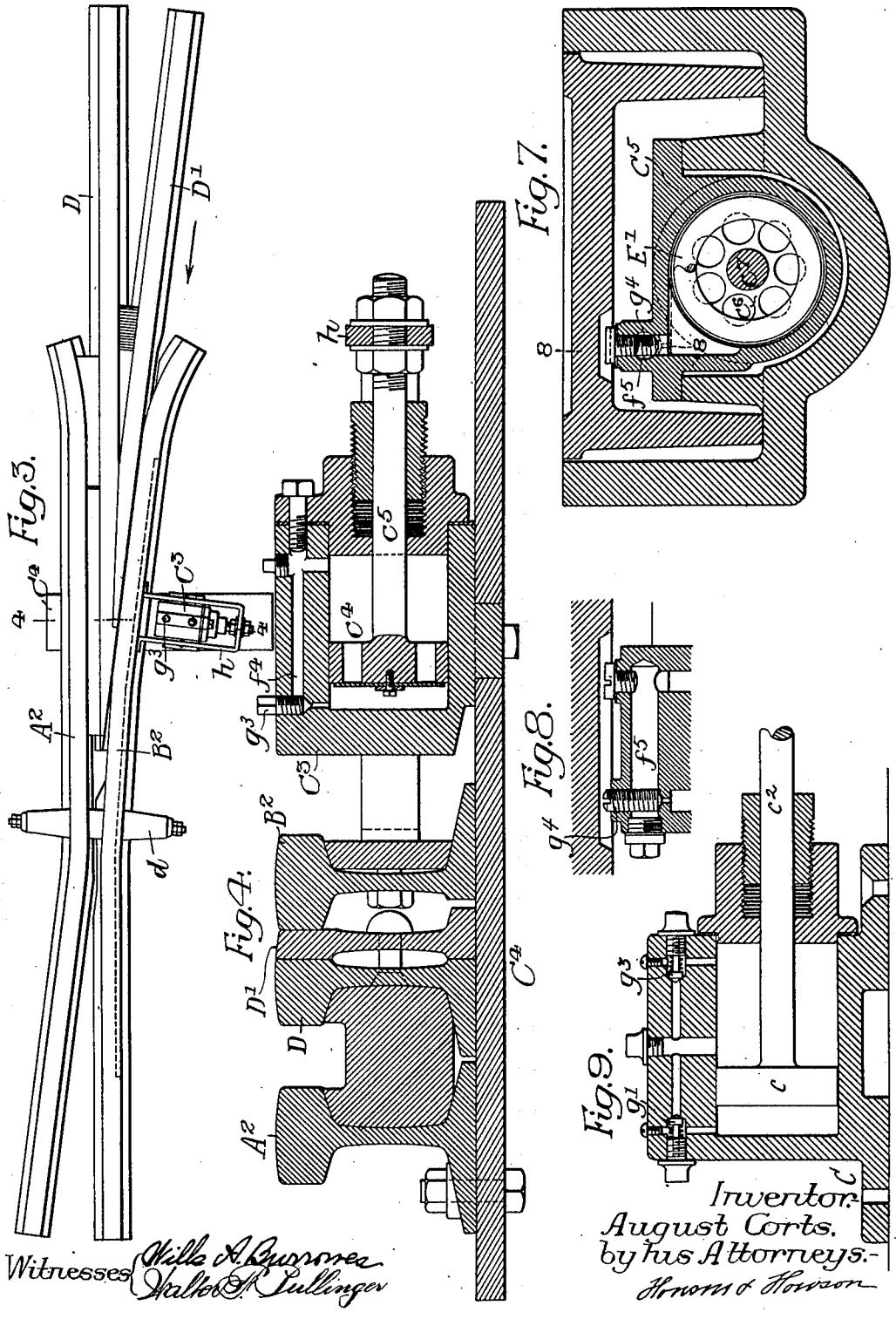

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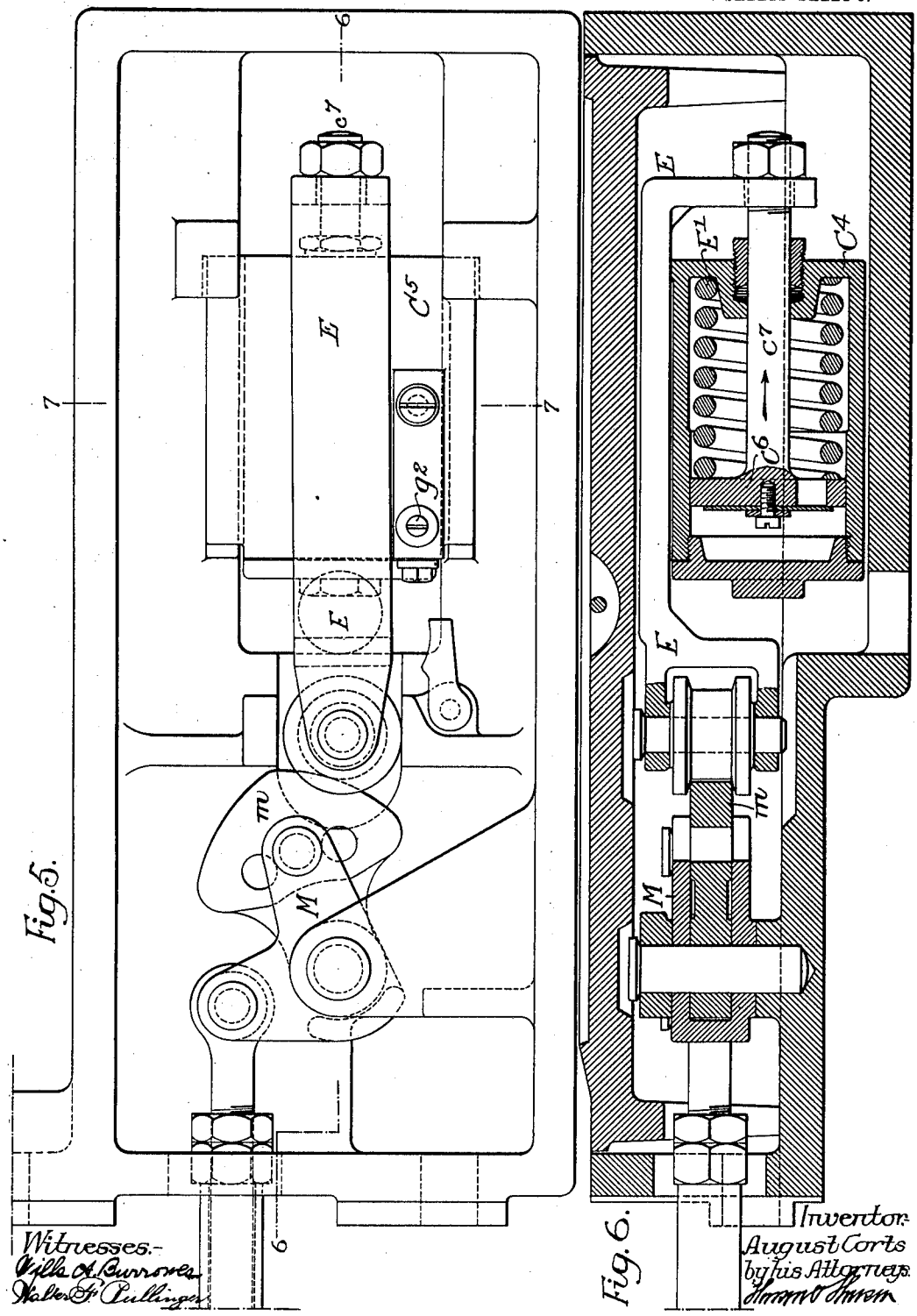

Fig. 5.

Fig. 6.

Witnesses.-
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UNITED STATES PATENT OFFICE.

AUGUST CORTS, OF WYNCOTE, PENNSYLVANIA, ASSIGNOR TO WILLIAM WHARTON, JR., & COMPANY, INCORPORATED, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MOVEMENT-RETARDING DEVICE FOR RAILS.

