2 Sheets--Sheet 1.

G. W. STORER.

Evaporating-Pans.

No. 143,939. Patented Oct. 21, 1873.

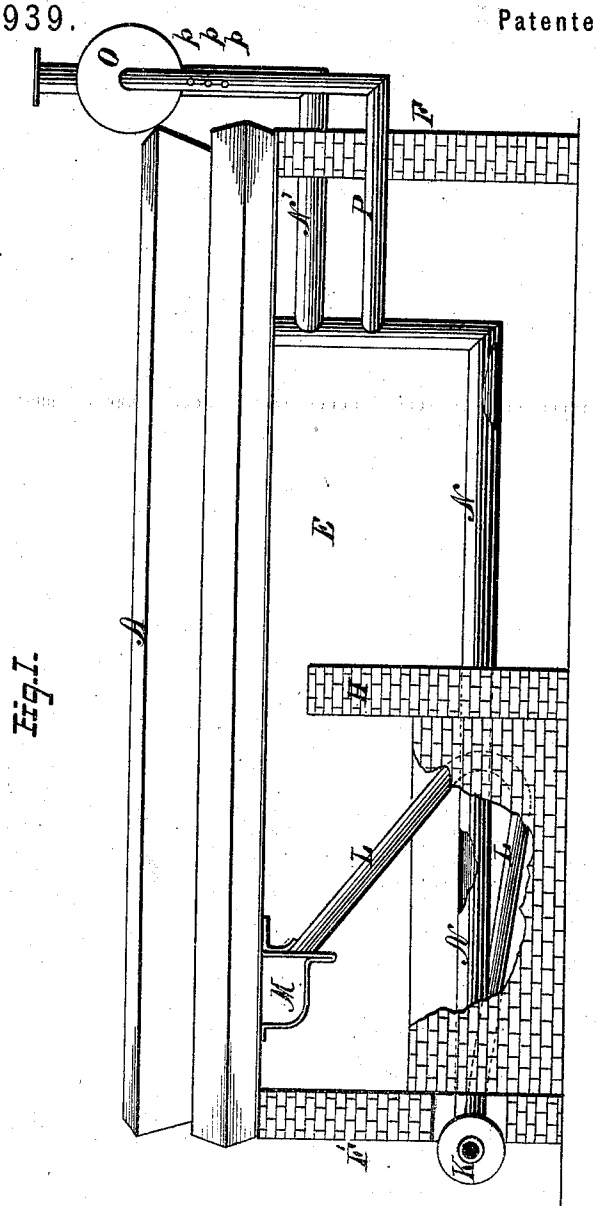


Fig. 1.

WITNESSES:

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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

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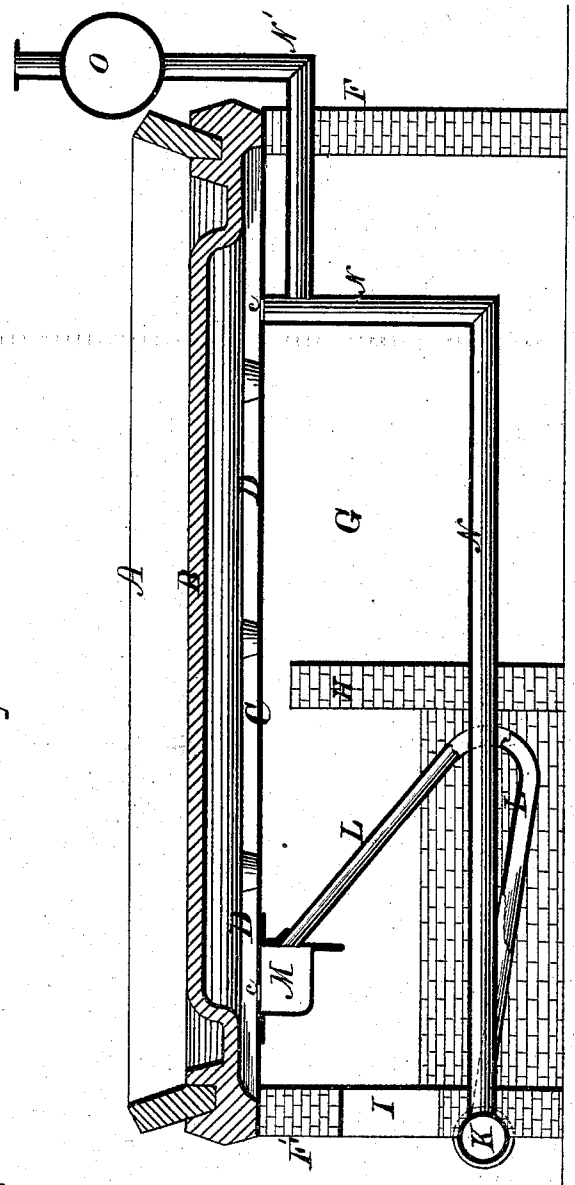


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE W. STORER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN EVAPORATING-PANS.

