

No. 859,441.

PATENTED JULY 9, 1907.

J. ERWOOD.  
VALVE.

APPLICATION FILED APR. 9, 1906.

Fig. 1.

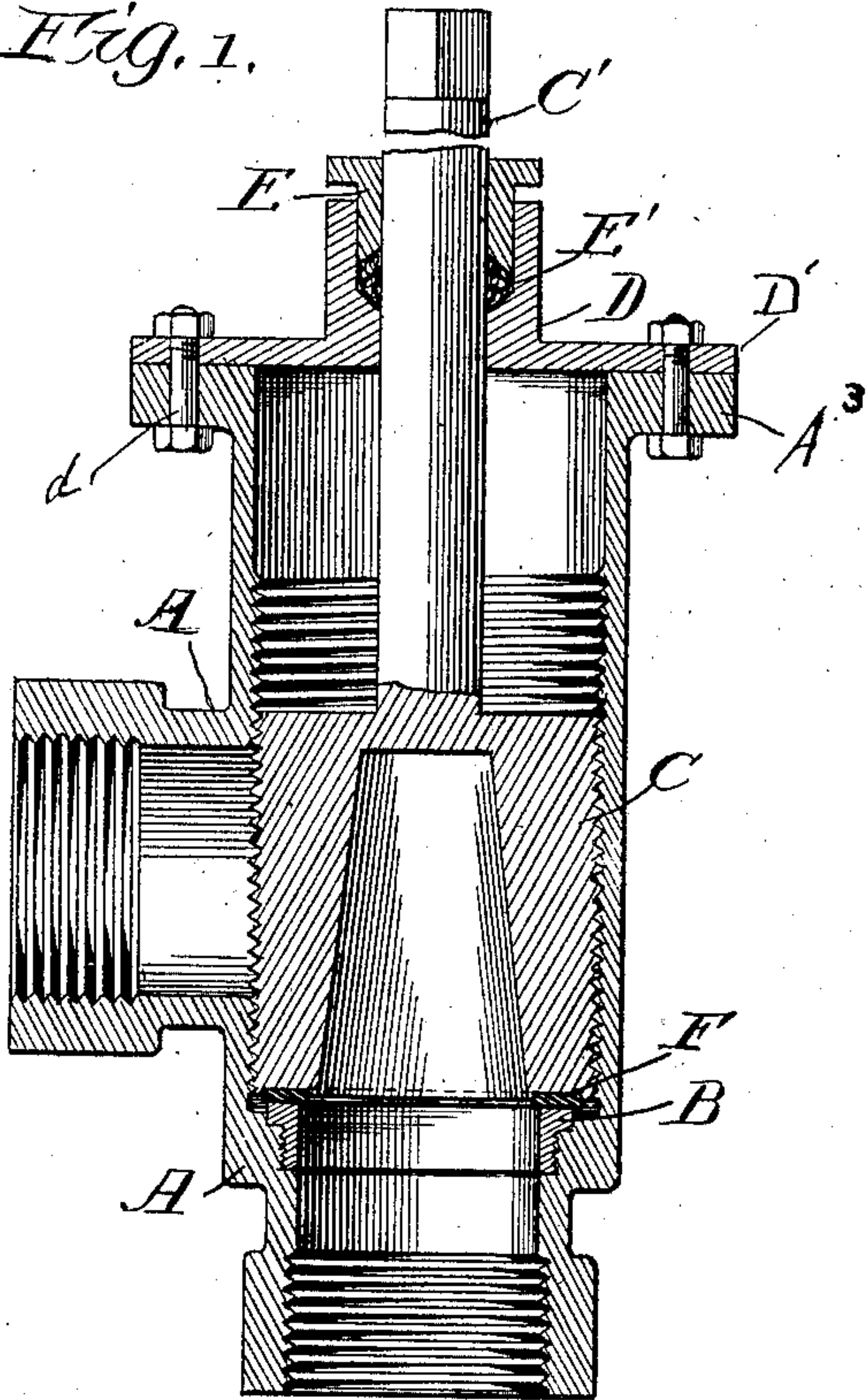


Fig. 2.