1,020,802. Specification of Letters Patent. **Patented Mar. 19, 1912.**

Application filed November 23, 1908. Serial No. 464,154.

To all whom it may concern:

Be it known that I, AUGUST CORTS, a citizen of the United States, residing in Wyncote, Montgomery county, Pennsylvania, have invented certain Improvements in Movement-Retarding Devices for Rails, of which the following is a specification.

My invention is adapted for use in connection with the movable rails of track structures such as switch rails, movable guard rails of frogs, etc., and the object of my invention is to provide means for retarding the return of the rail to its normal position after being released from the control of the wheel which has moved the rail from its normal position.

In the accompanying drawings:—Figure 1, is a plan view of a point switch illustrating my invention; Fig. 2, is a transverse section on the line 2—2, Fig. 1; Fig. 2^a, is an enlarged view of part of Fig. 2; Fig. 3, is a plan view of a frog structure illustrating my invention; Fig. 4, is an enlarged transverse sectional view on the line 4—4, Fig. 3; Fig. 5, is a plan view of a pivoted tongue switch device to which my invention is applied; Fig. 6, is a longitudinal sectional view on the line 6—6, Fig. 5; Fig. 7, is a transverse sectional view on the line 7—7, Fig. 5; Fig. 8, is a sectional view on the line 8—8, Fig. 7; and Fig. 9, is a sectional view of a modification of the cylinders illustrated in Fig. 2.

Referring in the first instance to Figs. 1 and 2, A, A′ are fixed rails of the track; B, B′ are the movable switch rails, and in the drawings the rail B′ is located against the fixed rail A′. b is the operating rod, b' is the spring box, and b^2 is a tie rod coupling the two switch points B, B′ together, and the spring box b' is attached to this tie rod so that on moving the operating rod b the movable rails can be moved so that the rail B will be in contact with the rail A, or the rail B′ in contact with the rail A′. This is the ordinary type of switch known as the split switch.

If a car is traveling on the rails A′ and B and coming from the butt end of the switch, the flanges of the wheels will push the switch rail B′ away from the rail A′ and the spring in the spring box b' will immediately return the switch rails to their normal position, causing a chatter and shock as each wheel passes the switch. By my invention I am enabled to prevent this chatter by retarding the return movement of the switch rails to their normal position, as the retarding means will prevent the return of the switch rails until the last wheel has passed over the switch, then it will gradually return the rail to its normal position.

C, C′ are two cylinders mounted on a plate C^2 clamped to the fixed rails A, A′ in the present instance. Both of the cylinders may be mounted directly on one of the cross ties if desired. c, c' are pistons mounted in their respective cylinders C, C′, and attached to or forming part of the pistons are rods c^2 and c^3 coupled to a head b^3 formed by bending an iron into U-form. This head is attached in the present instance to the tie rod b^2 coupling the two switch rails B, B′. The piston rods can be adjusted on the head by means of the nuts, as illustrated in Fig. 2.

In each piston is one or more ports e and on the rear of each piston is secured a flexible valve e' held to the piston by a screw or other means, so that when the piston c is moved in the direction of the arrow, Fig. 2, the liquid in front of it will pass through the port e and opening the valve e' will flow to the rear side of said piston. When the piston is moved in the opposite direction the valve e' will be closed and the liquid flows partly through a by-pass f connected to the rear end of the cylinder by a reduced passage f' and connected at a point near the forward end of the cylinder by an enlarged passage f^2.

g is a valve cut as clearly shown in Fig. 2^a, and this valve can be set so as to reduce the passage leading from one end of the cylinder to the other to any degree desired.

f^3, f^3 are longitudinal grooves in the cylinder extending from the forward end of each cylinder to a point about the middle thereof to allow the fluid to freely flow around the piston, so that the piston as it is traveling in this forward part of the cylinder is practically out of action.

The above described device is particularly adapted to a split switch as illustrated in Fig. 1, where the switch points are either set against one rail or the other.

