A. STILLMAN.

Evaporator Pan.

No. 6,519. Patented June 12, 1849.

Fig. 1.

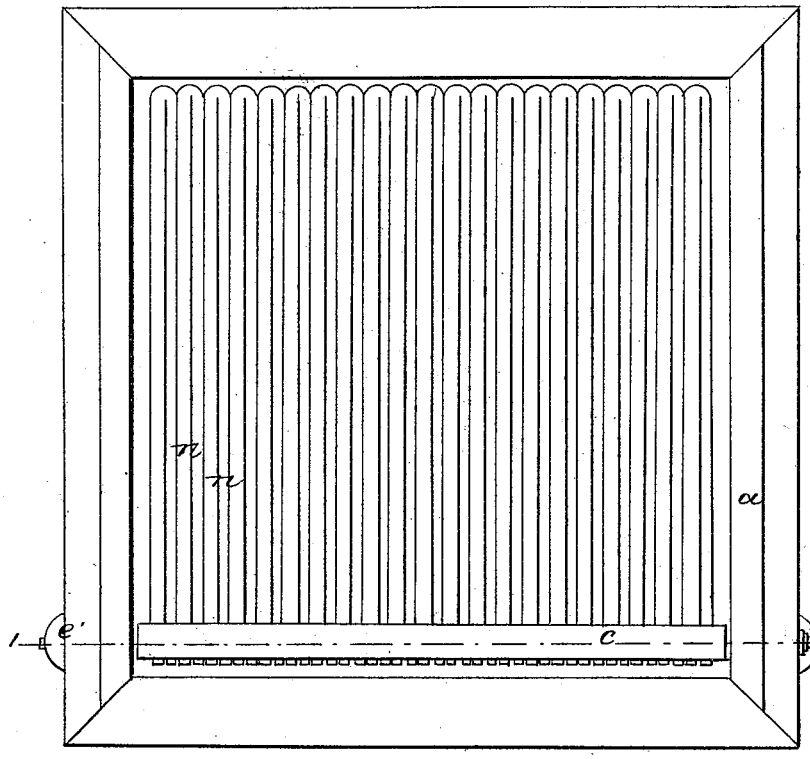


Fig. 5

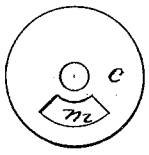


Fig. 4

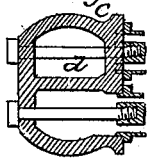


Fig. 2

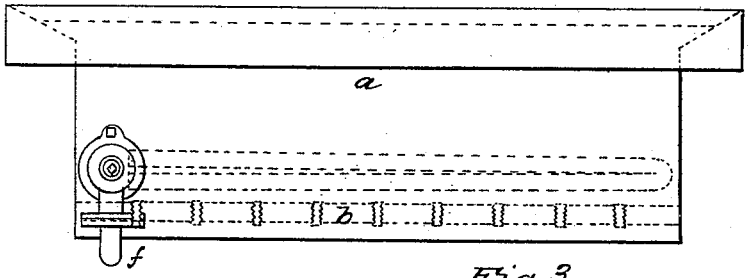


Fig. 3

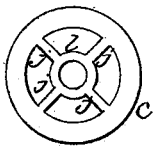
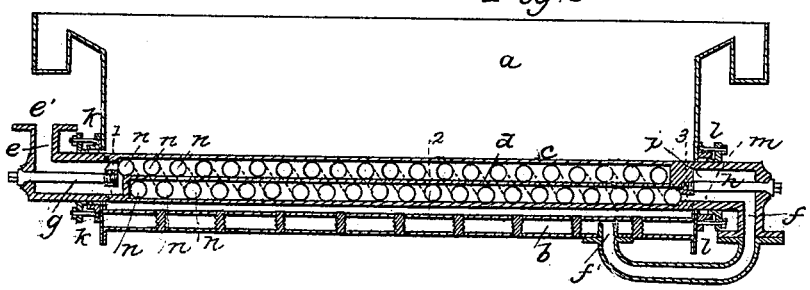


Fig. 3



UNITED STATES PATENT OFFICE.

ALFRED STILLMAN, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-PIPES FOR SUGAR-BOILING.

Specification forming part of Letters Patent No. **6,519**, dated June 12, 1849.

