

No. 702,353.

Patented June 10, 1902.

C. H. ATKINS.

WATER AND AIR RELIEF VALVE FOR STEAM PASSAGES.

(Application filed July 23, 1900.)

(No Model.)

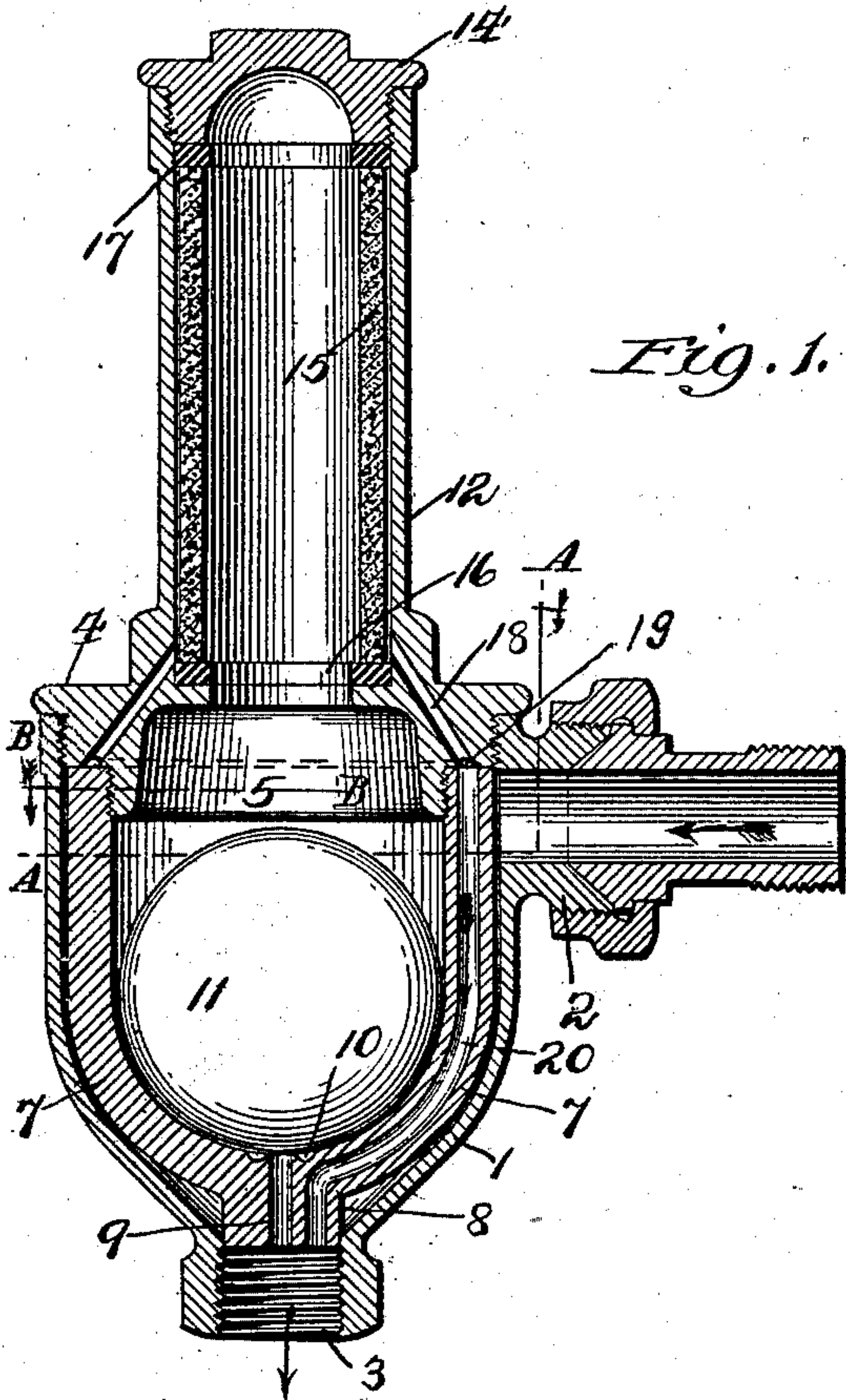


Fig. 1.

