

No. 673,455.

Patented May 7, 1901.

E. B. ROTH.
VALVE MECHANISM.

(Application filed Aug. 22, 1900.)

2 Sheets—Sheet 1.

(No Model.)

Fig.1.

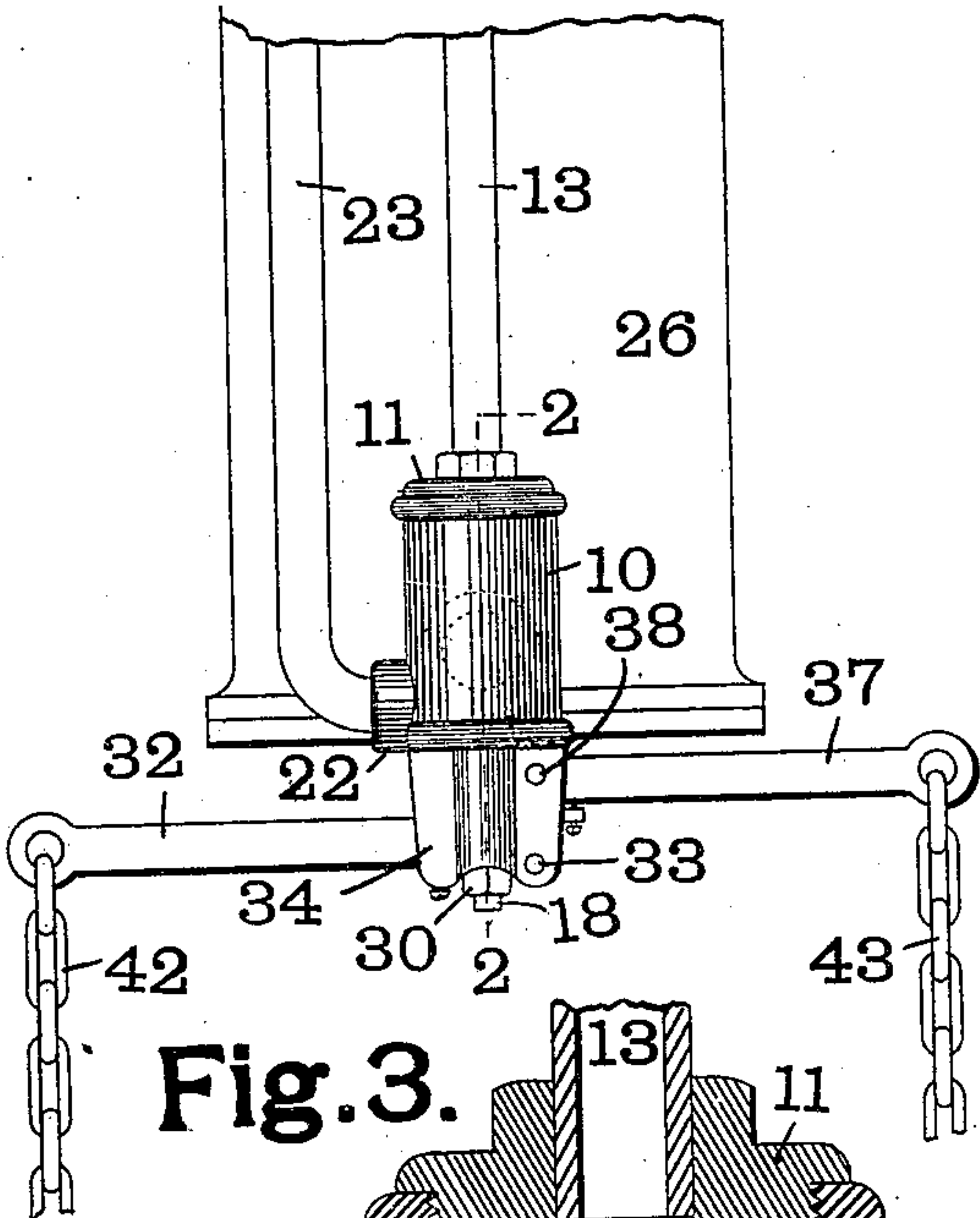


Fig.2.

