

(Model.)

O. F. BURTON.
VALVE.

No. 420,224.

Patented Jan. 28, 1890.

Fig. 1.

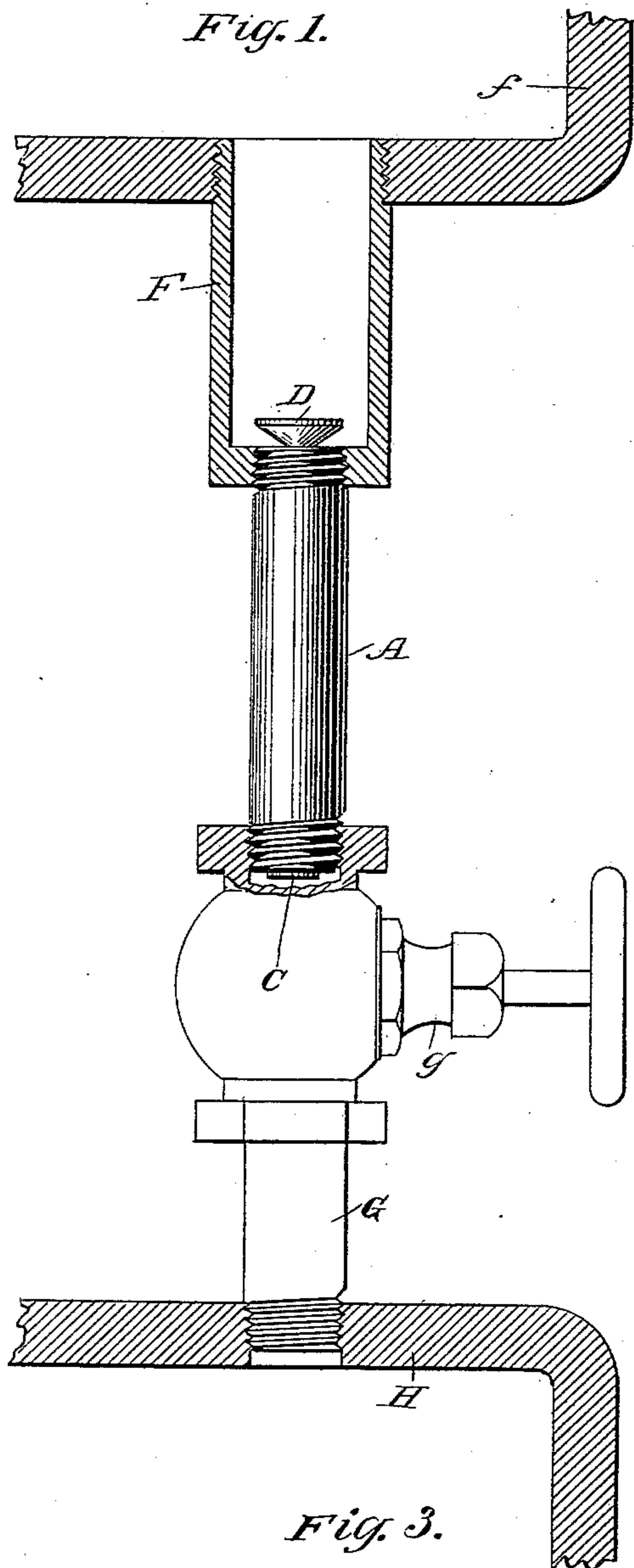


Fig. 2.

