

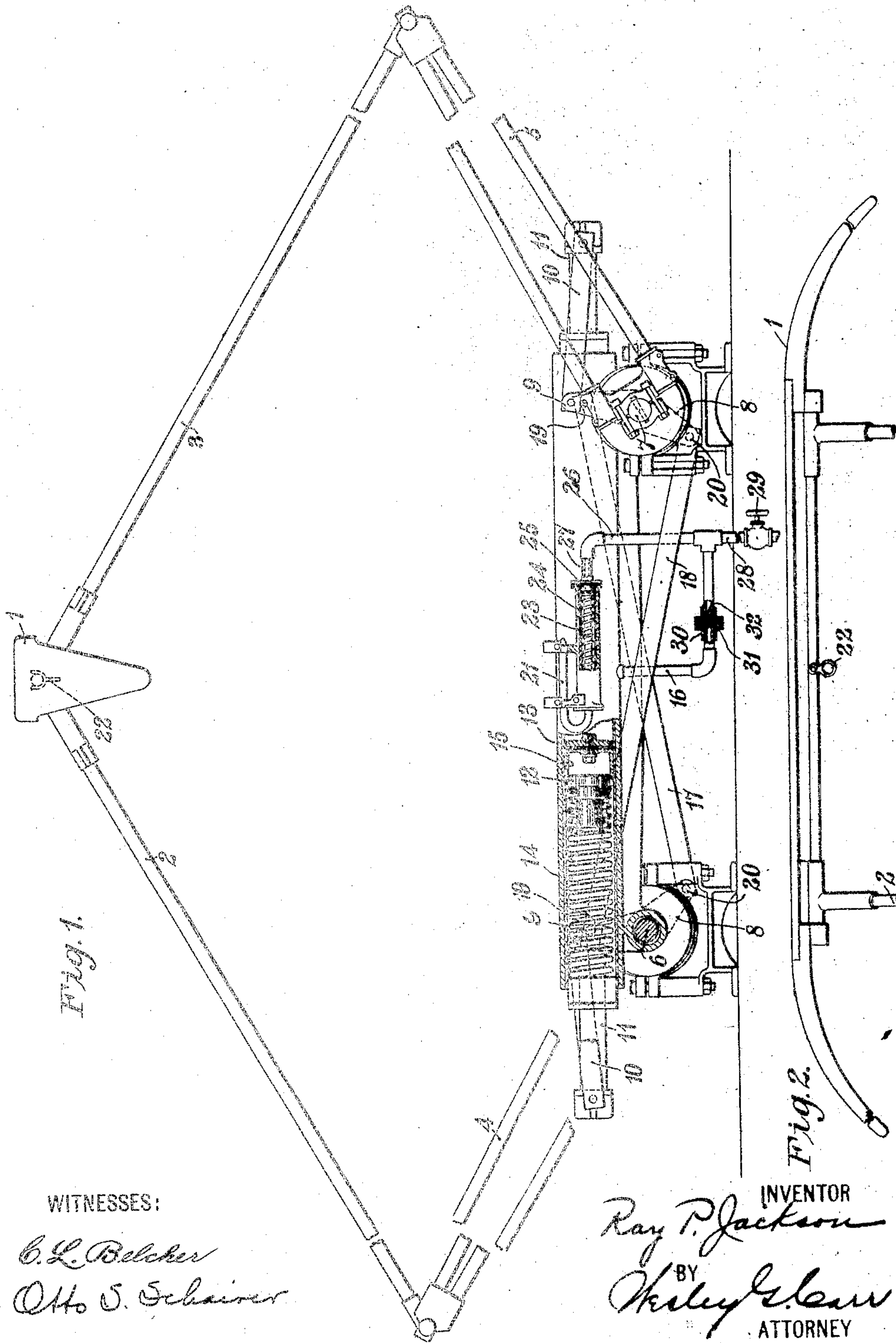
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R. P. JACKSON.

