

May 9, 1933.

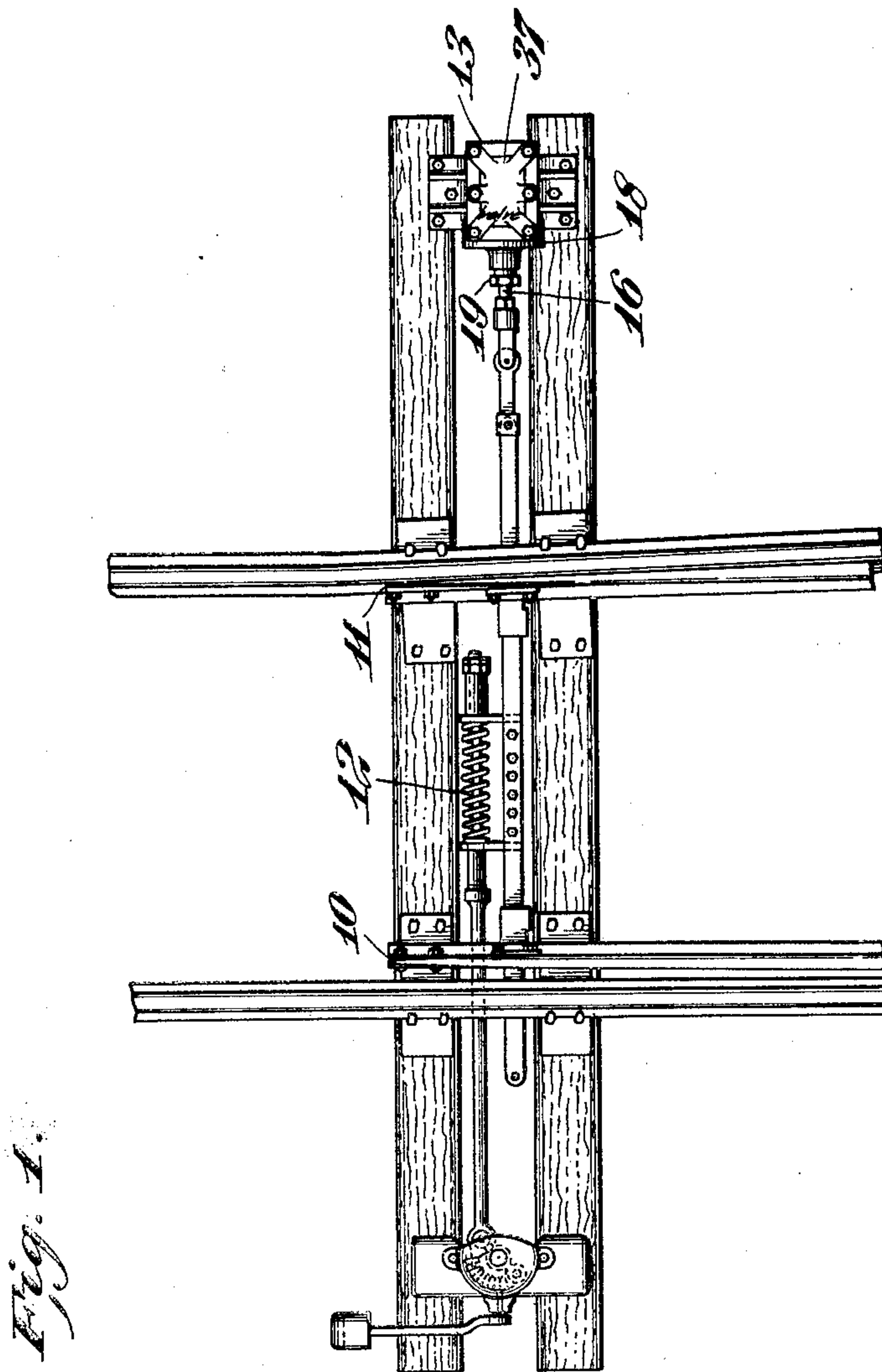
C. A. ALDEN

1,907,699

BUFFER

Filed Aug. 3, 1929

