

J. I. QUARMBY AND E. J. AND S. R. EWING.

HOT AIR FURNACE.

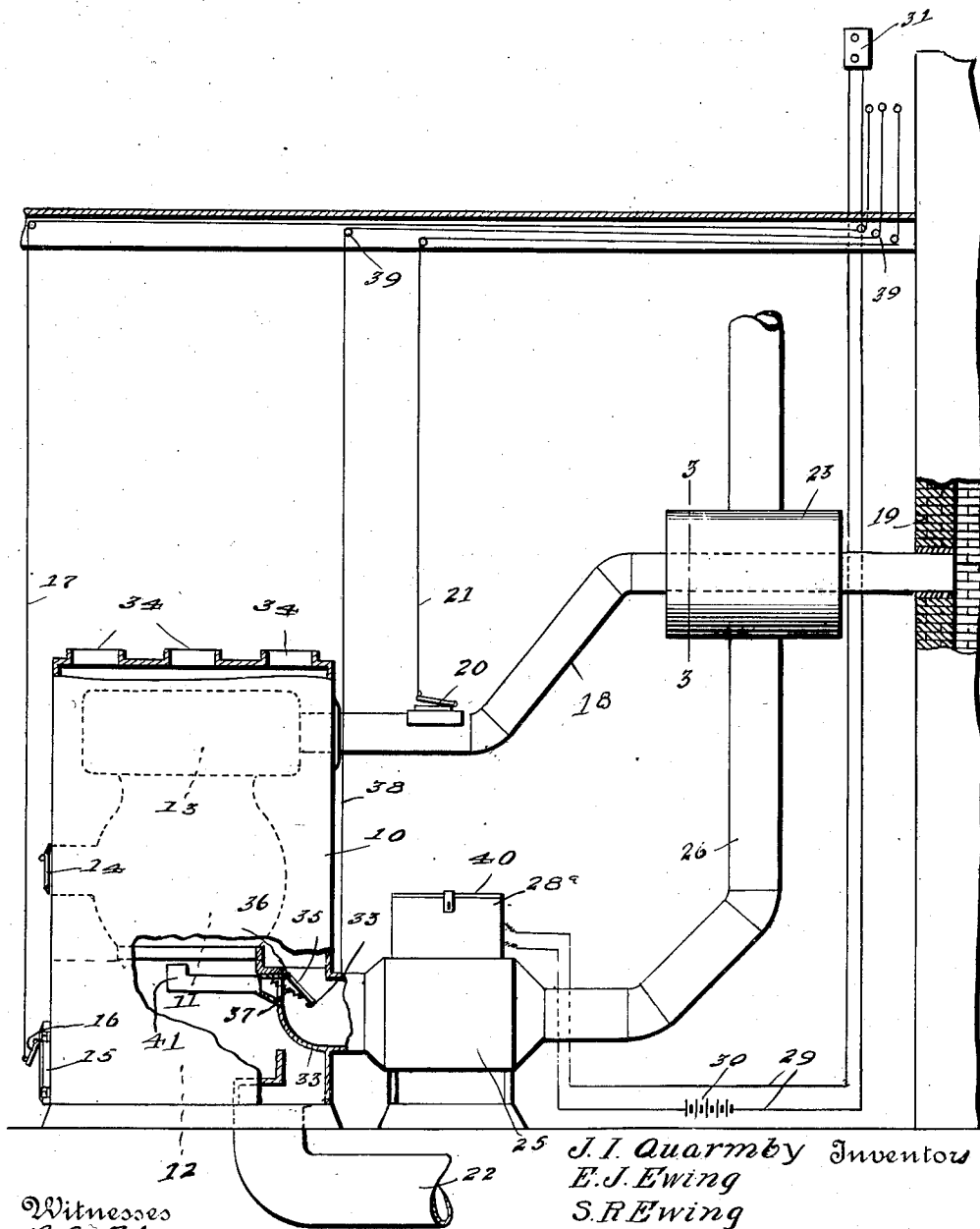
APPLICATION FILED APR. 18, 1919.

1,384,635.