Assuming that a train enters the switch from the rear and has its wheels on the rails B and A′, it naturally pushes the rail B toward the rail A, finally forcing these rails together as its wheels pass from one

to the other of them. Such movement is not opposed by the piston c' of the cylinder C′ for its valve e' opens to allow its free movement from the rear to the front of said cylinder. The first part of the movement of the piston c from the front to the rear of the cylinder C is likewise unopposed, since the liquid therein flows from in front of said piston through the grooves f^3. While the latter part of the piston movement is retarded by the throttling action of the passages f and f' and the valve g, the wheels of the approaching train move the rails at a substantially uniform rate, so that by the time the wheels are ready to pass from the rail B to the rail A, these two members are actually or practically in contact in spite of the retardation; it being understood that the valve g is set to attain this end. Even if the train be moving through the switch at its maximum speed, this retardation is not sufficient to prevent the above action. On the return movement of the switch points, after the train has passed, under the action of the spring b', the piston c is obviously able to move freely in its cylinder without holding back and the piston c' also moves freely during the first part of its stroke from the front to the rear in the cylinder C′. The latter half of its movement, however, is retarded by the throttling action of the passages f and f' and the valve g of said cylinder C′; it being possible to set said valve so that the switch points may be caused to return at any desired speed to their normal positions. In any case their speed of movement is reduced to such a point that the noise and hammering action otherwise occurring is effectually prevented.

If the switch is set so that the rail B is against the rail A then the piston in the cylinder C is in action and the piston in the cylinder C′ is out of action so far as preventing chattering is concerned.

In Fig. 9, I have shown a modification in which the piston is solid; there being three ports in the cylinder connected to the by-pass and spring valves g' and g^3 between the ends of the cylinder and the central port respectively, so that when the piston is located at either end of the cylinder it will move quickly toward the middle of the cylinder and slowly in the opposite direction it being understood that the fit of the piston in the cylinder is such as to allow slow or retarded movement.

In Figs. 3 and 4, I have shown my invention as applied to a frog having a spring guard rail. A^2 is a fixed rail; B^2 is the movable rail of the frog; and D, D′ are the rails of the fixed point. If a wheel is passing through the frog in the direction of the arrow, Fig. 3, it will move the rail B^2 away from the rail D′, but as soon as the wheel has passed the frog the spring in the spring box d will cause the rail to return to its normal position. C^3 is a cylinder mounted on a plate C^4 secured to fixed rails of the frog, and in this cylinder is a piston c^4 attached to and forming part of a rod c^5 extending rearwardly through a stuffing box and attached to the U-shaped bar h secured to the movable rail B^2. The by-pass f^4 is arranged in the cylinder C^3 connecting with both ends of the cylinder, and the plug valve g^3 is so situated as to regulate the flow of liquid through the by-pass, so that when the movable rail B^2 is pushed away from the fixed rail the liquid will flow through the ports in the piston c^4 and past the valve carried by the piston, but on the return, the liquid will flow through the by-pass from one end of the cylinder to the other and past the valve g', and the quickness of the return will depend upon the position of the valve g'.

In Figs. 5, 6, 7 and 8, I have shown a device for returning the pivoted point switch to its normal position. The details of this particular construction of mechanism are set forth and claimed in an application for patent filed by Arthur B. Davenport, Jr., and Chauncey Reigart, on July 20th, 1908, under Serial No. 444,450, and I lay no claim to the particular operating mechanism, but in this instance the plunger E which connects the mechanism and which is pressed forward by a coiled spring E′ is under the control of fluid within a cylinder C^4, so that the movement in one direction will be rapid, but the movement in the other direction will be retarded.

Within the cylinder C^4 is a piston c^6 having a port therein and connected to a rod c^7 which passes through a stuffing box in the head of the cylinder and is attached to an arm of the plunger E. Between the rear end of the cylinder and the piston is a spring E′, alluded to above. In the piston is a port closed by a yielding valve, so that when the piston is moved in the direction of the arrow and the spring is compressed by the action of the cam lever M on the roller carried by the plunger E, the liquid in the cylinder will freely flow through the port in the piston and past the valve, and on the return movement the fluid must pass through the by-pass f^5, and the area of the passage is regulated by the valve g^4, the by-pass forming communication between one end of the cylinder and the port at about the center of the cylinder, as in no case will the piston travel more than one-half the length of the cylinder.

