(No Model.)

C. BROWN.

BOILER CLEANING DEVICE.

No. 412,458. Patented Oct. 8, 1889.

Fig. 1.

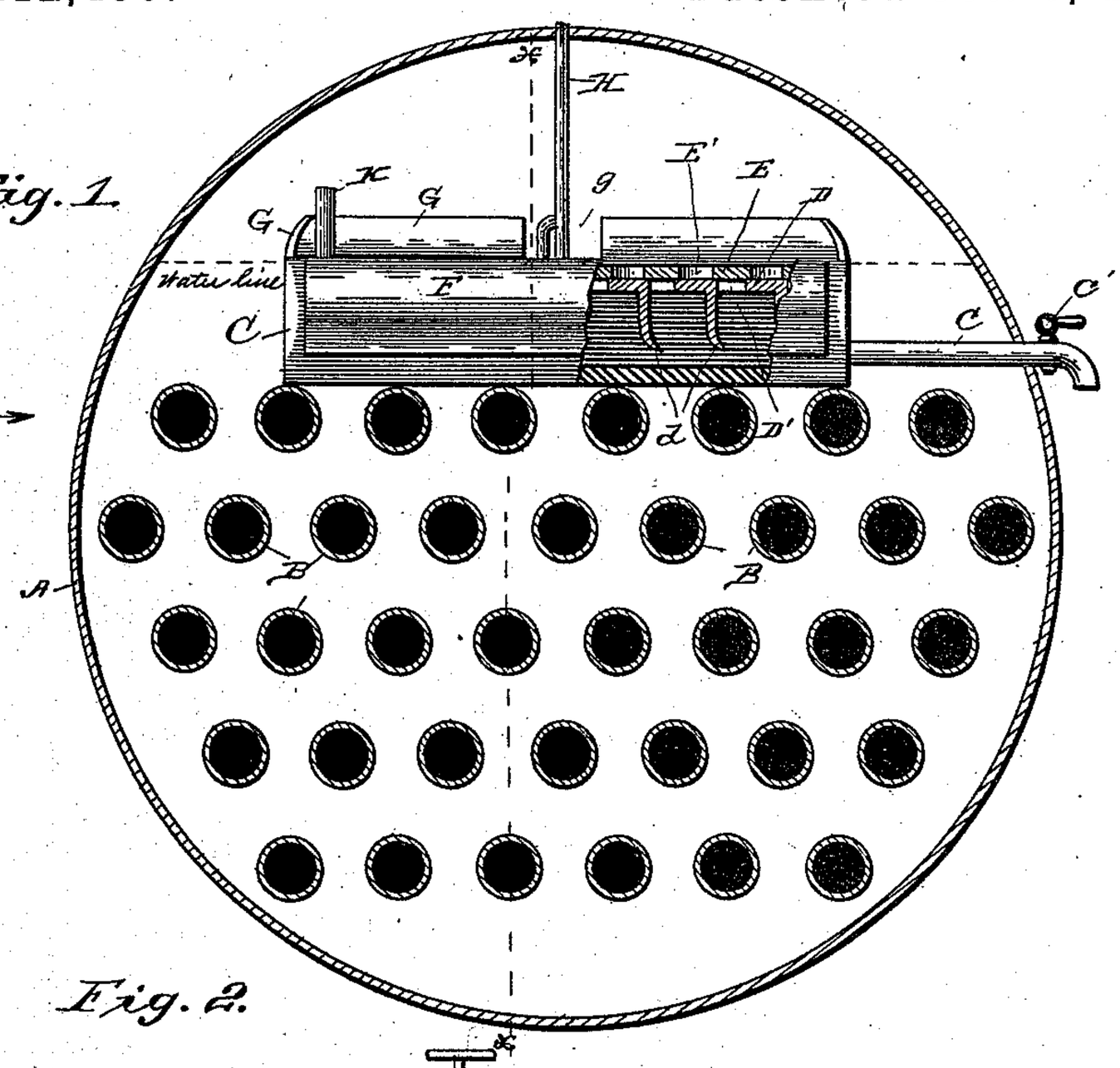


Fig. 2.