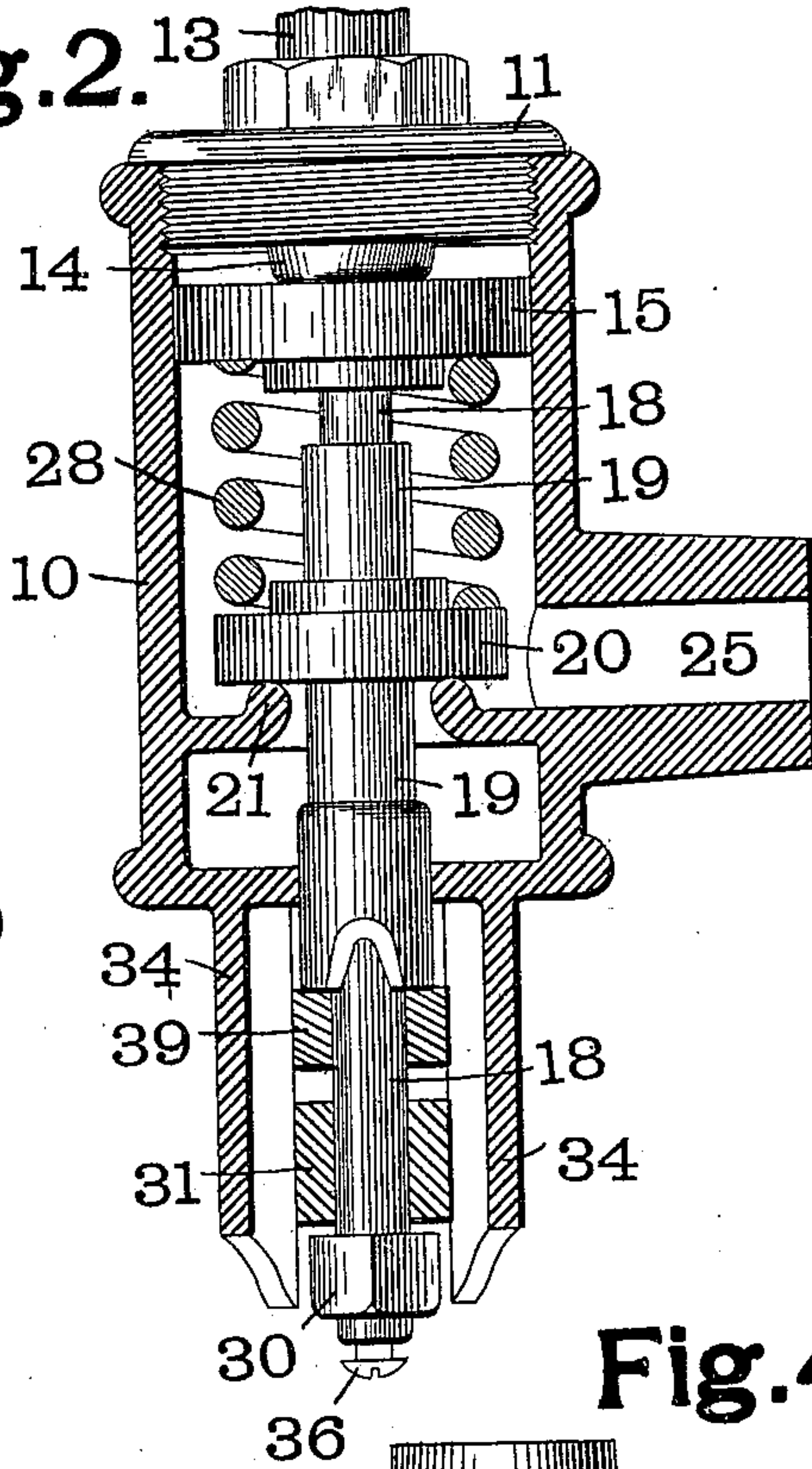


Fig.3.

