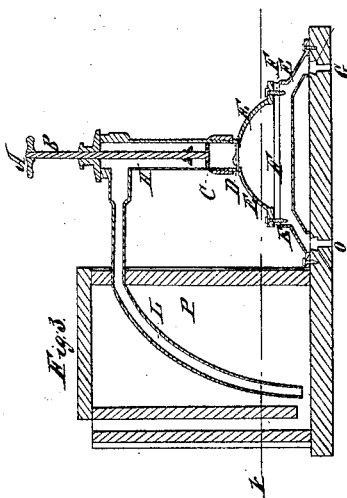
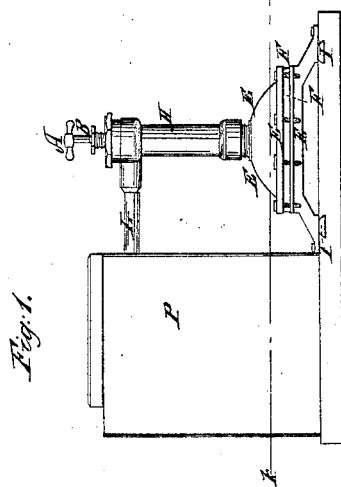
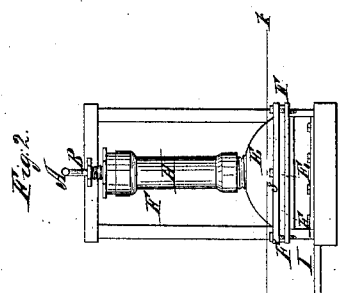
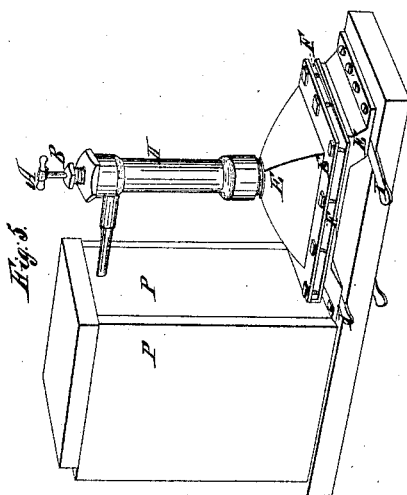
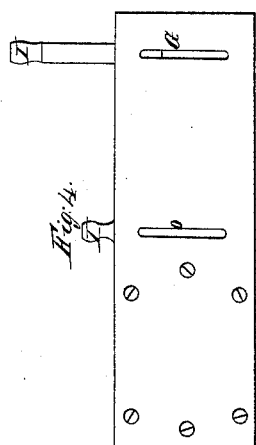


P. K. Hubbs,
Steam-Boiler Condenser.

No. 6,384.

Patented Apr. 24, 1849.



UNITED STATES PATENT OFFICE.

PAUL K. HUBBS, OF HOLMESBURG, PENNSYLVANIA.

FILTERING APPARATUS FOR STEAM-BOAT BOILERS.

Specification of Letters Patent No. 6,384, dated April 24, 1849.

To all whom it may concern:

Be it known that I, PAUL K. HUBBS, of Holmesburg, in the county of Philadelphia, in the State of Pennsylvania, have invented
5 a new and improved mode of filtering and introducing water into steam boilers and for the filtration of fluids for all purposes; and I do hereby declare that the following is a full and exact description:

10 The nature of my invention consists in providing for steam boilers on board of steam vessels, a filtering apparatus, so placed from the river below and the pressure from the river below and the suction
15 of a pump above the filter plate.

The filter plate F in Figure 1 of drawings hereto attached may be made of porous stone, natural or prepared of sand, gravel, charcoal, paper or cloth and in any form the
20 builder may fancy. That which I think the best however, is an oblong flat plate for stone, or semi-globular for other material, especially for cloth, and protected on either side by a wire support. The filter plate F
25 being placed in between the casing E E' Fig. 1 and properly packed with rubber or other material and the plates E E' screwed down or drawn closely together securing the filter between them air tight from all sources but
30 the space above and below it; and being located below the water level of the river as shown by the dotted line K Figs. 1, 2 and 3 secured from any excessive pressure from the river by the shut offs I I Figs. 1 and 4
35 and 5 being closed entirely or partly as occasion may require.

I commence filtration by opening the shut off I nearest the bow of the boat, (I open this shut off because the pressure upon the
40 filter is made intense when the boat is moving, the direction of the spout as shown in the drawings hereto attached favoring the action of the pressure, see dotted lines marking the direction of spouts O and G Fig.
45 3). I now throw into gear the handle A, Fig. 3 of the piston rod B. The pump H is arranged for various speeds, to be geared as before named to a moving part of the engine. After creating a vacuum over the

filter plate F by the action of the piston, it 50 is kept at or changed to such speed only as to continue the vacuum. The pipe L Fig. 3 being extended below the water level K, the syphon action alone I believe to be entirely
55 sufficient to supply any desired quantity of filtered water, but if not, a slight action of the pump may be resorted to. The water then enters the pipe O (if next the bow) Fig. 3, the pipe G being closed, passes the filter plate F and by the pump H and (being 60 part of and connected with) syphon pipe L into the reservoir P where the syphon will maintain the water at water level of the river, and whence the ordinary force pump will conduct it into boilers. When the boat 65 is in motion the filtering plate may be cleansed by opening the rear spout and thus permitting the water to pass against the bottom washing off the mud and other material adhering to it. During the time of the stop- 70 page of the boat, should mud have accumulated in the pores of the filtering plate it can be unscrewed (it may be constructed to slide in and be removed while the boat is in motion) and another put in, or the plate 75 reversed and the pump started, instantly cleansing it. It is better however to have several plates and replace when the pores become filled, cleaning all at leisure at end of voyage. 80

What I claim as my invention and desire to secure by Letters Patent is—

Placing a boiler filter near or upon the bottom of a vessel with a pump elevating the water from its upper surface, when the 85 reservoir beneath the filter is connected with the outside water by means of two inclined apertures with stops or valves for closing them. Constructed substantially as herein described, whereby the greatest amount of 90 pressure may be exerted upon the filtering diaphragm and it may be washed by a current produced by the motion of the boat substantially as herein described.

P. K. HUBBS.

Witnesses present:

JNO. COOK,
A. BROWN, Sr.