

No. 702,157.

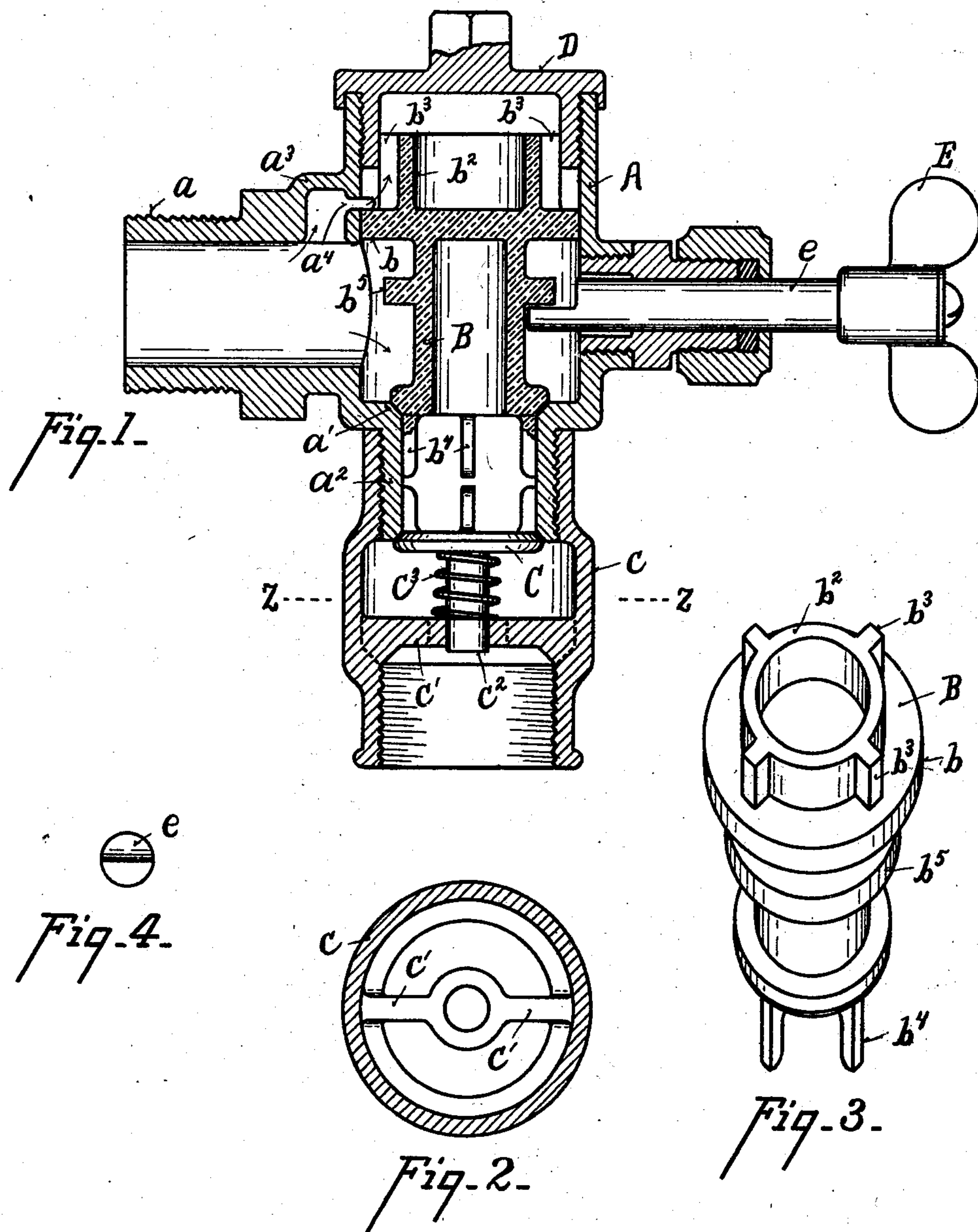
Patented June 10, 1902.

