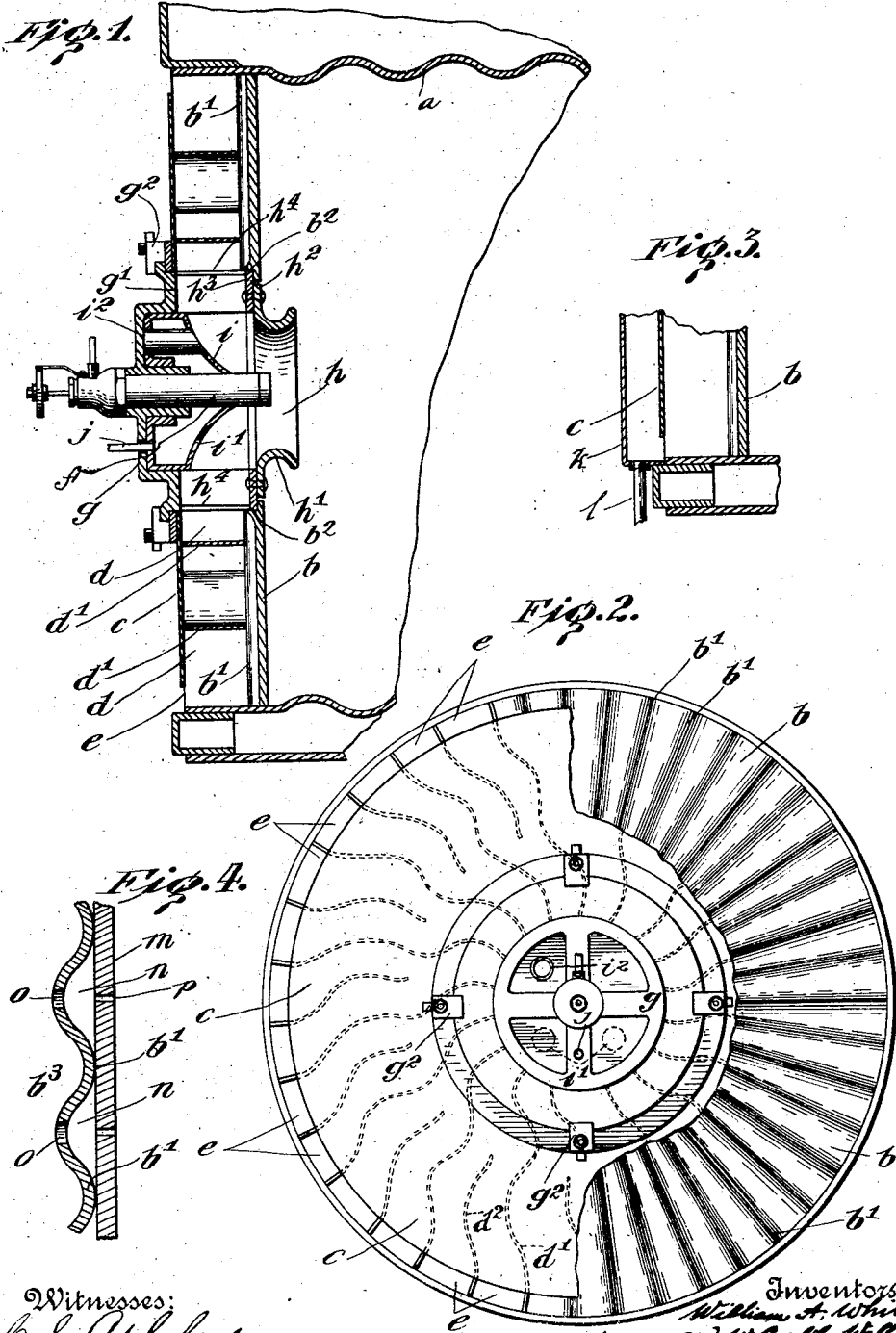


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FURNACE FRONT.

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1,082,576.

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FURNACE-FRONT.

1,082,576.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, WILLIAM A. WHITE, a citizen of the United States, and WILLIAM CARLILE WALLACE, a subject of King George V, both residents of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Furnace-Fronts, of which the following is a specification.

This invention relates to oil burning furnaces and our improvements therein may be briefly summarized as follows: First: by the provision in a hollow furnace front, of centering irregular heat passages in which to break up and preheat the air supplied for combustion. Second: in conjunction with the heated air supply aforesaid, and a centrally arranged oil burner, the provision of a concentric air inlet passage, said passage having a constricted or Venturi-like neck. Third: in conjunction with the aforesaid heated air supply, oil burner and concentric air inlet, the provision of an approximately cone faced valve, slidable longitudinally upon the burner tube and adapted to regulate the quantity of heated air supplied to the burner.

In the drawing accompanying this application: Figure 1 is a vertical section of a furnace front having our improvements; Fig. 2 is a front view thereof, partly broken away to expose the radial corrugations on the inner plate; Fig. 3 is a detail showing a partial view of the furnace front with air box and pressure pipe, and Fig. 4 is a modification showing a partial detail view of the corrugated inner plate showing a protecting plate therefor with air exits.

