2 Sheets—Sheet 1.

F. M. LOVE.

EVAPORATOR.

No. 48,628. Patented July 4, 1865.

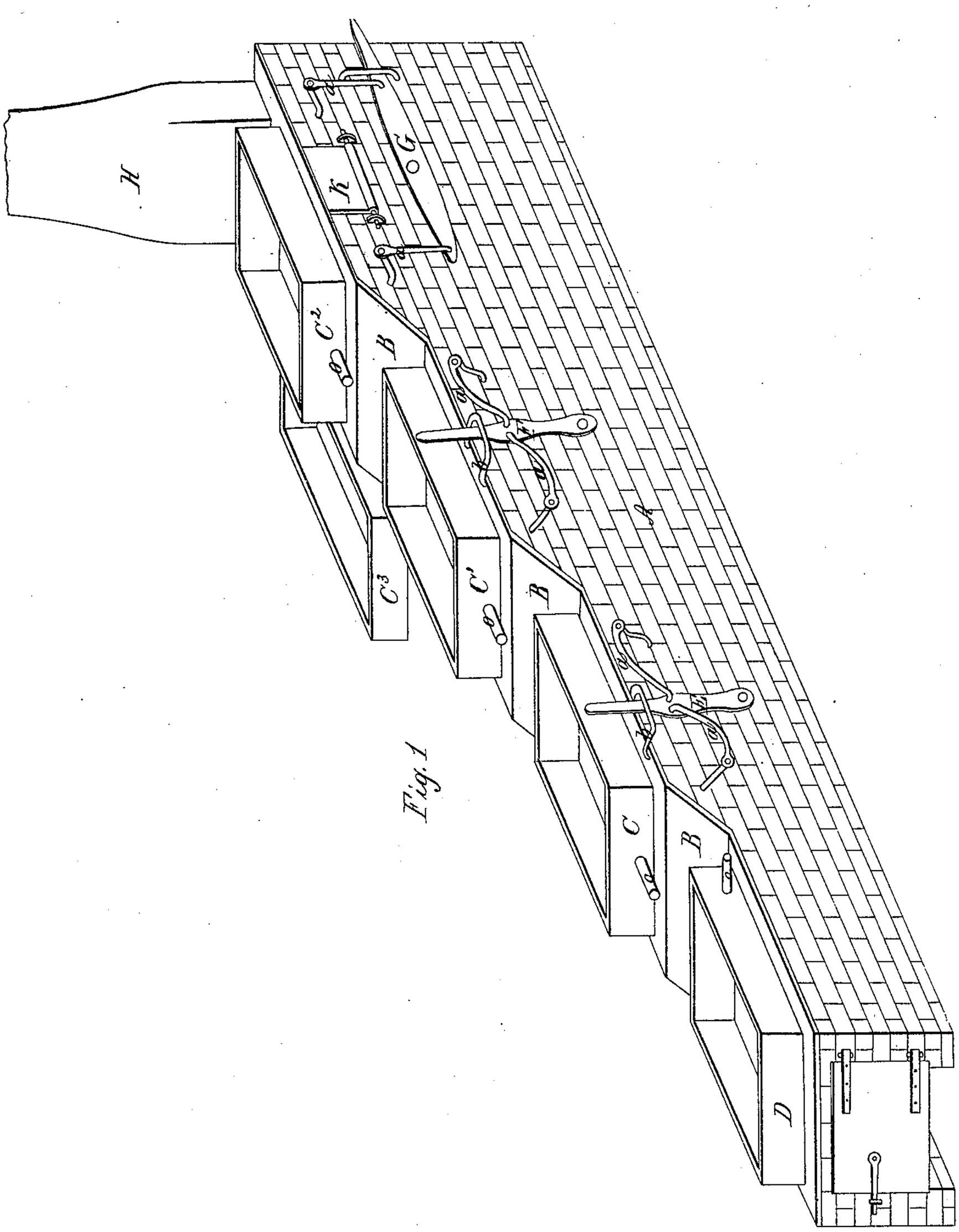

Fig. 1

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2 Sheets—Sheet 2.

