

No. 741,828.

PATENTED OCT. 20, 1903.

C. L. PRESNELL.
CYLINDER RELIEF VALVE.
APPLICATION FILED JUNE 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

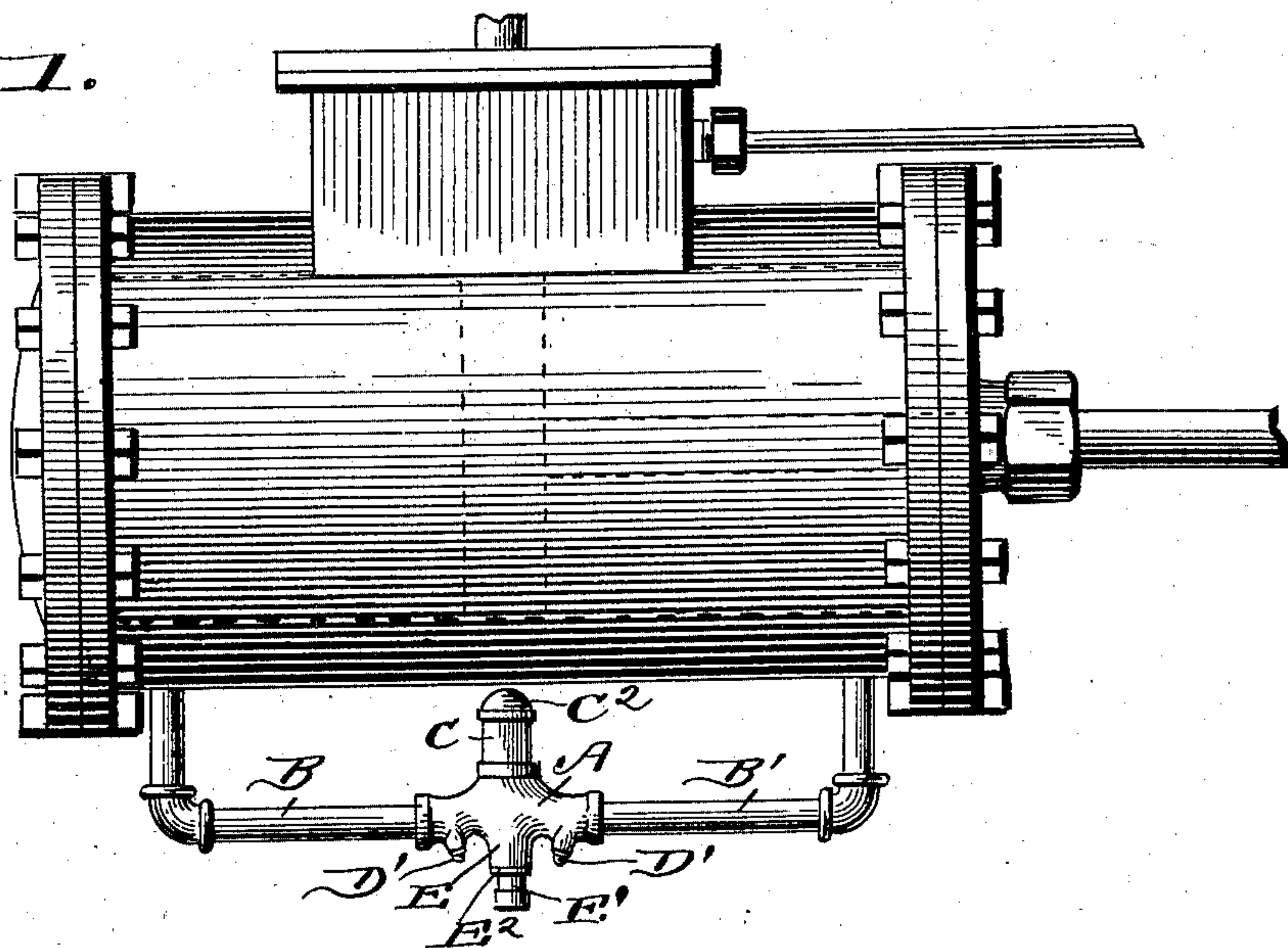
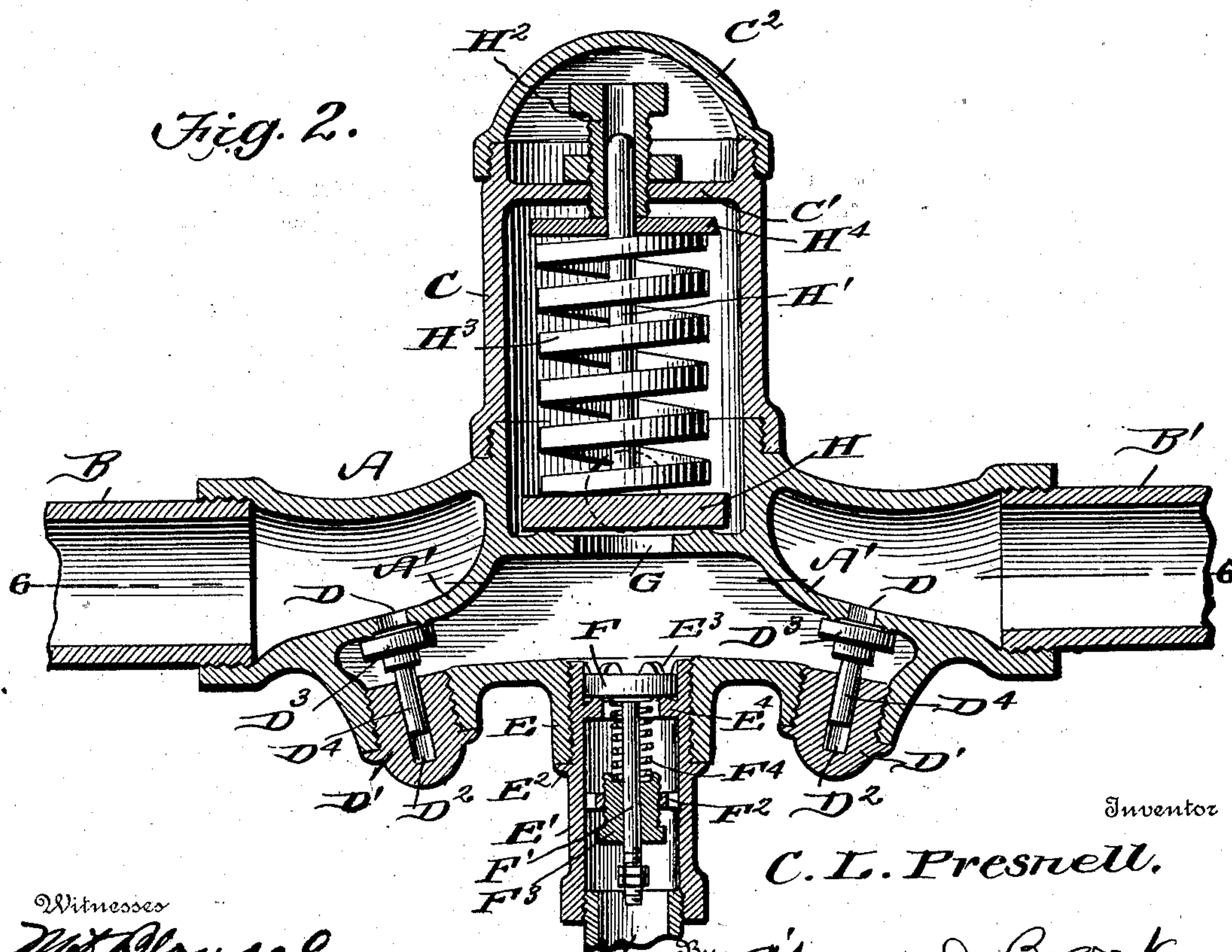


