

J. AKERSTREAM & J. H. FERGUSON.
HOT AIR FURNACE.
APPLICATION FILED DEC. 19, 1907.

966,878.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

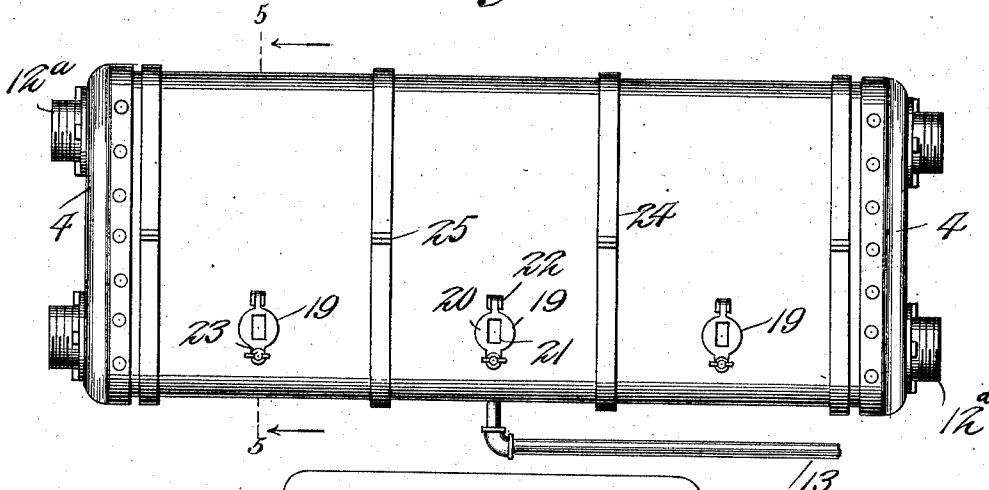


Fig. 2.

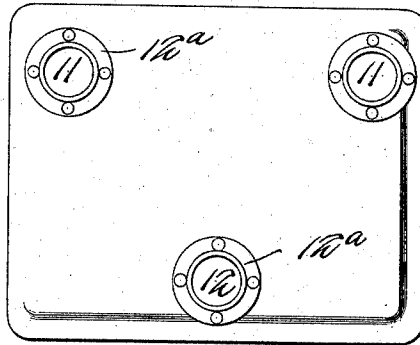
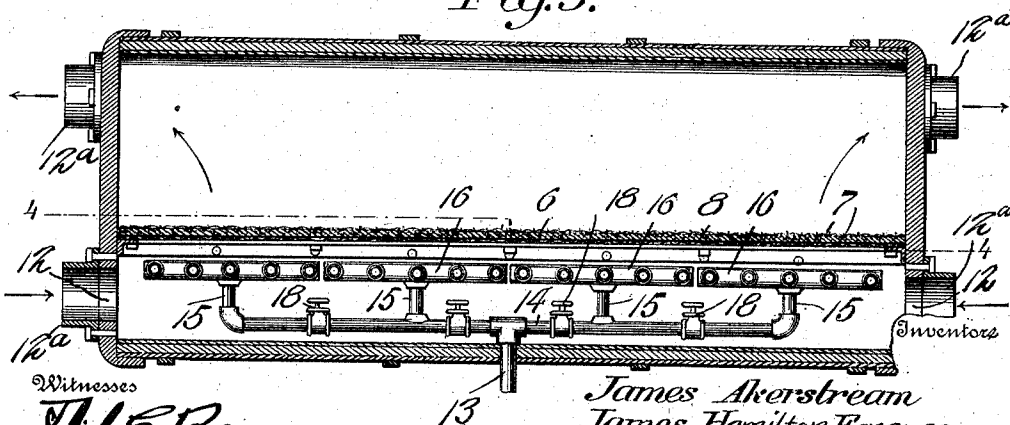


