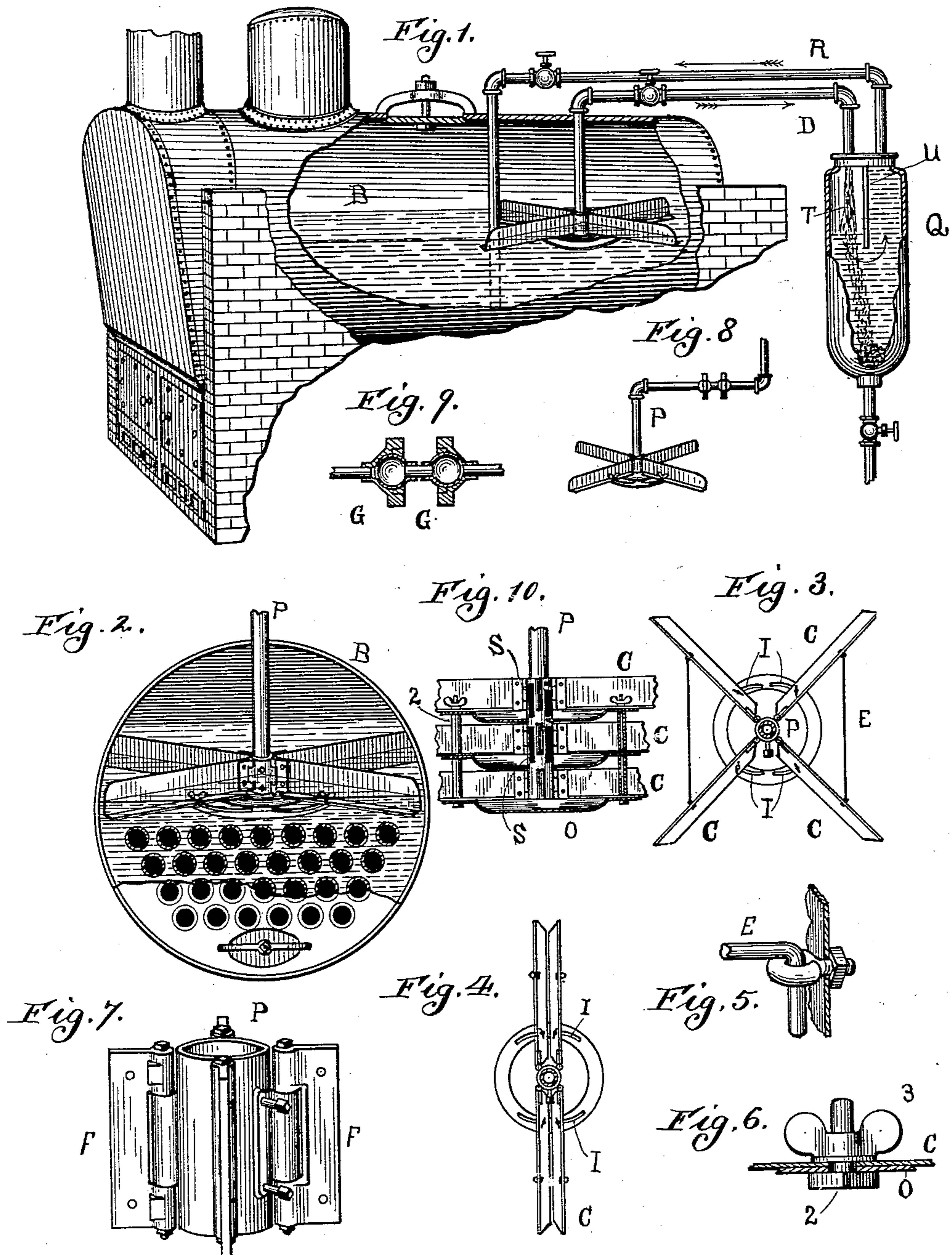


(No Model.)

G. R. FORD.  
BOILER CLEANER.

No. 560,126.

Patented May 12, 1896.



Witnesses:

R. J. Jacker,  
C. Hondelink

Inventor:  
George R. Ford

By

Edward Taggart.  
Atty.

