(No Model.)

A. W. CASH.

STEAM VALVE.

No. 550,217. Patented Nov. 19, 1895.

FIG. 1.

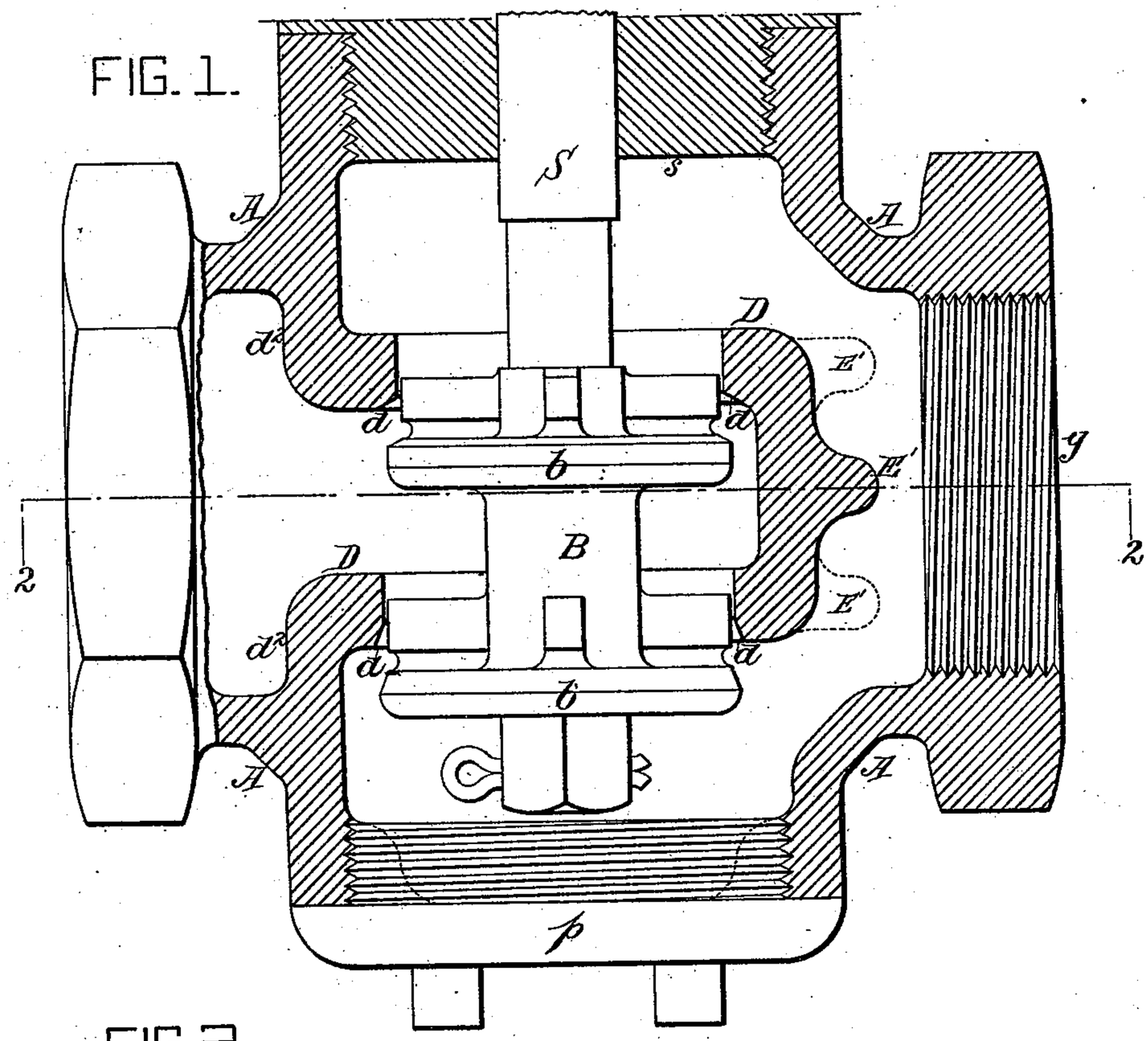
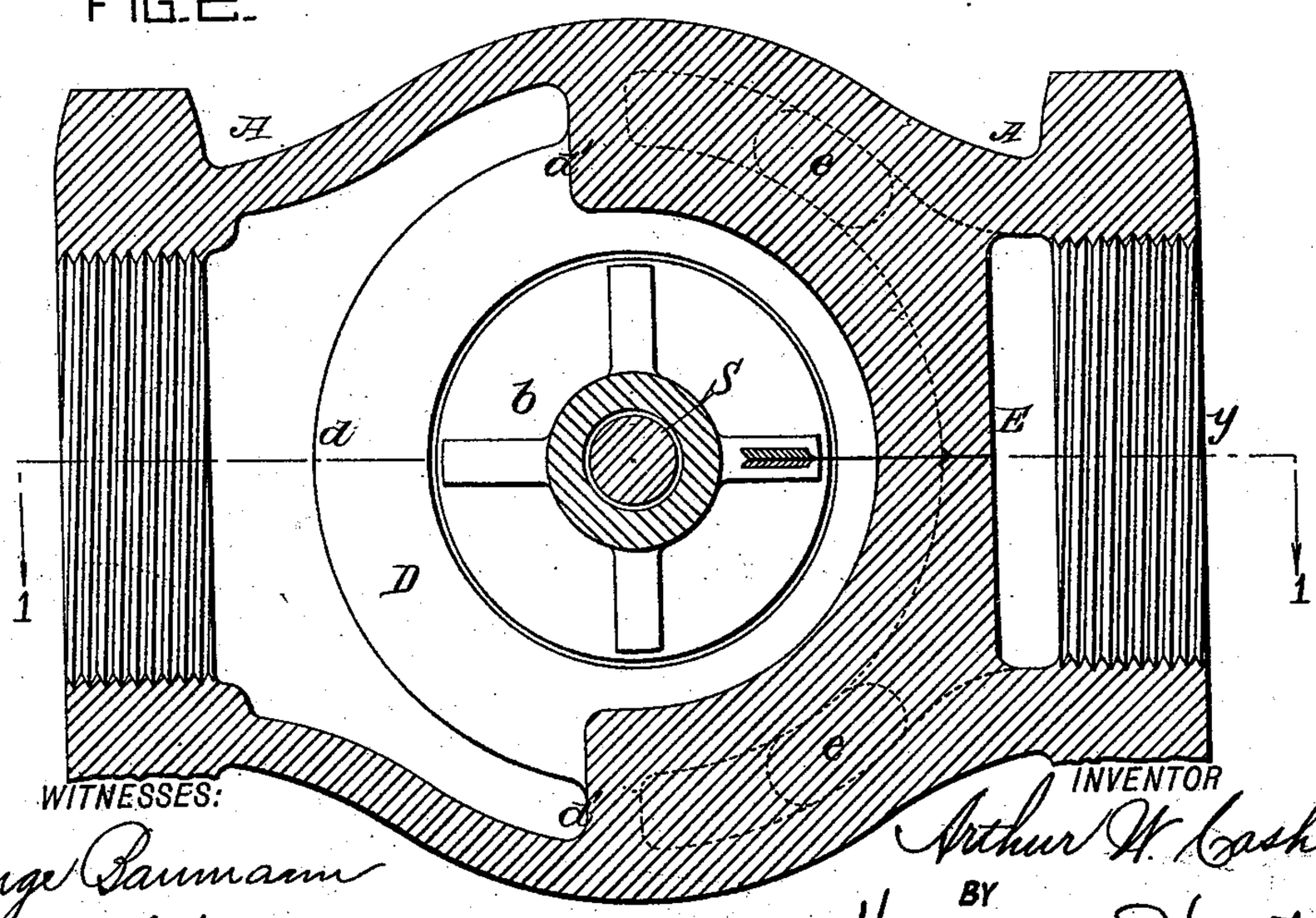


FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR W. CASH, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE FOSTER ENGINEERING COMPANY, OF SAME PLACE.

STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 550,217, dated November 19, 1895.

Application filed October 13, 1894. Serial No. 525,755. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. CASH, a citizen of the United States of America, and a resident of Newark, New Jersey, have invented an Improved Steam-Valve, of which the following is a specification.

The object of my invention is to so construct a double-seated balanced steam-valve as to insure a steam-tight seating of the valve under varying temperatures.

In double-seated balanced valves as usually constructed it has always been found difficult to entirely prevent leakage when the valve is seated. I have discovered that this trouble is in part at least due to a tendency of the inner casing or structure carrying the two seats to expand under the steam heat unequally or in a direction which causes the valve-seat openings to elongate or be distorted from a true circular outline to a slightly oblong or oval outline and prevent a tight joint when the valve-disks are brought to the seatings. To overcome this difficulty I construct the valve-casing in the manner which I will now describe, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section on the line 1 1, Fig. 2, and Fig. 2 is a sectional plan on the line 2 2, Fig. 1, of a form of valve embodying my invention.

A is the outer casing of the valve, and D is the inner circular casing, having seatings *d d* for the disks *b b* of the valve B. The valve-stem S is shown in this instance as passing up through a box or plug *s*, screwed into the upper part of the casing. For convenience of description *x* may be referred to as the inlet for the steam and leading to the inner chamber, while the steam-outlet may be at the bottom or side of the outer casing, as may be found desirable. In this case the outlet may be considered to be at *y*, at the side opposite the steam-inlet, while the bottom opening in the valve-casing is shown closed by a plug *p*.

When double-seated balanced valves—such, for instance, as so far described—are constructed in the machine-shop, the circular valve-disks and their seatings are carefully made to fit each other precisely; but when the valve is put into practical use under steam the high temperature, I have found, tends to cause the valve-seat casing to expand away from the inlet or, in general, in the direction of the arrow, Fig. 2, sufficiently to cause the seat-openings *d d* to become distorted from a true circular outline to one that is slightly oblong or oval, and consequently the valves when seated do not make a tight joint and leakage ensues, as already explained.

The inner casing or chamber of double-seated-valve bodies is usually supported by connecting webs or partitions *d'* and *d²*, half-way around on the side which I have termed the "inlet;" but since in these double-seated balanced valves there must be a steam-space for the free circulation of the steam about the outside of the inner casing to or from both valves the other half of this casing D is left without support or resistance to expansion. The webs *d' d²* are connected with and, in fact, are a part of the body-casting, and consequently by radiation help to carry off the heat from that part of the inner chamber to which they are attached, while the unsupported portion of the inner chamber is subjected to the maximum heat without means for conduction of heat to the outer casing. This produces an unequal expansion of the inner structure, elongates the circular opening of the valve-seats, and causes the valve to leak when subjected to high temperatures. To prevent this trouble, I provide around the outer side of the valve-seat casing a web or webs, such as to effectually resist unequal radiation, and consequently unequal expansion of the inner seat-casing D in a direction to cause the seat-openings to become distorted.

If the valve-seatings *d d* are sufficiently near each other, a single web E will suffice midway between the top and bottom of the inner or seat casing, as shown by full lines in Fig. 1; but if the seats *d d* are far apart it will be desirable to have two such webs opposite the two seatings, as indicated, for instance, by dotted lines at E' in Fig. 1.

The web or webs will extend around the outer side of the seat-casing D from the partition *d'* on one side to the corresponding partition *d'* on the other, as shown in Fig. 2, connecting the inner casing with the outer structure or valve-body, as shown, except, of course,

opposite the outlet *y*, where the web becomes a projecting strengthening-rib. The web or webs may be made discontinuous, as by leaving openings *e*, (indicated by dotted lines in Fig. 2;) but I prefer to make the web or webs continuous, as shown by full lines in that figure.

I have found that the construction described effectually prevents such expansion of the seat-casing as would distort the valve-seat openings, and thus I prevent the leakage trouble found in double valves as usually constructed.

I claim as my invention—

1. A balanced steam valve, having within the outer structure or valve body an inner or seat casing provided with two seats and valves, and leaving a steam space around a part of said seat casing in communication with both valves, and an expansion resisting web or webs extending from and connecting the inner casing with the outer structure or valve body on said steam space side, substantially as described.

2. A balanced steam valve, having within the outer structure or valve body an inner or seat casing provided with two seats and valves, and leaving a steam space around a part of said seat casing in communication with both valves, and a continuous web or webs connecting the inner casing with the outer structure or valve body on said steam space side, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR W. CASH.

Witnesses:

GEORGE BAUMANN, Jr.,

EDITH J. GRISWOLD.