

(No Model.)

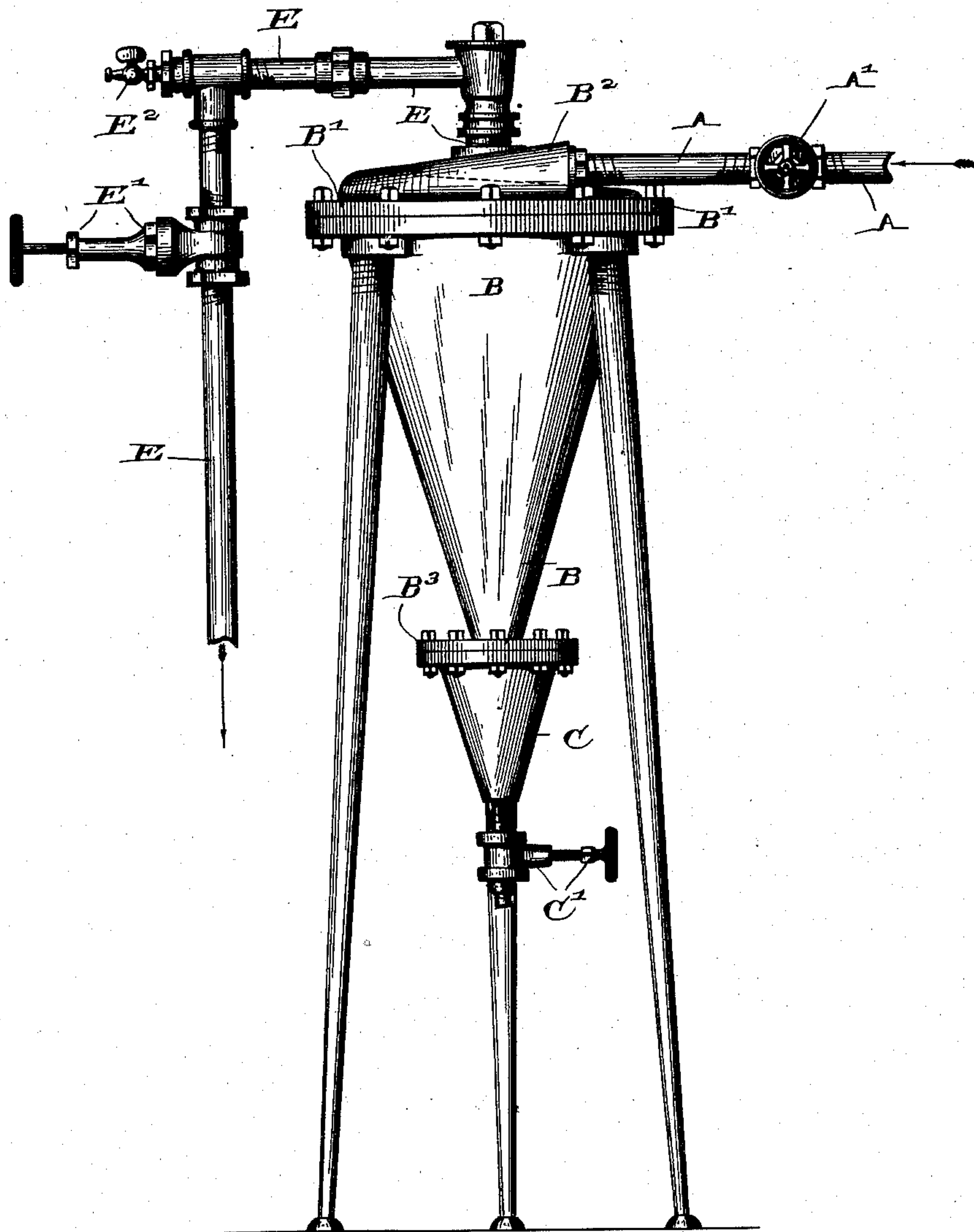
2 Sheets—Sheet 1.

E. BRETNEY.
WATER PURIFIER.

No. 453,105.

Patented May 26, 1891.

FIG. 1.



Witnesses

H. W. Neely

Frank M. Wood

Inventor

Eugene Bretney,

By his — Attorneys

Wm. C. Bradford.

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FIG. 2.

