Jan. 17, 1928. 1,656,326

E. H. JOHNSON

FIREPLACE

Filed June 21. 1926

Fig. 1.

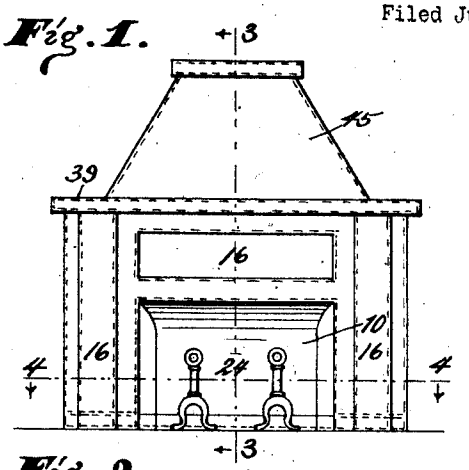


Fig. 2.

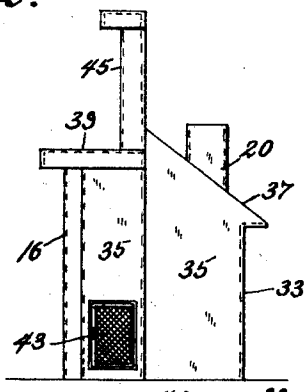


Fig. 3.

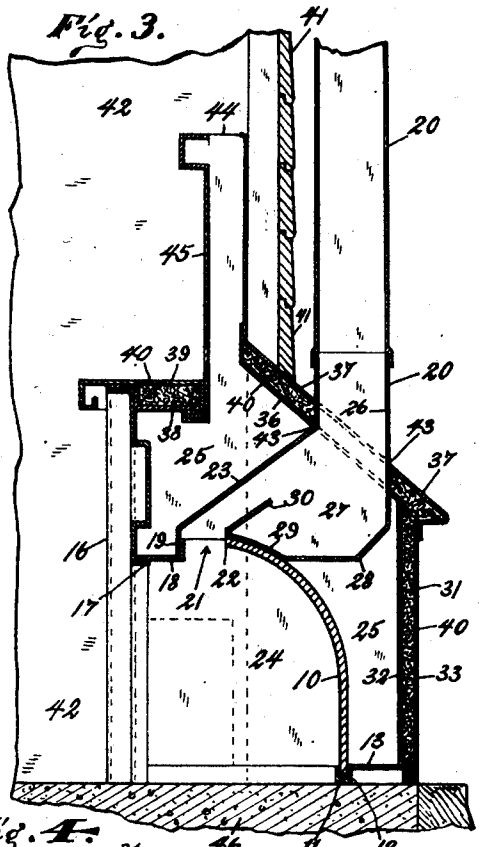
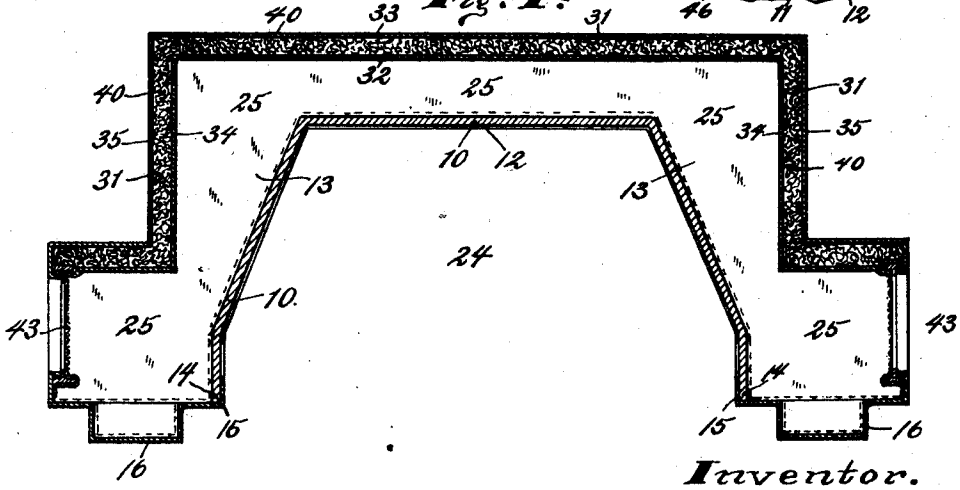


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FIREPLACE.

