(No Model.)

T. CRANEY.

SALT MAKING APPARATUS.

No. 344,634. Patented June 29, 1886.

Fig. 1

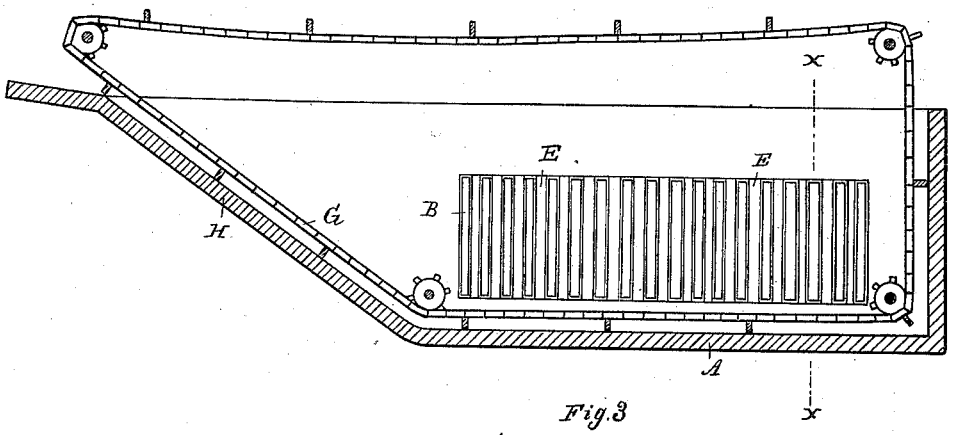


Fig. 3

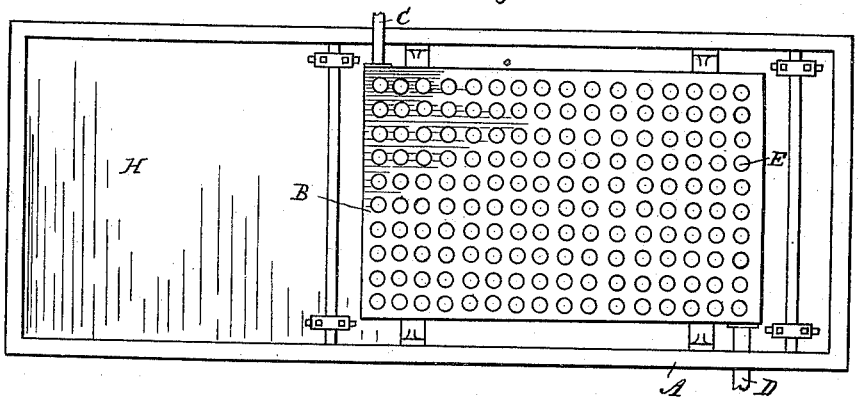
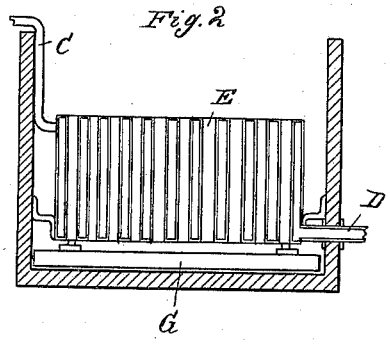


Fig. 2



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UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

SALT-MAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 344,634, dated June 29, 1886.

Application filed October 29, 1885. Serial No. 181,256. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, of Bay City, in the county of Bay and State of Michigan, have invented new and useful Improvements in Salt-Making Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and useful improvement in apparatus for manufacturing salt; and the invention consists in the arrangement and construction of a novel device for heating and evaporating the brine, all as more fully hereinafter set forth.

In the drawings which accompany this specification, Figure 1 is a vertical central longitudinal section of the apparatus. Fig. 2 is a cross-section on line *x x* in Fig. 1. Fig. 3 is a plan thereof.

A is a brine receiving and evaporating pan, substantially of the form heretofore used in the manufacture of salt, and commonly called a "grainer."

B is a metallic box of corresponding shape with the pan, and of such relative dimensions in regard to the pan that it can be secured therein in the position shown in the drawings—that is, completely submerged in the brine—and with its bottom and sides at such a distance from the bottom and sides of the pan as will appear hereinafter. The box may be secured in this position by suspending it from the top or by supporting it on brackets from the sides of the pan, or in any other convenient manner that will not interfere with the operation of the device, as hereinafter described. This box is provided with steam inlets and outlets C D, and with a series of vertical flues, E, which are open on top and bottom, leaving the box steam-tight. These tubes are spaced closely, with enough distance between them to permit a free circulation of steam around the tubes.

In practice, steam being admitted to the steam-box B, the brine in the pan will get quickly heated, while at the same time a rapid circulation will take place through the whole brine, said circulation being in an upward direction through the flues E and in a downward direction on the sides of the box. It will be seen that as the salt crystals begin to form the circulation will carry them quickly to the bottom of the pan, and, provided there is enough room left there to allow the crystals to settle, they will accumulate there, and can be withdrawn by a suitable scraper—such as the known endless-scraper device G, shown in the drawings—which passes underneath the steam-box and draws the salt up the incline H.

It is not necessary to provide for a free circulation of brine upon all sides of the steam-box, although I consider it preferable, as the whole heating-surface of the box is made operative thereby. I also prefer to have the bottom of the pan unobstructed, so as to leave the scraper free to scrape the whole bottom.

As iron is liable to discolor the salt, I prefer to make the steam-box and tubes of copper, or copper and iron combined, the copper covering the parts exposed to contact with the brine.

I am enabled to make with an apparatus thus constructed a larger amount of salt than has been possible heretofore with a pan of like capacity, the manufactured salt being also of much finer and even grade, owing to the uniform heating and circulation of the whole brine and the rapid evaporation due to the large increase of heating-surface, which I have obtained by means not heretofore used or known in connection with salt-pans, and which I have adapted to the purpose so as not to interfere with the collection of the salt.

In an application concurrent with the present one I have described a modification of the apparatus.

What I claim as my invention is—

1. In combination with the salt-pan, a steam-heating box of corresponding shape, and provided with a series of circulating flues or passages arranged and operating substantially as described.

2. In an apparatus for making salt, the combination of the following elements: A salt pan or grainer, and a steam-heating box secured within the grainer at a distance above its bottom, with a free circulation of brine on one or more sides, and provided with vertical brine-circulating flues or passages through it, substantially as described.

3. In combination, the salt-pan A, the steam-

heating box B, of corresponding shape, secured within the grainer at a distance above the bottom, and with a free circulation of brine upon its sides, and a series of vertical brine-circulating passages or flues through the steam-heating box, said box being provided with steam inlets and outlets C D, and said vertical flues being inclosed within the box, all arranged substantially as described.

THOS. CRANEY.

Witnesses:
H. S. SPRAGUE,
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