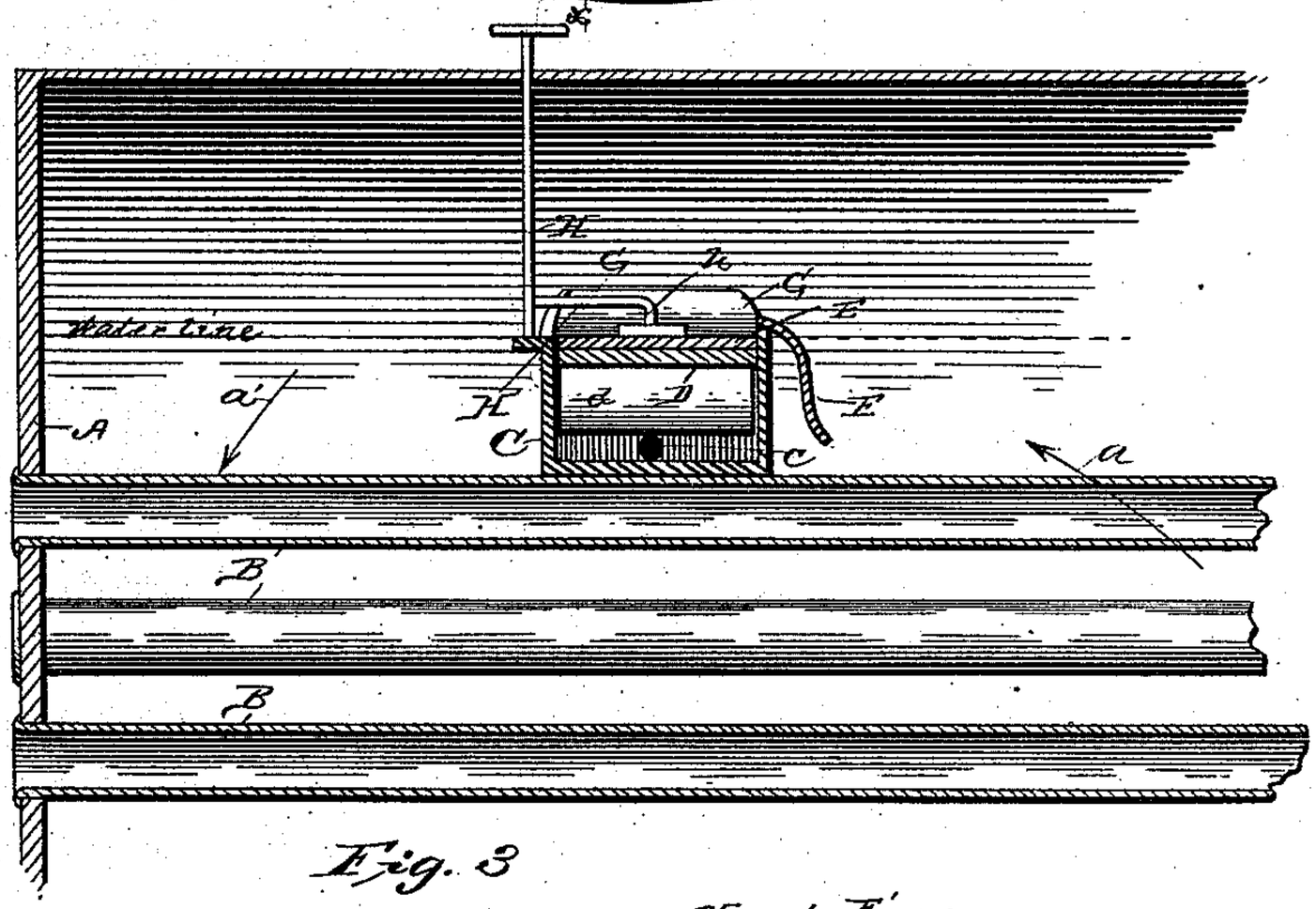
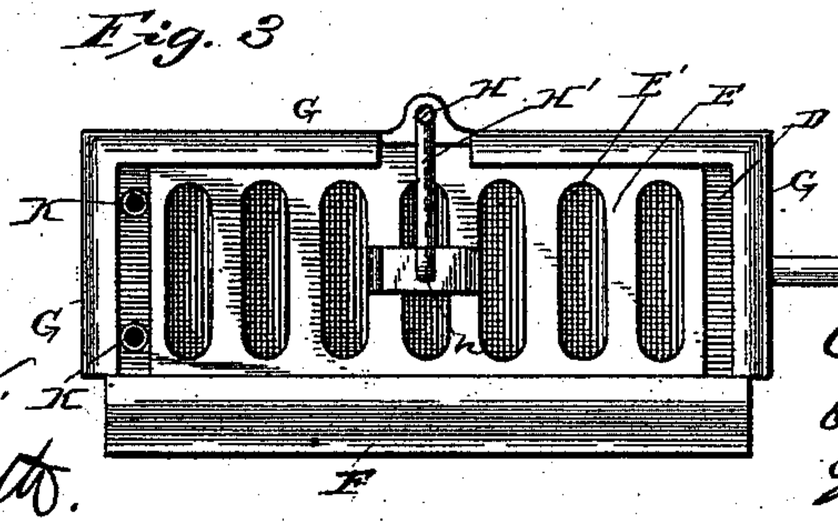


