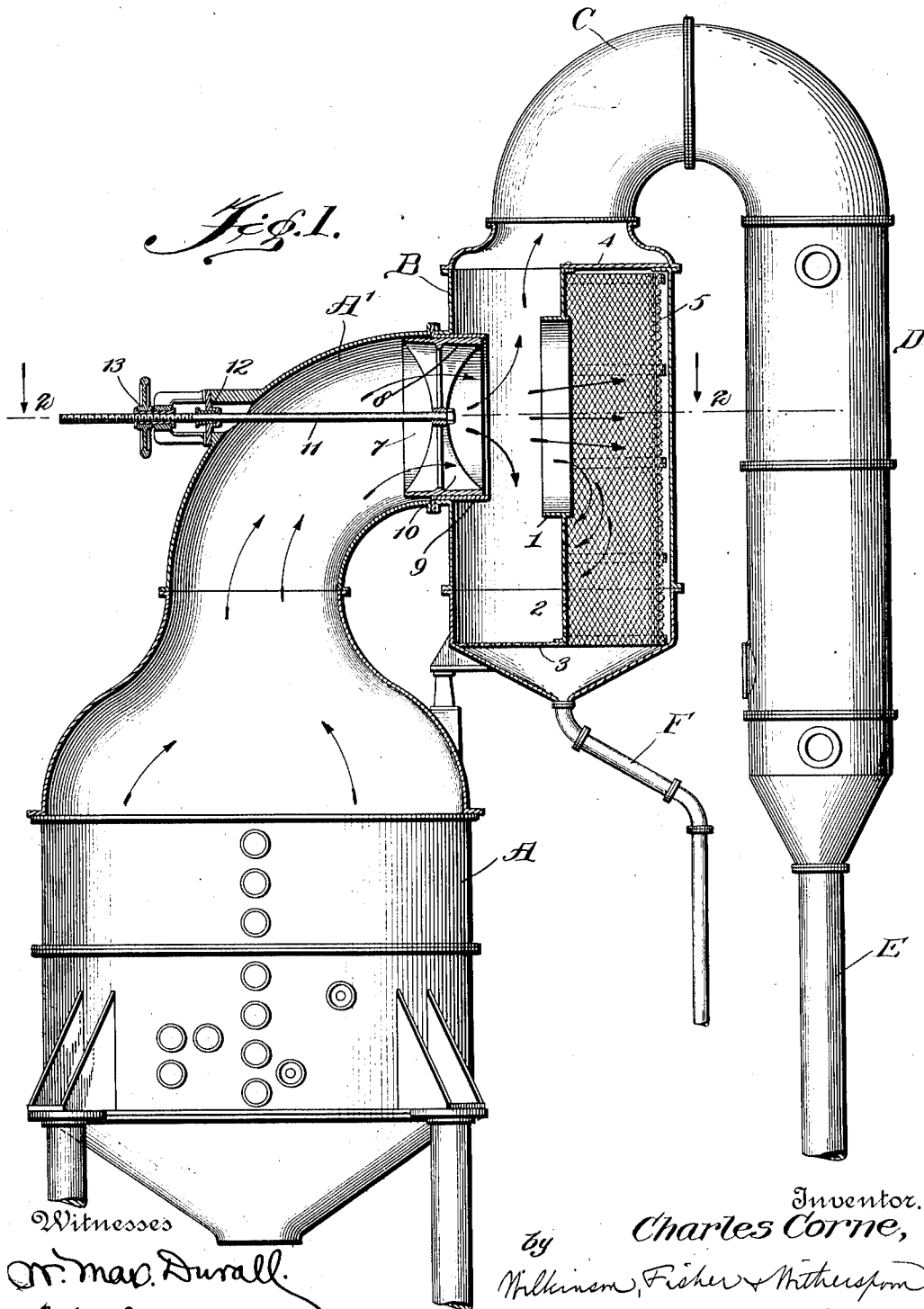


C CORNE.
EVAPORATING APPARATUS.
APPLICATION FILED SEPT. 2, 1911.

