No. 874,466. PATENTED DEC. 24, 1907.

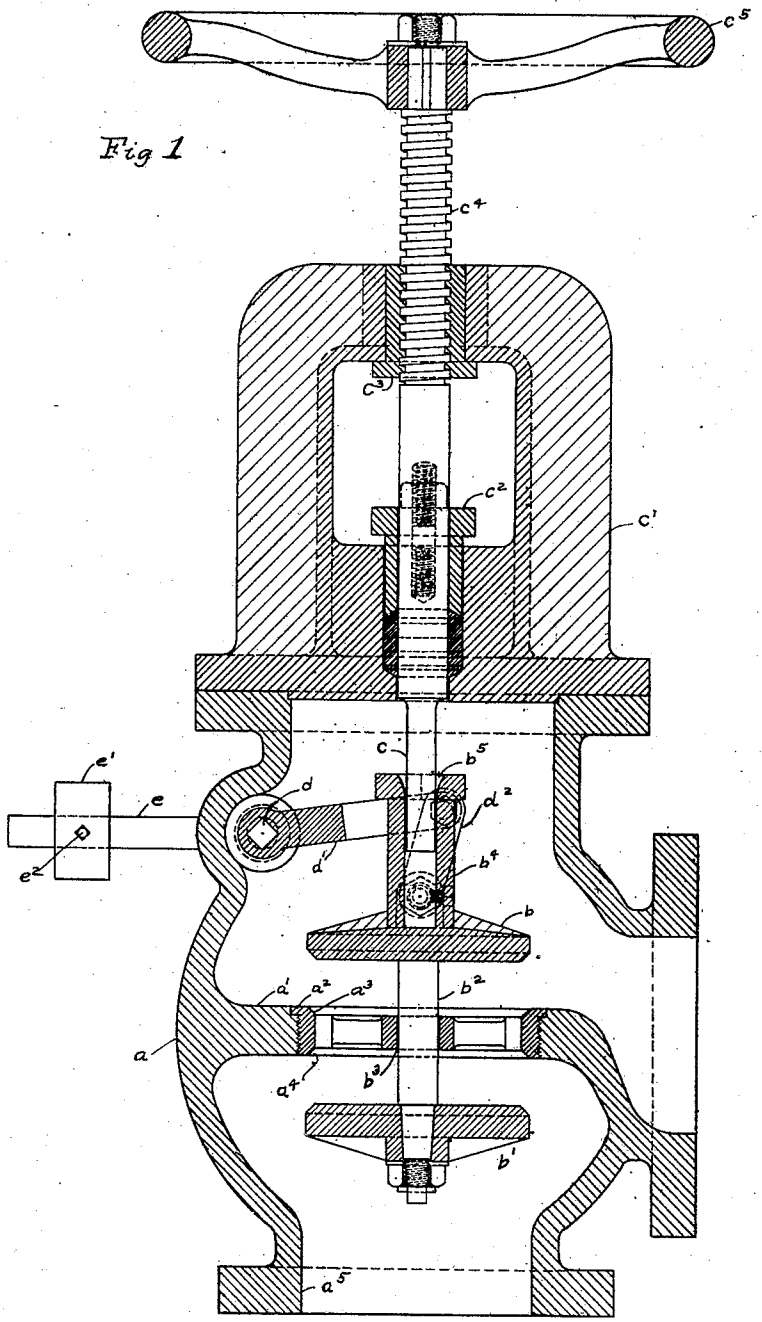
H. F. WEINLAND.

VALVE.

APPLICATION FILED MAY 13, 1907.

4 SHEETS—SHEET 1.

Fig 1



WITNESSES:

H. F. Weinland

Oliver H. Hanse

INVENTOR.

Henry F. Weinland

BY Percy Norton

ATTORNEY.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 874,466. PATENTED DEC. 24, 1907.