F. SCHREIDT.
RELIEF VALVE.

(Application filed Oct. 7, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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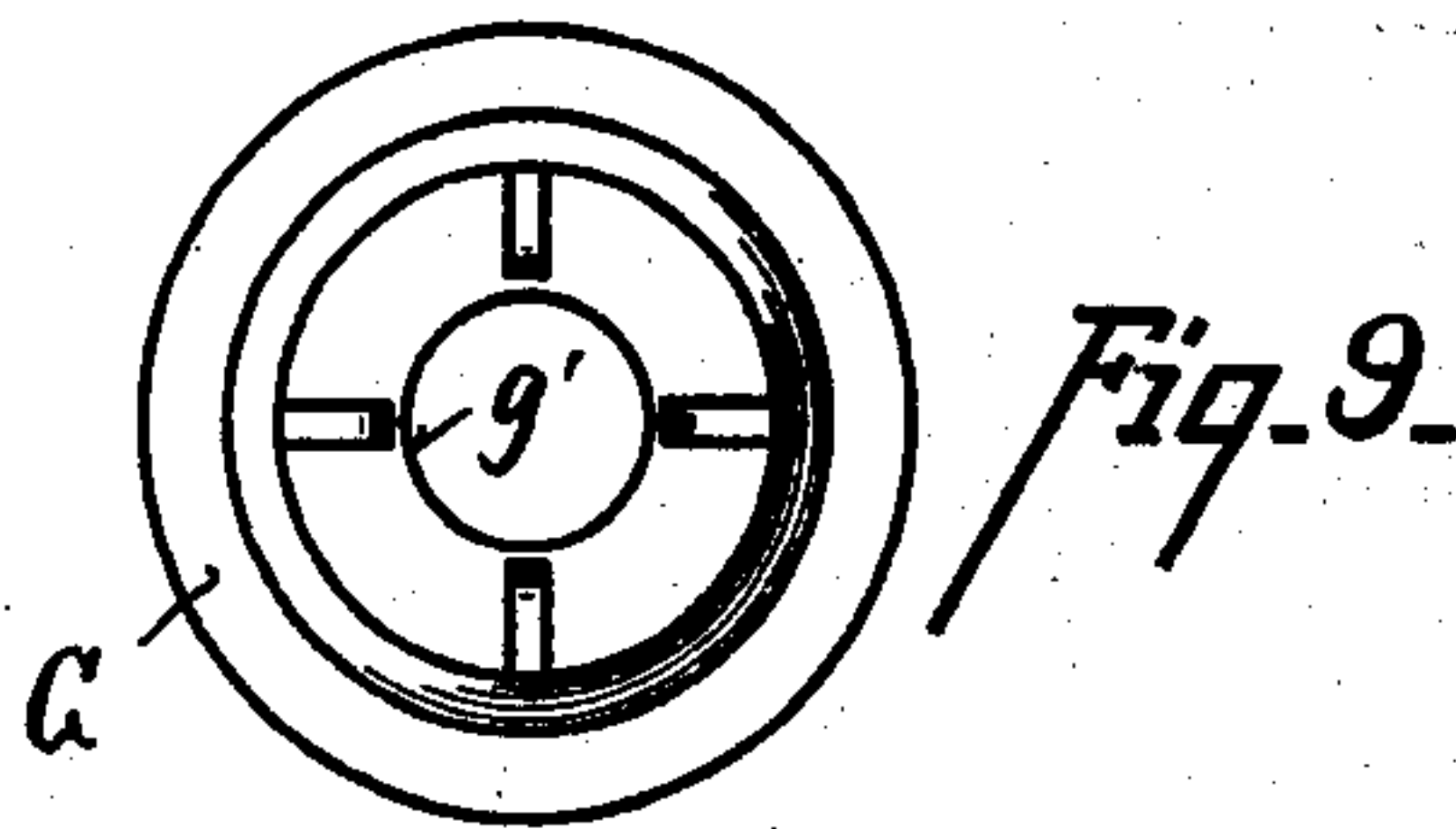
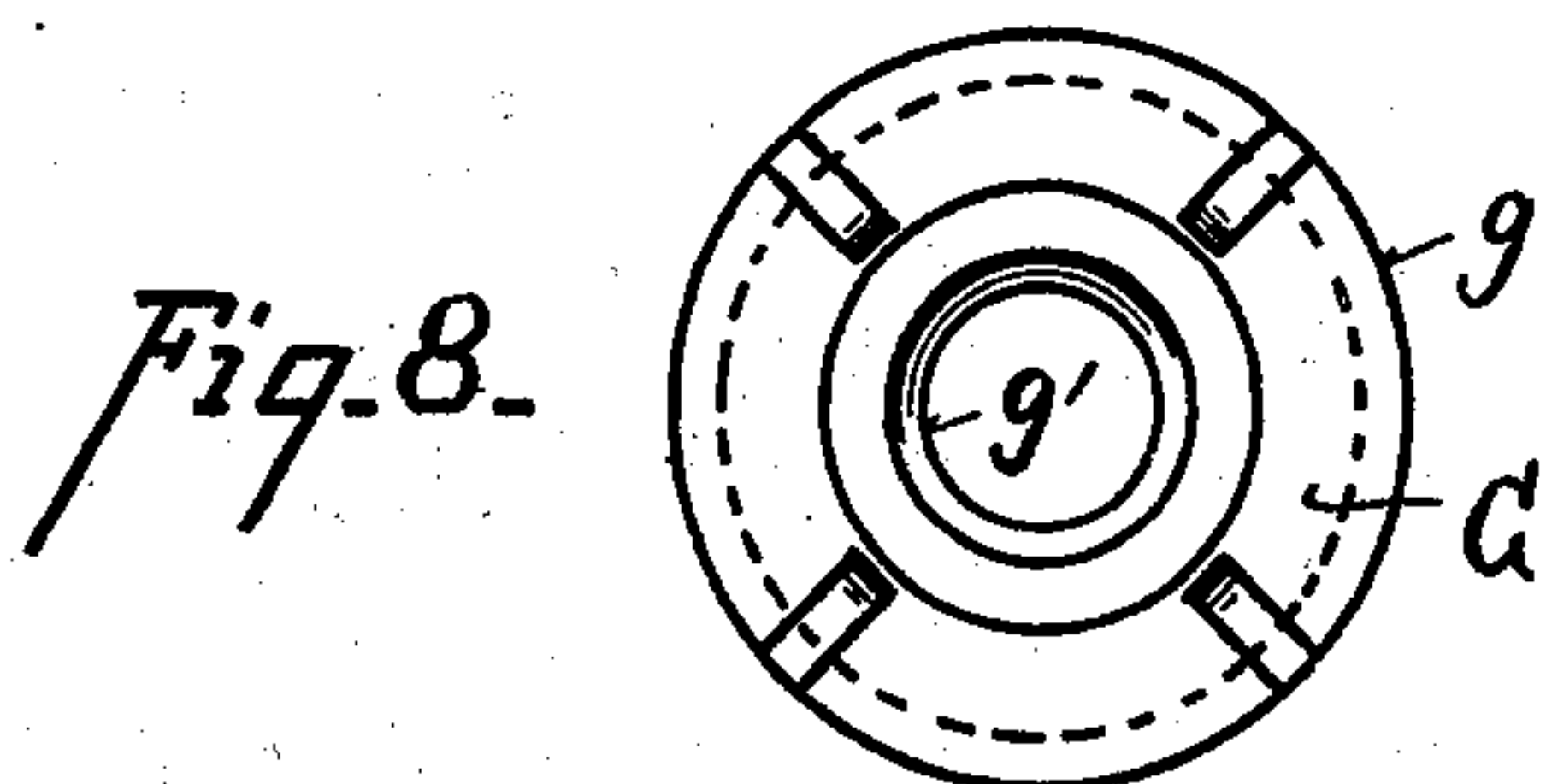
