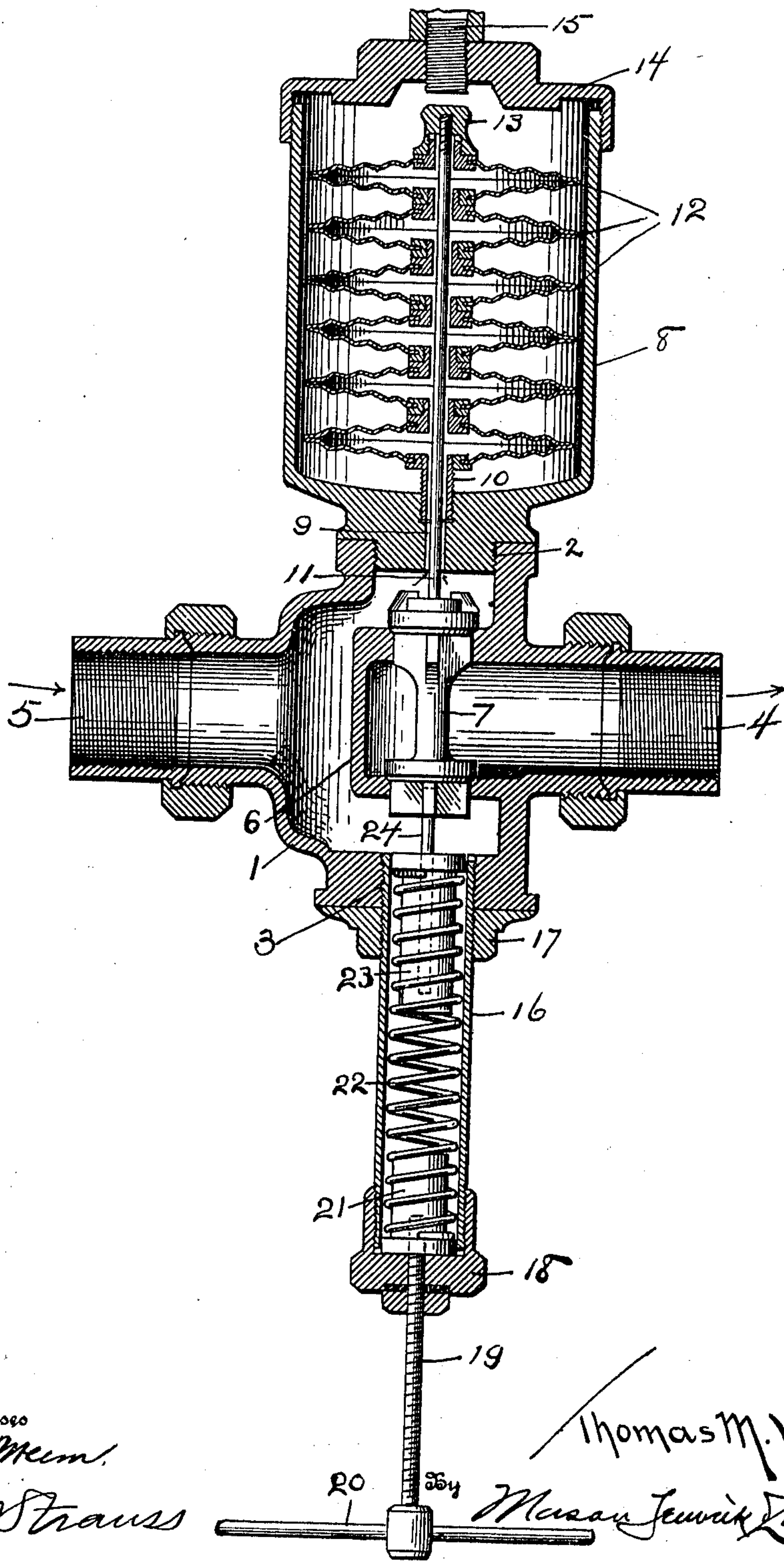


T. M. WILKINS.
 FLUID PRESSURE VALVE REGULATOR.
 APPLICATION FILED AUG. 18, 1909.

970,284.

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Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS M. WILKINS, OF EAST RANDOLPH, NEW YORK, ASSIGNOR OF FIVE-SIXTEENTHS TO W. E. ZIERDEN, OF JOHNSONBURG, PENNSYLVANIA, ONE-FOURTH TO JOHN G. WHITMORE, OF RIDGWAY, PENNSYLVANIA, AND SEVEN-SIXTEENTHS TO ZIERMORE REGULATOR COMPANY, OF JOHNSONBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FLUID-PRESSURE VALVE-REGULATOR.

970,284.

Specification of Letters Patent. Patented Sept. 13, 1910.

