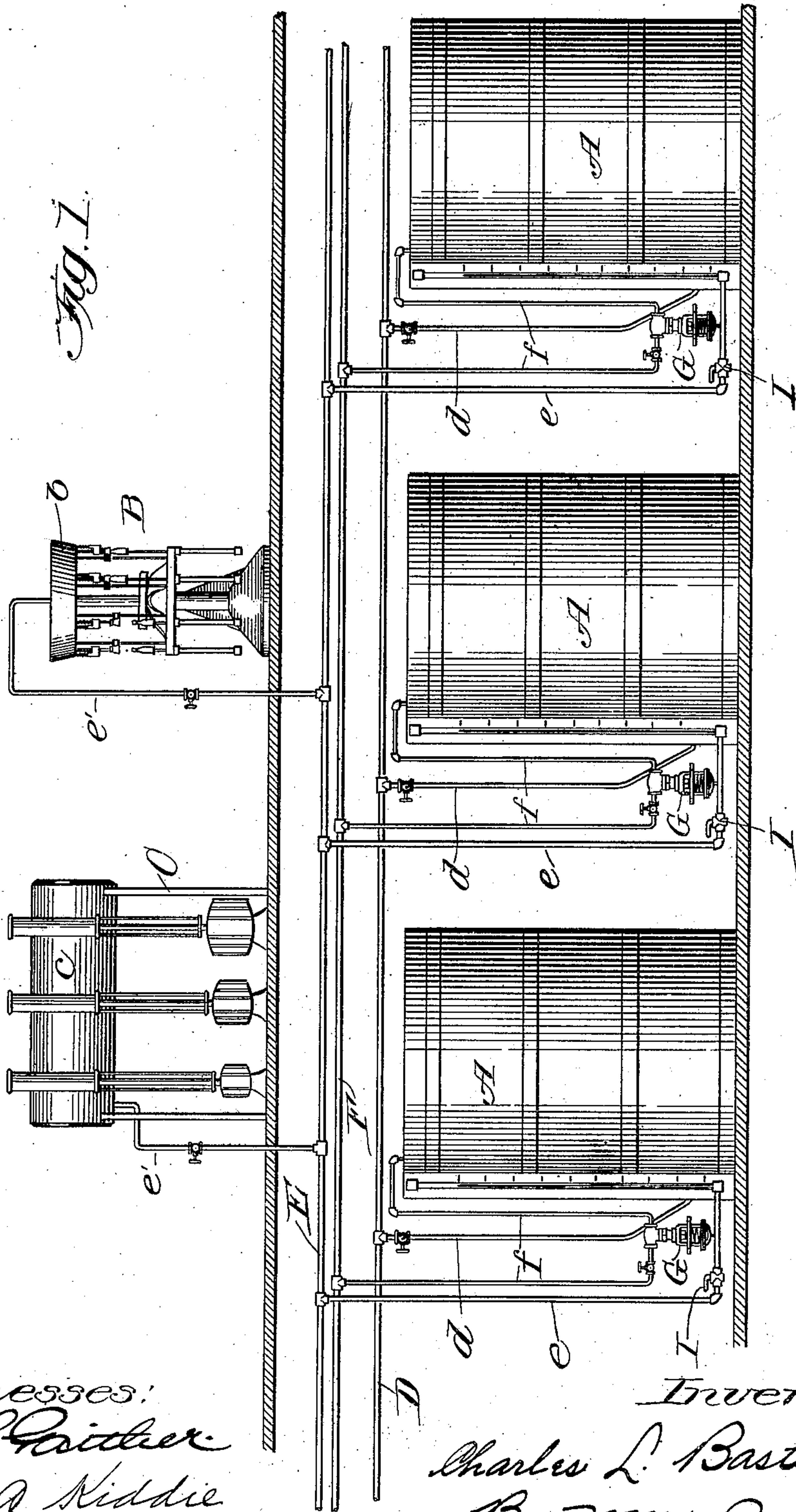


C. L. BASTIAN.  
 PIPE LINE SYSTEM FOR BREWERIES AND BOTTLING ESTABLISHMENTS.  
 APPLICATION FILED DEC. 1, 1905.

934,879.

