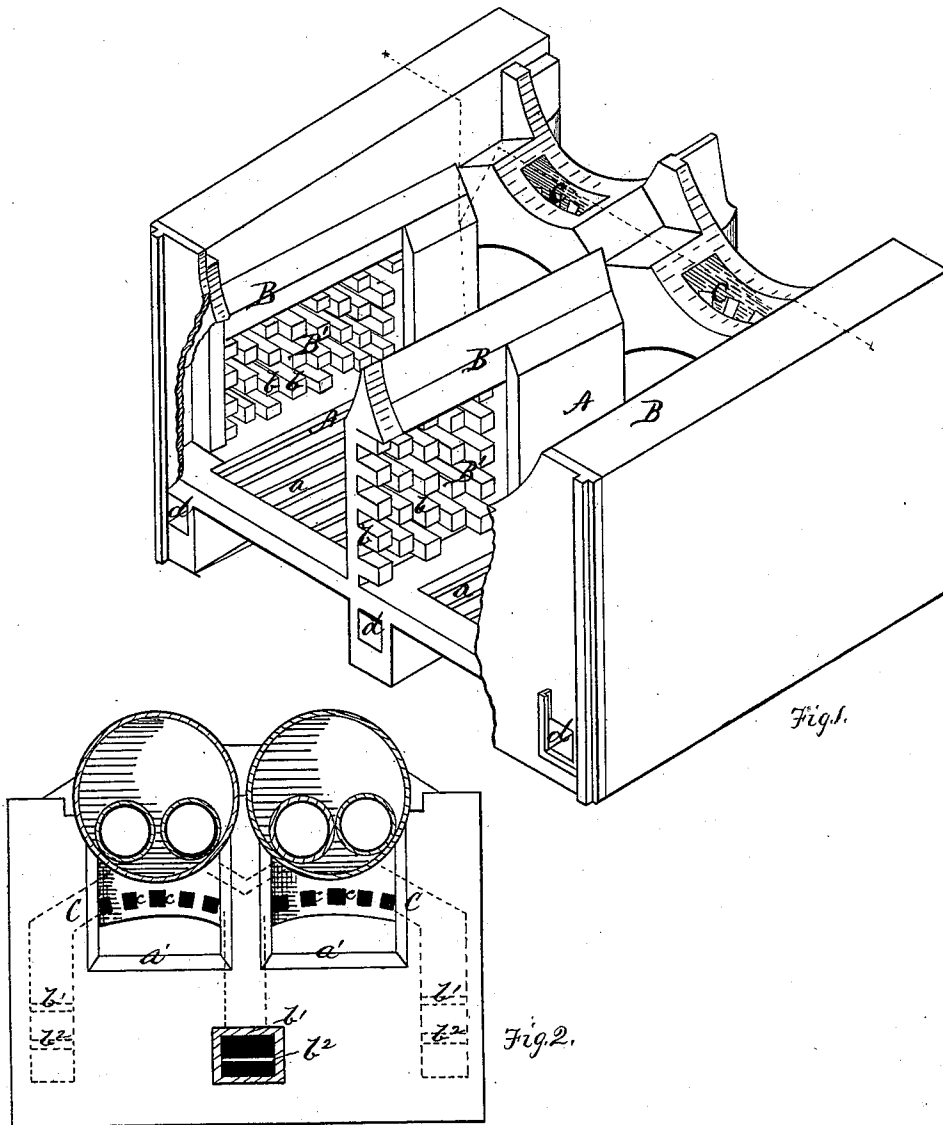


H. SWINDELL.

HEATING AND FEEDING AIR TO BOILER FURNACES.

No. 177,436.

Patented May 16, 1876.



WITNESSES.

R. L. Wanshall
James I. Kay

INVENTOR

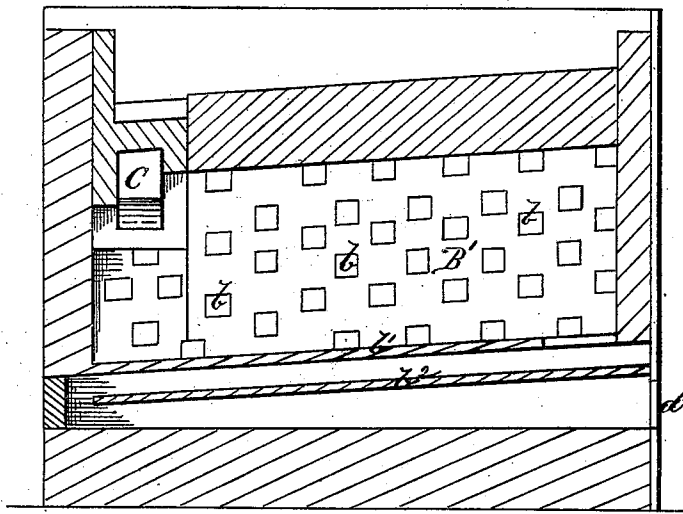
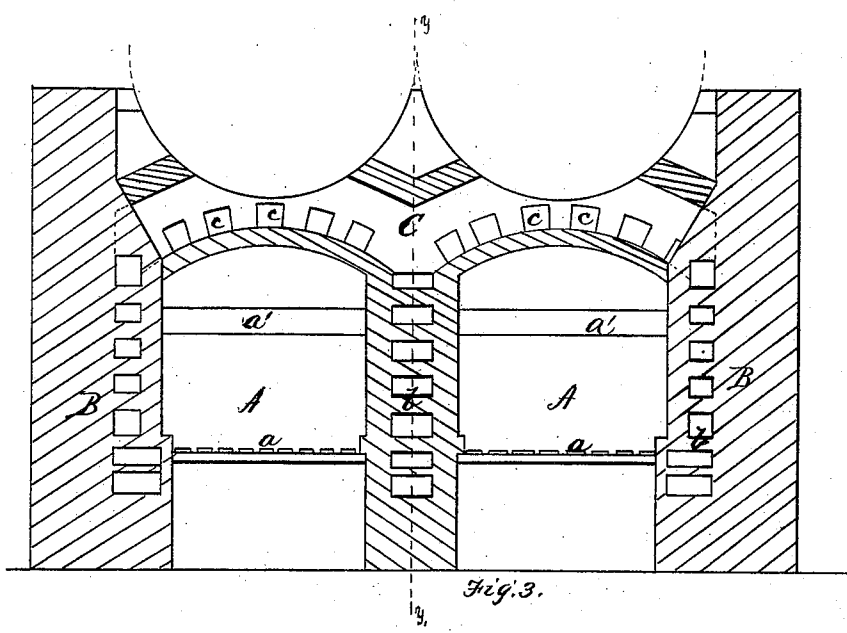
Henry Swindell
By Babewell & Kerr
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Fig. 4.