2 Sheets-Sheet 1



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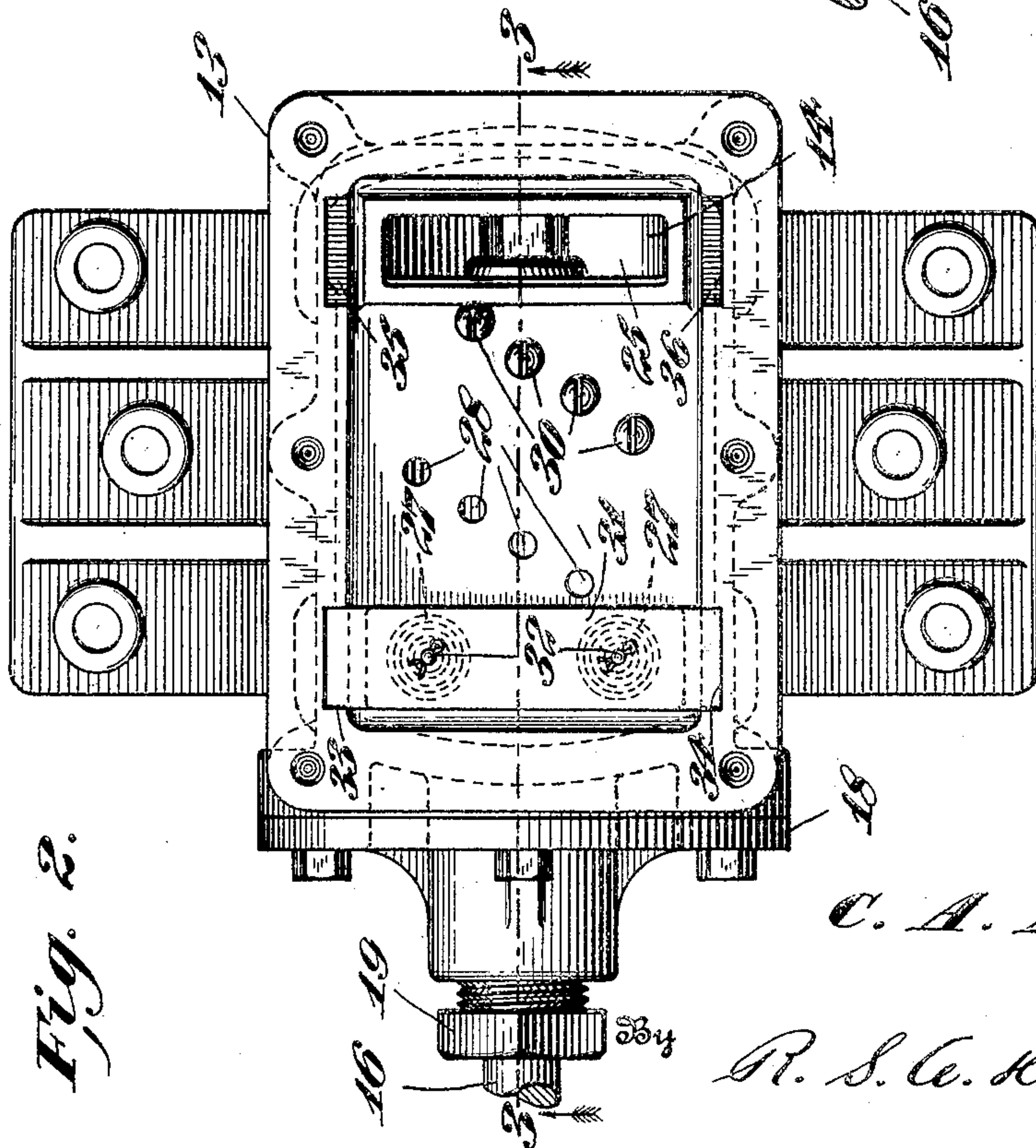