Patented Sept. 21, 1909.

3 SHEETS—SHEET 1.



Witnesses:  
 H. S. Richter  
 M. A. Kiddie

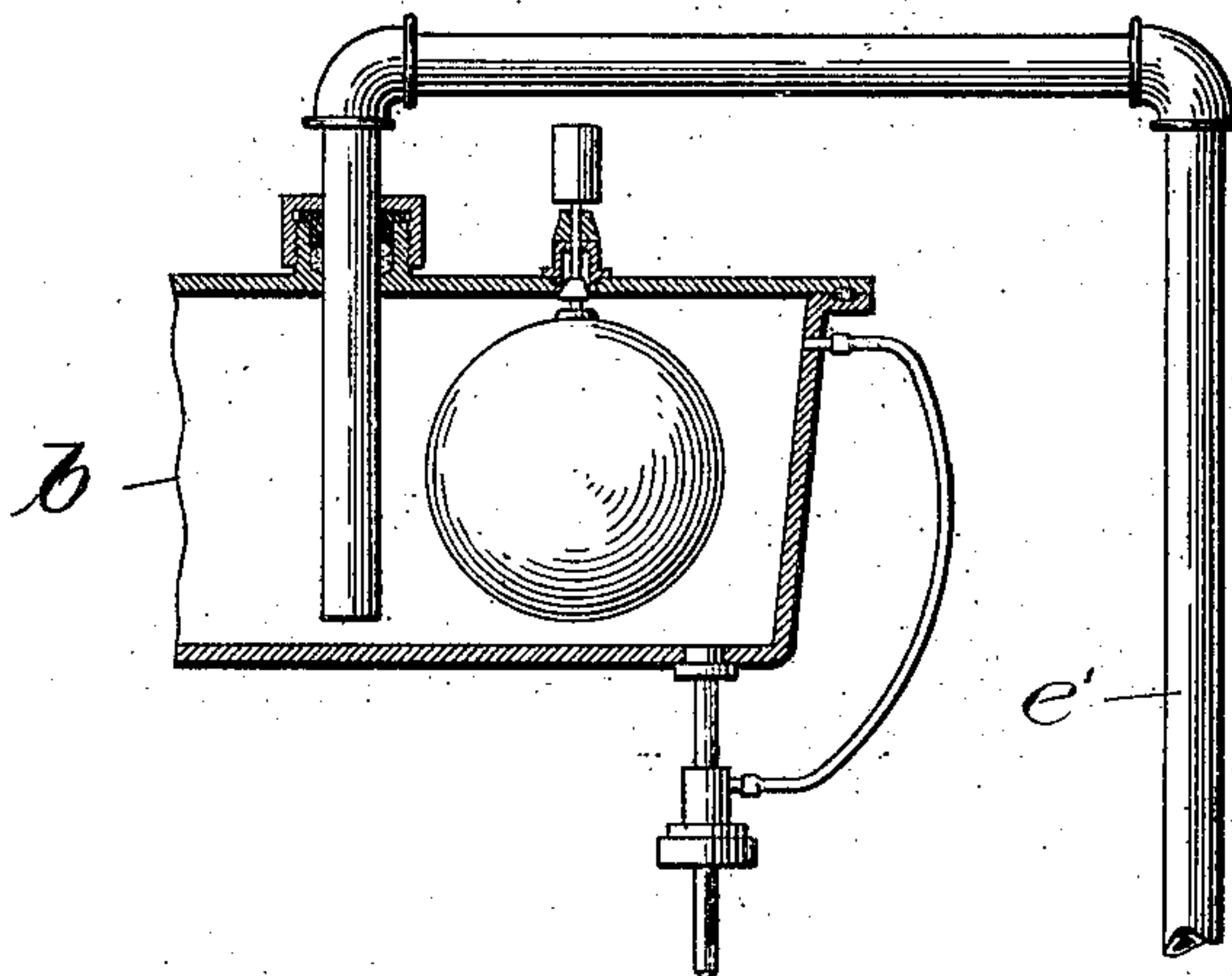
