

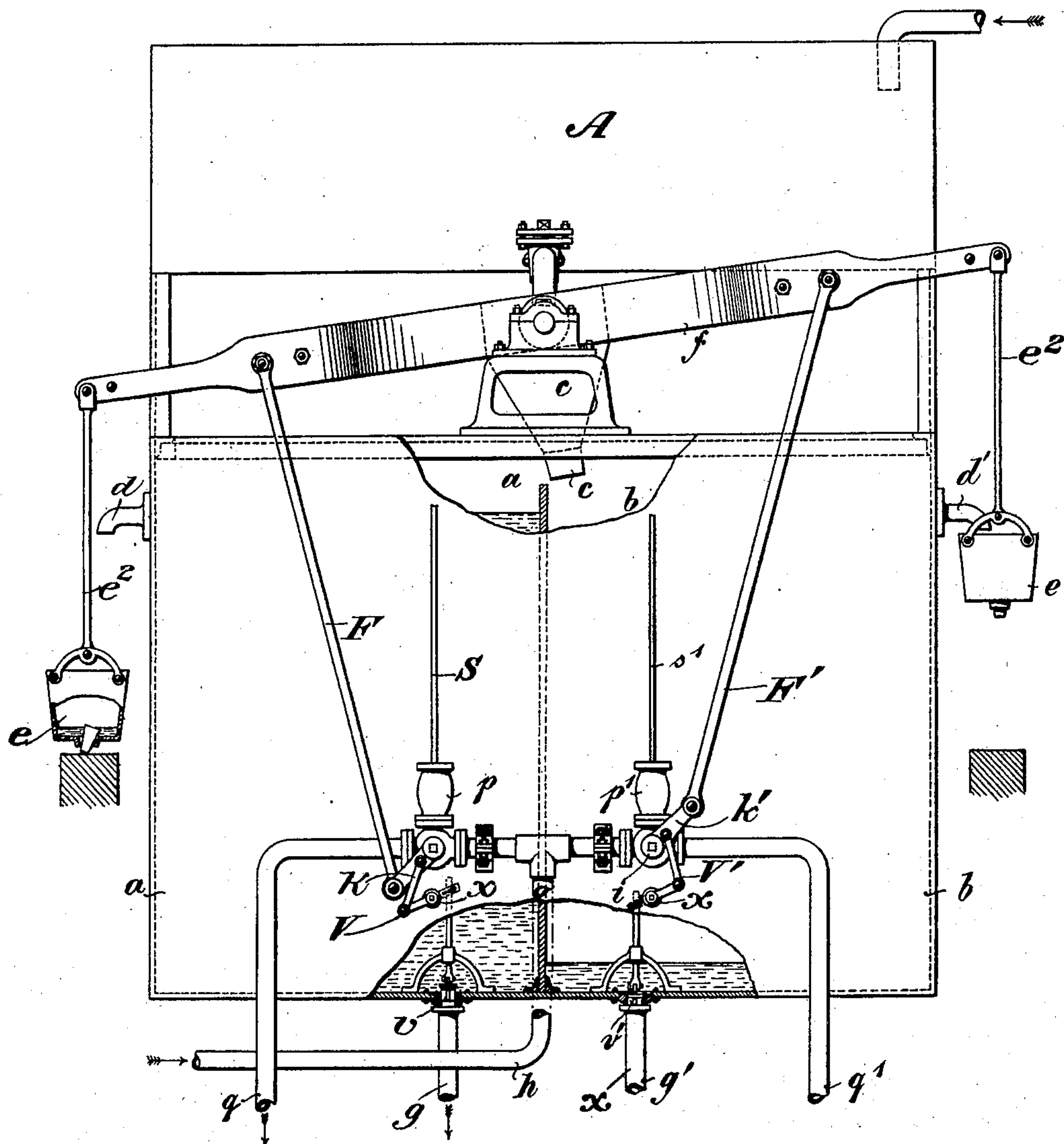
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Patented May 14, 1901.

