

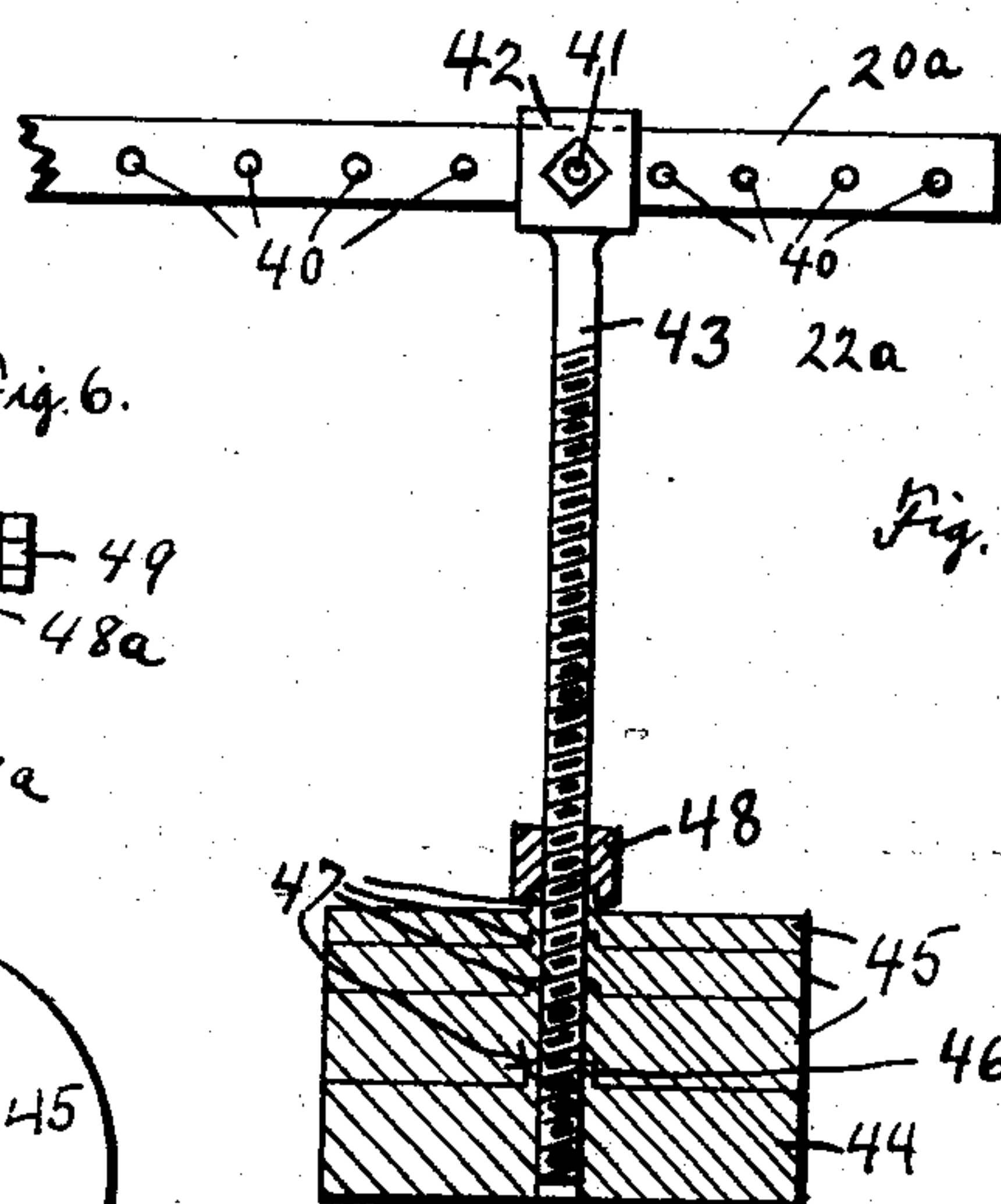
