

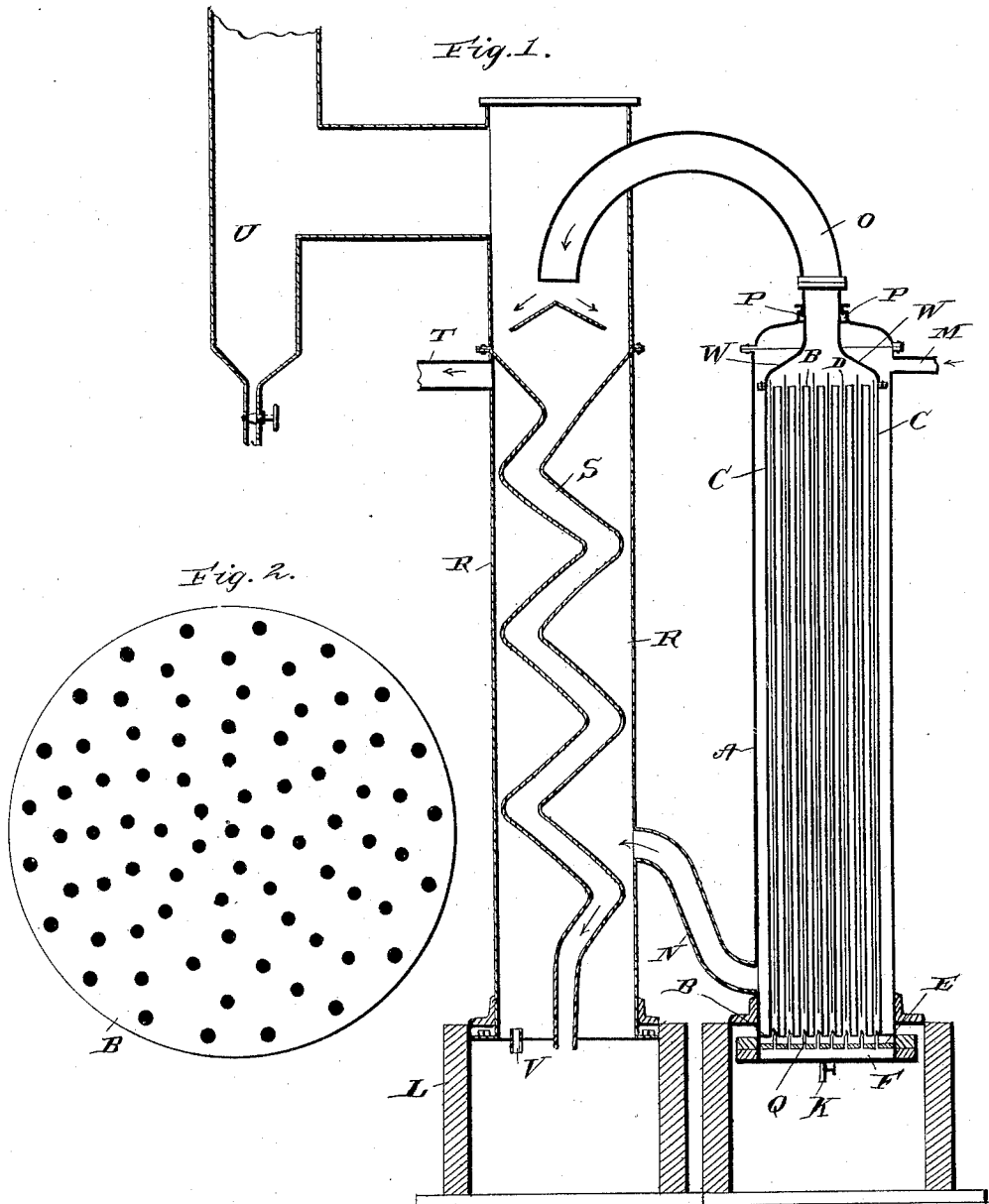
(No Model.)

2 Sheets—Sheet 1.

J. A. MORRELL.
EVAPORATOR.

No. 468,776.

Patented Feb. 9, 1892.



