

C. WALKER.  
DRAINAGE SYSTEM.  
APPLICATION FILED JUNE 8, 1910.

995,930.

Patented June 20, 1911.

Fig. 1.

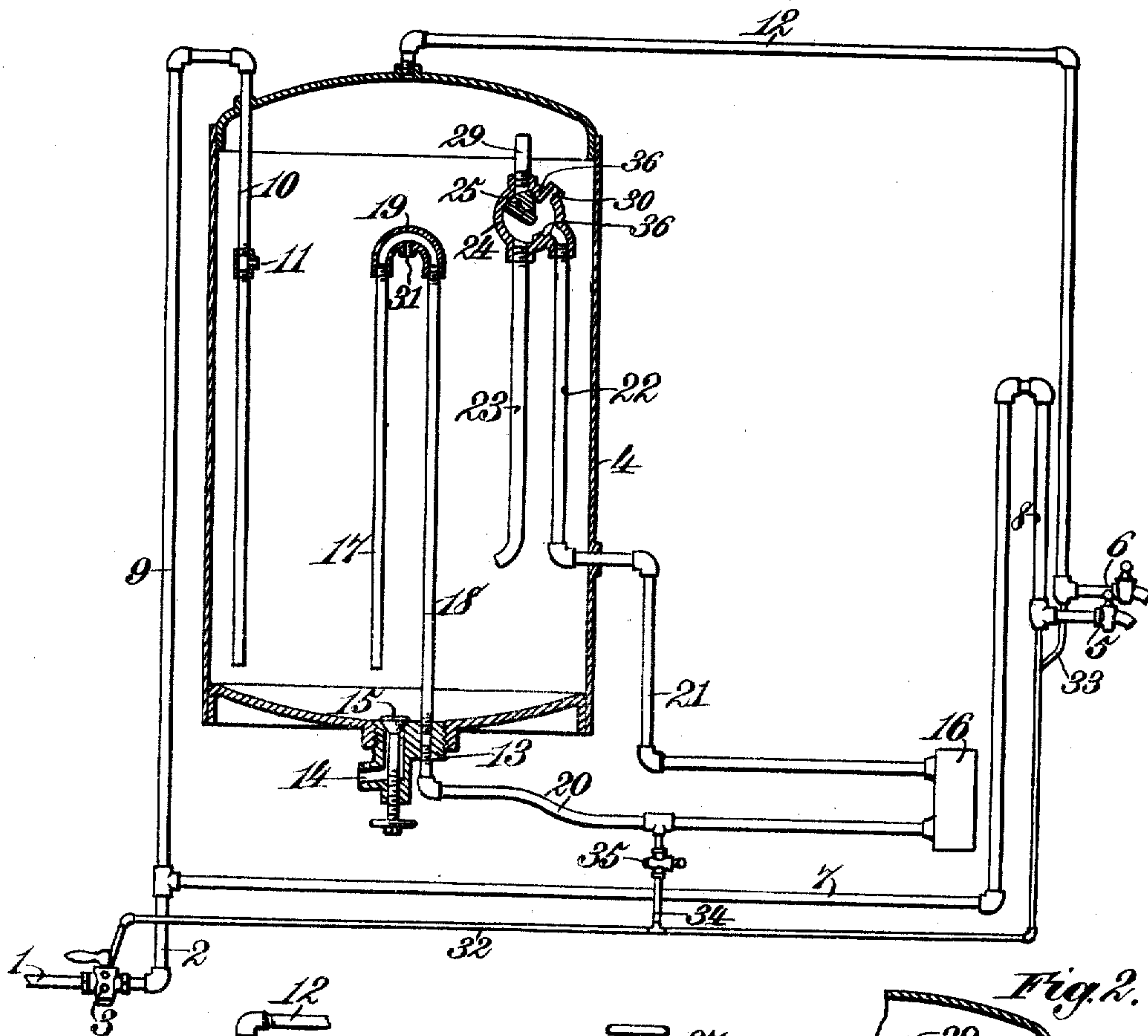


Fig. 2.