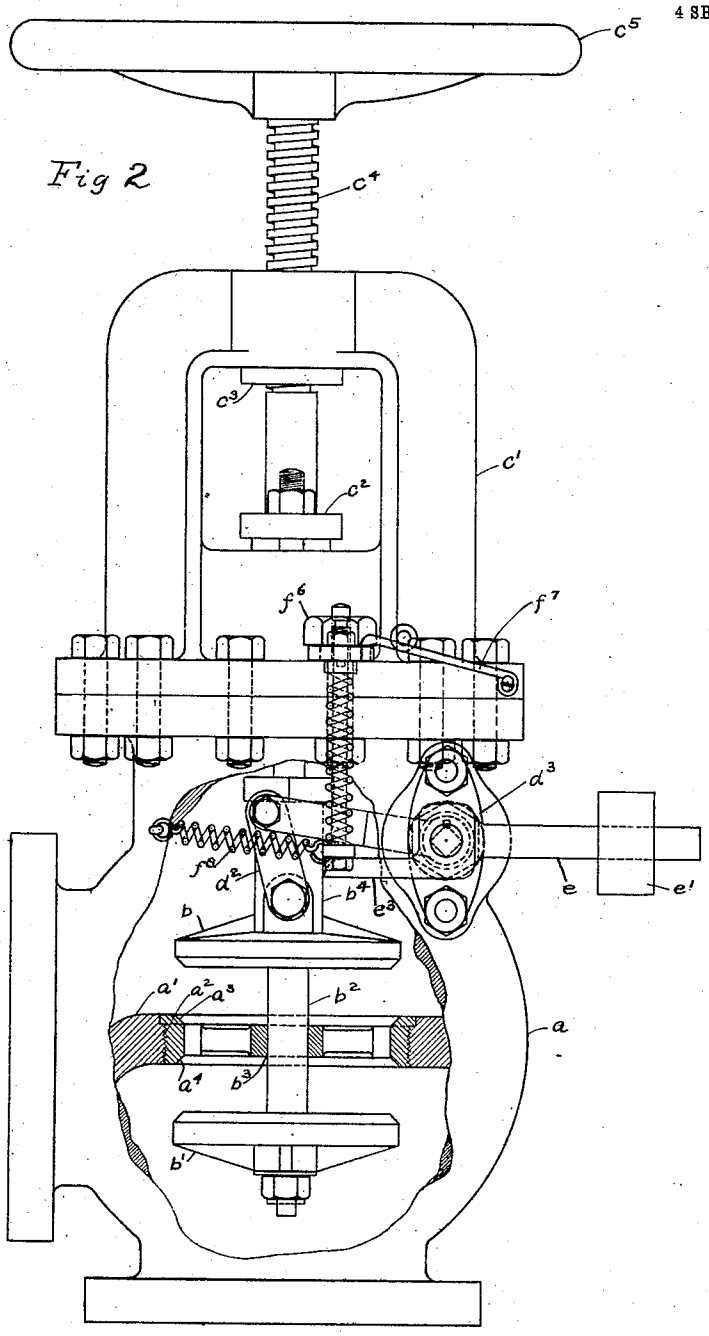
H. F. WEINLAND.

VALVE.

APPLICATION FILED MAY 13, 1907.

4 SHEETS—SHEET 2.

Fig 2



WITNESSES:

H. G. Weinland

Oliver H. Hauser

INVENTOR.

Henry F. Weinland

BY Percy Norton

ATTORNEY.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 874,466. PATENTED DEC. 24, 1907.