Fig. 3.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4

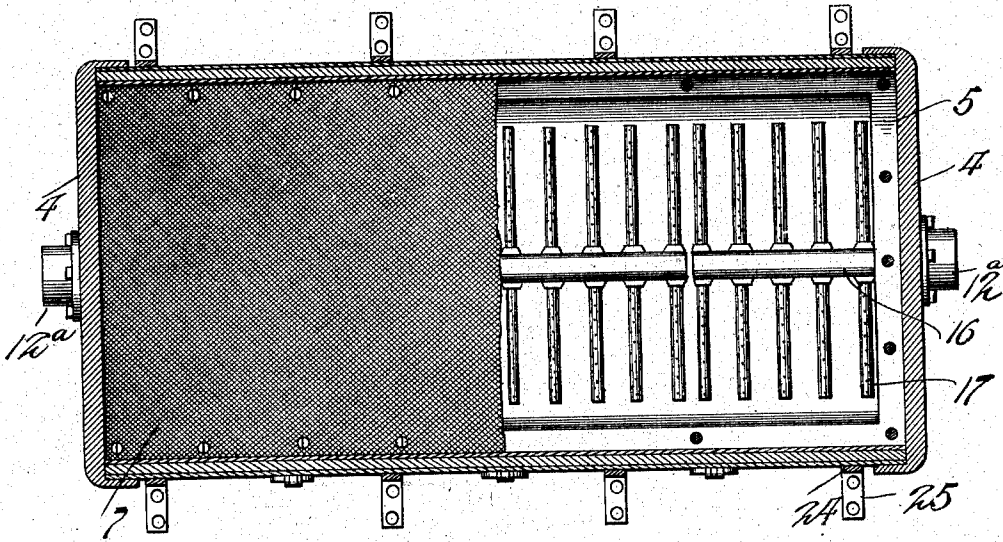
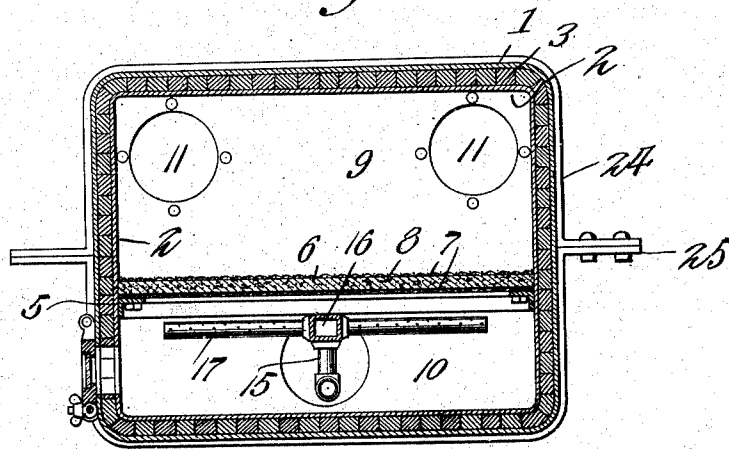


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES AKERSTREAM AND JAMES HAMILTON FERGUSON, OF WINNIPEG, MANITOBA, CANADA.

HOT-AIR FURNACE.

966,878.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed December 19, 1907. Serial No. 407,264.

To all whom it may concern:

Be it known that we, JAMES AKERSTREAM and JAMES HAMILTON FERGUSON, subjects of the King of Great Britain, residing at Winnipeg, in the Province of Manitoba and Dominion of Canada, have invented new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

This invention relates to improvements in hot air furnaces primarily adapted for the use of gaseous fuel as a heating medium. The main object of the present invention is the provision of a furnace, of the type described, wherein the heating chamber and hot air reservoir are divided by a heat storing plate which is adapted to be highly heated in the burning of the fuel and to radiate said heat into the reservoir, the storing plate being adapted for the ready passage of air therethrough so as to heat the air both by contact and radiation.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in elevation of a furnace constructed in accordance with our invention. Fig. 2 is an end elevation of the same. Fig. 3 is a longitudinal section of the same. Fig. 4 is a longitudinal horizontal section of the same on the line 4—4 of Fig. 3. Fig. 5 is a transverse section of the same.

Referring particularly to the drawings, our improved furnace comprises a shell or casing 1, preferably rectangular in transverse section and of a sectional area commensurate with the size of the furnace desired. Within the shell in spaced relation therewith is arranged an interior lining 2 of asbestos or other fire-proof material, between which lining and the shell is arranged a wood lagging 3. The ends of the shell are closed by heads 4, preferably edge flanged to overlie and engage the shell, the manner of securing the heads to the shell being immaterial so far as the present invention is concerned. At a point somewhat below the center of the shell or casing thus provided are secured angle brackets 5, said brackets extending entirely around the casing and forming a support for what we term a heat storing plate 6.

The storing plate comprises spaced layers of metallic netting 7 between which is ar-

ranged a mass of refractory material 8 such as asbestos, wool, pumice stone, fire clay, or the like, the layer of refractory material being arranged primarily to permit the passage of air therethrough.

That portion of the casing above the storing plate will be hereinafter termed the hot air reservoir, as at 9, while that portion below said storing plate will be hereinafter termed the heat chamber, as 10. The heads of the casing are provided with openings 11 arranged adjacent the sides of the casing, said openings being in communication with the hot air reservoir and serving to permit the escape of hot air into the apartment to be heated, either directly or through suitable pipes (not shown), by which the hot air may be conducted to the point of use. The openings 11 are preferably arranged near the upper edge of the head, and while shown in pairs in each head may be in any desired number or arrangement. Each head is also formed with an air inlet 12 communicating with the heating chamber, these inlets 12 serving as cold air inlets by which the air in normal condition is admitted to the heating chamber. The said heads have means whereby air inlets and hot air conveying pipes may be attached thereto for communication respectively with the lower and upper chambers of the casing, said pipe attaching means being indicated at 12^a.

