No. 760,594. PATENTED MAY 24, 1904.

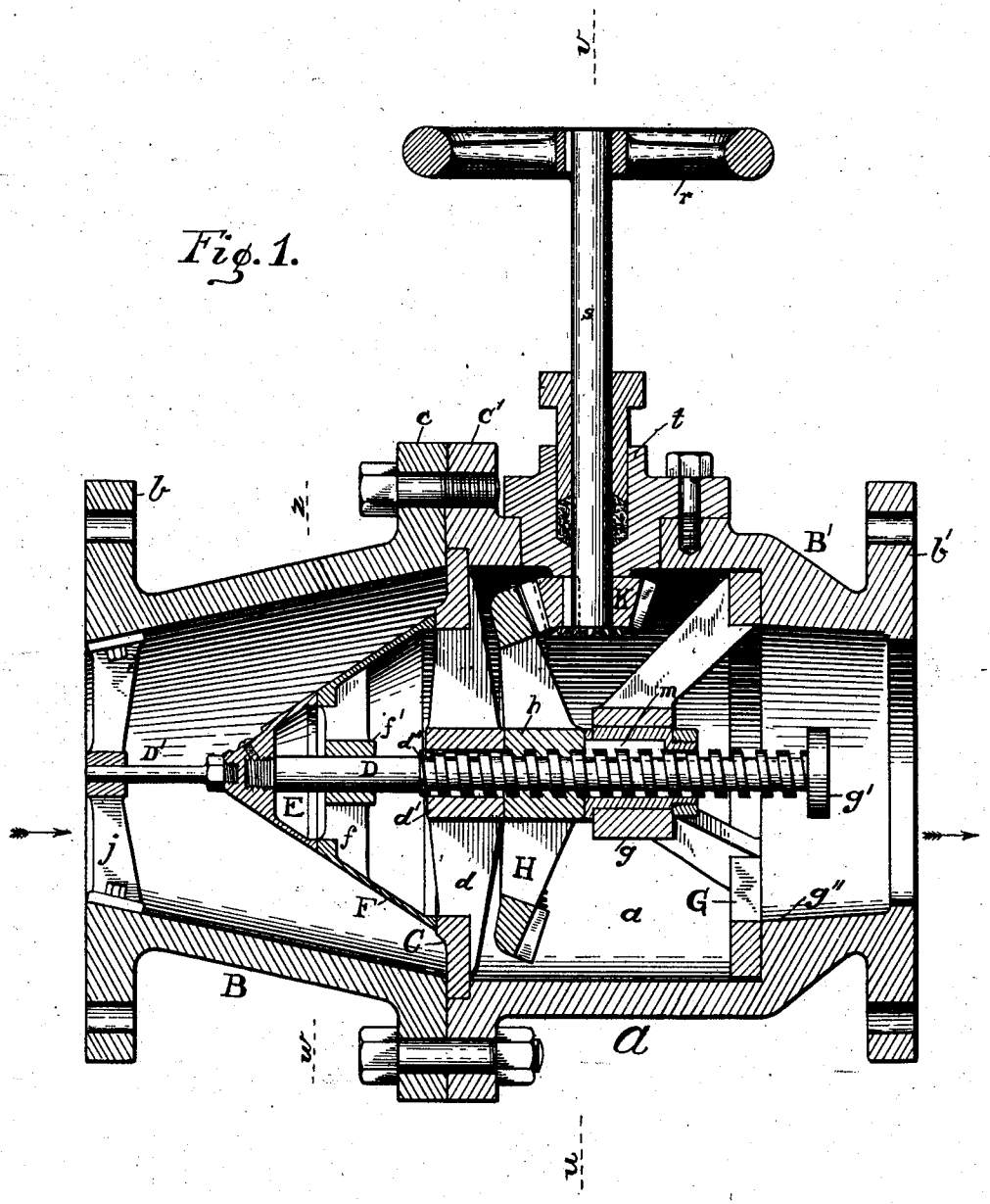
F. W. A. WIESEBROCK.

VALVE.