Fig. 2.



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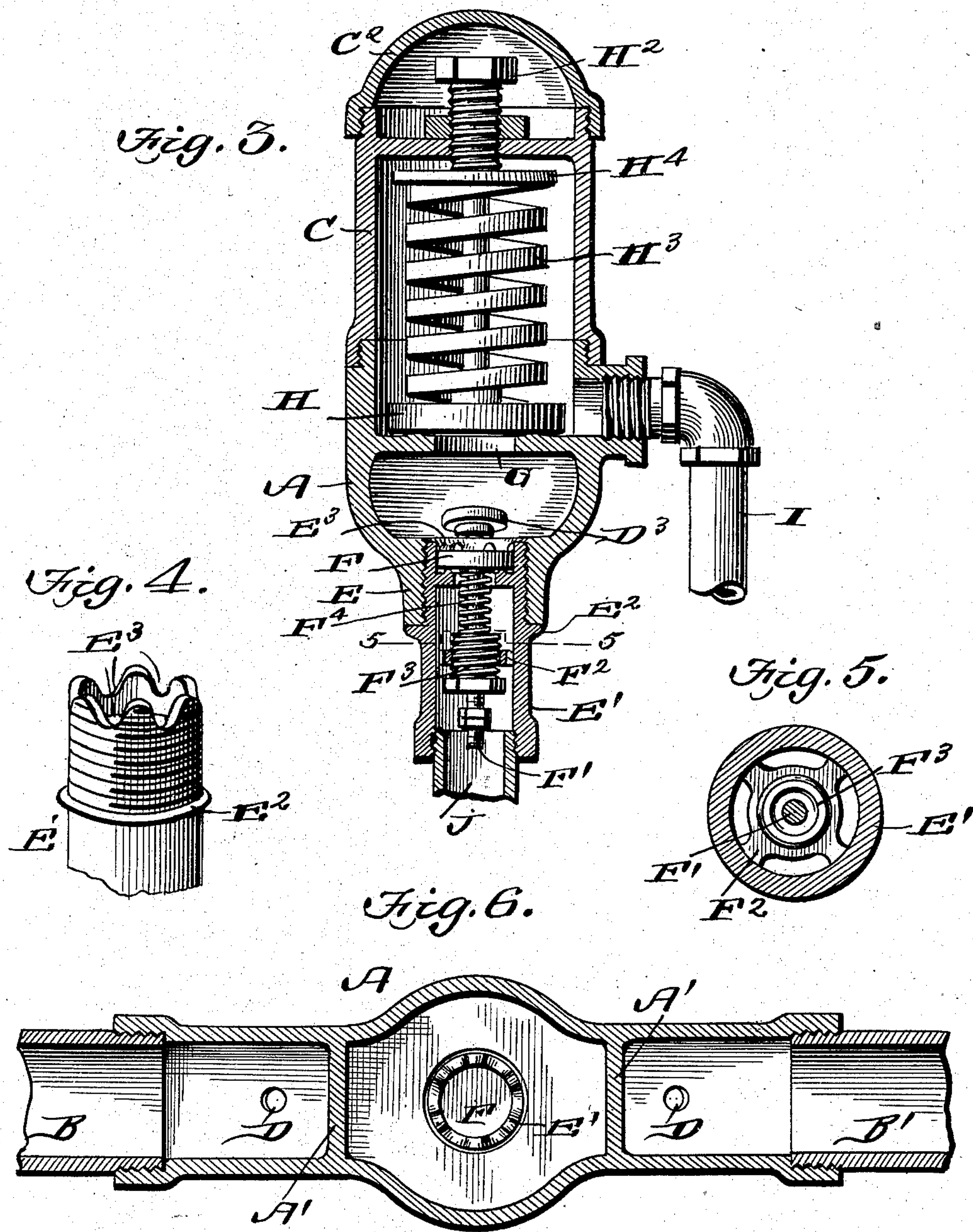
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UNITED STATES PATENT OFFICE.

CHARLES L. PRESNELL, OF MOUNTAIRY, NORTH CAROLINA.

CYLINDER RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 741,828, dated October 20, 1903.

Application filed June 27, 1903. Serial No. 163,416. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. PRESNELL, a citizen of the United States, residing at Mountairy, in the county of Surry and State of North Carolina, have invented a new and useful Cylinder Relief-Valve, of which the following is a specification.

My invention relates to a cylinder relief-valve; and the object of my invention is to provide a valve of this character which will automatically open on excessive pressure due to water in an engine or pump cylinder by reason of condensation of steam in the cylinder or feed-pipe or by reason of water having been carried to the cylinder from the boiler while steam is being drawn therefrom.

A still further object of my invention is to provide a valve which will automatically open and drain a cylinder when steam is cut off from the cylinder, thereby avoiding danger from water collecting in the cylinder through a leaky throttle-valve, for example, and freezing.

My invention consists in the novel features of construction and combination of parts hereinafter fully described, particularly pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a side elevation showing my valve applied to an engine-cylinder. Fig. 2 is a vertical section taken centrally and longitudinally through the valve-casing. Fig. 3 is a sectional view taken vertically through the center of the valve at a right angle to Fig. 2. Fig. 4 is a perspective view of a sleeve forming one of the valve-seats. Fig. 5 is a section on the line 5 5 of Fig. 3. Fig. 6 is a section on the line 6 6 of Fig. 2.