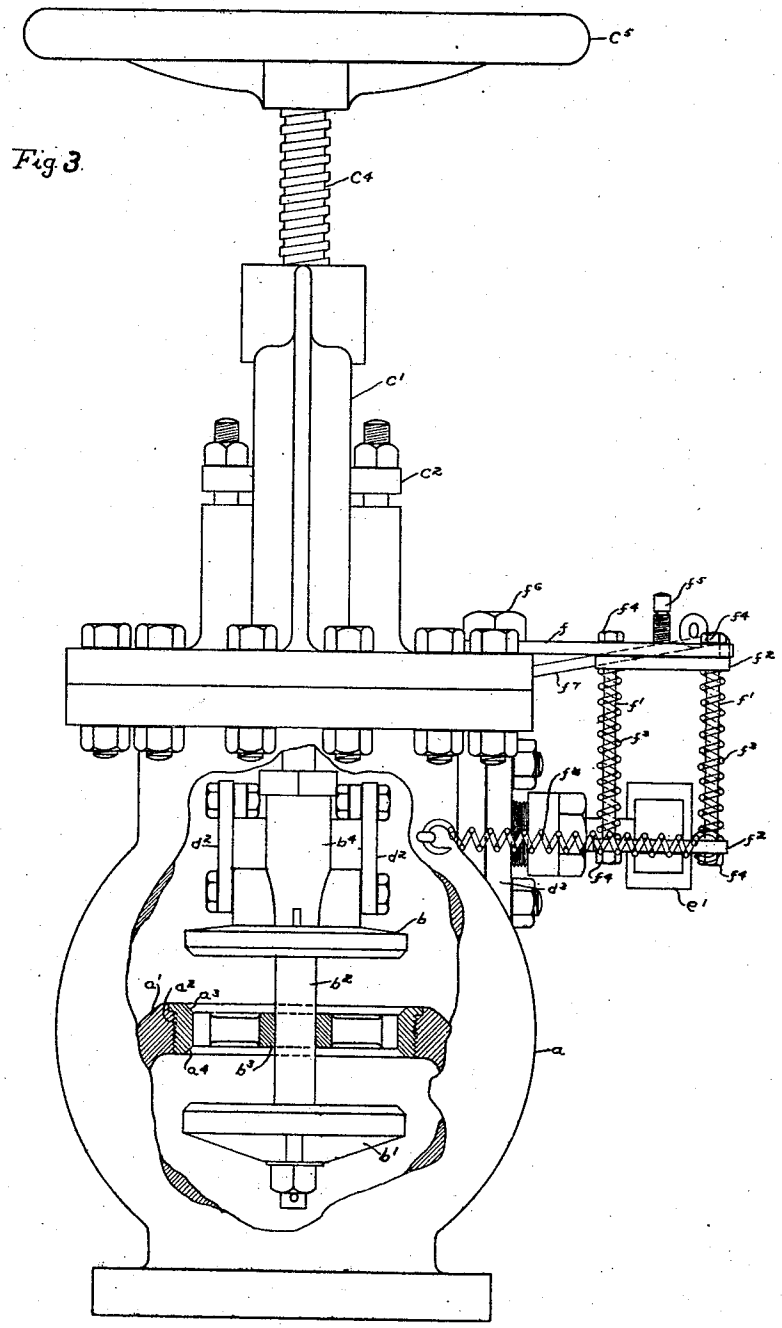
H. F. WEINLAND.

VALVE.

APPLICATION FILED MAY 13, 1907.

4 SHEETS—SHEET 3.

Fig. 3.



WITNESSES:

H. G. Weinland

Oliver A. Hauser

INVENTOR.

Henry F. Weinland

BY

Percy Norton

ATTORNEY.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 874,466. PATENTED DEC. 24, 1907.

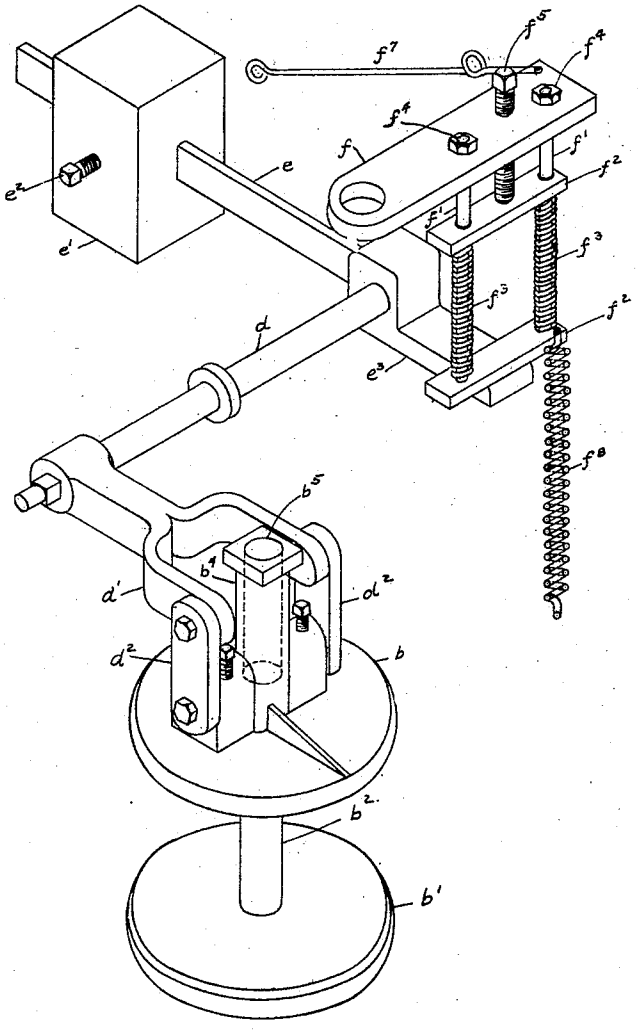
H. F. WEINLAND.

