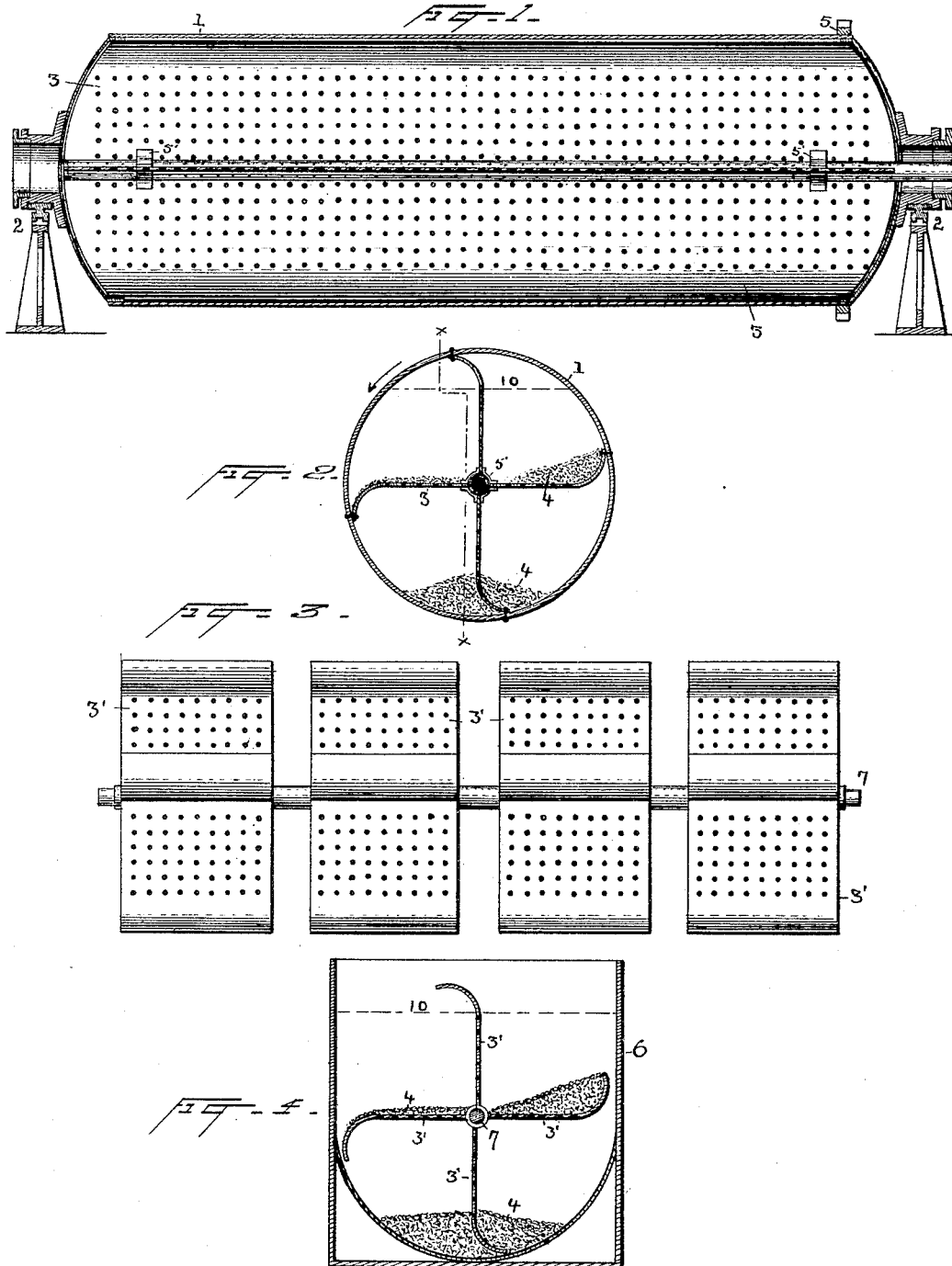


(No Model.)

E. DEVONSHIRE.
WATER PURIFIER.

No. 458,946.

Patented Sept. 1, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

EASTON DEVONSHIRE, OF LONDON, ENGLAND, ASSIGNOR TO THE REVOLVING PURIFIER COMPANY, LIMITED, OF SAME PLACE.

WATER-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 458,946, dated September 1, 1891.

Application filed February 9, 1891. Serial No. 380,848. (No model.)

To all whom it may concern:

Be it known that I, EASTON DEVONSHIRE, a subject of the Queen of Great Britain, residing at London, county of Middlesex, England, have invented a certain new and useful Improvement in Water-Purifiers, of which the following is a specification.

My invention relates to apparatus for purifying water by bringing it into intimate contact with iron or other chemically-acting material of the general character described in my application, Serial No. 376,373, filed October 7, 1890, in which the iron relied on for chemical action in the water was in the form of perforated partitions or grids, and in which means were provided for polishing the grids.