The control of the position of the switch point is regulated by the movable cam plate m pivoted to the lever M, as fully disclosed in the application above referred to. Thus it will be seen that in every case the mov-

able rail can be freely forced away from its normal position, but its return will be retarded by the slow flowing liquid in the cylinder.

In a patent granted to Victor Angerer, No. 851,612, dated April 23rd, 1907, is claimed broadly, a pivoted switch tongue, a spring tending to hold the switch tongue against the rail, and means for retarding the movement of the switch tongue toward the rail, and, therefore, I lay no claim to this particular combination.

I claim:—

1. The combination in a switch structure of a movable rail; a spring placed to allow the rail to move and capable of returning it to its normal position; a cylinder containing liquid; a piston therein connected to the rail, there being ports so arranged that the piston is capable of moving freely from either end of the cylinder to substantially the middle thereof, is capable of moving freely in one direction from the middle of the cylinder toward one end thereof, and is retarded when moved in the opposite direction from substantially the middle of the cylinder toward the other end thereof.

2. The combination in a track structure, of a movable rail, a spring for returning the rail to its normal position, a cylinder, a piston in the cylinder, a rod connected to the piston and extending through the cylinder, with means for connecting the piston with the movable rail, a by-pass in the casing of the cylinder, a valve in the by-pass, a port in the piston, a valve adapted to close said port, so that on movement in one direction the liquid will flow through the port in the piston, and on movement in the opposite direction it will flow through the by-pass, retarding the return movement of the rail.

3. The combination in a switch of two movable switch rails; means for shifting said rails; a spring for normally holding the rails in a predetermined position; two cylinders containing liquid; a piston having a port in each cylinder; piston rods respectively connecting the movable rails to the pistons; valves for the ports of the pistons; there being a by-pass extending from the rear end of each cylinder to a point near the opposite end thereof; and valves for said by-passes; said parts being arranged so that one cylinder and its associated parts retards movement of the switch points from their middle positions in one direction, and the other cylinder and its associated parts retards movement of said switch points from the middle position in the other direction.

4. The combination in a switch structure, of two fixed rails, two movable rails, a spring for returning the movable rails to their normal position against either one of the fixed rails, two fixed cylinders, a piston in each cylinder, a piston rod for each piston, said piston rods being connected to the movable switch rails, each cylinder having a by-pass and a valve in the by-pass, and each cylinder having longitudinal channels at its forward end, the pistons having ports therein and valves closing the ports, the ports being so arranged that the liquid in both cylinders will flow freely when the pistons are moved in one direction and when the pistons are moved in the opposite direction the liquid will be wire drawn in one cylinder and will freely flow in the other cylinder.

5. The combination in a switch structure of a movable rail; a spring placed to allow the rail to move from and capable of returning it to its normal position; a cylinder containing liquid; a piston therein connected to the rail; there being ports to permit passage of the liquid from one part of the cylinder to the other; and flow controlling means for the ports arranged to permit the piston to move freely from either end of the cylinder to substantially the middle thereof and retard said piston when it is moved in one direction from the middle of the cylinder toward one end thereof.

6. The combination in a switch of two movable switch rails; means for shifting said rails; a spring for normally holding the movable rails in a definite position; two cylinders containing liquid; a piston for each cylinder; means connecting the pistons with the rails; there being ports connecting the ends of the cylinder; and open channels in the walls of each cylinder extending from one end to the middle thereof; with a valve in the ports of each cylinder placed to retard movement of the piston from the middle of the cylinder toward one end thereof.

7. The combination in a switch of two movable switch rails; means for shifting the rails; a spring connected to the rails so as to hold them in a definite position; two cylinders; a piston for each cylinder; means for connecting the pistons to the rails; each piston having a valve controlled passage; there being ports connecting the ends of each cylinder and an open channel formed in the walls of each cylinder; with a valve in each port for controlling the flow of liquid therethrough.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

AUGUST CORTS.

Witnesses:

ERNST CORTS,

FRANK S. GENTRY.