

(No Model.)

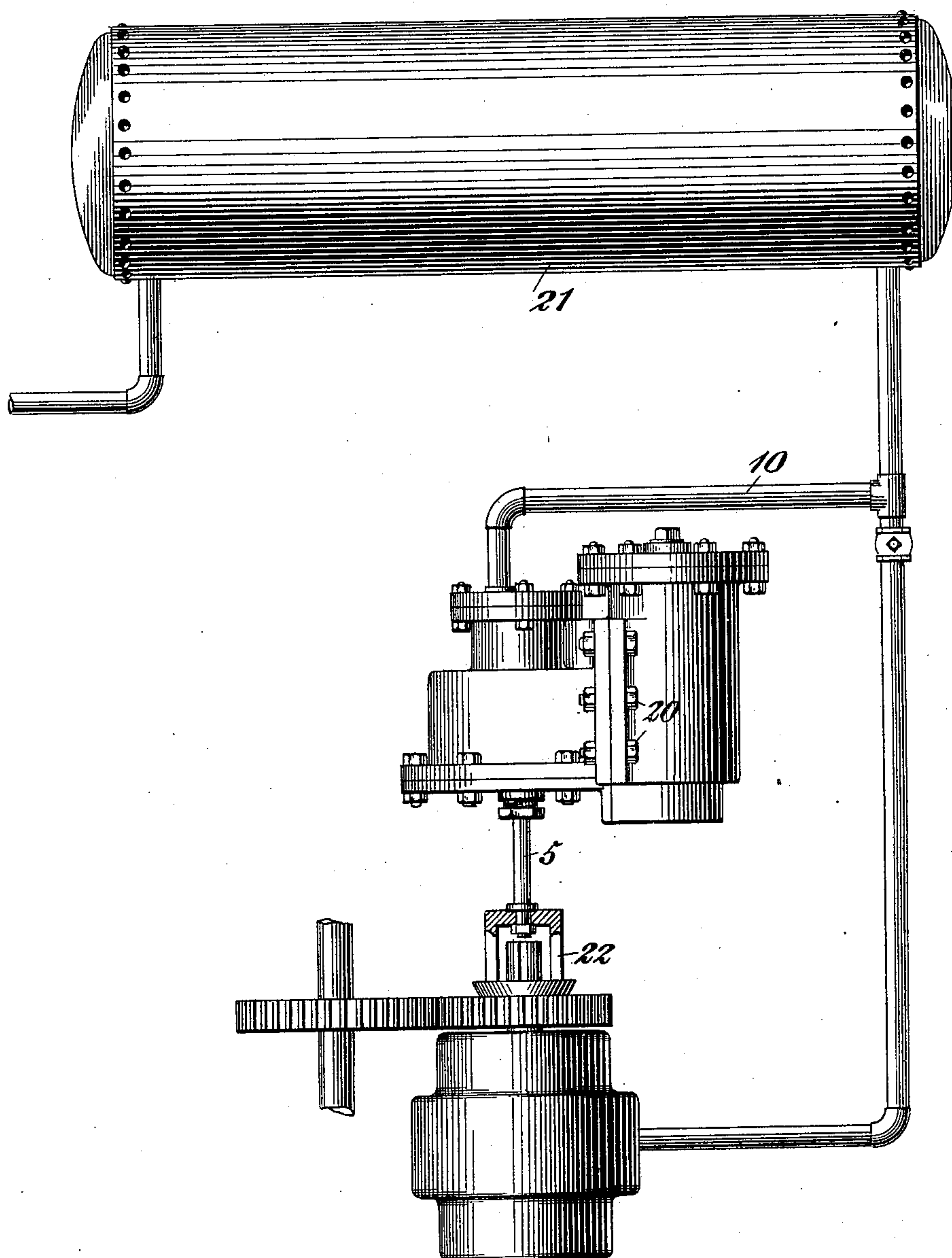
2 Sheets—Sheet 1.

J. J. NEF.  
AIR BRAKE.

No. 602,094.

Patented Apr. 12, 1898.

*Fig. 1,*



**WITNESSES:**

C. K. Kayworth  
Harry A. Goss.

INVENTOR

John J. Keef  
BY  
J. C. Chapin  
His ATTORNEY

(No Model.)