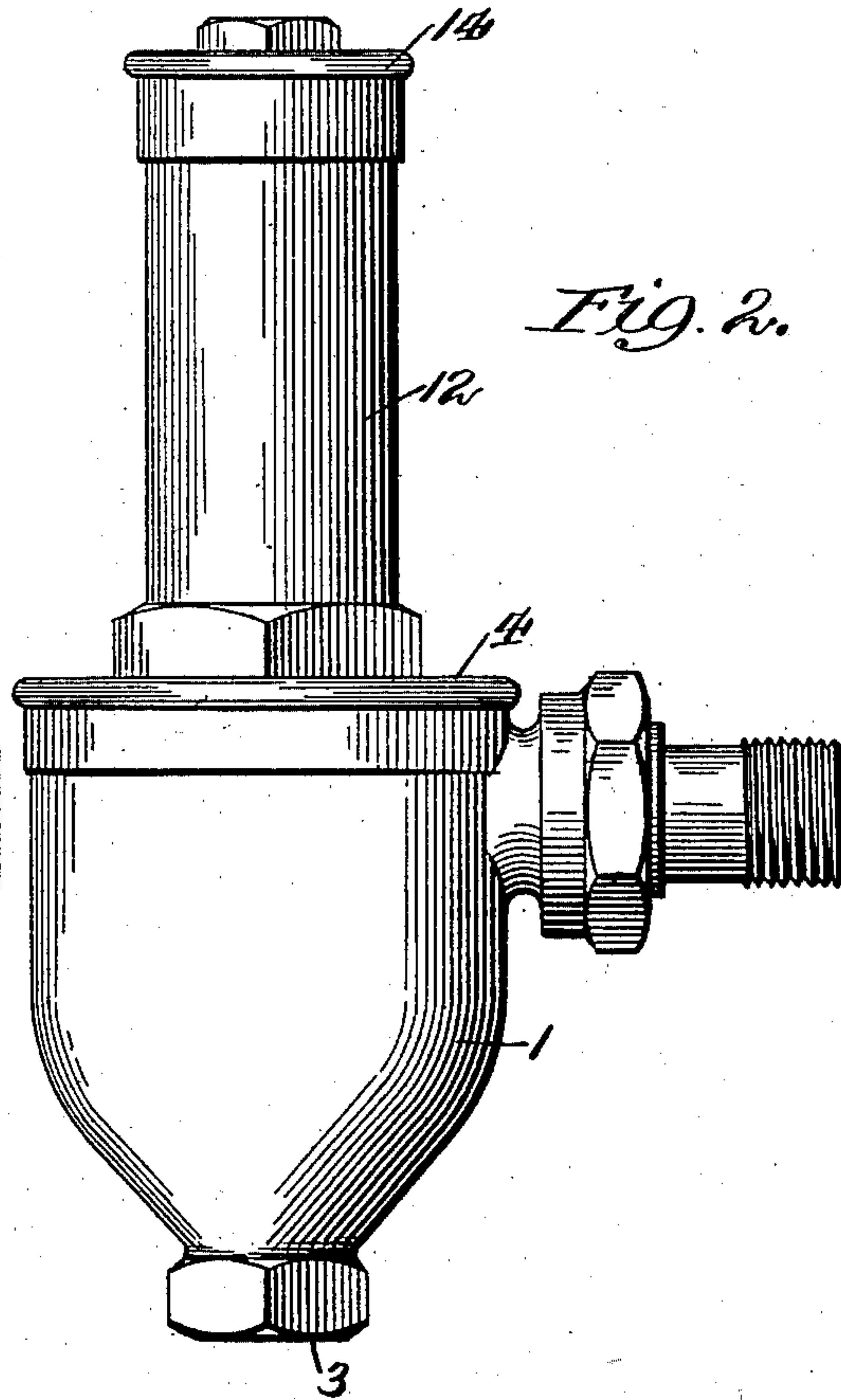


Fig. 2.

