(No Model.)

J. H. PIERCE.

VALVE.

No. 534,228. Patented Feb. 12, 1895.

Fig. 1.

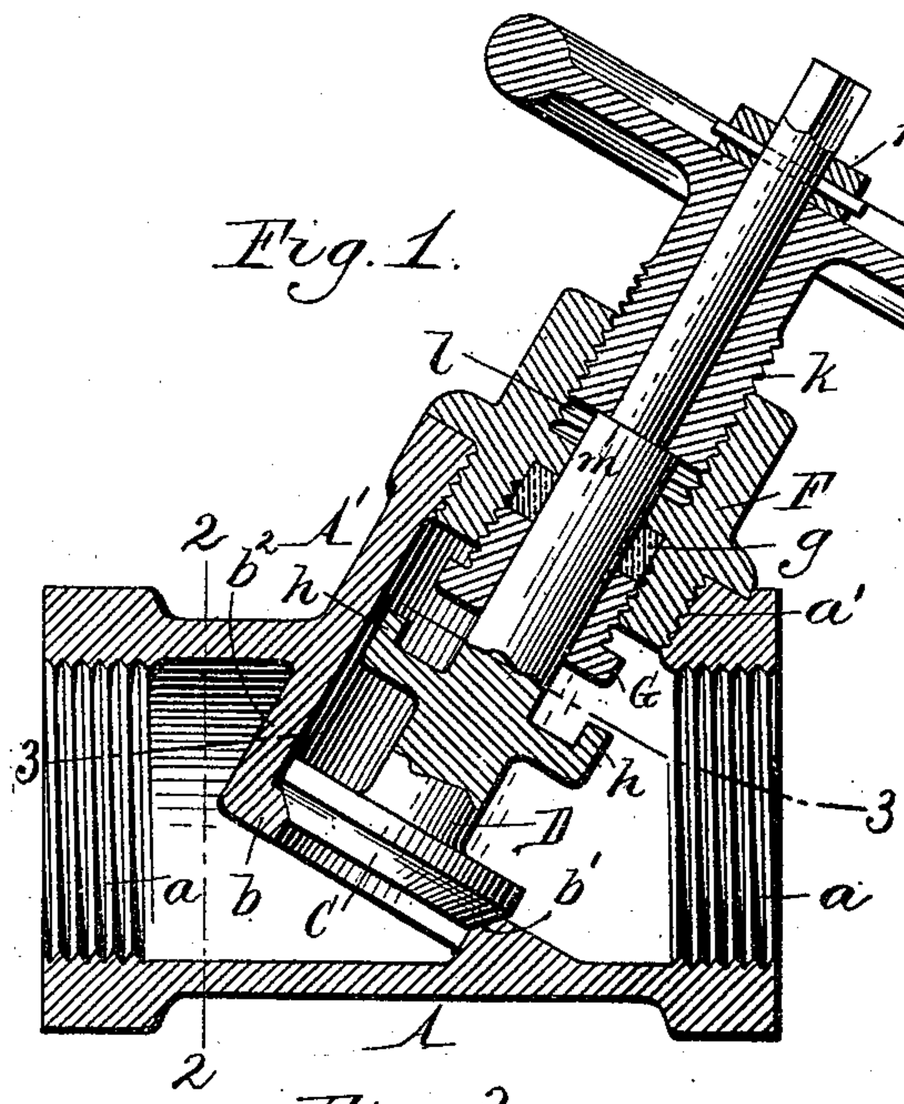


Fig. 2.

