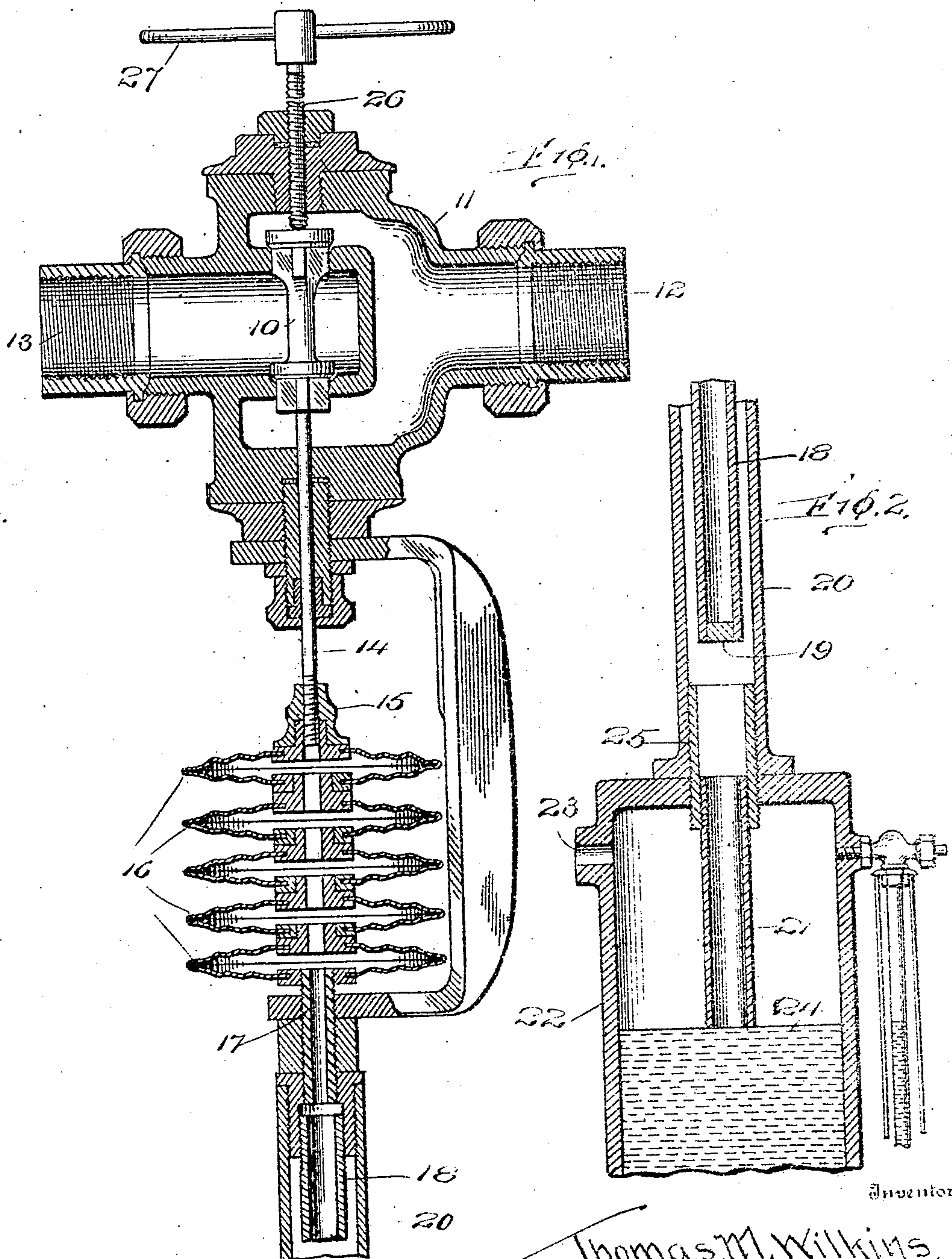


T. M. WILKINS.
VALVE REGULATOR.
APPLICATION FILED MAY 6, 1910

Patented Nov. 22, 1910.

976,713.



Witnesses

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VALVE-REGULATOR.