The heating medium for our improved furnace is to be a gaseous fuel, and for this purpose a gas inlet pipe 13, leading from any source of supply opens through the lower part of the casing and within the latter is connected to a longitudinally disposed pipe 14 which extends longitudinally of the casing and at appropriate intervals is provided with stand pipes 15 which in turn support short feed pipes 16 into which lead a series of oppositely projecting pipes 17 perforated to permit the exit of the escaping gas, said pipes 17 thereby serving as burners. The feed pipes 16 are arranged in alinement longitudinally of the casing, each of said pipes being fed by one of the stand pipes 15, and the feed pipe 14 beyond each of the respective pipes is valved, as at 18, so that the gas supply to any one of the pipes 16 will be readily controlled. One wall of the casing is provided with a series of ports 19 in alinement with the valves 18, said ports providing for the control of the valves from

beyond the casing when desired. The ports are preferably closed by cover plates 20 centrally formed with an inspection opening 21 covered by transparent refractory material, as isinglass, whereby when the ports are closed the operator may readily determine the condition of the burners within the furnace by inspection through said openings. The covers are adapted for securing in any appropriate manner, being preferably hinged at top and having bifurcated lower extensions to receive a threaded shank of a fixed bolt 23 and to be secured thereon by the usual thumb nut.

The casing is encircled by bands 24 having laterally projected perforate sections 25, which extend centrally and laterally from the side walls of the casing. This construction provides a convenient means for supporting the furnace from any convenient fixture or base.

In use after the ignition of the respective burners and the closing of the ports 19 the cold air finds its way through the inlets 12, becomes highly heated by direct contact with the flame from the burners, and also by its passage through the heat storing plate, it being obvious that the flame from the burners will impart a sufficient degree of heat to the material of the storing plate to render the same highly heated. The air thus heated will find its way through the outlets 11 and pass to the point of use. It is, of course, understood that the air passing through the heat storing plate is heated thereby as well as by the burners, and that such air in its passage through the heat reservoir to one of the outlets is further heated by radiation from the heat storing plate. The furnace of the present invention will, therefore, quickly heat the desired quantity of air to a degree controlled by the condition of the heat storing plate, it being understood that after the storing plate has become heated the fuel supply to the burners may be gradually reduced and the heat of the storing plate mainly depended upon as the heating medium. As the air drawn in the inlets 12 is controlled in quantity by the heat condition of the interior of the furnace it is at once apparent that practically perfect combustion occurs at the burners, and hence there is no necessity for an outlet for the products of combustion and the entire heat is utilized in the air reservoir.

The material of which the furnace is composed is unimportant so far as the present invention is concerned it being understood that we contemplate the use of any appro-

priate material and the construction of the furnace in any desired sectional contour or area.

Having thus described the invention what is claimed as new, is:—

1. The herein described hot air furnace comprising a horizontally disposed casing, a horizontally disposed plate therein extending from end to end and from side to side thereof and dividing said casing into an upper chamber and a lower chamber, said plate being adapted to permit the passage of products of combustion and heated air therethrough, heads on the ends of the casing having air inlet openings to the lower chamber and further provided with means for connecting heated air conveying pipes to the upper chamber, said heads forming the end walls of the said upper and lower chambers, extending directly across the ends of the said plate and when removed affording access to both of said chambers and to said plate, and a gas supply pipe having a series of burners in the lower chamber under the said plate.

2. The herein described hot air furnace comprising a horizontally disposed casing, horizontally disposed angle brackets extending around the casing on the inner side thereof, certain of said angle brackets being secured to the walls of said casing, a horizontally disposed plate in the casing, extending from end to end and from side to side thereof and secured on said angle brackets, said plate being adapted to permit the passage of products of combustion and heated air therethrough and dividing the casing into an upper chamber and a lower chamber, heads on the ends of the casing having air inlet openings to the lower chamber below the said plate and further provided with means for connecting hot air conveying pipes to the upper chamber above said plate, said heads forming the end walls of the said upper and lower chambers, extending directly across the ends of the said plate, and when removed affording access to both of said chambers and to said plate, bands extending around the casing and having laterally projecting sections forming supports therefor, and a gas supply pipe having a series of burners in the lower chamber.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES AKERSTREAM.

JAMES HAMILTON FERGUSON.

Witnesses:

HENRY YOUNG,

WILLIAM TREWELLA.