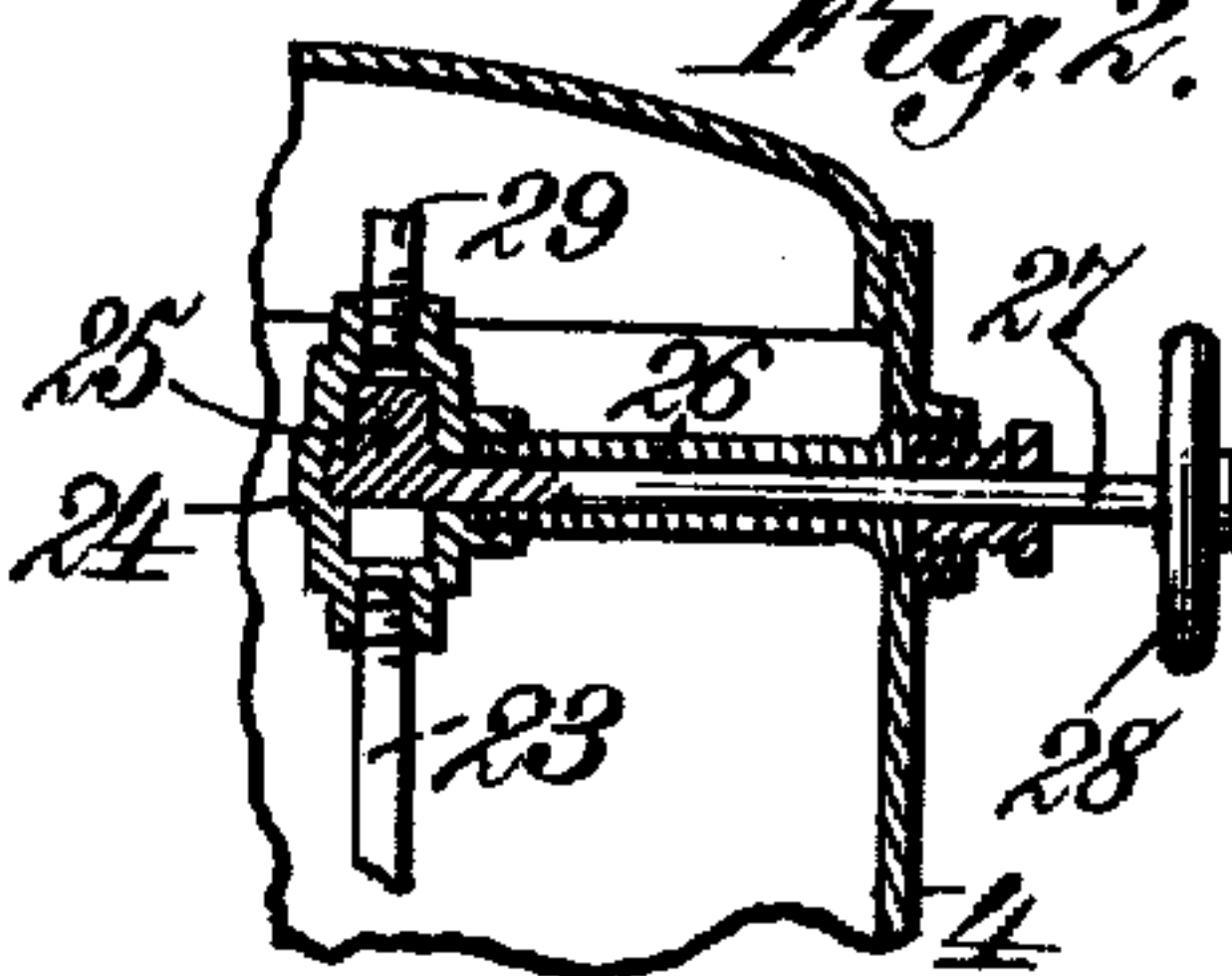


Fig. 3.