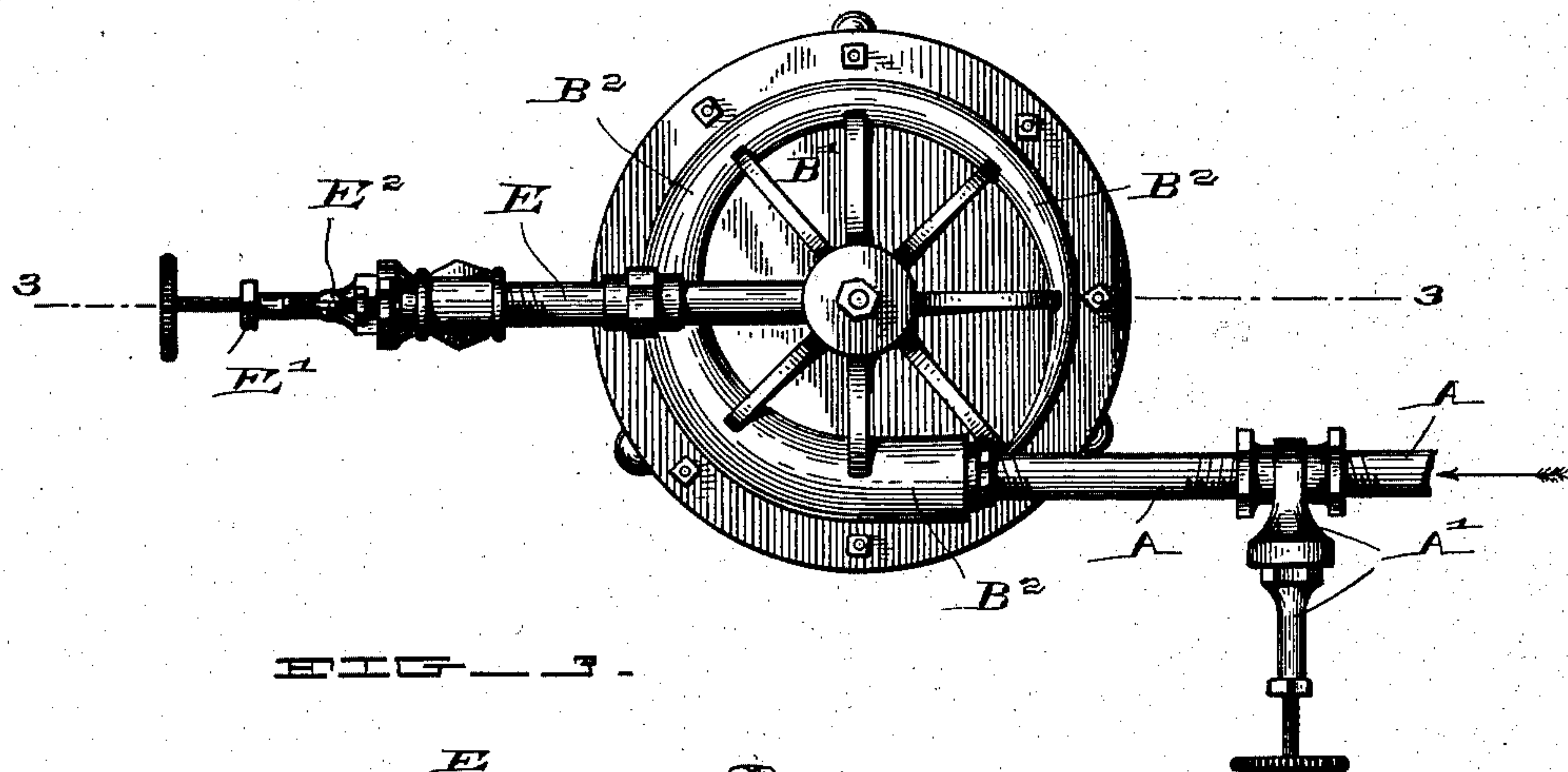