VALVE.

APPLICATION FILED MAY 13, 1907.

4 SHEETS—SHEET 4.

Fig 4



WITNESSES:

H. F. Weinland

Oliver H. Haase

INVENTOR.

Henry F. Weinland

BY Percy Norton

ATTORNEY.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY F. WEINLAND, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

VALVE.

No. 874,466. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed May 13, 1907. Serial No. 373,294.

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to valves, and more particularly to automatic valves.

The object of my invention is to provide a valve adapted for use when boilers are employed to supply steam for engines or heating or other purposes, and is so arranged that in the event an accident occurs to the boiler, such as the blowing out of a tube, the back pressure from the main will close the inlet from the boiler, or if the main is broken the pressure from the boiler will close the outlet to the main.

My invention is particularly adapted for use when several boilers are connected to a single main and used in combination, for if any one of the boilers gives way the valve will operate to cut it off from the others.

A further object of my invention is to provide means to control the action of the valve, while under pressure, to meet the varying conditions of the load, a good illustration of these changing conditions being an electric light plant where the load is essentially different at night from the requirements of the day time.

A further object of my invention is to provide means to balance the valve in its normal working position; to steady the valve under varying pressures and prevent its chattering.

A further object is to provide an additional safety device adapted to release the means employed to control the valve.

With these and other objects in view, my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings, Figure 1 is a vertical section of a valve constructed in accordance with my invention. Fig. 2 is an elevation, partly broken away, taken from the opposite side. Fig. 3 is another elevation, partly broken away, taken at right angles to Figs. 1 and 2; and Fig. 4 is a perspective view of the valve proper and the tension device.

Like letters represent the same parts in the several views.

In the drawings, a represents a valve casing, having a centrally-located annular-projection a^1 therein, within which a spider a^2 is screwed as shown, although it may be fixed in any suitable manner. The spider is provided with valve seats a^3 and a^4 upon opposite sides of same. The valve which I have shown comprises two disks b and b^1, fixed to the stem b^2, the disk b closing upon the upper seat a^3, and the disk b^1 closing against the under seat a^4. The valve stem b^2 is movable longitudinally through a bearing b^3 of the spider, and the disk b is provided with an extension b^4 having a recess b^5 adapted to receive the lower end of a valve rod c. A yoke c^1 is bolted to the valve casing for the purpose of carrying the valve rod as shown, a stuffing box c^2 being provided and a screw nut c^3 fixed to the yoke receives the screw-threaded portion c^4 of the rod c, so that when the hand-wheel c^5 is operated, it will raise or lower the valve-rod c to close or release the disk b of the valve.

Having shown the means necessary to manually close the valve against the flow of steam in either direction, I will now describe the means employed to balance the valve in its open position. Within an enlarged portion of the valve chamber, a rock-shaft d is journaled, having a knee-action connection to the valve by means of levers d^1 and d^2, the lever d^1 being rigidly fixed at one end to the rock-shaft, the lever d^2 being pivoted at one end to the valve and the other ends of said levers being pivoted together as shown; and to prevent side strain, in operation I preferably provide two sets of the levers d^1 and d^2 arranged in like manner on opposite sides of the valve, as particularly shown in Figs. 3 and 4.

