

(No Model.)

R. G. PETERS.

SALT MAKING APPARATUS.

No. 377,268.

Patented Jan. 31, 1888.

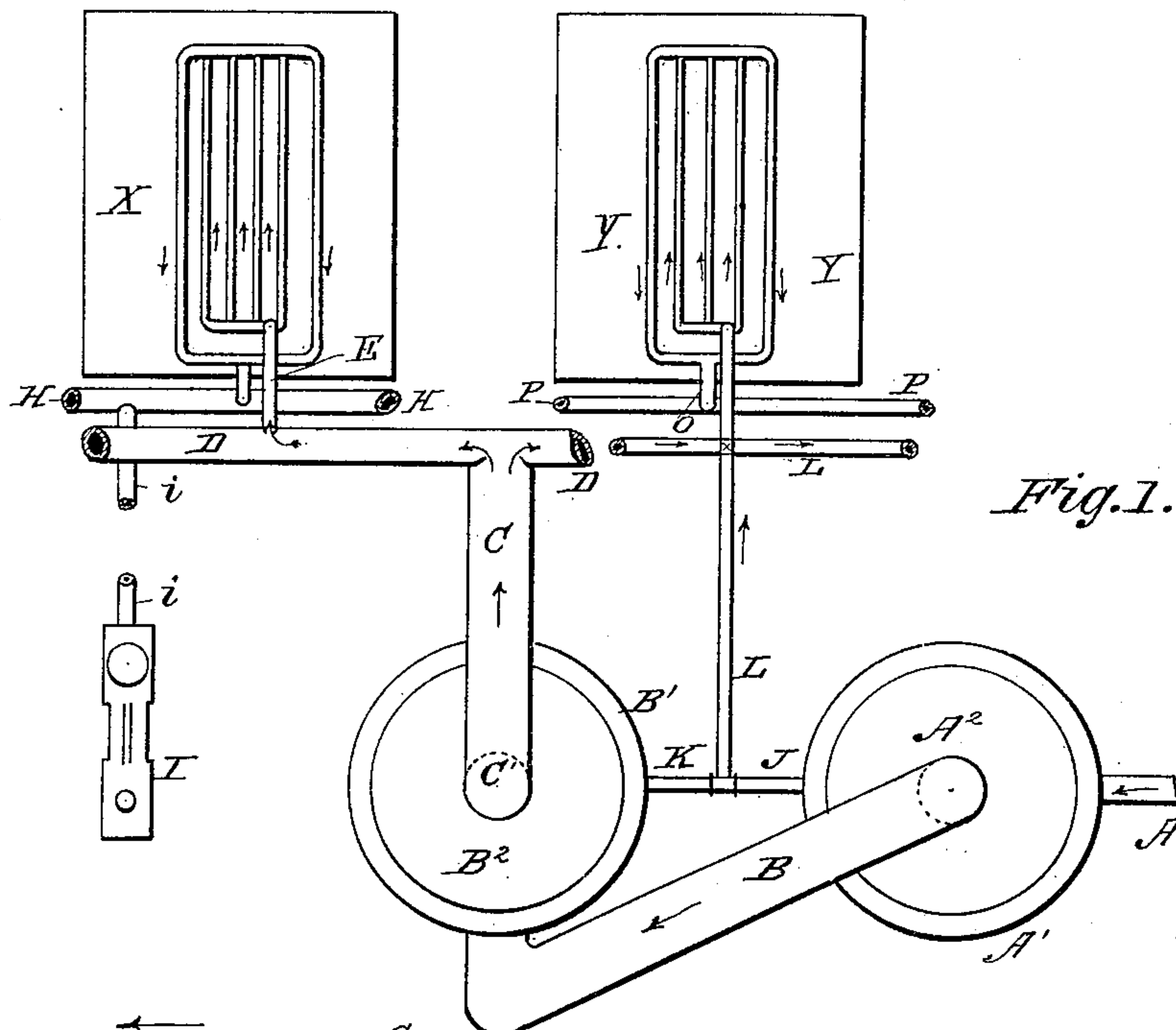


Fig. 1.