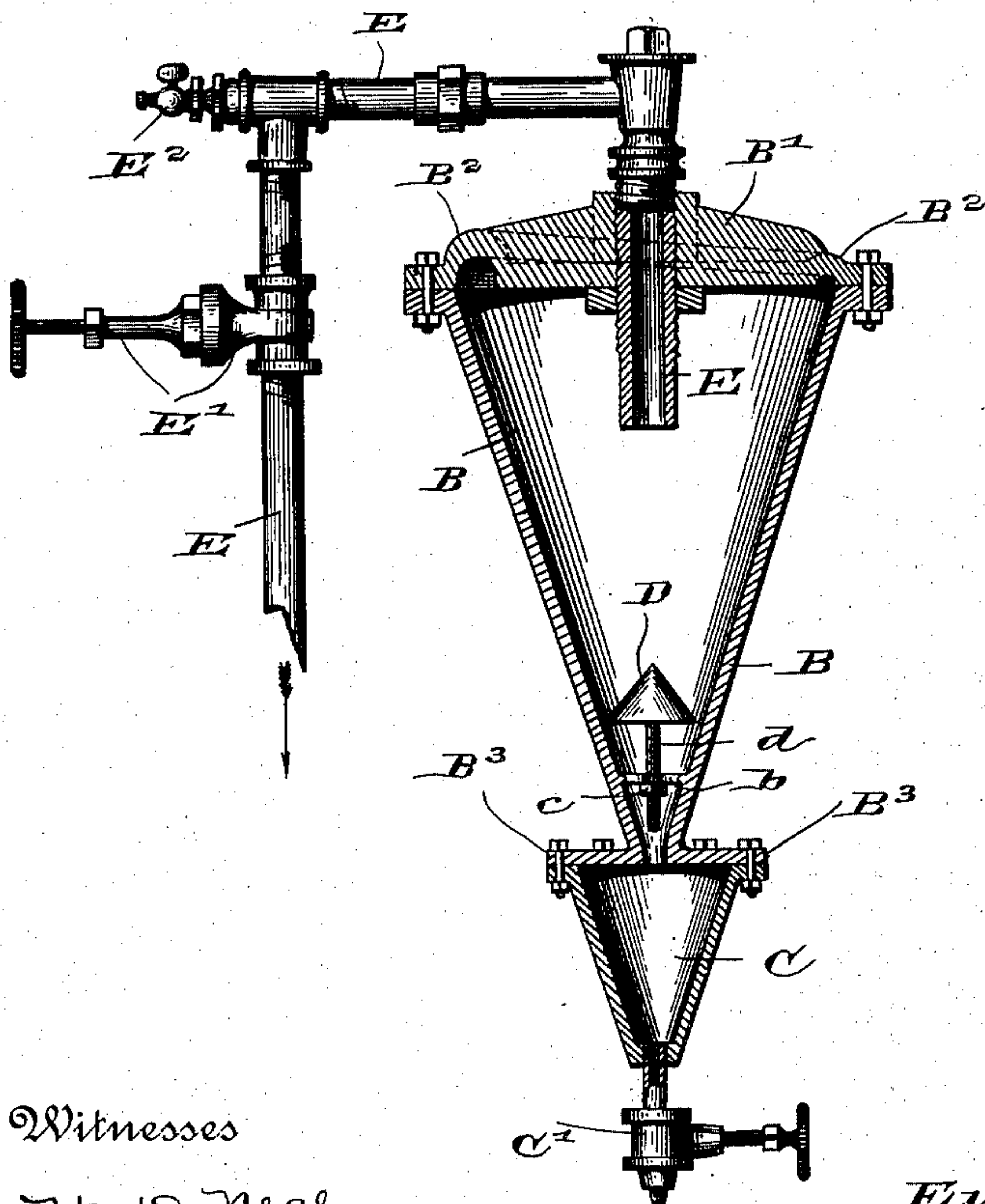