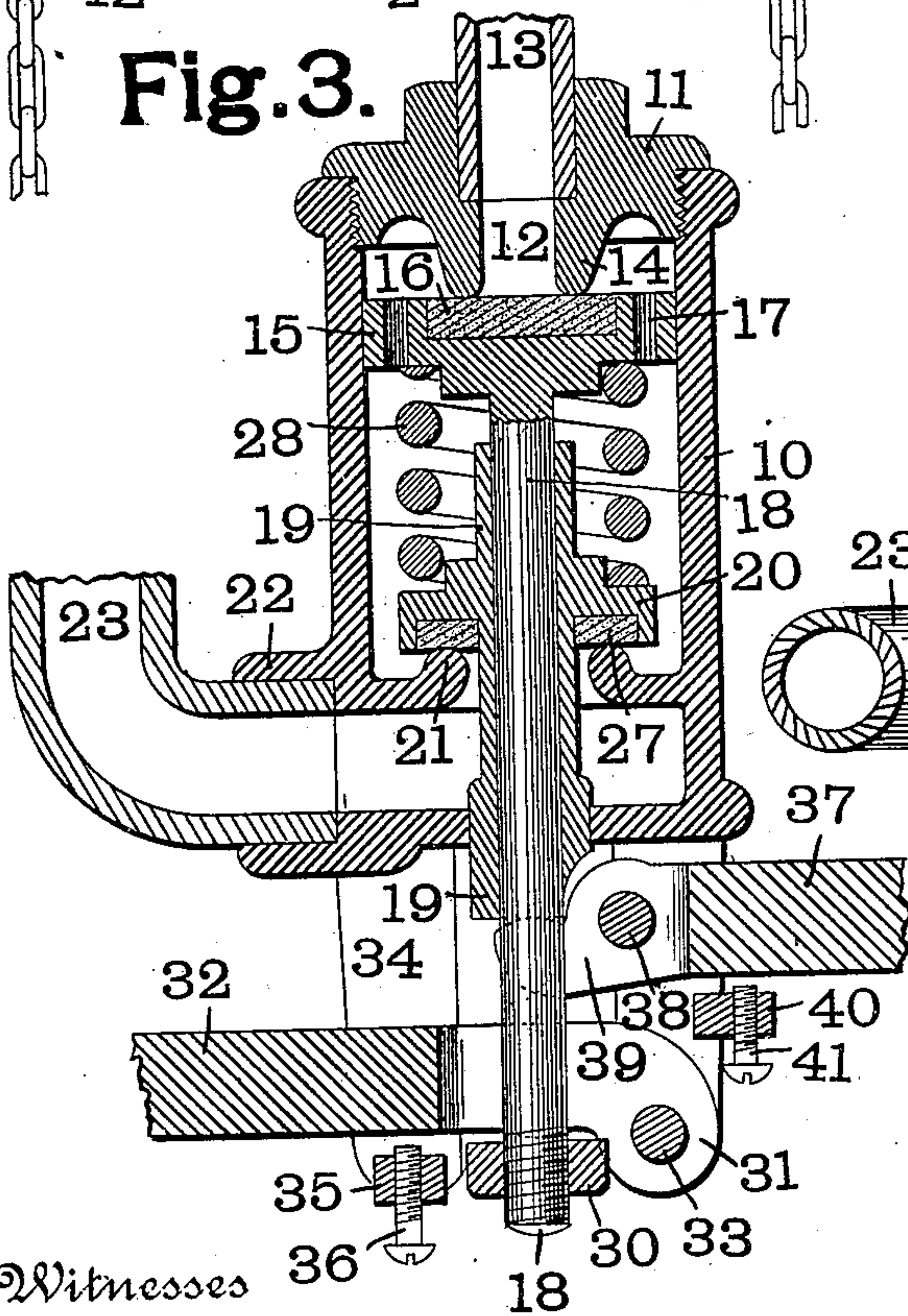