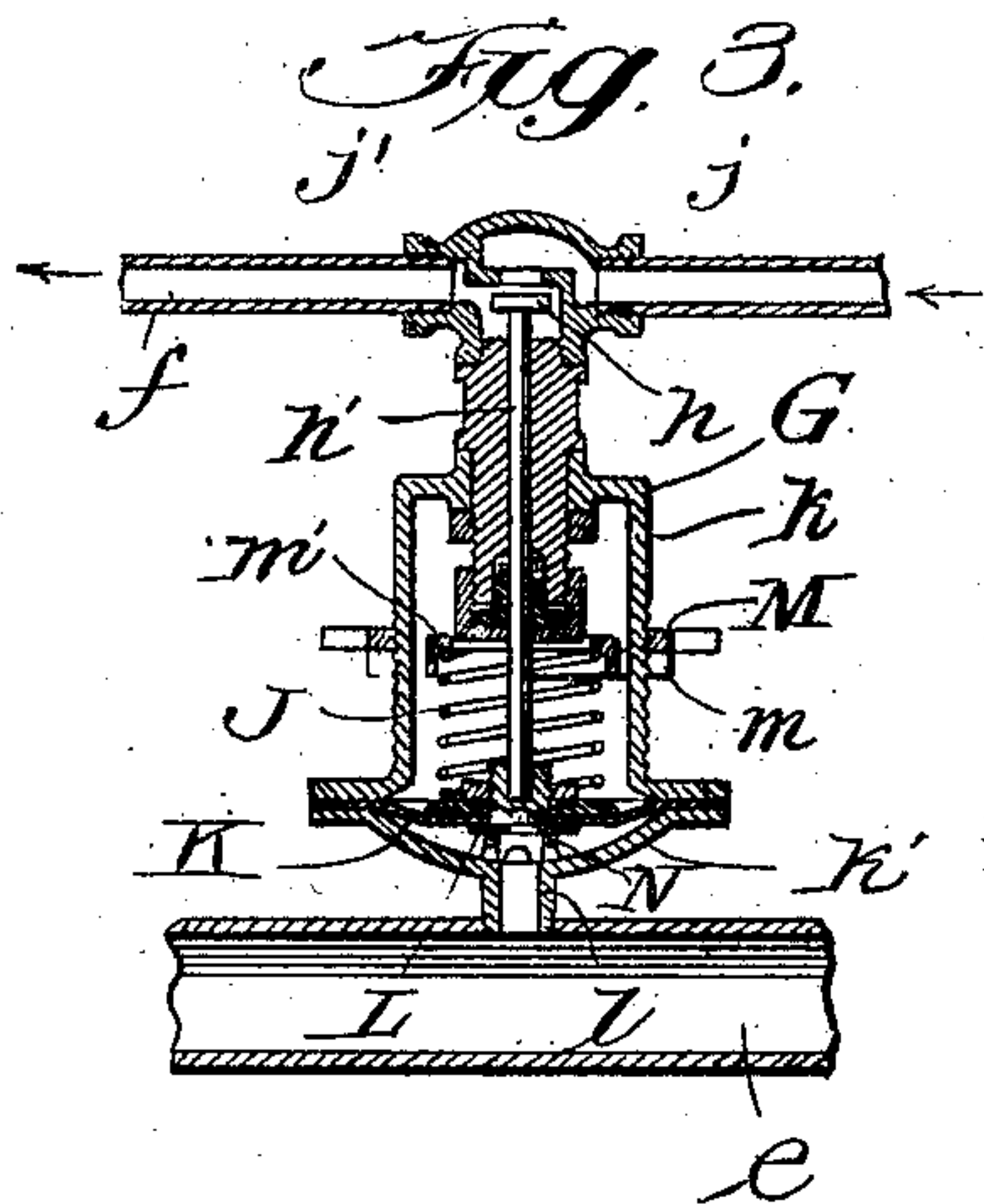
Inventor:  
 Charles L. Bastian,  
 By Wm. B. Bell  
 atty