In said figures the letter *a* indicates the shell of an oil burning furnace, of which the front portion is constructed according to my invention. Said front portion is composed in part of the inner circular furnace or heat plate *b*, having radial corrugations *b'*, to enhance rigidity while providing a maximum of heating surface, an outer, circular plate, as *c*, being separated from plate *b* by an intervening space, which is divided into a number of centering passages *d* by a series of undulating, radial partitions *d'*, and short intermediate partitions *d''*. Air inlets, as *e*, are provided near the periphery of plate *c*, and the air received thereat, in passing to the center is broken in its pas-

sage by impingement against the undulations or angular surfaces of partitions *d'*. An oil burner, as *f*, is supported centrally and axially through plate *c*, as by a spider or housing *g*, which may be bolted to said plate *c*; the burner nozzle projecting toward the furnace interior, through a central opening formed in plate *b*. Projecting inwardly from plate *b*, in concentric relation with the oil burner *f*, is an air outlet or supply tube *h*, said outlet extending inwardly beyond the burner nozzle, and having a constricted or Venturi-like neck portion *h'*, to increase the velocity of air inflow at the point of initial combustion.

An approximately cone-faced valve, as *i*, is mounted concentrically about and adapted to slide longitudinally along the burner tube, to increase or decrease the size of the air passage allowed through outlet *h*, and thereby regulate the quantity of preheated air for combustion supplied to the burner. The valve *i* may be hollow, and have openings *i'* in its cone face to permit air to circulate about the burner tube. Said valve may also have an observation opening or tube *i''* therethrough. A bolt or stud, as *j*, extending from the rear of valve *i*, passes outwardly through a hole provided therefor in spider *g*, and may thereby be manipulated to operate the valve.

Obviously, the supply tube *h* may be held in position in any suitable manner. As here shown it has an annular flange *h²*, by which it is bolted to a ring *h³*, held against the outer surface of plate *b*, lying within a recess *b²* therein, whereby it may be easily removed. The spider *g* has a flange *g'* through which it is held in engagement with the plate *c* by pivotal catches as *g²*. Connections as the legs *h⁴* connect spider *g* with ring *h³*. In this manner the spider *g*, carrying the burner, valve and supply tube may be easily adjusted and secured in place, or removed.

When it is desired to furnish assisted draft to the furnace, a circular air box, as *k*, may be provided exteriorly of plate *c*, enclosing the inlets *e*, (see Fig. 3) a supply pipe, as *l*, communicating therewith from a compressed air supply. In the modification shown in Fig. 4 we may employ an interior relatively thick plate, as *m*, lying against the corrugated plate *b³*, to protect said plate from the intense heat of the furnace and

thus prolong its life. In this manner air spaces *n* will be formed between plate *m* and the channels formed by the corrugations of plate *l*². Relatively large sized apertures *o* may be provided in corrugations of plate *l*², communicating with spaces *n*, and relatively small apertures *p* in plate *m* permit streams of heated air from spaces *n* to enter the furnace over an extended area to assist combustion.

In the operation of our invention, the valve *i* being adjusted to supply the requisite quota of air to the burner, the air passing through passages *d*, is broken in its traverse by impingement against the angular surfaces presented by the undulating partitions *d'*, and is raised in temperature by passing over the heated partitions. The valve regulated quota of heated air is delivered through the constricted supply tube at the initial combustion zone, the arrangement provided assisting in the promotion of high efficiency in combustion.

We claim:

1. A furnace front having a series of irregularly curved, centering, air heating and supply passages in the same vertical plane therein, an oil burner axially penetrating said front, and means supplying heated air from said passages to the combustion zone of said burner.

2. A furnace front composed of a corrugated inner plate, an outer plate separated therefrom, a series of inwardly directed, heat conducting, irregularly curved partitions forming passages between said plates, air inlets at the periphery of said outer plate, and a central outlet in said inner plate; together with an oil burner penetrating said front and an air supply tube extending inwardly from said outlet in concentric relation to the burner nozzle.

3. A furnace front having an air heating and supply passage therein, an oil burner extending through said front, and a constricted supply tube, outwardly flared at both ends, for the heated air, in concentric relation to the burner nozzle, said burner nozzle lying within said supply tube whereby the air impinges on the fuel jet within said tube.

4. A furnace front having an air heating and supply passage therein, an inlet there-

for, and a constricted supply tube, outwardly flared at both ends; together with an oil burner directed toward and terminating within said supply tube, and a conoidal faced valve to regulate the flow of air through said supply tube.

5. A furnace front having an air heating and supply passage therein, an inlet therefor, and a constricted supply tube, outwardly flared at both ends; together with an oil burner axially penetrating said front and terminating within said supply tube, a support for said burner, a conoidal faced valve concentric with and slidable over said burner, and having its apex presented to said supply tube, whereby the air impinges on the fuel jet within said supply tube, and means for moving said valve to and from said supply tube to regulate the air admission.

6. A furnace front composed of a corrugated plate, means conducting air to the outer surface of said plate, a protecting plate lying against the inner surface of said corrugated plate, forming covered air channels with the corrugations, said corrugated plate having relatively large air openings communicating with said air channels, and said protecting plate having relatively small air openings communicating with the furnace interior.

7. A furnace front having a burner tube axially penetrating the same, an air supply tube in concentric arrangement with said burner tube, a conoidal faced valve slidable upon said burner tube to regulate the air admission through said supply tube, a spider supporting said burner tube and valve, and a ring supporting said air supply tube; together with means uniting said burner tube, spider and ring, and means removably securing the same in the furnace front, whereby the burner tube, air supply tube and valve may be removed as a whole from said furnace front.

Signed at the borough of Manhattan in the city, county and State of New York this 22nd day of March A. D. 1912.

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