Witnesses:

C. H. F. Gaudin
James J. Sheehy

Inventor:

James A. Morrell
by W. R. Stringfellow

Attorney

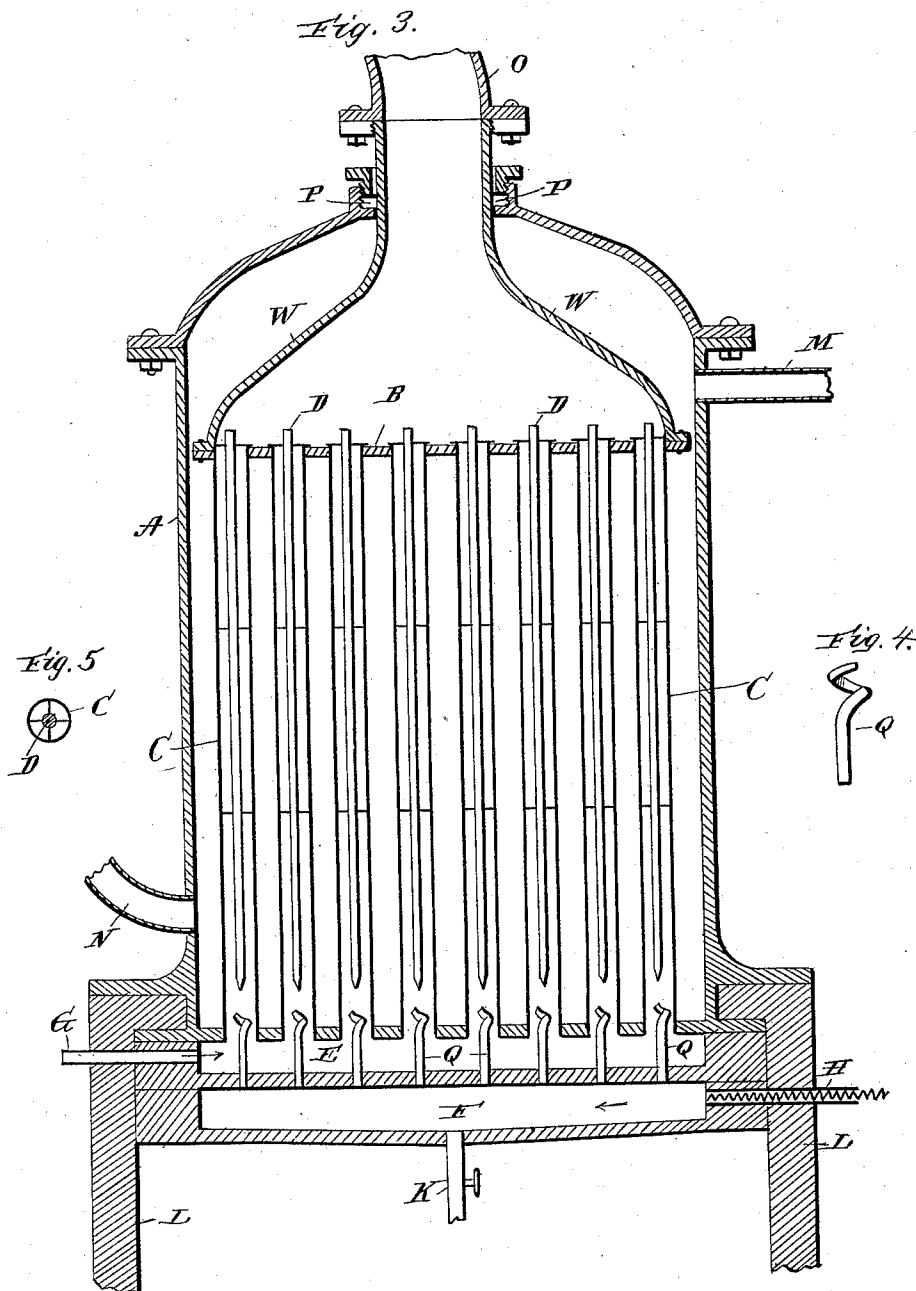
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Witnesses:

C. H. Paeder
James Shuey

Inventor,

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W. R. Stringfellow
Attorney

UNITED STATES PATENT OFFICE.

JAMES A. MORRELL, OF NEW ORLEANS, LOUISIANA.

EVAPORATOR.

SPECIFICATION forming part of Letters Patent No. 468,776, dated February 9, 1892.

Application filed March 16, 1891. Serial No. 385,327. (No model.)

