

(No Model.)

A. ANDERSON.
FURNACE.

No. 507,095.

Patented Oct. 24, 1893.

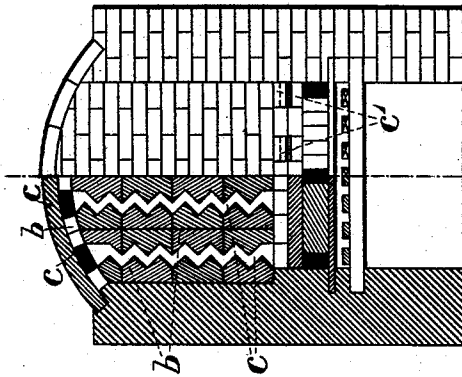


Fig. 2

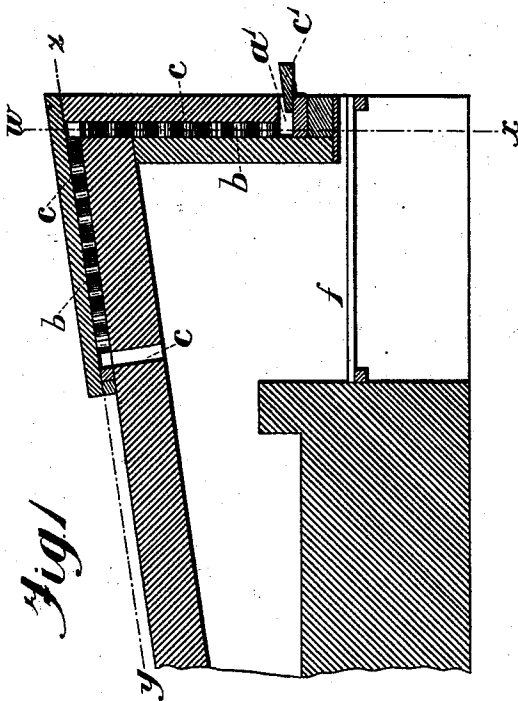


Fig. 1

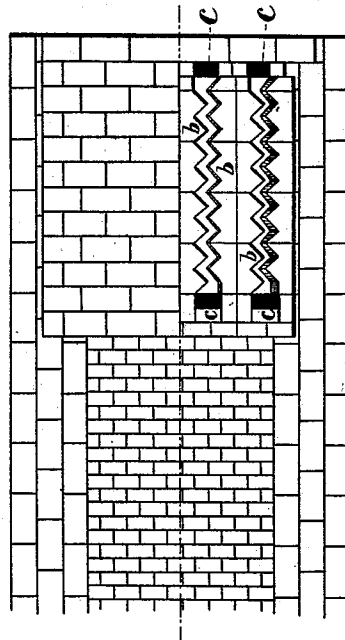


Fig. 3

Witnesses

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ALEXANDER ANDERSON, OF SUNDERLAND, ENGLAND.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 507,095, dated October 24, 1893.

Application filed July 5, 1892. Serial No. 438,986. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER ANDERSON, a subject of the Queen of Great Britain and Ireland, and a resident of Sunderland, county of Durham, England, have invented certain Improvements in or Relating to Furnaces, of which the following is a specification.

This invention has reference to improvements in or relating to furnaces, whereby economy in fuel is effected by the consumption of a greater part of the gases and products of combustion in the manner herein-after explained. Various methods have been tried by way of introducing air at the furnace bridges and through the side walls or fronts and arches of furnaces all with improved results as compared with the ordinary systems of firing.

By my invention herein I adopt the system of introducing air to the furnace through channels contiguous to the furnace itself but I also improve upon these channels by greatly increasing their heating surface and it is the method thus adopted and its application to furnaces that forms the subject of this invention.

I will fully explain my invention with reference to the accompanying drawings, in which—

Figure 1 shows a longitudinal section; Fig. 2 a half end vertical section on line *w x* in Fig. 1, and a half end elevation, and Fig. 3 a half plan and a half plan on line *y z* in Fig. 1 all three figures representing an ordinary brickwork furnace of for example the forge and mill or puddling type.

Referring to the drawings it will be seen that channels *C* are formed in the masonry whereby air can enter the said channels, traverse them and find exit contiguous to the furnace bridge, the advantages accruing to which are too well known to need further description here. Hitherto these channels have been formed in practically straight lines from point to point except where the conformation of the furnace has necessitated a turn and the result of this construction of course has been to warm or heat the air traversing the same to a certain extent prior to its delivery near the furnace bridges. Now it is well known that the hotter the air is when commingling with the hydrocarbon gases from the furnaces the better are the results obtained as regards economy and to obtain the

desired increase in temperature I greatly increase the heating surfaces of any given length of channel contiguous to a furnace and I obtain this increased heating surface by a special conformation or design of brickwork without substantially altering the original length measured along the center line of the channel.

In the figures, the furnace *f* is shown arched with nine-inch ordinary bricks on which the specially formed bricks *b* are laid so as to form the horizontal zigzag channels shown in the drawings. These are then covered with ordinary brickwork. Similarly the end of the furnace is built up with the specially formed bricks *b* so as to form the vertical zigzag channels shown, the vertical communicating with the horizontal channels at the junction of the end wall with the arch of the furnace. In the special bricks *b* illustrated, each side of the triangle shaped formation measures three inches. The brick is nine inches long. There are four such sides. Therefore the increased heating surface obtained by this particular design of brick as applied to air channels contiguous to furnaces is at least twenty-five per cent. The result in practice is to proportionately increase the temperature of the air, to consume more fuel in the form of smoke or gases which would have been otherwise wasted and to consequently reduce the general expenditure on fuel.

In the drawings *c'* are bricks fitting into the air entry apertures *A'*. These bricks can be slid backward and forward to regulate the amount of air entering.

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

The improvement in brickwork furnaces consisting in the formation of the channels within the walls of the furnace with zig-zag-shaped bricks separated from the flame of the furnace itself by other bricks of ordinary form, such zig-zagged channels being controlled as to the amount of air passing through them by sliding brick *c'* placed at the entry to each of the aforesaid zigzag channels substantially as set forth.

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

ALEXANDER ANDERSON.

Witnesses:

WILLIAM WILSON,
WILLIAM MOSS.