Specification forming part of Letters Patent No. **143,939**, dated October 21, 1873; application filed September 30, 1873.

To all whom it may concern:

Be it known that I, GEO. W. STORER, of Philadelphia, in the county of Philadelphia and in the State of Pennsylvania, have invented certain new and useful Improvements in Evaporating-Pans; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my apparatus, the intervening side wall being removed so as to afford a view of the construction and arrangements of parts; and Fig. 2 is a vertical longitudinal section of the same.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable salt water, saccharine juices, &c., to be evaporated in a convenient, speedy, and inexpensive manner; and it consists, principally, in the hollow grate-bars and the pipes connecting their ends, when constructed as shown, and combined with each other and with the double-bottom pan, for the purpose of utilizing more thoroughly the heat from the burning fuel, substantially as is hereinafter specified. It consists, further, in combining, with the double-bottom pan, hollow grate-bars, and their connecting pipes, suitable pipes which connect the lower front side of said grate-bars with the rear end of said pan, for the purpose of insuring a circulation of water and increasing the heating capacity of the apparatus, substantially as is hereinafter shown.

In the annexed drawings, A represents an evaporating-pan, constructed, preferably, with wooden sides, and having an inner and an outer bottom, B and C, respectively, between which is formed a chamber, D, which is water-tight. The pan A is supported upon suitable side and end walls, E and F, respectively, and at one end of the space thus inclosed is formed a fuel-chamber, which is separated from the rear portion of said space by means of a bridge-wall, H, of usual form and relative dimensions. A door-way, I, provided in and through the front end wall F′, permits access to be had with the interior of said fuel-chamber.

At the front of the wall F′, immediately below the doorway I, is placed a mud-pipe, K, from which a number of pipes, L, extend rearward and slightly downward to or near the bridge-wall H, where they are curved upward and forward, and extend in such direction at an angle of about forty-five degrees to and connect with a pipe, M, that is secured to or upon the lower side of the pan A, and is connected with the chamber D by means of suitable openings *c*, that are provided in and through the bottom C. The pipes L are placed in parallel lines and at such relative distances as to enable them to form grate-bars, between which air can freely circulate, while at the same time the fuel employed will be properly supported. From each end of the mud-pipe K, outside of the grate-bars L, a pipe, N, extends horizontally rearward to a point near the rear wall F, and thence vertically upward to the pan A, and is connected to or with the space D between its bottoms. From a point just below the pan A a branch pipe, N′, extends from the pipe N rearward through the wall F, and thence upward to and is connected with a drum, O, which is placed horizontally at a point above the upper edge of said pan.

As thus constructed the operation of the apparatus is as follows: Water is supplied to the system of pipes until the same, the chamber D, and the drum are filled to a point above the top of the pan, after which a fire is started within the fuel-chamber. The heat of the burning fuel upon the horizontal portions of the pipes L causes the water therein to boil, while the heated escaping products of combustion pass upward and rearward, and impinge upon the inclined upper portions of said pipes against the bottom of the pan and against the rear portions of the pipes N, after which said gaseous products escape through a suitable opening in the rear wall into the usual exit-flue, having during their passage to the latter imparted a large percentage of their heat to the water contained within the parts named. As the most intense heat is produced within the upper portion of the fuel-chamber the water contained within the upper arms of the pipes L will be caused to flow upward into the chamber D, from whence the current will pass rearward to the pipes N, and downward and forward through the same to the mud-pipe K, to be again returned to said pipes L, the flow of

water described being constant and causing each portion of the bottom of the pan to receive a like quantity of heat.

The especial office of the drum O is to furnish a head for the water; but, if desired, the apparatus may be used for the additional purpose of a steam-generator, in which event said drum will serve as a steam-chamber.

A pipe, P, extending from the end of the drum O downward, and then horizontally inward to the pipe N, operates as a water-arm, and enables gage-cocks *p* to be located in a convenient position.

The apparatus described is simple, compact, and comparatively inexpensive in its parts, while, from the very large heating-surface exposed to the action of the fire and heated gases, a minimum consumption of fuel only is required to produce a maximum evaporation of the liquid contents of the pan.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the evaporating-pan A, provided within its double bottom with the chamber D, the hollow grate-bars L, and pipes K and M, substantially as and for the purpose specified.

2. In combination with the pan A, hollow grate-bars L, and the pipes K and M, the pipes N, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of September, 1873.

GEO. W. STORER.

Witnesses:
GEO. S. PRINDLE,
JOHN R. YOUNG.