In constructing my valve I employ an elongated valve-casing A, of brass or any other suitable metal. The casing is open at each end, the end portions being interiorly threaded, and into these ends are fitted pipes B B', the pipe B leading from the lower head end of a cylinder and the pipe B' leading from the lower side of the crank end. A socket is formed on the upper side of the casing, and over this socket is secured a downwardly-open dome C, divided adjacent its upper end by a partition C' into upper and lower compartments, the upper compartment being closed by a removable cap C². The casing A

is divided into three chambers by the obliquely-arranged divisional wall A', whereby are formed two outer chambers, which are practically continuations of the pipes B B', respectively, and a lower intermediate chamber below the dome C. The walls A' have openings D formed in them, and a valve-seat is formed on the under side of the walls around the openings. Plugs D' are threaded into the lower wall of the casing, and sockets D² are formed in these plugs in alinement with the openings D. A check-valve D³ co-operates with each seat, the stem D⁴ of the valve sliding in the socket D² and the valve opening by gravity. Between the plugs D an opening is formed in the bottom of the casing and is surrounded by an annular depending interiorly-threaded flange E, and into this flange is threaded the upper portion of a depending sleeve E', the lower end of the flange resting against a shoulder E², formed in the sleeve. The upper inner end of the sleeve has a notched or serrated edge, as shown at E³ in Fig. 4. A valve-seat E⁴ is formed in the sleeve adjacent its upper end. A valve F rests on said seat and has a depending stem F'. A web F² is formed in the sleeve below the seat, and working in the central threaded perforation of the web is a tension-nut F³. The valve-stem F' extends loosely through the nut F³. A coiled spring F⁴ encircles the stem, bearing at its upper end on the valve F and at its lower end against the inner end of the nut F³. The tendency of this spring is to lift the valve F from its seat. An opening G affords communication between the intermediate chamber and the lower portion of the dome, the opening being normally closed by a valve H. In the partition C' is arranged a threaded perforated nut H², and the valve-stem H' slides through same. A spring H³ encircles the stem and bears downward on the valve H and upward on a washer H⁴, which is held in position by the nut H². By adjusting the nut the tension of the spring H³ can be regulated. An exhaust-pipe I leads from one side of the dome, and a drip-pipe J is connected to the lower end of the sleeve E'.

The operation of my device is as follows: On opening the throttle-valve to admit steam to the head end of the cylinder forward movement of the piston will force any water that

may be in the crank end through the pipe B' and opening D into the intermediate chamber, the same pressure closing valve F and also closing the valve D³ on the side of the casing adjacent the pipe B. On the return movement of the piston water will be forced from the cylinder through the pipe B, the valve D³ on the pipe B' side closing. The valve H is set by the spring H³ for the working pressure, and should this pressure be exceeded will lift, allowing the water to escape through the dome and pipe I. When steam is shut off and pressure is removed, the valves D³ fall by gravity, leaving the opening D uncovered, and the valve F is lifted by the spring below it, and any water collecting in the cylinder can drain out.

It is obvious that no valves will have to be operated by hand to clear the cylinder of water.

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

1. The combination with a cylinder, of a valve-casing having communication with each end of the cylinder, oppositely-acting check-valves arranged in said casing, a spring-actuated drip-valve in the lower part of the casing, a safety-valve in said casing, and means for regulating the pressure required to lift the last-mentioned valve.

2. The combination with a cylinder, of a valve-casing having end and intermediate chambers and a dome, pipes connecting the end chambers with the ends of the cylinder, check-valves arranged between each end chamber and the intermediate chamber, said valves opening by gravity and closing by reason of pressure in the intermediate chambers, a valve in said intermediate chamber adapted to be closed by pressure within the cylinder, a spring adapted to lift said valve when steam is cut off from the cylinder, and a relief-valve arranged in the dome and adapted to permit escape of steam and water from the intermediate chamber at a predetermined pressure.

3. A device of the kind described comprising a casing arranged beneath a cylinder, said casing having end and intermediate chambers, pipes connecting the end chambers with the ends of the cylinder, check-valves adapted to open automatically when steam is cut off from the cylinder, a valve arranged in the intermediate chamber, and a spring adapted to lift said valve when pressure of steam in the intermediate chamber falls below a predetermined point.

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