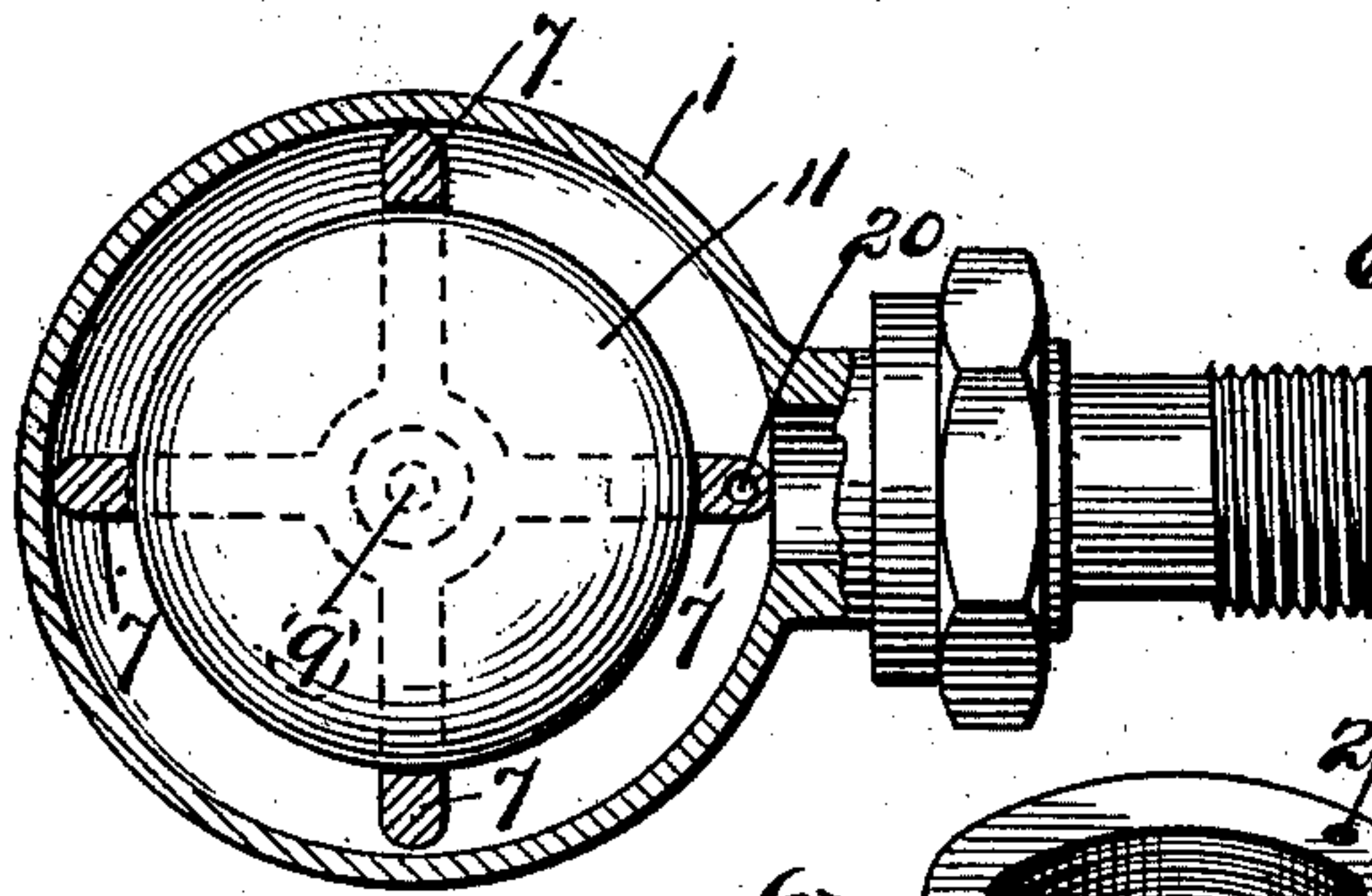


Fig. 3.