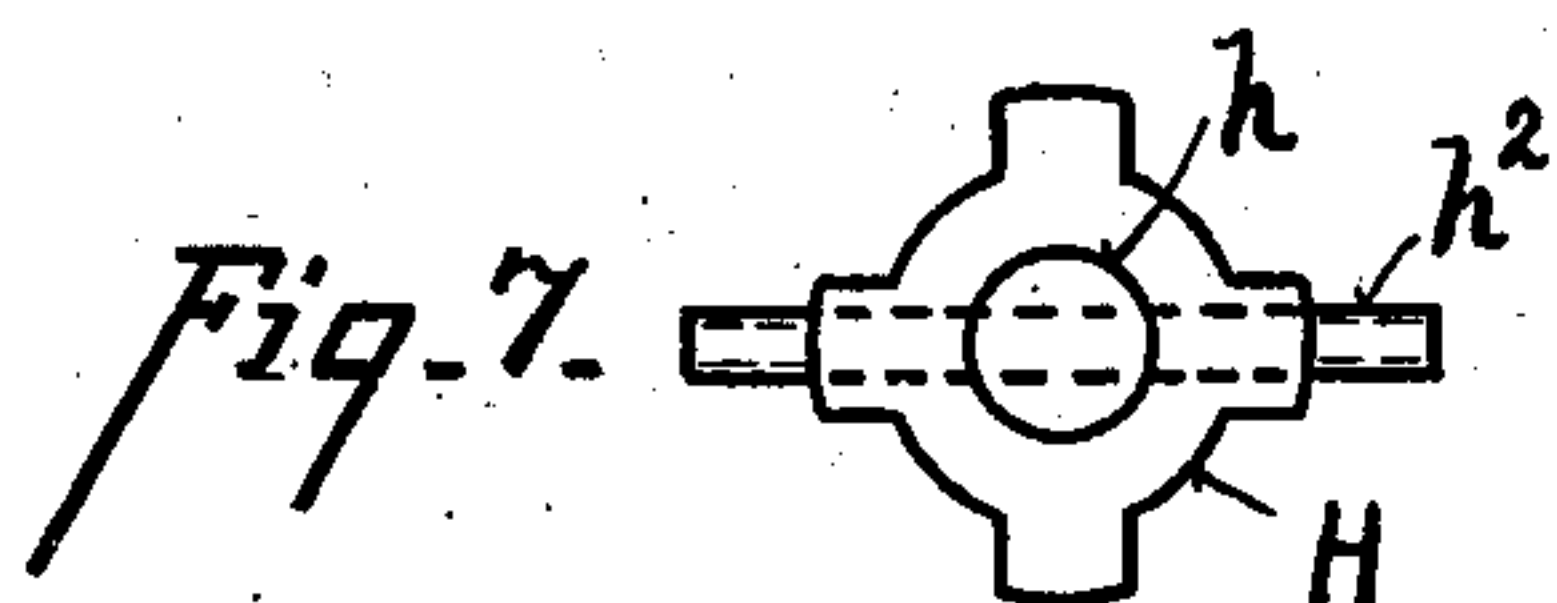
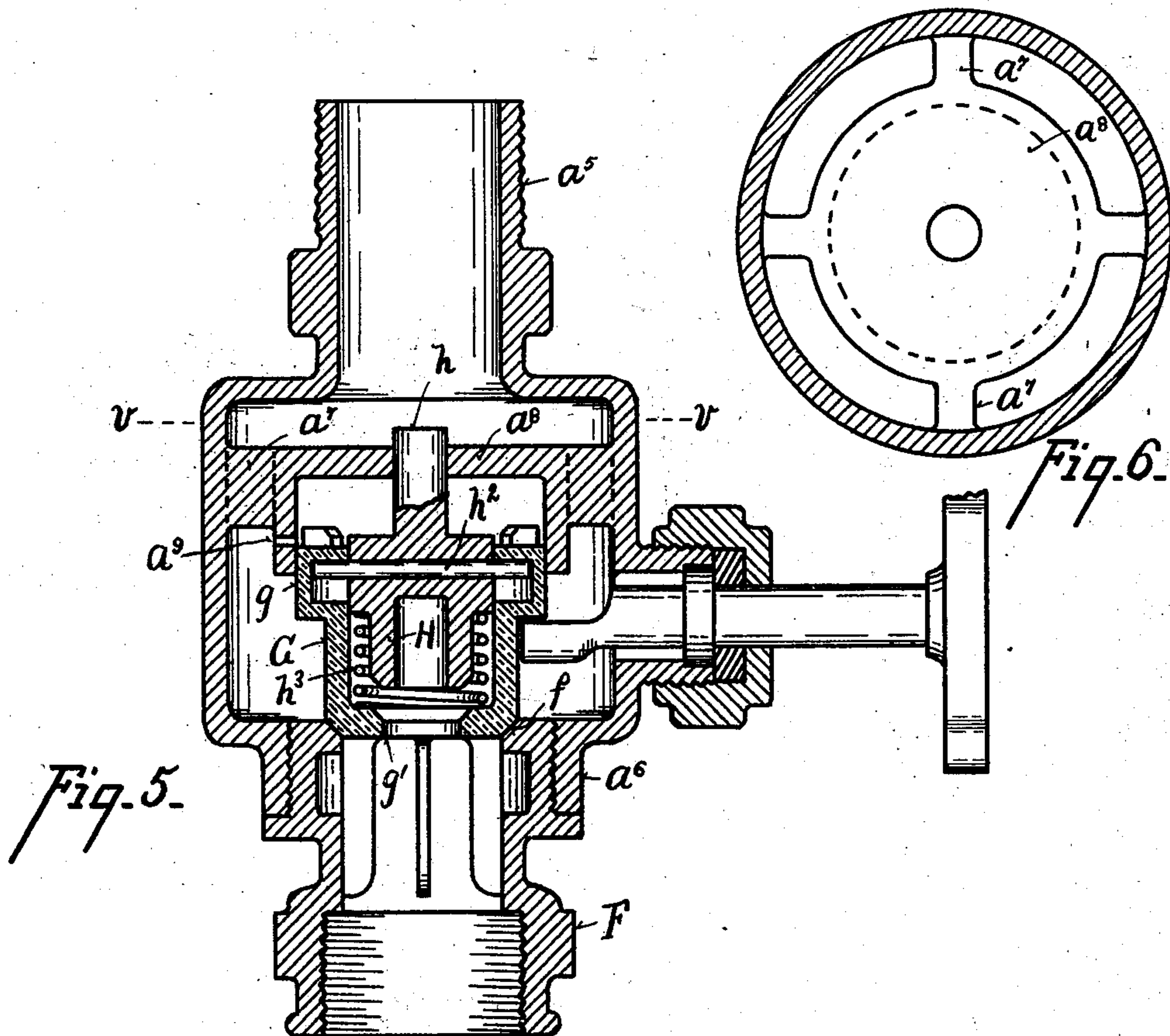
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Witnesses