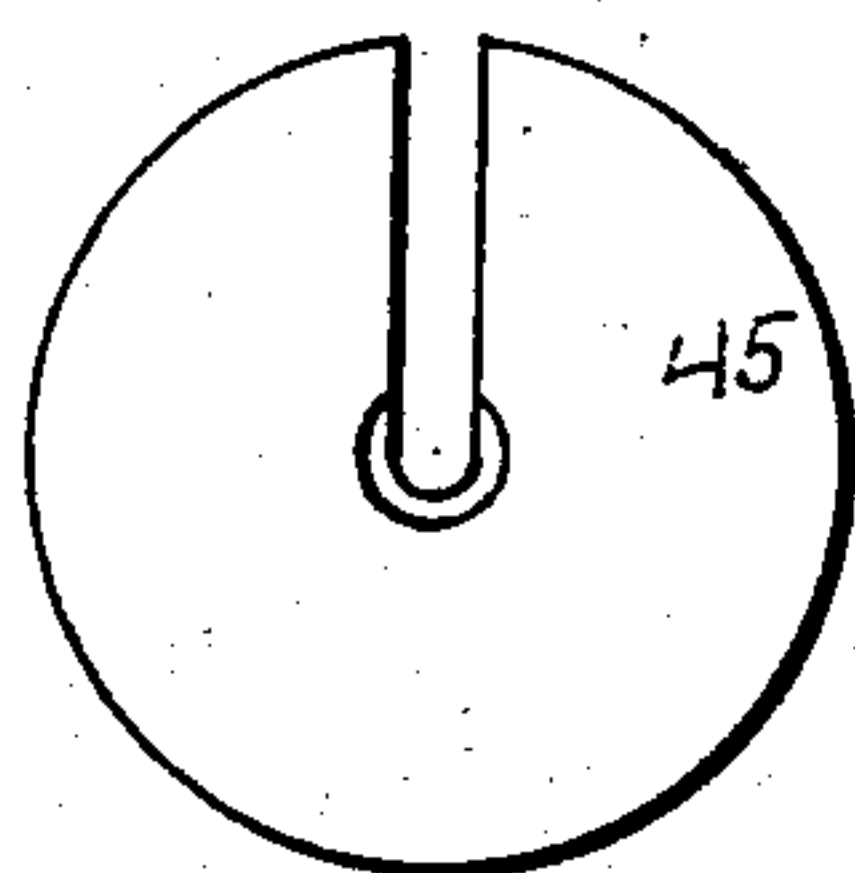