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

CLARK BROWN, OF FREEPORT, ILLINOIS.

BOILER-CLEANING DEVICE.

SPECIFICATION forming part of Letters Patent No. 412,458, dated October 8, 1889.

Application filed June 18, 1889. Serial No. 314,683. (No model.)

To all whom it may concern:

Be it known that I, CLARK BROWN, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Boiler-Cleaning Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in devices for collecting and discharging impurities from water in steam-boilers, the object of the invention being to provide a simple mechanical means for collecting the impurities which rise to the surface of water in circulation in a boiler and discharging it through a pipe passing through the wall of the boiler for the purpose of preventing the deposit of such impurities in the form of scale on the boiler walls and flues.

The invention is fully described and explained in this specification, and shown in the accompanying drawings, in which—

Figure 1 is a cross-section of an ordinary tubular boiler with my improved device in working position therein, the device itself being shown partly in front elevation and partly in vertical section. Fig. 2 is a vertical section through the line X X, Fig. 1, the plane of section being parallel to the flues of the boiler and transverse to the device for collecting and discharging impurities. Fig. 3 is a top plan of the device removed from the boiler.

In these views, A is an ordinary horizontal boiler provided with flues B, and C is a preferably-rectangular box supported by the flues, and having its upper margin approximately at the water-level of the boiler. A discharge-pipe *c* extends from the lower level of the box outward through the shell of the boiler, and is provided with a stop-cock *c'*, by means of which it may be opened and closed. The box C is provided with a top D, in which are formed a series of transverse openings D', the top and its openings being a grating, each of whose cross-bars is provided with a dependent flange *d*, extending downward nearly to the bottom of the box C. Upon the top D rests a cover E, formed with a series of transverse openings E', and adapted to slide back and forth longitudinally in the box in order to cover or expose the openings D' in the top D. A rod H, extending upward through the shell of the boiler and provided at its upper end with a handle for turning it, has its lower end stepped in a suitable socket at the upper rear edge of the box, and an arm H', extending forward from the rod H, is provided at its free end with a downwardly-extending leg *h*, which enters a suitable socket in the upper face of the sliding cover E. It is evident that by the partial rotation of the rod H the sliding cover E may be moved in either direction and thus made to cover or expose the openings D' of the top D. Steam-pipes K, passing through the top D at the end opposite the discharge-pipe C, extend upward into the steam-space above the water-line of the boiler and admit steam from said space to the interior of the box. An apron F extends forward and downward from the upper front margin of the box, and wings G extend across the ends and along the rear of the upper margin of the box, a space *g* being left open at the center of the wing along the rear edge. The water in a steam-boiler when in circulation moves upward at the front of the boiler and downward at the rear end thereof, the current of circulation between the rear and front being approximately horizontal. All ordinary impurities in the water collect on its surface under the operation of applied heat and move with the current in the form of a scum on the surface of the water. When the box and the operative parts connected with it are in the position illustrated and hereinbefore described, the current of water and the impurities on the surface of it approach the box in the direction indicated by the arrow *a* in Fig. 2. The apron F facilitates the movement of the current and the impurities over the front margin of the box, and the wings G serve as a dam, tending to arrest the current and bring about the deposit of the impurities floating on the surface. If the cover E be in such a position as to expose the openings in the top D, the impurities as they settle will pass through these openings into the box beneath, and after such a deposit has accumulated, if the cover be moved into such a position as to close the openings D', and the stop-cock *c'*