FIG. 3.



Witnesses

H. D. Neely,

Frank H. Hood.

Inventor

Eugene Bretney,

By—his—Attorneys

Wm. C. Bradford.

UNITED STATES PATENT OFFICE.

EUGENE BRETNEY, OF INDIANAPOLIS, INDIANA.

WATER-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 453,105, dated May 26, 1891.

Application filed November 3, 1890. Serial No. 370,176. (No model.)

To all whom it may concern:

Be it known that I, EUGENE BRETNEY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Water-Purifiers, of which the following is a specification.

The object of my said invention is to free water or other liquids from impurities by the employment of centrifugal force, resulting from the pressure under which it is introduced into the apparatus; and said invention consists in an apparatus for accomplishing this object, and a process of using the same, as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of an apparatus embodying my said invention; Fig. 2, a top or plan view of the same, and Fig. 3 a central vertical sectional view thereof on the dotted line 3 3 in Fig. 2.

In said drawings, the portions marked A represent an ingress-pipe through which water is introduced into my apparatus; B, the main body or tank thereof; C, a supplemental tank or settling-chamber; D, a gate located at a point in the main tank just over the opening into the supplemental tank, and E an egress-pipe. The ingress-pipe A leads from any convenient source of water-supply to the upper portion of the main tank, to which it is preferably connected at one side thereof, so that the inflow shall be tangential thereto. The water being introduced under pressure this causes a vortical motion of the water inside the tank, resulting in the purification of the water, as will be presently described. The pipe is preferably connected, as shown most plainly in Fig. 1, to a raised portion B² on the cover or upper end of the tank near its edge, which raised portion continues around said cover circumferentially, tapering downwardly as it progresses until it reaches the level of the cover just behind where it starts and where the pipe A enters. The under side of the cover is grooved correspondingly, which aids in giving the water the desired motion, and, indeed, when this construction is employed the tangential ap-

proach of the pipe is not indispensable. The pipe should be provided with a valve A', by which the inflow of the water may be controlled, and by which it may be shut off altogether when desired.

The main body or tank B is preferably in the shape of an inverted cone, being largest at its upper end and tapering down gradually nearly to a point. It is provided with a cover B', which preferably embodies the raised portion B², into which the ingress-pipe enters, as has already been described. It should also be provided with a bridge-piece b, near the lower end, to which to connect the adjustable gate D. Where the supplemental tank is employed, this tank B should be provided with a flange B³ to serve as a top for said supplemental tank. The tapering form is of value for two reasons—it causes the impurities, when they are driven to the periphery, to descend in a substantial straight line to the orifice, which is at the point of the cone, and it also reduces the diameter of the whirling body of water at the point farthest from the ingress-pipe, which is also the source of power.

The supplemental tank C, when used, is of substantially the same form as the main tank B, but may be and preferably is of a smaller size. When used, it serves as a settling-chamber into which the sediment separated from the water will descend, and from which it may be afterward drawn off by means of a blow-off valve C'.

The gate D is preferably in the form of a cone, and provided with a downwardly-extending stem d in the form of a screw-rod, which passes through a correspondingly-screw-threaded hole in the bridge-piece b, and is thus capable of adjustment. This screw-threaded stem should be provided with a lock-nut c to hold it securely in place after it has been adjusted. In operation this gate should be adjusted so as to leave a narrow annular opening between its edge and the interior surface of the tank B adjacent thereto just sufficient to permit the sediment separated from the water to pass through with facility.

The egress-pipe E starts from a point on a line passing centrally vertically through the apparatus a short distance below the cover and passes up centrally through said cover or top off to the place to which it is desired

to convey or discharge the purified water. It should be provided with a valve E', by which the discharge may be regulated or cut off, and also with an air-cock E², by which any air which may pass into the apparatus with the water may be allowed to escape.

As will be readily understood, when water is introduced into the tank B it gradually expels the air until it reaches the level of the lower end of the pipe E, but there being no opening in the tank above this level that portion of the air above said level will be confined in the space it occupies and will form an air-cushion against which the upper surface of the body of water in the tank will press. This keeps the upper surface of the water free from contact with the inner surface of the cover of the tank, and the motion of the water is thereby facilitated, while there is also a space provided so that any impurities driven to the surface of the water may float thereon. The pressure of the water will always compress the air somewhat, so that its upper surface will always be somewhat above the lower end of said pipe E, and therefore there is no danger of any impurities floating on the surface being drawn or forced into said pipe.

The operation or process of purifying water with my improved apparatus may be described as follows: As above stated, the water enters under pressure in a tangential direction, which causes a vortical motion in the body of water inside the main tank, and the impurities therein are thus driven by centrifugal force to the outer portion of the body of water next to the interior surface of the sides of the tank down which said impurities will naturally descend to the bottom, and where the supplemental tank is provided they will pass through into said supplemental tank, which thus becomes a receptacle for such impurities. The egress-pipe, starting as it does from near the center of the body of water, receives the water in its purified condition, and in that condition the water is driven off through this pipe by the same pressure with which it is introduced into the apparatus.