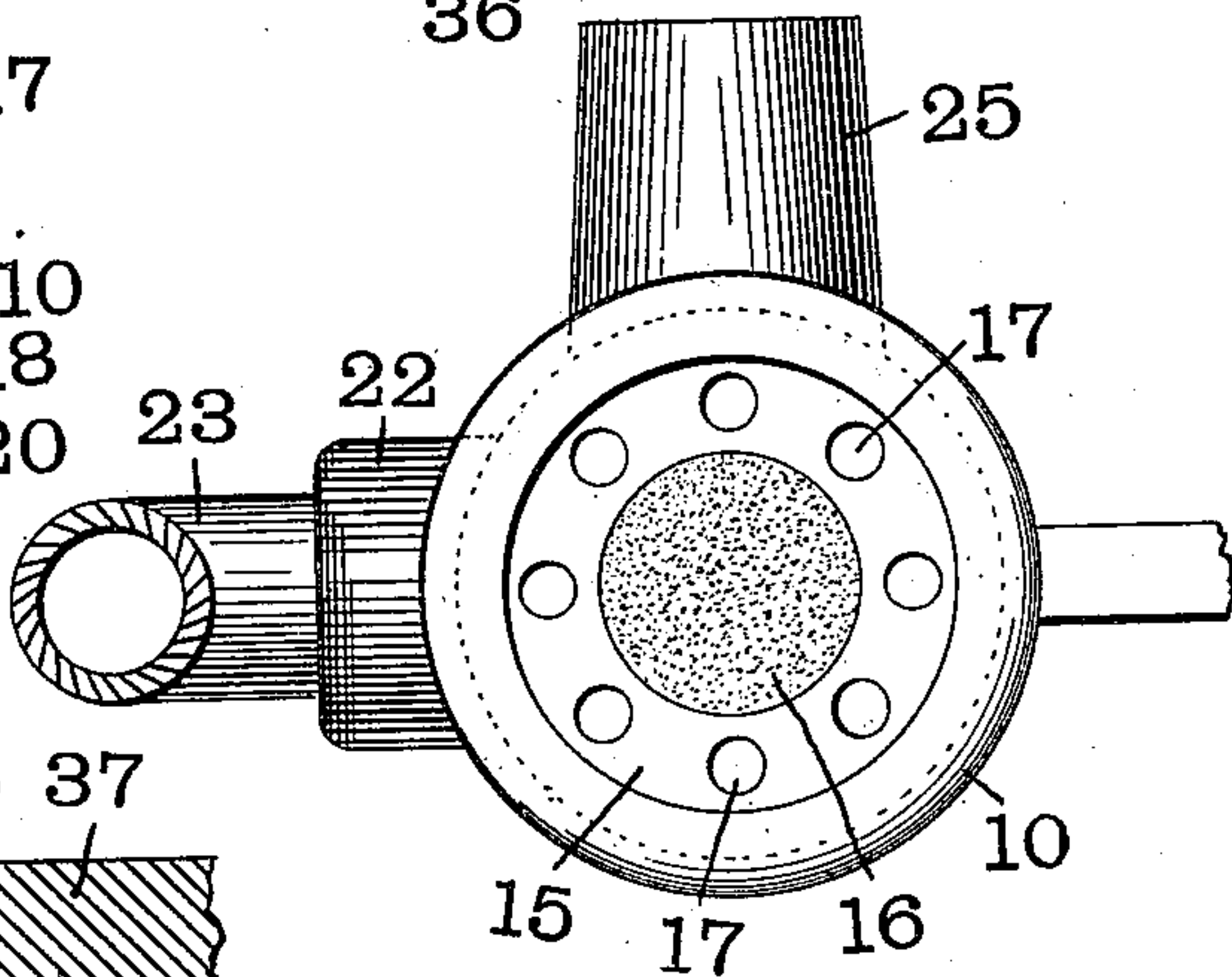


