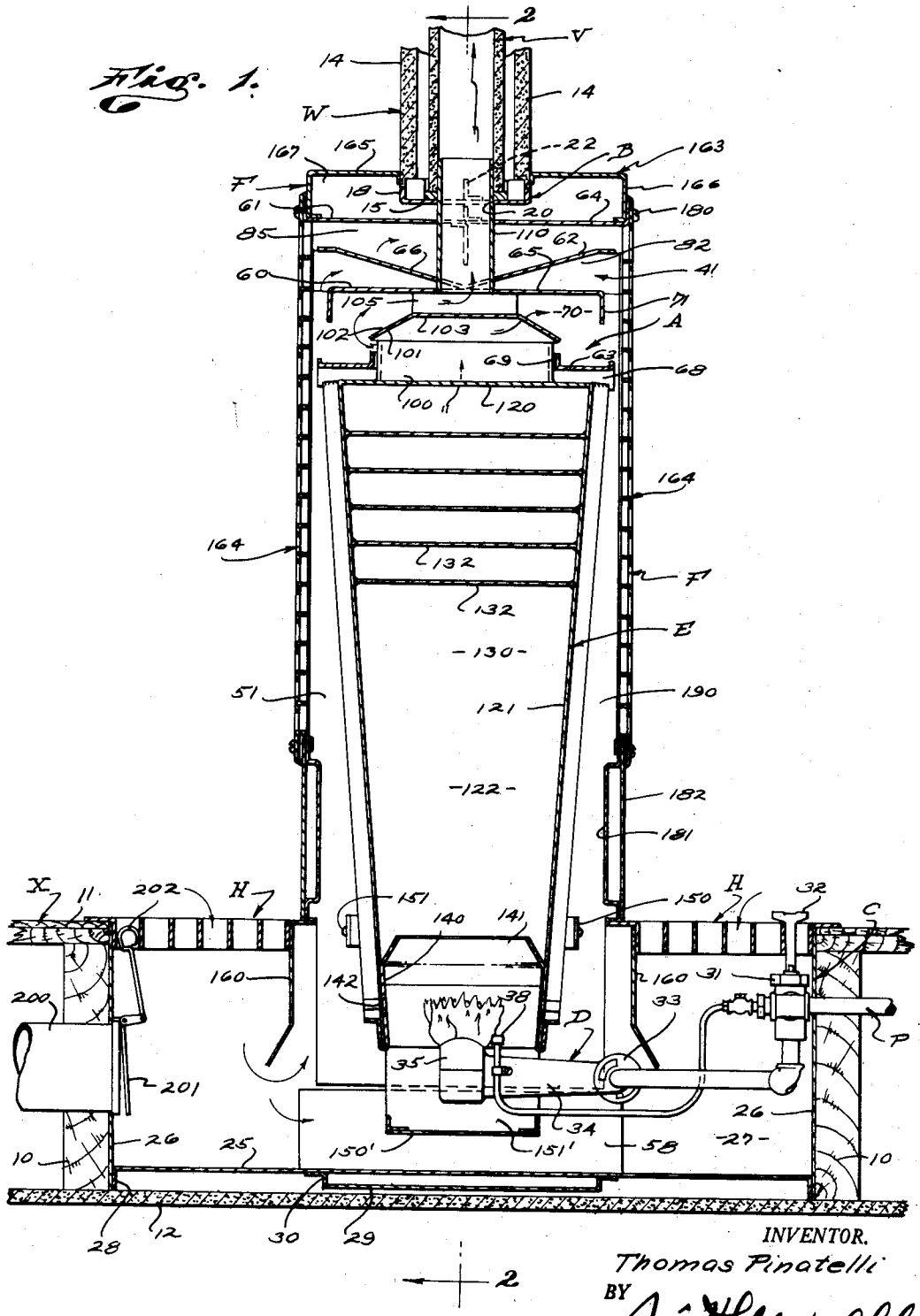
Sept. 6, 1955 T. PINATELLI 2,716,976

HEATER APPLICABLE TO FLOOR AND WALL

Filed June 11, 1951 3 Sheets-Sheet 1

Fig. 1.



