

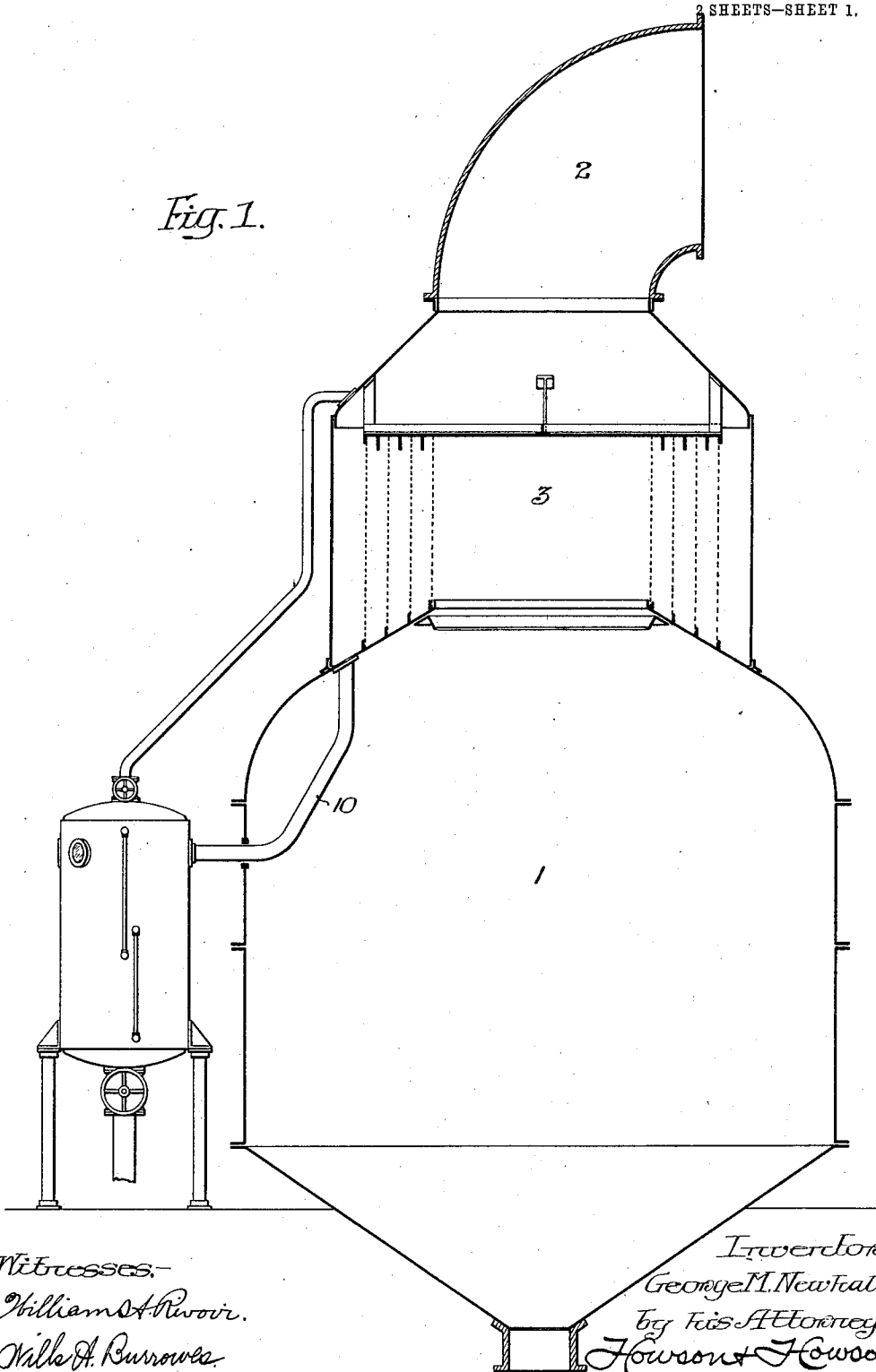
G. M. NEWHALL.
SEPARATOR FOR VACUUM PANS.
APPLICATION FILED SEPT. 2, 1910.

1,015,629.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses—
William A. Rivoir.
Will A. Burrows.

Inwitness—
George M. Newhall.
by His Attorneys:
Howson & Howson

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2 SHEETS—SHEET 2.

Fig. 3.