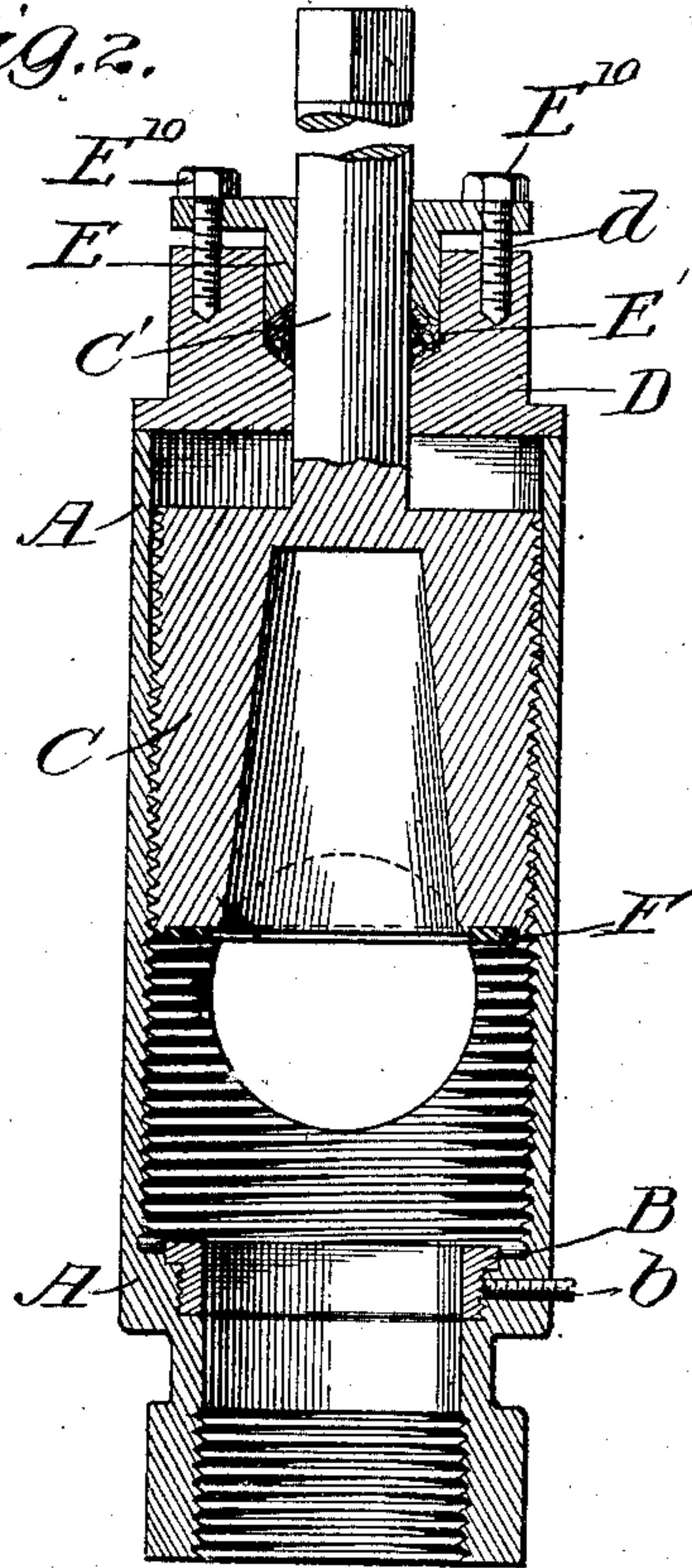
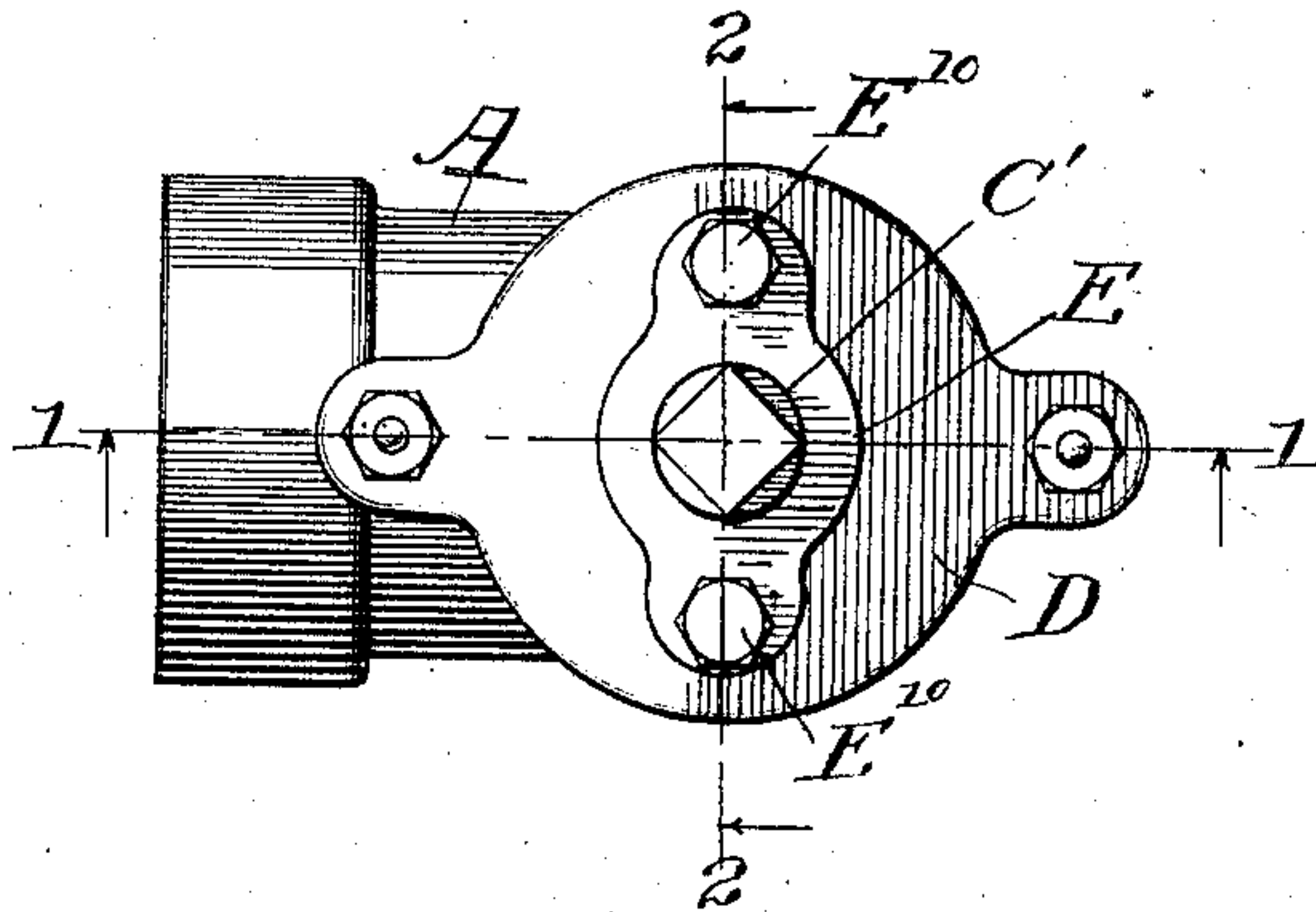