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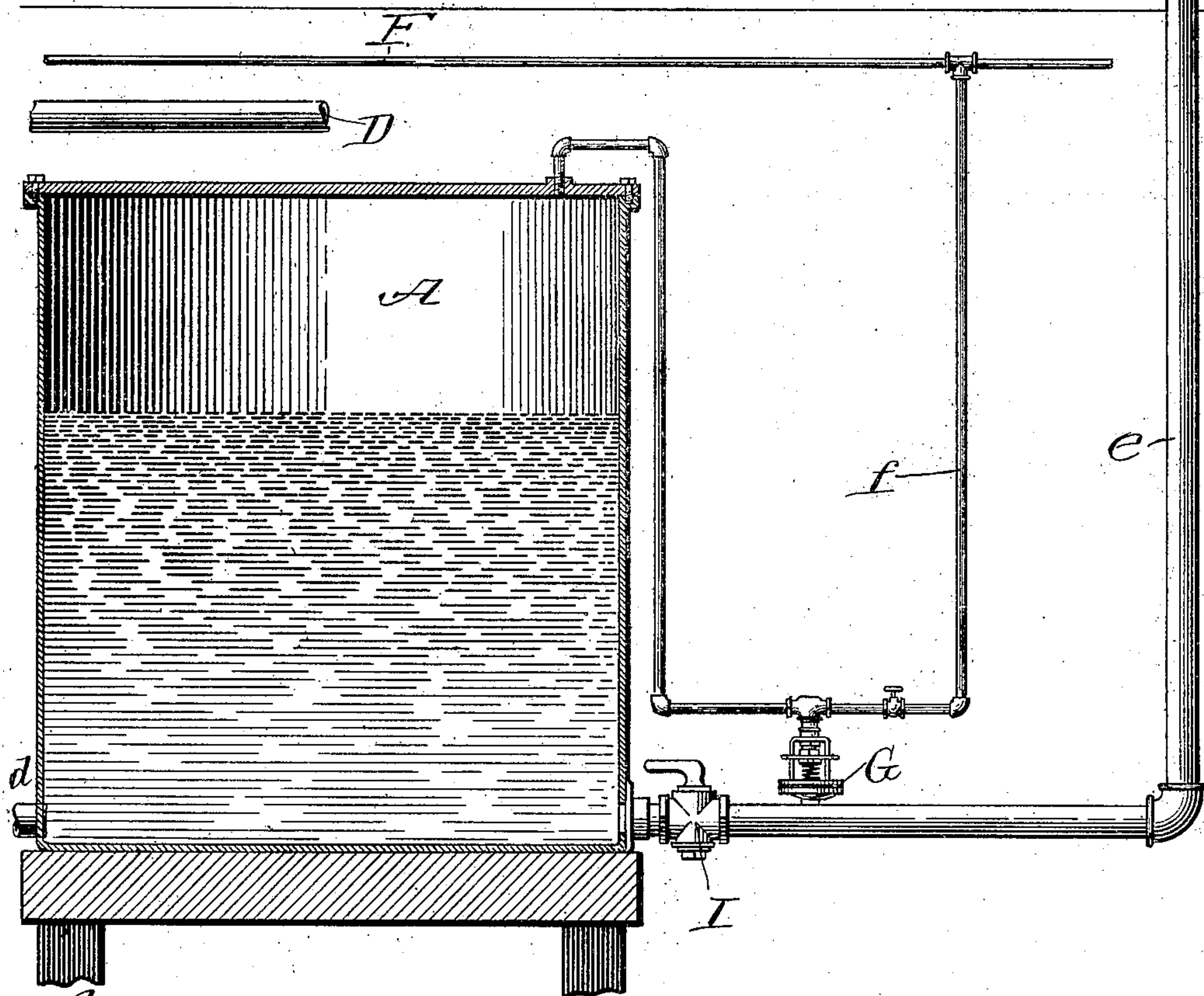
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3 SHEETS—SHEET 2.



