J. G. FULTON.

Feeders and Filters for Boilers.

No. 137,357. Patented April 1, 1873.

Fig. 1.

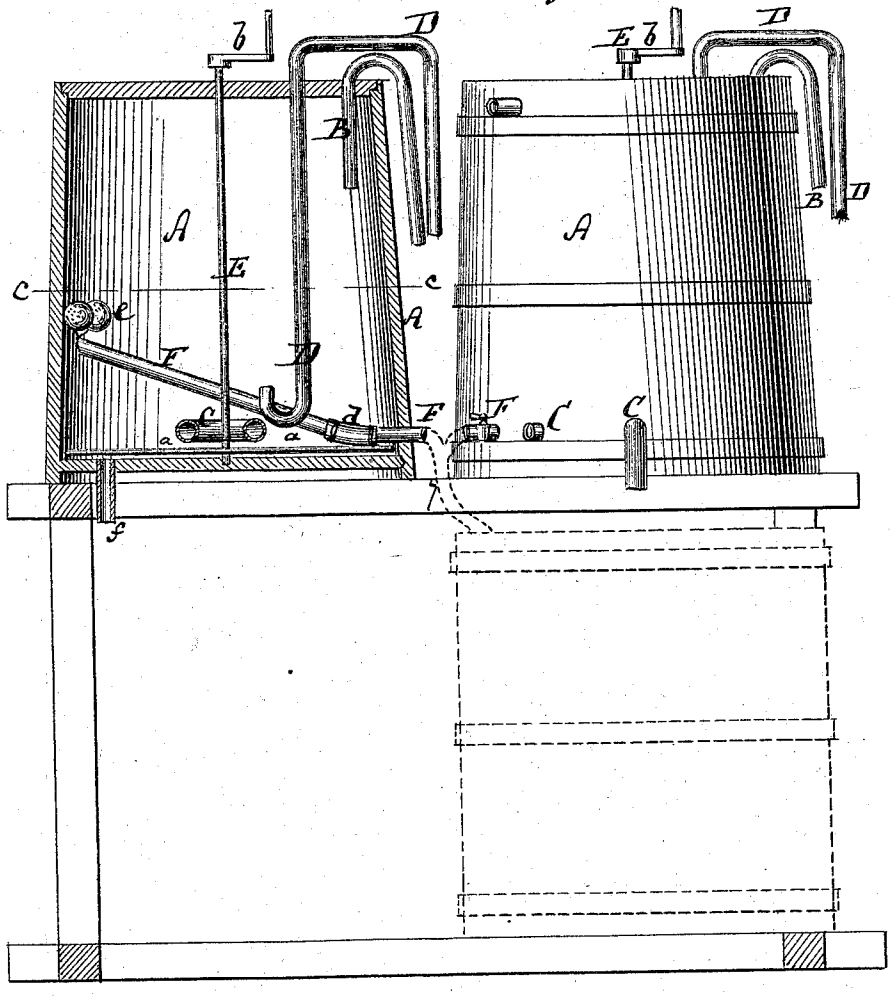
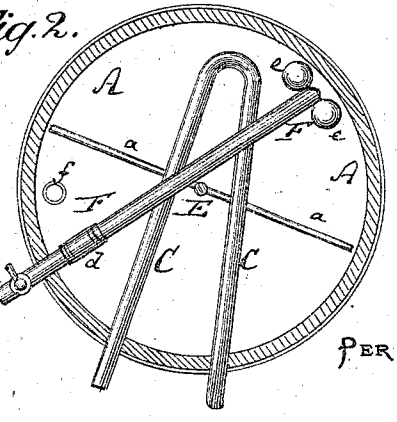


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN G. FULTON, OF TOLEDO, OHIO.

IMPROVEMENT IN FEEDERS AND FILTERS FOR BOILERS.

Specification forming part of Letters Patent No. **137,357**, dated April 1, 1873; application filed December 31, 1872.

To all whom it may concern:

Be it known that I, JOHN G. FULTON, of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Improvement in Feeders and Filters for Boilers for Steam Engines, of which the following is a specification:

The object of this invention is to exclude from steam-boilers all those impurities that are usually contained in the feed-water supplied to them, and by which incrustations are formed within the boilers, and thereby to prevent the formation of incrustations as far as practicable, and the formation of sediment within the boilers. The invention consists, more particularly, in the arrangement, within tanks that contain the feed-water, of a flexible piece of pipe which is connected with floats, that hold the end of said pipe in the upper and therefore purer part of the water contained within said tanks, so that the water flowing through such flexible pipes into the boiler, will be comparatively pure, inasmuch as the sediment settled within such tanks will not be allowed to enter the pipes. The invention also consists in the arrangement of stirring devices within such tanks, for agitating and stirring the sediment that will settle on the bottom of the tanks, so that such sediment will run out when the necessary cock is opened, to discharge the accumulated impurities.

In the accompanying drawing my invention is more fully illustrated.

Figure 1 represents a side view, partly in section, of my improved apparatus, and Fig. 2 a horizontal section of one of the tanks taken on the plane of the line C C, Fig. 1.

Similar letters of reference indicate corresponding parts.

A in the drawing is a tank of suitable size, shape, and material. Water is supplied to it through a pipe, B, from a suitable reservoir. A pipe, C, may be conducted into the tank, and coiled along or above the bottom of the same, for heating its contents, the said pipe C extending from the engine. Another pipe, D, may, for similar purposes extend directly from the boiler toward the lower part of the tank, to admit steam into the same. E is a vertical shaft fitted through the tank, and provided at its lower end with a stirring device, *a*, and at its upper end with a crank handle, *b*, so that it may be revolved within the tank, to agitate any sediment therein, for the purpose of clearing the tank of the impurities that have settled on the bottom. F is a pipe, extending the tank to the boiler, or to any intermediate vessel placed between the tank and the boiler. That end of the pipe F which is within the tank A is made of rubber or other material so as to be flexible, or at least provided with a flexible joint at *d*, so that it can freely swing up and down with the tank. *e e* are floats, attached to the inner end of the pipe F, to hold the same elevated in the feed-water, say, within two inches below the surface of the water contained within the tank, at whatever height such water may be. After the feed-water has been supplied to the tank, it is heated and boiled by the steam from the boiler, and so that its impurities will settle in the tank. The pipe F will then supply the boiler from the pure upper portion of such feed-water, as the end of the pipe is always within the upper part of the feed-water. Chemicals of suitable kind, such as alum, lime, or other substances, may be added to the water, to precipitate the impurities, or otherwise decompose them and make them harmless, if the boiling of the water alone should not suffice. *f* is a pipe attached to the bottom of the tank, for drawing off the water and impurities that have settled on the bottom of the tank.

There may be two or more such tanks, A, applied in connection with each boiler, if desired; and still better it would be to discharge from one of two tanks alternately into a lower receiving-tank, so that the latter may precipitate any impurities that may have entered it from one of the first. This plan contemplates tanks the capacity of which is more than sufficient for, say, twenty-four hours' consumption of water, thereby giving the impurities in the upper tank time to settle, before the water is discharged into the lower tank, from which the steam-boiler is supplied.

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

1. The feed-water supply-tank A, in combination with the flexible or movable discharge-pipe F and the floats *e*, for the purpose of drawing the water from a point below the level of its surface, as set forth.

2. The stirring device E *a b*, in combination with the bottom of the tank A, having a sediment discharge-pipe, as specified.

3. The arrangement of pipe D and heating pipe C with the feed-water tank A and the flexible pipe F, and stirrer E, as set forth.

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