(No Model.)

E. R. STILWELL.

FEED WATER PURIFIER.

No. 592,671. Patented Oct. 26, 1897.

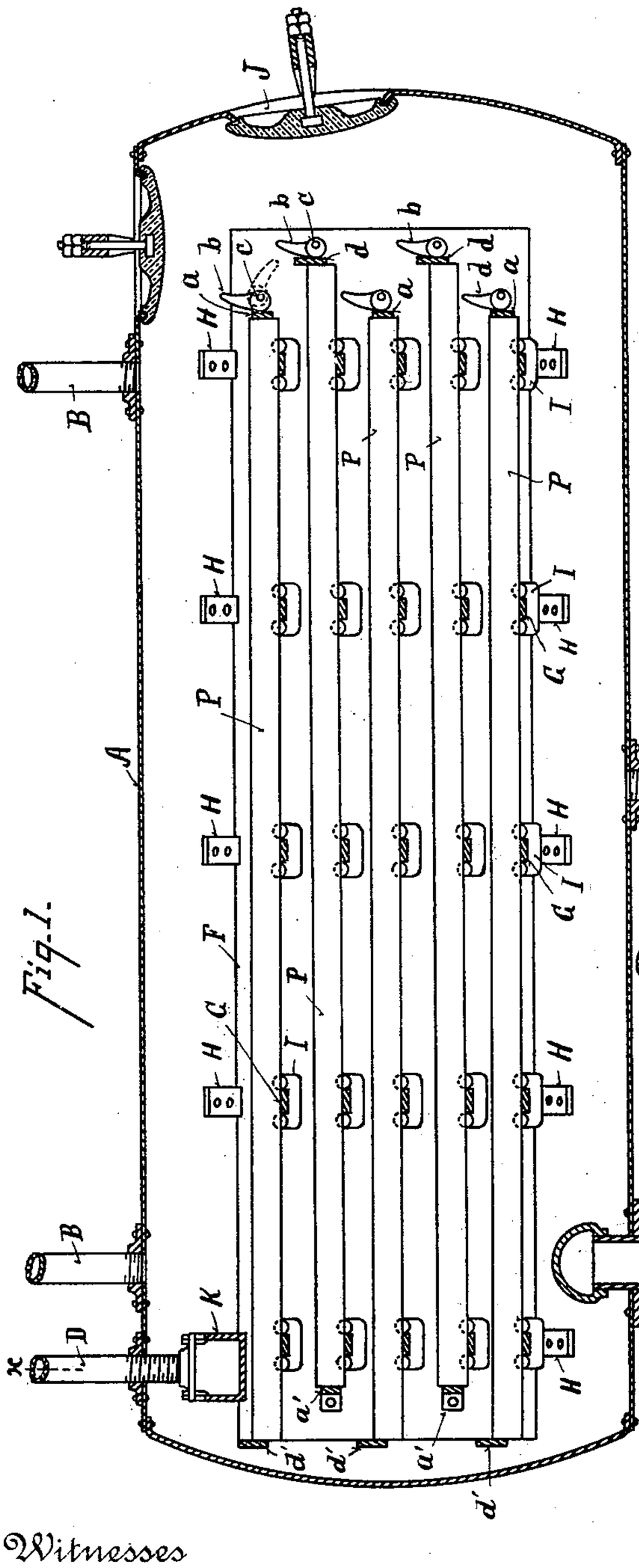

Fig. 1.

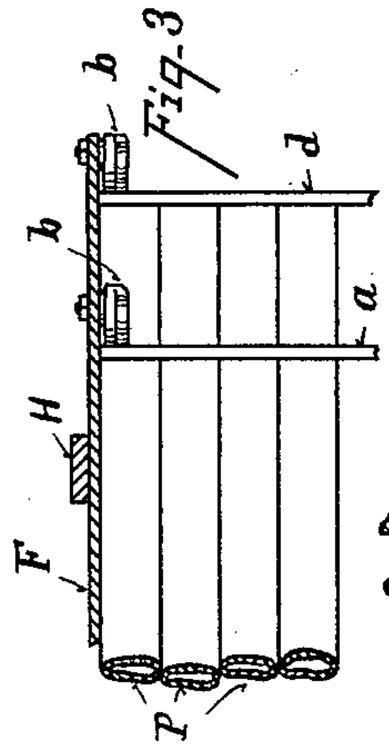

Fig. 3.

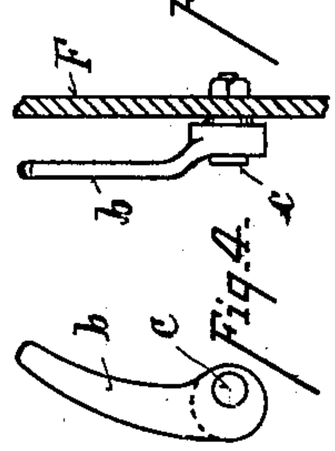

Fig. 4.

Fig. 5.