CONTROLLING MEANS FOR PNEUMATICALLY OPERATED DEVICES.

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CONTROLLING MEANS FOR PNEUMATICALLY-OPERATED DEVICES.

No. 879,267.

Specification of Letters Patent.

Patented Feb. 18, 1908.

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To all whom it may concern:

Be it known that I, RAY P. JACKSON, a citizen of the United States, and a resident of Wilkesburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Controlling Means for Pneumatically-Operated Devices, of which the following is a specification.

My invention relates to pneumatically-operated devices and particularly to trolley collectors that are adapted to be operated pneumatically.

The object of my invention is to provide novel and improved means for controlling the operation of devices of the character above specified.

A device to which my invention may be conveniently applied is a trolley collector that comprises means for normally raising the trolley, pneumatically-actuated means for lowering the same and a pneumatically-actuated catch for retaining the trolley in its lowermost position. As heretofore arranged, a valve has been employed for controlling the supply of fluid to each of the fluid-pressure-actuated devices and it is the specific object of my invention to provide means whereby the operations of both devices may be governed by a single valve.

Figure 1 of the accompanying drawing is a view, partially in side elevation and partially in section, of a trolley collector and controlling means therefor, and Fig. 2 is a view, in end elevation of a portion of the apparatus shown in Fig. 1.

A sliding contact shoe 1 is carried at the inner extremities of arms 2 and 3 of a double pantograph frame, the inner extremities of the other arms 4 and 5 of which are rigidly secured to shafts 6 and 7, respectively. For the purpose of effecting rotation of the shafts, crank levers 8 are also rigidly mounted thereon, the upper ends 9 of which are connected, by means of links 10 and piston rods 11, to blocks or heads 12 that are loosely fitted in cylinder 13. The blocks or heads 12 and the pantograph frame are normally maintained in the position shown by means of springs 14 and the blocks or heads are adapted to be moved outwardly so as to collapse the pantograph frame by means of fluid-pressure

exerted between pistons 15, no mechanical connection being provided between the pistons 15 and the blocks 12 in order that the pantograph frame may extend and collapse freely with sudden variations in the height of the trolley conductor and without affecting in any substantial degree the positions of the pistons 15. Fluid-pressure for operating the pistons is supplied to the cylinder through a pipe 16. The movements of the lower arms 4 and 5 of the pantograph frame are caused to correspond by means of links 17 and 18, opposite ends of which are connected respectively at 19 and 20 to the upper and lower extremities of the crank levers 8 that are mounted upon different shafts.

Since the pantograph frame is normally extended by the springs 14 and since it is collapsed by means of pneumatic-pressure exerted between the pistons 15, it is desirable to provide means whereby the frame may be maintained in a collapsed condition when the trolley is not in use, and for that reason a catch 21 is provided to engage a suitable device 22 that is attached to the lower side of the contact shoe 1. The catch 21 is normally maintained in the position shown by means of a spring 23 and is operated to effect release of the device 22 by means of fluid-pressure exerted in a cylinder 24 behind a piston 25, fluid pressure being admitted to the cylinder from a pipe 26. The resiliency of the spring 23 may be so adjusted with reference to the resiliency of the springs 14 that a greater pressure must be exerted behind the piston 25 to effect operation of the catch 21 than that which it is necessary to exert between the pistons 15 to cause the pantograph frame to collapse or to maintain it in a collapsed condition. The piston 25 also is preferably fitted loosely in the cylinder 24 so as to permit the fluid to escape slowly, or an exhaust port may be provided at a convenient location, as at 27, the parts being arranged in this manner for a purpose which will be hereinafter more fully set forth. The pipes 16 and 26 communicate with a supply pipe 28 in which a valve 29 is located whereby the supply of fluid to the cylinders 13 and 24 is governed. The interior of the pipe 16 is constricted at a suitable point 30 by any suitable means; as here shown, a diaphragm

31 having a small aperture 32 is provided for the purpose.

