T. E. WARREN.

CIRCULATING SYSTEM.

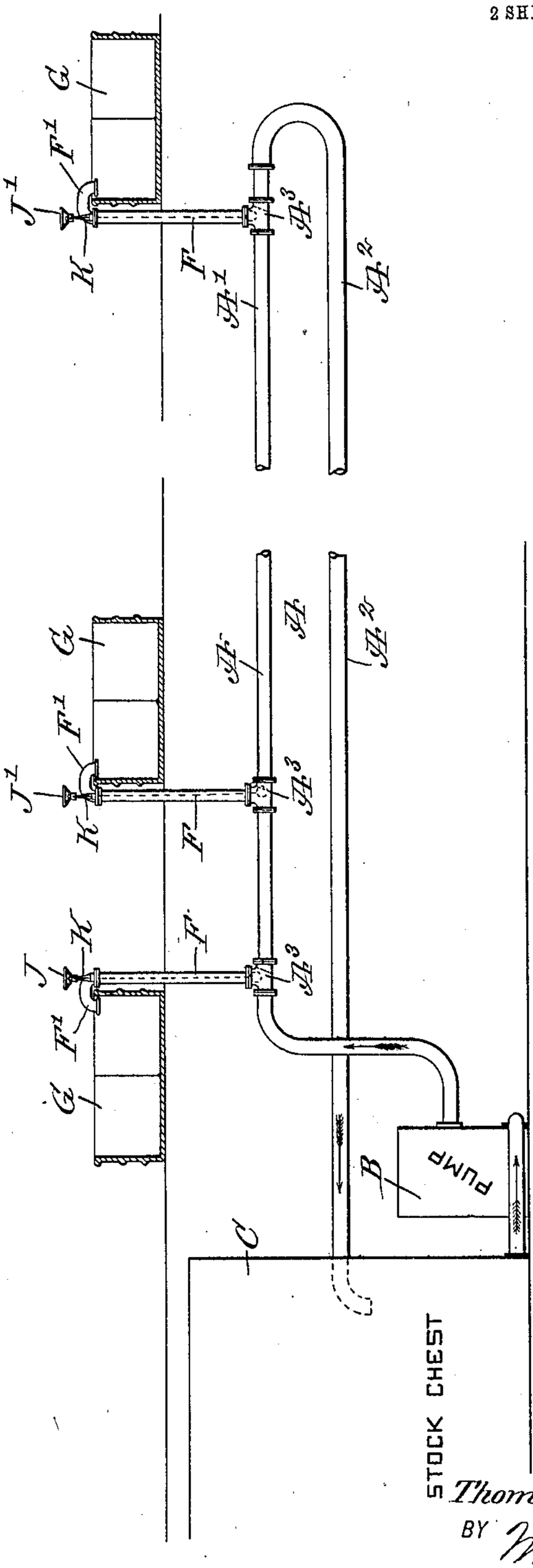
APPLICATION FILED OCT. 5, 1908.

916,810.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

F. G. Hackenberg.

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2 SHEETS—SHEET 2.