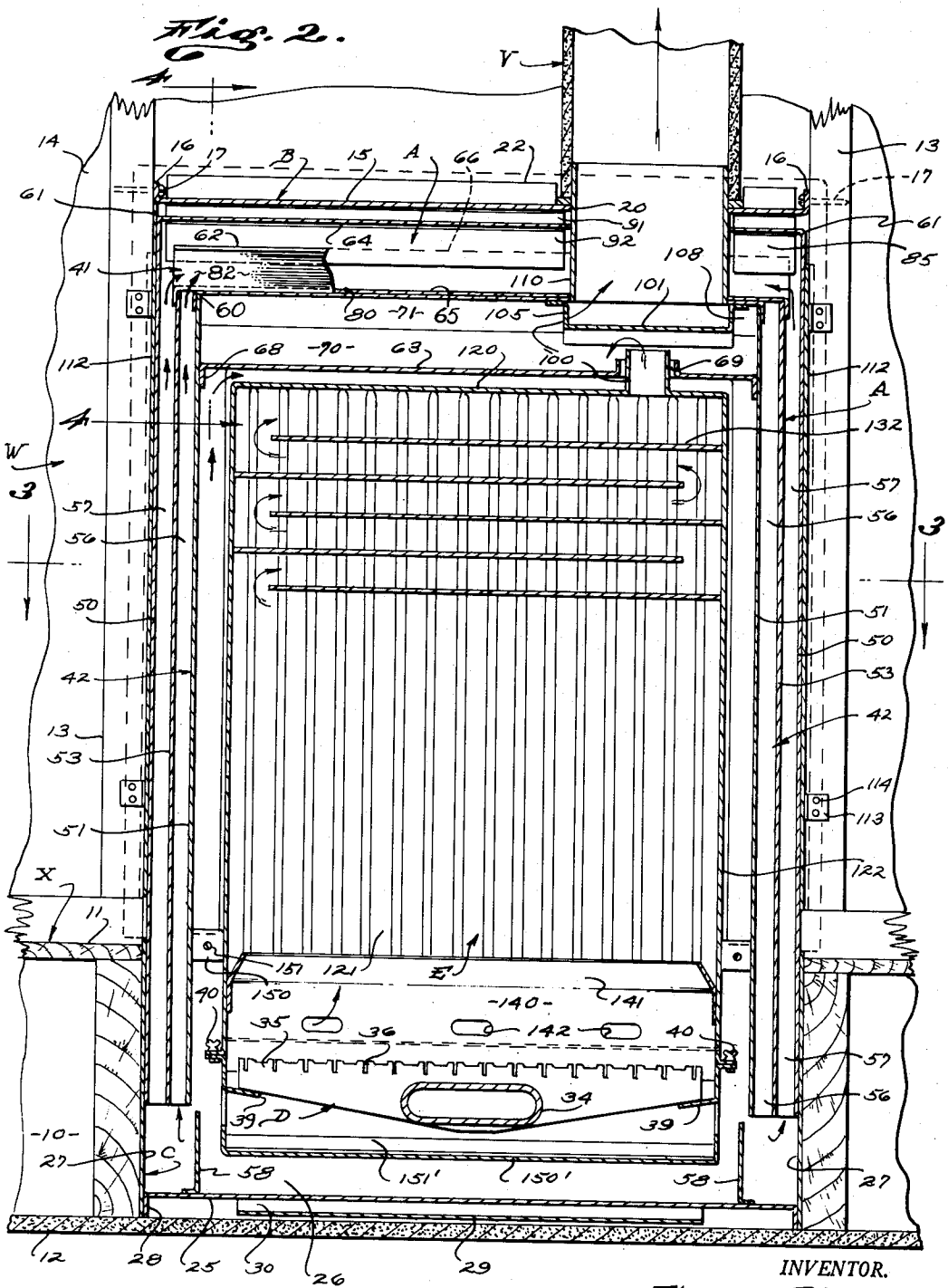
INVENTOR.
Thomas Pinatelli
BY
Attorney

Sept. 6, 1955 T. PINATELLI 2,716,976

HEATER APPLICABLE TO FLOOR AND WALL

Filed June 11, 1951 3 Sheets-Sheet 2

Fig. 2.