Fig. 3.



Witnesses:  
O. W. Merrill  
M. Gertrude Ady

Inventor:  
John Erwood  
by Burton Burton  
his attys.



# UNITED STATES PATENT OFFICE.

JOHN ERWOOD, OF CHICAGO, ILLINOIS.

## VALVE.

No. 859,441.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed April 9, 1906. Serial No. 310,625.

*To all whom it may concern:*

Be it known that I, JOHN ERWOOD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved blow-off valve for steam boilers which shall be superior to any now in use in respect to freedom from liability to obstruction by scale or other hard substance issuing from the boiler.

It consists of the features of construction set out in the claims.

In the drawings:—Figure 1 is an axial section at the line 1—1 on Fig. 3 of a valve embodying my improvements, the valve being shown in closed position. Fig. 2 is a similar section at the line 2—2 on Fig. 3 showing the valve partly open. Fig. 3 is a plan view of the valve.

The valve body, A, has a lateral coupling connection, A', for inlet from the boiler. The barrel or main limb of the body is cylindrically chambered from the upper end down to a point about half an inch below the lower side of the inlet passage, the chamber being interiorly threaded, not only above and past the inlet aperture, but substantially to the lower end of said cylindrical portion—that is, for the half inch, more or less, below said lower side of the inlet. Below that point the chamber is reduced in diameter and threaded to receive an annular brass seat, B, which may be rendered secure by a set screw, b, set in from the outside of the body. The valve, C, is cylindrical and exteriorly threaded for engaging the interior thread of the cylindrical chamber, which, being of full diameter to the top, permits the valve to be entered at the top and screwed down into the chamber to closed position, the stem, C', being integral with the body of the valve and emerging through a cap-plate, D, secured by bolts, d, d, taking through lugs, D', on the cap-plate, and A', on the upper end of the body. A simple form of gland, E, is provided to retain the packing, E', the gland being secured by bolts, E<sup>10</sup>, E<sup>10</sup>, taking through lugs on the gland, and on the upper end of the boss, D<sup>2</sup>, constituting a stuffing box, formed on the top of the cap-plate, D. The valve, C, may be interiorly chambered on the under side, merely for lightening it; and at the lower end it receives in annular grooves cut for that purpose a lead gasket or packing, F, for seating on the seat, B, the gasket being wider than the brass seat, and the brass seat being higher than the recess into which it is screwed in the body, so that the contact of metal to metal at seating is limited to the lead above and the brass seat below.