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This invention relates to means for heating a room; and it comprises a fire place that is especially adapted for use in cabins that are located in remote places where it is difficult to obtain artisans sufficiently skillful to erect fire places or to obtain building material such as brick or stone of which fire places are usually formed; and an object of this invention is to provide a fire place that is made of light-weight sheet metal and assembled at a factory ready to install in a building so that it can be shipped or transported to any place and installed by relatively unskilled labor. In other words when the fire place is finished at the factory it is a light weight spacious body that can be installed in a room or building by any ordinary mechanic. While this fire place is constructed especially for cabins such as are commonly erected in or near forest or forest reserves it is equally useful and can be installed in any building or used in an open space, as at a camp.

Another object of this invention is to provide a fire place that is adapted to use a minimum amount of fuel relative to the amount of heat that it disperses through a room. As is well known fire places constructed heretofore have been very extravagant in the use of fuel, and have been arranged so that it has been possible to utilize only a small part of the heat, most of the heat being permitted to pass up the chimney; and a further object of this invention is to provide means for utilizing a major part of the heat instead of wasting it.

Another object of this invention is to provide a fire place constructed so that air can pass into it from adjacent the floor line of a room and there heated and then be discharged back into the room. To that end I provide a fire place having a combustion chamber and an air chamber surrounding it on the back, sides and top with air inlets adjacent the floor line of the room and a discharge outlet above the mantel connected to the fire place so that the air in the room is circulated as stated.

Another object is to provide means for preventing the heat from escaping rearwardly of the fire place so that a major portion of the heat will pass into the air circulating in the air chamber and be discharged into the room. This is accomplished by providing an insulating chamber to the fire place that is packed with asbestos; and this chamber not only holds the heat from escaping rearwardly and to the sides of the fire place, but also functions to prevent cold outside air from passing through the walls of the fire place into the room.

A feature of the invention is shown in the construction and arrangement of parts in the fire place flue in the base of which is arranged a spark arresting chamber that also functions to prevent down-drafts in the chimney from passing through the fire place into the room.

Other features of invention are shown in the construction, combination and arrangement of parts whereby a fire place is provided that is easy to construct, assemble and install, that is strong, durable and efficient in use, and which also is adapted to conserve fuel.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is a front view of a fire place constructed in accordance with this invention; Fig. 2 is a side view of the fire place shown in Fig. 1; Fig. 3 is an enlarged central vertical section on line 3—3, Fig. 1; and Fig. 4 is an enlarged cross section on line 4—4, Fig. 1.

The fire place comprises a fire wall 10 that has its bottom edge 11 seated in an elongated slot 12 that is formed in a front edge portion of a base plate 13 as best shown in Figs. 3 and 4. The front edges 14 of the fire wall 10 are fitted and brazed to the corners 15 of a mantel support 16 that has its center portion cut away to form the opening into the fire place.

A ledge 17 of the support 16 at the top of the fire place opening is turned under to form a seat to which is brazed an edge portion of an angle iron 18 that in addition to forming a part of the top wall of the fire place also supports the front edge 19 of the flue or chimney 20.

The fire wall 10 in addition to being angled from its back wall forwardly and outwardly to form a large combustion chamber, as indicated in Figs. 1 and 4, also has an upper portion of its back wall curved forward toward the angle iron 18 to form a surface with which the fire can contact and be deflected forward toward the flue open-

ing 21 that is between the upper edge 22 of the fire wall 10 and the angle iron 18.

The flue 20 adjacent the fire place is provided with a deflector plate 23 that has its front edge 19 resting on and brazed to the angle iron 18; and this plate is inclined upwardly and rearwardly across the flue opening 21 and also extends a considerable distance past the opening so that as the flame passes from the fire place combustion chamber 24 it will extend along the underside of the plate 23 so that the heat can pass through the plate into a hot air chamber 25. A large spark arresting chamber 27 is provided in the flue 20 that will prevent sparks from escaping to the outer air; and also arrest considerable heat that otherwise would escape through the flue and permit it to pass through the walls thereof into the hot air chamber 25. Also the fire wall 10 on its back, sides and top, as well as the angle iron 18, are arranged so that heat can pass through them into the air chamber 25.