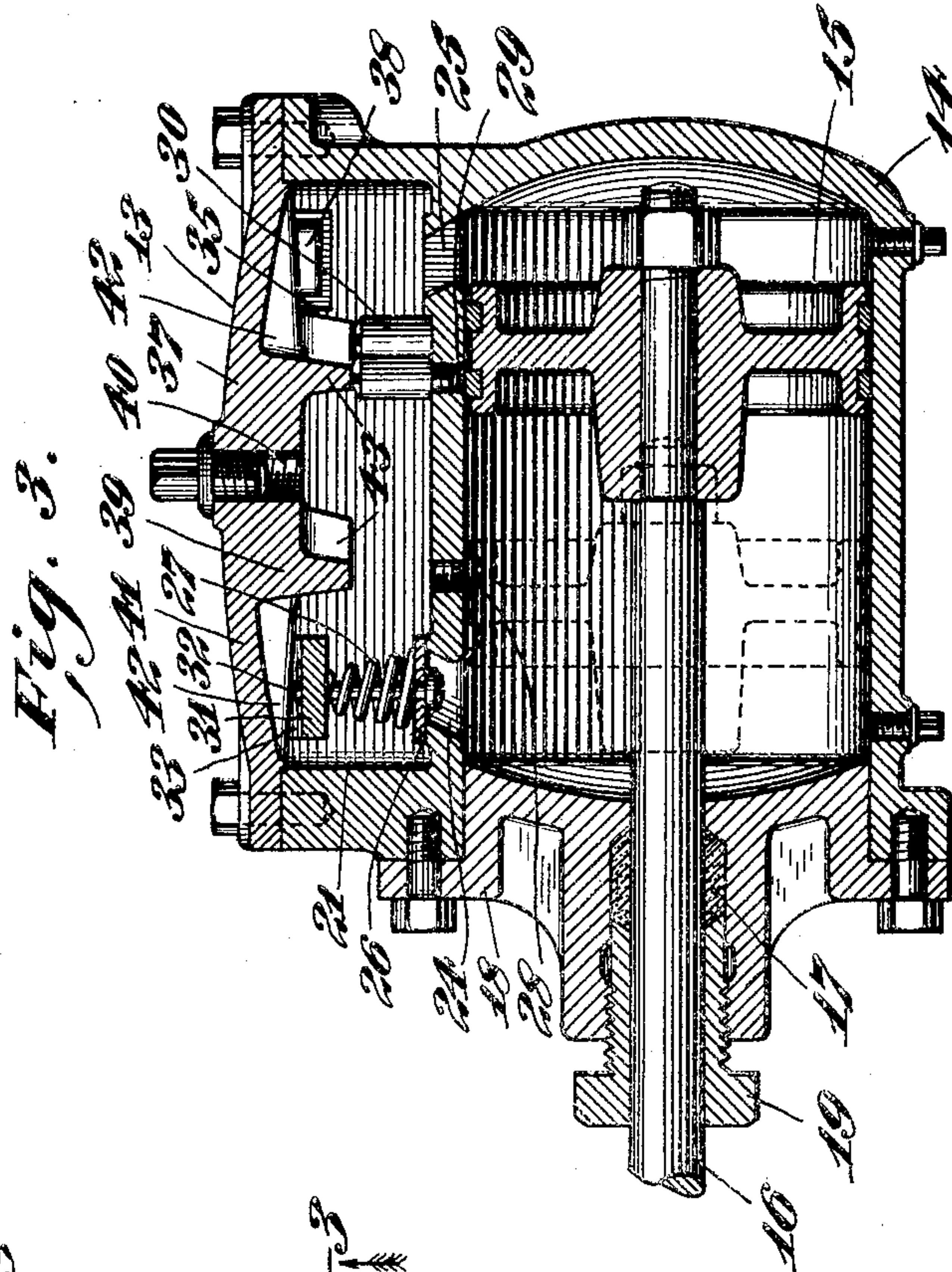
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UNITED STATES PATENT OFFICE