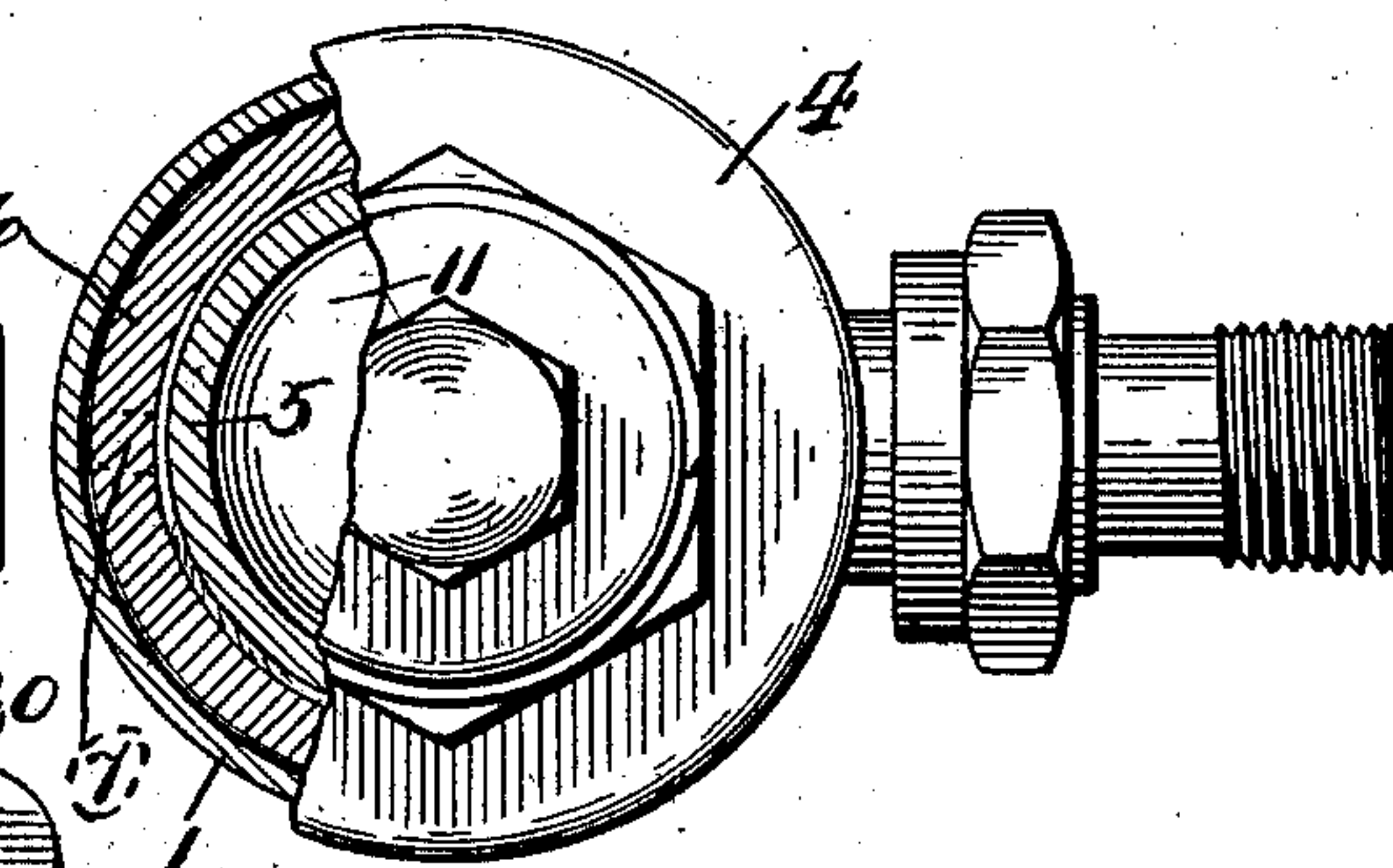


Fig. 4.