I have shown and prefer to use a supplemental tank as a receptacle for the sediment or "settling-chamber;" but I have successfully used in actual practice an apparatus otherwise similar, but without this tank, and without the gate D, attaching the blow-off valve directly to the lower point of the main tank B. It will be apparent, however, that with such a construction the blow-off valve would necessarily have to be opened more frequently than where a sediment-receptacle is provided, as is shown and described herein. The gate D might be used when the supplemental tank was not used, in which case it would substantially cut off the settled sediment from the whirling body of water, and would thus aid somewhat in the operation.

My whole apparatus is shown as supported by legs standing on a floor, and I have used

it in connection with the business of manufacturing ice; but it may obviously be mounted in any way and used for any desired purpose. There are some features also shown and described herein which, while desirable, are subsidiary to the main or leading device, and may be dispensed with or varied without departing from my principal invention.

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

1. An apparatus for purifying water, consisting of a stationary tank, an ingress-pipe arranged to give the water a whirling motion, and an egress-pipe extending down into said tank to a central point therein.

2. An apparatus for purifying water, which consists of a tank in the shape of an inverted cone, a tangential ingress-pipe connected thereto at or near its upper end, and an egress-pipe connected centrally to its upper end.

3. In an apparatus for purifying water, a tank having an egress-pipe and a tangential ingress-pipe through which the water enters under pressure, said egress-pipe being located centrally and extending down into the tank from the upper end, said tank being air-tight above the level of the lower end of said pipe, whereby when water is introduced in said tank it will first fill the tank to about the level of the bottom end of said pipe and be held from reaching the top by the cushion formed by the confined air, substantially as set forth.

4. The combination, in an apparatus for purifying water, of a tank, a tangential ingress-pipe through which the water enters under pressure, and an egress-pipe, the egress-pipe starting from a central point within the tank and leading thence up through the upper end thereof and off to the point of discharge, and an air-cock in said egress-pipe, whereby when water is introduced into the tank the air therein may be allowed to escape until the water reaches the level of the lower end of the egress-pipe, after which said air will be confined and form an air-cushion, substantially as set forth.

5. An apparatus for purifying water, consisting of a tank, a tangential ingress-pipe, a central egress-pipe, valves in said pipes, and an air-cock also in said egress-pipe.

6. The combination, in an apparatus for purifying water, of a tank in the form of an inverted cone, a tangential inlet-pipe whereby the water is introduced under pressure, a central egress-pipe, and an internal centrally-located gate the periphery whereof is arranged in proximity to the interior adjacent surface of the tank, substantially as set forth.

7. The combination, in an apparatus for purifying water, of a tank in the form of an inverted cone, an ingress-pipe, an egress-pipe, and an internal centrally-located gate the periphery whereof is arranged in proximity to the interior surface of the tank, and which is adjustable on its support, whereby an open-

ing of greater or less width may be secured between said gate and said tank, substantially as set forth.

8. The combination, in an apparatus for
5 purifying water, of a main tank in the form of an inverted cone, a bridge-piece extending across it interiorly near its lower end, which bridge-piece is provided with a screw-threaded hole, and a gate, said gate having a screw-
10 threaded stem which enters the hole in the bridge-piece, whereby the annular opening between the periphery of the gate and the interior surface of the tank may be varied.

9. In an apparatus for purifying water, a
15 tank the upper end whereof is provided with an annular raised portion extending around it at or near its edge, which gradually tapers downwardly from the point of commencement and to which the ingress-pipe is connected,
20 substantially as set forth.

10. In an apparatus for purifying water, a tank the cover or upper end whereof is provided with a raised portion, in which is a hole, to which the ingress-pipe is connected,
25 which hole develops into a groove on the under side of said cover or end, and which groove is annular in form and tapers gradually until

it finally disappears, whereby the vortical motion of the water is assisted, substantially as set forth.

11. The combination, in an apparatus for purifying water, of a tank, an ingress-pipe, an annular raised portion to which said ingress-pipe is connected and which tapers gradually from the point of said connection
35 and finally disappears, and a centrally-arranged egress-pipe, said pipes being provided with the necessary valves.

12. The combination, in an apparatus for purifying water, of a main tank, a tangential
40 ingress-pipe, a central egress-pipe, a supplemental tank or sediment-receptacle attached to the lower end of the main tank, and a blow-off valve attached to the lower end of said receptacle, said main tank and said receptacle
45 being each of the form of an inverted cone.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 29th day of October, A. D. 1890.

EUGENE BRETNEY. [L. S.]

Witnesses:

CHESTER BRADFORD,
FRANK W. WOOD.