1,012,523.

Patented Dec. 19, 1911.

2 SHEETS-SHEET 1.

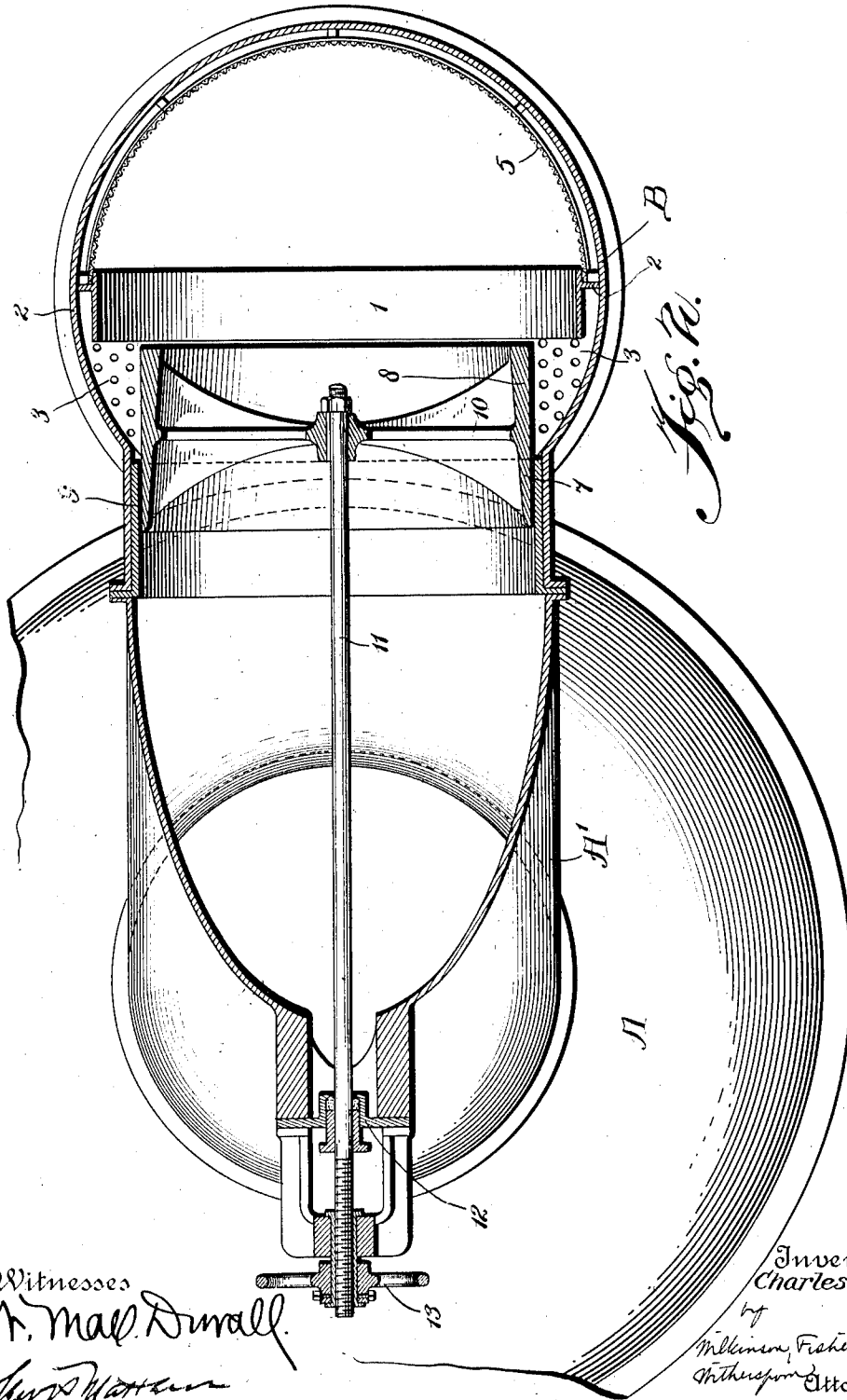


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Witnesses
M. M. D. D. D.
H. H. H.

