No. 724,511. PATENTED APR. 7, 1903.

A. SCHÜTT.

HEATER.

APPLICATION FILED APR. 12, 1902.

NO MODEL.

Fig. 1.

Fig. 2.

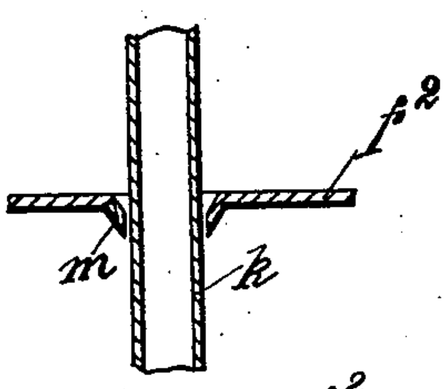
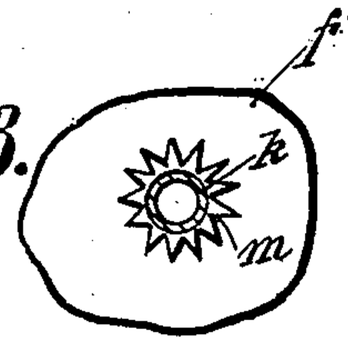


Fig. 3.



WITNESSES:

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HEATER.

SPECIFICATION forming part of Letters Patent No. 724,511, dated April 7, 1903.

Application filed April 12, 1902. Serial No. 102,578. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SCHÜTT, mechanical engineer, a subject of the Emperor of Germany, and a resident of No. 19 Pestalozzi street, Charlottenburg, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

The present invention relates to an improved construction of a vaporizer, by means of which smallest possible quantities of liquid may be spread over the largest possible heating-surface. As a matter of fact it may be stated here that efforts have been made to solve this problem by evaporating liquids in a pipe, as in the case of Serpollet; but such forms of execution are suffering from the drawback that in so narrow a space the development of steam cannot take place in a uniform and quiet manner. Now the present invention is adapted to solve this task in quite satisfactory a manner by creating a construction which combines the advantage of vaporizing the fluid spread out in a very thin layer (irrigation) with the advantages granted by an ordinary large-surface steam-boiler.

In the accompanying drawings, Figure 1 is a vertical section of the entire irrigation-evaporator. Fig. 2 is a vertical section of a heating-tube in same, and Fig. 3 a top view of said heating-tube.

Similar letters refer to similar parts throughout the several views.

In the represented form of execution, a is a cylindrical vertical boiler, and $b\,b'$ its bottoms or ends, between which tubes k are spanned—for instance, strongly rolled in. The bottoms are provided with domes c and c', the lower one, c', of which is divided into two parts by a partition l. The steam or hot gas intended for heating the device enters from the socket d, passes through the tubes k, situated at the left-hand side of the partition l, in a perpendicular direction from bottom to top, thence in the opposite direction through the tubes k, situated at the right-hand side of the partition l, and escapes through the socket e. The fluid to be evaporated comes from outside the tubes and is designed to run down along the tubes and to evaporate at the same time. For such purpose the boiler is provided with horizontal partitions or bottoms $f'\,f^2\,f^3$, which fit tightly to the barrel of the boiler and are perforated for the passage of the tubes k, the intermediate spaces being dimensioned in such a manner that the liquid must run down on the outside of the tubes k and is prevented from dripping down between them. For the purpose of insuring a larger irrigating effect the apertures in these partitions or bottoms may be provided with prongs m, Figs. 2 and 3, intended to serve as guides for the liquid. The liquid to be evaporated enters the boiler through the top socket g, spreads over the top partition f', and runs down along the tubes k. Those parts of the liquid which, in the case of the boiler being considerably strained, fall down freely instead of running down along the tubes will reach the second partition f^2 of the boiler of exactly the same arrangement as the first one, when they will be compelled to go on running down. If the size of the boiler be proportionate to the effect it is to take, the whole of the liquid will be vaporized before it reaches the last partition; otherwise any not vaporized quantity of liquid will accumulate on said last bottom, from where it may be drained off through the socket h. The steam or vapor may be taken off in different manners, preferably, however, through a collecting-pipe i, which tightly passes through all the bottoms $f'\,f^2\,f^3$ and whose parts contained between two successive bottoms are perforated for the purpose of permitting the steam produced by the evaporating liquid to get, as shown by the arrows, into the collecting-pipe i, whence they may be drawn off and led upward.

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

1. A heater comprising a boiler or shell, with upright heating-tubes therein, while the space surrounding said tubes forms a chamber which contains a fluid to be vaporized and the vapor produced therefrom, a horizontal partition located within the shell and having apertures through which the fluid may pass from one side of the partition to the other, and an upright collecting-pipe which extends through the said partition and has vapor-receiving apertures both above and

below said partition, the upper end of said collecting-pipe extending through the top of the shell to the outside thereof.

2. A heater comprising a boiler or shell with upright heating-tubes therein, a collecting-pipe extending within the boiler and provided with an imperforate portion at the top, and with an apertured lower portion, and a partition located within the shell at the imperforate portion of the collecting-pipe, said partition having apertures through which the fluid to be vaporized may pass from above the partition to below the same, and the shell being provided above said partition with an inlet for the fluid to be vaporized.

In witness whereof I have hereunto signed my name, this 29th day of March, 1902, in presence of two subscribing witnesses.

ALFRED SCHÜTT.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.