The invention consists in the improvements in water-purifiers in which iron is the active material, hereinafter described and claimed. In said purifier the active material is in the form of radiating plates extending lengthwise of the purifier.

In the accompanying drawings, which illustrate the invention, Figure 1 is a longitudinal section of a purifier on the line *xx* of Fig. 2. Fig. 2 is a cross-section at right angles to Fig. 1. Fig. 3 is a view showing a modified form of the paddles or grids. Fig. 4 is a cross-section through a purifier employing a stationary tank instead of a revolving cylinder.

Referring first to Figs. 1 and 2, 1 is a cylinder mounted to revolve on the trunnions 2, the trunnions forming, respectively, a water-inlet and a water-outlet. Within the cylinder is a device for bringing the water into intimate contact with iron for the purpose of producing chemical action, consisting of several perforated plates 3, radiating from the center and connecting at the periphery with the cylinder. Four of these radiating plates are shown, although in practice a larger number would ordinarily be used. The plates are preferably perforated for about three-fourths of their width, as shown, the plates near the outer edge being left unperforated. In each of the compartments between the paddles or plates is placed a quantity of loose stones, or in some cases scraps of iron or other hard particles, as indicated at 4 4. 5 is a gear around the periphery of the cylinder, by

means of which it may be revolved. Extending through the center of the cylinder is a perforated air or gas pipe. The inner edges of the plates are held in proper relation by braces 5', which loosely encircle the air-pipe.

In Fig. 3 the plates, instead of being made continuous throughout the length of the cylinder, are divided up into several shorter paddles 3'. Either the long or the short plates may be used in the inclosing vessel in the form of the rotating cylinder of Fig. 1 or in the form of the stationary tank 6 of Fig. 4. In the latter figure the water inlet and outlet are not through the trunnions, as in Fig. 1. The water may in this apparatus be introduced through the open top of the tank and be led away through a pipe from any suitable part of the tank. These short paddles are secured to the shaft 7, and are moved by rotation of the shaft. Stones or other hard particles are also employed in this apparatus.

In using either form of apparatus water is preferably passed into the purifier at one end and out at the opposite end. By preference the water is not allowed to entirely fill the cylinder or the tank, but rises to the level indicated by the line 10. As the plates are carried around by rotation of the cylinder or by rotation of the shaft 7, the water rushes through the perforations in the plates, being thereby thoroughly subdivided and brought into intimate contact with the iron, of which the plates are composed. As the plates revolve, the stones or other hard particles resting on them move around and keep the surfaces bright and clean. As each plate approaches the vertical position, the particles roll down onto the opposite face of the preceding plate and polish it. As the plates revolve they raise water into the air-space above the water-line 10, and as they move still farther they carry air from said space down into the water, owing to the form and arrangement of the plates. The air then rises through the water. In this way the extent of aeration is increased. With the first form of purifier the air rises from the central pipe to the top of the cylinder, and is then carried down again into the water. In the second purifier the central pipe is not neces-

sary, since the tank is open to the air at the top and sufficient air will be carried down by the revolving plates.

Having thus described the invention, what I claim is—

1. The combination, in a water-purifier, of a purifying vessel or tank having a water-inlet at one end and a water-outlet at the other end, whereby a stream of water may be passed through it, perforated iron plates extending lengthwise of the purifier, and means for moving said plates through water in the purifier, substantially as described.

2. The combination, in a water-purifier, of a purifying vessel or tank having a water-inlet at one end and a water-outlet at the other end, whereby a stream of water may be passed through it, perforated plates extending lengthwise of the purifier and radiating from the center, and means for moving them through water in the purifier, said perforated plates constituting the means for chemically acting on the water, substantially as described.

3. The combination, in a water-purifier, of a purifying vessel or tank having a water-inlet at one end and a water-outlet at the other end, whereby a stream of water may be

passed through it, perforated plates extending lengthwise of the purifier, means for moving said plates through water in the purifier, and means for polishing the plates, substantially as described.

4. The combination, in a water-purifier, of an inclosing vessel, a series of radiating iron plates dividing said vessel into longitudinal compartments and constituting the chemical agent of the purifier, and the compartments containing loose hard particles, whereby as the purifier is moved said particles move around on the plates and polish them, substantially as described.

5. The combination, in a water-purifier, of a purifying vessel or tank having a water-inlet and a water-outlet, perforated iron plates the outer edges of which extend above the water-line and are curved, which plates form the chemical agent of the purifier, and means for moving said plates through water in the purifier, substantially as described.

This specification signed and witnessed this 4th day of February, 1891.

EASTON DEVONSHIRE.

Witnesses:

W. PELZER,

EUGENE CONRAN.