(No Model.)

3 Sheets—Sheet 1.

T. CRANEY.

EVAPORATING APPARATUS.

No. 549,958. Patented Nov. 19, 1895.

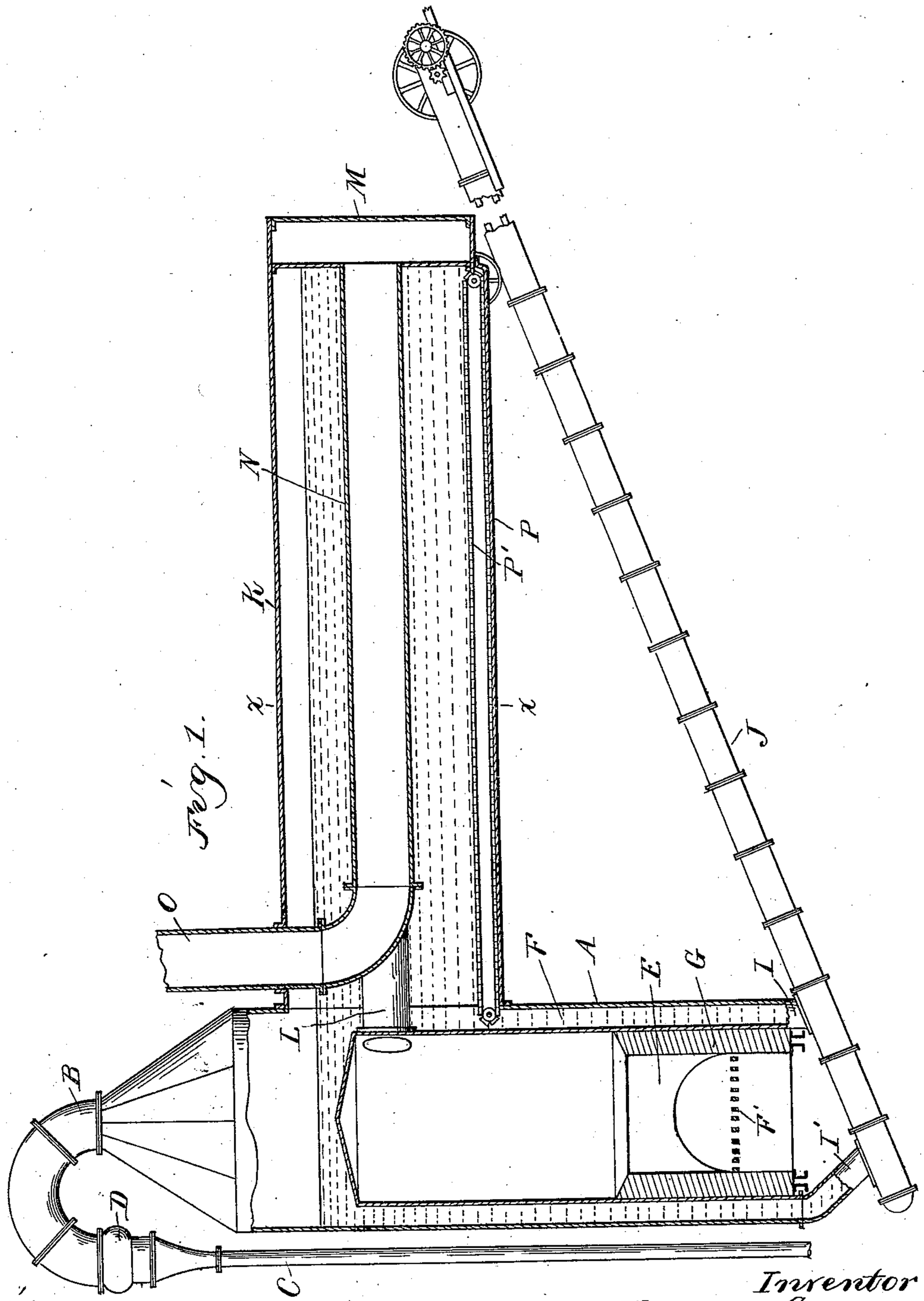

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

T. CRANEY.

