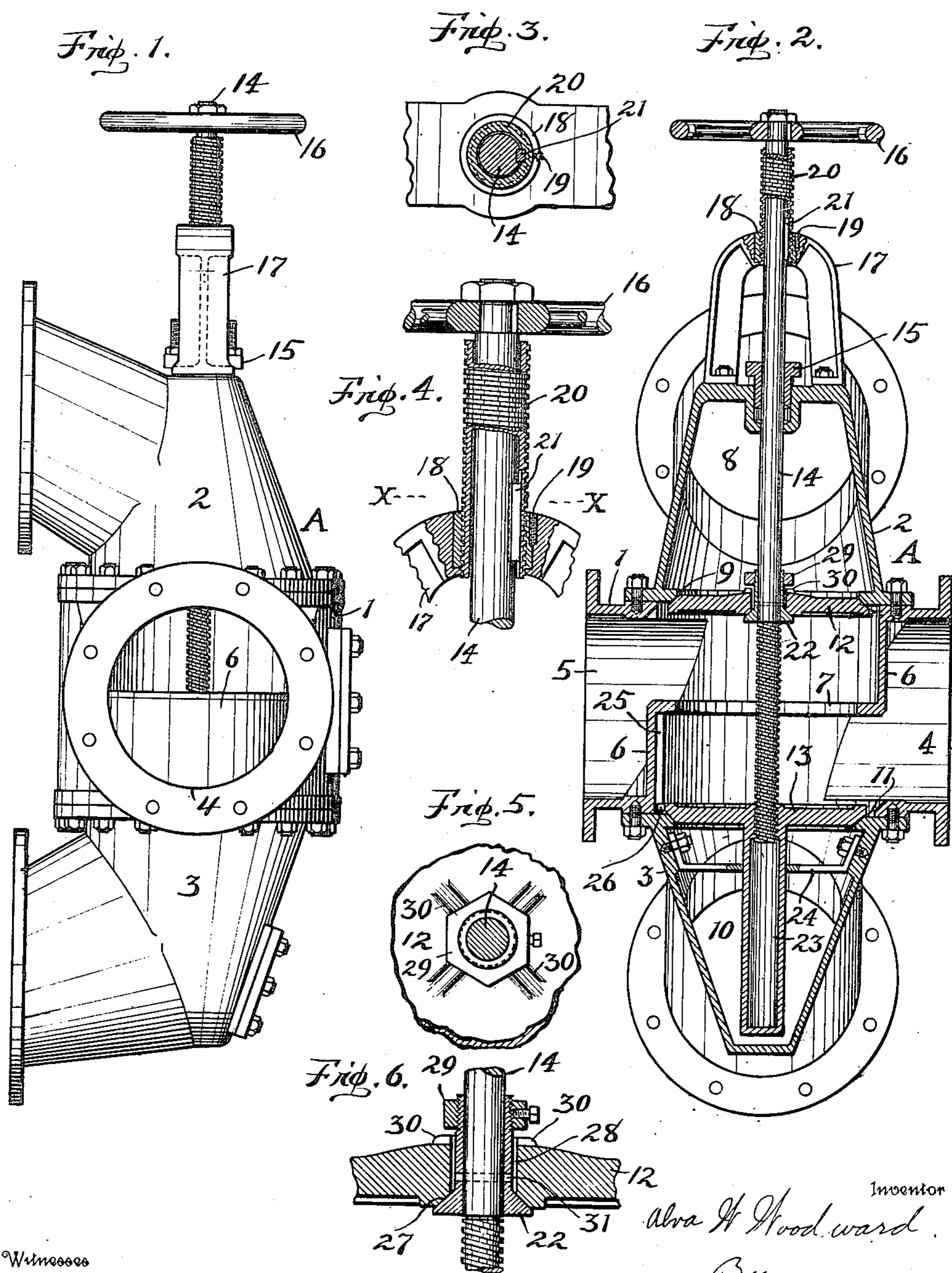


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 BY-PASS VALVE.
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Patented Aug. 1, 1911.



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BY-PASS VALVE.

999,536.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALVA W. WOODWARD, a citizen of the United States of America, and resident of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in By-Pass Valves, of which the following is a specification.