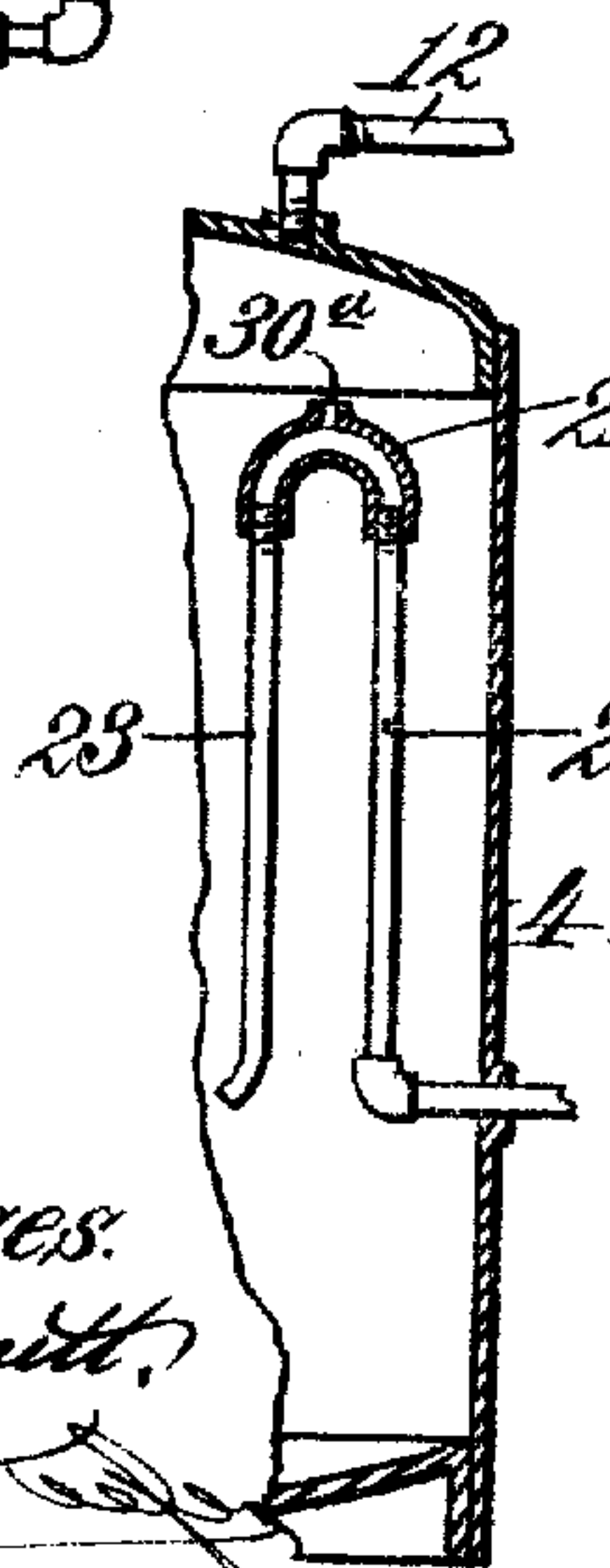
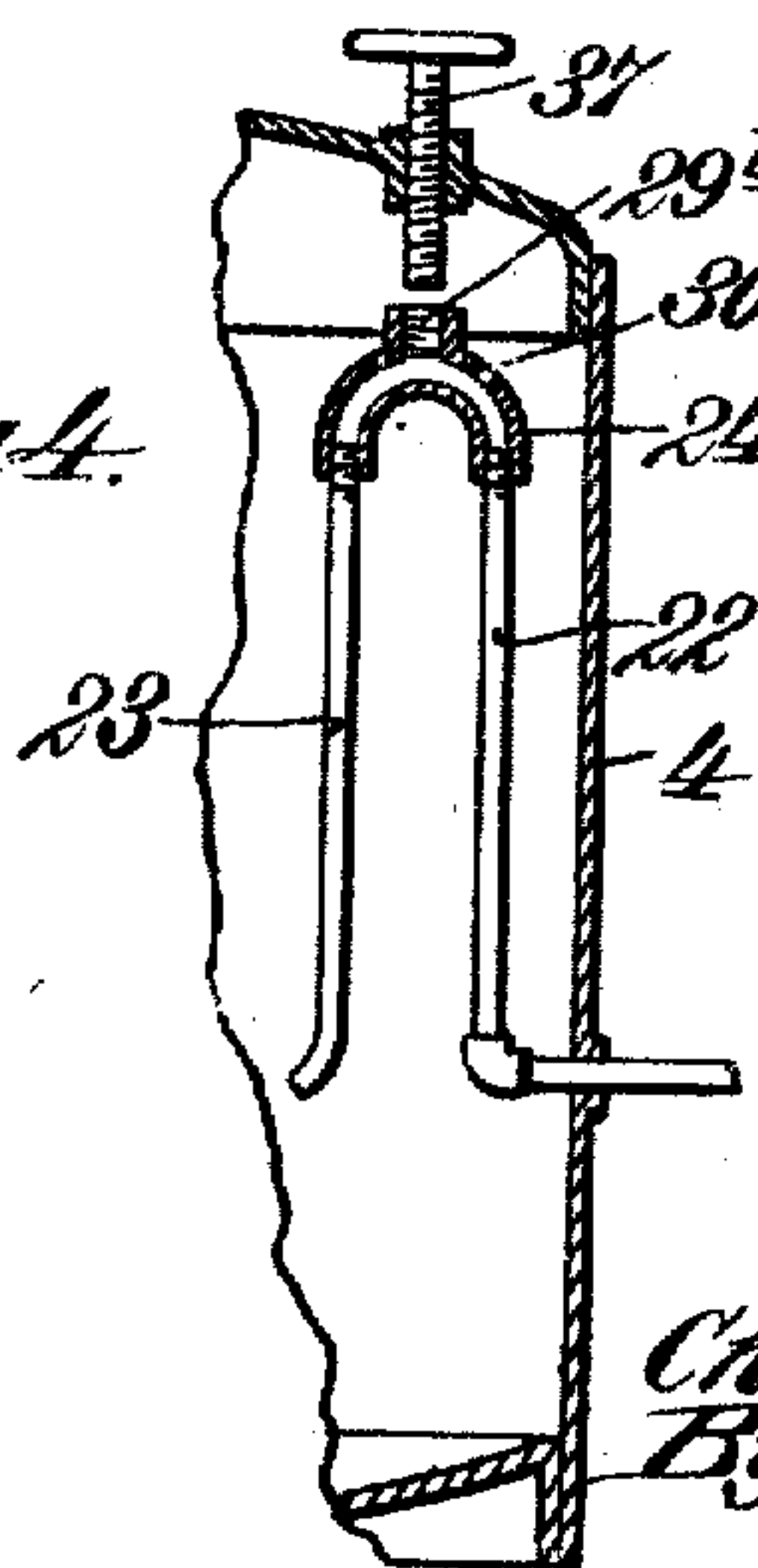


