T. FAIRBANKS.

Stove Pipe.

No. 3,100. Patented May 26, 1843.

Fig. 3.

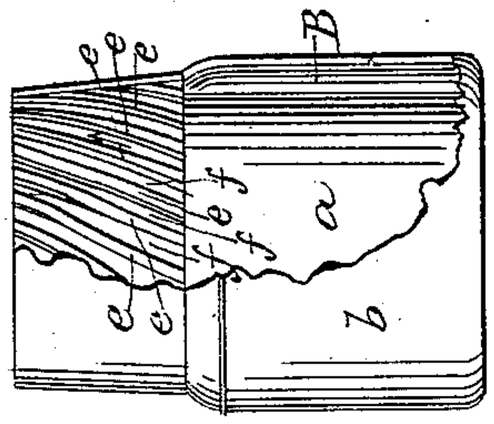


Fig. 2.

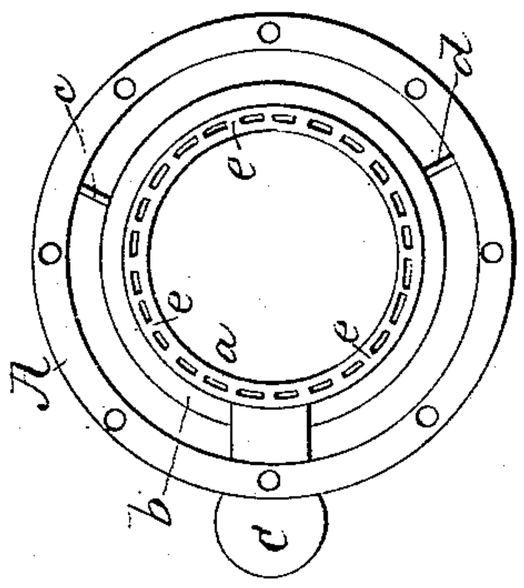
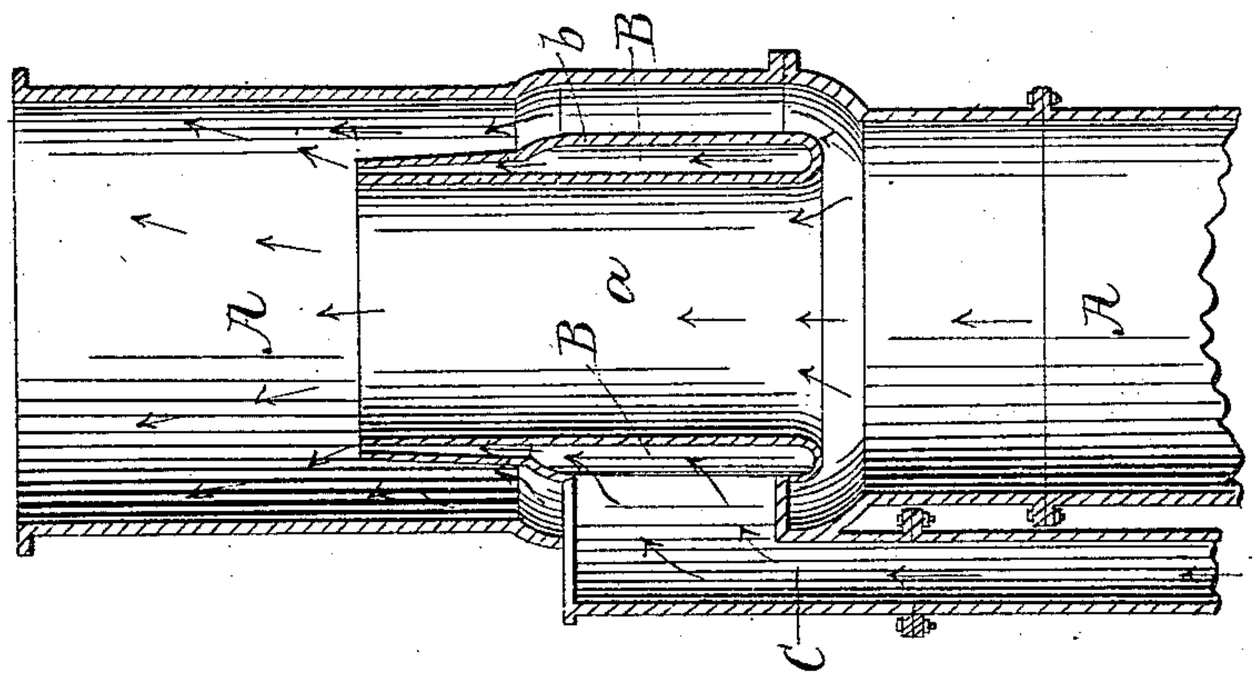


Fig. 1.



UNITED STATES PATENT OFFICE.

THADDEUS FAIRBANKS, OF ST. JOHNSBURY, VERMONT.

MACHINE FOR CREATING DRAFT IN FLUES.

Specification of Letters Patent No. 3,100, dated May 26, 1843.

