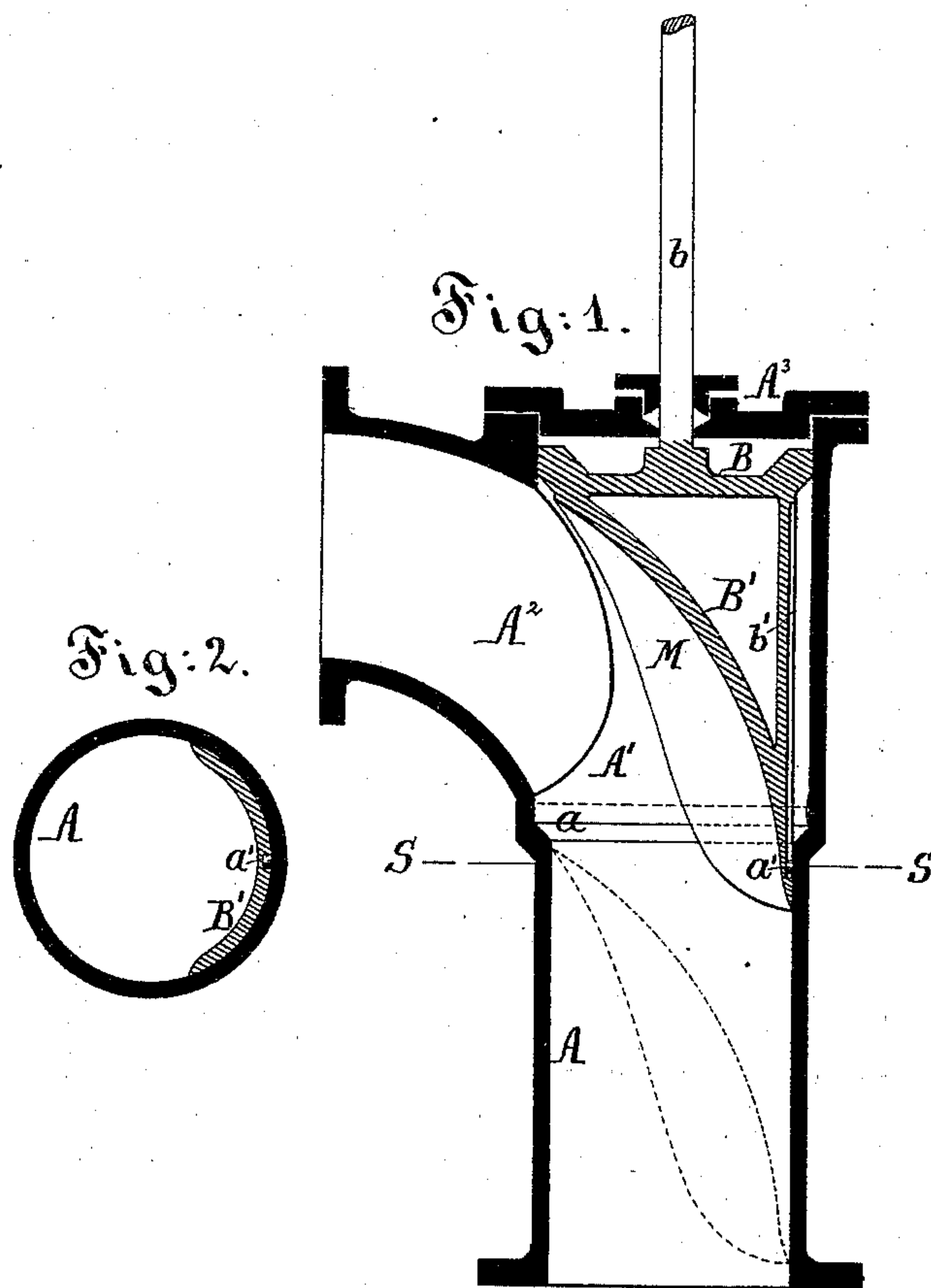


J. F. FIFIELD.  
Stop-Valve.

No. 199,814.

Patented Jan. 29, 1878.



Witnesses:

*A. Berry*  
*H. A. Johnstone.*

Inventor:

*James F. Fifield*  
*by his attorney*  
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*New York*

# UNITED STATES PATENT OFFICE.

JAMES F. FIFIELD, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN STOP-VALVES.

Specification forming part of Letters Patent No. **199,814**, dated January 29, 1878; application filed December 17, 1877.

*To all whom it may concern:*

Be it known that I, JAMES F. FIFIELD, of Brooklyn, Kings county, in the State of New York, have invented certain new and useful Improvements Relating to Stop-Valves; and I do hereby declare that the following is a full and exact description thereof.

My improvement is intended more particularly for water-valves of large area applied at points where the pipe makes a short bend, so that the valve can move axially and close tightly against a suitable seat, while on being sufficiently withdrawn it will be moved out of the path of the water.

It has long been common to select such situations for valves, and even to make right-angled bends in pipes for the purposes of allowing their introduction. But in all previous arrangements, so far as I am aware, the valve and the adjacent surfaces have formed angular recesses in which the water was agitated and retarded. I so construct my valve and the adjacent parts that, while the closing of the valve brings together close-fitting surfaces in the most approved manner, the opening of the valve not only moves the body of the valve out of the path of the water, but presents a smoothly-rounded surface to the action of the water. When my valve is open the water flows through a smoothly-curved passage with little or no more resistance than in a pipe curved to a corresponding radius.