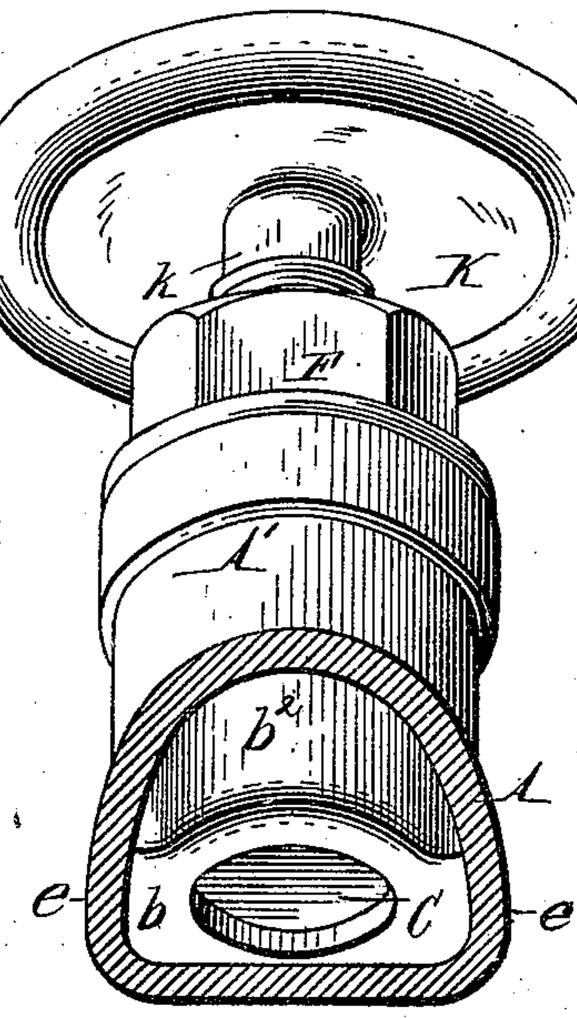


Fig. 3.

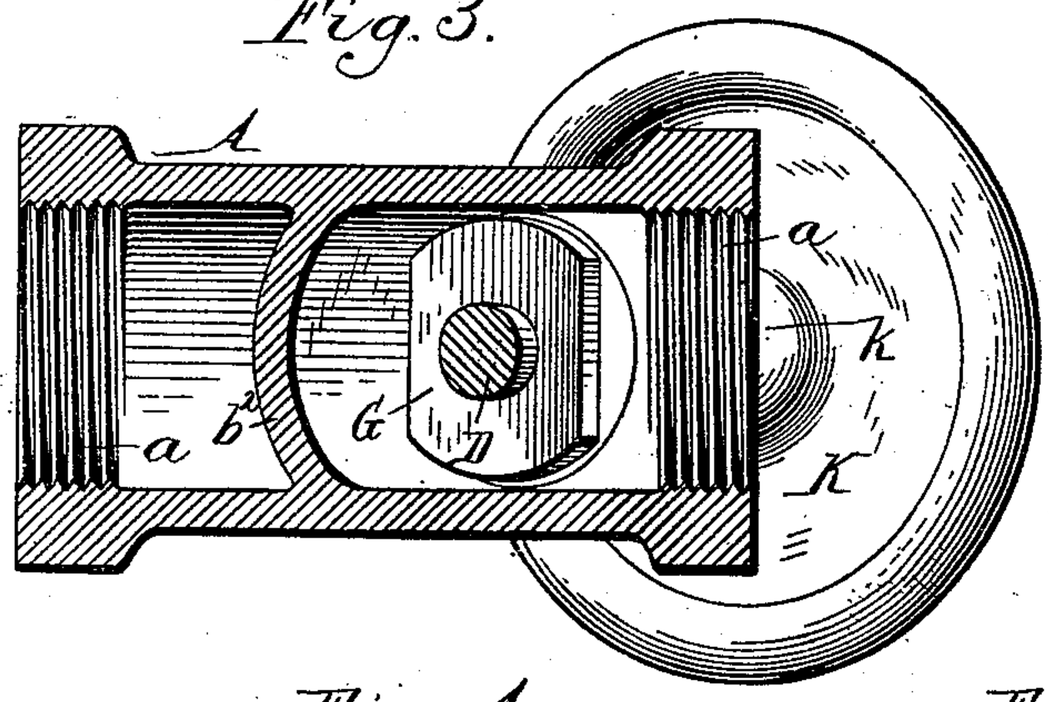


Fig. 5.

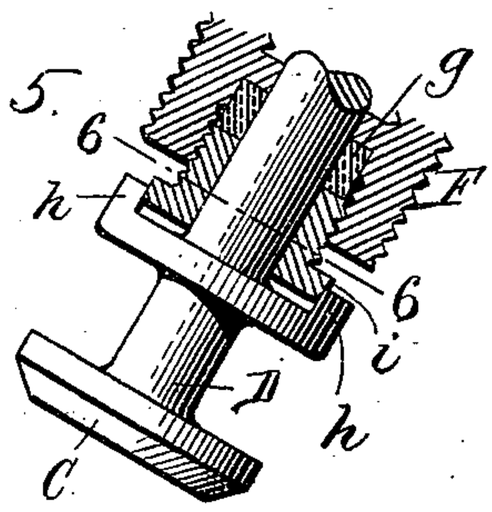


Fig. 7.

Fig. 4.