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To all whom it may concern:

Be it known that I, THOMAS M. WILKINS, a citizen of the United States, residing at East Randolph, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Fluid-Pressure Valve-Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to fluid pressure regulators for valves and has for an object to provide a regulator comprising one or more diaphragms with means for exerting pressure upon both the interior and exterior of the diaphragms.

A further object of the invention is to provide in combination with a valve casing, a casing in communication with the valve casing, with one or more diaphragms disposed within the last-mentioned casing, and means for introducing fluid under pressure within the diaphragms and within the casing and around the diaphragms.

With these and other objects in view, the invention comprises certain novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

The drawing presents a diametrical vertical sectional view of a valve casing to which is attached the fluid pressure regulator of the present invention.

A valve casing 1 is employed open both at the top and the bottom as at 2 and 3 and with the usual outlet and inlet passages 4 and 5. Within the casing a partition 6 is employed with a valve 7 therein producing a balance valve of substantially the usual type. Into the opening 2 in the top of the valve a casing 8 is inserted and secured in any approved manner as by the screw threads shown, such casing communicating by means of a passage 9 with the interior of the valve casing. Into the passage 9 a screw-threaded sleeve 10 is inserted forming a continuation of the passage 9 through which passages extends a valve stem 11 connected with the valve 7. Within the casing 8 any approved number of diaphragms 12 are located communicating interiorly with the passages 9

and 10 and secured at their lower sides to the sleeve 10 and with the valve stem 9 secured to the upper part of the diaphragms by means of a cap 13 or otherwise so that fluid pressure admitted from the valve casing 1 passes upwardly through the passage 9 and sleeve 10 into and exerts pressure upon the interior of all of the diaphragms. It will be apparent that as pressure is exerted within the diaphragms the diaphragms will be expanded to lift the cap 13 and therewith the valve 7 which is connected with such cap by means of the valve stem 11.

The casing 8 is closed in any approved manner at the upper end as by the cover 14 and means is provided as the pipe 15 introduced within said casing for introducing fluid pressure into the casing upon the exterior of the diaphragms 12.

The lower opening 3 of the valve casing is closed by a tube 16 with a jam nut 17 employed to maintain the tube rigidly in position and closed at its lower end by a cap 18 through which extends the screw 19 with a handle or handwheel 20 for manipulating the said screw. Within the tube 16 a block 21 is disposed to receive immediate pressure from the screw 19 with a spring 22 associated with said block bearing at its opposite end against a block 23 which is movable within the tube 16 against the tension of the spring 22 and a stem 24 is provided connecting the block 23 with the valve 7 whereby the pressure of the spring 22 is communicated directly to the valve 7.

It will be apparent that by the use of the diaphragms and the fluid pressure upon opposite sides of the diaphragm only the valve will be subjected to pressure equal to the difference of the pressure in the fluids operating upon the diaphragms, but the pressure upon the valve 7 may be varied by the manipulation of the screw 19 whereby the tension of the spring 22 is increased or decreased as occasion may require.

While the device is adapted for various uses it is intended especially as a boiler feed water pump regulator. In use the device is normally so set that the diaphragms 12 hold the valve 7 open. Say for instance, the valve is set to be held open at five pounds pressure and steam is admitted to the inlet

5 passes at once through the passage 9 and sleeve 10 into the interior of the diaphragms. This causes an expansion of the diaphragms to still further open the valve. The opening
 5 of the valves is limited by the cap 13 striking against the pipe 15 at the top of the casing 8. At the same time feed water from the pump is admitted through the pipe 15 to the casing 8 upon the exterior of the dia-
 10 phragms 12. If the diaphragms are set to hold the valve open at five pounds pressure it will be apparent that it will require feed water pressure five pounds in excess of the steam pressure to close the valve. In this
 15 way the excess pressure of feed water will close the valve and stop the admission of steam to the pump.

While as above stated an example of five pounds excess pressure has been mentioned
 20 it will, of course, be apparent that the valve may be set to any pressure desired so that any pressure in excess of steam pressure either more or less than the example mentioned will operate the valve in the same
 25 manner.

What I claim is:—

The combination with a valve casing and

a longitudinally slidable valve disposed within the casing, of valve stems extending upon opposite sides of the valve and through 30 the casing, a receptacle secured to one side of the casing and in communication therewith and into which one of the valve stems extends, flexible diaphragms disposed with- 35 in the receptacle and having their interiors in communication with the valve casing, means at the remote ends of the diaphragms for connecting such diaphragms rigidly with the valves stems, means to admit a fluid into the receptacle about the exterior of the flexi- 40 ble diaphragm, a tube disposed at the opposite side of the valve casing and into which the other valve stem extends, a spring disposed within the tube and adapted to normally hold the valve from its seat, and 45 means to adjustably vary the tension of the spring upon the valve.

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

THOMAS M. WILKINS.

Witnesses:

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