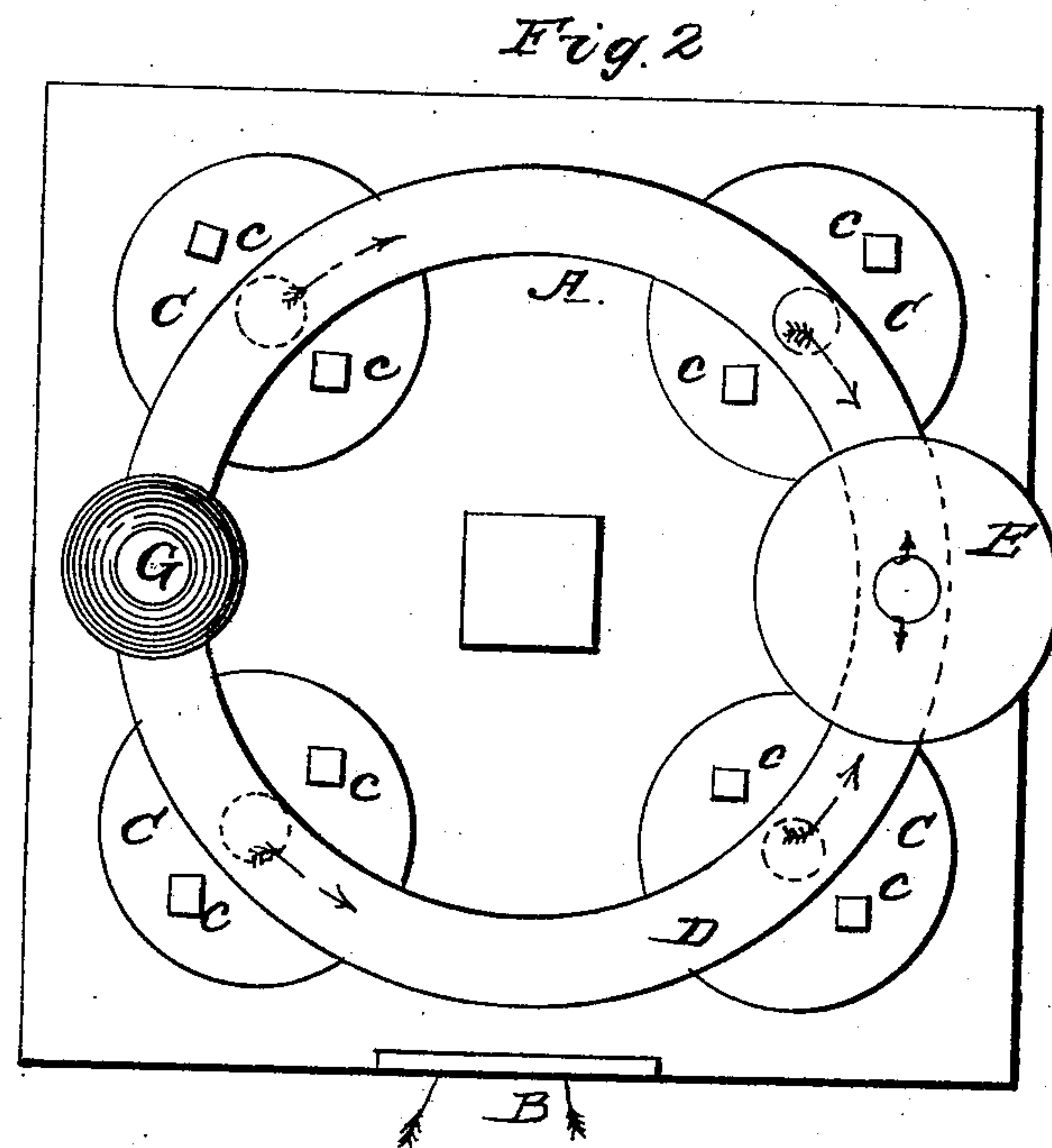