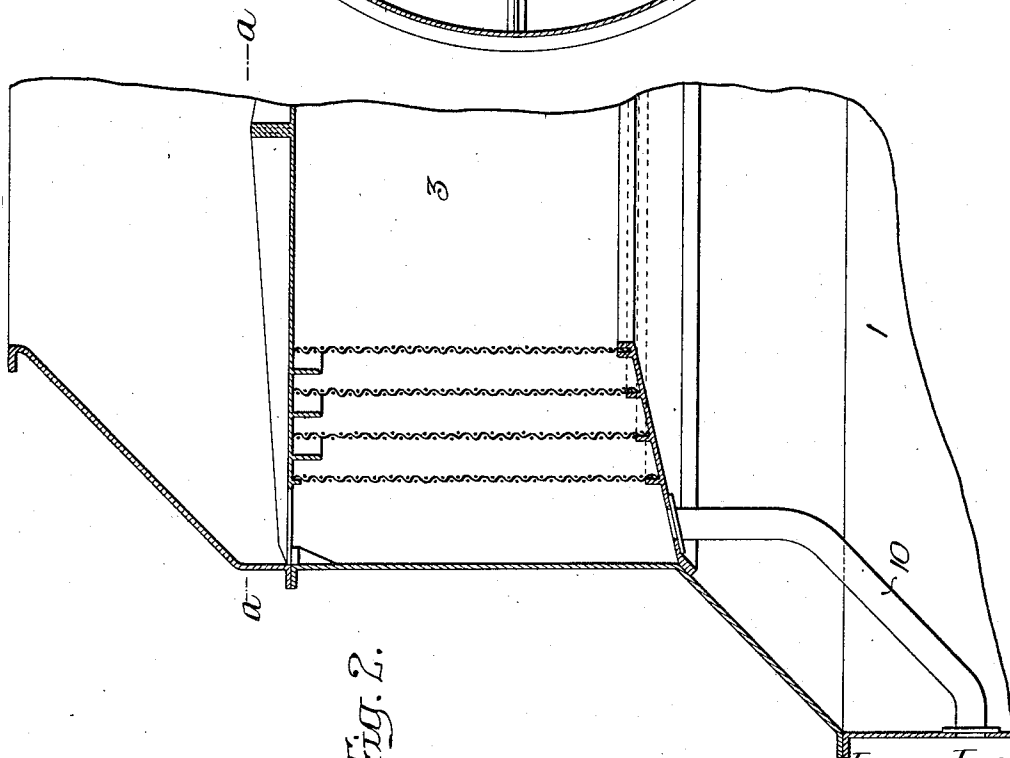
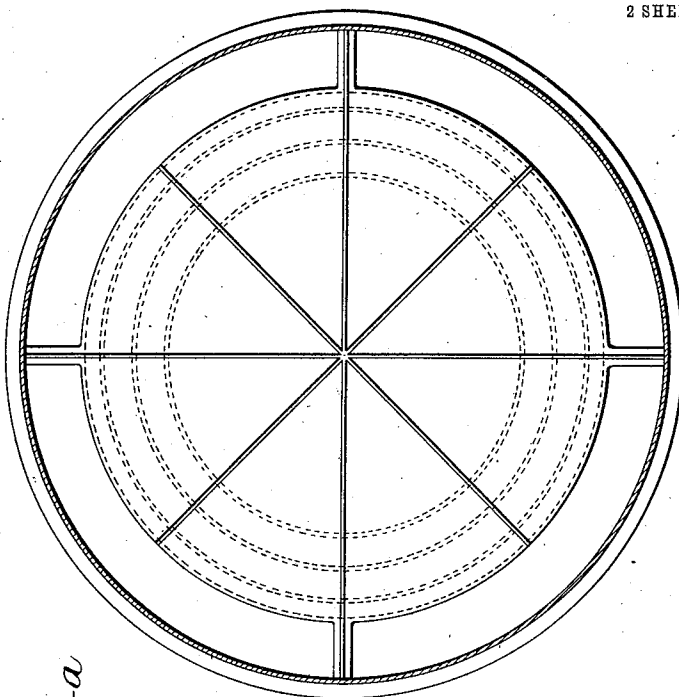


Fig. 2.

Witnesses—
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UNITED STATES PATENT OFFICE.

GEORGE M. NEWHALL, OF PHILADELPHIA, PENNSYLVANIA.