*Fig. 2.*



Witnesses:

H. S. Paiter  
 M. A. Kidd

Inventor:

Charles L. Bastian  
 by J. M. Bell  
 atty.

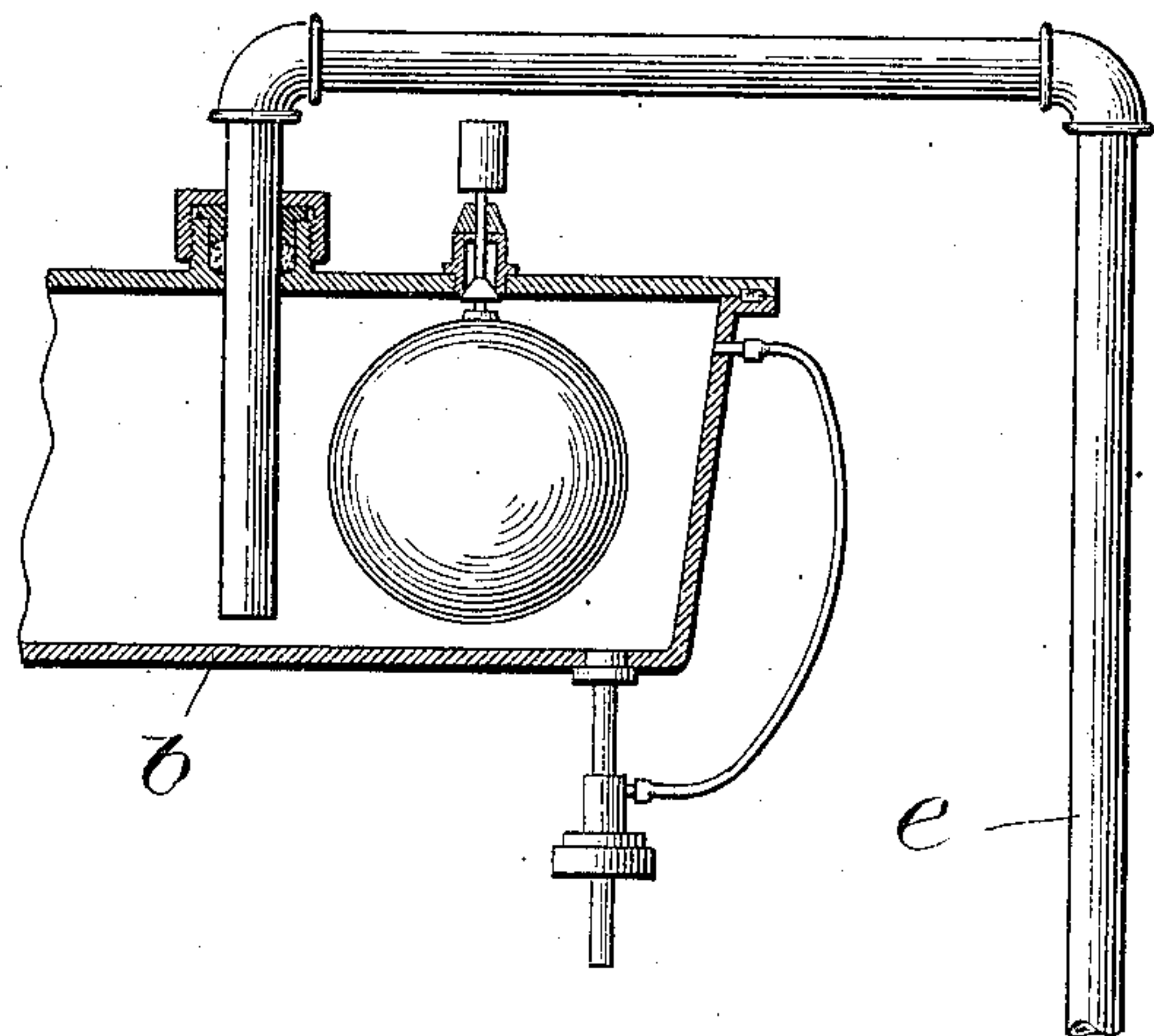


