

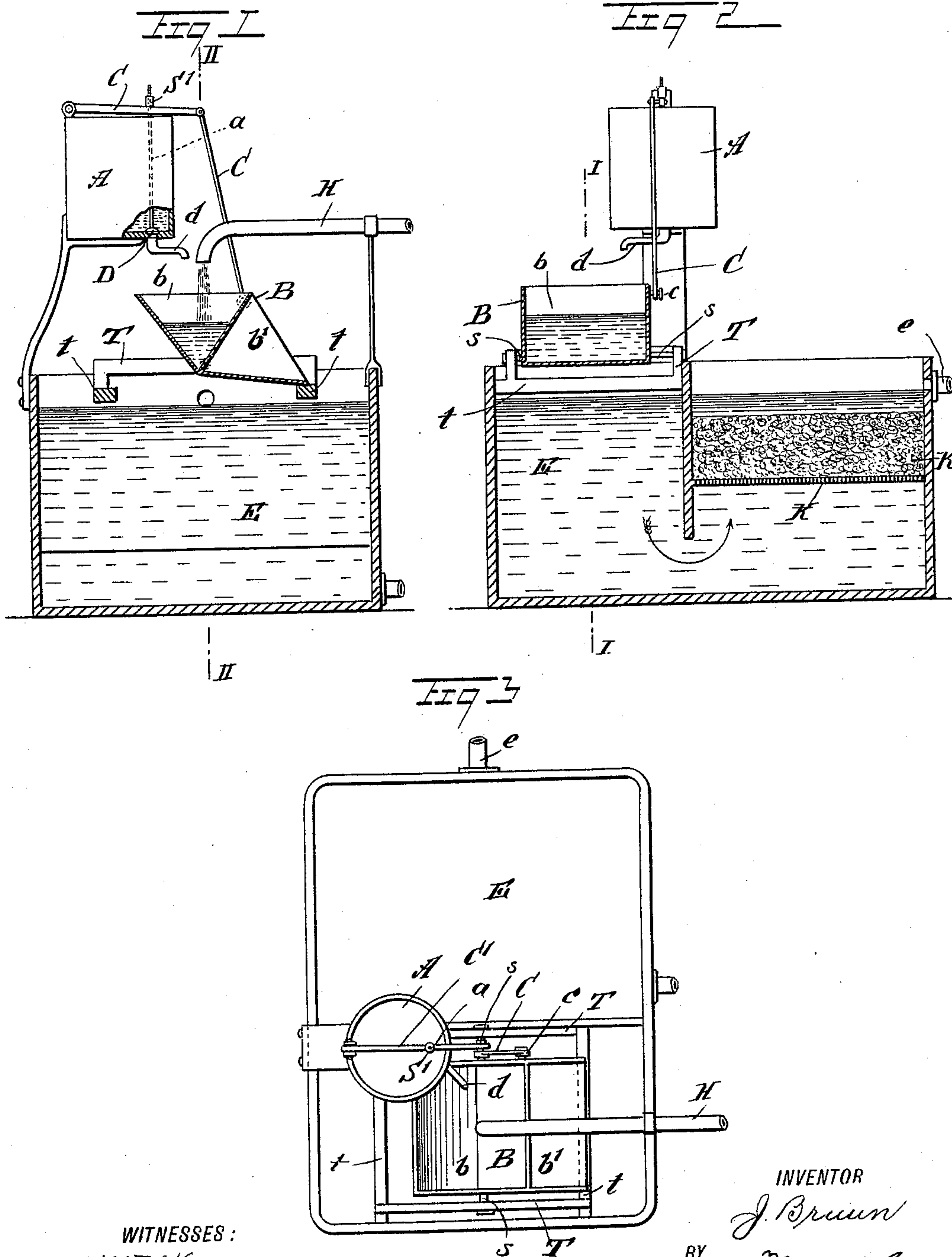
(No Model.)

2 Sheets—Sheet 1.

J. BRUUN.
FEED WATER PURIFIER.

No. 583,786.

Patented June 1, 1897.



WITNESSES:
H. Walker,

James B. Munn,

INVENTOR
J. Bruun
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No. 583,786.

Patented June 1, 1897.



WITNESSES :

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George B. Oring

INVENTOR

J. Brown.

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UNITED STATES PATENT OFFICE.

JULIUS BRUUN, OF COPENHAGEN, DENMARK, ASSIGNOR TO V. LÖWENER,
OF SAME PLACE.

FEED-WATER PURIFIER.

SPECIFICATION forming part of Letters Patent No. 583,786, dated June 1, 1897.

