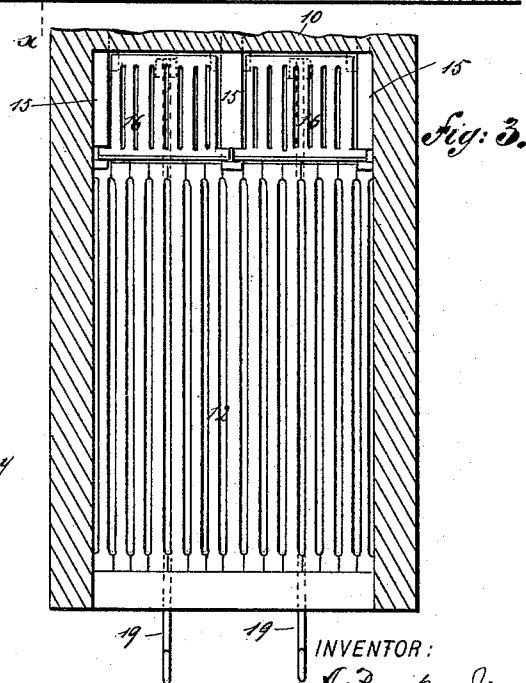
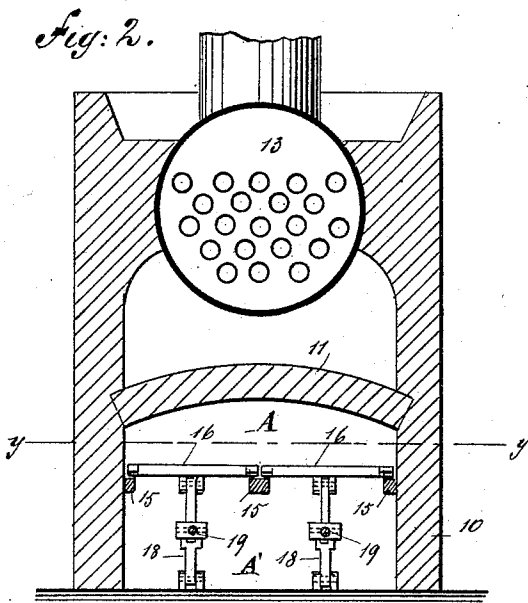
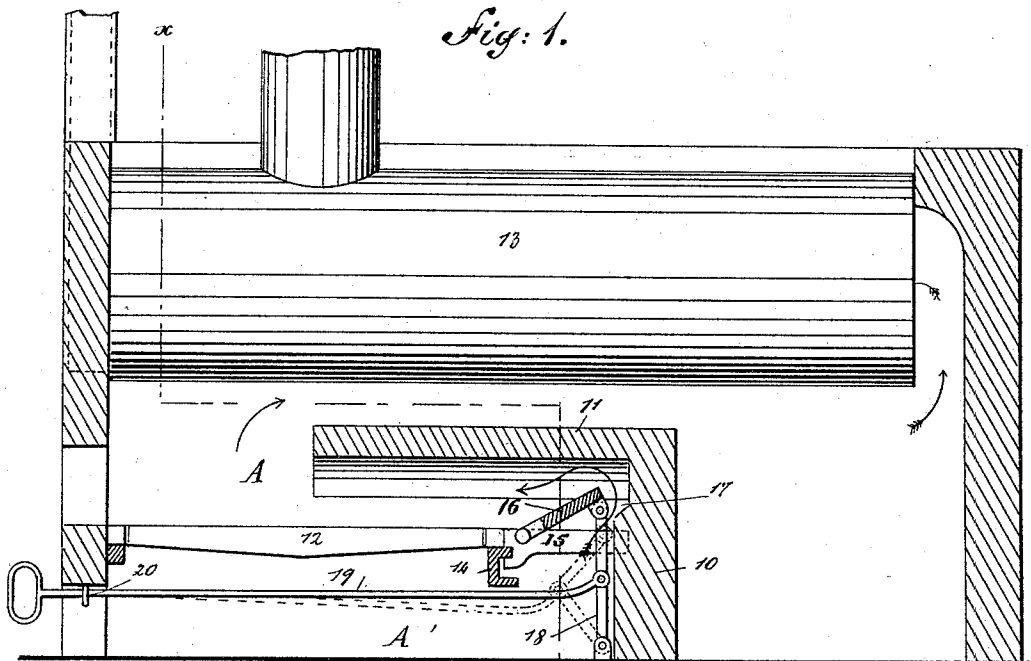


(No Model.)

A. BACKUS, Jr.
FURNACE.

No. 463,023.