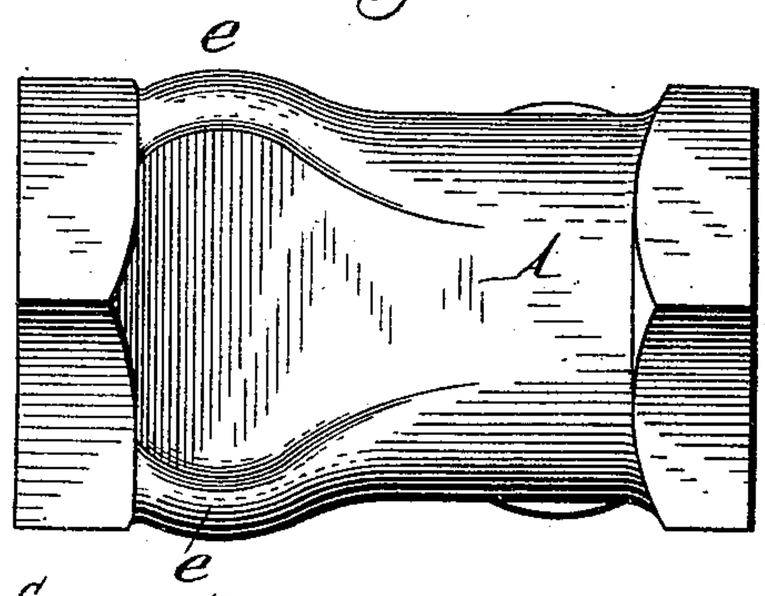
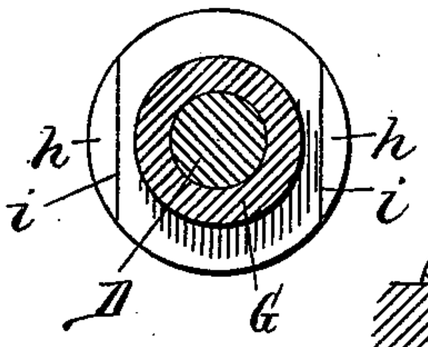
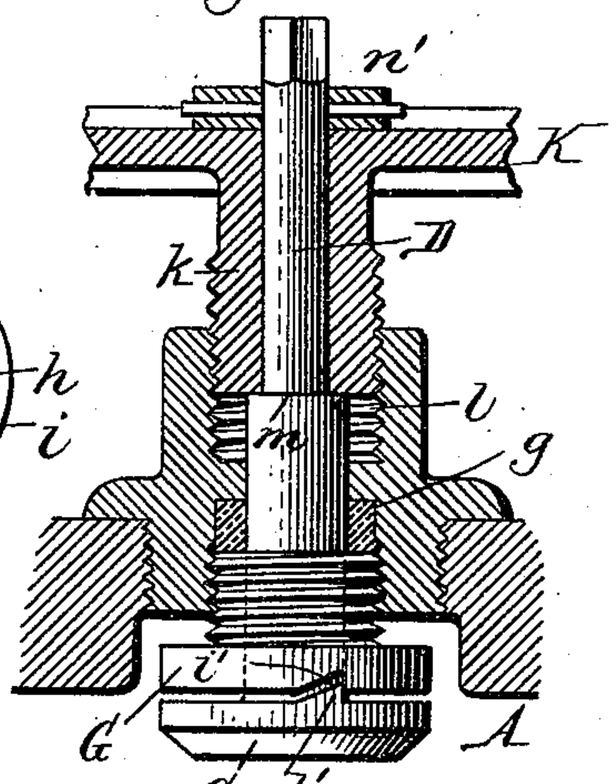


Fig. 6.





Witnesses.
Emil Neuhart
Chas. F. Burkhardt.

James H. Pierce
Inventor.
By Wilhelm Bonnet.
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES HODGSON PIERCE, OF WEST BAY CITY, MICHIGAN, ASSIGNOR OF FIFTEEN-SIXTEENTHS TO ISAAC PIERCE, OF SAME PLACE.

VALVE.

SPECIFICATION forming part of Letters Patent No. 534,228, dated February 12, 1895.

Application filed September 15, 1893. Serial No. 485,540. (No model.)

To all whom it may concern:

Be it known that I, JAMES HODGSON PIERCE, a citizen of the United States, residing at West Bay City, in the county of Bay and State of Michigan, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates to that class of valves which are provided with a disk or frustum of a cone which is attached to a spindle and moved by the latter toward and from its seat.

One object of my invention is to improve the valve casing of a straight-way valve in such manner that the body is reduced in length and height, while the flow of the fluid through the same is not retarded.

Another object of my invention is to improve the stuffing box through which the valve stem passes.