Witnesses
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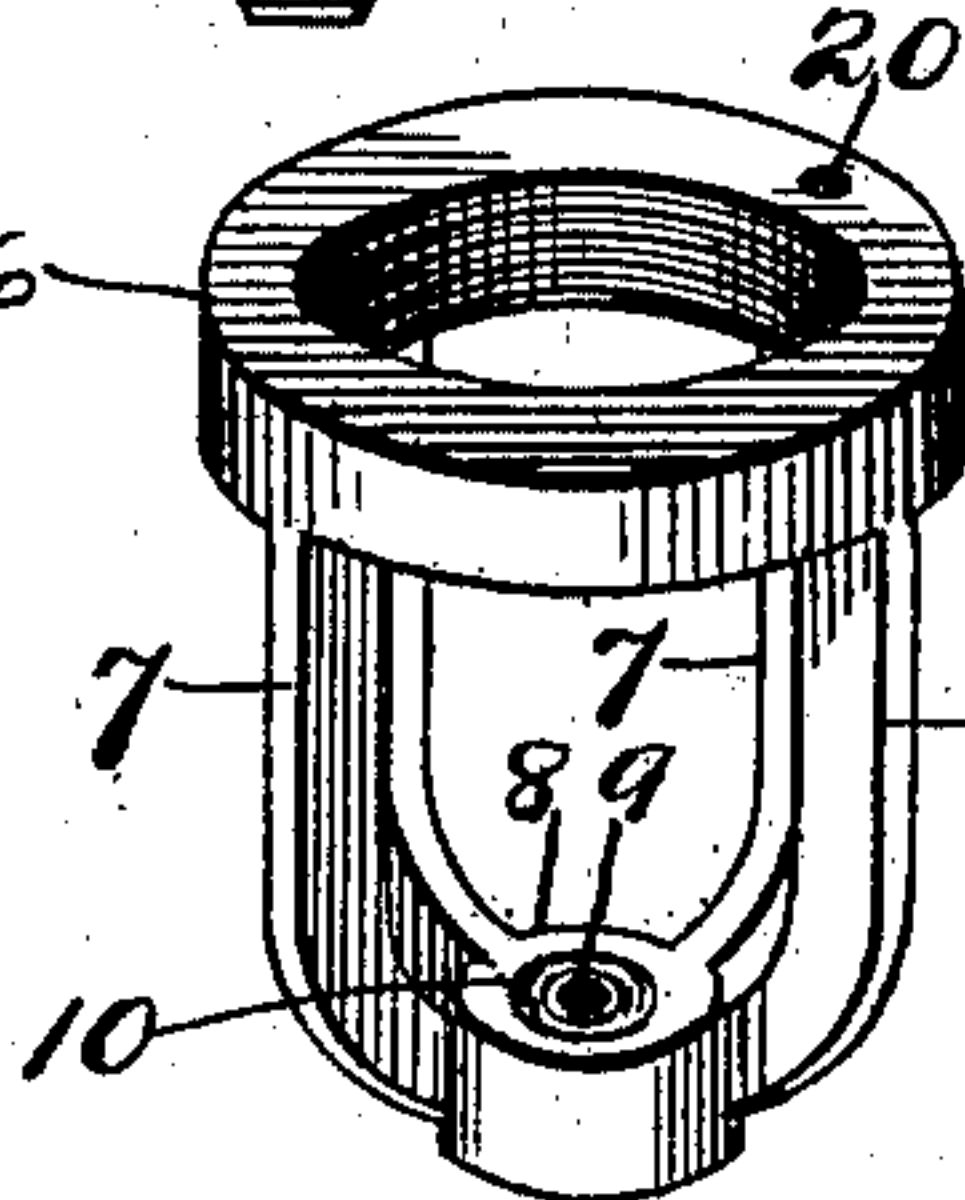


Fig. 5. Inventor
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UNITED STATES PATENT OFFICE.

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WATER AND AIR RELIEF-VALVE FOR STEAM-PASSAGES.

SPECIFICATION forming part of Letters Patent No. 702,353, dated June 10, 1902.

Application filed July 23, 1900. Serial No. 24,483. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HENRY ATKINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water and Air Relief-Valves for Steam-Passages, of which the following is a full, clear, and exact specification.