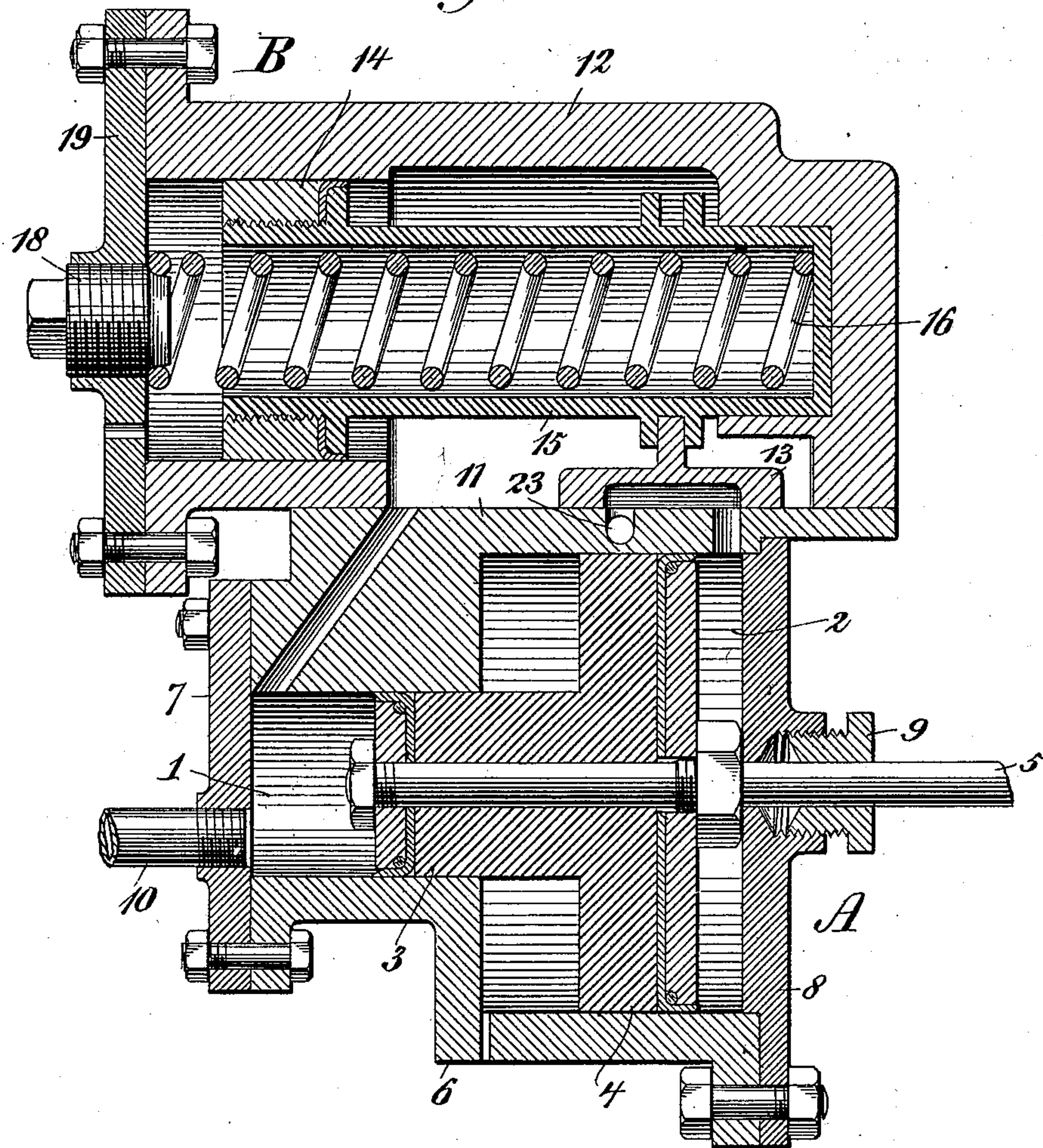
2 Sheets—Sheet 2.

J. J. NEF.  
AIR BRAKE.

No. 602,094.

Patented Apr. 12, 1898.

*Fig. 2.*



WITNESSES:

*D. H. Raymond*  
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# UNITED STATES PATENT OFFICE.

JOHN J. NEF, OF NEW YORK, N. Y.

## AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 602,094, dated April 12, 1898.

Application filed July 31, 1897. Serial No. 646,579. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. NEF, a citizen of the United States, residing in the city, county, and State of New York, have invented  
5 a new and useful Improvement in Air-Brakes, of which the following is a specification.

This invention relates to automatic pressure-governors, and has for its object the provision of efficient and reliable means for automatically throwing the pump used to supply fluid under pressure into and out of action, according as the fluid-pressure falls below or rises above a certain degree.

This invention consists in a novel structure and arrangement of parts whereby a piston-rod is adapted by its movement in one direction to engage and in the other to disengage the pump and its actuating mechanism, the said piston-rod being attached to  
20 two pistons of different diameters, upon the smaller of which the fluid-pressure acts, at all times tending to keep the pump in operation, but upon the larger the fluid-pressure is admitted or exhausted according as its intensity is above or below a certain predetermined point, the admission and exhaust to the larger piston being controlled by a valve, which valve is actuated in one direction by the action of the fluid-pressure upon a piston in  
30 the valve-chamber and in the other direction by a spring, the result being a very compact and simple construction, and at the same time one that is reliable and efficient.