The difficulty arising from scale or other hard particles from the boiler getting between the valve and

seat of a blow-off device and preventing the valve from being closed after blowing off, is chiefly caused by the fact that as the valve approaches its seat in closing, and the orifice through which the discharge occurring is greatly narrowed, any piece of scale or other hard substance entering into the narrowed orifice is liable to be caught between the two proximate faces of valve and seat, the shape of the scale permitting it to enter but not to pass through, or the advancing valve catching the scale in the instant of its passing. In the latter case the valve may be backed up to release the scale, but in the meantime it may be jammed into a corner of the seat and retained, or the shape may prevent it from escaping; and in any event, when there is considerable scale the same thing may recur as often as the valve is operated for closing, a different piece being caught each time. In the operation of the valve shown in the construction of the above-described valve, it is designed to prevent this difficulty; for it will be observed that in closing the valve the inlet is completely shut off,—except as to leakage past the thread,—while the valve is still a half inch, more or less, from its seat. Any piece of scale that might be caught at the margin of the inlet under the lower end of the valve in the closing movement of the latter is in an entirely different situation from a piece of scale which might, in ordinary construction of valves, be caught between the valve and seat, because it is in position to be sheared off by the continued closing movement, instead of to be merely pinched tight between two binding surfaces; and if sheared off it has a half inch clear space in which to escape before the valve reaches its seat. Any scale that may be carried by the water passing while the valve is wide open, and which might be lodged upon the seat at the side opposite the inlet will be almost certain to be flushed off in the continued operation. If a piece of scale should become thus lodged and remain until the valve is operated for closing, the only obstructive effect will be that the valve cannot perfectly reach its seat; but it will have cut off the inlet while it is yet half an inch away from its seat, and the leakage past the thread is so slight that it will not cause a boiler to be drained of water in many hours, so that danger of the boiler draining out in the night on account of leaking blow-off is avoided.

The thread is designed to be sufficiently loose so that there will be no danger of its binding on account of unequal expansion and contraction, but steam at least, and to some extent, water, may pass the thread, and water of condensation will accumulate above the valve in the valve chamber between the upper end of the valve head and the cap, D, and will constitute a water packing of the thread, but the water will be readily forced out past the thread when the valve is opened, and thus all fine silt which might be carried past the



thread or remain lodged in it will be flushed out at each operation, and the thread will be kept perfectly clear at the upper part. At the lower part it will be evident that the thread will be at all times flushed clear  
5 in the operation of the valve.

I claim:--

1. A blow-off valve comprising a cylindrically chambered body having a lateral port and a smooth annular valve seat in a plane transverse to the axis of the cylindrical chamber at a considerable distance from the nearer side of the port, such chamber being interiorly threaded at the zone of the port and for a considerable distance there-  
10 past in the direction of the valve seat; a cylindrical valve exteriorly threaded for engaging said interior thread and adapted to be screwed into the chamber from the side of the port opposite the seat and to seat endwise on said  
15 annular seat, and adapted when screwed into the chamber past the port to obstruct said port at all positions of its rotary movement in the thread.
2. A blow-off valve comprising a body having a cylindrical chamber provided with a lateral port and a smooth annular valve seat in a plane transverse to the axis of the chamber at a considerable distance longitudinally of the chamber from the proximate side of the lateral port and  
20 having an axial port opening through said annular valve seat, the chamber being threaded from a point at the opposite side of the lateral port from the seat to a point a considerable distance beyond the other side of said port, and a cylindrical valve exteriorly threaded for engaging  
25 said interior thread and adapted to be screwed into the chamber from the side of the port opposite the seat and to seat endwise on said annular seat and adapted when screwed into the chamber past the port to obstruct said  
30 port at all positions of its rotary movement in the thread.

3. A blow-off valve comprising a cylindrically chambered body open at both ends and having a lateral port, the chamber of the body being reduced in diameter at a considerable distance longitudinally from the proximate side of the lateral port and having a smooth annular valve seat formed on the shoulder produced by such reduction of diameter, said chamber being interiorly threaded at the zone of the lateral port and for a considerable distance there-past toward said annular seat; a cylindrical valve exteriorly threaded for engaging said interior thread and adapted to be screwed into the chamber from the side of the port opposite the seat and to seat endwise on said annular seat, and adapted when screwed into the chamber past the port to obstruct said port at all positions of its rotary movement in the thread.  
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4. A valve body having a cylindrical chamber with a lateral port and an end port; a smooth annular valve seat which encompasses the end port located at a considerable distance longitudinally of the chamber from the proximate side of the lateral port, said chamber being threaded interiorly at the zone of the lateral port and for a distance there-past in both directions; a cylindrical valve exteriorly threaded for engaging said interior thread and adapted to be screwed into the chamber from the side of the port opposite the seat and to seat endwise on said annular seat, and adapted when screwed into the chamber past the port to obstruct said port at all positions of its rotary movement in the thread.  
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In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 7th day of April, 1906.

JOHN ERWOOD.

In the presence of--

CHAS. S. BURTON,  
M. GERTRUDE ADY.