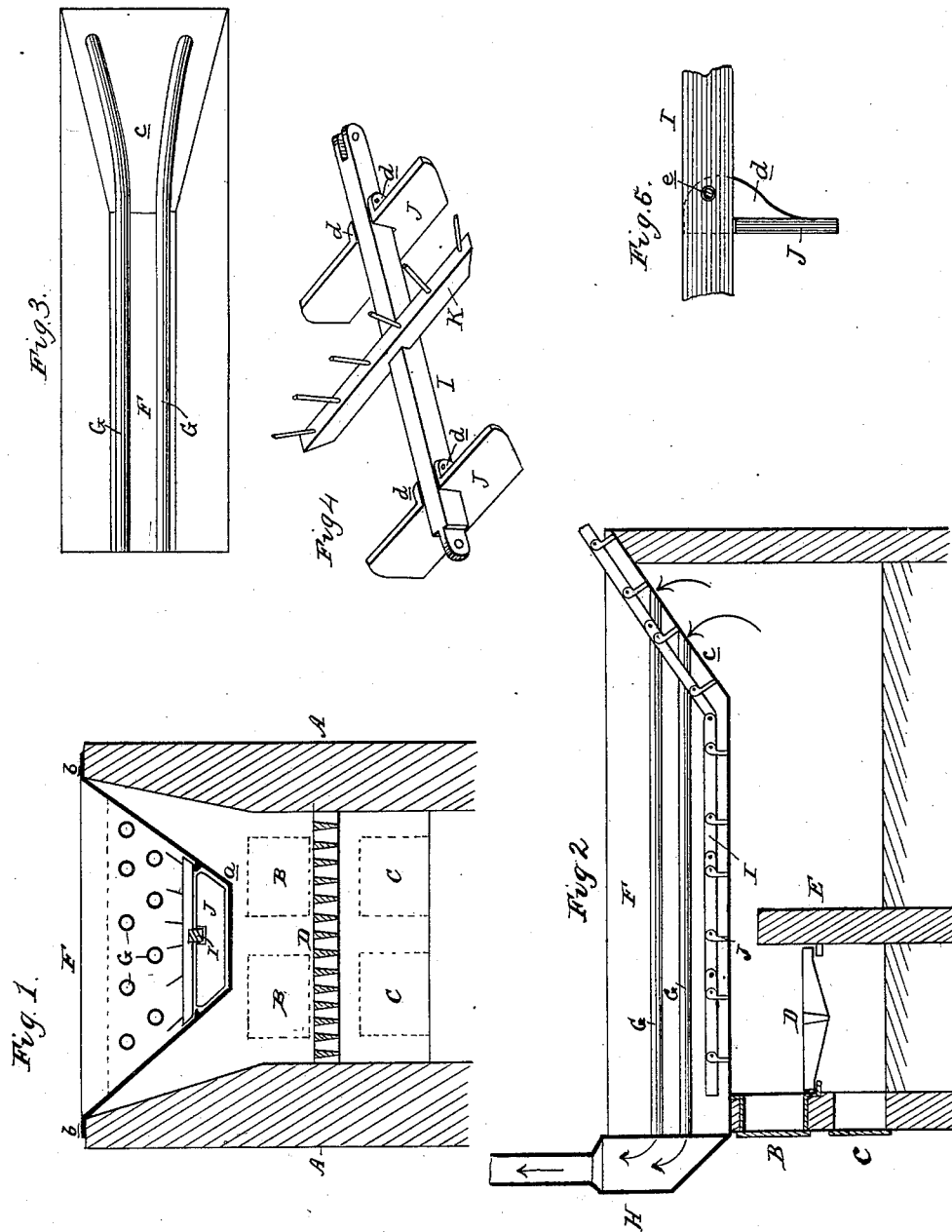


(No Model.)

A. JOHNSON.  
SALT EVAPORATOR.

No. 264,701.

Patented Sept. 19, 1882.



Witness  
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att'y

# UNITED STATES PATENT OFFICE.

ANDREW JOHNSON, OF SAGINAW, MICHIGAN.

## SALT-EVAPORATOR.

SPECIFICATION forming part of Letters Patent No. 264,701, dated September 19, 1882.