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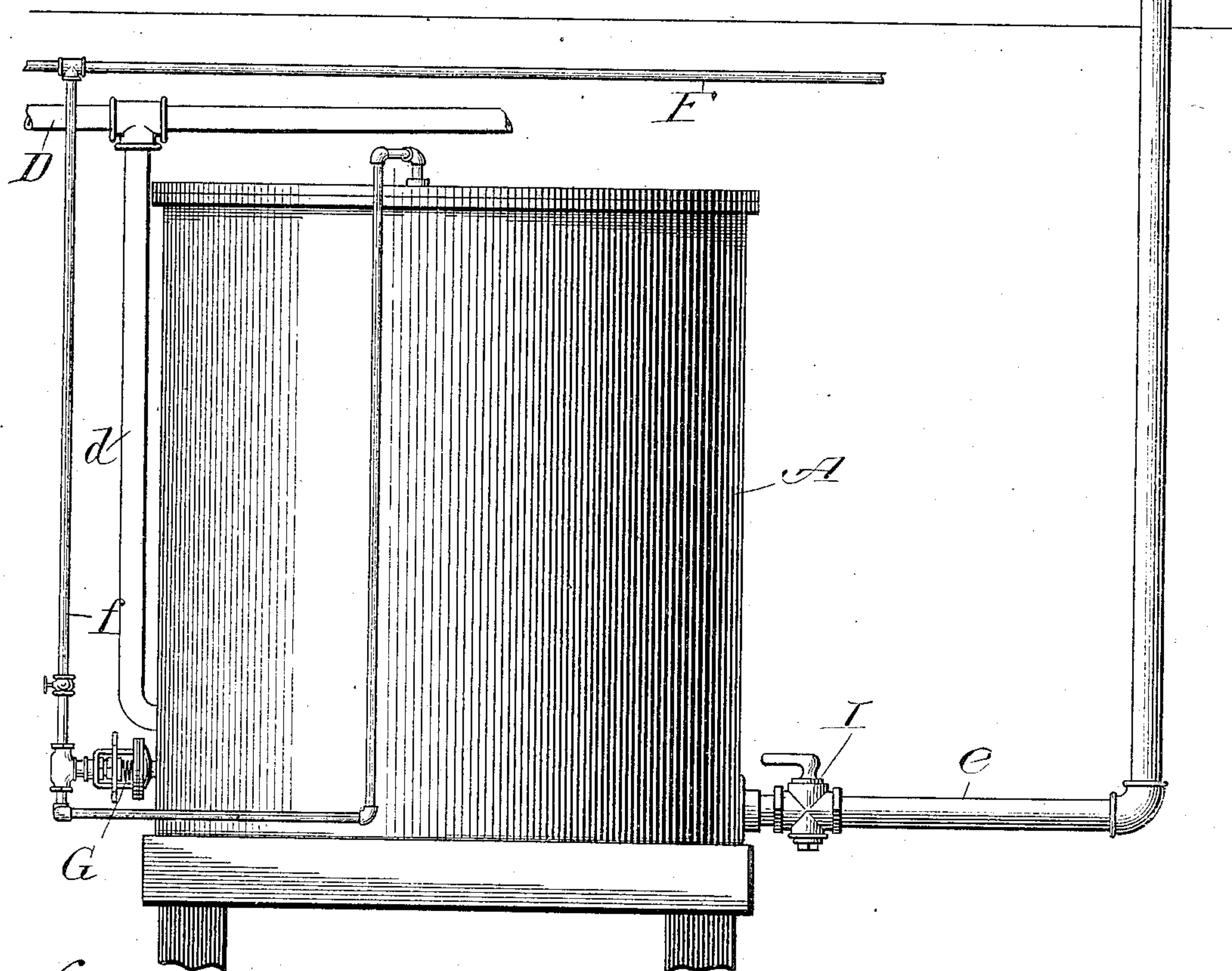
934,879.

Patented Sept. 21, 1909.