My invention relates to valves for relieving radiators and other steam-passages of air and the water of condensation; and it has for its primary object to provide an improved valve which shall automatically open when the water rises to a predetermined level to permit the water to escape and close when the water falls below such level to prevent the escape of the steam and which shall also be of such construction as to afford the air a permanently-open exit through which the steam cannot pass.

A further object of my invention is to provide means whereby the valve-chamber may be readily relieved of the scale, dirt, and other foreign matter accumulated from the heating system or other steam-passage to which my improved device may be applied.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a vertical sectional view of my improved valve. Fig. 2 is a side elevation thereof. Fig. 3 is a plan section taken on the line A A, Fig. 1. Fig. 4 is a plan, partly sectioned, on the line B B, Fig. 1; and Fig. 5 is a detail perspective view of the valve-cage hereinafter described.

My improved valve is more especially adapted for use in connection with heating systems employing vacuum-pumps or other suction or exhausting devices for drawing off the air and water; but, as will be understood, it may nevertheless be employed to advantage in other systems.

1 represents a valve body or chamber having any suitable inlet-fitting 2, which adapts it for connection with the heating system or

other steam-passage to be relieved of air and the water of condensation, and at a suitable point, preferably the bottom of this chamber 1, is formed an outlet 3, which has a threaded neck adapted to be secured to any suitable discharge-pipe, and when employed in heating systems having exhausting devices for removing the air and water such outlet 3 would be connected to the suction-port of the exhauster. The upper end of this chamber 1 is closed by a cap 4, which is preferably threaded therein and which is also provided with a smaller threaded flange or nipple 5, depending into the chamber 1, and upon this flange 5 is screwed a valve-cage consisting of a threaded ring 6, upon which are formed one or more spider-arms 7, terminating at their lower ends in a member 8, having a central aperture 9, surrounded by a valve-seat 10, upon which rests a ball-valve 11. The lower end of the member 8 is formed into a plug, which seats in and closes the outlet 3 under normal conditions, but which is capable of being raised out of said outlet 3 by backing off the cap 4 a slight distance and without loosening the valve-cage or permitting the escape of the contents of the chamber 1 past the threaded connection therewith of the cap 4, said threaded connection being of sufficient length to permit of this adjustment or upward movement of the plug or member 8. The purpose of thus making the plug or member 8 removable from the outlet 3 and affording an unrestricted exit from the chamber 1 to the pipe connected with the outlet 3 is to provide for blowing off the scale, dirt, and other foreign matter accumulating in the chamber 1 from the heating system, a result of common occurrence in new systems, owing to the scale and the small fragments adhering to the surfaces of new pipes and the dirt and other particles left in the pipes by the workmen. With this construction, therefore, it will be seen that by backing off the cap 4 a slight distance the entire outlet 3 may be thrown open and the steam-pressure or the suction of the exhausting device utilized for blowing out the chamber 1, whose bottom portion may be funnel shape, as shown in the drawings, to facilitate the downward movement of the particles.

Formed on or secured to the cap 4 is a casing 12, which is preferably cylindrical and which is provided at its lower end with a shoulder 13 and at its upper end with a removable cap 14. Seated upon this shoulder 13 is a cylinder 15, composed of some porous material—such as burnt fire-clay, brick-clay, carbon, or other substance—having small capillary passages through which air may pass, but which are so small as to be capable of condensing steam before it can find its way therethrough. The upper end of this cylinder 15 is impinged by the cap 14. In order that the joints between the cap 14 and the shoulder 13 may be rendered absolutely tight, however, I prefer to interpose a gasket 16 between the shoulder 13 and lower end of the cylinder and a similar gasket 17 between the upper end and the cap 14. The cylinder 15 is of slightly less diameter than the casing 12, and extending from the casing 12 at one or more points between the seating ends of the cylinder 15 are one or more air-vents 18, which extend downwardly through the cap 4 and communicate with an annular groove 19, formed in the lower face of said cap, and this annular groove in turn communicates with a duct 20, extending downwardly through the ring 6 and one of the spider-arms 7 and finally discharging through the plug 8 directly into the outlet 3.