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UNITED STATES PATENT OFFICE.

FRANK SCHREIDT, OF MANSFIELD, OHIO.

RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 702,157, dated June 10, 1902.

Application filed October 7, 1901. Serial No. 77,805. (No model.)

To all whom it may concern:

Be it known that I, FRANK SCHREIDT, a citizen of the United States of America, and a resident of Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Relief-Valves, of which the following is a specification.

The object of my invention is a relief-valve which is held shut not by a spring that is regulated to a certain tension which when exceeded allows the valve to open for the escape of water of condensation, but by steam upon the live-steam end of the cylinder and which is opened upon the exhaust end of the cylinder for the escape of the water of condensation, either by any pressure of the water which is great enough to lift the weight of the valve or is held open constantly when there is no steam-pressure upon it. This object is attained by the means described in the specification, particularly pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central sectional view of a relief-valve embodying my invention. Fig. 2 is a horizontal sectional view of the same, taken upon line $z z$ of Fig. 1. Fig. 3 is a detail perspective view of the main valve. Fig. 4 is a detail end view of the cam-stem of the hand-wheel for lifting the main valve. Fig. 5 is a view, similar to Fig. 1, of a modified form of valve. Fig. 6 is a sectional view of the same, taken upon line $v v$ of Fig. 5. Fig. 7 is a detail plan view of the auxiliary valve. Fig. 8 is a similar view of the main valve. Fig. 9 is an inverted plan view of the main valve.

Referring to Figs. 1 to 4, cylinder-casing A of the main valve has a lateral externally-screw-threaded extension a to be screwed into the end of a steam-cylinder. At its lower end casing A has an inwardly-projecting horizontal flange, which forms seat a' for main valve B, and an exteriorly-screw-threaded extension a^2 , the lower end of which forms the seat for the secondary valve C, whose valve-case c is interiorly screw-threaded at each of its ends, the upper end to engage extension a^2 and the lower to be connected to an exhaust-pipe. Casing c has a cross-bar c' formed integral with it, which has a central perforation through which the stem c^2 of secondary

valve C projects. The valve is held yieldingly to its seat by a light spring c^3 .

Above extension a a by-pass a^3 is formed integral with casing A and communicating with a port a^4 in the walls of the casing. The upper end of the casing is closed by a cap D.