INVENTOR.
Thomas Pinatelli
BY
Attorney

Sept. 6, 1955 T. PINATELLI 2,716,976

HEATER APPLICABLE TO FLOOR AND WALL

Filed June 11, 1951 3 Sheets-Sheet 3

Fig. 3.

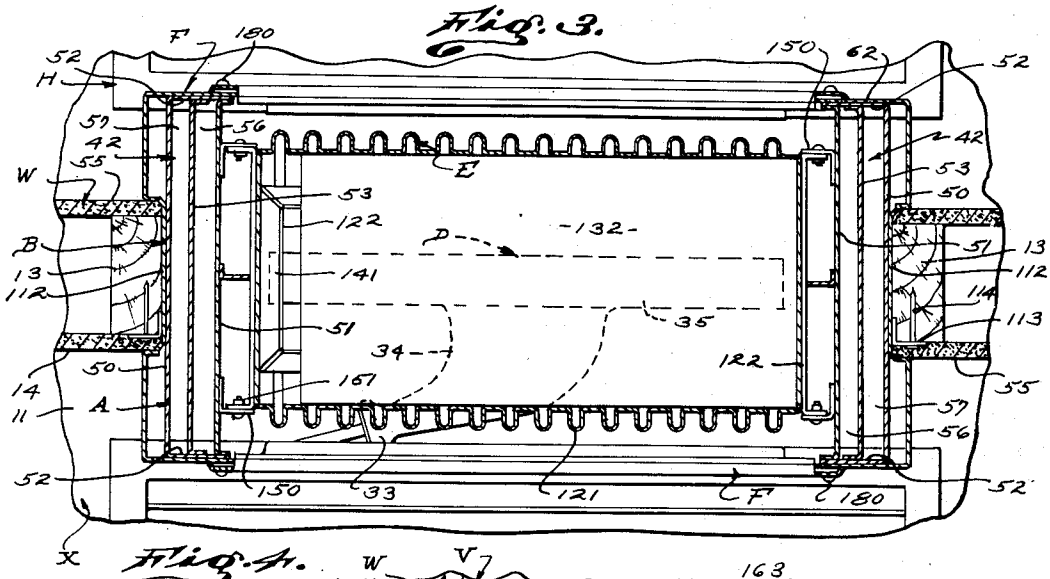


Fig. 4.

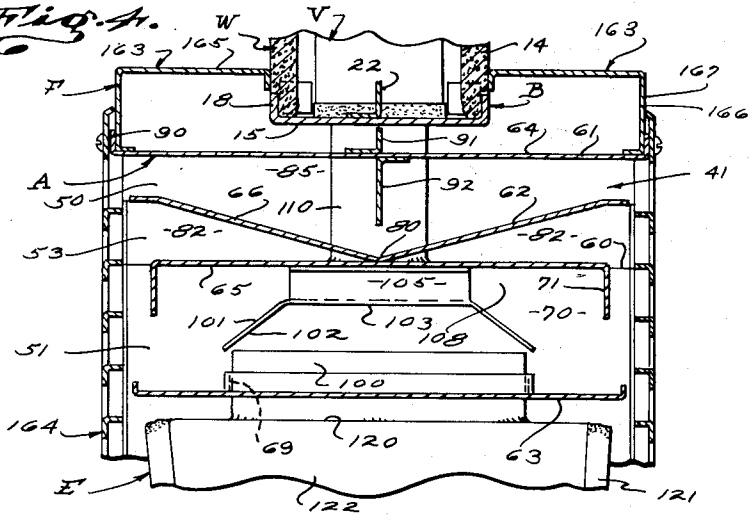


Fig. 5.

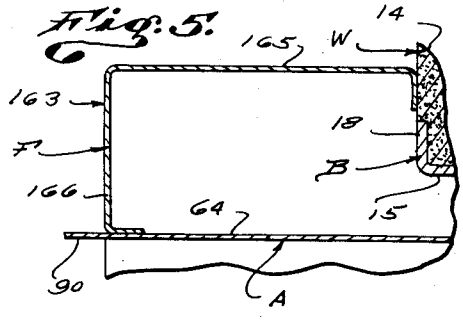
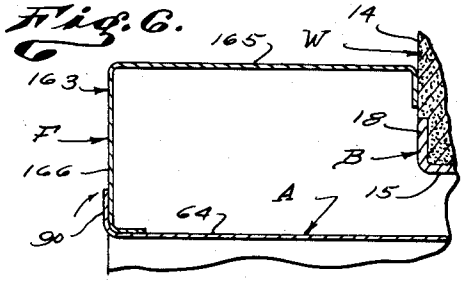


Fig. 6.