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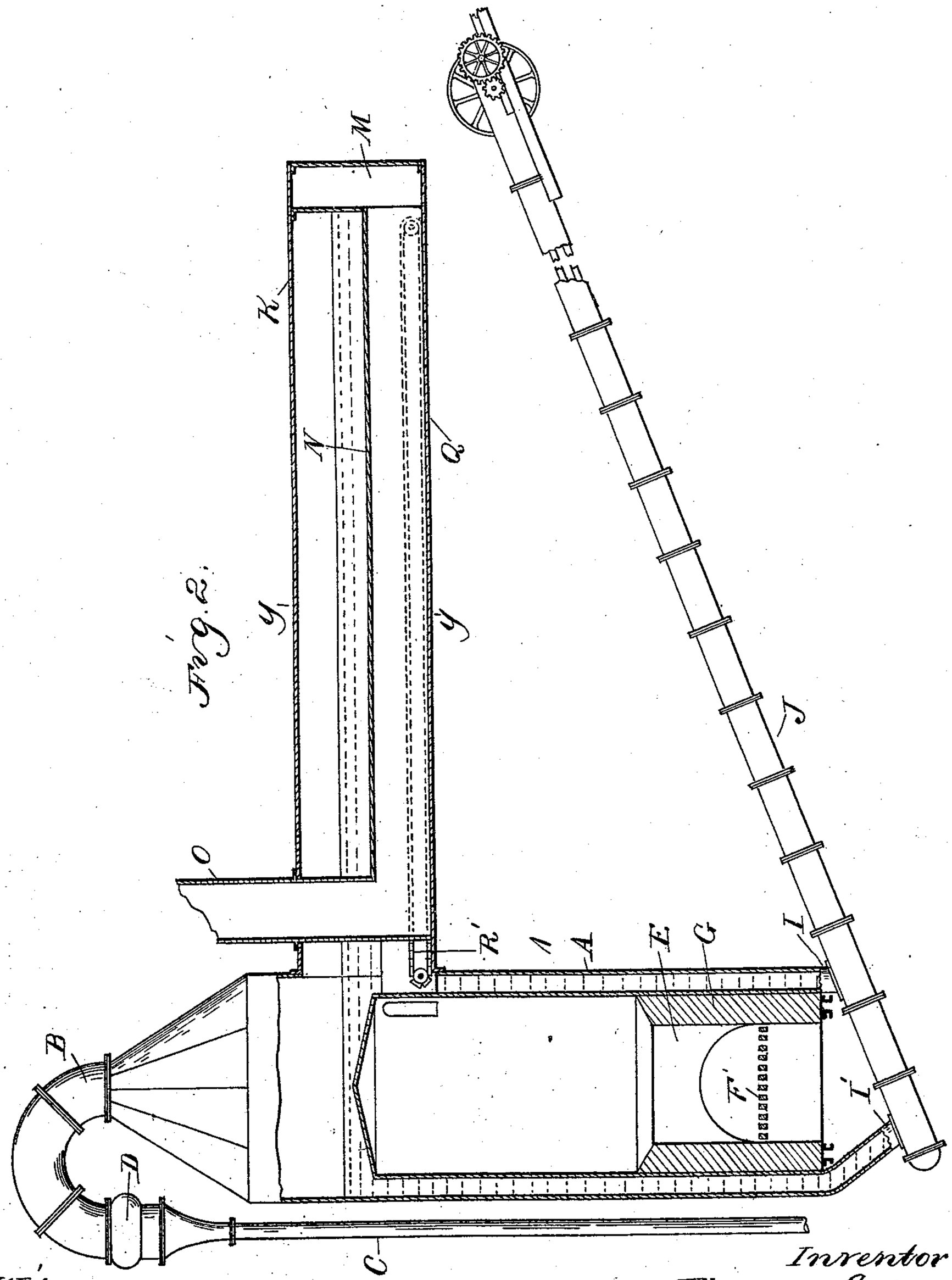

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

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EVAPORATING APPARATUS.

