No. 676,566. Patented June 18, 1901.

# A. MAGNUSON.

## HEATING FURNACE.

Application filed Jan. 22, 1901.

(No Model.)

Fig. 1.

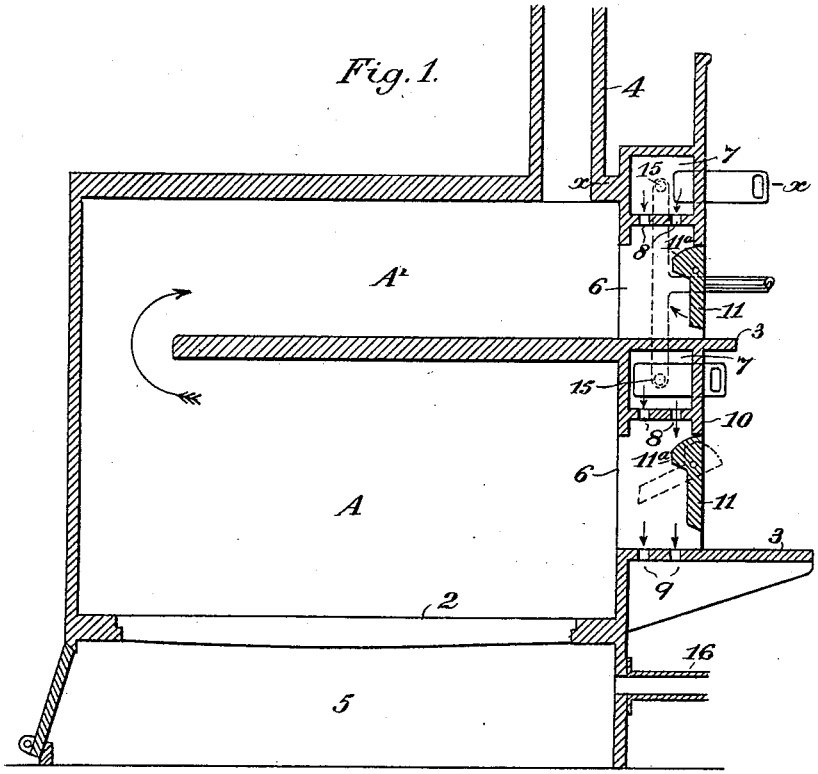



Fig. 2.

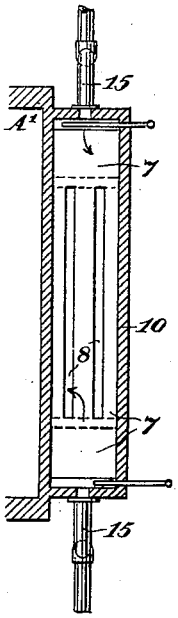
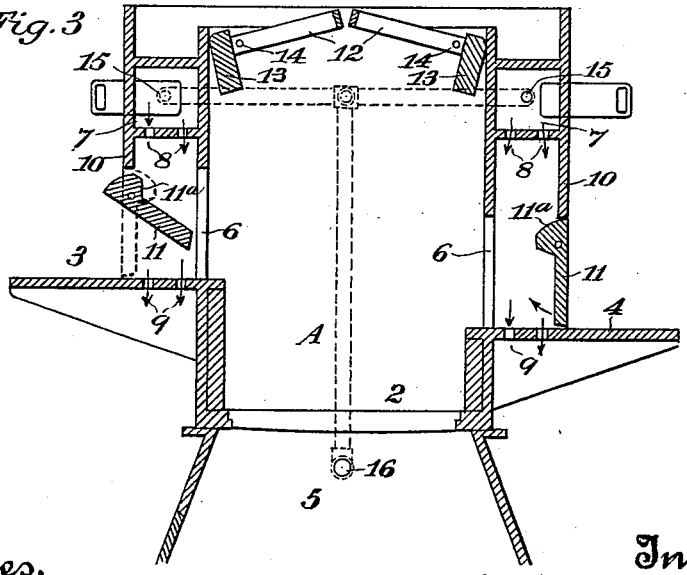



Fig. 3

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# UNITED STATES PATENT OFFICE.

ALFRED MAGNUSON, OF EMERYVILLE, CALIFORNIA.

## HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 676,566, dated June 18, 1901.

Application filed January 22, 1901. Serial No. 44,261. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED MAGNUSON, a citizen of the United States, residing at Emeryville, county of Alameda, State of California, have invented an Improvement in Heating-Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in furnaces for heating purposes. It relates to that class of furnaces which are employed for various purposes—such as for heating rods, bolts, ironwork for blacksmithing, and the like—and generally for any purpose where a strong heat is required.

The object of the invention is to provide a means for preventing the escape of heat through the doors of the furnace and for protecting the workmen from the hot blast which would otherwise be thus produced. It is also designed for preventing the too-free escape of heat through the top of the furnace when the latter is opened, but to allow for such escape when necessary.

It consists in the combination, with a furnace, of one or more wind boxes or compartments located with relation to the doors or openings to be protected, means for supplying an air-blast into such chambers, and means for delivering an air-blast transversely of the doors or openings and in such a manner as to cut off the heat from the interior of the furnace and prevent its escaping.

