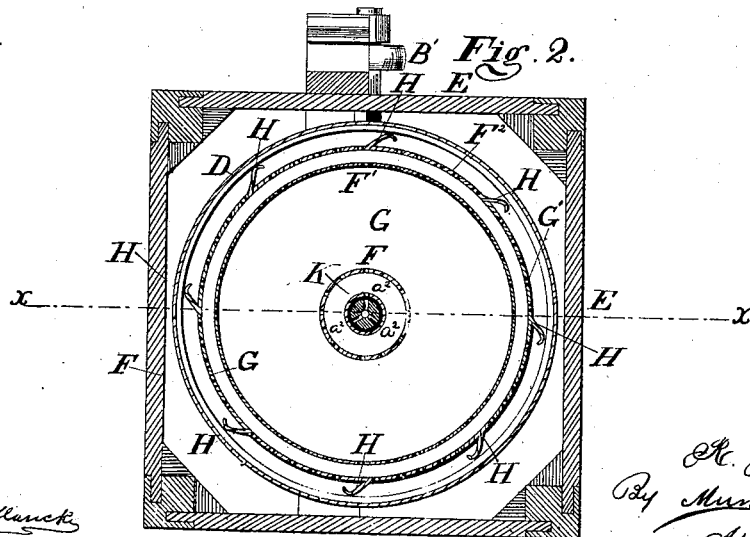
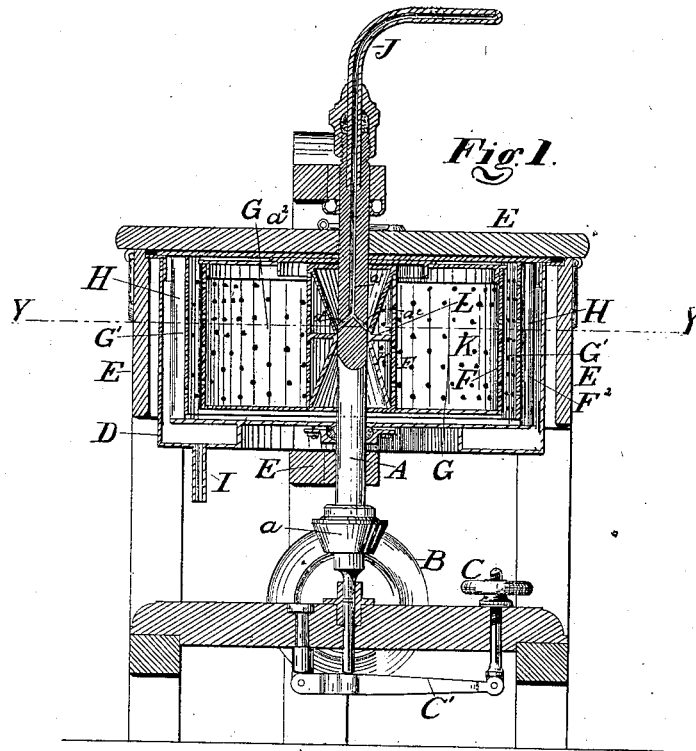


No. 46,724.

PATENTED MAR. 7, 1865.

R. STEWART.
CENTRIFUGAL FILTER.



Witnesses
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ROBERT STEWART, OF BROOKLYN, NEW YORK.

IMPROVED APPARATUS FOR FILTERING LIQUIDS, &c.

Specification forming part of Letters Patent No. 46,724, dated March 7, 1865.

To all whom it may concern:

Be it known that I, ROBERT STEWART, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Centrifugal Filtering-Machines; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical central section of my improved filtering-machine, the line *x x*, Fig. 2, indicating the plane of section. Fig. 2 is a horizontal section of the same in the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

The subject of this invention is an improvement on the filtering apparatus for which Letters Patent of the United States No. 35,441 were granted Horatio N. Fryatt on the 3d day of June, A. D. 1862. In this machine there is nothing to prevent the escape of vapor at the central orifice, and only partially successful provision is made against the overflow and escape of the liquid, for if the liquid be introduced for a certain length of time faster than it is forced through the filtering-chamber the consequent accumulation must necessarily result, first, in the entire overflow of the filtering-chamber; and hence the mixture of the filtered with the unfiltered liquid, and then the escape and waste of the liquid through the opening at which it is introduced at top.

