

(No Model.)

G. O. BERGSTROM.
HOT AIR FURNACE.

No. 575,766.

Patented Jan. 26, 1897.

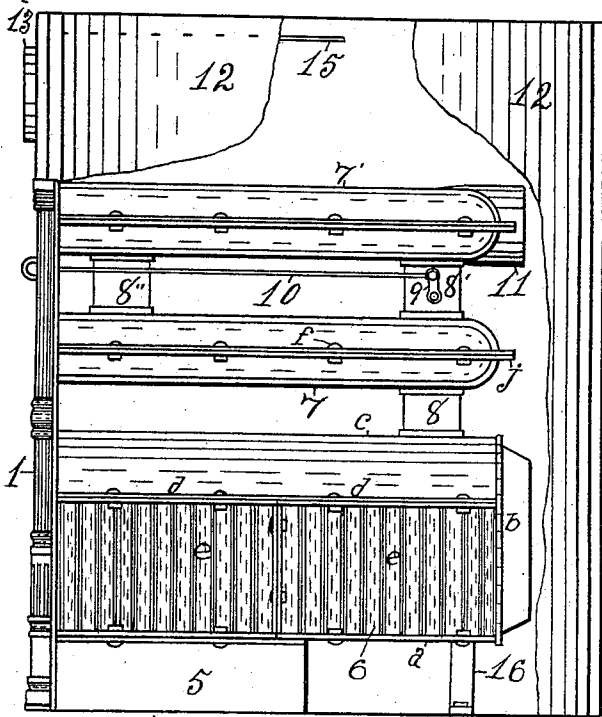


Fig. 1.

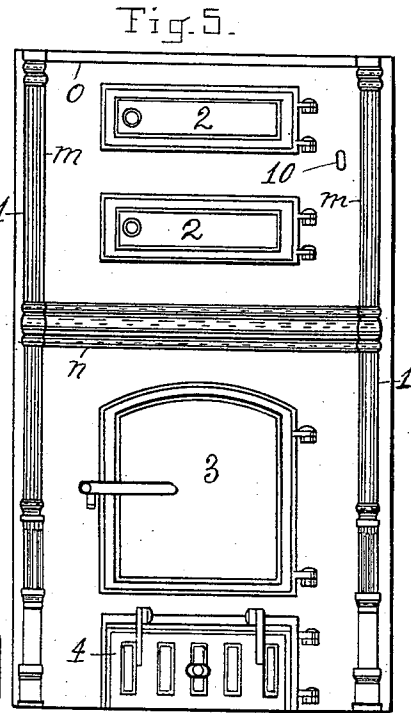


Fig. 5.

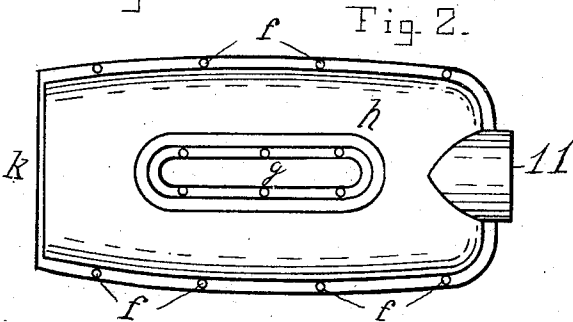


Fig. 2.

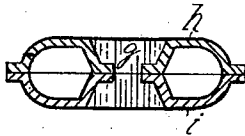


Fig. 3.

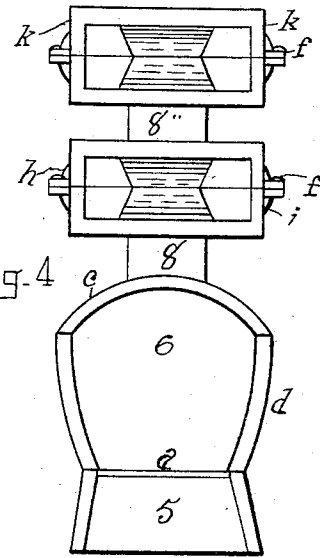


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE O. BERGSTROM, OF NEENAH, WISCONSIN, ASSIGNOR TO BERGSTROM BROS. & CO., OF SAME PLACE.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 575,766, dated January 26, 1897.