# UNITED STATES PATENT OFFICE.

GEORGE R. FORD, OF CHICAGO, ILLINOIS.

## BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 560,126, dated May 12, 1896.

Application filed July 11, 1895. Serial No. 555,598. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE R. FORD, a citizen of the United States, residing at the city of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Boiler-Cleaner, of which the following is a specification.

My invention relates to a new and useful device for collecting dirt and solid particles which accumulate within a steam-boiler and for expelling the same from the boiler.

The objects of my invention are, first, to collect and direct toward a given point all solid matter which may float upon the water, or be carried in suspension in the water, to a certain point where the same may be taken up and carried out of the boiler; second, to form a current which will return to the boiler the water carried out with the dirt and refuse, leaving the refuse in a settling basin or drum; third, to provide a plurality of collectors arranged in series one above the other, so as to apprehend any refuse or material floating either at the top or below the surface of the water and to convey the same to a central point, from which the dirt and refuse will be removed from the boiler; fourth, to provide adjustable collapsible wings which may be expanded when in use and retracted so as to enable the person to clean the boiler without interfering with the refuse-collector; fifth, to provide in the settling basin or drum a space which is not filled with water, but which is an open space filled by the steam-pressure above the water, into which the refuse is carried, thereby allowing the refuse to be emptied more freely from the tube which conducts it from the collector to the settling-basin. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows substantially a side elevation of a boiler with one side partially cut away in order to show the location of the cleaner within the boiler and also to show all the connections between the boiler-cleaner, the boiler and the settling-drum, and the return-pipe. Fig. 2 is a cross-section of a boiler with the boiler-cleaner in position. Fig. 3 is a plan view of the boiler-cleaner detached with the arms extended. Fig. 4 is a plan view of the boiler-cleaner with the arms collapsed or closed together. Fig. 5 is a detail view of the eye and the end of the brace which is de-

signed to retain the wings of the cleaner in their expanded position. Fig. 6 is an enlarged view of the nut and a portion of the bolt which attaches the wing to the pan. Fig. 7 is an enlarged view, partially in perspective, of the hub and the hinged plates to which the wings are secured. Fig. 8 is a perspective view of the boiler-cleaner and pan together with the double adjustment which may be used in connection with my boiler-cleaner. Fig. 9 is an enlarged view of the double-ground union for adjusting the pan to the required position in the boiler. This form is useful in marine engines, but would not be used ordinarily in stationary engines. Fig. 10 is a side elevation of my boiler-cleaner with a plurality of basins and a plurality of sets of wings, the sets of wings being placed one above the other and adapted to carry the refuse to the hub in order to catch the refuse at different depths of water and in different currents, there being an opening or openings into the hub which is connected with the discharge-pipe for each set of wings.

Similar letters refer to similar parts throughout the several views.

B represents the boiler of any ordinary construction, and within the boiler is placed the boiler-cleaner, consisting of wings C C and the hub P, and the modified form of my invention consisting of a series of wings arranged above each other—that is, a plurality of sets.

D represents the pipe connecting with the hub and extending to the settling-drum Q, the material gathered by the wings being carried by the force of the steam through the pipe D into the space T in the settling-drum Q.

E represents the braces which are connected at their ends to the wings C C, retaining said wings in the position shown in Fig. 3 when said wings are in position to gather the refuse material and convey the same to the central hub within the pan O, said pan O being secured to the wings and beneath the set of wings.

R represents the return-pipe, which opens into the settling-drum Q at one end and at the other end extends into the boiler at a point below the bottom of the lowest pan of the cleaner.

In order to facilitate the flow of the water and refuse through the hub P and discharge-pipe D, I provide a partition or other suitable

means, (shown by U.) The pressure being greater in the outgoing current through D than in the incoming pipe R, a space filled with the steam is formed at one side of the upper end of the settling-drum, and into this space the refuse and water are discharged from the pipe D, the same settling to the bottom of the settling-drum, substantially as shown.