Also the plate 23 is inclined so that sparks from the fire will be deflected against the surface 26 of flue 20 and fall by gravity into the spark chamber 27 and not pass out of the flue. This chamber is provided with a floor 28 that has a curved portion 29 that rests on the upper curved portion of the wall 10; and this floor terminates in a short baffle plate 30 that is spaced apart and arranged parallel with the plate 23.

The baffle plate 30 is provided to prevent downdrafts in the flue 20 from passing through the fire place into a room. In other words a down draft in the flue will first enter the chamber 27 at the rear thereof and then travel along the floor 28 and be deflected against the baffle plate 30 and turn back up the flue. By this construction and arrangement of the walls of the spark chamber and the baffle plate 30 down drafts through the fire place are practically avoided.

The sides, top and rear of the hot air chamber 25 are enclosed by an insulating chamber 31 that is formed of pairs of rear walls 32, 33, side walls 34, 35, roof plates 36, 37, and mantel plates 38, 39 that are arranged in parallel pairs and spaced apart, as best shown in Figs. 3, 4; and preferably the spaces between these pairs of walls are filled with a material 40, such as asbestos, that is a non-conductor of heat.

The walls 32, 33, 34, 35 have their bottom edges secured to the base plate 13 as indicated in Figs. 3, 4, and these walls support the roof plates 36, 37 which are inclined inwardly and upwardly to form a roof over the rearward portion of the fire place which when in use has its rear portion extending outward through an opening in the wall 41 of a cabin room 42 as indicated in Fig. 3.

An opening 43 is provided through the plates 36, 37 for the flue 20 and this opening is near the center of the plates so that the flue can extend upward on the outside of the cabin parallel with and clear of the wall 41.

Oppositely arranged air inlets 43 are provided in the walls 35 near the floor line of the room 42 so that when the fire place is in operation air can pass from the room on opposite sides of the fire place into the hot air chamber. The inlets 43 are preferably air radiators such as are used for discharging heated air into a room from a hot air furnace. Their construction and use are well known and are therefore not shown or described in detail.

An air discharge outlet 44 is provided by an extension 45 extending upward from the mantel plate 39 and roof plate 37. Preferably the fire place is seated on a concrete base 46 as indicated in Fig. 3; however it can be seated on any suitable base.

With the parts thus constructed and arranged and the fire place in operation, air will be circulated from the floor line of the room through the inlets 43 into the air chamber 25 and then out through the opening 44 into the upper part of the room; and as the air is circulated through the air chamber it will be heated, and as previously stated a large portion of the heat developed by combustion in the combustion chamber will pass into the air circulating through the hot air chamber to heat the room.

Preferably all of the metal surface visible from positions within the room are formed of sheet metal having a smooth surface that can be treated by painting or enameling to give it a polished finish. This sheet metal preferably is of the same thickness and quality as that used in forming automobile bodies.

Also the mantel and support can be paneled as indicated in the drawing to add strength and an artistic finish to the structure.

It is understood that the edge portions of the sheet metal can be brought together and secured in various ways well known in the art including brazing and riveting. Preferably the fire wall 10 is much thicker than the other walls that are made of very light weight material.

Also it is understood that the fire place can be made in various sizes.

I claim as my invention:

1. In a transportable fire place the combination of a base plate having a slot therein, a fire wall having its lower end seated and brazed in the slot of said base plate, said wall having its upper end curved forwardly, a mantel support brazed to said base plate and fire wall, a mantel on said support, an angle iron adjacent the top of said fire wall that is secured to said support, a flue supported by said angle iron and fire wall, other

walls secured to said base plate and arranged to form an air chamber around said fire wall and the bottom end of said flue, radiators for introducing air into the bottom of the air chamber, and a vertically arranged air outlet above said mantel.

2. In a transportable fire place the combination of a base plate having a slot therein, a fire wall having its lower end seated and brazed in the slot of said base plate, a mantel support secured to said base plate and fire wall, a mantel secured to said support, an angle iron arranged adjacent the upper end of said fire wall that is secured to said support, a flue secured to and supported by said fire wall and angle iron, other walls having their lower ends secured to said base plate and arranged to form an insulated air chamber around said fire wall and base of said flue, a roof supported by said other walls, a radiator through which air can pass into the bottom of the air chamber, and a vertically arranged air outlet above said mantel.

In witness whereof, I have hereunto affixed my signature.

EDWARD H. JOHNSON.