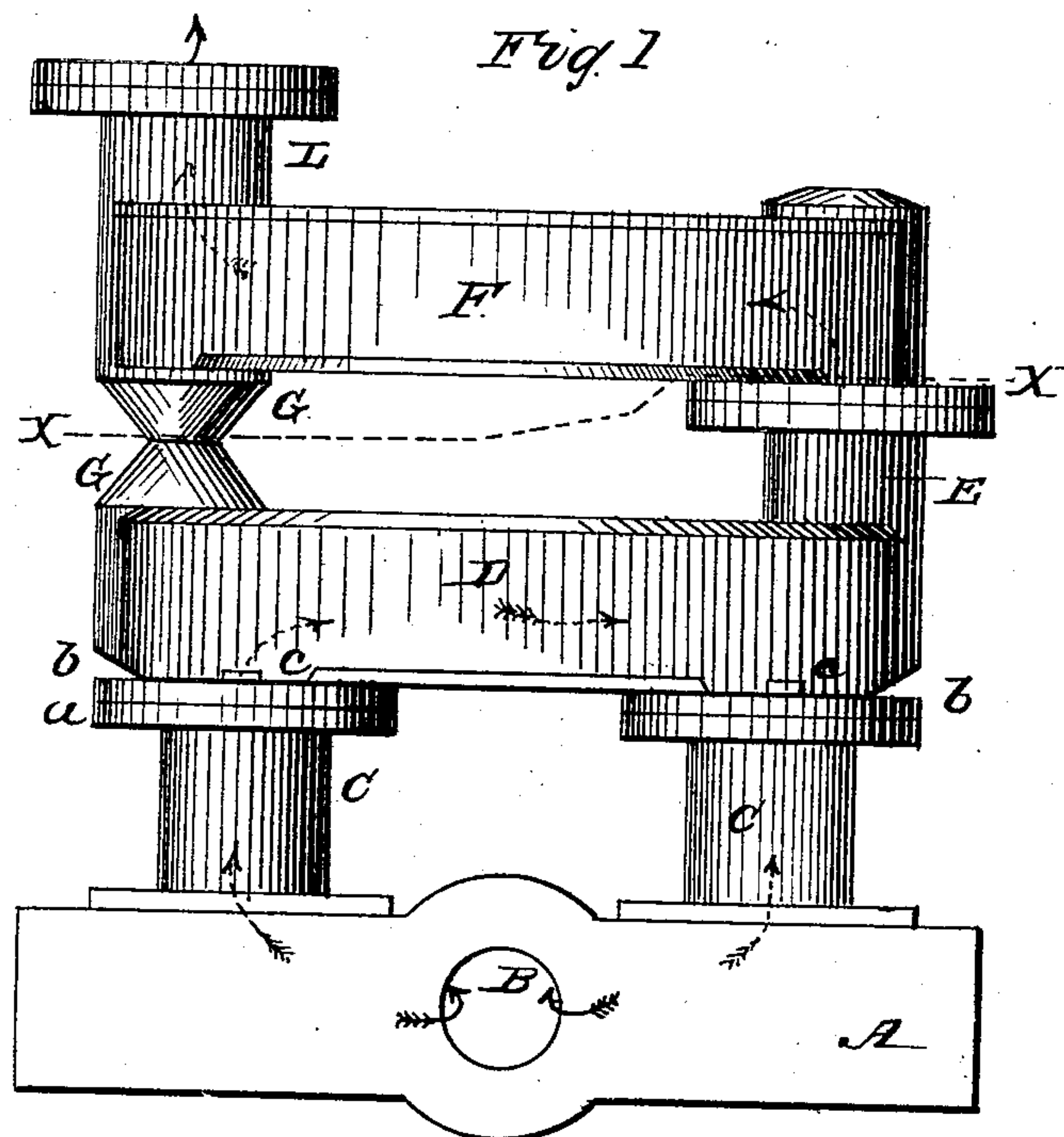