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Fig. 2

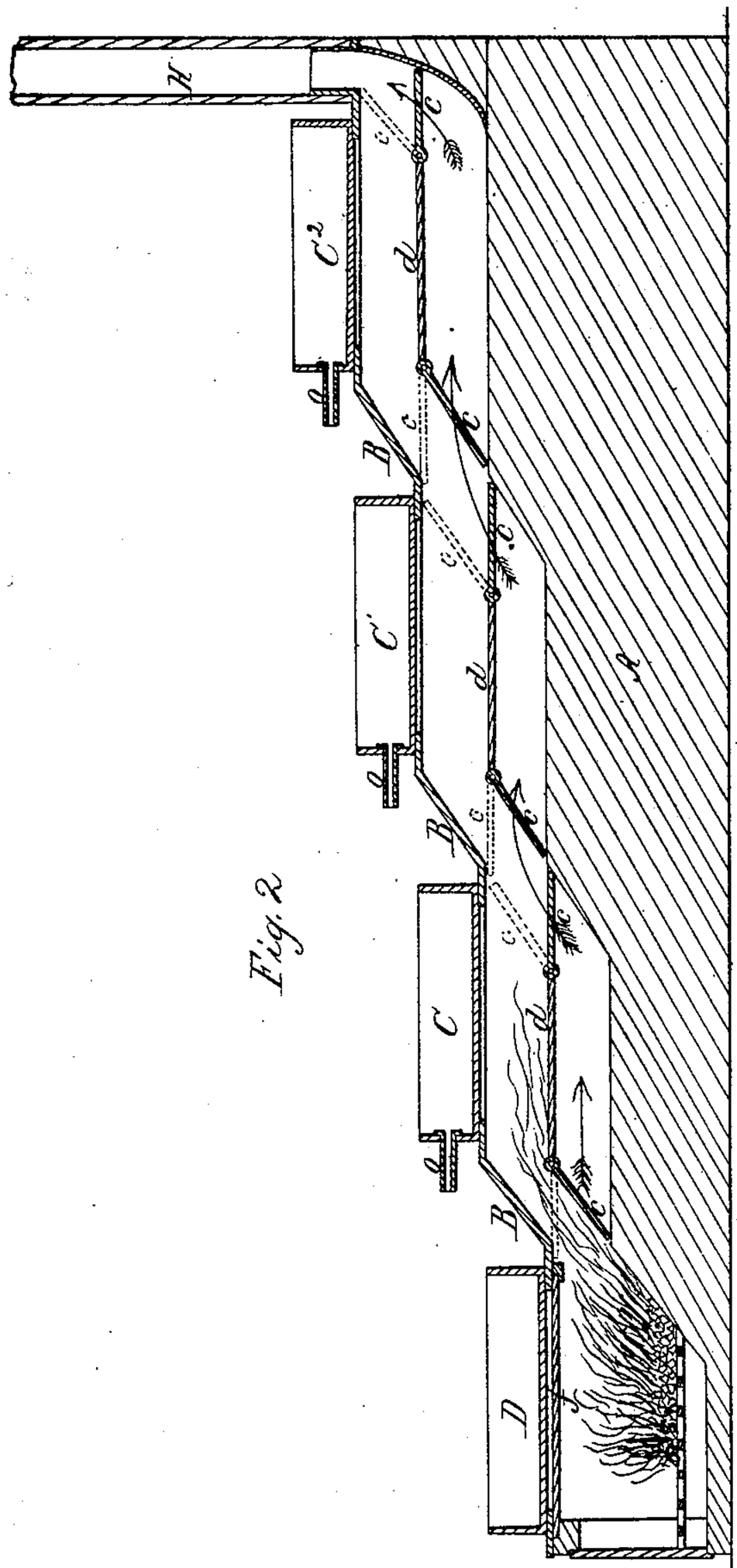
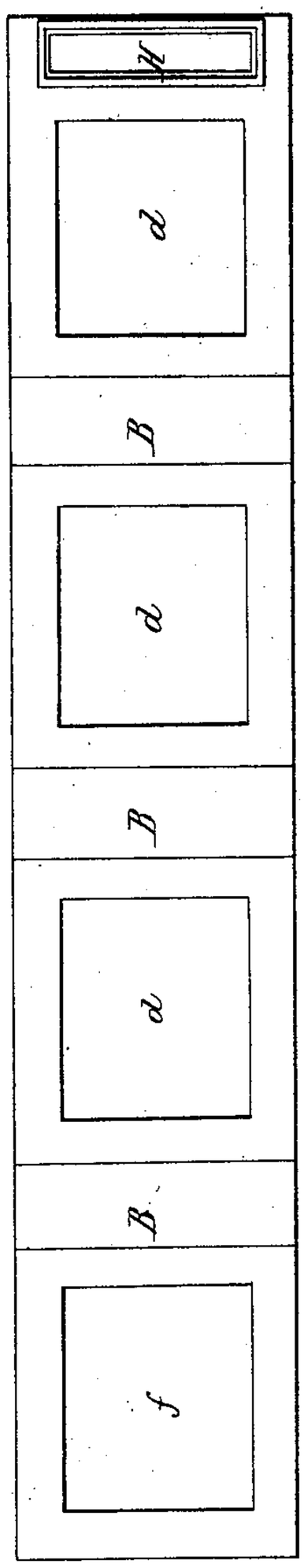


Fig. 3



Witnesses
Wm Sullivan
Jno. L Smithmyer

Inventor
F. M. Love

UNITED STATES PATENT OFFICE.

F. M. LOVE, OF WALDRON, INDIANA, ASSIGNOR TO HIMSELF AND SAML. C. LOVE, OF SAME PLACE.

IMPROVED EVAPORATOR.

Specification forming part of Letters Patent No. **48,628**, dated July 4, 1865.

To all whom it may concern:

Be it known that I, F. M. LOVE, of Waldron, in the county of Shelby and State of Indiana, have invented a new and useful Machine for Obtaining Molasses from Sugar-Cane, called "Superior;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view; Fig. 2, a section, and Fig 3 a top view.

