(No Model.)

E. KÖRTING.

HEATING APPARATUS.

No. 314,945. Patented Mar. 31, 1885.

Fig. 1.

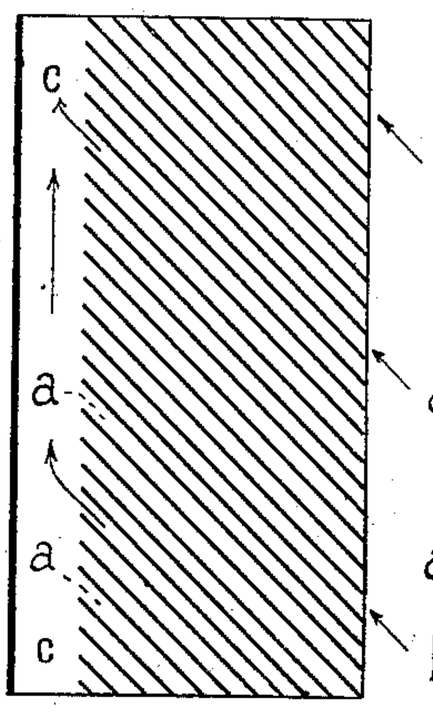


Fig. 2.

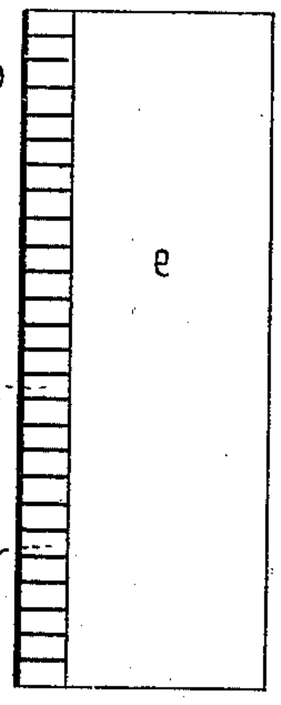


Fig. 4.

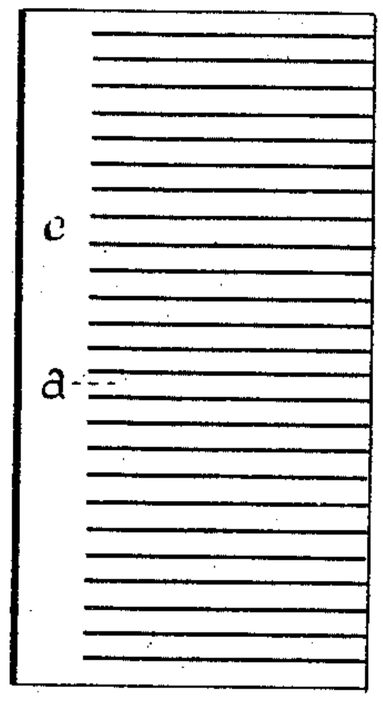


Fig. 5.

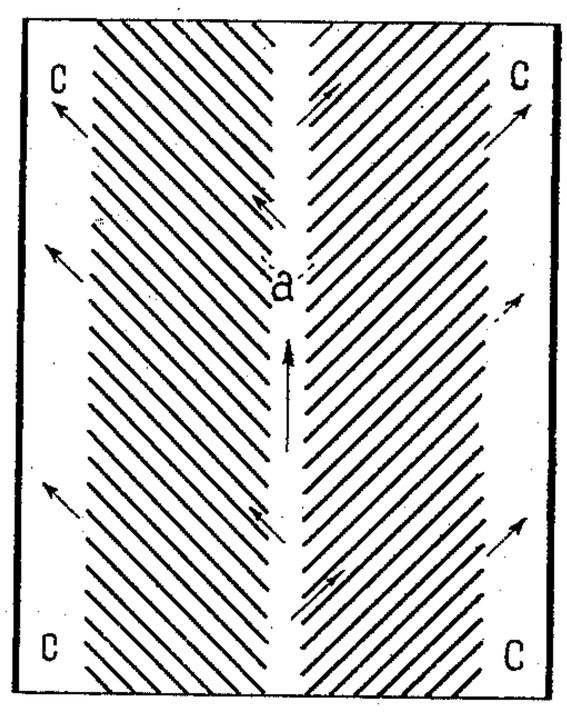


Fig. 3.

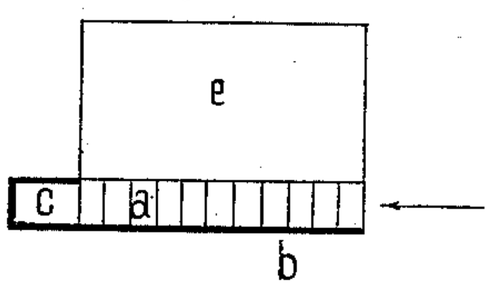


Fig. 7.