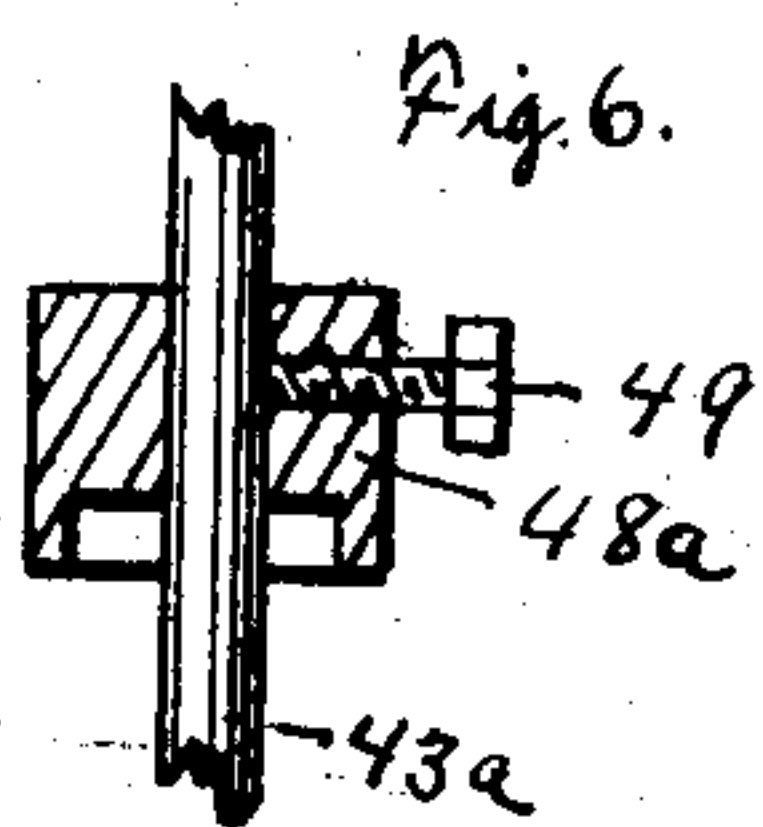
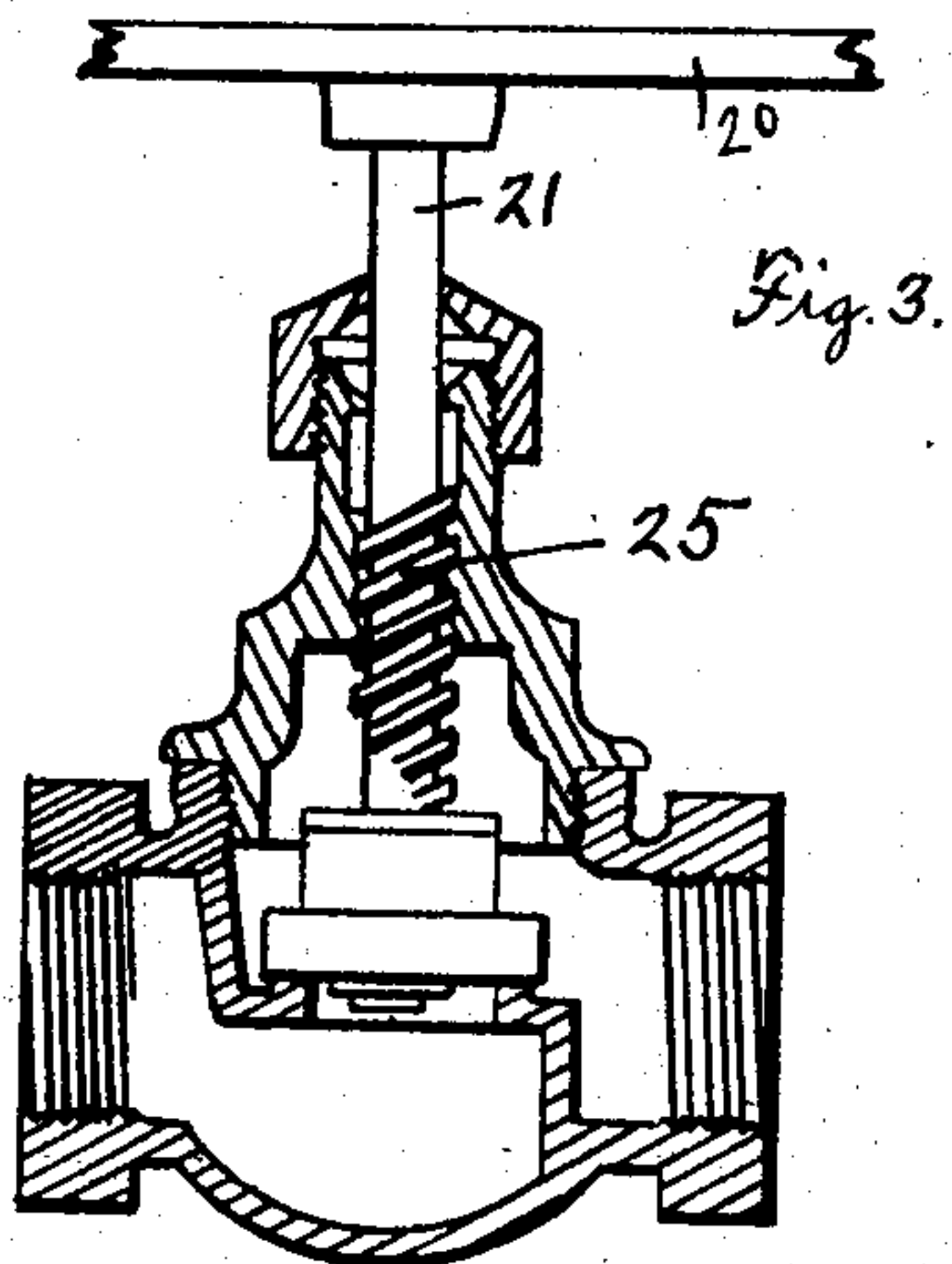