To all whom it may concern:

Be it known that I, JAMES AUGUSTINE MORRELL, 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 Evaporators; and I do 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 an improvement in apparatus for evaporating liquids or saccharine solutions, and its novelty will be fully understood from the following description and claim when taken in connection with the annexed drawings.

The objects of my invention are to evaporate liquids in transit by means of nitrogenous vapor surcharged or impregnated with electricity, which will be blown in contact with and through the liquid, and is an improvement upon Letters Patent No. 242,216, issued to me on the 31st day of May, 1881. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my improved apparatus. Fig. 2 is a top view of one of the plates. Fig. 3 is a sectional side view of evaporating apparatus. Fig. 4 is a side view of air-pipe. Fig. 5 is a top view of tube, showing core in same.

Similar letters refer to similar parts throughout the several views.

To carry my invention into effect, I use an apparatus such as shown in Fig. 1.

Referring by letter to the various parts, A designates a metal shell, in which are placed plates B, which hold pipes C in position. These pipes are preferably constructed of copper and may be of any desired length, say thirty or forty feet. Within these pipes I place cores, as shown by D, which are held in center of pipes C by suitable means, and the core causes the liquid to assume an annular form, thus placing the liquid or saccharine solution near the outer periphery of the pipe, whereby the conversion of the water in the saccharine solution into steam is facilitated.

E is a liquid-chamber, F designating an air-chamber; G, an inlet-pipe for liquids; H, an inlet-pipe for air and in which is placed a

wire for conveying an electric current within air-chamber F.

Extending upward from air-chamber F are pipes Q, said pipes having a spiral end, as shown in Fig. 4, and when in position extend upward in lower end of pipes C, so as to enable a discharge of air to be made in a twisting or curling current and rendering more effective service.

K shows a waste-pipe provided with a cock.

L are braces or posts suitably placed on a bed-plate or foundation and which support my evaporator.

M is an inlet for steam into shell A.

N is a pipe connecting shell A and worm-column R, and through which steam passes from A to R and heats liquid while in transit through worm S, and at a point shown by T is an outlet for steam.

O is a goose-neck through which liquid and vapor passes from evaporator-shell A to column R, and as the liquid passes from A through the goose-neck it strikes the deflector and the top of the worm and causes a separation, the vapor going in one direction and the liquor descending through worm.

P is a metal cover provided with stuffing-boxes, which can be packed with asbestos, whereby the iron funnel-mouth cover W is free to move in said boxes and thus allow the pipes C to expand when heated.

U is a reservoir for condensed vapor, which is provided with a discharge-cock, as illustrated, and V is an outlet for condensed vapor in column.

In operation the liquid or saccharine solution is fed into the chamber E through the pipe G, and it ascends into the pipes C, being subjected while flowing into said pipes to a blast of heated nitrogenous vapor which is surcharged or impregnated with electricity, whereby its efficiency as a crystallizing agent of the solution is increased. To deoxidize the air or convert the same into nitrogenous vapor, I force it through scrap-copper placed in a cast-iron chamber, which is heated to a red heat. The air in its transit from the heating-chamber to the air-chamber F of the apparatus is carried through an iron pipe, which contains a continuous copper coil, through which electricity is generated, whereby it will be perceived that by reason of the friction of the va-

por in passing along the copper coil it will become charged therefrom. The charged vapor is forced by suitable means upward through pipes Q and into the liquid or saccharine solution in pipes C, the latter pipes being heated by steam to any desired temperature, preferably from 900° to 1,000°, and through the employment of the cores D the conversion of the water in the solution into steam is accelerated, and the steam passes from the shell A or evpaorator as heretofore described.

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

15 The improved apparatus for evaporating liquids, consisting of a shell having steam inlet and outlet ports, pipes arranged in said

shell and connected by plates, core-rods placed in said pipes, a liquid-chamber arranged beneath and communicating with the pipes, a liquid-feed pipe leading into said chamber, an air-chamber arranged beneath the liquid-chamber and having an inlet-port, and pipes leading up from the air-chamber through the liquid-chamber and to connect the air-chamber and the pipes, substantially as and for the purpose set forth.

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

JAMES A. MORRELL.

Witnesses:

ALPHONSE J. CUNED,
PERCY D. PARKS.