Fig. 4.



Witnesses:  
Robert Smith

*[Signature]*

Inventor:  
Charles Walker  
By *[Signature]*  
Att'y.



# UNITED STATES PATENT OFFICE.

CHARLES WALKER, OF KNOXVILLE, TENNESSEE.

## DRAINAGE SYSTEM.

995,930

Specification of Letters Patent. Patented June 20, 1911.

Application filed June 8, 1910. Serial No. 565,824.

*To all whom it may concern:*

Be it known that I, CHARLES WALKER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented new and useful Improvements in Drainage Systems, of which the following is a specification.

This invention relates to improvements in drainage systems for water service pipes and it proposes a system wherein by the opening of a suitably constructed drain valve, all the pipes in the building including those that are trapped, are completely drained, and without the necessity of opening the several faucets, and wherein the draining of the hot water boiler is automatically prevented beyond a prescribed limit. As an incident of the system the invention proposes a means to provide for the instantaneous delivery of hot water.

An embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a diagram of the system; Fig. 2 is a detail sectional view illustrating the arrangement of a valve to be hereinafter specifically referred to; and Figs. 3 and 4 are sectional views illustrating alternative features of construction which may be embodied in the system.

Similar characters of reference designate corresponding parts throughout the several views.

The water is admitted to the building through a pipe, as 1, between which and the main distributing pipe 2, a drain valve, as 3, is interposed. This drain valve is preferably of the construction shown in my co-pending application, Serial No. 545,915.