INVENTOR.
Thomas Pinatelli
BY
Attorney

United States Patent Office 2,716,976 Patented Sept. 6, 1955

2,716,976

HEATER APPLICABLE TO FLOOR AND WALL

Thomas Pinatelli, Los Angeles, Calif.

Application June 11, 1951, Serial No. 230,870

6 Claims. (Cl. 126—116)

This invention relates to a heater and it is a general object of the invention to provide a heater particularly practical and effective as applied to building construction such as is commonly employed in the ordinary home or dwelling.

This application is filed as a continuation in part of my application entitled "Heater" filed March 20, 1950, Serial No. 150,739, now abandoned.

The usual home or dwelling is generally of frame construction and it has been common to incorporate heaters in such structures. Typical heaters employ gas as fuel and are of two types, namely, floor heaters and wall heaters. Floor heaters, as ordinarily constructed, are of substantial depth, making them ordinarily practical or suitable for incorporation in a ground or lower floor only, whereas wall heaters are generally confined to wall construction and are possessed of various limitations that result from being thus confined.

It is a general object of this invention to provide a heater of improved construction that may employ gas as a fuel and which combines in a single structure various features and advantages inherent or characteristic of floor heaters with advantageous features of wall heaters. The invention provides a structure having a substantial portion incorporated in a floor without depending below the joists of the floor, and it involves a body portion that extends upwardly above the floor in a manner to be incorporated in a wall without unreasonable projection therefrom.

Another object of this invention is to provide a heater of the general character referred to which receives cool air at or from the floor and divides such air so that a portion thereof is employed in carrying out the desired combustion necessary for the generation of heat while the balance is circulated in a manner to be effectively heated and efficiently discharged into the room or rooms above the floor.

Another object of the invention is to provide a heater construction of the general character referred to which includes few basic elements or units that can be easily and satisfactorily incorporated in a building as the construction thereof progresses, which elements are such as to aid in carrying out building operations such as plastering, and are such as to receive or accommodate the balance of the heater structure when the building is completed, in order to complete the heater.

Another object of the invention is to provide a furnace of the general character referred to involving few simple, inexpensive parts which make the structure simple and convenient to install and at the same time practical and inexpensive of manufacture.

The structure involving the present invention includes a plurality of separable units which, when assembled, form the completed heater. The elements include a header applicable to or incorporated in the wall with which the heater is combined, and an upwardly opening box-like base insertable in the floor beneath the wall. A body in the form of an inverted U-shaped structure is

applied beneath the header and has a horizontal head that extends parallel with the wall beneath the header, and depending end ducts which extend down from the ends of the head and into the base. A core forming a heat generating chamber and heat radiator is inserted in the body and depends from a point near the head of the body downward into the base where it is open and has a portion forming an initial combustion chamber. The core handles the combustion that takes place in the heater and acts as a heat radiating element. A burner is confined to the base, being located about midway between the top and bottom of the base, and is characterized by a burner head delivering combustible gas into the core. A shell is provided and includes top sections engaged on the head of the body at opposite sides of the wall and side sections that depend from the head sections to the base. The side sections are preferably substantially flat and vertical and their upper portions, in fact, about three fourths of their areas, are occupied by perforations or openings through which the heated air escapes. Floor plates are provided at the top of the base flush with the floor and have apertures passing air into the base. Fins are provided in the base so that the air entering through the floor plates flows down into the bottom of the base and then to the burner and to the exterior of the core. A shelf is provided in the base beneath the burner and is preferably carried by the core, and the bottom of the base beneath the burner is of double wall construction, forming an effective heat insulator.