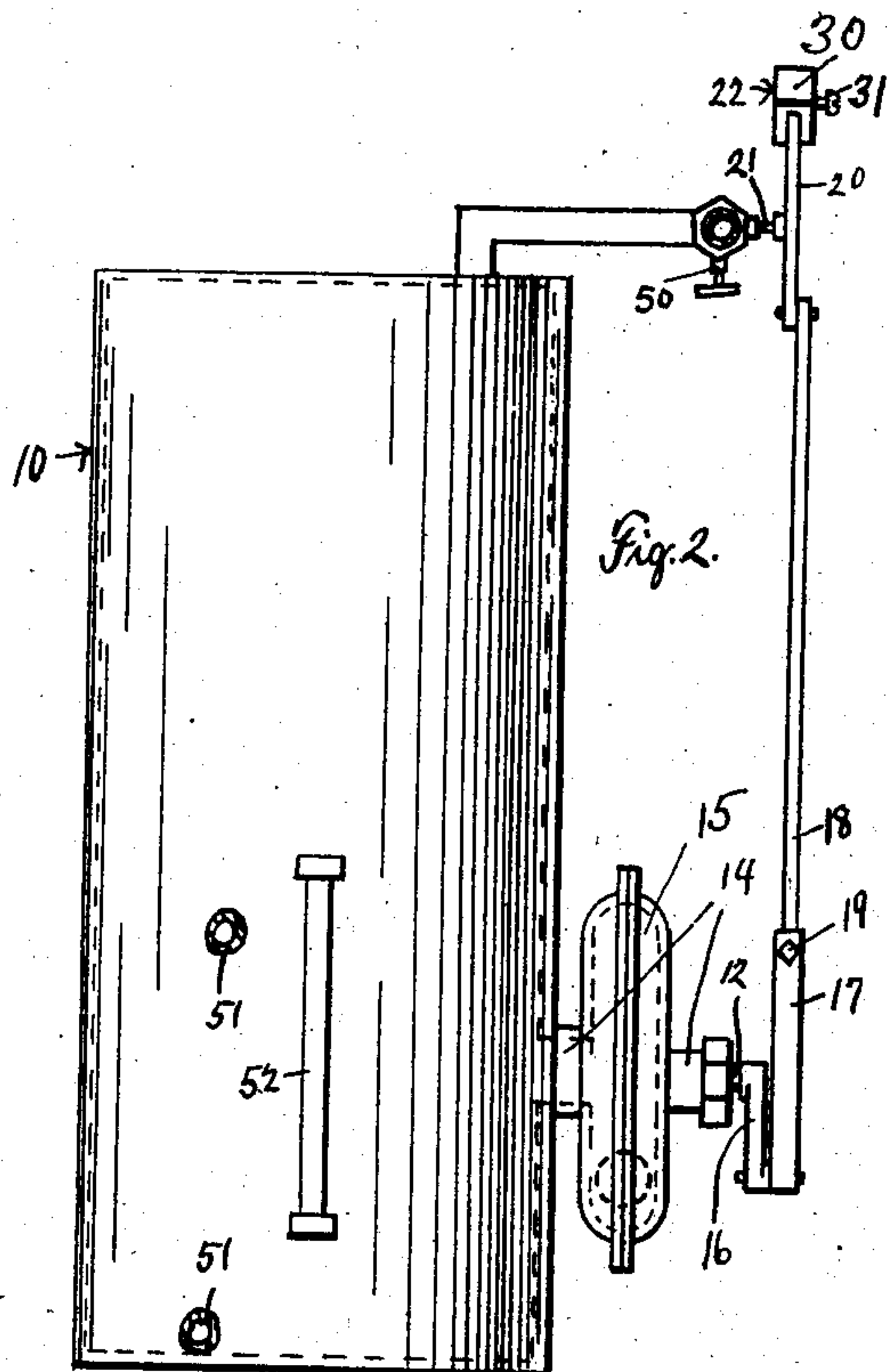