The hot water boiler is designated by the numeral 4 and the cold and hot water faucets are designated by the numerals 5 and 6 respectively. The cold water faucet 5 is connected with the pipe 2, by a pipe, as 7, which is continued to a point above the faucet 5 and which is connected with the latter by a depending pipe, as 8. The boiler 4 is connected with the pipe 2 by a pipe, as 9, forming in effect a continuation of said main distributing pipe 2 and from which depends a pipe 10 which projects into said boiler and which, a short distance from the upper end of the boiler, is provided with a small opening 11. The boiler is, in turn,

connected with the hot water faucet 6 by a pipe, as 12.

In some cases it may be desired to completely drain the boiler. For this purpose a casting, as 13, is threaded into the lower head of the boiler and is provided with a discharge way, as 14, which is normally closed by a valve, as 15, the stem of which is threaded through the lower end of the casting 13.

The water back is shown at 16 and the connections thereof with the boiler are of special character. The inflow connections of the water back consist of pipes 17 and 18, connected at their upper ends by a curved union 19 and forming in effect an inverted U tube. The pipes 17 and 18 are confined within the boiler and the pipe 18 is secured in the casting 13 aforesaid, and communicates with the pipe 20 which is also joined to said casting on the outside of the tank and which leads directly to the water back. The outflow connections of the water back consists of piping 21, the end section of which projects into the boiler and therein is connected to an upstanding pipe, as 22, which is in turn connected to a pipe, as 23, by a union 24, the latter being associated with the upper end of the pipes 22 and 23. The preferred construction of this union is shown in Figs. 1 and 2 wherein it will be noted that the union forms also a casing to inclose a sector valve 25, the stem of which is passed through a bushing, as 26. The latter is joined to the union 24 and is secured in the wall of the boiler by a suitably packed joint. The stem 27 of the valve 25 projects through the bushing 26, and on the exterior of the boiler carries a hand wheel. The valve 25 controls the communication of the union 24 with the pipe 23 and also with a pipe, as 29, which communicates with the upper portion of the boiler and adjacent to which a small opening, as 30, is formed in the union. The union 19 is provided with a small opening, as 31, for a purpose which will presently appear.

The trapped pipes of the system are connected to the valve 3 by supplemental drain pipes, as 32, 33 and 34. The pipe 32 connects directly to the lower end of the pipe 8; the pipe 33 extends between the hot water faucet 6 and the pipe 32; and the pipe 34 connects the pipe 20 and the pipe 32. A



valve 35 is interposed in the pipe 34 and is closed during the warm season in order to prevent the drainage of the water back in the event of the accidental or unauthorized manipulation of the drain valve 3, but during the cold season when the temperature is below freezing, the valve 35 is opened.

Normally the water from the pipe 1 passes through the valve 3 and to the cold water faucet 5 by way of the pipes 7 and 8 and to the boiler 4 by way of the pipes 9 and 10. The water thus admitted to the boiler circulates through the water back, being returned from the latter to the boiler, and is drawn off by the faucet 6 through the pipe 12. In case it is desired to heat the water in the usual manner, the valve 25 is positioned as shown, *i. e.*, as closing the pipe 29 so that the water returning from the water back flows into the boiler through the pipe 23. But in case an instantaneous supply of hot water is desired, the valve 25 is turned to close the pipe 23, in which case the water from the water back is delivered into the upper part of the boiler through the pipe 29. The movements of the valve 25 in either direction are limited by lugs, as 36. When the valve 3 is turned to interrupt the communication of the pipes 1 and 2 and to drain the system, the water in all the pipes will be drained. The pipes 9 and 7 drain through the pipe 2, while the trapped pipes drain through the pipes 32, 33 and 34. The latter pipe also drains some of the water from the upper portion of the boiler. The amount of water thus drained from the boiler through the pipe 34 is determined by the position of the opening 31. It will also be apparent that that portion of the pipe 10 between the upper end of said pipe and the opening 11 is also drained as well as the union 24 and the pipes 22 and 18, the water back and the connections thereof. In Fig. 3 the pipes 22 and 23 are connected by a union as 24<sup>a</sup> which is similar to the union 19 and is provided with a small opening 30<sup>a</sup>. This construction is not adapted for the instantaneous delivery of heated water, the opening 30<sup>a</sup> providing simply for the drainage of the pipe 22 and the union 24<sup>a</sup>.