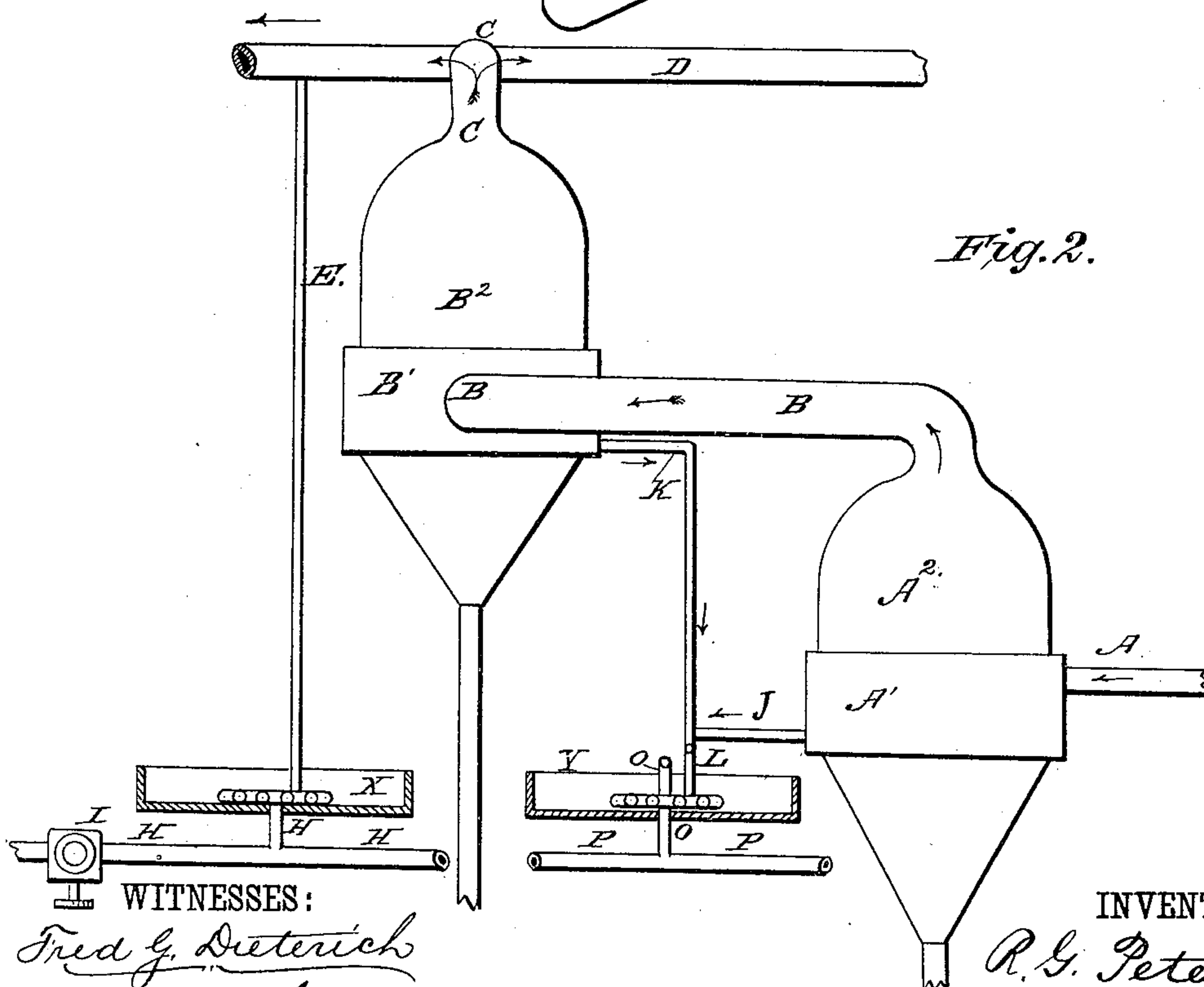


Fig. 2.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

RICHARD G. PETERS, OF MANISTEE, MICHIGAN.

## SALT-MAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 377,268, dated January 31, 1888.

Application filed March 26, 1887, Serial No. 232,609. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD G. PETERS, of Manistee, in the county of Manistee and State of Michigan, have invented a new and useful  
5 Improvement in Salt-Making Apparatus, of which the following is a specification.