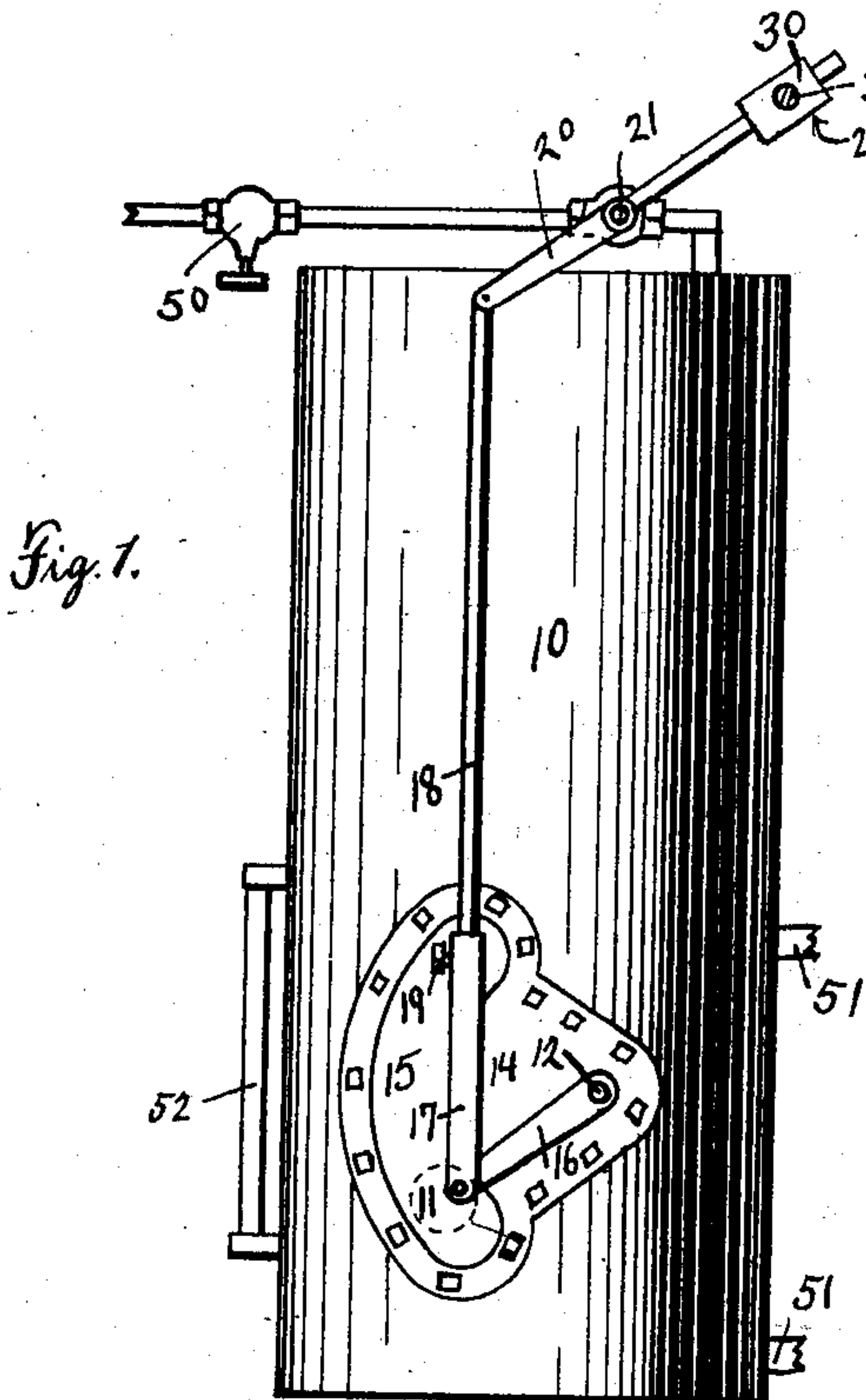
No. 746,149