To all whom it may concern:

Be it known that I, ALFRED STILLMAN, of the city, county, and State of New York, have invented a new and useful Improvement in Pans for Evaporating Saccharine Juices and other Liquids; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of a sugar-pan on my improved plan; Fig. 2, an elevation; Fig. 3, a vertical section taken at the red line 1 of Fig. 1; Fig. 4, a section taken at the line 2; Fig. 5, a section taken at the line 3.

The same letters indicate like parts in all the figures.

Evaporating-pans have heretofore been made with a double bottom and with series of steam-tubes within to increase the heating-surface; and these tubes have been so arranged as to branch off from a main steam-tube, communicating at one end with the boiler and at the other with the false bottom of the pan. According to one method the main pipe is divided into two parts by a cross vertical partition in the middle of its length, and these two ends are united by bow-tubes, so that the steam which enters one division of the main pipe passes through the bow-tubes into one and out of the other section into the false bottom. The objection to this is that some of the branch pipes are necessarily much shorter than others, and hence the steam that circulates through them passes off without giving off its caloric in sufficient quantities; and, according to the other plan, the branch pipes are single, with a horizontal partition in them, in connection with a like partition in the main pipe, the upper division receiving the steam from the boiler, which, passing along the upper division of the branch tubes, returns along their lower division into and out of the lower division of the main pipe to the false bottom. The obvious defect of this latter is the small amount of heating-surface exposed to the liquid to be evaporated, for the partition which divides the branch tubes is not exposed, and therefore all the heat applied to it is necessarily lost.

The object of my improvement is to avoid these defects and obtain a larger amount of heating-surface than can be attained by any of the known plans, and this I attain by making the main steam pipe with a horizontal partition, which divides it into two compartments, connected by a series of siphon-tubes, which pass along horizontally from the upper one and return in parallel lines to the lower one, the lower legs being placed below the spaces between the upper legs, so as to leave a free passage for the circulation of the liquid to be evaporated. The steam from a boiler or other source enters one compartment of the main pipe, passes along the upper legs of the siphon-tubes, and then along the other legs to the other compartment of the main pipe, and thence into the false bottom. This arrangement, while it supplies an equal amount of steam to all the branch pipes of the series, presents an equal amount of heating-surface in each branch, and greater in the aggregate than by any other method with which I am acquainted.

In the accompanying drawings, *a* represents an evaporating-pan such as is used for evaporating sacharine matter, with a double bottom, *b*.

c is the main steam-pipe, divided into an upper and lower compartment by a horizontal partition, *d*. This pipe is connected at the ends with an induction-pipe, *e*, and an eduction-pipe, *f*, by turned and ground joints, the faces at the ends of the main pipe being formed with a groove to receive a corresponding tongue on the ends of the pipes *e* and *f*, so that these can be secured steam-tight to the main steam-pipes by screws *g* and *h*, which pass through the ends of the induction and eduction pipes, and are tapped into nuts *i* in the main steam-pipe and connected therewith by arms *j*, the heads of the screws being made conical and properly packed to prevent the escape of steam, which admits of turning, for the purpose of cleaning the pan, the main steam-pipe without turning the induction and eduction pipes *e* and *f*, which pass through stuffing-boxes *k l*, attached to the side of the pan. The continuation of the induction-pipe is secured by flanges at *e'*, and the eduction-pipe communicates with the false bottom at *f'* to discharge the steam therein to heat the bottom of the pan. The upper compartment of the main steam-pipe communicates with the induction-pipe, and the lower compartment with the eduction-

pipe, and these two compartments are connected by means of the branch siphon-pipes *n*, one leg of which is secured to and opens into the upper compartment, and the other leg with the lower compartment, and the series is so arranged that the lower legs are placed below the spaces between the upper ones, to give a free chance for the liquid to circulate around all the pipes. The steam from the boiler or other vessel enters the upper compartment of the main steam-pipe and passes along the upper legs of the series of siphon-tubes; then along the lower legs into the lower compartment of the main steam-pipe, and thence through the eduction-pipe into the false bottom, carrying with it out of the pipe and tubes any water which may be there through the opening *m*.

What I claim as my invention, and desire to secure by Letters Patent, is—

Connecting the two compartments of the main steam-pipe of the evaporating-tubes of evaporating-pans by means of a series of siphon-tubes, which receive the steam from one compartment and discharge it into the lower compartment, whereby I am enabled to obtain a larger amount of heating-surface than by any other known plan.

ALFRED STILLMAN.

Witnesses:

ROBERT F. WINSLOW,

J. J. GREENOUGH.