The body has plaster stops on the outer sides of the depending end ducts and has projections by which the body is secured to elements of the wall, such as studs. The core and body have cooperating lugs joined by screw fasteners serving to support the core in the body in spaced relation thereto. Each end duct of the body is formed to have spaced parallel passageways open at the bottom of the body to receive air from the base where the flow of air into the body is regulated by members located in the base. The head of the body receives the air discharging from the upper ends of the passageways and also handles the products of combustion from the core. The core has horizontal baffles therein causing the products of combustion to follow a zig-zag path in the core, and a discharge pipe of the core delivers the gases of combustion into the head of the body. Plates forming the head of the body establish chambers, the lowermost of which receives the products of combustion from the core and carries a hood which causes tortuous flow of the gases before they reach an exhaust pipe that delivers them into the flue provided in the wall. An intermediate chamber in the head receives air from one passage in each end duct of the body and an upper chamber receives air from the other passageways of the end ducts of the body. The several chambers of the head are open to the side sections of the shell, the upper portions of the lowermost chamber being enclosed so that the gases of combustion are trapped and directed into the exhaust pipe.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a vertical detailed sectional view of the heater provided by the present invention, showing it installed in connection with a floor and wall, which elements are of typical construction, the section being taken crosswise of the heater. Fig. 2 is a vertical detailed sectional view of the heater taken lengthwise thereof, being a view taken as indicated by line 2—2 on Fig. 1. Fig. 3 is a plan section taken as indicated by line 3—3 on Fig. 2. Fig. 4 is an enlarged detailed sectional view of a portion of the

structure taken as indicated by line 4—4 on Fig. 2. Fig. 5 is an enlarged view of the upper corner portion of Fig. 4, showing the parts as they occur when initially assembled and Fig. 6 is a view similar to Fig. 5, showing the parts illustrated in Fig. 5 with the flange of the body formed to retain the top section of the shell.

The heater provided by this invention is applicable, generally, to building constructions, and it is such that it can be varied or accommodated to the use of various fuels or means of generating heat. The invention is particularly practical for use where electricity or gas is employed and in the case illustrated a gas burner is shown. The structure is applicable to various building constructions or arrangements. However, it is particularly practical as applied to the ordinary or conventional frame construction and in its preferred form it may be applied to a floor and wall so that heat from the structure is delivered at both sides of the wall or in a manner to supply rooms defined by the wall.

In the drawings a typical or simple floor X is shown and a wall W is illustrated projecting upwardly from the floor. In accordance with conventional construction the floor is shown as involving elongate parallel joists **10** that carry a floor proper, **11**. The joists may carry or support a ceiling **12** if the space beneath the floor structure is finished. The wall W is shown as involving spaced vertical studs **13** to which facings **14** of plaster, or the like, are applied. The structure or heater of the present invention can be applied to a building at any time. However, it is preferred that certain units or elements of it be incorporated in the course of construction of the building, in which case the joists **10** of the floor that occur where the heater is to be applied are spaced to accommodate the heater, and in like manner the studs or other framing occurring at the heater may be likewise located.

The structure provided by the present invention is characterized by a plurality of elements or units which are separable and which, when assembled, form the complete heater. These elements involve, generally, a body A that includes means handling the products of combustion and delivering them to a flue or vent V provided in the wall W, and means handling air that is circulated in the heater and which is maintained out of contact with the products of combustion. A header B is provided and is applicable to the wall W, preferably as the wall is constructed or framed. A base C is provided or inserted in the floor X, preferably as the floor is constructed or framed, and occurs beneath the wall. A burner D is confined in the base C and in a typical situation is supplied with gas from a supply pipe P incorporated in the floor. A core E is carried in the body A and depends into the base C and is combined with the burner and serves to handle the products of combustion and acts as a radiating head. A shell F houses the body and core, and the floor plates H close the top of the base and are preferably flush with the top of the floor.

The header B is preferably in the form of a flat horizontally disposed plate **15** that extends lengthwise of the heater or in the direction of the wall W so that it extends between the studs **13** of the wall between which the heater is located. The ends of the plate **15** are adapted to be secured to the studs **13** as by flanges **16** on the ends of the plate and in the case illustrated the flanges project upwardly from the ends of the plate and are shown secured to the studs by suitable fasteners **17**. Side flanges **18** are provided on the longitudinal edges of the plate **15** and are shown as projecting upwardly and they are located so that they are effective as forming plaster stops. The plate **15** is provided with an opening **20** for passing the exhaust pipe of the body A, the opening **20** being located in the plate **15** so that it registers with the lower end of the flue V incorporated in the wall W. In the form of the header illustrated in the drawings suitable ribs **22** project up from the plate **15** and serve to stiffen the plate and also serve to positively space the plate **15** below any wooden element or other structure incorporated in the wall.