Fig. 6.

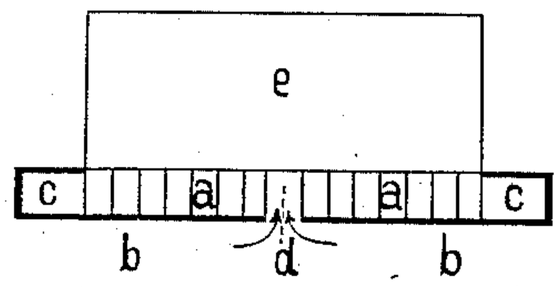


Fig. 9.

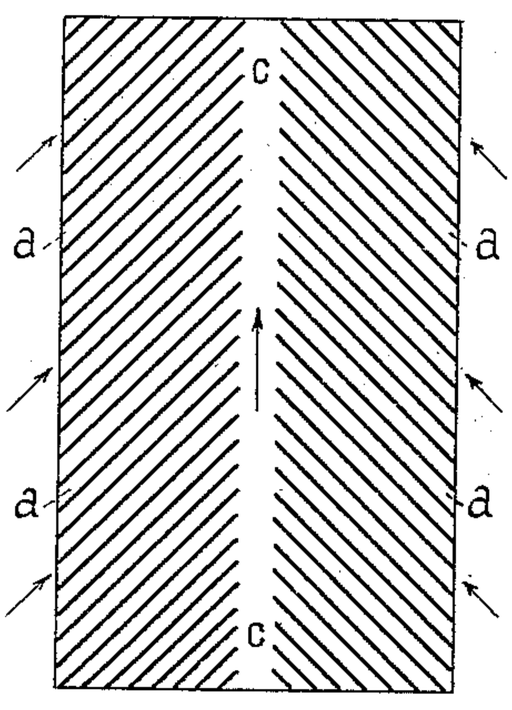


Fig. 8.

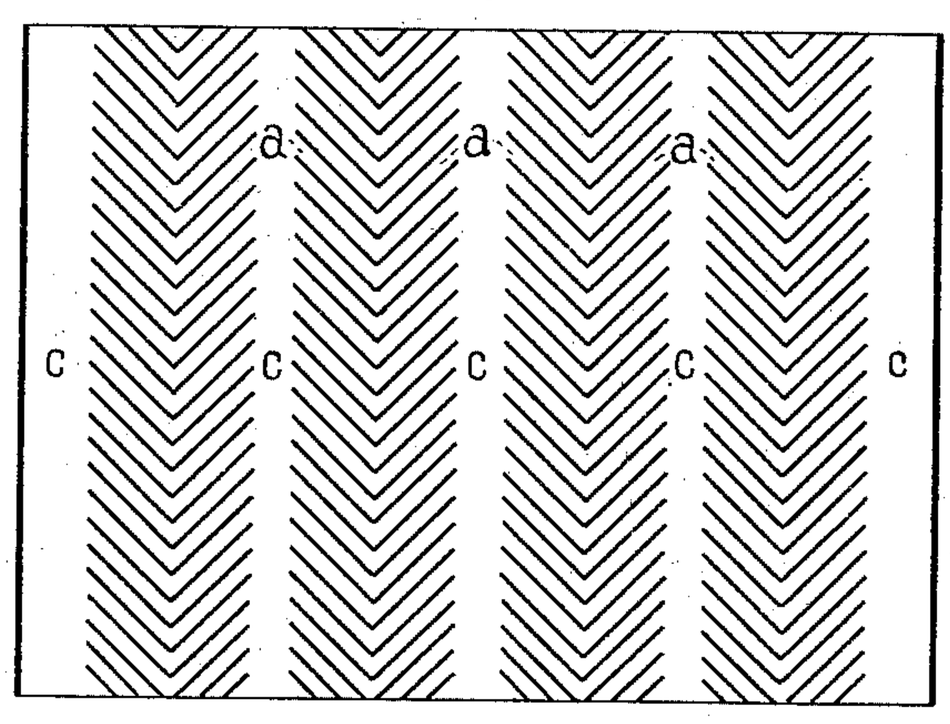
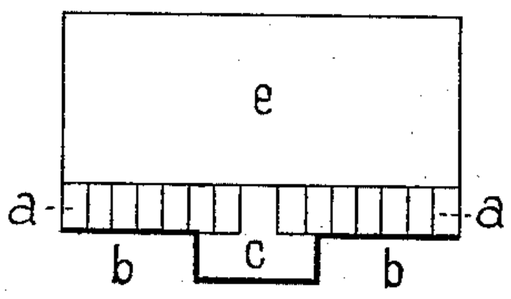
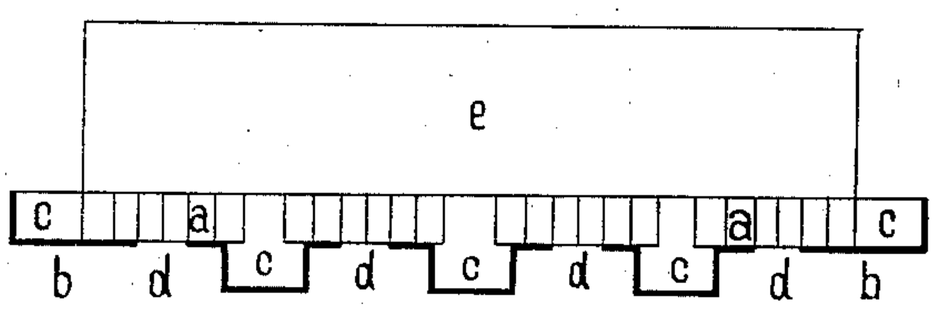


