

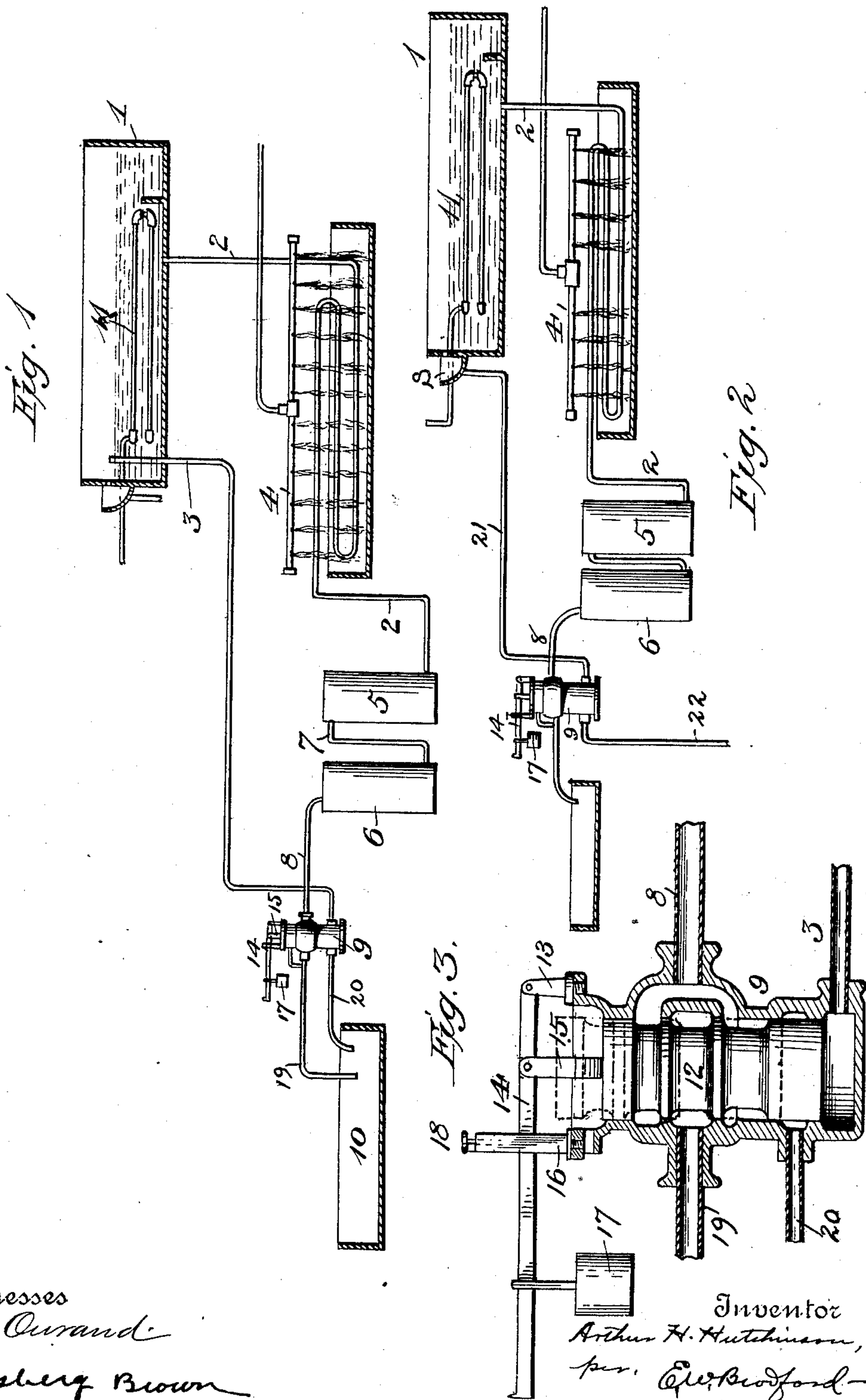
No. 716,549.

Patented Dec. 23, 1902.

A. H. HUTCHINSON.
AUTOMATIC WATER REGULATOR.

(Application filed May 13, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

ARTHUR H. HUTCHINSON, OF WAYNESBORO, PENNSYLVANIA, ASSIGNOR TO
FRICK COMPANY, OF WAYNESBORO, PENNSYLVANIA, A CORPORATION.