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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 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 regulating valves, and has for an object to provide a valve adapted to control the supply of water to a boiler.

A further object of the invention is to provide in combination with a valve diaphragms adapted to actuate the valve with spring means for regulating the tension on the valve and with improved means for expanding the diaphragms to open the valve when the water in the boiler falls below the required height.

A further object of the invention is to provide in connection with the water column of a steam boiler a tube extending to the water line and surrounding another tube in which is a confined liquid, such liquid being also confined within the diaphragms regulating the valve.

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.

In the drawings:—Figure 1 is a view in longitudinal section of a balanced valve and diaphragms for actuating the valve. Fig. 2 is a view in vertical section of the top of the water column of a boiler showing the tube extending therein to the water line and about the tube connected with the diaphragms.

Like characters of reference designate corresponding parts throughout the several views.

The invention which forms the subject-matter of the present application is intended to control the introduction of steam to a pump or feed water to a boiler and embodies a balanced valve 10 disposed in the valve casing 11 of substantially the usual and ordinary balanced valve type. Communicating with the valve casing 11 are nipples or unions 12 and 13 either one of which could

serve as the inlet and the other the outlet for steam to the pump or water to the boiler.

Extending through the valve casing is a valve stem 14 rigidly connected at its lower end with a nut or collar 15 which forms the upper extremity of a battery of flexible diaphragms 16 connected in the usual manner and secured at the lower end to a threaded nipple 17. The threaded nipple 17 is in communication with a tube 18 which is plugged as at 19 at the lower end and is surrounded by a tubular casing 20. The tube 18 and the diaphragm 16 are filled with water or any desired or approved liquid and the tubular casing 20 is in communication by means of a tube 21 with the top of the water column 22 connected with a steam boiler. A passage 23 is provided for admitting steam into the top of the water column above the water line 24. The tube 21 extending downwardly into the water column may be adjusted as to height by means of a coupling 25 screw-threaded and by reason of such screw-threading adjustable vertically. To limit the movement of the valve 10 a screw 26 is preferably inserted through the top of the valve casing 11 and provided with engaging means 27 for operating the same although the use of such screw and operating means is not essential to the present invention.

In operation the diaphragm 16 exerts tension upon the valve stem 14 to hold the valve to seat under normal temperature. When the water line 24 is above the lower end of the tube 21 such tube 21 and tubular casing 20 will be filled with the water which will surround the tube 18 which is filled with water or other fluid. When the water line drops below the end of the tube 21 the water passes from out the tubular casing 20 and tube 21 and such tubular casing and tube are then filled with steam which surrounds the tube 18 and raises the temperature of the liquid therein either vaporizing such liquid or expanding it without vaporizing as the case may be and thereby expanding the diaphragm 16 and opening the valve 10. The opening of the valve 10 automatically admits steam to the pump or to admit water to the boiler when the water is supplied under constant pressure.

With the device constructed as shown and the diaphragm and tube 18 filled with water

it is found that the action is very acute and practically instantaneous both as to opening and closing the valve. The admission of steam to the casing 22 almost instantly raises the temperature of the liquid contained in the tube 18 to such an extent as to open the valve 10 while the moment the water line reaches the tube 21 the steam within the tube 21 and the tubular casing 20 is condensed and the water flows up and surrounds the tube 18 thereby reducing the temperature of the confined liquid such temperature further being reduced by the great radiation surface of the diaphragms themselves.

15 What I claim is:—

The combination with a valve casing and reciprocating valve mounted therein of a valve stem extending outwardly through the

valve casing, an adjusting screw inserted through the valve casing and adapted to 20 variably limit the movement of the valve, hollow diaphragms connected with and to operate the valve stem, a closed tube communicating with the interior of the diaphragms, a casing surrounding the tube, a 25 water column carrying and communicating with the casing, and a tube extending downwardly from the casing a predetermined variable distance into the water column.

In testimony whereof I affix my signature 30 in presence of two witnesses.

THOMAS M. WILKINS.

Witnesses:

E. P. CRUMP,
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