The nature of my invention consists in constructing a furnace with two or more graduations, as shown in Figs. 1 and 2.

The tops B B B B are of iron, and so constructed, as shown in Fig. 3, that, if desired, the fire from the furnace can play upon the bottoms of the movable-iron boxes C, C′, C², and D, in which the juice of the sugar-cane is placed. Fig. 2 shows that when the fire is built under box D the heat will be most intense under that box and gradually decrease as it passes to the flue. The furnace is supplied with three sets of cranks, (one for each box,) E, F, and G, playing upon valves *c c c c* and *c*, by means of which the heat can be prevented from touching the boxes C C′ C², but forced to pass through the lower channel into the flue H, as shown on Fig. 2 in red lines. Those valves *c c c c* and *c* are separate for each box, and in that way the heat can be applied to either, all, or none of the boxes, as the case may require. The partitions *d d d*, to which those valves are attached, are firmly walled into the furnace; but the partition *f*, being immediately over the fire, is movable, being slipped into a groove made in the walls of the furnace near the top. This partition or plate can be drawn entirely out of the furnace endwise, or slipped in in the same way, as the case may require.

o o o o represent pipes for the purpose of running the juice from one box into the other, as the case may require.

a a a a, &c., are the arms which are attached to the cranks E, F, and G, by means of which the valves are worked.

K represents a door, one of which is attached to each side of the box on the furnace, for the purpose of letting cool air to the bottoms of the boxes to cool them more quickly and prevent the burning of the juice.

A represents the furnace.

Operation: First fill box C² with juice from the mill and put a few gallons of water in each of the other boxes, at the same time shutting the heat off from boxes C and C′, letting the fire strike box C² only. As soon as the juice in box C² boils, skim it and discharge it into a separate box attached to box C², (designated as box C³,) and fill box C² again with juice from the mill. Bring this to a boil and skim it. Then discharge the contents of box C³ into box C′, leaving the settlings in box C³ to be washed out before it is filled again from box C². Then discharge box C² again into box C³. Fill box C² again from the mill. Then let the heat strike box C′ and box C². As soon as box C² boils, skim it and empty it into box C³. Previous to this last-mentioned discharge box C′ must be discharged into box C. Then discharge box C³ into box C′ again, and box C³ is ready to receive the discharge of box C² again. Then let the fire strike box C and C′ and C², and boil it till box C is done, observing the shutting off of the heat from box C to prevent it from burning when near done. But the operator will generally commence boiling in box C′, using box C² for heating water. In that case he must finish over box D⁴. If so, he will observe to slip plate *d*⁴ into the groove in the furnace to prevent box D⁴ from burning, (when near done,) the heat radiating from plate *d*⁴ being sufficient to finish said box without danger of burning. Then, after said box is done and refilled, plate *d*⁴ will be withdrawn, letting the fire strike the bottom of box D⁴, as before. As soon as box C is done (or D⁴, as the case may be) and emptied, discharge box C′ into it and fill box C′ from box C³, and box C³ from box C², and box C² from the mill, as before. If the heat under either or all the boxes should be too intense in spite of shutting the fire off by means of the valves, the doors K might be opened to admit cool air and assist in cooling the same. With this mode of operation I have no use for box D⁴, the furnace under it being covered with an iron plate. This box D⁴ can be removed and its place only

used for a furnace, or used as above specified, thus using it to finish in.

It must be observed that I neutralize the acid in the fresh juice with lime or bisulphate of lime, before it comes to a boil in box C^2, or the box first used. I can have a settling-box by the side of each box on the furnace, to be used as box C^3, or I can dispense with them altogether, permitting the juice to settle in any box, or each box successively, by shutting off the heat.

I can make my furnace to use any number of boxes. I can also reverse it, placing flue H or the chimney at the end of plate d^4 and building the fire under box C^2, if desired; but in this case the chimney will have to be a third higher, it being in this case a third longer than the horizontal length of the flue, while in the other only equal to it. I can have any one, all, or none of my boxes to boil or stop at the pleasure of the operator.

If desired to make an evaporator capable, with three boxes, of making from seventy-five to eighty gallons per day, the furnace should be twenty feet long, twenty inches wide in the clear. The boxes should be about five feet long and two feet wide at the bottom, and should flare considerably at the top. The chimney in all cases should be as long as the horizontal length of the furnace.

I do not claim the furnace A, nor the boxes C, C′, C^2, C^3, or D; nor do I claim the valves *c c c c*, nor the cranks E, F, and G, nor the doors K, nor the plate *f*; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

The combination of the furnace A with the valves *c c c c* and *c*, the graduations with plates B B B B and *f*, the boxes C, C′, C^2, C^3, and D, the partitions *d d d* and doors K, and the pipes *o o o o*, all, or as many of each of the above mentioned boxes, plates, valves, cranks, pipes, and graduations as may be desired, arranged and operating substantially as and for the purpose shown and described.

F. M. LOVE.

Witnesses:

JAMES E. FREEMAN,

JOHN F. BALLARD.