If the pantograph frame is extended to substantially the position shown in Fig. 1 and it is desired to remove the trolley from service, the valve 29 will be opened to admit fluid to the cylinders 13 and 24. The exertion of pressure between the pistons 15 causes the pantograph frame to collapse and when the contact shoe 1 reaches its lowermost position, the valve 29 will be closed. The air within the cylinder 24 thereupon escapes around the piston 25 or through the exhaust port 27 and, since the constricted portion of the pipe 16 delays the passage of fluid from the cylinder 13 to the cylinder 24, the spring 23 will overcome the pressure exerted upon the piston 25 and will cause the catch 21 to engage the device 22 upon the lower side of the contact shoe 1. The fluid within the system continues to escape gradually but without effect upon the devices. In order that the devices may operate as indicated, it may be desirable to provide a difference in the degrees of resiliencies of the springs 14 and 23, as before noted.

If it is desired to extend the pantograph frame the valve 29 will be opened for only a very short period whereupon a pressure will be exerted behind the piston 25 sufficient to cause the catch 21 to release the device 22 while but a slight pressure will be exerted between the pistons 15 because the constricted portion of the pipe 16 delays the supply of fluid to the cylinder 13. Thus it is seen that both the operation of the trolley and of the catch may be governed by means of a single valve.

While I have shown and described my invention as applied to a trolley, it will be readily understood that it is equally applicable to other pneumatically-operated devices which operate in a similar manner and to devices, the structural details and arrangements of the parts of which may differ considerably from what has here been shown and described, the specific device to be controlled forming no part of my present invention.

I claim as my invention:

1. The combination with a trolley that is normally raised, fluid-pressure-actuated means for depressing the same, a catch for retaining the trolley in its depressed position and fluid-pressure-actuated means for causing the catch to release the trolley, of a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the passage to the former means being provided with a constricted portion.
2. The combination with a trolley that is normally raised, fluid-pressure-actuated means for depressing the same, a catch for retaining the trolley in its depressed position

and fluid-pressure-actuated means for causing the catch to release the trolley, of a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the passage to the former means being provided with a constricted portion and a valve in the unbranched portion of the supply pipe or conduit.

3. The combination with a device having a normal position, fluid-pressure-actuated means for causing the device to occupy an abnormal position, a catch for retaining the device in the abnormal position and fluid-pressure-actuated means for causing the catch to release the device, of a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the passage to the former means being provided with a constricted portion.

4. The combination with a device having a normal position, fluid-pressure-actuated means for causing the device to occupy an abnormal position, a catch for retaining the device in the abnormal position and fluid-pressure-actuated means for causing the catch to release the device, of a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the passage to the former means being provided with a constricted portion, and means for governing the supply of fluid that is located in the unbranched portion of the pipe or conduit.

5. The combination with a device having a normal position, fluid-pressure-actuated means for causing the device to occupy an abnormal position, a catch for retaining the device in the abnormal position, and fluid-pressure-actuated means for causing the catch to release the device, of a pipe or conduit provided with a valve and having branch passages whereby fluid-pressure may be applied to the respective means, the branch passage to the former means being provided with a pressure-retarding or reducing means.

6. The combination with a device having a normal position, fluid-pressure-actuated means for causing the device to occupy an abnormal position, a catch for retaining the device in the abnormal position, and fluid-pressure-actuated means for causing the catch to release the device, of a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the passage to the former means being provided with a constricted portion, and means for permitting the escape of fluid from the latter means.

7. The combination with a device adapted to occupy two different positions, fluid-pressure-actuated means for moving the device to one of its positions and a catch for holding

it in that position, of fluid-pressure-actuated means for controlling the catch and a pipe or conduit having branch passages whereby fluid-pressure may be applied to the respective means, the branch passage leading to one of said means being provided with a pressure-retarding or reducing means.

In testimony whereof, I have hereunto subscribed my name this 24th day of February, 1906.

RAY P. JACKSON.

Witnesses:

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