Fig. 10.





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J. Stabler Blandford

Inventor:
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by Marallus Bailey
Atty

UNITED STATES PATENT OFFICE.

ERNST KÖRTING, OF HANOVER, PRUSSIA, GERMANY.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 314,945, dated March 31, 1885.

Application filed July 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, ERNST KÖRTING, of Hanover, Kingdom of Prussia, Germany, engine-manufacturer, have invented a new and useful Improvement in Heating Apparatuses, of which the following is a specification.

My invention relates to apparatuses for heating air, and its object is to increase the efficiency of the same by means of short inclined or horizontal channels open at both ends and adapted to conduct the air along the heating-surface. The channels are formed between the said surface and an outer plate or shell by parallel division-walls, and they are put in communication with a main or collecting channel acting in the manner of a chimney to cause a draft.

In the accompanying drawings, Figure 1 is a front elevation of an apparatus embodying my invention with the front plate removed. Fig. 2 is a side view, and Fig. 3 is a plan of the same.

The remaining figures represent modifications of the invention as applied to heating apparatuses of varying width, and will hereinafter be more specifically referred to.

Fig. 1 represents in elevation a single system of inclined channels, *a*, for a narrow heating apparatus and one main channel, *c*, the front plate of the channels being removed. With this arrangement the air enters from the space around the apparatus directly into the channels at one end, and then passes into the channels *c*, as indicated by arrows. Fig. 2 is a side view and Fig. 3 a plan corresponding to Fig. 1, but showing the front plate, *b*, and the heating apparatus *e*. Fig. 4 is an elevation of a system of horizontal channels with one main channel *c*. Figs. 5 and 6 show, respectively in elevation and plan, a double system of channels, *a*, and two channels *c* applied to an apparatus of greater breadth, the air being admitted to all the channels *a* through a slit, *d*, in the wall *b*, and passing toward either side into the channels *c*. In the arrangement of Figs. 7 and 8 the main channel *c* is placed partly between and partly in front of two systems of inclined channels *a*, the air entering directly into the latter from either side of the apparatus. Figs. 9 and 10 finally represent a very broad heating-apparatus with four double systems of conducting-channels, to which the air is again admitted by slits *d* in the plate *b*, while there are five main channels *c* for the heated air.

The heating apparatuses *e* are shown in outlines only, as their interior construction does not form any part of this invention.

In Figs. 4, 5, 7, and 9 the plates closing the channels in front are supposed to be removed, as in Fig. 1.

The partition-walls of the channels *a* may be cast upon or fixed to the outer surface of the heating apparatus, or attached to the inner surface of the plate or plates *b;* or they may consist in separate strips of any suitable material inserted between the said apparatus and the plates *b*. In like manner as the apparatuses shown in the drawings are provided on one side with the described channels, there may be channels on two or more sides. The channels may be applied to heating apparatuses of round or other form, and horizontal channels may be employed with the apparatuses Figs. 5 to 10, instead of inclined channels, as well as with the apparatus Figs. 1 to 3.

The described conducting-channels operate to increase the efficiency of the heating-surface, inasmuch as they all draw in air at the same temperature and convey it along the heating-surface in numerous thin and short currents, so as to bring all portions thereof in close contact with the said surface, and for such time only as is necessary to heat it to the required degree. The mean difference between the temperature of the air and the heating-surface is, in consequence, greater than with ordinary air-heaters along the surface of which the air rises in an unlimited current from the bottom to the top, so that the particles of air which are already heated will remain unnecessarily long in contact with the said surface and prevent the latter, especially in its upper part, from giving off heat in the measure, as is the case with my improved arrangement.

I claim as my invention—

The combination, with the channels *a*, formed upon a heating apparatus for air, substantially as described, of one or more collecting-channels, *c*, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNST KÖRTING.

Witnesses:
HY SPRINGMANN,
B. ROI.