The base C is an upwardly opening box-like unit insertable in the floor X to occur between frame elements or floor joists **10**, and it fits the floor so that its top or upper end is flush with the surface of the floor and it is above the ceiling **12** carried by the frame or joists of the floor. In the form illustrated the base involves a flat bottom **25**, sides **26** and ends **27**. The sides and ends are flat vertically disposed sheet metal elements that project up from the edges of the bottom **25**, and it is preferred that the sides and ends be joined to the bottom **25** by flange joints **28** which project down from the edges of the bottom. As a result of this construction the bottom **25**, which is preferably a plain flat plate, is spaced above the ceiling **12** when the base is incorporated in the floor with the lower edges of the flange connections **28** flush with the bottom of the joints **10**.

In the preferred construction the central portion of the bottom **25**, that is, the portion of the bottom that occurs beneath the burner D, is constructed to be of double wall formation, so that this portion of the bottom is an effective heat insulator. In the case illustrated a heat insulating plate **29** is spaced below the bottom **25** at the center of the bottom and is parallel therewith, and is spaced above the ceiling **12**, the plate **29** being carried by flanges **30** which are fixed to the lower side of the bottom **25**.

The burner D is located entirely within the the base C, and in the case illustrated the supply pipe P enters the base through one of its vertical parts, and the flow of fuel such as gas, to the burner, is controlled by a valve **31** with an operating knob **32** conveniently accessible, as shown in Fig. 1. The burner D is shown as involving a mixer **33** which received gas and air and forms a mixture which is delivered through a neck **34** to the head **35** of the burner, which is an elongate horizontally disposed part with upwardly facing openings **36**. It is to be understood that the burner, as shown in the drawings, may be provided with suitable accessories such, for example, as a pilot type lighter **38**, etc.

A mounting means is provided for supporting the burner with its head portion **35** about midway between the top and bottom of the base C. In the case illustrated the mounting means for the burner involves brackets **39** at the ends of the burner head **35**, which brackets are releasably connected to the lower end of the core E by suitable screw fasteners **40**.

The body structure, or body A is a rigid, sheet-metal unit, characterized by an elongate, horizontally disposed head structure **41** and end ducts **42** which are vertically disposed and which depend from the ends of the head structure **41** to occur at the ends of the heater. The head structure **41** extends parallel with and is spaced a slight distance beneath the header B while the end ducts **42** of the body depend from the head into the base C to terminate in the lower portion of the base, as clearly illustrated in Fig. 2 of the drawings. The head structure **41** of the body receives and handles air delivered to it by the end ducts **42** and it also handles the gases or products of combustion from the core structure or core E.

Each end duct **42** in the form of the invention illustrated involves an outer vertical wall **50**, an inner vertical wall **51**, vertical side walls **52** extending between the vertical edges of the inner and outer walls, and a vertical partition **53** extending between the side walls **52** and spaced between the inner and outer walls **50** and **51**. The walls **50** and **51** and the partition **53** are preferably flat parallel vertically disposed plates of sheet metal, and they are joined together and with the side walls **52** by suitable flange connections such as are illustrated in Fig. 3 of the drawings. The inner and outer walls and the partition are of substantial width and they are dis-

posed to extend crosswise of the heater so they have portions projecting beyond the outer sides **55** of the wall W in the manner clearly illustrated in Fig. 3 of the drawings. As a result of the construction just described each end duct **42** of the body establishes an inner vertical passageway **56** that extends upwardly from the lower end of the end duct which occurs in the base C at the head structure **41** of the body, and an outer passageway **57**, which likewise extends from the base C to the head structure of the body. It is to be observed that the lower ends of the passageways **56** and **57** are open and open downwardly in the base C, and it is to be observed that air control members **58** are provided in the base and are suitably related to the open lower ends of the passageways to limit or restrict the flow of air into the passageways, so that only a limited amount of air that enters the base C from the floor plates is allowed to enter the passageways **56** and **57** of the body.