PATENTED DEC. 8, 1903.

F. J. PLATT & J. RATCHFORD.
VALVE AND OPERATING MEANS.

APPLICATION FILED JUNE 12, 1903.

NO MODEL.



WITNESSES
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UNITED STATES PATENT OFFICE.

FRANK J. PLATT AND JOHN RATCHFORD, OF DAYTON, OHIO, ASSIGNORS
TO FRANK J. McCORMICK, OF DAYTON, OHIO.

VALVE AND OPERATING MEANS.

SPECIFICATION forming part of Letters Patent No. 746,149, dated December 8, 1903.

Application filed June 12, 1903. Serial No. 161,148. (No model.)

To all whom it may concern:

Be it known that we, FRANK J. PLATT and JOHN RATCHFORD, citizens of the United States, residing at Dayton, Montgomery county, Ohio, have invented a certain new and useful Valve and Operating Means, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof, and in which like characters of reference designate the same parts.

Our invention relates to a new and useful valve and operating means whereby the valve is controlled by certain predetermined conditions of the substance after it has passed through said valve—as, for example, the automatic maintenance of a certain level of hot water in a hot-water heater or other apparatus requiring similar service.

Our invention consists of the constructions, arrangements, and combinations of the parts hereinafter described, and briefed in each of the appended claims.

In the drawings illustrating our invention, Figure 1 is a front elevation view showing our invention as applied to a hot-water heater. Fig. 2 is a side elevation view of the same. Fig. 3 is an enlarged central vertical sectional view through the automatic valve. Fig. 4 is an enlarged view of a portion of the counterbalance-arm of the automatic valve, showing the sectional counterweights adapted to be secured thereto, said weights being in central vertical section. Fig. 5 is a plan view of one of the weights shown in Fig. 4. Fig. 6 is a sectional view showing means for attaching the weight-locking member to a smooth weight-rod.

In said drawings, 10 represents a hot-water heater or other chamber of suitable construction desirably piped and in which or an extension of which a suitable float or operating means 11 is mounted to be acted upon by the substance coming into said heater or chamber 10. In the specific instance shown in the drawings the float or operating means 11 is mounted upon a shaft 12, fulcrumed in and extending beyond a projection 14, projecting laterally from the chamber 10, said projection 14 being hollow and having an enlarged segmental-shaped chamber 15, communicat-

ing with the hollow of said projection 14, said chamber 15 and projection 14 being formed of two halves suitably packed and bolted together. Within the hollow of chamber 15 the float or operating means 11 is mounted, and the water coming from chamber or heater 10 through the hollow or projection 14 into chamber 15 causes said float or operating means 11 to rise and fall as the level of said water varies. Upon the outer end of shaft 12 is a crank 16, to which is fulcrumed one end of a member 17, having a rod 18 slidably mounted in its other end and adapted to be secured at different positions thereto by a set-screw or clamp 19. The remaining end of rod 18 is pivotally connected to a lever 20, secured to the valve-stem 21, which acts as the fulcrum of said lever 20, the remaining end of said lever 20 being provided with a suitable counterweight means 22, adapted to partially counterbalance the weight of lever 20, pitman connections 17 and 18, crank 16, and float or operating means 11, as well as to counterbalance the force exerted upon the valve-disk by the pressure of the water or other substance adapted to be closed thereby. It will thus be seen that the valve thus counterbalanced is rendered very sensitive to the action of the float or operating means 11, and at the same time said float or operating means 11 is rendered very sensitive and responsive to changes in the water-level. This is of great importance, as it enables all such apparatus requiring uniformity of water-level or uniform similar conditions to have such uniform conditions maintained with the utmost nicety and uniformity without the manipulation of an experienced engineer almost constantly attending it, as is necessary with devices where our invention is not used.