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BUFFER

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My invention relates to buffers and particularly to buffers for use with spring operated switches.

In connection with switches for use in trackage where a single track leads into a double track it is necessary to provide some sort of a spring switch which will enable trains going in one direction to always take the proper track and which will permit trains going in the opposite direction to pass through without permanently changing the position of the switch, so that as soon as the train has passed through, the switch will automatically return to its normally closed position to take care of a train going in the first-mentioned direction.

Heretofore it has been the practice to provide ordinary spring switches for opposing the opening of the switch points from their normally closed position and for automatically closing the points when they are opened by the passage of a train therethrough onto the single track.

The principal objection to this type of switch is that immediately after each set of wheels has passed beyond the switch points, the switch points are thrown back to their normally closed position and have to be operated again by the next set of wheels as they pass through the switch. This causes considerable wear and tear on the switch points each time a long train passes through the switch.

It is therefore the object of my invention to provide a buffer for the spring switch which will operate to prevent the closing of the switch points during the passage of a train therethrough and which will permit the switch points to close as rapidly as desired without shock as soon as the train has passed beyond the switch.

Another object of my invention is to provide means in the cylinder casing of the buffer for controlling the transfer of the operating fluid from one side of the piston to the

other side thereof during the operation of the piston.

Another object of my invention is to provide a buffer with adjustable means for regulating the speed at which the piston thereof returns to its normal position.

Another object of my invention is to provide a buffer having its parts so arranged that the return stroke of the piston is controlled by the suction of fluid into the cylinder, thus eliminating heavy pressure against the joints and thereby obviating the possibility of leakage of the fluid used as a filler.

Another object of this invention is to provide a buffer which is adapted to be used for either a left-hand or a right-hand switch by simply removing the cover and transferring the valve assembly from one end to the other end of the buffer.

Another object of my invention is to provide a cover for the buffer which is of such construction that the cover will always indicate the location of the valve, whether the buffer is assembled for left-hand or right-hand operation of a switch.

The novel features of my invention will be more fully understood from the following description and claims taken with the drawings in which:

Fig. 1 is a plan view of my improved buffer as applied to a spring railroad switch.

Fig. 2 is a top view of my buffer with the cover removed.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Referring to the drawings, 10 and 11 designate the points of a spring switch. These points are yieldingly held in the position shown in Fig. 1 by the spring 12, thus allowing a train moving downwardly from the single track to pass onto the track to its right.

The compression of the spring 12 permits the switch points 10 and 11 to be moved to the left by the wheels of a car going in the

opposite direction, that is, onto the single track, thus allowing the car to pass through the switch. Upon the passage of the car through the switch the spring 12 operates the switch points to their normally closed position, so that a car moving in the downward direction will always take the track to its right.

In order to retard the closing of the switch points each time a set of wheels passes through the switch, and in order to permit the closing of the points without shock after the train has passed therethrough, I provide a buffer 13 which permits the switch to open freely but which retards the closing of the switch sufficiently to permit a train to pass therethrough before the switch is allowed to close, and which is capable of being adjusted so as to allow the switch to close at the desired speed as soon as the train passes therethrough, thus obviating the wear and tear on the switch points which occur with the ordinary spring switch.

The buffer 13 comprises a cylinder 14 having therein a piston 15 which is connected to one end of the piston rod 16, the other end of the rod 16 being operatively connected through suitable connections to the switch points 10 and 11. Suitable packing 17 is provided around the rod 16 where it passes through the cylinder head 18, the packing being held in place by the adjustable nut 19.

The cylinder 14 is normally filled with oil, and arranged above it is an oil reservoir 21 having passages 24 and 25 provided in its bottom which communicate with the cylinder 14. One of these passages is controlled by the valve 26 which is yieldingly held in its closed position by the springs 27 and which is capable of being opened by the pressure of the fluid during the travel of the piston 15 toward the end of the cylinder containing the valve 26.

The bottom of the oil reservoir 21 also contains a plurality of threaded ports 28 and 29 which communicate with the cylinder 14 and which are capable of receiving screw plugs 30. These ports are so arranged that after the beginning of the travel of the piston during its return stroke, oil will be drawn down by suction from the reservoir 21 first in a small quantity and then in a gradually increasing quantity until the piston passes the opened ports so that in operation the speed of the piston will be slow at first and then gradually increased until it has passed a certain point, and then at practically uniform speed until the switch points are in their normal position. The length of time the switch points are held open and the speed of the return stroke of the piston are regulated to the required degree by the manipulation of the plugs 30 after the installation of the buffer.