Patented July 12, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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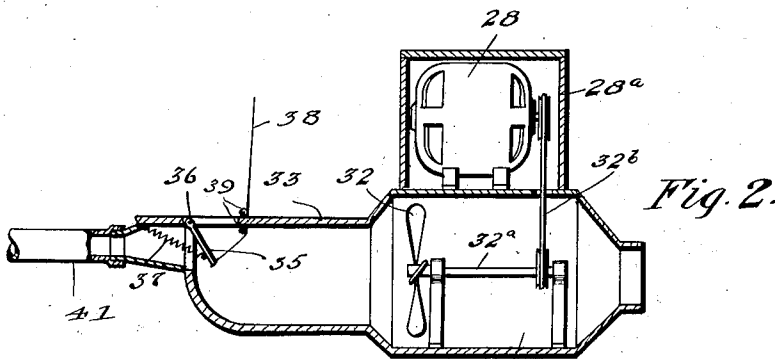
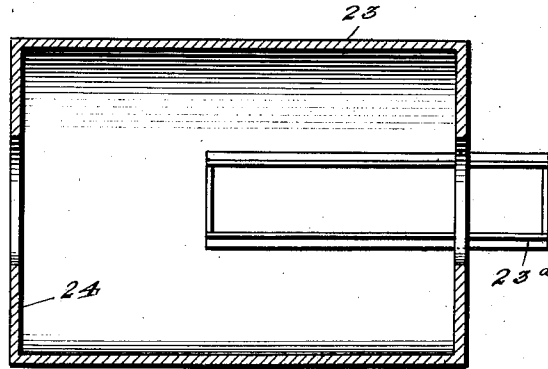
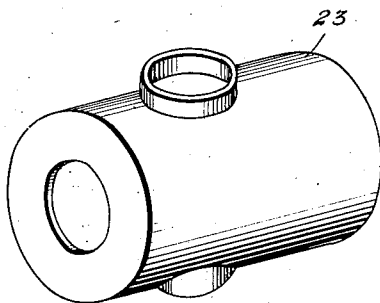
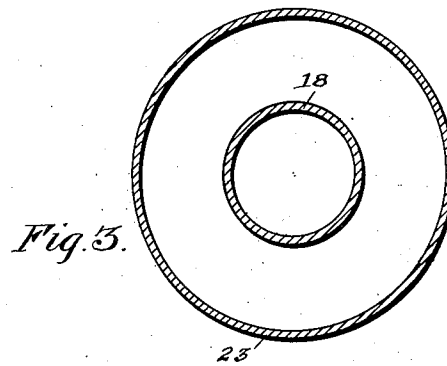
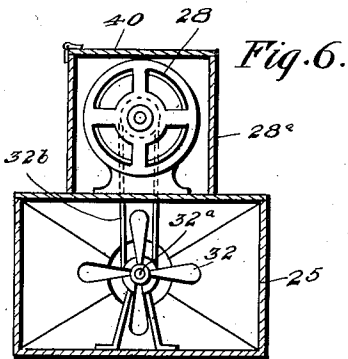
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UNITED STATES PATENT OFFICE.

JONATHAN I. QUARMBY, EARL J. EWING, AND SAMUEL R. EWING, OF LANSING, MICHIGAN.

HOT-AIR FURNACE.

1,384,635.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JONATHAN I. QUARMBY, EARL J. EWING, and SAMUEL R. EWING, citizens of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

10 This invention relates to furnaces and more particularly to means for regulating a fire by providing an apparatus especially designed for use in connection with heating furnaces.

15 An object of the invention is to provide an apparatus to be used in connection with furnaces for supplying pre-heated air to the fire box to aid combustion, which results in a material reduction in the amount of fuel consumed for a given amount of heat, thereby reducing the cost of operation.

20 Another object is to provide means for quickly starting a fire and for quickly extinguishing the same, so that when desired a high temperature may be obtained in a very short time.

25 Other objects and advantages of the invention will appear as the following description is read in connection with the accompanying drawings.

30 In the drawings:

Figure 1 is a view partly in section and partly in elevation, illustrating the invention.

35 Fig. 2 is an enlarged sectional view taken through the suction or mixing chamber illustrating the manner of forcing the pre-heated air into the furnace.

40 Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a detail perspective view of the hot air drum.

45 Fig. 5 is a sectional view through the hot air drum illustrating the moisture or water tank therein, the section being taken on a line with the smoke pipe.

50 Fig. 6 is an enlarged sectional view through the suction chamber, the section being at right angles to the one shown in Fig. 2.

Referring to the drawings in detail, like characters of reference denote corresponding parts throughout the several views.