In order to make the wings collapsible or so that they may be folded up, I hinge the same to the hub-piece through the hinged plate F, or other suitable means, and then attach them to the basin by means of a bolt 2, extending through the wing and through the slot I of the pan, the construction being shown fully in Figs. 3 and 4, and when a plurality of pans are used the wings are placed above each other and the pans above each other in the manner shown in Fig. 10, and the bolt 2 would then extend through one wing of each series, it being understood that in a cleaner having a plurality of wings in the series there is one bolt and slot for each wing; but when a series of wings are placed one above the other the bolt may be extended so that it will reach from the top to the bottom of the series of wings, as shown in said Fig. 10.

When the operator desires to clean the boiler, the rods E E are lifted from their position and the wings are collapsed or shut together, as shown in Fig. 4.

3 represents the thumb-nut used for securing the bolt 2 in position. Above each pan there is a hole or a series of holes extending into the hub P. These holes are shown by S. The object of the holes is to allow the refuse collected in the pans to be sucked up and carried out through the discharge-pipe.

In the case of marine boilers, where an adjustment is required, I use the double-ground action shown in Fig. 9 by G G. The same is also shown in Fig. 8. It will be understood that the pressure of the discharge-pipe is greater than the pressure upon the return-pipe, the return-pipe penetrating the boiler to a point below the bottom of the lowest pan. This construction causes the steam to form a steam-space in the settling-drum whenever the settling-drum is provided with a partition or other means, as shown in Fig. 1, and as above described.

Instead of using a partition U, as above described, a short cylinder or other means may be used to surround the opening of the discharge-pipe D in the cylinder Q, and inasmuch as the pressure in the outgoing pipe is greater than that exerted upon the boiler through the incoming pipe the water which is carried up through D will be again returned to the boiler through R.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination with a steam-boiler, of a cleaner consisting of a hollow hub, a plurality of vertically-arranged radiating wings

hinged to said hub, an outwardly-extending arm or plate secured to each wing, and a pan located below the hub and supported by the arms or plates, substantially as described.

2. The combination with a steam-boiler, of a cleaner consisting of a hollow hub, a plurality of vertically-arranged radiating wings loosely connected to said hub, an outwardly-extending arm or plate secured to each wing, a pan located below the hub and provided with a series of elongated slots, and bolts or rods passing through the arms or plates and slots in the pan, substantially as described.

3. The combination with a steam-boiler, of a boiler-cleaner consisting of a central hollow hub, a plurality of wings hinged to the said hub, a pan attached to the said hub beneath the said wings and provided with slots, bolts or rods attaching the wings to the pan through said slots, and suitable means for retaining the said wings expanded, and said wings adapted to collapse or shut together when not in use, substantially as described.

4. In a steam-boiler cleaner, the combination with a central hollow hub, of a plurality of radiating wings hinged to the hub, an outwardly-extending arm or plate secured to each wing, a pan located below the hollow hub and provided with a series of elongated curved slots, bolts or rods passing through the arms and slots in the pan, whereby the latter is supported, a settling-tank provided with a steam-space, a delivery-pipe leading from the hollow hub to the steam-space, and a return-pipe leading from the settling-tank back to the boiler, substantially as described.

5. In a steam-boiler cleaner the combination with a central hollow hub, of a plurality of radiating wings hinged to the hub, an arm or plate secured to each wing, an eyebolt secured to each plate, rods removably connected to the eyebolts between the plates whereby the latter are held distended or spread apart, a pan located below the hollow hub and provided with elongated slots, and a bolt or rod secured to each plate and passing through the slots in the pan whereby the latter is supported, substantially as described.

6. In a steam-boiler cleaner, the combination with a hollow hub, of several series of radiating wings hinged around the outer wall of the hub one series arranged above the other, of a plate or arm secured to each wing of each series, a pan located below each series of wings, and each provided with elongated slots, a bolt passing vertically through each series of arms or plates and through the slots in the pans, whereby the latter are supported, a settling-tank, and pipes leading to and from said tank and boiler, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE R. FORD. [L. S.]

Witnesses:

EDWARD TAGGART,  
CHRISTOPHER HONDELINK.