L. E. O. DE VISSER.
APPARATUS FOR PURIFYING WATER.

(Application filed Mar. 10, 1899.)

(No Model.)



Witnesses:
James R. Mansfield
Wm. J. Sullivan

Inventor:
L. E. O. De Visser
By his Attorneys
Alexander F. Towell

UNITED STATES PATENT OFFICE.

LOUIS EDUARD OTTO DE VISSER, OF SCHIEDAM, NETHERLANDS.

APPARATUS FOR PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 674,142, dated May 14, 1901.

Application filed March 10, 1899. Serial No. 708,544. (No model.)

To all whom it may concern:

Be it known that I, LOUIS EDUARD OTTO DE VISSER, a subject of the Queen of the Netherlands, residing at Schiedam, Netherlands, have invented certain new and useful Improvements in Apparatus for Purifying Water, (for which I have applied for patents in England, dated January 26, 1899, No. 1,877; in Germany, dated January 19, 1899; in France, dated January 28, 1899, No. 273,285, and in Belgium, dated January 27, 1899, No. 110,114,) of which the following is a specification.

This invention is an improved apparatus for automatically introducing prescribed quantities of chemicals, &c., into water or other liquids; and the invention consists in the novel construction and combination of parts hereinafter described and claimed, and illustrated in the accompanying drawing, which represents a side elevation of the apparatus.

A designates a water-reservoir, below which are two tanks *a b* of similar capacity. These tanks are respectively connected by pipes *g g'* to any suitable receptacle from which the water may be withdrawn for use in the boilers.

f designates an oscillating frame which is suitably pivoted over tanks *a b* and has suspended from its opposite ends buckets *e e'* by means of rods *e²* or in any other suitable manner. These buckets hang below the overflow-outlets *d d'* of the tanks *a b* and are thus filled with the water overflowing from said tanks.

The frame *f* is provided with the spout *c*, which directly underlies the outlet of the reservoir A, and according to the inclination of said frame this spout *c* will direct the water escaping from the reservoir into either the tank *a* or *b*.

The outlets *g g'* of the tanks *a b* are opened and closed by means of valves *v v'*, the stems of which are connected to jointed levers V V', the lower arms of said levers being loosely pivoted to the casings of the tanks *a b* at *x x*, and the upper arms thereof likewise pivoted to valve-arms *k k'*, and the outer ends of said valve-arms are pivoted to the lower ends of rods F F', which in turn are attached to frame *f*, so as to be operated thereby. These valve-arms *k k'* are connected to three-way or other suitable valves *i i'* for regulating the admission and discharge of acid to and from

the containing-receptacles *p p'*, to which are attached the capillary tubes *s s'*.

Acid is conducted to the receptacles *p p'* alternately by means of a pipe *h*, and it is discharged therefrom through the pipes *q q'*, which empty into the same receptacles into which the contents of the tanks *a b* are discharged.

As shown in the drawing, the water is being discharged from the reservoir A through the spout *c* into tank *b*. When this tank is filled, it overflows through the pipe *d'* into the bucket *e'*, which when sufficiently filled to overbalance the weight of the bucket on the opposite side of the apparatus will drop, thereby oscillating the frame *f* and shifting the position of spout *c*, so as to direct the water escaping from the reservoir into the tank *a* and simultaneously raising the bucket *e*. This oscillation of the frame *f* depresses rod F', shifting valve-rod *k'* and valve *i'* and closing the inlet and opening the outlet of receptacle *p'* to permit the acid to escape therefrom through pipe *q'*. When the valve-rod *k'* is shifted, jointed lever V' is simultaneously operated to raise the valve *v'* and permit the water in receptacle *b* to escape through the pipe *g'* and commingle with the acid discharged through the pipe *q'*. Simultaneously with the depression of rod F' rod F is raised, shifting valve-rod *k* and closing the outlet and opening the inlet of receptacle *p* by shifting the valve *i*, and as the operation on the opposite side of the apparatus has already closed the inlet to receptacle *p'* the acid flowing through pipe *h* will now enter receptacle *p*. When rod F is raised and valve-rod *k* shifted, jointed lever V is simultaneously operated to depress valve *v* and close the outlet of chamber *a*, thus preventing the escape of water entering said chamber through the spout *c*.