In Fig. 4 there is shown an alternative construction in which the pipes 22 and 23 are connected by a union 24<sup>b</sup> generally similar to the union 24<sup>a</sup> but provided with a large opening 29<sup>b</sup> and a small opening 30<sup>b</sup>. The opening 29<sup>b</sup> is of a diameter equal to the diameter of the pipe 22 and is provided to deliver hot water directly into the upper end of the boiler, as when an instantaneous delivery of hot water is desired. By closing this opening, hot water is caused to discharge into the boiler through the pipe 23. The means for closing the opening 29<sup>b</sup> consists of a stem 37 which is threaded through the upper head of the boiler.

From the foregoing description it will be readily seen that the present system provides for the complete drainage of all the pipes in the building and for the drainage of some of the water from the upper portion of the boiler, the draining of the major portion of the water in the boiler being, however, prevented by the opening 31 which limits the point to which the water in the boiler may be drained.

Having fully described my invention, I claim:

1. The combination with a service pipe, a main supply pipe and a drain valve interposed between the pipes, of a boiler, a pipe connecting the boiler and the main supply pipe, a water back, an inverted U pipe disposed within the boiler and connected to the water back, the U pipe having a small opening at its upper end, a return connection between the water back and the boiler and a drainage connection between the water back and the valve.

2. The combination with a service pipe, a main supply pipe, a drain valve interposed between the pipes and hot and cold water faucets, of a boiler, a pipe connecting the boiler and the main supply pipe, a connection between the cold water faucet and the main supply pipe and including a pipe which leads down to the cold water faucet, a pipe connecting the upper end of the boiler and the hot water faucet, a water back, an inverted U pipe disposed within the boiler and connected to the water back, the U pipe having a small opening at its upper end, a return connection between the water back and the boiler and drainage connections between the water back and the lower ends of the pipes which lead to the faucets, and the valve.

3. The combination with a service pipe, a main distributing pipe and a drain valve interposed between the pipes, of a system of piping directly connected with the main distributing pipe, the system of piping being for the purpose of supplying a building with water, which normally flows from the service pipe through the valve and into the main distributing pipe, the system of piping being so connected through the intermediary of the main distributing pipe with the valve as to be drained of water when the valve is manipulated for this purpose, a boiler interposed between the main distributing pipe and a part of the system of piping, and means for automatically preventing the drainage of the boiler during the drainage of the system of piping.

4. The combination with a service pipe, a main distributing pipe and a drain valve interposed between the pipes, of a system of piping directly connected with the main distributing pipe, the system of piping being for the purpose of supplying a building with



water, which normally flows from the service pipe through the valve and into the main distributing pipe, the system of piping being so connected through the intermediary of the main distributing pipe with the valve as to be drained of water when the valve is manipulated for this purpose, a boiler interposed between the main distributing pipe and a part of the system of piping, and means for providing for the drainage of the boiler during the drainage of the system to a certain point and for preventing further drainage of the boiler beyond said certain point.

5. The combination with a service pipe, a main supply pipe and a drain valve interposed between the pipes, of a boiler, a pipe connecting the boiler and the main supply pipe and provided with a small opening within the boiler near the upper end thereof, a water back, an inverted U pipe disposed within the boiler and connected to the water back, the U pipe having a small opening at its upper end, a return connection between

the water back and the boiler and a drainage connection between the water back and the valve.

6. The combination with a service pipe, a main supply pipe and a drain valve interposed between the pipes, of a boiler, a pipe connecting the boiler and the main supply pipe, a water back, an inverted U pipe disposed within the boiler and connected to the water back, the U pipe having a small opening at its upper end, a return connection between the water back and the boiler and including two pipes disposed within the boiler and a union connecting the upper ends of the last named pipes and provided with a small opening, and a drainage connection between the water back and the valve.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES WALKER.

Witnesses:

H. G. MOORLY,  
Roy M. PARKER.