APPLICATION FILED MAY 16, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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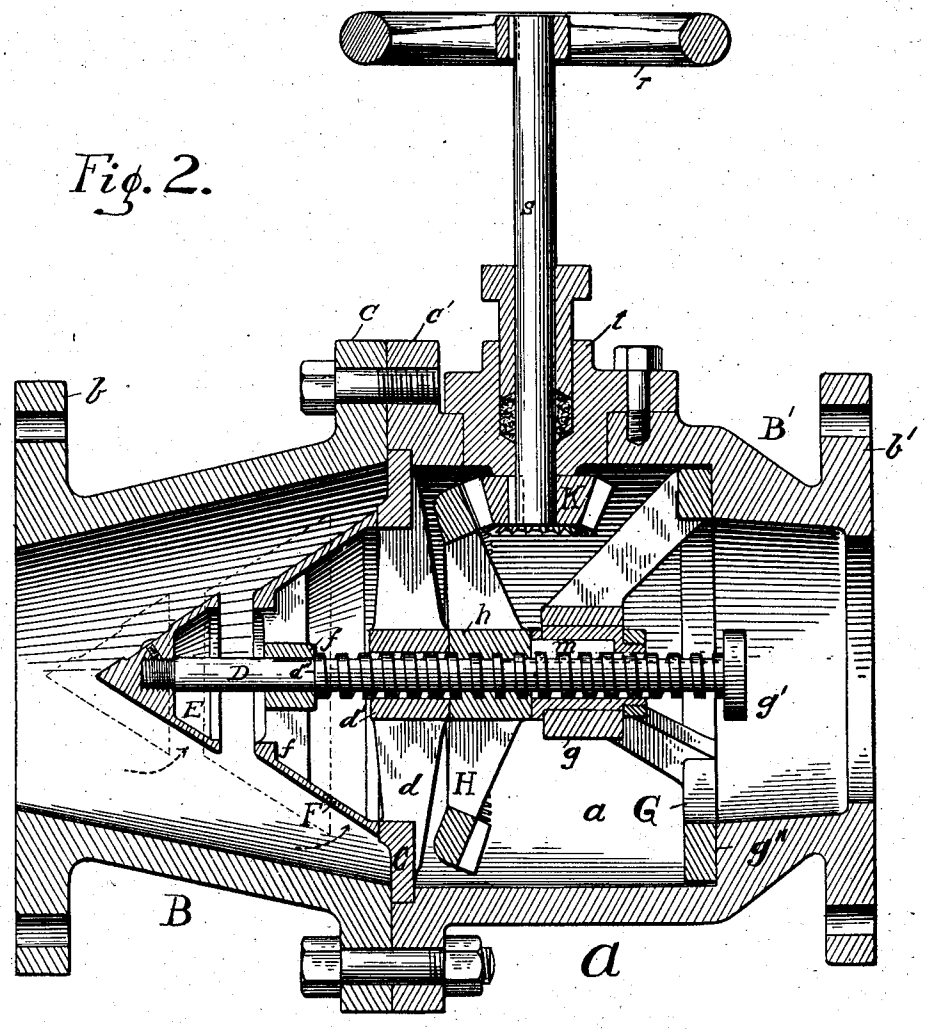
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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.