Application filed July 27, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW JOHNSON, of Saginaw, in the county of Saginaw and State of Michigan, have invented new and useful Improvements in Salt-Evaporators; and I 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.

The nature of this invention relates to certain new and useful improvements in the construction and operation of apparatus for evaporating salt-brine and removing the salt from the evaporator.

The invention consists in the peculiar construction of the evaporator and in the means, in combination with said evaporator, for removing the salt when crystallized, all as more fully hereinafter described.

Figure 1 is a vertical cross-section of my improved evaporator and furnace, showing also the position of the device by means of which salt is removed from the bottom of the evaporator. Fig. 2 is a longitudinal central section through the center of Fig. 1. Fig. 3 is a plan view of a section of the rear end of the evaporator. Fig. 4 is a perspective detail of one of the scraper-sections. Fig. 5 is a sectional detail of the same.

In the accompanying drawings, which form a part of this specification, A represents the side walls of a furnace, provided with the usual feed-doors, B, draft-doors C, combustion-chamber and grates D, and bridge-wall E, all being of the usual construction of furnaces.

F is the evaporating-pan, in cross-section V-shaped, with the point of the V cut off, leaving a flat bottom, *a*, to the pan, with flaring sides terminating in flanges *b*, which rest upon the side walls of the furnace. The rear end of this pan is made with an incline, *c*, for the purposes hereinafter described.

G are return-flues, the rear ends of which communicate, through the inclined rear wall of the evaporator, with the chamber in rear of the bridge-wall, and, extending longitudinally through such chamber or evaporator, communicate, through the front wall thereof, with the smoke stack or jacket H, in a similar manner to the return-flues of steam-generators.

By this means of construction of the evaporator

I am enabled to utilize the fuel to the greatest degree of economy, and utilize mechanical means for withdrawing the salt, which, after being crystallized, is deposited on the bottom of the evaporator by the following-described device:

I represents a bar, which is made in short sections, as shown in Fig. 4, and provided with means for coupling the adjoining sections at either end, so that the various sections forming such bar will extend from the front end of the evaporator to the extreme rear thereof at the upper end of the rear inclined end, at or near which point it is attached to any known mechanism which will give said sectional bar a short reciprocating motion.

J are scrapers, made of any suitable material, hinged at intervals to said bar by means of the ears *d*, which embrace the sides of the bar, and a bolt, *e*, so that as the bar is reciprocated toward the front of the evaporator these scrapers will fold up against the bar and pass over the salt deposited in the bottom of the evaporator, while a motion of the bar in the opposite direction will cause them to assume a vertical position, and as the shape of the scrapers conform to the interior shape of the evaporator such rearward motion of the bars will withdraw the salt, step by step, toward the rear of the evaporator, by the inclined plane at the rear end thereof, onto any platform or into any receptacle that may be built at that point to receive it. This bar, with its scrapers, is located below the return-flues, and in order to allow the scrapers to pass up the inclined plane which forms the rear end of the evaporator, the rear ends of the tubes are spread apart, as shown in Fig. 3, to allow the scrapers to pass. At intervals between the scrapers there are secured to the sectional reciprocating bar a series of rakes, K, the teeth of which project upward, which, in the reciprocation of the bar to which they are attached, will keep the brine in a state of agitation. The teeth nearest the ends of the rake-head are set upon an incline similar to that of the sides of the evaporator and prevent the incrustation of salt upon such sides.

What I claim as my invention is—

1. In combination with a furnace constructed substantially as described, an evaporating-pan with sloping sides and rear end and pro-

vided with return-flues, substantially as and for the purposes described.

2. In combination with a furnace, substantially as described, an evaporating-pan with  
5 sloping sides and rear end and provided with return-flues, the rear ends of which are inclined outwardly from the center of the pan to allow the removal of the salt from the bottom thereof, substantially as specified.

10 3. In combination with a furnace, substantially as described, an evaporating-pan with sloping sides and rear end and provided with

return-flues, and the scrapers adapted by mechanical means to remove the salt from the bottom of the pan, substantially as set forth.

4. In combination with a furnace, substantially as described, and with an evaporating-pan with sloping sides and rear end, having return-flues therein, the scrapers and rakes, substantially as and for the purposes described.

ANDREW JOHNSON.

Witnesses:

E. SCULLY,  
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