In the drawings accompanying and forming  
35 a part of this specification, Figure 1 is a general view showing the pump with an actuating mechanism, the governor, and a reservoir in which compressed fluid is stored. Fig. 2 is a sectional view of the governor on a plane  
40 passing through the centers of the pistons, this plane being parallel to the plane of the view shown in Fig. 1.

Similar characters of reference designate like parts in both figures.

45 This governor comprises, in a general way, two main parts, designated A and B, respectively. One part, being that designated by A, is a compound cylinder or, in other words, consists of two cylinders of different diameters, preferably arranged upon the same  
50 axis. In this compound cylinder are arranged two pistons of diameters to correspond to the

different bores of the compound cylinder, rigidly attached together and to a piston-rod, the movement of the pistons and rod operating to stop and start the pump. The second  
55 main part above alluded to, designated generally by B, consists of a valve-chamber secured to the compound cylinder, said valve-chamber having a cylindrical portion in which  
60 is fitted a piston adapted to be acted upon by the fluid-pressure in the valve-chamber and by a spring, the movement of said piston imparting its motion to the valve in the chamber and thus controlling the admission  
65 and exhaust of fluid-pressure in the valve-chamber to and from the larger of the two cylinders of the compound cylinder. The smaller cylinder of the compound cylinder and the valve-chamber have open communication at all times with the reservoirs or  
70 source of supply.

In the preferred form of my invention herein shown and described the part which I have designated generally by A comprises  
75 the compound cylinder 6, the head 7 for the small end, the head 8 and stuffing-box 9 for the larger end, the pistons 3 and 4 and rod 5, together with any approved form of packing and means for connecting the pistons and  
80 rod.

The valve-chamber and its accessories, designated in a general way by B, comprises the main valve-chamber casting 12, the valve 13, the piston 14, the hollow piston-rod 15, the  
85 spring 16, together with the head 17 and adjusting-screw 18. The valve-chamber 12 is secured to the compound cylinder 6 by means of screws or bolts 20 20.

As shown in the drawings, the piston in the  
90 compound cylinder 6 is in its extreme right position, the operating mechanism of the pump connected through clutch 22, and the pump in operation. The parts will remain in this position and the pump will remain in operation  
95 until the pressure of fluid in the reservoir rises above a predetermined point, when the pressure on the piston 14 in valve-chamber 12 overcomes the tension of spring 16 and moves the piston to the left, carrying with it valve  
100 13, thereby opening communication between the valve-chamber 12 and the larger of the two cylinders 2, thus admitting reservoir pressure into the cylinder 2 where it acts upon the



piston 4 and overcomes the pressure in cylinder 1, acting upon the piston 3 through the difference in their areas. The piston is thus forced to the left and the clutch 22 thrown out of engagement and the pump out of operation.

When the pressure in the reservoir falls below a predetermined point, the spring 16 will overcome such pressure acting upon the piston 14 and move it to the right, carrying the valve 13 to the position shown in Fig. 2, closing connection between the valve-chamber and cylinder 2 and opening communication between cylinder 2 and the exhaust 23. The air from cylinder 2 having exhausted, the piston 4 is forced to its extreme right position by the pressure in cylinder 1 on piston 3 and the pump put in operation, as already described.

What I claim is—

1. The combination in an air-brake system of a pump and pump-operating mechanism of a compound air-cylinder comprising two cylinders of different diameters, a piston within said compound cylinder having heads of different diameters corresponding with the bores of said compound cylinder, a valve-chamber in open communication with the smaller cylinder and having a port communicating with the larger cylinder and an exhaust-port, a valve in said valve-chamber, and means acting under variations in air-pressure for operating said valve to alternately open and close said larger cylinder to the valve-chamber and the exhaust, substantially as described.

2. The combination in an air-brake system of a pump and pump-operating mechanism,

of a compound air-cylinder comprising two cylinders of different diameters, a piston within said compound cylinder having heads of different diameters corresponding with the bores of said compound cylinder, a valve-chamber having open communication with the smaller of said cylinders, and having a port connecting with the larger of said cylinders, an exhaust-port, and a valve controlling said ports whereby air is admitted to the larger cylinder to move the piston in one direction and exhausted therefrom to move it in the opposite direction, substantially as described.

3. The combination in an air-brake system of a pump and pump-operating mechanism, a compound air-cylinder comprising two cylinders of different diameters, a piston within said compound cylinder having heads of different diameters corresponding with the bores of said compound cylinder, a valve-chamber having open communication with the smaller of said cylinders and having a port connecting with the larger of said cylinders, an exhaust-port and means for controlling said ports whereby air is exhausted from the larger cylinder to allow the piston to move in one direction, and is admitted to said cylinder to move the piston in the opposite direction, substantially as described.

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

JOHN J. NEF.

Witnesses:

CHARLES G. STEVENSON,  
J. C. CHAPIN.