3 SHEETS—SHEET 3.



*Fig. 4.*



Witnesses:

*H. S. Raiter*  
*M. A. Kiddis*

Inventor:

*Charles L. Bastian*  
*by Wm. F. Bell*



# UNITED STATES PATENT OFFICE.

CHARLES L. BASTIAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO BOTTLERS MACHINERY MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PIPE-LINE SYSTEM FOR BREWERIES AND BOTTLING ESTABLISHMENTS.

934,879.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed December 1, 1905. Serial No. 239,383.

*To all whom it may concern:*

Be it known that I, CHARLES L. BASTIAN, 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 Pipe-Line Systems for Breweries and Bottling Establishments, of which the following is a specification.

This invention relates to pipe line systems for breweries and bottling establishments and its object is to deliver the liquid to the head of a filling machine or a racking machine at all times according to certain predetermined conditions of pressure and thereby avoid undue agitation of the liquid which tends to release the contained and enriching gases and to produce foaming which is highly objectionable.

With this object in view my invention contemplates the automatic regulation of pressure in the supply vat to compensate for the loss of pressure consequent upon the lowering of the level of the liquid therein.

In the accompanying drawings of my invention Figure 1 is a diagrammatic view showing the invention embodied in a complete pipe line system. Fig. 2 is a sectional view illustrating the invention. Fig. 3 is a sectional view of the regulating valve. Fig. 4 is a view, partly in section, illustrating another embodiment of the invention.

In the ordinary filling system the beer is stored in bonded vats A on the floor below the filling machine B and the racking machine C and it is forced into the heads b, c of these machines by air pressure which is somewhat in excess of the pressure required to raise the liquid to said heads. A main liquid inlet pipe D is provided with a valved branch d tapping each vat near its bottom and a main liquid outlet pipe E is similarly provided with a valved branch e tapped to the bottom of each vat and valved branches e' connected to the heads of the filling and racking machines. A main air inlet pipe F has a valved branch f connected to the top of each vat.

The system thus far described is one commonly employed and it has been customary to increase the pressure in the vat once or twice during the filling operation for the purpose of providing sufficient pressure to deliver the liquid from the vat to the head of the filling or racking machine. This system is open to all of the objections of a

non-automatic system and furthermore it fails to provide a constant compensation for the loss of pressure in the vat due to the lowering of the level of the liquid in the vat and the result has been that the liquid is delivered to the head under varying conditions which tend to produce foaming and otherwise seriously interfere with the filling operation. For illustration, assuming that the filling machine is located about twelve feet above the supply vat and the latter has a capacity of 100 barrels and contains initially 80 barrels of beer. If an excess pressure of two pounds is provided in the head of the filling machine, an initial air pressure of about ten pounds will be required in the vat. It will be readily understood that the pressure in the vat will decrease as the liquid is drawn off and delivered to the head and the interruption to the evenness of flow thereby produced will be increased rather than avoided by the periodical increase of pressure. In fact it is the common occurrence that when the air pressure in the tank is thus periodically increased the beer will be so greatly agitated for a while as to cause foaming and much trouble in the filling operation. This unevenness of flow will be wholly overcome by automatically increasing the air pressure in the vat to constantly compensate for the loss of pressure due to the withdrawal of the liquid. I have accomplished this automatic regulation of the pressure in the vat by providing a regulating valve G in the branch air pipe to each vat, this valve being operated and controlled by the pressure of the liquid. In Fig. 1 the regulating valve is located in the branch liquid outlet pipe between the vat and the shut-off valve I; in Fig. 2 the regulating valve is located in the branch outlet pipe on the delivery side of the shut-off valve; in Fig. 4 the regulating valve is mounted directly on the vat close to the bottom thereof.

The regulating valve is illustrated in Fig. 3 and comprises a valve h carried by a stem h' and normally held by a spring J away from its seat j in the casing j'. A diaphragm K is clamped between the skeleton frame k and the base k' and said base is shaped to provide a chamber L beneath the diaphragm and it has a nipple l which is screw-threaded into the branch liquid outlet pipe e, as shown in Figs. 1 and 2, or into the vat, as shown in Fig. 4. The ten-



sion of the spring may be adjusted by a threaded ring M operating on the skeleton frame against arms *m* projecting outwardly from the plate *m'* against which the spring abuts. A stop N limits the movement of the valve under the influence of the spring. I make no claim in this application to the construction of this valve as the same forms the subject matter of an application No. 289,893 filed December 1, 1905.