It will thus be seen that a comparatively small movement of the float or operating means 11 must open or close the valve, and in the accomplishment of this end our genius has provided such valve by departing from the ordinary construction of valve only by providing the valve-stem and valve with very coarse multiple threads 25 in place of the very fine threads theretofore provided, said multiple threads 25 being preferably a triple thread and so coarse or such a high

pitch that a quarter-turn or less of the valve-stem 21 will fully open or close the valve, and consequently the pitch of said threads 25 is such that but little pressure of the substance adapted to be closed by said valve is required to open said valve; but, as before stated, the counterweight means 22 counterbalances such pressure and other conditions and renders said valve highly sensitive and responsive to said float or valve-operating means 11, which in turn renders said float or valve-operating means 11 highly sensitive and readily responsive to variations in the water-level or other conditions adapted to operate said float or valve-operating means 11.

Since the counterweight means 22 is adapted to counterbalance the pressure upon the valve and part or all of the weight of the connections and the float or operating means 11, we have provided means for varying the counterbalancing influence of said counterbalancing means 22 in the instance shown in Figs. 1 and 2 by a weight 30, slidably mounted upon said lever 20 and adapted to be maintained in different positions of adjustment thereon by set-screw 31, clamping said weight 30 to said lever 20. However, very frequently wide variations of the counterbalancing pressure of the counterbalancing means 22 are required in places where it is impossible or not convenient to make the counterbalance-arm of lever 20 of sufficient length or the weight 30 of sufficient size to procure such adjustment, and for such cases we have devised the counterbalancing means shown in Figs. 4 and 5, in which the counterbalance-arm of the valve-lever 20^a is provided with a plurality of holes 40, through any one of which is adapted to pass a bolt 41, adapted to clamp said lever 20^a between the bifurcated ends 42 of a rod 43, to the opposite end of which is secured a weight 44, while any number of slotted weights 45 are adapted to be placed upon said rod 43 and secured to said weight 44. In the instance shown in the drawings said weights 44 and 45 are secured, as aforesaid, by threading rod 43 throughout a portion of its length and threading or otherwise securing weight 44 to the end thereof. Weight 44 has a circular projection 46 upon its upper surface, while weights 45 are each provided on opposite sides with a correspondingly circular recess and projection 47, said recesses and projections 46 and 47 being adapted to fit each other for interlocking said weights together, which interlocked position of said weights is maintained by a member 48, adjustably mounted upon said rod 43 to interlock with the upper weight. Said member 48 may be adjustably mounted on rod 43 in any desirable manner, it being adjustably mounted thereon in the instance shown in the drawings, Fig. 4, by being threaded thereto and in Fig. 6 by set-screw 49 clamping member 48^a to smooth rod 43^a. Any number of weights may be readily placed upon or removed from rod 43 by backing off member 48

and then raising the weights slightly and removing or inserting them upon rod 43, their slots permitting lateral removal or insertion. 70

The adjustability of the connection between the float or operating means 11 and the valve operator or lever 20 permits the variation at will of the height of the water-level at which the automatic valve is adapted to be closed. In the main supplying said automatic valve is a hand-operated valve 50 for shutting off the water when the apparatus is not in use, and which relieves the strain upon the automatic valve during periods of idleness and adds greatly to the life of the automatic valve. 75 80

Pipes 51 lead each at a different level from the feed-water heater 10 to the boiler, (not shown, but of usual construction.) so that the upper of the pipes 51 supplies the heater 10 with steam from the boiler to superheat the water therein, and the lower of said pipes 51 is the water-conduit between said heater 10 and said boiler. 85 90