Inventor
Charles Corne
by
Milliner, Fisher &
Hathorn Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES CORNE, OF NEW ORLEANS, LOUISIANA.

EVAPORATING APPARATUS.

1,012,523.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed September 2, 1911. Serial No. 647,440.

To all whom it may concern:

Be it known that I, CHARLES CORNE, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Evaporating Apparatus; 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 appertains to make and use the same.

My invention relates to improvements in evaporating apparatus used in the manufacture of sugar, whether from cane or beets. In such apparatus, the boiling is generally effected *in vacuo*, and there is most violent ebullition, which causes the carrying over into the condenser not only of the aqueous vapor boiled out of the juice or syrup, but also a material part of the syrup itself. If this syrup finds its way to the condenser, it is carried away with the outflow from the condenser, and is lost.

Various devices have been designed to prevent this loss of syrup by what is known as entrainment, as just described, and these are technically known as catch-alls, and my invention relates to an improved separator, or catch-all, whereby a large amount of the syrup, or sucrose, so entrained is recovered, and only a very small and inappreciable amount finds its way to the condenser.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 shows an elevation, partly in section, of the improved separator, interposed between the condenser and the vacuum pan. Fig. 2 shows a section along the line 2—2 of Fig. 1, and looking down.

A represents a vacuum pan, the top of which, as shown in Fig. 1, is in section, and the neck A' of this pan opens into the separator B, which is connected by the large pipes C to the condenser D, which is supplied with water for condensing purposes in the usual way, and is drained off by the pipe E. The separator B is also drained off by the pipe F. If the separator be at sufficient height above the platform, say thirty-five feet, or more, any liquid will drain out through the pipe F; but if not so high, a pump may be used to suck the liquid trapped in the separator, as will be per-

fectly obvious. It will be noted that the pipe F is not connected directly to the vacuum pan, as I have found in practice that where such connection is made, there is apt to be a flow of syrup from the pan through said pipe to the condenser. This separator incloses a ring 1, attached to the partition 2, said partition being preferably about midway of the separator, and at right angles to the path of the vapors coming from the vacuum pan. This partition 2 is connected at the bottom to the semi-circular, perforated plate 3, and at the top to the imperforate semi-circular plate 4, and a semi-cylindrical wire screen 5, spaced from the outer shell of the separator, is connected to said partition 2. A sliding cylindrical sleeve 7, preferably tapered interiorly, as at 8, is mounted in the cylinder 9, attached to the neck A' of the vacuum pan, and this cylinder is provided with one or more transverse webs 10, to which is connected the rod 11, screw-threaded at its outer end, so as to be moved inward and outward by means of a suitable nut and screw arrangement, operated by the hand wheel 13. This rod passes through a stuffing box 12 in the neck of the vacuum pan. By moving this sleeve 7 in or out, the distance between it and the ring 1 is varied, and a wider or narrower passage is provided between its face and that of the ring 1 for the escape of vapor coming from the vacuum pan.

The operation of the device is as follows:—The liquid in the vacuum pan being in a condition of violent ebullition, the aqueous vapor with the entrained sucrose passes up through the neck of the vacuum pan, and through the sleeve 7, and the heavier particles of syrup, or water containing sucrose, are carried forward by their own inertia into the semi-cylindrical chamber inclosed by the wire screen. Such particles either drop of their own weight, or strike the wire and gradually drip down. At the same time, the lighter particles of aqueous vapor are sucked by the vacuum in the condenser up through the pipes C and into the condenser, and are drained off. A small part of the syrup will fall down on the perforated bottom 3, and will drain through into the pipe F. By having the sleeve 7 adjustable relative to the ring 1, the apparatus may be adjusted for differences in temperature in the vacuum pan, or for differences of vacuum in the condenser, it being well

known in the manufacture of sugar that greater heat and greater vacuum are employed at certain stages of the evaporation than at others. By having the interior of the sleeve 7 contracted outward, the flow of vapor is caused to converge in toward the center of the ring 1, and the heavier particles will be carried by their momentum through this ring.