This invention relates to improvements in by-pass valves for gas, steam, water and other fluids, and the object thereof is to provide a controlling unit for fluids adapted to cause the flow of the fluid to pass directly through the unit from the supply main, or, instead, cause the flow to pass through the unit after first passing through a pipe or other circulating system accordingly as the valve mechanism is set, and to so construct the unit with its valve mechanism that the operation of opening or closing of the passage for the direct flow will effect the opening or closing of the passage for the flow of the fluid through the circulating system. This object is accomplished by the construction illustrated in the accompanying drawings in which—

Figure 1, is a side elevation of the unit; Fig. 2, is a vertical central section of Fig. 1. in a plane at right angles thereto; Fig. 3, is a detail view showing a cross section on the line X—X of Fig. 4.; Fig. 4, is a detail view, partly in vertical section, showing the threaded sleeve for the operating rod; Fig. 5, is a detail view showing a plan of Fig. 6.; and Fig. 6, is a detail view showing a vertical section of the pilot valve and contiguous parts of the apparatus. Figs. 3 to 6 inclusive are drawn upon an enlarged scale.

Similar characters of reference indicate corresponding parts throughout the several views, and, referring now to the same: The invention comprises a casing A having three parts: a central part 1; upper part 2; and lower part 3. The central part has a supply opening 4 and discharge opening 5 which are separated by an internal partition 6 having a valve-way 7 therein. The upper part 2 of the casing has an inlet opening 8, and a valve-way 9 that affords communication with the discharge opening 5 of the central part 1. The lower part 3 of the casing has an outlet opening 10, and a valve-way 11 that affords communication with the supply opening 4 of the central part 1. The valve-

ways 7, 9, and 11 are horizontally disposed and are arranged in vertical alinement.

12 and 13 are valves, respectively, for the valve-ways 9 and 11, and are adapted respectively to close the valve-way 7 in the partition 6 from opposite sides.

An operating rod 14 extends centrally through the valve-ways 7, 9, and 11, and through a stuffing box 15 in the top of the upper part 2. The lower end of the rod is screwthreaded and the upper end has fixed thereon a hand-wheel 16 by which the rod is manipulated. The yoke 17 surmounts the casing and has fixed in its upper part a removable, internally threaded, collar 18 that is held in place by a screw 19. Upon the upper part of the rod 14 is an externally screw-threaded sleeve 20 that screws into the collar 18, and is secured loosely upon the shaft by a key 21 that allows longitudinal movement of the rod in the sleeve, and also causes the sleeve to turn with the rod. The threads on the lower part of the rod and those on the sleeve are shown in the drawings as left hand, it being essential that they correspond in that respect though right hand threads may be employed as well. But, the threads on the rod are of double the lead of those on the sleeve.

The valve 13 has a hollow stem 23 that extends through a guide 24, and the rod 14 has threaded connection with the valve and is adapted to project into the hollow stem as the valve is raised. A vertical rib 25 on the partition 6, adjacent the side of the valve 13, is engaged by lugs 26 on the edge of the said valve and prevents the valve from turning. The valve 12 has a central pilot valve 22 which is flared at its lower end and is adapted to seat upwardly against a corresponding face 27 on the valve 12. The central bore 28 of the valve 12 is somewhat larger than the upper portion of the pilot valve and therefore affords a passageway therethrough for fluid when the lower flared end is not seated. A collar 29 is secured to the upper part of pilot valve above the valve 12, and lugs 30 on the top of the valve 12, adjacent its bore 28, serve to prevent the collar 29 from closing the passageway through the bore when the pilot valve is moved downward. The pilot valve is fixed upon the rod 14 by means of a pin 31 so that the valve 12 will be carried upward or

downward by the pilot valve as the case may be.