55 The invention is illustrated as applied to a furnace of the hot-air type, but it is un-

derstood that the invention may also be used in connection with other types of furnaces or stoves. The furnace, which is shown at 10, includes the usual fire box 11, ash pit 12 and dome 13. The fire box is provided with the usual door 14 and the ash pit with a door 15, having therein the usual damper 16, the latter being controlled through the medium of a chain or cable 17, leading to some convenient point. 18 indicates a smoke pipe, which leads from the furnace to the flue 19, the said pipe being equipped with a damper 20, which is controlled by a chain or cable 21. Cold air is supplied to the furnace so as to promote combustion, and for this purpose there is provided the usual cold air intake 22, which communicates with the interior of the furnace through the ash pit and beneath the fire box.

60 All of the foregoing construction may be of the usual or any preferred type, the invention residing in supplying pre-heated air and moisture to the interior of the furnace. For this purpose there is located upon the smoke pipe 18, a heating drum 23, the walls of this drum surrounding the pipe and being spaced from the latter to provide for circulation of air. Positioned within the drum 23, is a receptacle 23^a, which is adapted to contain water, so that the heat within the drum 23 will vaporize the water and cause it to mix with the air.

75 Located near the bottom of the furnace is a combined suction and drum 25, the latter communicating with the interior of the drum 23 through the medium of a pipe 26. The drum 25 is also in communication with the cold air intake through the medium of a pipe 27, which forms a continuation of the pipe 26 and extends from the opposite side of the hot air drum 23. By this means cold air will be admitted through the pipe 27 and will enter the drum 23, where it will become heated and moistened by the water in the receptacle 23^a, and pass through the pipe 26 into the drum 25, where it will be fed to the furnace through the lower rear end thereof.

80 To provide for drawing in the heated air from the drum 23 and forcing the same into the furnace, there is provided a motor 28, which is mounted within a casing 28^a, and is included in an electric circuit 29, having a suitable source of electric energy 30 and a push button 31, by means of which the motor 105 110

is controlled. The motor 28 is designed to operate a fan 32, which is mounted upon a shaft 32^a, located within the chamber 25; the said shaft being driven by a belt 32^b from the motor. The heated air is forced by the fan through a short pipe section 33 into the furnace chamber and rises upward and circulates around the fire box 11 and the dome 13 before passing through the openings 34 into the distributing pipes. The heated air is thus caused to travel through all of the distributing pipes in an even volume, the distribution of heat being assured irrespective of the angle or length of the distributing pipes. By locating the button 31 at a convenient point, the motor 28 may be operated, when desired, to force the flow of air through the pipes.

The short pipe 33 is controlled by a damper 35, the latter being hinged, as indicated at 36, so as to obstruct the passage of air upward around the outside of the fire box, when desired, this damper being normally urged to an open position through the medium of a spring 37. A chain or cable 38 has one end connected to the damper 35 and passes over pulleys 39 to some convenient point of operation. In order to gain access to the interior of the combined mixing and suction chamber, there is provided a door 40, located in the top thereof.

To prevent the ashes from being blown through the door 15 of the ash pit, there is provided a pipe 41, which communicates with the short pipe section 33 to direct the draft upward through the fire box when the damper 35 is properly regulated.

It is believed that when the foregoing description is read in connection with the accompanying drawing, the construction, operation and advantages of the invention will be apparent.

Various changes may be made in the form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention, what is claimed is:

1. A hot air furnace of the class described comprising a smoke pipe leading therefrom, a heating drum mounted upon said smoke pipe, a cold air intake pipe passing through said drum, a drum connected with said intake pipe, a firebox contained within said furnace, a motor mounted within a casing to provide for drawing heated air therefrom, and forcing same into the furnace, a shaft located within said chamber, a belt provided on said motor for driving said shaft, a fan mounted upon said shaft located within said drum, and a short pipe section mounted upon said shaft located within said drum.

2. A hot air furnace of the class described comprising a smoke pipe leading therefrom, a heating drum mounted upon said smoke pipe, a cold air intake pipe passing through said drum, a drum connected with said intake pipe, a fire box contained within said furnace, a motor mounted within a casing to provide for drawing heated air therefrom and forcing same into the furnace, a shaft located within said chamber, a belt provided on said motor for driving said shaft, a fan mounted upon said shaft located within said drum, a short pipe section mounted upon said shaft located within said drum, a receptacle positioned within said drum and adapted to contain water so that the heat within the drum will vaporize the water and cause same to mix with the air, a damper controlling said short pipe section so as to obstruct the air upward around the outside of the fire box when desired, a spring for normally urging the damper to an open position, and a pipe communicating with said short pipe section for directing the draft upward through the fire box when the said damper is properly regulated.

In testimony whereof we affix our signatures.

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