In accordance with the present invention the upper edge **60** of the inner wall **51** of each end duct **42** is straight and horizontally disposed, and the upper edges **61** of the outer walls **50** are straight and horizontally disposed, and are spaced a substantial distance above the edges **60**, as clearly illustrated in Figs. 1 and 2 of the drawings. The upper edges **62** of the partitions **53** occur at elevations between the edges **60** and **61** and instead of being straight and horizontal they are formed to be V-shaped, as is clearly illustrated in Fig. 4 of the drawings.

The head structure **41** of the body is a collector for products of combustion and acts as a back draft diverter, and involves four plates that extend longitudinally of the heater or between the end ducts **42**. In the preferred arrangement there is a bottom plate **63**, a top plate **64**, a lower baffle plate **65** and an upper baffle plate **66**.

The bottom plate **63** is a flat horizontally disposed plate elongate in form and having its ends fixed to the inner sides of the inner walls **51** below the top edges **63** of the walls **51**. In the case illustrated flanges **68** on the ends of the bottom plate serve to connect it to the walls **51**. The plate **63** is preferably uninterrupted or imperforate except for an opening **69** which is provided to pass the discharge pipe provided on the core E, the opening **69** being in register with the flue V provided in the wall W.

The lower baffle plate **65** is a flat horizontally disposed plate extending between the upper edges **60** of the inner walls **51**. The baffle plate **65** is spaced above the bottom plate **63** providing a lower chamber **70** in the head of the body. In accordance with the present invention the bottom plate 63 is preferably about co-extensive in width with the walls **51** to which it connects, whereas the baffle plate **63** is somewhat narrower than the walls **51** and at its longitudinal edges it has depending vertically disposed aprons **71** which serve to enclose the upper portion of chamber **70** forming a chest that catches the products of combustion discharged into chamber **70** from the core structure.

The upper baffle plate **66** extends between the upper edges **62** of the partitions **53** and it is V-shaped in cross section, as shown in Fig. 4, corresponding to the contour of the upper edges **62** of the partitions. The upper baffle plate **66** is preferably about co-extensive in width with the partitions **53** and it is preferred that the parts be related so that the lowermost part or point **80** of the upper baffle touches the top side of the lower baffle **65**. The upper baffle plate **66** extends upwardly and outwardly at the sides of the body from the point where the plates **65** and **66** are engaged, defining intermediate chambers **82** in the head of the body opening at the sides of the body.

The top plate **64** of the head structure **41** of the body is a flat, horizontally disposed plate, extending between the horizontal edges **61** of the outer walls **50** and it is spaced above the upper baffle **66** so that an upper chamber **85** is established in the head structure, as clearly shown in Fig. 4 of the drawings. In the preferred construction the top plate **64** is somewhat wider than the outer walls **50** to which it connects so that it has projecting portions in the form of flanges **90** initially flat with the rest of the plate, but finally turned up to retain parts of the shell F, as shown in Fig. 6 of the drawings.

In the preferred form of the invention the top plate **64** has a longitudinal, central, vertically disposed fin **91** that projects upwardly to engage or closely approach the header B, as shown in Fig. 4. Furthermore, it is preferred that a longitudinal central vertical fin **92** be provided on the top plate **64** to depend therefrom into the channel formed by the V-shaped baffle plate **66** to form a blinding plate checking vision from one side of the heater to the other at this point.

With the body construction above described the inner passageways **56** in the end ducts **42** of the body open upwardly and discharge into the intermediate chambers **82** so that air from the passageways **56** can spread or flow lengthwise of the head structure **41** of the body and is free to discharge from the sides of the body. Air from the outer passageways **57** discharges into the upper chamber **85** and is free to flow lengthwise of the heater from the ends thereof and to discharge from the sides of the body where the upper chamber **85** is open.