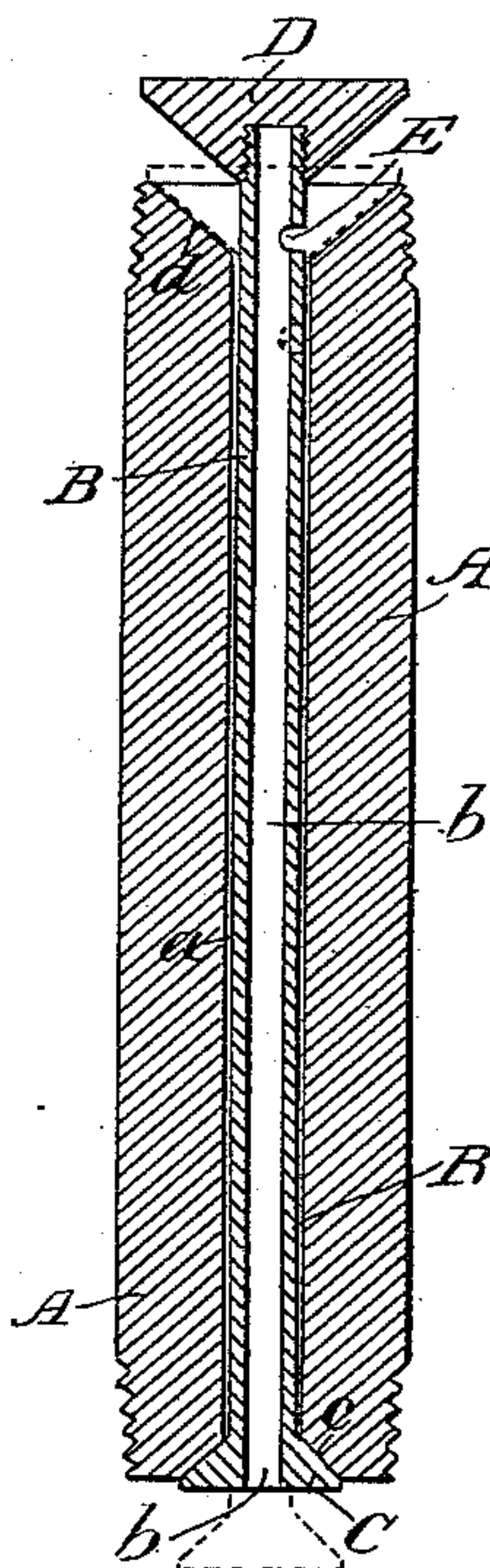


Fig. 3.

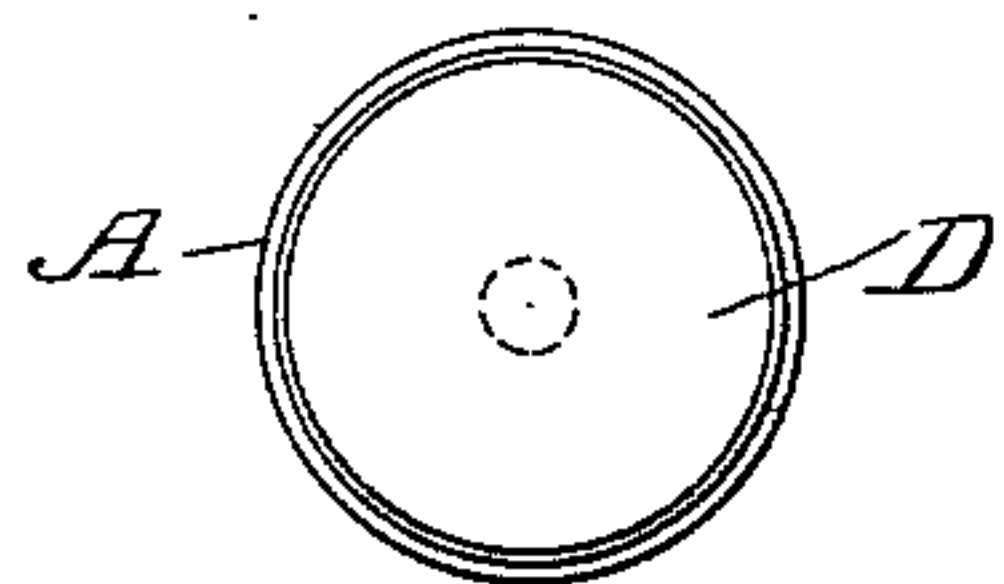
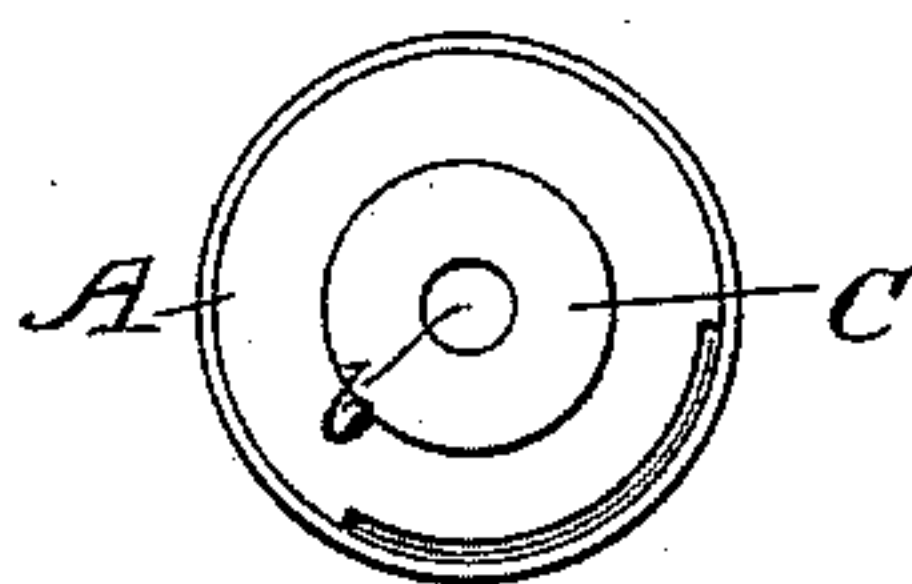


Fig. 4.



WITNESSES:

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OSCAR F. BURTON, OF BROOKLYN, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 420,224, dated January 28, 1890.

Application filed March 27, 1889. Serial No. 304,927. (Model.)