SEPARATOR FOR VACUUM-PANS.

1,015,629.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed September 2, 1910. Serial No. 580,233.

To all whom it may concern:

Be it known that I, GEORGE M. NEWHALL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Separators for Vacuum-Pans, of which the following is a specification.

My invention relates to separators for vacuum pans, more particularly for use with liquids which tend to entrain with the vapor so as to be carried to the vapor pipe leading to another effect, or to the condenser.

In the boiling of sugar it is well known that particles of the sugar solution will entrain and be carried over with the vapor, and many means have been proposed to avoid the loss of such sugar particles by preventing such entrainment.

One object, therefore, of my invention is to provide a novel form of separator which shall satisfactorily remove all particles of the solution from the vapor flowing from a vacuum pan, it being especially desired to so arrange and proportion the devices for accomplishing this end that the liquid particles carried by the vapor shall be held back or stopped by capillary attraction. I further desire that the arrangement of the devices for accomplishing the above end shall be such that there shall be no tendency in the apparatus to blow into spray any liquid after it has once been deposited. These and other features of my invention are more fully set forth hereinafter, reference being had to the accompanying drawings, in which:

Figure 1, is a sectional elevation of a vacuum pan equipped with my improved separating apparatus; Fig. 2, is an enlarged sectional view of a portion of the apparatus shown in Fig. 1, and Fig. 3, is a sectional view on the line *a-a*, Fig. 2.

In prior devices known to me and of the same class as that to which my invention belongs, it has been customary to run the current of vapor through a series of screens, of which that first passed through had the largest area so that the said vapor current was caused to increase its velocity as it flowed through the screen, with the result that liquid particles at first deposited on the smaller area screens were afterward blown into spray. In the present invention, however, I cause the vapor arising

from the vacuum pan to pass through a series of screens which successively increase in area so that the vapor current is slowed down as it passes from one screen to another, thus providing the best condition for the deposition of any entrained vapor particles as well as permitting these to remain undisturbed until they have attained such size as will permit them to flow away.

In the above drawings, 1 represents a vacuum pan of suitable construction in which sugar or other solutions may be boiled for the purpose of effecting the evaporation and concentration of the same. 2 is an elbow connection of a vapor pipe leading to another effect or to the condenser, and 3 represents an intermediate section containing the separating means forming the subject of my invention. Such means comprise in the present instance a series of annular screens, spaced some distance apart. These screens are so arranged that all the vapor arising from the mass of liquid boiling in the vacuum pan, must pass through the same before gaining access to the vapor pipe for delivery to the next effect or to the condenser. It is particularly to be noted that the screens are of successively increasing area so that the vapor flows initially through the one offering the smallest area for its passage to that offering the greatest area. For example, in the present instance the first screen passed through has a little more than half the area possessed by the last one, and if desired the apertures in the succeeding screens may be successively increased in size. Under operating conditions, the vapor rising from the boiling solution must pass through the several screens before gaining access to the pipe leading to the next effect or to the condenser, and with such an arrangement the screens will catch the liquid particles entrained with the vapor; such action being facilitated by the decrease in velocity of the vapor current as it passes from one screen to another. Such liquid particles, under the action of capillary attraction, aid in the deposit of further particles from the vapor current, and as they increase in size will flow into the lower part of the chamber in which the screens are located to a pipe 10. From thence, the liquid may pass into a suitable feed chamber or to another portion of the evaporator, while the vapor,

free of entrained particles of liquid, will pass through the elbow 2 to the next effect or to the condenser.

I claim:

- 5 1. The combination with a vacuum pan, having a heating chamber with an outlet, and a separating chamber between the heating chamber and the outlet, of a plurality of annular foraminous walls disposed in
10 said separating chamber, through which vapor from the heating chamber can pass, said walls having their foraminous surfaces successively increasing outwardly in available area for the passage of vapor.
- 15 2. In a vacuum pan, the combination of a heating chamber, and means for separating liquid particles from vapor generated in

said chamber, said means consisting of a plurality of foraminous screens, whose foraminous surfaces successively increase outwardly in area of passage presented to the vapor as it approaches the outlet whereby the velocity of flow of vapor is reduced, and the vapor is finely divided and the liquid separated from the vapor by capillary attraction at the screens. 20 25

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

GEORGE M. NEWHALL.

Witnesses:

WILLIAM E. BRADLEY,
WM. A. BARR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."