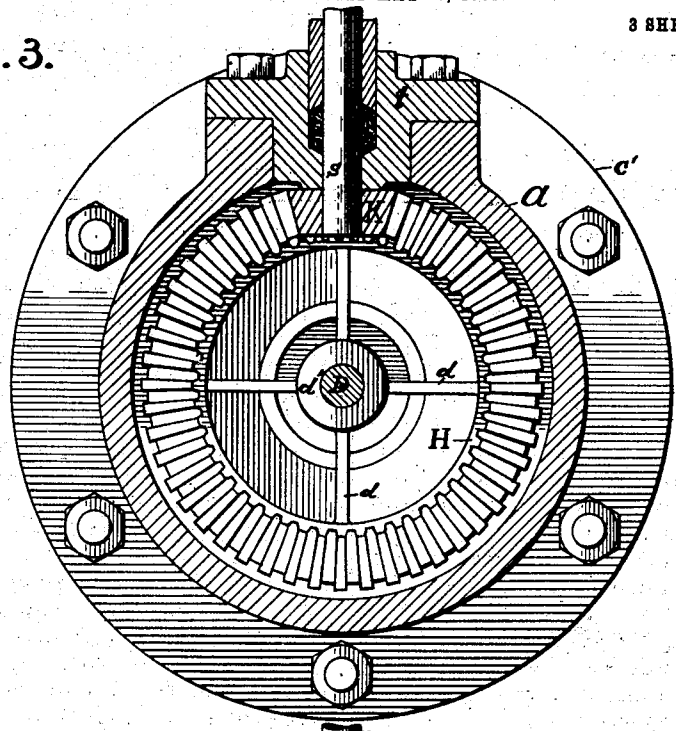
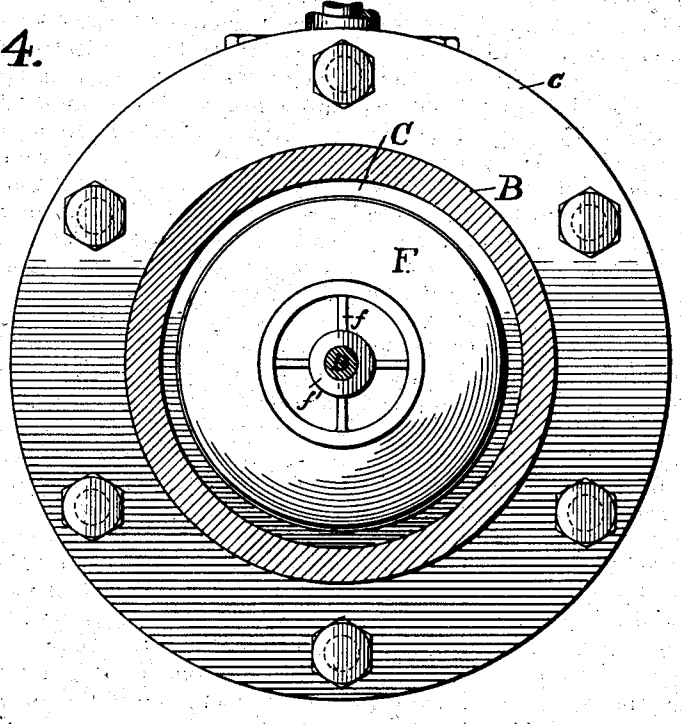


Fig. 4.



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No. 760,594. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM A. WIESEBROCK, OF NEW YORK, N. Y.

VALVE.

SPECIFICATION forming part of Letters Patent No. 760,594, dated May 24, 1904.

Application filed May 16, 1903. Serial No. 157,495. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM A. WIESEBROCK, of New York, in the county of New York and State of New York, have invented certain Improvements in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a longitudinal vertical section of the apparatus, showing the same with the valves closed. Fig. 2 is a longitudinal vertical section showing the valve-sections partly open. Fig. 3 is a cross-section of the apparatus on line *u v*. Fig. 4 is a cross-section of the apparatus on line *w z*.

This invention relates to a multiple valve the sections of which are mounted upon a common stem and are so constructed that they will be successively opened by means of shoulders on the stem, so that in this way the power required for operating the valve is reduced.

A is the shell or casing of the apparatus, and while the body of the same is represented in the accompanying drawings to be of cylindrical form, yet, if desired, it may be constructed of any other form and out of any suitable material. The body of the shell A is provided with conical inlet and outlet pieces B B', having flanges *b b'* of suitable diameter to connect the apparatus with a suitable pipe-line.

In order to fit and adjust the interior parts and to maintain sufficient free passage area throughout the apparatus, the central portion *a* of the same is larger in area than the inlet and outlet portion, and the conical portion B, forming the inlet to the valve, is for this purpose removably fastened, by means of flanges *c c'*, to the central portion of the casing.