Having now described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a valve-operating means, the combination of a feed-water heater, a feed-water inlet-pipe entering said heater near its top, a valve for said pipe, said valve having a stem 21 provided with coarse threads 25, a float in said feed-water heater, adjustable connecting means between said float and said valve-stem, whereby said valve may be operated by said float, and a plurality of pipes, each at a different level, connecting said feed-water heater with the boiler, substantially as specified. 95 100 105

2. In a valve-operating means, the combination of a feed-water heater, a feed-water inlet-pipe entering said heater near its top, a valve for said pipe, said valve having a stem 21 provided with coarse threads 25, means whereby said valve-stem may be operated, operating means in said feed-water heater, a crank for said operating means, an extensible pitman connecting said crank and said means whereby said valve may be operated, and a plurality of pipes, each at a different level, connecting said feed-water heater with the boiler, substantially as specified. 110 115

3. In a valve-operating means, the combination of a receptacle, a pressure-pipe leading into said receptacle, a disk valve in said pipe, means whereby said valve may be operated, floating means within said receptacle, for controlling said valve, a connection between said floating means and said means whereby said valve may be operated, and adjustable means independent of said float means and connection for counterbalancing the pressure in said pipe upon the disk of said disk valve, substantially as specified. 120 125 130

4. In a valve-operating means, the combination of a receptacle, a pressure-pipe leading into said receptacle, a disk valve for said pipe having stem 21, provided with coarse

multiple threads 25, a lever 20 secured to said valve-stem intermediate its ends, a float within said receptacle, a connection between said float and one arm of lever 20, and counterweight means connected to the remaining arm of said lever 20, substantially as specified.

5. In a valve-operating means, the combination of a receptacle, a pressure-pipe leading into said receptacle, a disk valve for said pipe having stem 21, provided with coarse multiple threads 25, a lever 20 secured to said valve-stem intermediate its ends, a float within said receptacle, a connection between said float and one arm of lever 20, and counterweight means adjustably mounted upon the remaining arm of said lever 20, and consisting of a rod 43, having a weight 44 secured thereto, a plurality of weights 45, and means whereby any number of said weights 45 may be removably secured to said rod 43, substantially as specified.

6. In a valve-operating means, the combination of a receptacle, a pipe therefor, a valve for said pipe having stem 21, having coarse multiple threads 25, a lever 20 secured to said valve-stem, a float within said receptacle, a connection between said float and lever 20, and counterweight means adjustably mounted upon said lever 20, and consisting of a rod 43, having weight 44 secured thereon, a plurality of slotted weights 45, having recesses and projections upon their opposite faces, a weight 48 adjustably secured to said rod 43, the adjacent faces of said weights 44 and 48 being provided with projections and recesses adapted to fit said recesses and projections upon said weights 45, substantially as specified.

7. The combination of receptacle, a pressure-pipe leading into said receptacle, a plurality of valves for said pipe, a float controlled

by the contents of said receptacle, one of said valves having its valve-stem provided with very coarse threads, a weight independent of said float and connected to said valve-stem having said coarse threads for normally keeping said valve closed, and a connection between said float and said valve-stem having said coarse threads, substantially as specified.

8. The combination of a receptacle, a pressure-valve for supplying said receptacle with its substance passed therethrough, means whereby said valve may be opened and closed by a slight movement, a float connected to said means for regulating said valve, and counterbalance means independent of said float and connected to said valve at a different point from said means whereby said valve may be opened and closed for counterbalancing the pressure upon said valve whereby said valve is rendered sensitive to the slight movement of said float, substantially as specified.

9. The combination of a valve, a stem therefor having very coarse threads whereby a slight movement of said stem will open and close said valve, a valve-disk on said stem and having a valve-seat in the body of said valve, counterbalance means for rotating said stem and counterbalancing the pressure upon said valve, whereby in the absence of said counterbalance means the pressure upon said valve-disk will turn said stem and open said valve, substantially as specified.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, at Dayton, Ohio, this 25th day of May, 1903.

FRANK J. PLATT.
JOHN RATCHFORD.

Witnesses:

GEO. W. KEPLER,
F. J. McCORMICK, Jr.