Fig.4.



Witnesses

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2 Sheets—Sheet 2.

Fig. 5.

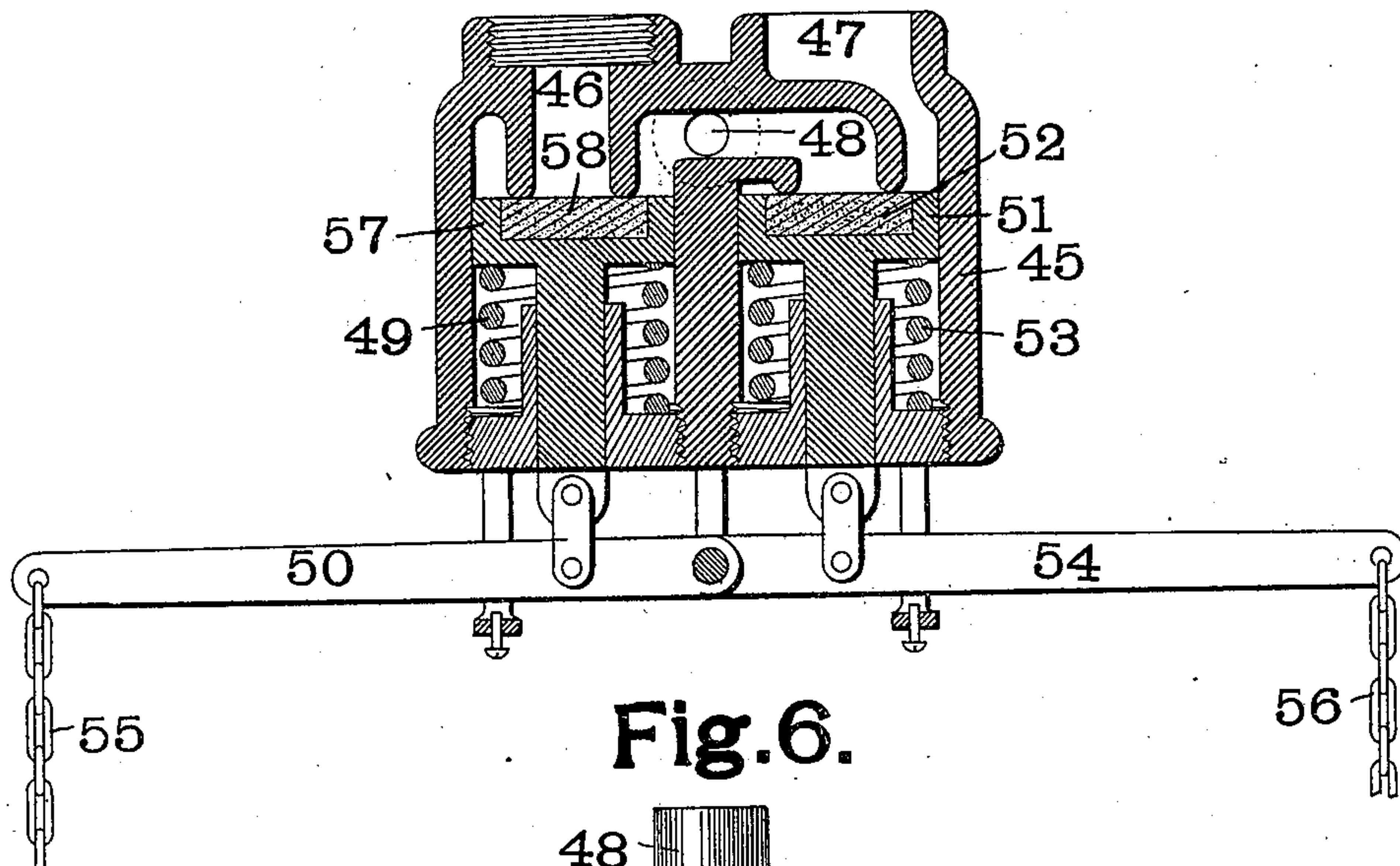


Fig. 6.