J. YOUNG.
Hot-Blast Furnace.

No. 9,908.

Patented Aug. 2, 1853.



UNITED STATES PATENT OFFICE.

JESSE YOUNG, OF FRANKLIN FURNACE, OHIO.

IMPROVED ARRANGEMENT OF PIPES FOR HOT-BLAST FURNACES.

Specification forming part of Letters Patent No. 9,908, dated August 2, 1853.

To all whom it may concern:

Be it known that I, JESSE YOUNG, of Franklin Furnace, in the county of Scioto and State of Ohio, have invented a new and useful Improvement in Air-Heating Pipes for Hot-Blast Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is an external view of my improvement. Fig. 2 is a plan or top view of the lower pipe, or a horizontal section of Fig. 1, *xx*, Fig. 1 being the line of section.

Similar letters of reference indicate corresponding parts in each of the two figures.

The invention relates to an improved arrangement of air-heating pipes for hot-blast furnaces; and it consists in a series of annular horizontal pipes connected by short vertical pipes, which also serve as supports or pedestals, and a hollow case upon which the pipes rest and through which hollow base the cold air is admitted into the pipes.

By the above arrangement, as will be hereinafter shown, the air passes slowly through the pipes and is exposed a sufficient length of time to the action of the heat to become heated with a small expenditure of fuel.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and also its practical advantages.

A represents a base or air-chest, which is hollow and of rectangular form, having an opening, B, at one side, through which the cold air is admitted into it.

C C C C are hollow pedestals, secured to the upper surface of the base or air-chest and communicating with it. The pedestals have flanges *a* on their upper ends, and a circular pipe, D, also has flanges *b*, which rest upon the flanges *a* of the pedestals. The flanges *a* *b* are secured together by bolts *c*, and consequently the lower pipe, D, is secured to the pedestals. The pedestals communicate with the interior of the pipe D. The cold air is admitted into the opening B and passes around the base or air-chest A, and then passes upward through the hollow pedestal C into the pipe D. (See arrows in both figures.) From the pipe D it passes upward through a connecting tube or pedestal, E, into a circular

pipe, F, immediately above the circular pipe D. Any desired number of circular pipes may be employed. All the pipes above the lower one are supported by solid knobs or projections G, any proper number being employed. The hollow pedestal E also helps to support the upper pipe, F, and there will be, of course, one of those pedestals to each of the upper pipes, as they connect the several pipes, and afford the necessary communication between them. The pedestals E are placed at opposite points on the several pipes, as will be seen in Fig. 1. For instance, the pedestal E of the pipe F is at a point opposite to the pedestal E', which connects with an upper pipe. (Not represented.) This arrangement allows the air to pass around each pipe before passing into the one immediately above it.

The horizontal pipe is admitted by all persons experienced in the manufacture of iron to be the best and most economical form, for the same reason that the horizontal boiler is better than those of other form—viz., the heat applied produces the greatest effect. (See Overman on the manufacture of iron.) The great objection, however, to the horizontal pipes, as at present arranged, is that being made of cast iron they are necessarily heavy, and being laid horizontally and heated in that position they will bend and eventually break in consequence of the burning of the supports which are solid. Consequently vertical pipes are much used. They resist well the influence of the heat, but are less favorable conductors of it, and are more expensive to use. By my improved arrangement the air is heated principally, almost wholly, in the annular horizontal pipes, the short vertical pipes serving as mediums to conduct the air from one horizontal pipe to the other, and also serving as supports or pedestals. The annular horizontal pipe retards the progress of the air. It has a circuitous passage, as it fills each annular horizontal pipe, and it then ascends at a right angle into the short vertical pipe, and thence into the annular horizontal pipe above it. Hence the progress of the air through the pipes is retarded or has a less rapid motion, and is exposed a sufficient length of time to the action of the heat to become heated with a small expenditure of fuel.

In my improvement I have counteracted the influence of the heat by employing the hol-

low base and pedestals. The current of cold air passing through these acts upon the principle of a water-tuyere and protects them from the strong action of the flame.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The arrangement of a series of annular horizontal pipes, D, short vertical connecting, pipes C E E', which also serve as supports or pedestals, and a hollow base, A, through which

the cold air passes into the pipes, and upon which hollow base the pipes rest, by which arrangement the air is made to pass slowly through the pipes and base, and is exposed a sufficient length of time to the action of the heat to become heated with a small expenditure of fuel.

JESSE YOUNG.

Witnesses:

CORNELIUS MCCOY.

H. G. THORNTON.