The rock-shaft d extends through the valve casing and is provided with a stuffing-box d^3. A lever e is fixed to this extension of the rock-shaft, outside of the valve casing, and is provided with a movable weight e^1 having a set-screw e^2 to fix it in its adjusted position. The recess b^5 in the valve that receives the lower end of the rod c is of such length that when the rod c is raised the valve will have sufficient play to operate automatically by the fluid pressure through the valve in either direction.

With the rod c raised to give free play to the valve, the weight e^1 is adjusted to balance the valve in its open position, as shown

in Figs. 1, 2 and 3, and this so steadies the valve in operation as to prevent the chattering of the valve on its seats under varying pressure.

To resist the fluid pressure in one direction, which in steam practice will ordinarily be from the boiler through the valve inlet a^5, I provide a tension device or elastic stop, comprising a stop-plate f, secured to the valve-casing, having two pendent bolts f^1, which carry the movable plates f^2, and the spiral springs f^3 inclosing said bolts, between the plates f^2; the bolts f^1 being provided with heads f^4 to hold the frame in position on the stop-plate f. The lever e is provided with a tail e^3, extending beyond the rock-shaft opposite its weighted end, said tail being of sufficient length to engage the lower plate f^2 of the tension device. When the rod c is raised to permit of the automatic movement of the valve, the movable weight e^1 is adjusted so as to balance the valve in its open position, with the tail e^3 resting lightly against the lower plate f^2. It will be seen that when the fluid pressure comes through the inlet, the arrangement is such that the tension device tends to resist this pressure and hold the valve open. By the use of a set-screw f^5, threaded through the stop-plate f and engaging the top-plate f^2, the tension of the device may be adjusted to resist the fluid pressure to a predetermined degree and to vary said resistance as conditions may require, while the valve is under pressure; but the adjustment of the tension device is such that if a break occurs in the main, the pressure through the inlet a^5 will close the disk b^1 upon its seat and hold it there, thus preventing further escape of steam into the main.

In the event the tension device should, from any cause, become rigid, and thereby prevent the closing of the valve, I have provided means for throwing it out of engagement, and for this reason I have pivoted the stop-plate f on the bolt f^6 of the casing, so that the frame of the tension device will swing in a horizontal plane. It is normally held in engagement with the tail e^3 of the lever by means of a hook f^7, pivoted to the valve-casing and adapted to engage a perforation in the stop-plate. A tension spring f^8 attached to the lower plate f^2 of the tension device and to the valve-casing, is adapted to instantly draw the frame of the tension device away from and out of engagement with the tail e^3, of the lever, when the hook f^7 is released, thus permitting the disk b^1 to close upon its seat. The weight e^1 is primarily for the purpose of balancing the valve, and to prevent the chattering of the valve under variance of pressure, and in the event of a burst in the boiler, the disk b will close upon its seat and be held there by the pressure from the main, but if for any reason it is desirable to resist the closing of the valve in this direction, the adjustment can be made by the movable weight e^1.

Having thus described my invention, I claim:

1. A valve, a valve casing having an inlet and outlet, devices to hold the valve in open position against a predetermined pressure in either direction, and means accessible while the valve is under pressure, to adjust said devices to varying pressures.

2. A valve casing having an inlet and outlet, a valve adapted to close either the inlet or outlet, devices to hold the valve in open position against a predetermined pressure in either direction, and means, accessible while the valve is under pressure, to adjust said devices to varying pressures.

3. A valve, a valve casing having an inlet and outlet, an elastic stop having a connection with the valve and adapted to resist the movement of the valve, and means, accessible while the valve is under pressure, to adjust the stop to varying pressures.

4. A valve, a valve casing having an inlet and outlet, a spring having a connection with the valve and adapted to resist the movement of the valve, and means, accessible while the valve is under pressure, to adjust the spring to varying pressures.

5. A valve, a valve casing having an inlet and outlet, a tension device having a connection with the valve and adapted to resist the movement of the valve, and means, accessible while the valve is under pressure, to adjust the tension device to varying pressures.

6. A valve, a valve casing having an inlet and outlet, a device engaging said valve to manually control the valve, and means, acting through said device, to balance the valve.