Application filed October 29, 1896. Serial No. 610,431. (No model.) Patented in Denmark July 24, 1893, No. 361, and in England March 26, 1895, No. 14,314, and May 8, 1896, No. 9,844.

To all whom it may concern:

Be it known that I, JULIUS BRUUN, machin-
ist, of Raadmandsgade 24, Copenhagen, in the
Kingdom of Denmark, have invented certain
5 new and useful Improvements in or Relating
to Feed-Water Purifiers, (for which I have ob-
tained Letters Patent in Denmark, No. 361,
dated July 24, 1893, and in Great Britain, No.
14,314, dated March 26, 1895, and No. 9,844,
10 dated May 8, 1896,) of which the following is
a specification.

This apparatus has for its object to remove
automatically from feed-water for steam-boil-
ers such matters as may produce sediment
15 or incrustation, to prevent said matters en-
tering the boilers, and to admit only pure
water. The apparatus is applicable where
crude or natural water is used for feeding.
The purifying process consists in adding a
20 suitable chemical solution or reagent for any
special kind of water, and in cases where the
reagent is apt to cause a sediment if not
stirred up—for instance, by lime-milk, &c.—
the arrangement is somewhat different from
25 the arrangement in cases where the reagent
remains in a state of perfect and constant
solution.

Reference is to be had to the accompanying
drawings, forming a part of this specification,
30 in which similar characters of reference de-
note corresponding parts in all the views.

Figure 1 is a sectional view of the apparatus
on the line 1 1 of Fig. 2. Fig. 2 is a sectional
view on the line 2 2 of Figs. 1 and 3. Fig. 3
35 is a plan view of the apparatus for use in con-
nection with a reagent in perfect and constant
solution. Fig. 4 is an end elevation of the
apparatus for use in connection with a reagent
not in perfect and constant solution and re-
40 quiring agitation, and Fig. 5 is a longitudinal
section of the form of the invention shown in
Fig. 4.

Referring to Figs. 1, 2, and 3, the apparatus
consists of a container A for the reagent.
45 This container has a foot-valve D at its base,
which discharges into a balanced oscillating
receiver B, consisting of two chambers *b b'*
and revoluble about its pivots S, S', which are
mounted in a suitable frame T, situated in

the upper part of a filtering-tank E or other- 50
wise conveniently located.

The natural water to be treated is led direct
through an inlet-pipe H into one of the cham-
bers, say *b*, of the balanced oscillating re-
ceiver B, and when this chamber is filled 55
the center of gravity is moved and the receiver
oscillates in such manner as to pour out its
contents into the tank E below, bringing the
other chamber *b'* below the orifice of the pipe
H. A lever C is pivoted at *c* to the receiver 60
B, and this lever C is in turn pivoted to the
lever C', to which the stem or spindle *a* of the
valve D is attached by a nut S'. By these
means the valve D is operated at each oscil-
lation of the receiver B. The lifting motion 65
of the valve D is variable by means of the
nut S' on its spindle *a*. Owing to the oscil-
lating movement of the receiver B through
these said adjustable connections C C' and
spindle *a*, the container foot-valve D is opened 70
and closed, and thereby any predetermined
quantity of the reagent is allowed to flow
through the pipe *d* and discharge into one of
the chambers, say *b*, of the oscillating re-
ceiver B. 75

The movement of the receiver B is regu-
lated by suitably-disposed stops, such as *t t*,
by which the discharge and quantity of re-
agent necessary to separate the stony ingre-
dients from predetermined volumes of the 80
water under treatment is determined.

That side of the receiver B which is filled
with water through the inlet-pipe H descends
and the container-valve D opens simultane-
ously, admitting the reagent solution at each 85
operation, whereby a fixed quantity of nat-
ural water is automatically mixed with a cer-
tain quantity of reagent each time the re-
ceiver oscillates and pours the mixture out
into the lower tank E. In this tank the sep- 90
aration of the stony or deleterious matter
takes place. These are precipitated to the
bottom while the pure water ascends through
a superposed filter K, which may consist of
wood flock, hay, mats, or the like, (placed on 95
a suitable frame *k*, as shown,) which will per-
mit the water to pass on freely, but arrest
the passage of any small light particles of

reagent or matter which may be suspended in the water. After having passed through this filter the water is purified and may then be led through a delivery-pipe *e* to the feed-water vessel or directly to the suction-pipe of the feed-pump.