AUTOMATIC WATER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 716,549, dated December 23, 1902.

Application filed May 13, 1901. Serial No. 60,060. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. HUTCHINSON, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Water-Regulators, of which the following is a specification.

My said invention relates to mechanism for the regulation of the flow of water from any tank or vessel, by the use of which the water may be maintained at an even height or level in said vessel, it being particularly adapted and designed for use in regulating the flow of distilled water from the boil-tank of an ice-making plant, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar parts are indicated by similar reference characters, Figure 1 is a view, partly in section and partly in elevation, of those parts of an ice-making plant in the operation of which this invention may be employed; Fig. 2, a similar view of a slightly-modified form, and Fig. 3 a central vertical section through the automatic regulating-valve.

In said drawings, the portions marked 1 represent the boil-tank; 2, the outlet-pipe; 3, the overflow-pipe; 4, a cold-water-supply pipe; 5 and 6, filters; 7, a pipe connecting them; 8, a pipe leading from the filter 6 to the regulator; 9, said regulator, and 10 a storage-tank.

The boil-tank 1 is of the usual or any appropriate form, containing the usual heating-coil 11.

The outlet-pipe 2 leads from the bottom of tank 1 under the cold-water supply 4, where it is formed into a coil, and thence to filter 5, which is connected to filter 6 by pipe 7, as shown and well understood. From said filter 6 a pipe 8 leads to the regulator 9.

The pipe 3 extends up within the tank 1 and has slits or openings at the level of the skim-holes and leads to the bottom of the casing of the regulator 9. Said regulator 9 consists of a suitable casing with appropriate connections for the discharge-pipes, and contains a piston 12, formed with suitable ports

arranged to connect with the inlet and outlet openings. Said piston 12 is preferably of cylindrical form, as shown, having circumferential depressions forming ports between circumferential ribs, and the interior of the casing is correspondingly formed. Thus when said ribs register, as shown in whole lines in Fig. 3, the ports are closed and the passage of water through the regulator prevented; but when out of register, as indicated by dotted lines, then said ports are open and water permitted to flow through said regulator, as will be presently described. A standard 13 is provided on one side of the top of the casing 9, and a lever 14 is pivoted thereto, extending horizontally across the top thereof and pivoted to a standard 15, extending up from the top of the piston 12. Said lever extends some distance beyond the casing, through a bifurcated standard 16 on the opposite side of the casing, and has a weight 17 mounted thereon. A set-screw 18 is provided to limit and regulate the movement of said lever.

The operation is as follows: The reboiler 1 receives its supply of water from any source, and the operation of boiling and skimming is or may be according to any suitable method. When the water reaches a level in said reboiler or boil-tank 1 slightly above the lower edge of the skim-holes, it will begin to flow into pipe 3 through the opening therein which is on the same level as said edge of the skim-holes and through said pipe into the lower portion of the casing of regulator 9 under the piston 12. As said pipe fills the pressure of water therein operates to raise said piston, which opens the port connecting the pipe 8 with outlet-pipe 19 and permits water from the bottom of the reboiler to flow through pipe 2 under cooler 4, through the filters 5 and 6, and through said pipe 8 and regulator 9 and out through pipe 19 into the storage-tank 10, from which it is used in any approved manner. At the same time the lower port in the casing is also opened, permitting the water from pipe 3 under the piston to flow out pipe 20; also into said tank 10. The pipes 2, 8, and 19 and upper ports being of larger area than pipe 3 or its controlling ports, as shown

most plainly in Fig. 3, the level of water in tank 1 is quickly lowered until below the level of the opening into pipe 3, when the weight of the piston and weight 17 (which is adjusted to secure just the pressure desired) will soon overcome the weight of the water in said pipe 3 and permit said piston to fall to close the ports and shut off the outflow from tank 1 through pipe 2. Then it will again rise to the level required to flow into pipe 3, when the above-described operation is repeated, and the operation goes on in this manner continuously and automatically as long as desired.