For the prevention of the formation of boiler incrustations I have found that hydrochloric acid or sal-ammoniac, with or without the addition of chlorid of barium, may be introduced into the water, so as to neutralize its alkaline properties, and this can be most advantageously accomplished by the herein-described device for automatically measuring and supplying a certain quantity of the acid or chemicals to predetermined certain

quantities of water. Means are also provided whereby the water contained in the vessels *e e'* is also allowed to flow into the lower reservoir after the balance-beam has become depressed. As soon as the balance-beam has been depressed the water flows through spout *c* into receptacle *a*, and so on successively, flowing first into tank *a* and then into tank *b*. This rise and fall of the balance-beam actuates a counting mechanism *m*, by means of which the apparatus constitutes a water-meter.

The devices for the supply of the acid solution are arranged in front of the apparatus. The acid solution flows from a wooden vessel through the lead pipe *h* and the three-way cock *i'* into the small reservoir *p'* until the level in the capillary tube *s'* is equal to that in the wooden vessel. When the balance-beam descends, the three-way cock is turned through ninety degrees and the contents of holder *p'* flow through pipe *q'* and the acid solution from holder *p'* mixes with the water from tank *b*. The operation on the other side of the apparatus is the same.

Tanks *a* and *b* are of equal capacity, as are also holders *p* and *p'*. These receptacles *p* and *p'* are advantageously formed of tombac, (one hundred parts of copper and twelve and one-half parts of tin.) The dimensions of the acid-receptacle are of course dependent upon the size of the water-meter and also upon the strength of the acid solution which it is desired to employ and the like.

What I claim as new is—

1. The combination of opposite water-tanks, means for alternately filling the same, the valved outlets for the tanks and mechanism for alternately opening said valves; with the acid-containing vessels, the supply and outlet pipes thereof, and the valves controlling the inlet and outlet of acids from said vessels, said valves being actuated by the valve-actuating mechanism of the tanks.

2. The combination of the water-supply, a pair of tanks, an oscillating beam provided with buckets adapted to be filled by overflow from the tank so as to oscillate the beam, and valved outlets from the tanks, and connec-

tions for operating the valves thereof from the beam; with vessels, the supply-pipe communicating therewith and outlet-pipes therefrom, and the valves controlling the inlet and outlet to said vessels, and connections for operating said valves from said beam, for the purpose and substantially as described.

3. The combination of a balance-frame, an acid-containing receptacle and an acid-holder intermediate the source of supply and the point of consumption of the acid, and a combined inlet and outlet valve adapted to control the flow of acid to and from said intermediate holder; with connections between the balance-frame and the combination-valve whereby when the said frame is tilted the combination-valve is operated, for the purpose and substantially as described.

4. The combination of the water reservoir and tank, a spout for establishing communication therebetween, said spout being attached to a balance-frame and said tanks being provided with outlet-valves and overflow-pipes, and said frame being provided with buckets adapted to catch the overflow of liquid from the tanks; an acid-reservoir, acid-holders and capillary acid-holding tubes, and pipes between said reservoir and said holders, and between the holders and mixed water-and-acid container, valves being provided for controlling the inflow and outflow of acid to and from the acid-holders: with connections between the balance-frame and said valves whereby when either water-bucket is filled sufficiently said valves are operated to open communication between one water-and-acid container and one water-tank and one acid-holder, and to close communication between the other set of such devices; and a water-meter for registering the amount of water flowing through spout *c*, for the purpose and substantially as described.

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

LOUIS EDUARD OTTO DE VISSER.

Witnesses:

ADA N. MAN,
ERNEST A. MAN.