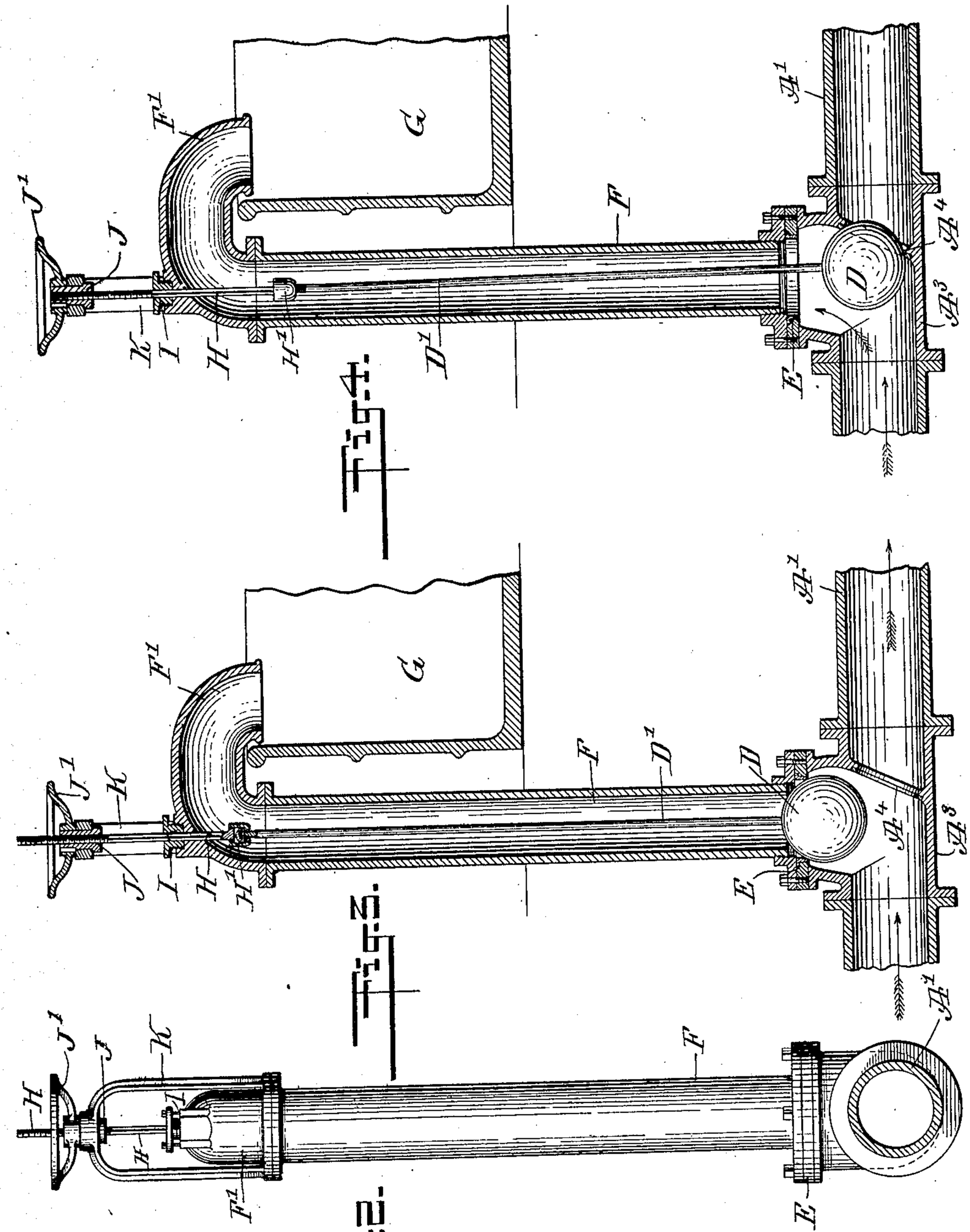

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS E. WARREN, OF TICONDEROGA, NEW YORK.

CIRCULATING SYSTEM.

No. 916,810. Specification of Letters Patent. Patented March 30, 1909.

Application filed October 5, 1908. Serial No. 456,302.

To all whom it may concern:

Be it known that I, THOMAS E. WARREN, a citizen of the United States, and a resident of Ticonderoga, in the county of Essex and State of New York, have invented a new and Improved Circulating System, of which the following is a full, clear, and exact description.

The invention relates to paper-making and its object is to provide a new and improved circulating system, more especially designed for circulating fibrous stock, such as sulfite pulp, wood pulp, soda pulp and the like from a stock chest to beaters and other machines, and arranged to require comparatively little power to circulate the stock through the line and to prevent the water from leaking out of the stock and thus prevent the same from hardening in the pipe line.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement; Fig. 2 is an enlarged cross section of the pipe line and showing one of the branch discharge pipes leading to a beater; Fig. 3 is a sectional side elevation of the same and showing the ball valve in closed position relative to the discharge pipe and open relatively to the main pipe line; and Fig. 4 is a similar view of the same, and showing the ball valve open relatively to the discharge pipe and closed relatively to the pipe line.

The pipe line A has its outflow section A′ connected with the circulating pump B connected with the stock chest C, into which discharges the return section A^2 of the pipe line. In the outflow section A′ of the pipe line A are arranged inverted T-sections A^3, each provided in its forward end with an inclined valve seat A^4, in which is adapted to be seated a pendulum ball valve D also adapted to be seated on a horizontally disposed valve seat E arranged on the top outlet of the T-section A^3. The width of the inverted tee A^3 is just enough larger than the ball D to allow a free longitudinal motion of the ball D with respect to the inverted tee A^3. From the valve seat E extends upwardly a branch or discharge pipe F terminating in an elbow F′, discharging into the beater G or other machine to be supplied with fibrous stock from the stock chest C.