The valve 26 and the springs 27 are assem-

bled with the plate 31 by means of the screws 32. Recesses 33 and 34 are provided in one end of the upper portion of the buffer casting to receive the plate 31, when the valves are in the position shown in the drawings and recesses 35 and 36 are provided in the other end to receive the plate 31 when the valve is transferred to the other end of the buffer. The plate 31 is held in position by the cover 37 when the buffer is in its assembled condition. By this construction all that is necessary, in order to change the buffer to adapt it for operation in the opposite direction from that shown in the drawings, is to remove the cover 37 and lift the plate 31, containing the valve assembly, out of the recesses 33 and 34 and place it in recesses 35 and 36 thus placing the valve 26 in position to control the opening 25 instead of the opening 24.

The cover 37 is provided with a projection or lug 38 which is capable of entering the recesses 33 and 34 or 35 and 36 depending on the location of the plate 31 containing the valve assembly. As this lug cannot enter the recesses containing the plate 31, the opposite end of the cover must always be placed over the valve and, in order to determine the location of the valve after the cover has been placed on the buffer, the end of the cover which is over the valve is preferably marked with the word "valve". It will therefore be seen that if the plate 31 containing the valve assembly is transferred to the recesses 35 and 36 it will be necessary to reverse the cover, so that the lug 38 will enter the recesses 33 and 34. The boss 39 on the under side of the cover 37 surrounding the hole 40 extends below the portion 41 so that air will be trapped in the spaces 42 during the filling of the buffer with oil so that it will be impossible to completely fill the buffer with oil.

This feature is important so as to provide sufficient space to accommodate the piston rod 16 when it is moved to its innermost position should the fluid be placed in the buffer with the piston rod in its outermost position and therefore prevents the possibility of bursting the cylinder which otherwise might occur if it were possible to completely fill the cylinder 14 and reservoir 21 with oil when the piston rod 16 is in its outermost position.

The under side of the cover is also provided with ribs 43 which engage the top of the plugs 30 and therefore prevent these plugs from working out of the ports 28 and 29.

When the buffer is to be installed for operating a switch which is normally in the position indicated in the drawings, the buffer is assembled with the valve 26 and plugs 30 in the position indicated in the drawings. The piston rod is then connected through suitable connections to the switch points 10 and 11

and the buffer is mounted on the ties as indicated so that when the switch points 10 and 11 are fully thrown to their open position, the piston 15 will be moved to the position indicated in dotted lines in Fig. 3. After the buffer has been mounted on the ties, it is nearly filled with a suitable oil, but leaving the heads of the plugs exposed, and the cover is bolted lightly in position and a train is passed through the switch. If the buffer does not hold the switch open between wheels the plug 30 in the uppermost port 29 is transferred to the uppermost port 28, as viewed in Fig. 2 of the drawings. If the buffer still does not hold the switch open between wheels the plug is transferred from the next port 29, from the top, to the port 28 next to the other plug. If necessary all the plugs 30 may be transferred from the holes 29 to the holes 28 in order to obtain the desired adjustment.

After the desired action of the switch has been attained, the cover should be bolted down securely and the buffer should be filled with oil.

In operation, with the switch points 10 and 11 in their normally closed position and the piston in the buffer as indicated in full lines in the drawings, a train passing through the switch onto the single track will operate the points to compress the spring 12 and at the same time to move the piston 15 to the position indicated in dotted lines in Fig. 3. The movement of the piston 15 to this position will cause the valve 26 to be opened and the oil in one end of the cylinder to be transferred freely around the piston to the other end of the cylinder through the medium of the reservoir. As the return of the oil around the piston is very small during the initial movement of the piston in its return stroke, due to the fact that the valve 26 is closed and the ports 28 are either covered by the piston 15 or are to the right thereof, as viewed in the drawings, the switch points are not allowed to close during the time required for the passing of each set of wheels of a train therethrough, as any tendency on the part of the switch to close would not be rapid enough to allow the switch to close before it is engaged by the next set of wheels. As soon as the train has passed through the switch, the spring will cause the piston to uncover the ports 28 in succession and therefore after the initial movement of the piston the suction of the oil through the ports 28 will be increased until the piston passes this group of ports and thereafter at uniform speed, thus returning the switch points 10 and 11 to their normally closed position at a speed for which the buffer has been previously adjusted.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit

thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A fluid buffer comprising, a cylinder, an imperforate piston adapted to reciprocate within said cylinder, a reservoir adjacent said cylinder, said reservoir having an unrestricted passage in one end and a valve controlled passage in the other end and a plurality of ports adjacent each end thereof adapted to communicate the reservoir with the cylinder and a valve for controlling the valve controlled passage.