To all whom it may concern:

Be it known that I, OSCAR F. BURTON, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Valve, of which the following is a full, clear, and exact description.

My invention relates to a valve especially designed for use between supply and expanding chambers of pressure in working steam, water, gas, or other fluid; and the invention has for its object to provide a simple, inexpensive, automatic, direct-acting, and reliable valve of this character.

The invention consists in certain novel features of construction of the valve, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved valve, shown connected to a valved outlet-pipe on a steam-boiler and a pipe which receives the discharge from the valve, parts being broken away and in section. Fig. 2 is a central longitudinal section of the valve, drawn to a larger scale; and Figs. 3 and 4 are elevations of the exhaust and inlet ends of the valve, respectively.

This valve is very simple in construction, and consists of a body or case A, having a central bore *a*, which receives the hollow or tubular stem B of the valve proper, which consists of said stem and heads C D, preferably of unequal diameters or areas, fixed to opposite ends of it and adapted to close to seats *c d*, which are formed at opposite ends of the valve body or case A, these heads C D being arranged at the inlet and exhaust ends, respectively, of the device. Near the valve head or plug D one or more apertures or ports E are made laterally through the hollow stem, so as to open to the discharge-pipe F, connected to that end of the valve and opening to any expanding reservoir or chamber *f*, the other end of the valve-case next the valve C being connected to a valved pipe G, which opens to or communicates with the steam space or interior of a boiler or other vessel H, in which there is a fluid-pressure, a portion of the wall of said boiler or vessel being shown in the drawings. The valve is shown screwed

directly into the casing of an ordinary globe-valve *g* on the pipe G. I prefer to make the inner faces of the valve heads or plugs C D conical or tapering to fit onto countersunk seats *c d* in the valve-case. The area of the outlet or port E will preferably equal or exceed the cross-sectional area of the bore or passage *b* of the valve-stem.

The operation of the valve is as follows: It will be understood that the valve will ordinarily be placed to work vertically, or nearly so, and that the upper valve-head D will seat itself by gravity when the pressure in the supply and expanding chambers of pressure approaches equalization. I will suppose that the pressure in the supply-boiler H exceeds the pressure in the expanding-chamber *f*, with which the pipe F communicates, to an extent which will close the valve-head C and open the valve-head D, as shown in full lines in Figs. 1 and 2 of the drawings. The steam or fluid now has free passage from the boiler H through the pipe G and the bore *b* and port E of the valve to the pipe F and chamber *f*. This action will continue until the pressure in the chamber approaches the pressure in the boiler, whereupon the valve-head D will close and the valve-head C will open, as shown in dotted lines in Fig. 2 of the drawings, thus cutting off exit of steam or fluid from the valve-stem port E to the pipe F and chamber *f* and shutting off flow of steam from the boiler H. This action continues until by exhaustion of the steam or fluid from the chamber *f* the pressure on the valve-head D will not resist the pressure on the opposite head C, whereupon the head D will open and the head C will close and steam or fluid will again pass through the port E to the pipe F and chamber *f* until the pressure in this chamber rises to cause the valve-head D to close to again shut off the supply.

The marked advantage in giving the valve-head D a larger area than the opposite valve-head C is that when the valve-head D is once closed it will remain so for a time until the pressure of the steam or fluid in the chamber *f* falls considerably below the pressure in the boiler H, and when the limit is reached the lower pressure in the pipe F on the larger valve-head D cannot resist the higher pressure on the smaller valve-head C, and on so

much of the valve-head D as is exposed to the valve-stem bore *b*, and the head D will consequently open to admit another charge of steam or fluid from the boiler H through the
5 valve stem and port to the pipe F and chamber *f* and until the pressures again equalize at opposite ends of the valve; hence the construction of the valve with heads having different areas is preferred. In practice I may
10 provide two or more passages E, forming lateral ports near the head D of the valve, the operation being the same, as will readily be understood.

Having thus described my invention, what I
15 claim as new, and desire to secure by Letters Patent, is—

1. A direct-acting graduating-valve made with a bored body or case, a hollow stem fitted therein for endwise movement and pro-
20 vided at opposite ends with valve-heads of different areas, adapted to seat at opposite ends of the case, said stem provided, also,

next one head with a lateral port, substantially as herein set forth.

2. The combination, in a direct-acting graduating-valve, of a body or case A, bored at *a*,
25 a hollow stem B, fitted therein and provided with opposite valve-heads of different areas, and having a lateral port E near the larger head, substantially as herein set forth. 30

3. The combination, in a direct-acting graduating-valve, of a body or case A, bored at *a*,
35 and having countersunk end seats *c d*, a hollow stem B, fitted to slide in the case and provided with conical or tapering valve-heads C D, adapted to the seats *c d*, respectively, said
valve-stem having a lateral port E next the valve-head D, substantially as herein set forth.

OSCAR F. BURTON.

Witnesses:

HENRY L. GOODWIN,
C. SEDGWICK.