To all whom it may concern:

Be it known that I, THADDEUS FAIRBANKS, of St. Johnsbury, in the county of Caledonia and State of Vermont, have invented certain new and useful improvements or mechanical contrivances to be applied to the discharge-flues or chimneys of furnaces for the purpose of increasing the draft thereof and thereby promoting combustion of fuel, the said improvement being peculiarly adapted to the flues of furnaces or fireplaces for burning anthracite coal, and that the following specification, taken in connection with the accompanying drawings, constitutes a full and exact description thereof.

Figure 1 of the drawings above mentioned represents a vertical and central section of the upper part of a chimney flue having my improvement applied thereto. Fig. 2 is a top view of the same. Fig. 3 exhibits the arrangement of the discharging apertures of the air chamber, to be hereinafter described.

A Figs. 1, 2, denotes the top or upper portion of a steam boiler or furnace discharge flue or chimney, or that part thereof from which the smoke and gases or other waste volatile products of combustion freely escape into the atmosphere. In this flue a chamber B B, constructed of two concentric tubes or cylinders *a*, *b* (placed at a little distance apart from each other, and joined together or otherwise connected at their lower ends), is arranged as seen in Figs. 1, and 2, the space between these tubes constituting the chamber.

The upper portion of the chamber or space between the tubes may be left open, or the same may be covered over by a plate, suitably extending from one tube to the other, through which plate a series of orifices may be formed for the discharge of air from the air chamber B B into the flue A. Or instead of the said orifices and plate, the upper part of the outer tube may be brought quite near the inner tube or so as to contract the chamber or diminish the width thereof at its top, or part at which the air is expelled. The diameter of the external tube of the air vessel B B, is somewhat less than that of the interior of the chimney A, and this air vessel is supported in its position therein by means of any number of arms *c*, *d*, Fig. 2 extending from its external surface to the interior of the chimney or in any other convenient manner.

The air chamber so constructed communicates by means of a pipe C with an ordinary fan blower or revolving blast wheel or other suitable blowing apparatus, the said pipe C opening into the chamber and extending therefrom through the side of the chimney, and thence to the blowing machine.

Now when a powerful current of air is thrown by the blast apparatus, through the pipe C into the chamber B B, it will rush out the top of the chamber, with a velocity proportionate to the force, by which it is propelled through the pipe, and as the expelled air rises from the chamber it comes into contact with the ascending current or column of heated air, smoke or gases, proceeding from the burning fuel of the furnace and discharges the same from the chimney, thereby creating a powerful draft up the chimney or through the combustible matter of the furnace.

It has been customary heretofore, in the application of a blast pipe to a furnace, to introduce the same into the ash-pit or beneath the fire grate, or under the fuel, but by my improved method of arranging the blast it acts above the fire.

In order to greatly facilitate the escape of the smoke by means of the blast thus introduced into the chimney, I insert between the inner and outer cylinders or tubes *a*, *b* a series of curved or helical partitions *e*, *e*, *e*, each of which is placed at a short distance apart from that immediately succeeding it, and extending from one tube to the other, and some distance downward from the top of the tubes as seen in Fig. 3, the said figure being an elevation of the air chamber as removed from the chimney, and exhibiting a portion of the tube *b* as broken away in order to show the arrangement of spiral or helical partitions above mentioned. The spaces *f*, *f*, *f*, formed between the helical partitions, constitute so many openings or curved passages for the discharge of air from the chamber B, which air rushing through these passages diverges more or less from a vertical line, and ascends from the chamber with a whirling motion. The centrifugal force thus generated by said motion in the particles of the ascending currents of air, causes them to be thrown or spread out more or less

laterally and thus materially increases the effect of the expelled currents on the smoke and air in the chimney, and, as a consequence, greatly improves the draft of the chimney.

Although I have described the chamber B B as constructed of concentric tubes, in the manner set forth yet I am aware that there are various other shapes in which the said chamber may be formed. It may be a single cylinder having the spiral or helical discharging orifices in its top, or it may be otherwise conveniently arranged, but I generally prefer the construction of the said chamber as exhibited in Fig. 1, as in this case the currents of smoke proceeding from the furnace rise through the interior of the inner tube *a*, as well as on the exterior of the outer tube *b* of the air vessel, and thus a very great superficial area of discharged air is exposed to contact with the ascending column of smoke, thereby rendering its expulsion from the flue more thorough and effectual and of course greatly improving the draft.

Having thus described my invention, and explained the principles thereof by which it may be distinguished from others of like character, I shall now proceed to point out such parts thereof as I claim therein.

I claim—

The method herein above explained of creating a draft in flues or furnaces, that is to say, by arranging in the discharging flue or chimney of the furnace, a chamber or air receiver B B, into which air is forced by means of a blowing apparatus and is discharged therefrom through suitable apertures formed in its top or other proper part thereof, the whole being constructed and operating substantially in the manner and for the purposes herein above set forth: and I also claim arranging the discharging apertures of the chamber B B in helical or curved directions for the purpose of creating a rotating or whirling movement of the air expelled from the chamber into the chimney, in order to improve the draft thereof as herein before specified.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this tenth day of March in the year eighteen hundred and forty three.

THADDEUS FAIRBANKS.

Witnesses:
R. H. Eddy,
Ezra Lincoln, Jr.