Application filed November 13, 1896. Serial No. 611,990. (No model.)

To all whom it may concern:

Be it known that I, GEORGE O. BERGSTROM, a citizen of the United States, residing at Neenah, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Hot-Air Furnaces, of which the following is a specification.

My invention relates to the form and arrangement of the several parts of the furnace whereby a large surface is presented from which the heat which is produced by the burning fuel can be radiated and against which surface also a large body of fresh cold air may be presented to be warmed and distributed to the several apartments which it is desired to warm; and the object of my improvement is to produce a furnace having, in comparison with the amount of fuel burned, a large heating capacity. I attain this purpose by means of the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the furnace, the larger part of its outer wall or casing being broken away for the purpose of exposing the inner parts. Fig. 2 is a top view of its upper radiator. Fig. 3 is a transverse section of one of the radiators midway its ends. Fig. 4 is an elevation of the front end of the heating parts with the furnace-front removed, and Fig. 5 is an elevation of the furnace-front upon an enlarged scale.

Similar numerals and letters indicate like parts in the several views.

1 indicates the furnace-front; 2, doors which communicate with the radiator through which they can be cleaned; 3, the fuel-door; 4, ash-pit door; 5, the ash-pit; 6, the fuel-receptacle or fire-pot; 7 7', radiators; 8 8', short pipes for connecting the fire-pot to a radiator and the radiators to each other, respectively; 9, a damper-arm; 10, the damper-rod; 11, the smoke-escape pipe; 12, an inclosing wall or casing which is connected with the furnace-front and may contain several hot-air-distributing pipes, as 13, for carrying the hot air to the several rooms to be warmed; 14, a fresh-air-supply pipe; 15, the furnace-casing top; 16, a leg for supporting the fire-pot.

The front 1 may be of any suitable design which is adapted for connecting the fire-pot

and radiators when they are arranged in their proper position, and which is suited for connection with the inclosing wall or casing 12. The fire-pot 6 consists of a box-like inclosure having greater length than breadth or height, a suitable bottom *a*, a rear end *b*, its top *c*, and sides *d*.

The top of the fire-pot is an oval-shaped casting and extends from the front 1 to the rear end *b*, and the sides *d* consist of oval plates having corrugations *e* transversely thereof over their entire length. These corrugations are not a new invention, but are an important feature, as they add to the lasting quality of the fire-pot by reason of said corrugations absorbing the extension and contraction of the metal as the heat is increased or diminished without causing the plates to crack.

The rear end *b* of the fire-pot extends back a few inches beyond the ends of the sides *d* and from the pipe 8, where the heat from the fire-pot escapes, whereby the intensity of the heat upon said rear end is reduced. This extension, together with the aforesaid corrugations, gives a large radiating-surface for the fresh air to impinge against and be heated.

Directly over and lying parallel with the fire-pot are two radiators 7 7', which have greater length than breadth and are similar one to the other excepting in their heat receiving and discharge openings. They are formed of two corresponding parts *h* and *i*, which are connected together with bolts *f*. These radiators need not be of the exact form here shown, as radiators having the essential features of these of different form may be used. The number of radiators in any one furnace may be more or less than is here shown, they being so arranged relative to the fire-pot that all of the heat from said fire-pot will pass through their entire length and that their openings *g* will be free to receive the fresh or cold air which is to be warmed and distributed to the several rooms to be warmed.

A short pipe 8 connects the fire-pot and lower radiator, and a pipe 8' connects the two radiators at their rear end, and a pipe 8'' connects them at their front end.