In Fig. 2 the apparatus illustrated is the same as that just described, except the piston is operated by the skimmings from tank 1, taken from the bottom of skim-dish S through pipe 21, and after passing through the regulator runs to waste through a waste-pipe 22. By this arrangement a positive operation is secured and the system maintained full of water at all times, thus preventing air from getting into the water after it has been freed therefrom in the reboiler and the consequent advantages secured.

As will be readily understood, the arrangement of the details of the regulator is subject to various modifications without material change in operation, such as adding weights to the top of piston or depositing them in a cavity therein or substituting a spring for the weight 17 or reversing the arrangement, all of which may be accomplished without departing from my said invention. Instead of pipe 3 being smaller than pipe 8 the same result can be secured by arranging the stroke of the piston-valve to uncover less of the port controlling the flow from said pipe 3, as will be readily seen.

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

1. A regulator for controlling the flow of liquid from a containing device, comprising a single casing, a single piston therein, said piston and casing containing ports connecting inlet and outlet pipes which constitute separate passage-ways for the liquid, one of said inlet-pipes being connected at one end with a chamber between the end of said casing and one end of the piston and at its other end with an overflow from the water-containing device, substantially as set forth.

2. A regulator for controlling the flow of liquid from a receptacle, comprising a casing, a piston-valve therein, a pipe leading from an overflow from said receptacle to between the end of said piston and casing, an outlet-port being formed in said casing above said point, a pipe leading outwardly from said port, a second pipe leading from said receptacle and connected to an inlet to said casing at an intermediate point, and a discharge-pipe leading from said casing, a port being formed

leading from an outlet to said inlet to said outlet when the valve is open, substantially as set forth.

3. The combination, in an ice-making plant, with the reboiler, of a regulator for automatically controlling the flow of water therefrom, comprising a single casing, a piston-valve mounted therein, a plurality of inlet and a plurality of outlet openings being provided to said casing, and ports being formed to connect said inlet and outlet openings when said valve is open, a pipe leading from an overflow of said reboiler to the inlet-opening at the end of said casing, and another pipe leading from said reboiler to the other inlet-opening, substantially as set forth.

4. In an ice-making plant, the combination, of the reboiler, the system of pipes leading from the lower portion thereof through the cooler, the filters and regulator to the storage-tank, another pipe leading from an overflow of the reboiler to the regulator, and said regulator comprising a single casing and piston-valve with appropriate ports for connecting the several inlet and the several outlet openings to said casing when said valve is open, substantially as set forth.

5. In an ice-making plant, the combination, of the reboiler, the system of pipes leading therefrom to the storage-tank, another pipe leading from an overflow of said reboiler, a regulator interposed in said pipe system comprising a casing having a plurality of inlet and a plurality of outlet openings, a piston-valve therein, said casing and valve being formed with ways or ports connecting the inlet with the outlet openings when the valve is in open position, said overflow-pipe being connected to discharge into said casing between its end and one end of the piston-valve, whereby said piston-valve is actuated, and the other pipe being connected to another inlet-opening at a point between the ends of said piston, the controlling-ports of said overflow-pipe being smaller than the controlling-ports of said other pipe, substantially as set forth.

6. In an ice-making plant, the combination, with the reboiler and storage-tank, of a system of pipes for conducting the water from one to the other, and a regulator interposed in said system of pipes for automatically controlling the flow of water comprising a casing having a plurality of inlet and a plurality of outlet openings and a piston-valve in said casing, appropriate ports being formed through said regulator to connect said inlet and outlet openings when the valve is open, one pipe of the system leading from an overflow of said reboiler into said casing between its end and an end of said piston-valve, to operate it, and the other pipe leading from said reboiler and through an intermediate port or ports in said regulator, substantially as set forth.

7. In an ice-making plant, the combination
with the reboiler and storage-tank, of a sys-
tem of pipes leading from one to the other
and a regulator interposed in said system of
5 pipes having a casing with a plurality of in-
lets and a plurality of outlets to which said
pipes are connected, and a piston-valve in
said casing, appropriate ports being formed
in said parts of the regulator to connect said

inlets and outlets when the valve is open, so
substantially as set forth.

In witness whereof I have hereunto set my
hand and seal, at Waynesboro, Pennsylvania,
this 7th day of May, A. D. 1901.

ARTHUR H. HUTCHINSON. [L. S.]

Witnesses:

A. O. FRICK,
W. H. MANNS.