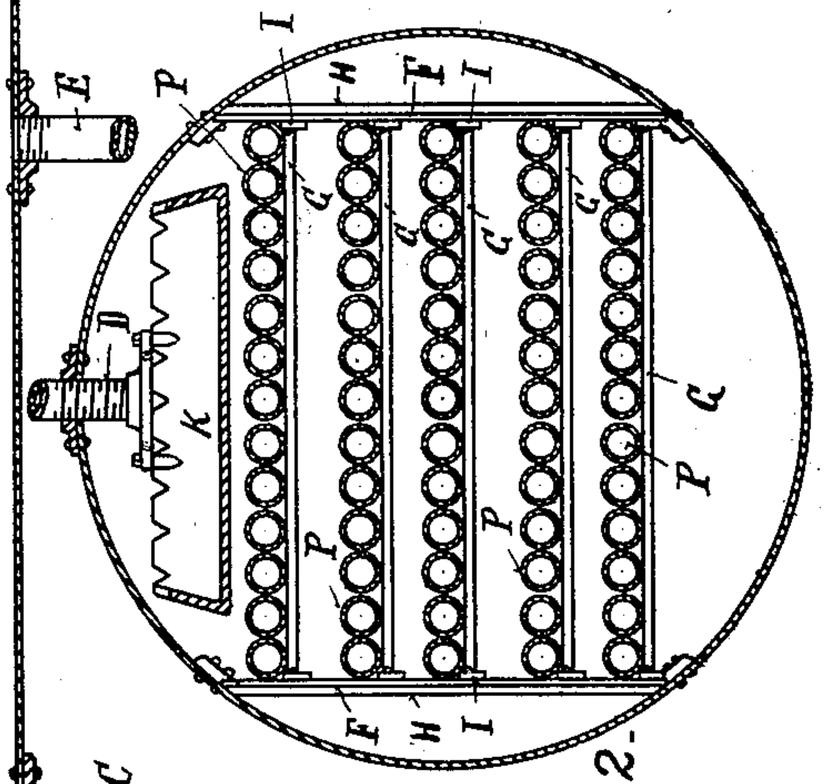

Fig. 2.

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UNITED STATES PATENT OFFICE.

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FEED-WATER PURIFIER.

SPECIFICATION forming part of Letters Patent No. 592,671, dated October 26, 1897.

Application filed April 23, 1897. Serial No. 633,480. (No model.)

To all whom it may concern:

Be it known that I, EDWIN R. STILWELL, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Feed-Water Purifiers, of which the following is a specification.

The object of my invention is, first, to so construct the shelves of a purifier that they may be readily taken out and put into the heater, being readily removable through a manhole.

Another object of my invention is to make the shelves of cylindrical pipe-sections, thereby increasing the heating-surface, as well as making the sections light and easily detachable, renewable, and replaceable.

The features of my invention are more fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central longitudinal vertical section. Fig. 2 is a section on line *x x*, Fig. 1. Fig. 3 is a sectional plan view of the shelves at one end thereof. Fig. 4 is a detailed view of the cam-clamp. Fig. 5 is a side view of Fig. 4.

A represents the shell of a horizontal purifier. B represents pipes for supplying live steam thereto.

D represents the water-supply pipe.

C represents the pipe through which the heated water is carried to the boiler.

E represents a blow-off pipe.

H represents a series of brackets rigidly secured to the shell of the purifier.

F represents longitudinal side plates secured to the brackets H and forming the side walls for the cylindrical-pipe-section shelves.

G represents a series of slats secured to the side plates F and brackets H by means of the U-brackets I. Each shelf is composed of a series of tubes or pipes P, resting on the series of slats G. The upper shelf inclines forward toward the manhole J, and the next shelf underneath is projected forward and inclined in the opposite direction. The sections of pipe composing the shelf are secured in position in the following manner:

a represents a slat running across the front end of the upper shelf and abutting the front ends of the pipes.

b represents an eccentric arm turning on the center *c*.

As shown in Fig. 1, the slat *a* is clamped at each end by the eccentric *b*, clamping the pipes between the removable slats *a d* at one end and the stationary slats *a' d'* at the other end. When the eccentric is turned over in position indicated in dotted lines, Fig. 1, the slat *a* is released and may be taken out and the pipes forming the shelf can be removed through the manhole. The second tier is held in like manner, but the slat *d* is elevated above the pipe sufficient to form a shelf and turn the water backward across the second tier of shelves. There is sufficient space between the ends of the tiers of pipe and the end of the heater to allow a person to work in for the purpose of removal and replacing the pipe-shelves. The shelves could be made of semicylindrical sections and accomplish part of the object of my invention, but the preferred form is the cylindrical.

By making the shelves of a series of pipe-sections arranged in intimate contact with each other throughout their entire length several advantages are obtained. First, a large amount of heating-surface is obtained and very thin material may be employed; second, the lime or magnesia which is deposited thereon begins at the abutting-point at the sides of the pipes, and as this fills up with deposit the water is raised, bringing it against a new and clean surface of the pipe, which consequently takes up heat better than if the entire surface of the shelf was covered with a deposit. This will continue until the top or highest portion of the pipe is covered with the deposit, when the sections can be removed and cleaned. I thus obtain a shelf which will not require cleaning so often, and at the same time preserve the heating efficiency by continually presenting a new uncovered surface of the shelf to the heating and depositing action. This is a very material advantage, as the heating efficiency of the ordinary shelf constantly deteriorates as the scale deposit increases, but with my pipe-shelf the heating efficiency is preserved a long time.

Another advantage obtained from the use of my pipe is that the scale readily cleans off of the shelves and they are hence much less trouble to clean than the ordinary shelves.

K represents the overflow-box.

Having described my invention, I claim—

1. A feed-water-purifier shelf, consisting of a plurality of cylindrical sections supported longitudinally side by side and in intimate contact with each other throughout their length, substantially as described.

2. In a feed-water purifier, vertically-arranged brackets secured to the inside of the purifier, shelves supported by said brackets and each consisting of a plurality of cylindrical sections arranged longitudinally side by side and in intimate contact with each other throughout their length, and means for detachably clamping said sections in position on the brackets, substantially as described.

3. In combination with a feed-water purifier, a series of brackets secured to the inside of the purifier, shelves composed of pipe-sections laid upon said brackets, and clamp-lever engaging with a slat extending laterally across said purifier and abutting the ends of the pipe-sections, whereby the said pipe-sections may be clamped in position by said lever, substantially as specified.

In testimony whereof I have hereunto set my hand.

EDWIN R. STILWELL.

Witnesses:
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