In a recess formed in flange *c'* and flush with its face is fitted the valve-seat C, having arms *d* and the central guide-bearing *d'* for the valve stem or rod D, which extends longitudinally through the casing A. Upon the forward end of the valve-stem D is rigidly mounted the foremost and smallest valve-section E, which thus participates in the movement of the valve-stem. One or more additional valve-sections F, having arms *f* and hubs *f'*, are slidably mounted upon the valve-stem D back of the front section E. Each of the valve-sections F is thus made of annular form, being provided with an outer rim, a central hub connected thereto, and a circular port or opening between rim and hub. The hub *f'* is adapted to be engaged by a collar or enlargement d^2 of valve-stem D, such collar being of a diameter less than the outer diameter of the valve-port. Thus when the collar engages the hub upon an axial movement of the valve-stem the valve will be moved forward, while the port will remain open. The valve-section E is made of conical form and the section F of frusto-conical form, the base of the section E being of the same diameter as the top of section F. Thus when the two valve-sections contact with each other they collectively form a single cone, which can be moved against the gas or liquid pressure with comparatively little force. The valve-stem D is threaded for a distance conforming to the required opening of the respective valve-sections and bears on its other end in the central guide ring or hub *g* of the rest G, which bears against and is rigidly fastened to the shoulder *g''*, formed in the outer shell or casing. Between this rest G and the valve-seat C and bearing against their respective central guide rings or hubs *d'* and *d'* is placed the gear-wheel H, having its screw-threaded hub *h* fitted to the screw-threaded part of the valve stem or rod D. Into the gear-wheel H meshes the pinion K, which is fastened to spindle *s*, which by passing through the gland *t* to the outside of the apparatus is provided with a hand-wheel *r*, thus supplying means for operating the valve.

Hand-wheel *r* is provided with signs "Open" and "Close," with arrows indicating the direction to turn it. To prevent the valve stem or rod D from rotating and to insure reliable reciprocating motion of the same when operating the valves, the screw-threaded portion of stem D is slotted and the central guide ring or hub *g* in rest G is provided with a feather *m*, engaging said slot. To regulate the opening distance of the valves, the stem D is also provided with the shoulder *g'* at its extreme end.

In valves for large pipes with a large area made according to this invention it will be found necessary to supply more bearings to support the weight of the valve-sections, because such sections become more numerous with the diameter of the valve. To insure in that case a true and tight setting of each section upon the other when closing the valve and to support the same while open against derangement on account of their own weight and to hold the same securely against the action of the fluid passing through the valves, they are supported in the manner shown in Fig. 1. In this case the rod D supports the valves on one side by resting movably in the hub-bearings of the rest G and of the valve-seat C, and on the other or inlet side of the valve they are supported by the bearing or brace j and rod D′, screwed into the point of the valve-section E.

To insure as near as possible a straight axial flow of the passing fluid through the valve when open, the valve-sections are made conical in shape, yet, if desired, they may be made in any other shape.

The operation of the valve is as follows: When the apparatus has been properly inserted in a pipe-line and the valve is to be opened, the hand-wheel r is turned in the direction "Open," indicated on the same. The turning of this wheel will by engaging the pinion and gear-wheel with its screw-threaded hub h move valve stem or rod D in the direction of the valve-sections, the rest G forming the point of resistance, and as the smallest valve-section E is fastened to stem or rod D this valve-section immediately opens, requiring in large-size valves seldom more than five per cent. of the power required to open at one effort the whole of the valve area. When this smallest valve-section has been opened to the desired distance, the collar d^2 will engage the hub f' of the valve-section F and push it forward; but as the collar is of a diameter less than that of the valve-port the latter will not be closed and the gas, steam, or liquid will flow around valve E and through valve F to the place of consumption. Each additional section of valve following is equally engaged by a shoulder on the stem or rod D, as before described, but not shown, until the whole area of the valve is opened. For closing the valve the hand-wheel r is rotated in the opposite direction, when the larger sections of the valve will close up first and the smallest section last by the backward motion of the valve stem or rod D. The faces of the several sections of valve may be provided with an elastic medium or otherwise be made to form a tight joint.

The apparatus may be inserted in a pipe-line of any desired inclination, with the operating-wheel in any desired position, without affecting its efficiency.

What I claim as new, and wish to secure by Letters Patent, is—

In a valve, the combination of a valve-seat having a guide-bearing, with a threaded valve-stem having a collar and engaging the bearing, a rest, a tapped gear-wheel mounted upon the valve-stem, a pinion engaging the gear-wheel, means for rotating the pinion, a slidable rear valve-section adapted to be engaged by the collar, and a front valve-section mounted upon the valve-stem, substantially as specified.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 6th day of May, 1903.

FREDERICK WILLIAM A. WIESEBROCK.

Witnesses:
L. BERINGER,
M. WIESEBROCK.