It also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section through my heating-furnace. Fig. 2 is a horizontal section on the line *x x* of Fig. 1. Fig. 3 is a longitudinal section showing a modification.

In the drawings here presented I have shown two forms of furnace in which my invention may be applied.

A is the furnace proper, which may be of any suitable or well-known description, and 2 is the grate upon which the fuel is placed.

3 represents hearths, which for convenience are placed in front of and below the door-openings, forming a rest and support for material which is to be introduced into or removed from the furnace.

5 is the ash-pit, located below the grates.

The furnace may have one or more heating-compartments. As shown in Fig. 1, the heat passes back through the lower compartment A and returns from the rear through an upper compartment A′. Each of these compartments is provided with door-openings, as at 6, and the combustion of the fuel in the lower chamber produces flame heat and gases which return through the upper compartment and furnish sufficient heat, so that articles may be heated in both upper and lower compartments.

4 is an escape-chimney for the waste products of combustion.

The furnace as shown in Fig. 2 is especially adapted for the heating of bolts by laying the latter upon the hearth, with the ends to be heated projecting into the furnace. In this case, for convenience and economy, there may be a plurality of hearths 3, over which access is had to the interior of the furnace from opposite sides.

The feature of my invention is the employment of one or more wind boxes or chambers 7, which extend above or between the doors, and these are so arranged as to receive air from any suitable air-blast apparatus, as through pipes 15. In the bottom of each wind-box are made slots or openings 8, in line above the space which is formed between the outer wall of the furnace and the supplemental wall or front 10, which stands vertically and essentially parallel with the furnace-wall and exterior to the wind-boxes. In line beneath the slots or openings 8 are similar openings 9, made through the hearth or lower part, so that the blast of air delivered from the box 7, passing down through the openings 8 and 9, will form a movable fluid wall, which effectually prevents the heat of the furnace being blown out and escaping through the furnace front or openings. The supplemental fronts 10 are provided with doors 11, having counterweights, as $11^a$, formed with or attached to them in such a manner that the doors pivoted at their opposite ends may be swung upon their pivots, so as to open and allow access to the interior of the furnace; but when released these doors will swing and close automatically by gravitation.

The air-blast discharged transversely to

the door-openings acts at all times to cut off any escape of heat outwardly when the doors are opened and also serves to keep the doors and the exterior surfaces measurably cool whatever may be the heat of the furnace. Any suitable blast may be employed, such as a force-blast introduced through the pipe 16 below the grates, thus providing a sufficient amount of air for combustion of the fuel.

In furnaces of the class shown in Fig. 2 and which are, as before described, usually employed for the heating of bolts and small articles, the top of the furnace is open and has grated bars 12, fulcrumed, as at 14, and having counterweights, as at 13, which act so that the doors are normally closed together at the center, lying approximately horizontal, while the hinges, being at the outer ends of the doors, whenever a strong blast of air or heat passes up, as when new fuel is thrown into the furnace and a temporary escape of gas takes place, these gratings will open to allow the surplus of gas to escape and will thereafter close by gravitation. The openings in these gratings are sufficient to normally allow the gases generated in the furnace to escape; but the whole construction serves to retain the greatest amount of heat in the furnace and not to waste fuel, and the operators are amply protected from the effects of the heat, which would otherwise escape through the doors.

I have here shown two forms of furnace to which my invention is applicable; but it will be manifest that it can be used in conjunction with furnaces of any class where it is desired to cut off and prevent the escape of heat from the interior through working openings.

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

1. The combination with a furnace having openings in its front, of a rigid inclosure fixed to and extending beyond said front and forming wind-boxes, and means for discharging air through said boxes transversely to said openings.

2. The combination with a furnace having openings, of a rigid and immovable structure forming an extension of the front of the furnace, and means for discharging air through the extension and across the furnace-openings.

3. The combination with a furnace having a front with openings therethrough of a supplemental front parallel with the furnace-front, having corresponding openings, one or more wind-boxes located between the two fronts, means for supplying them with air under pressure, and channels in said boxes whereby currents of air are discharged transversely to the door-openings.

4. The combination with a furnace, and the vertical front thereof, having openings, of a supplemental front parallel with the furnace-front having corresponding openings, one or more wind-boxes located between said fronts and above the openings, slots through which air from said boxes is delivered transversely across the openings, and counterweighted automatically-swinging doors pivoted in the exterior fronts.

5. The combination with a furnace and its vertical front having door-openings therethrough, of a horizontal hearth or projection below the opening, a second front parallel with and exterior to the furnace-front, wind-boxes located above the door-opening, with means for supplying them with air under pressure, slots made in the bottom of the wind-boxes, and corresponding slots made in a vertical plane therewith through the hearths whereby a sheet of air under pressure is caused to move transversely across the door-opening.

6. The combination in a furnace of the double front with openings therethrough, wind-boxes located between the fronts having slots or channels through which air under pressure is delivered transversely to the door-openings and hinged counterbalanced gratings suspended above the furnace-body substantially as described.

In witness whereof I have hereunto set my hand.

ALFRED MAGNUSON.

Witnesses:
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