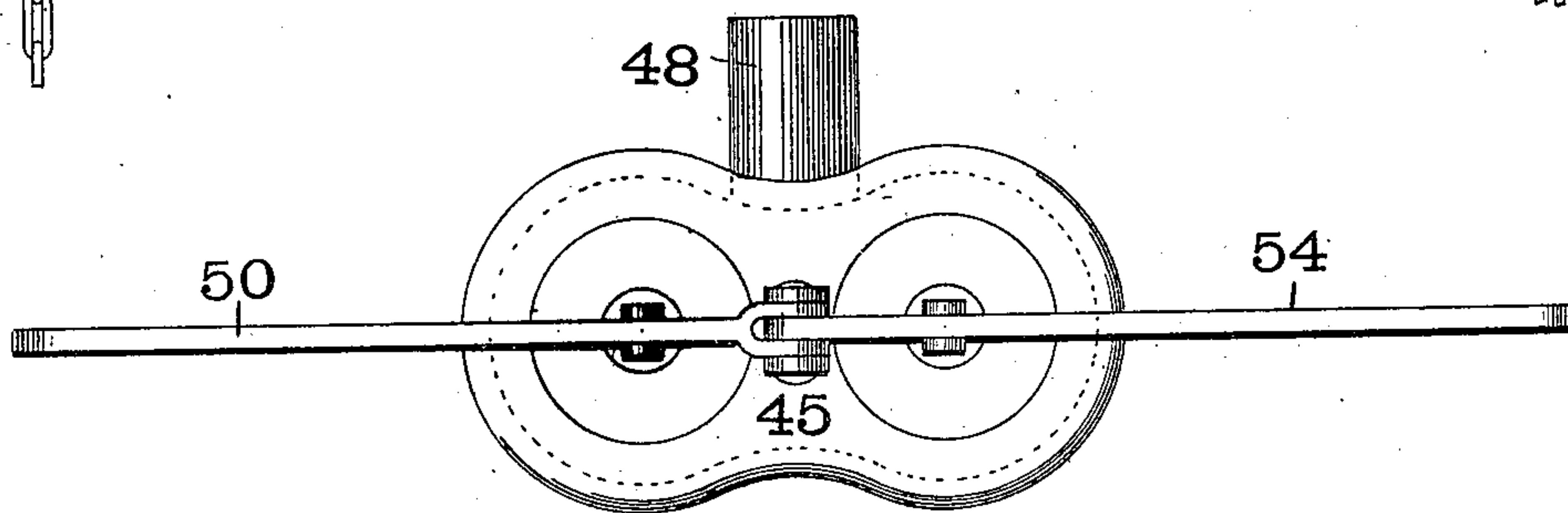
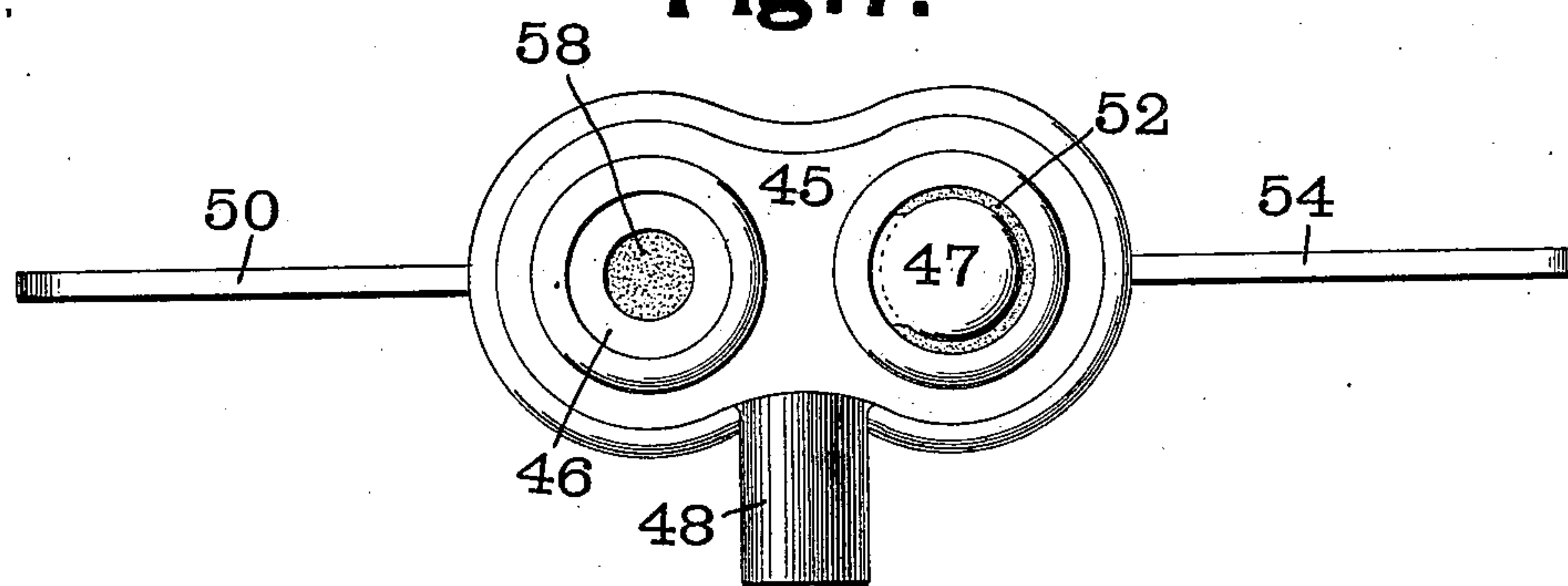


Fig. 7.



Witnesses

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EDWARD B. ROTH, OF ST. LOUIS, MISSOURI.

VALVE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 673,455, dated May 7, 1901.

Application filed August 22, 1900. Serial No. 27,674. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. ROTH, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have
5 invented a certain new and useful Valve Mechanism, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference
10 being had to the accompanying drawings, forming part of this specification.

My invention relates to a valve mechanism, and more particularly to a valve mechanism such as is used to control the supply and ex-
15 haust of air to and from a pneumatic hoist.