I attain this end by extending the valve, in the form of a curved wedge, far beyond the ordinary tight-fitting face. I provide for preventing the valve from turning around in its seat.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawing forms a part of this specification.

Figure 1 is a horizontal section through the valve and the adjacent parts. Fig. 2 is a cross-section on the line S S in Fig. 1.

Referring to the drawing and the letters of reference thereon, A is a straight portion of the pipe, and A<sup>1</sup> is a larger chamber formed therein, of sufficiently-increased diameter to allow a proper bearing-surface by which the valve shall close tightly upon a smoothly-turned

seat, a. A<sup>2</sup> is a smoothly-curved branch leading out one side from the chambered portion of the pipe A A<sup>1</sup>. The ends of the part A and A<sup>1</sup> are flanged to allow of connections to further lengths of pipe, as will be understood.

B is the main body of a valve, and B' is an extension formed in one therewith, or, if preferred, made in a separate casting, and firmly bolted thereto. The part B' is nearly a complete cylinder at one end, and is wedge-formed, presenting a smoothly-hollowed surface, M, on the side toward the water. Its smooth surface receives the force of the water as it flows past when the valve is open. The extension B' terminates in a sharp edge.

An internal pin, or, preferably, a flattened internal projection, a', is fixed on the interior of the pipe A near the seat a. It stands in a longitudinal groove, b', formed in the cylindrical surface of the extension B'.

The valve B B' is moved axially by means of its stem b, operated by suitable mechanism. (Not represented.) As it is traversed in closing or opening, the groove b' is guided on the pin or internal projection a', and firmly holds the valve against any rotatory or partially rotatory motion. The head A<sup>3</sup> is fitted removably, and equipped with a stuffing-box, as will be understood. The valve may be removed for repairs or other purpose, on removing the head A<sup>3</sup> and withdrawing the pin or stop a'. The spline or longitudinal groove b' in the part B' may, if preferred, be carried quite out at the thin end of the extension B', and in such case the guide a' need not be removed to allow the removal and replacement of the valve.

My valve may be introduced in either position with regard to the motion of the water, and the water flowing in either direction will be guided smoothly and caused to describe a continuous curve instead of, as usual, abutting against the main body B, and regurgitating in the angular recesses thus formed. The curved face M will receive the force of the water and deflect it with about equal effect, whether it moves in the one direction or the other. I can so apply the valve, that in case of failure of the connections for operating it, the valve shall, by the action of the water, be held tightly closed; or, if preferred in any case, I can introduce the parts in the reverse position



relatively to the motion and pressure of the water, so that, in case of failure, the valve shall be caused to open by the motion of the water.

My valve allows of use in all the ordinary and extraordinary conditions in which valves of this class are applied. It requires little, if any, greater range of motion than other valves thus situated. Its increased weight is not a serious objection. Sufficient power can always be commanded for operating it.

My valve may be used in a great variety of situations for controlling water, and may even, under some circumstances, be desirable in controlling the flow of gaseous fluids, as air and steam; but what I esteem its most important use is in controlling the flow through large pipes in the supply of towns and cities, where it is of great importance to conduct the water smoothly, and to maintain the pressure as far as possible at a great distance from the central or starting points. Experiments indicate that my valve, by the reduced resistance of the water in passing it, will realize an increase of many inches, or even feet, in the height to which water will rise after passing it, as compared with the height to which it will rise in passing a similar valve without my extension B'.

The part B or main body of the valve is of larger diameter than the interior of the pipe A, while the wedge-like extension B' is sufficiently small to move easily within the pipe A. The annular bearing-surface of the part B, which matches on the seat *a*, is turned conical, and adapted to fit with all the tightness due to the favorite construction known as a "poppet-

valve." In case of abrasion or other derangement the surfaces of the valve and seat can be renewed by ordinary tools. A packing may be formed by a ring of soft metal, wood, leather, or the like firmly attached to either the seat or the valve, if desired.

For large valves I propose to employ two stems and two stuffing-boxes. This will form a further guaranty against the turning of the valve.

I claim as my invention—

1. The valve B, having the extension B' with its smoothly-hollowed face M, in combination with a pipe or fluid-passage A and angular arm or bend A<sup>2</sup>, adapted to form a smoothly-curved passage for the fluid, as herein specified.

2. The chamber A<sup>1</sup>, larger than the pipe A, in combination with the branch or arm A<sup>2</sup> and with the valve B, having a wedge-like extension, B', of smaller diameter, adapted to move in the part A, and allow the main body B to come to a tight bearing on the annular seat *a*, as herein specified.

3. The pipe A, smaller than the chamber A<sup>1</sup>, and provided with the projection *a'*, in combination with the branch A<sup>2</sup> and valve B, having the groove *b'* and hollowed surface M, substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 13th day of December, 1877, in the presence of two subscribing witnesses.

JAS. F. FIFIELD.

Witnesses:

AUGUST D. E. FRANK,  
A. PFAFF.