By the means described it will be seen that the inlet 3 has permanent and direct communication with the interior of the chamber 1 and also with the interior of the cylinder 15, and as a consequence the air entering the said cylinder through the inlet 2 will percolate through the pores of the cylinder and find its way through the air-vents 18 and the duct 20 to the outlet 3, the passage of the air being assisted by the suction induced by the usual exhauster. It will also be seen that by the described construction the valve-chamber 1 is provided with two outlets, one of which—i. e., 3—is under normal conditions closed by the plug or member 8 and the other of which—i. e., 9—is automatically closed by the valve 11, and when the water of condensation which enters the chamber 1 through the inlet 3 rises therein beyond a predetermined level the valve 11 will automatically rise from its seat and permit such water to escape directly into the outlet 3 through the outlet or aperture 9, the valve 11 being buoyant.

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

1. In a relief-valve for the purposes described, the combination of a valve-body having an inlet and an outlet, a movable cage within said valve-body fitting said outlet and provided with a valve passage-way communicating therewith, said cage being provided with an air passage-way communicating with said outlet, an automatic valve within said cage controlling the valve passage-way

therein, and a porous steam-barrier between the inlet and the air passage-way in said cage.

2. In a relief-valve for the purposes described, the combination of a valve-body having an inlet and an outlet, an automatic valve normally controlling the thoroughfare between said inlet and outlet, a removable cage within the valve-body carrying said automatic valve and provided with an air passage-way communicating with the outlet beyond said valve, and a porous steam-barrier between the inlet and the air passage-way in said cage.

3. In a relief-valve for the purposes described, the combination of a valve-body having an inlet and an outlet, an automatic valve normally controlling the thoroughfare between said inlet and outlet, a removable cage within the valve-body carrying said automatic valve and provided with an air passage-way communicating with the outlet beyond said valve, a cap for said valve-body carrying said cage provided with an air passage-way communicating with the air passage-way in said cage, and a porous steam-barrier carried by said cap and interposed between the inlet of the valve-body and the air passage-way in the cap.

4. In a relief-valve for the purposes described, the combination of a valve-body having an inlet and an outlet, an automatic valve normally controlling the thoroughfare between said inlet and outlet, a removable cage within the valve-body carrying said automatic valve and provided with an air passage-way communicating with the outlet beyond said valve, a cap for said valve-body carrying said cage and provided with an extension, a tubular porous steam-barrier carried by said cap and having one side in communication with the inlet, said cap being provided with an air passage-way leading from the other side of the tubular steam-barrier to the air passage-way in the cage.

5. In a relief-valve for the purpose described, the combination of a valve-body having an inlet and an outlet, an automatic valve normally controlling the thoroughfare between said inlet and outlet, a cap closing said valve-body and carrying a casing having an air passage-way communicating with the outlet beyond the automatic valve, a tubular porous steam-barrier in said casing having one end seated against the casing, a cap closing the other end of the casing and seated against the other end of the said porous barrier, said air passage-way in the casing opening to the exterior of the tubular barrier and the interior of the barrier communicating with the inlet.

6. In a relief-valve for the purpose described, the combination of a valve-body having an inlet and an outlet, a cap closing said valve-body and having a supplemental threaded nipple, a valve-cage carried by said nipple independently of the valve-body and having a valve passage-way communicating

with the outlet, a valve in said cage to control said valve passage-way, said cap being provided with an air passage-way communicating with the outlet beyond said valve, and
5 a porous steam-barrier between said air passage-way and the inlet of the valve-body.

7. In a relief-valve for the purpose described, the combination of a valve-body having an inlet and an outlet, a cap closing said
10 valve-body and having a supplemental nipple, a valve-cage carried by said nipple independ-

ently of the valve-body and having a portion fitting and partially closing said outlet and provided with a valve passage-way communicating therewith, and an automatic valve
15 carried by said cage and controlling said valve passage-way.

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Witnesses:

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