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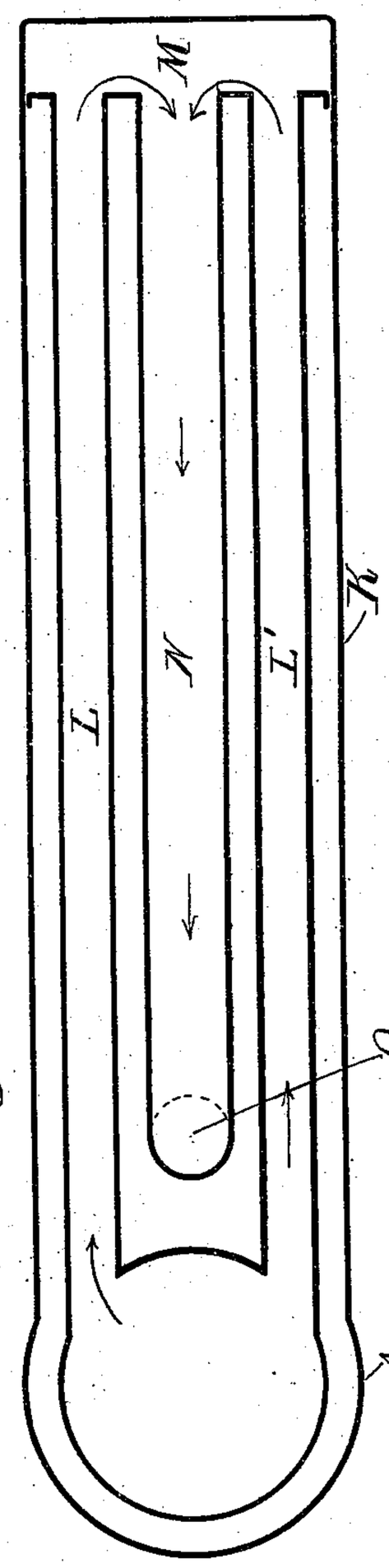

Fig. 3.

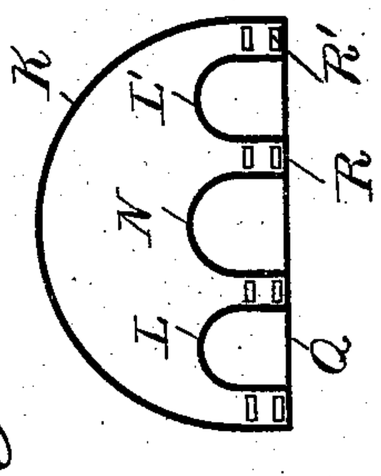

Fig. 5.

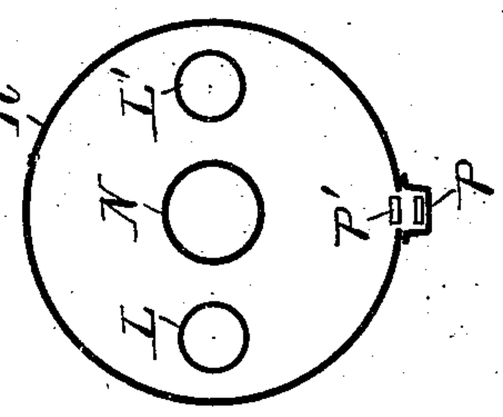

Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 549,958, dated November 19, 1895.

Application filed January 24, 1895. Serial No. 536,048. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Evaporating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of an evaporating apparatus comprising an evaporating-pan having a furnace-chamber within and a lateral evaporating-chamber through which the smoke-pipe from the furnace passes, so as to obtain the benefits of the heat in the products of combustion as well as the dry heat of the fire in the evaporation.