The object of my invention is to construct a valve for the purpose stated which will be simple and compact in construction and accurate in operation.

20 My invention consists in part in the combination, with a casing provided with supply and exhaust ports and a feed-passage, of a puppet-valve for said supply-port seating against the pressure, a valve for said exhaust-
25 port, and means for actuating said valves.

My invention also consists in part in the combination, with a casing provided with supply and exhaust ports and a feed-passage, of puppet-valves for said supply and exhaust
30 ports, one of said valves surrounding the stem of the other, and means for actuating said valves.

My invention also consists in various other novel features and details of construction, all
35 of which are described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate two forms of valve mechanism made in
40 accordance with my invention, Figure 1 is an elevation, on a reduced scale, of my preferred form of valve, together with a portion of a pneumatic hoist to which the same is attached. Fig. 2 is a section on the line 2 2 of
45 Fig. 1 on an enlarged scale. Fig. 3 is a section at right angles to that of Fig. 2. Fig. 4 is a top plan view of the valve mechanism with the cap removed. Fig. 5 is a section through a modified form of valve mechanism;
50 and Figs. 6 and 7 are a bottom and top plan view, respectively, of the form shown in Fig. 5.

Like marks of reference refer to similar parts in the several views of the drawings.

Referring first to the preferred form, (shown in Figs. 1 to 4,) 10 is the casing or body of the
55 valve mechanism, which is preferably cylindrical in form. The casing 10 is provided with the screw-cap 11, in which is formed a supply-port 12. The supply-port 12 communicates with a supply-pipe 13 and has formed
60 around it a valve-seat 14.

15 is a puppet-valve, which seats against the valve-seat 14. The valve 15 is preferably provided with a disk 16, of leather, rubber, or other suitable flexible material. The valve
65 15 has formed in it a number of openings 17, through which the air from the supply-pipe 13 passes when the valve is open. The valve 15 is carried by a stem 18. The stem 18 is surrounded by a sleeve 19, carrying a pup-
70 pet-valve 20. The valve 20 seats against the valve-seat 21 and controls the exhaust of air through the exhaust-port 22. The exhaust-port 22 is preferably connected with an ex-
75 haust-pipe 23.

25 is a feed-passage, which communicates with the interior of the casing 10 and is connected with the cylinder 26 of the pneumatic hoist.

The valve 20 is preferably provided with a
80 ring 27, of rubber, leather, or other flexible material.

The valves 15 and 20 are held in position against the valve-seats 14 and 21 by means
85 of a coil-spring 28.

The lower end of the stem 18 is provided with a nut 30, which engages with the bifurcated end 31 of the lever 32. The lever 32 is pivoted by means of a bolt 33 between down-
90 wardly-extending flanges 34 on the valve-casing. Carried by the flanges 34 is a lug 35, in which is a set-screw 36, limiting the downward movement of the lever 32.

37 is a lever which is pivoted between the flanges 34 by a bolt 38 and which is provided
95 with a bifurcated end 39, engaging the lower end of the sleeve 19. Carried by the flanges 34 below the levers 37 is a lug 40, provided with a set-screw 41, which limits the movement of the lever 37. The levers 32 and 37
100 are provided with chains 42 and 43, respectively, by means of which they are operated.

The operation of my valve mechanism is as follows: When it is desired to admit air to the cylinder 26 of the pneumatic hoist, the chain 42 is drawn downwardly. This actuates the lever 32, which comes in contact with the nut 30 on the stem 18, thus drawing the said stem, and consequently the valve 15, downwardly. This allows air to pass down through the supply-pipe 13 and supply-port 12 into the upper part of the casing 10, from whence it passes down through the openings 17 in the valve into the main portion of the casing 10 and thence out through the feed-passage 25 into the cylinder 26. As soon as the chain 42 is released the spring 28 forces the valve 15 back against the seat 14 and closes off the supply of air. When it is desired to release the air from the cylinder 26, the chain 43 is drawn downwardly. This raises the inner bifurcated end of said lever, which comes in contact with the lower end of the sleeve 19, thus raising the valve 20 and allowing the air to pass out through the feed-passage 25, casing 10, and exhaust-port 22, into the exhaust-pipe 23. As soon as the chain 43 is released the spring 28 forces the valve 20 down against the valve-seat 21, and thus closes off the exhaust.