In the embodiments of the inventions illustrated in Figs. 1 and 2 the spring will hold the valve *h* normally unseated while the valve I is shut off and there is no pressure in the outlet pipe *e*. At this time the pressure in the vat will be of that degree previously determined as necessary to produce a proper flow of the liquid into the head of the filling machine when the valve I is first opened. When this valve I is opened the liquid will flow into the pipe *e* and to the head and also through the nipple *l* into the chamber L, and the pressure of the liquid will be sufficient to overcome the tension of the spring and seat the valve *h* to shut off the air supply. As the level of the liquid in the vat lowers and the pressure in the vat correspondingly decreases the spring will open the valve *h* to admit more air pressure into the vat to compensate for the loss of pressure due to the drawing off of liquid from the vat. This operation is entirely automatic in action and is repeated as conditions require to constantly maintain in the vat a sufficient pressure to deliver the liquid to the head of the filling machine under the predetermined conditions.

In the embodiments of the invention illustrated in Fig. 4 the valve operates in the same automatic manner heretofore described except that the pressure within the vat will hold the valve *h* normally seated.

Any other suitable regulating valve may be employed and it may be located in any position where it will operate to automatically control the air supply to constantly maintain the required pressure in the vat.

I do not claim in this application the system herein disclosed for the same is included in my divisional application No. 337,678 filed October 6, 1906.

What I claim and desire to secure by Letters Patent is:

1. In a pipe line system for breweries and bottling establishments, the combination of a beer supply vat, a pipe connected to the vat at the bottom thereof and delivering beer to the head of a filling or racking machine, a pipe discharging into the vat at the top thereof for supplying air pressure upon the

beer in the vat, and means controlled by the pressure of the beer outside the vat for automatically increasing the air pressure in the vat without disturbing the beer to compensate for the loss of pressure as the level of the beer is lowered during the filling operation and thereby provide for constantly delivering the beer to the head at a predetermined pressure and without loss of gas.

2. In a pipe line system for breweries and bottling establishments, the combination of a beer supply vat, a pipe connected to the vat at the bottom thereof and delivering beer to the head of a filling or racking machine, a pipe discharging into the vat at the top thereof for supplying air pressure upon the beer in the vat, and means connected to said air pipe and controlled by the pressure of the beer to increase the air pressure in the vat relatively to the lowering of the level of the beer in the vat without disturbing the beer, whereby to effect the delivery of all the beer in the vat to the head at the same predetermined pressure.

3. In a pipe line system for breweries and bottling establishments, the combination of a beer supply vat, a pipe connected to the vat at the bottom thereof and delivering beer to the head of a filling or racking machine, a pipe discharging into the vat at the top thereof for supplying air pressure upon the beer in the vat, and a regulating valve connected to said air and beer pipes and operated by the pressure of the beer to maintain a constant pressure on the beer in the vat without agitating the beer and thereby deliver the beer to the head at a predetermined pressure during the filling operation.

4. In a pipe line system for breweries and bottling establishments, the combination of a beer supply vat, a pipe connected to the vat at the bottom thereof and delivering beer to the head of a filling or racking machine, a pipe discharging into the vat at the top thereof for supplying air pressure upon the beer in the vat without disturbing the beer, and a regulating valve connected to said air and beer pipes and comprising a valve seat in the air pipe, a valve, a diaphragm, a spring operating on one side of the diaphragm to hold said valve open, and a pressure chamber on the other side of the diaphragm in communication with the beer pipe, whereby said diaphragm is actuated by the spring to open said valve and by the pressure of the beer to close said valve.

CHARLES L. BASTIAN.

Witnesses:

WM. O. BELT,  
M. A. KIDDIL.