Main valve B has near its upper end a large horizontal flange b , which fits against the walls of the casing and when the valve is upon its seat comes just below port a^4 , so as to leave it uncovered. Above flange b the main valve has a cup b^2 , upon the sides of which are vertical wings b^3 to contact the inner walls of cap D to assist in guiding the main valve to and from its seat, a function in which they are assisted by wings b^4 at the lower end of the main valve, which contact the inner walls of extension a^2 . Below flange b is a flange b^5 , under which the cam-shaped end of stem e of hand-wheel E projects, so that the valve may be lifted from its seat at will by turning the hand-wheel.

In use when the end of the cylinder is filled with live steam it passes through port a^4 in on top of flange b and into cup b^2 , and the area thereof being much greater than that upon the under side of said flange holds the main valve firmly to its seat. When the steam has been exhausted, should there be any water of condensation left in the end of the cylinder the piston carries it into casing A, and as the water rises therein it comes in contact with the under side of flange b before it reaches port a^4 , raises the main valve off of its seat; and carries up flange b , thereby covering port a^4 , preventing water entering above the flange, so that the valve remains thrown from its seat to allow the water to escape past secondary valve C, which had been held up to its seat with a pressure just sufficient to counteract its weight. The purpose of valve C is to prevent outside air from raising valve B and getting into the casing when steam is exhausting from the cylinder.

In the modification shown in Figs. 5 to 9 casing A' has an upper externally-screw-threaded extension a^5 , which is to be screwed into a steam-cylinder, and a lower internally-screw-threaded extension a^6 , which receives a coupling F, the upper end of which forms valve-seat f of main valve G and the lower

end of which is to be connected to an exhaust-pipe. Connected to the inner walls of casing A' by arms a^7 is an inverted cup a^8 , near the lower edge of which is a slot a^9 . Main valve G consists of a cylindrical shell having an enlargement g at its top to fit snugly within cup a^8 , so that when the valve is seated its upper edge comes below slot a^9 and leaves it unobstructed. Main valve G has near its lower end an internal annular flange g' , which forms the seat for a secondary valve H, which consists of an inverted cup having an upwardly-projecting stem h , which passes up through a perforation in top of cup a^8 . Valve H has wings h' upon its sides which contact the walls of main valve G, and through its upper end passes a pin h^2 , which projects into enlargement g to limit the upper travel of valve H. Between wings h' and collar g' is a coiled spring h^3 .

In use upon the live-steam end of the cylinder the steam enters through slot a^9 in upon top main valve G and secondary valve H, carrying the latter to its seat. Upon the exhaust side spring h^3 lifts valve H from its seat. Any water of condensation coming with pressure against the under side of enlargement g raises the main valve, closing slot a^9 to prevent any pressure coming on top of the valve, and allows the water to be discharged from the casing. Should the water accumulate in small quantities in the valve-casing, so that it exercises no pressure against the under side of enlargement g , and if valve H were not held open by spring h^3 to allow the water that gets in on top of it to escape, this water would upon a large quantity of water coming into the valve under pressure prevent the valve from opening. Spring h^3 , however, opens valve H upon the exhaust end of the cylinder and allows the water that has accumulated to escape, thus keeping the valve in working condition for action should a large quantity enter the valve under pressure.

What I claim is—

1. In a relief-valve a casing having an inlet and an outlet opening, a main valve therein normally closing the outlet-opening having an enlarged upper end contacting the walls of the casing and forming therewith a closed chamber above the valve, said chamber having a slot in its walls situated above the normal position of the upper end of the valve and placing the chamber in communication with the interior of the casing, substantially as shown and described.

2. In a relief-valve a casing having an inlet and an outlet opening, a main valve therein normally closing the outlet-opening having an enlarged upper end contacting the walls of the casing and forming therewith a closed chamber above the valve, said chamber having a slot in its walls situated above the normal position of the upper end of the valve and placing the chamber in communication with the interior of the casing, and a hand-wheel having its stem passing through the casing and engaging the main valve for lifting it from its seat when desired, substantially as shown and described.

3. In a relief-valve the combination of a casing having an inlet and an outlet opening, a main valve therein seated against the outlet-opening and consisting of a shell having an internal flange and an upper enlarged end contacting the walls of the casing and forming therewith a closed chamber above the valve, said chamber having a slot in its walls situated above the normal position of the end of the valve and placing the chamber in communication with the interior of the casing, a secondary valve to be seated downward against the internal flange of the main valve and a light spring for raising it from its seat, substantially as shown and described.

FRANK SCHREIDT.

Witnesses:

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