My improvement consists, chiefly, in so constructing the apparatus as to prevent the escape of vapor and the overflow of the liquid during the distilling process, there being in my machine no communication with the interior, except that which is afforded by the pipe through which the liquid is introduced, and the filtering-chambers through which the liquid is forced by centrifugal force during the rotation of the apparatus.

My improvement also includes the disk or circular flange hereinafter referred to, which is employed to cause the liquid to enter the filtering-chamber at a suitable elevated point to compensate for gravitation, which influences the liquid in its passage through the filtering medium.

In order that others skilled in the art to which my invention appertains may be en-

abled to fully understand and use the same, I will proceed to describe it in detail, with reference to the annexed drawings.

A represents a vertical shaft, having a beveled pulley, *a*, through which a rotary motion is given the shaft A by a friction-wheel, B, whose shaft is provided with a pulley, B', receiving motion from a steam-engine or other source. By turning the wheel C the lever C' is made to elevate the shaft A to throw the pulley *a* out of contact with the friction-wheel B, and thus the operation of the machine may be suspended at a moment's notice. The shaft A extends centrally through an immovable circular casing, D, sustained within or by a frame, E.

Within the casing D, and fixed to the shaft A, so as to revolve therewith, are three cylinders, F F' F'', placed one within the other in such manner as to form two filtering-chambers, G G'. I may here remark that the cylinder F'' and chamber G' are simply used to effect a duplication of the filtering process, and are not to be regarded as essential parts of my apparatus. Each of the cylinders has a top and bottom, and is covered additionally by the casing D and frame E. They are all made pervious by perforations or otherwise, so that the liquid, when introduced into the cylinder F, may pass thence into and through the chambers G and G', such passage or movement of the liquid being superinduced by the centrifugal force it receives under the rotation of the cylinders. The chambers G and G' are filled with bone-black or other filtering material, and the filtered liquid, issuing in a rarefied condition from the chamber G', gathers on the wings H, or on the sides of the casing D, thence descends to the bottom of the latter, and passes off in a purified state through the discharge-spout I.

As the filtering process and also the effect of the rotation of the apparatus are well understood, I will not unnecessarily enlarge this description by further dwelling thereon, but will proceed to explain the manner in which the liquid is introduced.

The upper part of the shaft A is made hollow or tubular, as seen at *a'*, and the liquid entering therein from the pipe J, to which the shaft A is coupled, passes into the chamber K, which is formed between the shaft and the interior of the cylinder F through the branch-

ing apertures a^2 . These latter lead into the chamber K at a point a little above its mid-height, and the liquid on entering the said chamber K is received onto a disk or circular plate, L, which, as before mentioned, is used to give the liquid a tendency to enter the chamber G at the proper point to compensate for the influence of gravity upon the liquid, or, in other words, to prevent the larger quantity of liquid from accumulating in and moving through the chamber G, near the bottom thereof. The liquid is, however, allowed to pass gradually to the lower part of the chamber K through spaces between the periphery of the disk L and the cylinder F.

It is apparent that in the apparatus above described the liquid, after being introduced, has no place to escape, either in its natural form or in the form of vapor, except at the discharge-spout I.

The apparatus is used for decolorizing, deo-

dorizing, rectifying, and all similar purposes.

Having thus described my invention, the following is what I claim as new, and desire to secured by Letters Patent—

1. In connection with the filtering-chamber G, the construction and arrangement of the central receiving-chamber, K, and hollow shaft A, adapted to prevent the escape of the vapor and the overflow of the liquid, substantially as set forth.

2. The distributing-disk L, arranged and employed substantially in the manner and for the purposes herein described.

The above specification of my improved centrifugal machine for filtering liquid signed this 25th day of January, 1865.

ROBERT STEWART.

Witnesses:

C. D. SMITH,
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