It will be evident that the herein described apparatus can be readily manipulated, is not likely to get out of order, and is highly efficient in separating the sucrose entrained from the aqueous vapor, in the process of evaporation, as hereinbefore described.

It will be obvious that various modifications might be made in the herein described apparatus, which could be used without departing from the spirit of my invention, and I do not mean to limit myself to the specific details, or the construction or arrangement of parts, except as set forth in the claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a chamber inclosed by a wire screen in rear of said open ring, substantially as described.

2. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a chamber inclosed by a wire screen in rear of said open ring, with a sleeve directing the flow of the vapor from said vacuum pan toward said open ring, substantially as described.

3. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a chamber inclosed by a wire screen in rear of said open ring, with a sleeve directing the movement of the vapor coming from said vacuum pan toward said ring, with means for moving said sleeve toward or away from said ring, substantially as described.

4. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two, having a chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, said

separator having a chamber inclosed by a screen in rear of said open ring, substantially as described.

5. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two comprising a chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a chamber inclosed by a screen in rear of said open ring, and a sleeve directing the flow of the vapor from said vacuum pan toward said open ring, substantially as described.

6. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two comprising a cylindrical chamber divided by a partition into two chambers, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a screen in rear of said open ring, with a sleeve directing the movement of the vapor coming from said vacuum pan toward said ring and screen, with means for moving said sleeve toward or away from said ring, substantially as described.

7. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a wire screen in rear of said open ring, substantially as described.

8. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a wire screen in rear of said open ring, with a sleeve directing the flow of the vapor from said vacuum pan toward said open ring, substantially as described.

9. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a wire screen in rear of said open ring, with a sleeve directing the movement of the vapor coming from said vacuum pan toward said ring, with means for moving said sleeve toward or away from said ring, substantially as described.

10. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two, having a chamber divided by a partition, an opening in said partition in the line of travel of the vapor coming from the vacuum pan, and a

screen in rear of said opening, substantially as described.

11. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two comprising a chamber divided by a partition, an opening in said partition in the line of travel of the vapor coming from the vacuum pan, a screen in rear of said opening, and a sleeve directing the flow of the vapor from said vacuum pan toward said opening, substantially as described.

12. An evaporating apparatus, comprising a vacuum pan and a condenser, a separator interposed between the two comprising a cylindrical chamber divided by a partition into two chambers, an opening in said partition in the line of travel of the vapor coming from the vacuum pan, and a screen in rear of said opening, with a sleeve directing the movement of the vapor coming from said vacuum pan toward said opening and screen, with means for moving said sleeve toward or away from said opening, substantially as described.

13. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition into two semi-cylindrical chambers, one open at the top with a perforated bottom, and the other closed at the top, open at the bottom and provided with a wire gauze screen, and an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, substantially as described.

14. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition into two semi-cylindrical chambers, one open at the top with a perforated bottom, and the other closed at the top, open at the bottom and provided with a wire gauze screen, and an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, with a sleeve directing the flow of the vapor

from said vacuum pan toward said open ring, substantially as described.

15. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition into two semi-cylindrical chambers, one open at the top with a perforated bottom, and the other closed at the top, open at the bottom and provided with a wire gauze screen, and an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, a sleeve directing the movement of the vapor coming from said vacuum pan toward said ring, with means for moving said sleeve toward or away from said ring, substantially as described.

16. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, a chamber inclosed by a wire screen in rear of said open ring, and a pipe leading from the bottom of said separator, substantially as described.

17. In an evaporating apparatus, the combination with a vacuum pan and a condenser, of a separator interposed between the two comprising a cylindrical chamber divided by a partition, an open ring set in said partition in the line of travel of the vapor coming from the vacuum pan, and a chamber inclosed by a wire screen in rear of said open ring, with a sleeve directing the flow of the vapor from said vacuum pan toward said open ring, and a pipe leading from the bottom of said separator, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

CHARLES CORNE.

Witnesses:

G. N. BEBINGER,
PHIL MERAUX.