Patented Nov. 10, 1891.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ABSALOM BACKUS, JR., OF DETROIT, MICHIGAN.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 463,023, dated November 10, 1891.

Application filed January 13, 1891. Serial No. 377,604. (No model.)

To all whom it may concern:

Be it known that I, ABSALOM BACKUS, JR., of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful
5 Improvement in Furnaces, of which the following is a full, clear, and exact description.

My invention relates to an improvement in furnaces, and has for its object to provide a furnace of exceedingly simple, durable, and
10 economic construction, and to provide a means whereby perfect combustion will take place and a uniform maximum degree of heat may be obtained, and a decided economy in the use of fuel.

15 The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying
20 drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal vertical section
25 through a furnace embodying my improvements. Fig. 2 is a section taken practically on the line *x x* of Fig. 1, and Fig. 3 is a horizontal section through the fire-chamber, taken above the grate on the line *y y* in Fig. 2.

30 The bridge-wall 10 of the furnace is connected at its upper end with the rear end of an arch 11, located within the fire-chamber A, which arch is so placed that a suitable space intervenes between it and the grate 12, and
35 also between it and the boiler 13 when the furnace is employed for heating the latter. The arch extends from side to side of the fire-chamber and terminates longitudinally at a point at or near the center of the grate or the
40 fire-chamber, as is best illustrated in Fig. 1. The inner end of the grate 12 is supported upon an L or U shaped bar 14, the ends of which are secured in the sides of the fire-chamber, the said bar being located some distance
45 in front of the bridge-wall 10. The grate may be of any suitable or approved construction.

Upon the upper horizontal member of the angle bar or beam 14 the forward ends of a series of spacing-bars 15 are supported, the
50 rear ends of which bars are seated in the bridge-wall 10, as shown in Figs. 1 and 3. Be-

tween the spacing-bars 15 a series of gates or dampers 16 is pivoted at their forward or outer ends. The inner or rear ends of which gates or dampers, when the said dampers are
55 closed, are adapted to rest upon a shoulder 17, formed in the bridge-wall, as shown in Fig. 1, or the said dampers may be otherwise supported, if in practice it be found desirable.

Each damper has preferably secured to its
60 free end the upper extremity of a toggle-lever 18, the lower ends of the toggle-levers being pivoted to any suitable support formed, preferably, upon the floor of the ash-pit A'. The toggle-levers at the pivotal connection of
65 their members have pivotally attached thereto rods 19, which extend below the grate and out through the front of the ash-pit opening, being guided by suitable staples 20 or their
70 equivalent.

In operation the amount of air to be supplied to the fire is regulated by the manipulation of the rods 19 to open or to close the dampers or to partially open or close them. The air is supplied to the grate through the
75 ash-pit opening, from whence, when the dampers are open, it passes upward through the spaces at the rear of the grate under the arch, and is deflected thereby and forced
80 downward upon the fire, and after passing over the fire the air, together with the products of combustion, passes up over the arch 11 and is there superheated, and from thence the products of combustion, which by reason
85 of the oxygen mingled with them are in a high state of combustion, pass through the tubes of the boiler and out through the off-take flue of the furnace.

It will be observed that the air admitted is under perfect control, and that the heat may
90 contact with the boiler throughout its entire length, no obstruction being in the way. It will be further observed that the arch serves the purpose of a superheater, thereby adding materially to the intensity of the heat below
95 the center of the boiler.

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

1. In a furnace, a bridge-wall having an
100 arch connected therewith, extending within the fire-chamber over the grate, and also pro-

vided with a space between the grate and the bridge-wall and upward-opening dampers located within the said spaces with their rear edges next to the bridge-wall, as and for the
5 purpose specified.

2. A furnace provided with an arch connected with the top of the bridge-wall and extending within the fire-chamber some distance over the grate, and also provided with an opening
10 beneath the arch between the grate and the bridge-wall, upward-opening dampers located within the said openings with their rear edges next to the bridge-wall, and a mechanism for opening or closing the dampers, sub-
15 stantially as specified.

3. In a furnace, the combination, with the fire-chamber and an arch located at the rear

portion of the fire-chamber and connected with the bridge wall or back of the fire-chamber, of a grate, of less length than the fire-
20 chamber, located beneath the arch, whereby a space intervenes between the grate and the bridge wall or back of the chamber, upward-opening dampers pivotally located in the said
25 space with their rear end resting on a shoulder or stop 17 on the bridge-wall, and a shifting mechanism, substantially as described, connected with the dampers, whereby they may be raised or lowered, as and for the purpose specified.

ABSALOM BACKUS, JR.

Witnesses:

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