be opened, the pressure of the steam entering the box through the pipes K will force the contents of the box out through the discharge-pipe *c*, leaving the box perfectly free from such impurities. The dependent flanges *d* force the current of steam in its movement toward the discharge-pipe to pass along the bottom of the box, thus enabling it to completely clear the box of all its contents. Any impurities not deposited in the box in the first passage over it are carried on by the moving current and pass downward in the direction indicated by the arrow *a'*, Fig. 2, and are soon brought again by the circulation of the water into a position to be deposited in the box and discharged through the pipe *c*.

I have found in practice that by blowing out the contents of the box once in each day all impurities may be effectually removed from the water used in the boiler and any deposit of scale on the walls of the boiler completely prevented, and, in fact, the use of this device in a boiler previously coated with scale will not only prevent further accumulation, but will soon rid it of the former deposit, which falls to pieces if not renewed from day to day.

Having now described my invention and explained its operation, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination, with a box provided with a discharge-pipe and having a top formed with an opening or openings, of a cover adapted to close or expose said opening and means for operating said cover for the purpose of opening or closing the same, substantially as and for the purpose set forth.

2. The combination, with a boiler, of a box set therein and having its upper margin approximately at the water-level and having its top partly open, a discharge-pipe extending from the box through the boiler-shell and provided with means for opening and closing it, a cover adapted to close or expose the opening in the top of the box, and means for operating the cover from a point outside the boiler for the purpose of closing or exposing such opening, substantially as and for the purpose set forth.

3. The combination, with the boiler A, of the box C, set therein and provided with a discharge-pipe *c*, extending outward through the shell of the boiler and having a stop-cock *c'*, the grating-top D D', the cover E E', resting on the top D D' and adapted to close or expose the openings in the top, and the operating-rod H, extending outward through the shell of the boiler and connected with the cover E, whereby the cover may be adjusted with reference to the top of the box for the purpose of closing or exposing the openings therein.

4. The combination, with the boiler, of the box C, having the discharge-pipe *c*, and the grating-top D D', provided with the dependent flanges *d*, the cover E E', resting on the top D D', the operating-rod H, extending outward through the shell of the boiler and adapted to operate the cover D D', and means, substantially as shown and described, for admitting steam to the box, substantially as and for the purpose set forth.

5. The combination, with the box C, provided with the discharge-pipe *c*, apron F, and wings G, and having the grating-top D D', of the sliding cover E E', resting on the top, and the operating-rod H, extending through the shell of the boiler, substantially as and for the purpose set forth.

6. The combination, with the box C, having the discharge-pipe *c* and grating-top D D', of the cover E, resting on the top, the operating-rod H, and the pipes K K, connecting the interior of the box with the steam-space above the water-level of the box, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CLARK BROWN.

Witnesses:
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