The pipe 8' is provided with a damper, its arm 9 being connected to a rod 10, which ex-

tends through the furnace-front and from which point it can be operated. With this damper open the heat and smoke will pass from the fire-pot through the pipe 8, thence
 5 directly through the radiator 7 to the pipe 8' and radiator 7' and out through the smoke-outlet, but with said damper closed the heat and smoke will pass through the radiator 7 to its forward end, thence through the pipe
 10 8" to the radiator 7', back through it and out of the pipe 11, and thereby imparting to the entire interior surface of both radiators the benefit of all of the heat from the fire-pot. This damper needs to be open only in starting
 15 the fire.

The radiators are open at their forward end, and their end flanges *k* are bolted to the front 1, doors 2 being provided for closing said opening, upon the opening of which doors access is obtained to their interior, and the attendant with a scraper can scrape all soot and
 20 ashes to their rear, where they will fall through the pipes 8 8' into the fire-pot and from whence they can be removed through the ash-pit door 4.

The inclosing wall 12 may be of brick or metal, as the particular use and location of the furnace may require, said wall being provided with a sufficient number of fresh-air-
 30 supply and warm-air-discharge pipes or openings, the latter being from the top of said casing, as shown at the right, or, a cover 15 being provided for said casing, it may be from the left-hand side of said casing or wall.

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

1. In a hot-air furnace the combination of the following instrumentalities, a furnace-front having suitable doors for feeding fuel
 40 thereto and for removing soot and ashes therefrom, a wall, or case connected with said front and inclosing the fire-pot and radiators and being provided with suitable fresh-air-supply
 45 and warm-air-distributing openings, a fire-pot connected to said front consisting of an inclosure having greater length than breadth and having a longitudinally-oval-shaped top and sides, the latter having a series of corrugations transversely thereof over their entire
 50 length, two radiators having greater length than thickness arranged one over the other over said fire-pot, each having an open space midway its ends and sides extending through the same in the direction of said thickness,
 55 one end of said radiators being open, connected to said front around a door therein, and said radiators extending at right angles

with said front over said fire-pot, openings near each end of said radiators for the admission of the products of combustion from
 60 the fire-pot and for the escape of the same, connecting-pipes arranged, one for connecting the two radiators near their forward end, one between the fire-pot and lower radiator
 65 near their rear end, and one directly over the last-named pipe for connecting the radiators one to the other, said last-named pipe having a damper therein which when closed will direct the products of combustion as they leave
 70 the fire-pot and enter the lower radiator toward the furnace-front, thence upward to the upper radiator and toward its rear end and out of the smoke-pipe, substantially as described.
 75

2. A radiator for a hot-air furnace consisting of an inclosure having greater length than thickness, and having an open space midway its ends and sides extending through the same
 80 in the direction of said thickness for the circulation of air through said space, one end of the radiator being open and fitted for connection with the furnace-front around an opening therein which is adapted for closure
 85 at will, said radiator being provided with openings near each end thereof for the admission of the products of combustion from the fire-pot and for the escape of the same, substantially as set forth.

3. In a hot-air furnace, the combination
 90 with the fire-pot of a plurality of radiators arranged one over the other, over said fire-pot, and being open at one end and adapted for connection with the furnace-front at right angles with it and around an opening therein
 95 which is adapted for closure at will, said radiators having greater length than thickness and each having an open space midway its ends and sides extending through the same in the direction of said thickness for the circulation of air through said space, a pipe leading
 100 from the fire-pot to the lower radiator at its rear end, pipes connecting the radiators at each end thereof, a damper in their connecting-pipe at their rear end having means
 105 for its operation, whereby, the damper being open the products of combustion will pass from the fire-pot into and across the radiators and thence out of the smoke-pipe, but if closed will pass through the length of all of
 110 said radiators before its escape through the smoke-pipe, substantially as described.

GEORGE O. BERGSTROM.

Witnesses:

JOHN MAYER,
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