INVENTOR

Henry Swindell
by Bakewell & Kerr
Atty.

UNITED STATES PATENT OFFICE

HENRY SWINDELL, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN HEATING AND FEEDING AIR TO BOILER-FURNACES.

Specification forming part of Letters Patent No. 177,436, dated May 16, 1876; application filed February 17, 1876.

To all whom it may concern:

Be it known that I, HENRY SWINDELL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Boiler-Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a front view, in perspective, of a boiler-furnace embodying my invention, parts being broken away to show the arrangement and construction of the side walls. Fig. 2 is a view in rear of the bridge-walls; showing the air-ports of the arch. Fig. 3 is a section on line *x x*, showing flue of arch; and Fig. 4 is a section on the line *y y*, showing the regenerator-chambers.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of boiler and similar furnaces.

I will now proceed to describe my invention so that others skilled in the art to which it appertains may make and use the same.

In the drawing, *A A* indicate a series of boiler-furnaces, having the grate-bars *a a* and bridge-walls *a' a'*. *B* are the side and partition walls of the furnaces, built hollow, so as to form hot-air flues or heating-chambers *B'*, across which extend a series of check walls or bricks, *b b*, preferably alternately arranged, or so as to break spaces, and thus deflect and retard the air currents. The lower portion of the heating-chambers or air-flues *B'* are provided with cross-walls *b¹ b²*, forming a tortuous passage, through which the air is admitted, and the upper rear portions of *B'* communicate directly with a transverse or arch-flue, *C*, preferably located directly over the bridge-walls of furnaces *A*. *C* is a flue, which receives the heated air from the side or heating flues *B'*, and is perforated, as at *c c*, so as to discharge downward and backward into the products of combustion escaping from the furnaces, thus insuring the burning of any combustible gases escaping into the flues from furnaces *A*. *d d* are a series of doors or dampers placed at the mouth, or in the length of the air-passages which lead to the heating-chamber *B'*, by means of which the amount of air admitted to the heaters may be controlled.

The operation of these devices is as follows:

The doors or dampers *d d* being raised to admit the requisite amount of air, the air passes backward below the diaphragm *b²* and returns through the passage formed by *b¹* and *b²*, as shown by the arrows, escapes thence into the chambers *B'*, and is deflected by the checks or brick-work *b b*, which break up any currents that are formed and thoroughly heat the air. From *B'* the heated air passes into the arch or transverse flue *C*, and escapes into and mingles with the gas which passes the bridge-walls of furnaces *A*, promoting combustion in the flues beyond the furnaces, and utilizing to the full extent the fuel employed.

The advantages derived from the construction specified are, first, that air-currents, which would be detrimental to the combustion which takes place in the flues in rear of the bridge-walls, are avoided; and secondly, the checks, which cross the heating-chambers, take up and transmit the heat of the furnace-walls, insuring a full and uniform heating of the incoming air, so that strata of different temperatures do not form as in heating-chambers, where no means of deflecting the air-currents are employed. The volume of air passing through the heating-chambers will be regulated by raising or lowering the dampers accordingly, as the products of combustion, escaping from the stack, indicate that more or less air is needed.

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

1. In combination with a boiler or similar furnace, the air-flue *B'*, having the series of check-blocks *b b* and the transverse walls *b¹ b²*, substantially as and for the purpose specified.

2. The combination of the air-flues *B'*, provided with check-blocks *b b* and the transverse or arch flue *C*, substantially as and for the purpose specified.

3. In combination with the series of air-flues or chambers, arranged in the side walls of the furnaces, the transverse or collecting and discharging flue, substantially as specified.

In testimony whereof I, the said HENRY SWINDELL, have hereunto set my hand.

HENRY SWINDELL.

Witnesses:

F. W. RITTER, Jr.,
JAMES I. KAY.