In the modification shown in Figs. 5, 6, and 7 I use a casing 45, which is provided with a supply-port 46, exhaust-port 47, and feed-passage 48. The passage of the air through the supply-port 46 is controlled by a puppet-valve 57, provided with a disk 58 of flexible material. The valve 57 is held in position against its seat by a coil-spring 49 and is pivotally connected to a lever 50. The passage of air through the exhaust-port 47 is controlled by a puppet-valve 51, provided with a disk 52 of flexible material. The valve 51 is held in place against its seat by a coil-spring 53 and is pivotally connected to a lever 54. The levers 50 and 54 are provided with chains 55 and 56, respectively, by means of which the said levers are actuated.

The operation of my modified form of valve mechanism is as follows: When it is desired to admit air to the pneumatic hoist, the chain 55 is drawn downwardly, thus drawing down the end of the lever 50, and consequently drawing the valve 57 away from its seat and allowing air to pass through the supply-port 46 into the casing 45 and out through the feed-port 48 to the cylinder of the hoist. As soon as the chain is released the spring 49 forces the valve back into position. When it is desired to release the air from the hoist, the chain 56 is drawn downwardly, thus actuating the lever 54 and causing the same to draw the valve 51 away from its seat. The air can now pass back through the feed-passage 48 and out through the exhaust-port 47. As soon as the chain 56 is released the spring 53 forces the valve 51 back against its seat and cuts off the exhaust.

It will be seen that my valve is simple of construction and very compact. At the same

time it is simple and accurate in operation. The fact that the valve controlling the supply-port seats against the air-pressure makes the valve very sensitive, as the spring can be made just sufficiently strong to overcome the air-pressure and hold the valve to its seat. The fact that the supply and exhaust are controlled by independent means also makes my valve very accurate in its operation.

I am aware that valves for pneumatic hoists have been heretofore made in which two puppet-valves were used to control the supply and exhaust, in which the valve controlling the admission of air in the cylinder seated with the air-pressure and not against it, and in which the two valves were controlled by a single lever, so as not to be entirely independent of each other in action, and therefore do not claim such construction.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, a spring-actuated puppet-valve for said supply-port and seating against the pressure, a valve for said exhaust-port, said valves being independently movable, and means for actuating said valves.

2. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, puppet-valves for said supply and exhaust ports, and independent means for actuating said valves.

3. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, a puppet-valve for said supply-port and seating against the pressure, a valve for said exhaust-port, and independent means for actuating said valves.

4. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, puppet-valves for said supply and exhaust ports, one of said valves surrounding the stem of the other, and means for actuating said valves.

5. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, valve-seats for said supply and exhaust ports arranged facing each other, two puppet-valves, a spring between said valves and holding them against said valve-seats, and means for actuating said valves.

6. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, puppet-valves for said supply and exhaust ports, two independent levers for actuating said valves, and means for adjustably limiting the movement of said levers.

7. In a valve mechanism, a casing provided with supply and exhaust ports and a feed-passage, a puppet-valve for one of said ports provided with a stem, a sleeve surrounding said stem and carrying a valve for the other of said ports, and means for actuating said stem and sleeve.

8. In a valve mechanism, a casing provided

with supply and exhaust ports and a feed-
passage, a puppet-valve for said exhaust-port
provided with a stem, a sleeve surrounding
said stem and carrying a valve for said ex-
5 haust-port, a lever for actuating said stem,
and a second lever for actuating said sleeve.

9. In a valve mechanism, a casing provided
with supply and exhaust ports and a feed-
passage, a puppet-valve for said supply-port
10 provided with a stem, a sleeve surrounding
said stem and carrying a valve for said ex-
haust-port, a lever for actuating said stem,
means for adjustably limiting the movement
of said lever, a second lever for actuating
15 said sleeve, and means for adjustably limit-
ing the movement of said lever.

10. In a valve mechanism, a casing pro-
vided with a feed-passage, a removable cap
for said casing provided with a supply-port
and a valve-seat, a puppet-valve coöperating 20
with said seat and provided with a stem, an
exhaust-port, a valve for said exhaust-port
surrounding said stem, and means for actu-
ating said valves.

In testimony whereof I have hereunto set 25
my hand and affixed my seal in the presence
of the two subscribing witnesses.

EDWARD B. ROTH. [L. S.]

Witnesses:

JAMES H. BRYSON,
W. A. ALEXANDER.