When the reagent is, for instance, lime-milk or any other mixture which is apt to cause a sediment and does not remain in a perfect and constant solution, the container is made in form of a cylindrical vessel or drum *A'*, as shown in Figs. 4 and 5. The drum *A'* is arranged in such a manner that it may oscillate on trunnions *x x*, supported in bearings on a suitable frame. The tank *A'* is, by means of a rod *Y*, connected with the oscillating receiver *B* in such a manner that whenever the receiver *B* oscillates the tank *A'* will also make a corresponding movement to and fro around the trunnions *x x*.

As in the first-mentioned arrangement, the tank *A'* is provided with a foot-valve *D*, attached to a spindle *a*, which foot-valve may be operated by means of a system of levers *C*, *C'*, and *C''*, as in the first-mentioned arrangement. The inside of the oscillating tank is also provided with projecting ribs or wings *Z Z'* for the purpose of constantly stirring up and agitating the sediment of lime or other sediment that may sink to the bottom, thus keeping the mixture in a state of perfect and constant solution.

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

1. The combination, of a container having an outlet, a valve controlling the outlet, an oscillating receiver adapted to contain the substance discharged from the container, a feed-pipe independent of the container and arranged in operative relation to the receiver, so that different substances may be discharged into the receiver from the feed-pipe and from the container respectively, and a connection between the receiver and valve, whereby the valve is operated, substantially as described.

2. The combination, of a container having an outlet, a valve controlling the outlet, a movable receiver adapted to contain the substance discharged from the container, a feed-pipe independent of the container and arranged in operative relation to the receiver, so that different substances may be discharged into the receiver from the feed-pipe and from the container respectively, a connection between the valve and receiver, and a tank adjacent to the receiver, substantially as described.

3. The combination of a container having an outlet, a valve controlling the outlet, a feed apparatus, a feed-pipe independent of said container and leading to the feed apparatus so that different substances may be discharged from the container and from said feed-pipe, respectively, and a connection between the feed apparatus and the valve whereby the valve is operated by the feed appa-

ratus and in unison therewith, substantially as described.

4. The combination of a container having an outlet, a valve controlling the outlet, a movable feed apparatus in connection with the valve and actuating the same in unison with the movements of the feed apparatus, and a feed-pipe independent of said container and leading to the feed apparatus so that different substances may be discharged from the container and from the said feed-pipe respectively, substantially as described.

5. The combination of a container with an opening, a valve controlling the opening, an oscillating feed apparatus, a connection between the feed apparatus and the valve by which the valve is operated in unison with the feed apparatus, a feed-pipe independent of said container and leading to the feed apparatus so that different substances may be discharged from the container and from said feed-pipe respectively, and a tank located beneath the feed apparatus and receiving the water from the feed apparatus, substantially as described.

6. The combination of a container with an outlet-orifice, a valve controlling the outlet-orifice, a movable feed apparatus, a connection between the feed apparatus and the valve, whereby the valve is operated in unison with the movement of the feed apparatus, a tank located beneath the feed apparatus, and a frame held within the tank and immediately below the feed apparatus, the frame serving to limit the movement of the feed apparatus, substantially as described.

7. The combination, of a container having an outlet, a valve controlling the outlet, a tank adapted to receive water and the purifying substance from the container, a connection from the container to said tank, a feed apparatus for delivering water to said tank, and a connection between the container-valve and the feed apparatus in such a manner as to automatically bring a predetermined amount of purifying material together with a certain amount of water in the purifying-tank, substantially as described.

8. The combination of a movable container, a movable feed apparatus, adapted to discharge water into a tank or the like, a connection between said container and feed apparatus to cause them to move in unison, and means for discharging a predetermined portion of the contents of the container at each movement of the feed apparatus, substantially as described.

9. The combination of a movable container, a movable feed apparatus, adapted to discharge water into a tank or the like, a connection between said container and feed apparatus to cause them to move in unison and a valve located upon the container and operated by each movement of the feed apparatus to discharge a predetermined portion of the contents of the container, substantially as described.

10. A container having an outlet, a valve
controlling said outlet, a valve-opening mech-
anism having an adjustable connection with
the valve-stem to regulate the throw of the
5 valve and the amount discharged at each op-
eration thereof, a movable feed apparatus
adapted to discharge water into a tank or the
like, and an operative connection controlled
by the movement of said feed apparatus, for

causing the valve to be opened at each move- 10
ment thereof, substantially as described.

In testimony that I claim the foregoing as
my invention I have signed my name in pres-
ence of two subscribing witnesses.

JULIUS BRUUN.

Witnesses:

P. J. HOFMAN-BANG,
JULES BLOM.