2. A fluid buffer comprising a cylinder, a piston adapted to reciprocate within said cylinder, a reservoir adjacent said cylinder and having passages and a plurality of ports adjacent each end thereof communicating the reservoir with the cylinder, a valve for controlling one of said passages and plugs for a plurality of said ports.

3. A fluid buffer comprising a cylinder, a piston adapted to reciprocate within said cylinder, a reservoir adjacent said cylinder having a passage and a plurality of ports adjacent each end thereof for communicating the reservoir with the cylinder, a valve seat adjacent each of said passages, a valve assembly operatively mounted within one of said seats and adapted to be transferable as a unit to the other seat to provide a buffer effective in an opposite direction and transferable, plugs for a plurality of said ports.

4. A buffer for a spring switch comprising a cylinder, an imperforate piston in said cylinder, means for connecting said piston to the spring switch, said piston being capable of moving freely upon the operation of the switch from its normal position, a reservoir adjacent the cylinder, a cover for said reservoir, fluid in said reservoir and said cylinder and adjustable means between said cylinder and said reservoir adapted to regulate the operative speed of the piston during the return movement of the switch to normal position said means being locked against adjustment while the cover is in its assembled position.

5. A buffer comprising a cylinder, a reciprocable piston within said cylinder, a reservoir adjacent said cylinder and having passages communicating therewith, a valve assembly capable of being transferred to selectively control either of said passages, a cover for said buffer and means associated therewith for indicating the location of said valve assembly when the buffer is in its assembled condition.

6. A fluid buffer comprising a cylinder, a piston, a reservoir having passages therein communicating with the cylinder, a valve

assembly adapted to control one of said passages when the buffer is assembled for right-hand operation and adapted to control the other passages when the buffer is assembled
5 for left-hand operation, a cover for said buffer, and means associated with said cover adapted to indicate the location of the valve assembly.

7. A fluid buffer, comprising a cylinder,
10 a reciprocable piston within said cylinder, a reservoir having passages and a plurality of ports communicating with each end of the cylinder and adjustable means within said reservoir adapted to close certain of said ports
15 to govern the transfer of the fluid between the cylinder and the reservoir and a valve assembly capable of being transferred to selectively control either of said passages.

8. A fluid buffer, comprising a cylinder, a
20 piston capable of reciprocating within said cylinder, a reservoir adjacent said cylinder, said reservoir having a plurality of passages and ports communicating with said cylinder to provide means for by-passing fluid from
25 one end of the piston to the other end thereof, fluid within said cylinder and said reservoir, a valve assembly capable of being transferred to selectively control either of said passages, said valve adapted to open upon the move-
30 ment of the piston in one direction and to close upon the movement of the piston in the opposite direction and adjustable means wholly within said reservoir adapted to regulate the flow of fluid between the reservoir
35 and the cylinder when the aforementioned valve is in its closed position.

9. A fluid buffer comprising a cylinder, a piston reciprocally mounted within said cylinder, a reservoir adjacent said cylinder
40 and having passages communicating with each end of said cylinder, valve seats adjacent said passages and a valve assembly selectively positioned in one of said seats for controlling one of said passages.

10. A fluid buffer comprising a cylinder, a reservoir adjacent said cylinder and having a passage communicating with each end thereof, a valve for selectively controlling one of
45 said passages, and a piston reciprocally mounted within the cylinder adapted to move freely in one direction when the valve is controlling one passage and to move freely in the opposite direction when the valve is controlling the other passage, thereby adapting the
50 buffer to a right hand or a left hand buffer by transferring the valve.
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In testimony whereof I hereunto affix my signature.

CHARLES A. ALDEN.