The invention further consists in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a vertical central longitudinal section through an evaporating apparatus embodying my invention. Fig. 2 is a similar section through a slightly-modified form. Fig. 3 is a horizontal section centrally through the lateral branch or chamber of the evaporating-pan. Fig. 4 is a vertical section on line *x x* of Fig. 1. Fig. 5 is a similar section on line *y y*, Fig. 2.

A is an evaporating-pan.

B is the vapor-exit pipe at the top, which terminates in the vertical discharge-pipe C, at the top of which is a condenser D, the water from which, falling through the pipe C, forms the necessary vacuum in the evaporating-chamber.

E is a furnace-chamber concentric within the lower part of the evaporating-pan and forming the annular heating-chamber F between the two.

G is the brick lining of the furnace; F′, the grates therein.

I I′ are settling-legs at opposite points at the bottom of the heating-chamber F. J is an elevator-casing into which these settling-legs connect and in which is a suitable elevator for carrying the crystals as they form and deliver them to any desired point above the level of the brine.

K is the lateral extension of the evaporating-pan extending below and above the level of the fluid in the pan.

L and L′ are flues extending from the top of the furnace-chamber longitudinally through the branch K on each side thereof and connecting at its opposite end into the chamber M at the outer end of that branch.

N is a flue extending between the flues L L′, extending from the chamber M toward the furnace and at its opposite end terminating in the smoke-pipe O, which passes out through the top of the branch K. These flues are so arranged that the products of combustion from the furnace will pass horizontally through the branch K on each side thereof and into the chamber M and thence back again the whole length of that branch through the flue N, and finally be discharged, thus utilizing the heat of the products of combustion to assist in evaporation.

At the bottom of the branch or arm K, I form a trough P, in which runs a conveyer P′, driven from any source of power and discharging the salt as it is formed and settles into one of the settling-legs of the main evaporating-pan.

With a construction of this kind I obtain the best possible results from the heat of the fuel without materially adding to the expense or complication of the apparatus and without increasing the floor-space required therefor, except at such a height as not to interfere with the utilization of the space below the branch K, and as in plants of this kind as usually constructed the evaporating-pans are two or three stories high the lateral branch K will be upon the second or third story, where such room can easily be spared.

In place of making the flues cylindrical and running them through the middle of the branch K, I may make that branch with the flat bottom Q, as shown in Fig. 5, and the flues arch-shaped, as shown in that figure, being separated by the horizontal portions R, in which run the conveyers R′. This is rather the preferable construction where the lateral branch is upon the upper floor, as the bottom Q can then rest directly upon the floor-sills.

What I claim as my invention is—

1. In an evaporating apparatus, the combination of an evaporating pan, a furnace

chamber therein, a lateral evaporating chamber at one side of the pan at about the top of the fluid line, and communicating with the pan a pipe for the products of combustion from the furnace, leading out and returning back through such lateral branch and means for removing the crystallized material from the lateral evaporating chamber into the evaporating pan, substantially as described,

2. In an evaporating apparatus, the combination of an evaporating pan, a furnace chamber therein, a lateral branch at one side of the pan at or near the top of the fluid line, a pipe for the products of combustion from the furnace leading through such lateral branch, a conveyer for carrying the crystallized material from the lateral branch into the pan, and a settling leg at the bottom of the pan, substantially as described.

3. In an evaporating apparatus, the combination of a vertical evaporating pan, a furnace chamber therein forming beside the furnace a settling leg, an elevator at the bottom of the settling leg, a lateral branch on the evaporating pan, a series of flues therein comprising two outside flues extending from the furnace chamber to the end of the branch a central return pipe, and a smoke pipe at the end of the return pipe and means for removing the crystalline deposit from the lateral branches into the evaporating pan, substantially as described.

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

THOMAS CRANEY.

Witnesses:
M. B. O'DOGHERTY,
L. J. WHITTEMORE.