In the operation of this invention, the casing is connected with its central part in line
 5 with a gas or other main, so that when the valve mechanism is set as shown in Fig. 2, the fluid will flow through the supply opening-4, main valve-way 7, and on through the discharge opening 5; the circuit openings 8
 10 and 10 are connected respectively with corresponding terminals of a gas scrubber, heater, cooler or other appliance having a pipe or other circulating system. When it is desired that the flow through the main and
 15 central section 1 shall be diverted through the circulating system (not shown), the hand wheel is turned in the proper direction, and consequently the pilot valve will be carried with the rod 14 downward, and will leave
 20 its seat on the valve 12 if the latter tends to remain seated. The lower valve 13 remains upon its seat during the turning movement of the rod 14 until the latter passes downwardly in the sleeve 20 sufficiently for the
 25 hub of the hand-wheel 16 to impinge against the top of said sleeve. The further downward movement of the rod 14 is dependent upon the downward movement of the sleeve. The threads on the lower end of the rod
 30 having greater lead than those on the sleeve, will cause the valve 13 to move upwardly upon the rod, as the latter is turned, at a greater velocity than that of the sleeve 20 in its downward movement in the yoke.
 35 Thus the fluid may enter the circulating system through the bore of the valve 12, which will have the effect of equalizing the pressure upon both sides of each valve, and the tendency of the valves to remain seated due
 40 to greater pressure within the main is overcome. The valves 12 and 13 are drawn toward each other by turning the rod until the main valve-way 7 is closed upon either side by the valves 12 and 13, and the valve-ways
 45 9 and 11 are consequently opened to allow the fluid to pass through the circuit. It will thus appear that in opening the circuit valve-ways 9 and 11, the main valve-way 7 becomes closed, and in opening the latter, the
 50 former become closed, and thus accomplishing the object of the invention.

Having described my invention, what I claim and desire to secure by Letters Patent is:

55 1. In a by-pass valve, a casing having a main valve-way and two by-pass valve-ways; two valves arranged to close the main valve-way, one upon either side thereof, and each being also adapted to close one of said
 60 by-pass valve-ways; and an operating rod with means in connection therewith to adjust said valves.

2. In a by-pass valve, a casing having a main valve-way and two by-pass valve-ways, and having also supply and discharge

openings communicating respectively with the main valve-way, and inlet and outlet openings communicating respectively with the corresponding by-pass valve-ways, one of said by-pass valve-ways communicating
 70 also with the supply opening and the other with the discharge opening; two valves arranged to close the main valve-way, one upon either side thereof, and each being also adapted to close one of said by-pass valve-ways; and means to adjust said valves.
 75

3. In apparatus of the class described, a unit composed of a casing having therein a main valve-way and two by-pass valve-ways and a valve mechanism consisting of an
 80 operating rod and two valves in connection therewith, said valves being arranged to close the two by-pass valve-ways, leaving the main valve-way open, or to close the main valve-way and leaving the by-pass
 85 valve-ways open, accordingly as the valve rod is manipulated.

4. In apparatus of the class described, a casing having a central part, upper part and lower part, the said central part having an
 90 internal partition with a valve-way therein, a valve-way between said lower part and the central part, and another valve-way between the central part and said upper part, the two latter valve-ways communicating re-
 95 spectively with the central part upon opposite sides of said partition; and two valves in connection with means to operate the same adapted to close the latter two valve-ways, leaving the valve-way in said partition
 100 open, or close the valve-way in the partition, leaving the other valve-ways open accordingly as the operating means for the valves is adjusted.

5. In apparatus of the class described, a
 105 casing having therein a main and two by-pass valve-ways horizontally disposed and in vertical alinement; an operating rod extending into the casing and through said valve-ways; a valve between the main and
 110 lowermost valve-ways, having screw-threaded connection with the rod; another valve between the main and upmost valve-ways having connection with the rod; a collar mounted in fixed relation with the casing;
 115 and a sleeve keyed loosely on the rod and affording the latter longitudinal play therein and having screw-threaded relation with the collar.

6. In apparatus of the class described, a
 120 casing having therein a main and two by-pass valve-ways horizontally disposed and in vertical alinement; an operating rod extending into the casing and through said valve-ways; a valve between the main and
 125 lowermost valve-ways, having screw-threaded connection with the rod; another valve between the main and upmost valve-ways having a central bore; a pilot valve arranged loosely in said bore and having fixed connec-
 130

tion with the rod; and means for turning and longitudinally moving the rod.

7. In a by-pass valve, a casing having a main valve-way and two by-pass valve-ways,
5 each horizontally disposed and arranged in vertical alinement with the others; two valves, one for each of the by-pass valve-ways and adapted also to close the main valve-way; and an operating rod having
10 screw-threaded connection with one of said

valves and fixed connection with the other and being adapted to be turned and moved longitudinally to adjust said valves.

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

ALVA W. WOODWARD.

Witnesses:

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