The stem D′ of the valve D extends up in the branch pipe F and is connected by a ball and socket joint H′ with the lower end of a square rod H extending through a stuffing box I held on the elbow F′; the upper end of the square rod H being threaded and screwing in a nut J, having a hand-wheel J′, and mounted to turn in a bracket K attached to the elbow F′. The ball and socket joint H′ between the square rod H and the valve stem D′ allows the valve stem D′ to swing in any direction relative to the elbow F′, thus allowing the elbow F′ to be placed at any angle relative to the pipe line A.

When the operator turns the hand wheel J′, the nut J causes the square rod H to move up or down according to the direction in which the hand wheel J′ is turned, the upward or downward movement of the square rod H causing a like movement of the valve stem D′ and the pendulum valve D, so that the valve D is either seated on the seat E or the seat A^4, as will be readily understood by comparison of Figs. 3 and 4. As the fibrous stock flows forward in the outflow seat A′ of the pipe line A, it is evident that when the valve D is lowered it readily swings forward and onto the seat A^4 by the force of the flowing stock. When a valve D is raised to its seat E, the corresponding branch pipe F is closed, and the stock flows on through the adjacent open valve seat A^4, and when a valve D is lowered and seated on the corresponding valve seat A^4, then the flow of the stock is directed upwardly into and through the branch pipe F, to charge the beater G or other machine.

By the arrangement described, the circulating power pump can be continuously used to pump the stock, as the pipe line A is either connected with one of the beaters G, or, in case all the valves D are seated on the valve seats E and the branch pipes F are closed, then the stock is simply pumped back to the stock chest. It will be noticed that the pipe line A may be located at any point near or below the level of the stock in the stock chest C, so that very little power is required to circulate the stock through the

pipe line A, and in addition it is only necessary for the pump to lift the stock from the pipe line up the corresponding branch pipe F into the beater G or other machine. By having the valves D and seats E, A^4 wholly within the pipe line and branch pipes, it is impossible for the water in the stock to leak out through the valves, and hence the stock is prevented from hardening or otherwise deteriorating while in the pipe line.

It is understood that the valve D may be raised or lowered more or less relative to the seat E, so that only the required amount of stock is pumped into the corresponding beater G.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a circulating system for fibrous stock, a pipe line, a branch pipe leading from the said pipe line, a valve seat in the beginning end of the branch pipe, a valve seat in the pipe line adjacent to and forward of the said valve in the branch pipe, and a valve adapted to be seated on either valve seat.

2. In a circulating system for fibrous stock, a pipe line, a branch pipe leading from the said pipe line, a horizontal valve seat in the beginning of the said branch pipe, an inclined valve seat in the pipe line adjacent to and forward of the said horizontal valve seat, and a pendulum valve adapted to be seated on either of the said valve seats.

3. In a circulating system for fibrous stock, a pipe line, a branch pipe leading from the said pipe line, a horizontal valve seat in the beginning of the said branch pipe, an inclined valve seat in the pipe line adjacent to and forward of the said horizontal valve seat, a ball valve adapted to be seated on either of the said valve seats, a valve stem for the said ball valve and extending up in the said branch pipe, a screw rod extending through the top of the branch pipe, on which screw rod the said valve stem is fulcrumed, and a nut mounted to turn and screwing on the outer end of the said screw rod.

4. A circulating system, provided with a circulating pipe having a T-section, an inclined valve seat in the forward portion of the said section, a branch pipe rising from the said section, a horizontal valve seat at the beginning of the said branch pipe, and a pendulum ball valve adapted to be seated on either of the said seats.

5. A circulating system provided with a circulating pipe having a T-section, an inclined valve seat in the forward portion of the said section, a branch pipe rising from the said section, a horizontal valve seat at the beginning of the said branch pipe, a pendulum ball valve adapted to be seated on either of the said seats, and exterior means for raising and lowering the said pendulum valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS E. WARREN.

Witnesses:

FRANK B. WICKES,

ELIZABETH ARTHUR.