7. A valve, a valve casing having a pair of seats, a valve adapted to close on either of said seats, a device engaging the valve to positively move the valve toward either seat, and means, acting through said device, to balance the valve.

8. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a lever having a connection with the valve to positively move it toward either seat, and means, acting through said lever, to hold the valve in open position against a predetermined pressure in either direction.

9. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a lever having a connection with the valve to positively move the valve toward either seat, devices acting through said lever to hold the valve in open position against a predetermined pressure in either direction, and means to adjust said devices to varying pressures.

10. A valve, a valve casing having an inlet and outlet, a lever having a connection with the valve, devices acting through said lever to balance the valve and to oppose the fluid

pressure in one direction, and means to adjust said devices to varying pressures.

11. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a rock-shaft having a connection with the valve to positively move the valve toward either seat, and means, acting through said rock-shaft, to hold the valve in open position against a predetermined pressure in either direction.

12. A valve, a valve casing having an inlet and outlet, a rock shaft having a connection with the valve, devices acting through the rock shaft upon the valve to oppose the fluid pressure in either direction, and means to adjust said devices to varying pressures.

13. A valve, a valve casing having an inlet and outlet, a rock shaft having a connection with the valve, devices acting through the rock shaft to balance the valve and to oppose the fluid pressure in one direction, and means to adjust said devices to varying pressures.

14. A valve, a casing therefor, a lever, a connection from the valve to said lever, an elastic stop for said lever, a device to vary the tension of the stop, and means to throw said stop out of operating position.

15. A valve casing having a pair of seats, a valve adapted to close on either of said seats, an elastic stop, a connection adapted to engage said valve and stop to resist the movement of the valve in one direction, and means to vary the resistance of the stop.

16. A valve casing having a pair of seats, a valve adapted to close on either of said seats, an elastic stop, a connection to the valve adapted to engage the stop, and means to throw the stop out of operating position.

17. A valve casing having a pair of seats, a valve adapted to close on either of said seats, an elastic stop, a connection to the valve adapted to engage the stop, a device to vary the resistance of the stop, and means to throw the stop out of operating position.

18. A valve, a valve casing having an inlet and outlet, a tension device having a connection with the valve to resist the movement of the valve, and means to vary the resistance of the tension device while the valve is under pressure.

19. A valve, a valve casing having an inlet and outlet, a tension device having a connection with the valve to resist the movement of the valve under pressure, and means to throw the tension device out of operating position.

20. A valve, a valve casing having an inlet and outlet, a tension device having a connection with the valve to resist the movement of the valve under pressure, means to vary the resistance of the tension device and means to throw the tension device out of operating position.

21. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a lever, a connection from the valve to said lever, means imposed on said lever to balance the valve, and a tension device adapted to engage said lever to resist the fluid pressure against the valve in one direction.

22. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a lever, a connection from the valve to said lever, means imposed on said lever to balance the valve, an elastic stop adapted to engage said lever to resist the fluid pressure against the valve in one direction, and means to vary the tension of said stop.

23. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a lever, a connection from the valve to said lever, means imposed on said lever to balance the valve, an elastic stop adapted to engage said lever to resist the fluid pressure against the valve in one direction, means to vary the tension of said stop, and a device to throw said stop out of operating position.

24. A valve casing having a pair of seats, a valve adapted to close upon either of said seats, a rock shaft having a knee action connection with the valve, and devices acting through the rock shaft upon the valve to oppose the fluid pressure in either direction.

25. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a rock shaft having a knee action connection with the valve, and devices acting through the rock shaft to balance the valve and to oppose the fluid pressure in one direction.

26. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a rock shaft having a knee action connection with the valve, and devices acting through the rock shaft to balance the valve and to oppose the fluid pressure in one direction, and means to adjust said devices.

27. A valve casing having a pair of seats, a valve adapted to close on either of said seats, a rock shaft having a knee action connection with the valve, and devices acting through the rock shaft to balance the valve and to oppose the fluid pressure in one direction, and means independent of said rock shaft to manually close the valve.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HENRY F. WEINLAND.

Witnesses:

CLIFTON P. GRANT,

T. J. MCCORMICK.