The object of my invention is to utilize the waste heat from the vacuum-pans in the manufacture of salt to heat the grainers instead of  
10 the live steam ordinarily employed, thereby rendering available that which heretofore has been lost.

The invention will first be described in connection with the drawings, and then pointed  
15 out in the claims.

Figure 1 is a plan view of an apparatus for manufacturing salt having my improvement applied. Fig. 2 is a side elevation of the same.

20 Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings by letters, A<sup>2</sup> represents a vacuum-pan to the steam jacket or coil A' of which steam is admitted through  
25 the pipe A. From the upper part of the vacuum-pan A<sup>2</sup> projects a pipe, B, which is connected to the steam jacket or coil B' of a second vacuum-pan, B<sup>2</sup>, for conducting the vapors generated in the pan A<sup>2</sup> to the said jacket.

30 A pipe, C, extends from the upper part of the vacuum-pan B<sup>2</sup> and is connected to a main distributing-pipe, D, which in turn is connected to the pipe E, which is coiled at its lower end in the grainer X, whereby the vapors generated in the pan B<sup>2</sup> will be conducted  
35 to the grainer X for heating the brine in the same.

For the purpose of drawing off the condensed vapors from the coil in the grainer  
40 and for maintaining the requisite vacuum in the pans A<sup>2</sup> B<sup>2</sup>, I connect the air-pump I with the coil of pipe in the grainer by means of the tail-pipe H and pipe i, through which the vapors are drawn off and discharged. It will  
45 thus be seen that I utilize the vapors generated in the vacuum-pan B<sup>2</sup>, and which heretofore have been lost, to heat the grainer X.

For further utilizing the waste heat of the vacuum-pans I connect to the steam jackets

or coils A' B' the pipes J K, respectively, and 50 connect the said pipes to a distributing-pipe, L, which in turn is connected to the coil of pipe in the grainer Y, so that the water of condensation in the jackets or coils will be conducted to the grainer for heating the brine 55 therein. This water of condensation after passing through the pipe coiled in the grainer Y is conducted through branch tail-pipes O to main tail-pipe P and then discharged. The tail-pipe O is elevated from one to three feet 60 to insure the filling of all the pipes in the grainer before it is allowed to escape. I prefer to connect an air-pump to the hot-water pipes J K for assisting in drawing off the water of condensation from the jackets or coils 65 A' B' and for insuring a current through the coils in the grainer.

The grainers are of the ordinary construction, and although I have only shown one in each of the arrangements, yet it is to be understood that there is to be a series in each. 70 It will also be understood that instead of two or more vacuum-pans I might use a single one, conducting the vapors from it directly to the grainer. 75

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

1. In a salt-making apparatus, the combination, with the grainer X, of the vacuum-pans A<sup>2</sup> B<sup>2</sup>, provided with the jackets A' B', 80 the pipe B, connecting the upper part of the pan A<sup>2</sup> with the jacket B' of pan B<sup>2</sup>, the pipe C, leading from pan B<sup>2</sup>, and the pipe E, connected with the pipe C, and having its lower 85 end coiled in the grainer X, substantially as herein shown and described.

2. In a salt-making apparatus, the combination, with the grainer X, of the vacuum-pans A<sup>2</sup> B<sup>2</sup>, provided with the jackets A' B', 90 the pipe B, connecting the upper part of pan A<sup>2</sup> with the jacket B' of pan B<sup>2</sup>, the pipe C, leading from pan B<sup>2</sup>, the distributing-pipe, the pipe E, connected to the distributing-pipe, and having its lower end coiled in the grainer 95 X, the pump I, and the pipes H and i, connecting the coiled pipe to the pump, substantially as described.



3. In a salt-making apparatus, the combination, with the vacuum-pans  $A^2 B^2$ , provided with the jackets  $A' B'$ , and the pipe B, connecting the upper part of pan  $A^2$  with the  
5 jacket  $B'$  of pan  $B^2$ , of the grainer Y, the pipes J K, projecting from the jackets of the pans, the pipe L, having its lower end coiled

in the grainer and connected to the pipes J K, and the tail-pipe O, substantially as herein shown and described.

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Witnesses:

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