In the accompanying drawings: Figure 1 is a longitudinal sectional elevation of a straight-way valve provided with my improvements. Fig. 2 is a cross section in line 2—2, Fig. 1. Fig. 3 is a horizontal section in line 3—3, Fig. 1, looking upward. Fig. 4 is a bottom plan view of the valve casing. Fig. 5 is a detached sectional elevation of the valve and packing, showing the valve engaged with the gland of the stuffing box. Fig. 6 is a sectional view of the valve and gland, in line 6—6, Fig. 5, looking downward. Fig. 7 is a sectional elevation of the valve and stuffing box, showing a slightly modified construction thereof.

Like letters of reference refer to like parts in the several figures.

A represents the cylindrical main portion of the casing or body of a straight-way valve, provided at both ends with internally-threaded openings *a* in the usual manner and with an inclined cylindrical top portion A′ having an internally-threaded opening *a′*.

b represents the internal diaphragm in which the passage way or opening is formed which is surrounded by the valve seat *b′*. This diaphragm is connected along its upper edge with the upper portion of the valve body by a curtain b^2 in the usual manner.

C represents the valve and D the stem to which it is attached. This stem is preferably arranged at a rather steep angle to the axis of the valve body, usually at about sixty degrees, which arrangement permits the valve body to be made rather short and the top of the body to be made rather low, thereby rendering the valve compact and reducing its cost.

The steep angle of the stem places the diaphragm *b* at a correspondingly flat angle in the valve body. In order to avoid the constriction of the flow passage underneath the diaphragm, which would result therefrom, the cavity of the body is enlarged underneath the diaphragm by lateral bulges *e*, which are formed by making the bottom of the body at that point flat and joining it by upwardly converging sides to the upper part of the main portion of the body, which part retains the general cylindrical form of the main portion. This construction provides an ample flow passage underneath the diaphragm without materially increasing the weight of the valve body.

F represents the cap which is screwed into the inclined top A′ of the valve casing and which contains the stuffing box through which the valve stem passes. This stuffing box is arranged on the inner side of the cap, so as to open into the cavity of the valve casing.

g represents the packing arranged in the stuffing box and composed preferably of a wire of soft metal, or some other permanent or indestructible packing which retains its efficiency for a long time.

G represents the gland of the stuffing box which is screwed into the same from the inner side.

The stuffing box is properly packed in the shop where the valve is constructed and the packing is not ordinarily required to be afterward tightened or renewed.

In order to provide means for tightening the packing without removing the cap and connecting parts from the valve body, the valve or its stem is provided on the inner side of the gland with one or more lips *h* which project toward the gland, and the latter is provided with a corresponding number of flat sides *i*, as represented in Figs 1, 3 and 6. Upon unscrewing the valve from its seat until these lips engage against the flat sides of

the gland, as represented in Figs. 5 and 6, the gland can be turned and the packing be tightened by further turning the valve stem.

Instead of providing lips which engage against the sides of the flange of the gland, lips h' may be arranged to engage in notches or depressions i' in the under side of the gland, as represented in Fig. 7.

In many cases the lips or projections on the valve or its stem may be dispensed with and the gland can be turned merely by the frictional contact of the back of the valve against the lower side of the gland.

It is obvious that the construction and arrangement of the stuffing box herein shown and described is applicable, not only to straight-way valves but also to other valves in which the valve disk is attached to a stem which passes through a stuffing box, for instance globe valves.

K represents the hand wheel which is mounted on the valve stem and provided with a hollow shank k having an external screw thread which works in an internally-threaded cavity l formed in the outer portion of the cap F of the valve body. The spindle is free to turn in the shank of the hand wheel but is compelled to follow the axial movement thereof toward and from the valve seat by a shoulder m and washer n', as usual in loose spindle valves. The outer end of the spindle is made square or otherwise so shaped that a tool can be applied to it for turning the spindle in grinding the valve to its seat.

I claim as my invention—

1. A body for straight-way valves composed of a cylindrical main portion and a cylindrical top portion arranged at an oblique angle to the main portion and provided at its inner end with an inclined diaphragm having a valve-controlled passage, the cylindrical main portion having, below said diaphragm, a flat bottom and upwardly converging sides, forming lateral enlargements in the lower portion of the cavity below said diaphragm, substantially as set forth.

2. The combination with a valve casing or body, the valve and its stem, of a cap through which the stem passes, a stuffing box arranged in the inner portion of said cap and having its gland projecting into the cavity of the valve casing or body, and means, substantially as described, whereby the valve can be engaged with the gland for turning the same, substantially as set forth.

Witness my hand this 25th day of August, 1893.

JAMES HODGSON PIERCE.

Witnesses:
LEE E. JOSLYN,
ISAAC PIERCE.