In the form of the invention illustrated the discharge pipe **100** projecting up from the core passes through the opening **69** in the bottom plate **63** and discharges into the lower chamber **70**. In the case illustrated the discharge pipe **100** is rectangular in plan configuration and extends transversely of the heater or in a direction parallel with the inner and outer walls that form the end ducts of the body. A means is provided to circulate the exhaust gases in the lower chamber **70** and in the case illustrated this means involves a hood **101** located over the upper end of the pipe **100**. The hood is shown extending a substantial distance in either direction from the pipe **100** lengthwise of the heater or parallel with the head structure of the body, and it has lip portions **102** that extend down and toward the sides of the structure from the flat top **103** of the hood to enclose the space immediately above the pipe **100** sidewise of the heater, so that gases from the pipe **100** are directed by the hood to discharge in either direction horizontally therefrom and lengthwise of the heater, or parallel with the head of the body. The hood is supported in spaced relation below the lower baffle **65**, preferably by vertical flanges **105** and depend from the baffle **65** and connect to the ends of the flat top **103** of the hood. As a result of this construction there is a portion **108** of the lower chamber **70** established above the hood **101**. The exhaust pipe **110**, which is a part of the head structure of the body structure A, extends vertically from the lower baffle **65** through the baffle **66** and through the top plate **64** to project into the lower end of the flue V. The lower end of the exhaust pipe **110** is open to the portion **108** of the lower chamber **70**. As a result of the construction just described the exhaust gases delivered from the core E into chamber **70** are first directed horizontally and lengthwise of the heater and then flow from the ends of the hood **101** into the enclosed upper portion of chamber **70**, from which they flow into the portion **108** of lower chamber **70** to discharge out through the pipe **110**. As a result of this tortuous flow the burnt gases tend to dissipate a substantial portion of their heat to the various parts of the head **41** of the body and particularly to the lower baffle plae **65** of the head of the body, with the result that the exhaust gases are not dangerously hot when they enter the vent in the wall, and with the result that the air handled by the end ducts of the body structure and circulated in the chambers **82** and **85** of the head structure, is effectively heated before being discharged at the sides of the heater.

The body structure A constructed as above described is provided with a suitable mounting means and in the

form illustrated it is provided at the outer side of each outer wall 50 with vertically disposed plates 112, the edges of which are turned to project from the walls 50 and form plaster stops. Lugs 113 project at the outer sides of the outer walls 50 and are such as to engage studs 13 of the wall to which they can be connected by suitable fasteners 114. With this construction the body A, which is a rigid, inverted U-shaped element, can be arranged in place and made fast to the studding of the wall, and the parts on the outer sides of the outer walls 50 form satisfactory plaster stops, as clearly illustrated in Fig. 3 of the drawings.

The core structure or core E in the form of the invention illustrated involves a flat top 120 located in the body structure a short distance below the lower plate 63 of the head structure 41 of the body, and it has sides 121 joined to the lower edges of the top 120 and extending downwardly therefrom, and it has ends 122 depending from the ends of the top 120 and joining the vertical edges of the sides 121. In the preferred form of the invention the ends 122 are flat, vertically disposed plates, whereas the sides 121 are pitched or disposed so that they extend down and somewhat inward and are thus convergent, forming the core with a chamber 130 which is narrower at its lower end than at its upper end. Further, in the preferred form of the invention the side walls 121 instead of being flat, are corrugated, so that they are, in effect, vertically ribbed, as shown throughout the drawings.

In the preferred form of the invention a series of flat horizontal baffle plates 132 is provided in the upper portion of the chamber 130 formed by the core structure, and they are related, as shown in Figs. 1 and 2 of the drawings, so that the products of combustion flowing in the chamber 130 follow a zig-zag course in the upper portion of the chamber before reaching the outlet pipe 100.

In accordance with the present invention the lower end of the core structure terminates in the base C about flush with the top of the burner head 35, and the lower end portion of the core forms an initial combustion chamber where flame of combustion occurs. In the preferred form of the invention a liner 140 is provided in the lower end portion of the core or where the initial combustion occurs, and the upper edge portion 141 of the liner is preferably turned inward somewhat as shown in Fig. 1, to, in effect, definitely define the initial combustion chamber where the flame is confined. It is preferred, in practice, to provide one or more openings 142 in or through the sides of the core where the liner is provided, so that the flame occurring can be observed when inspection is necessary.

A mounting means is provided for supporting the core E in the body A, and in the form of the invention illustrated lugs 150 project from the exterior of the core and from the inner walls 51 of the body, which lugs are joined by suitable fasteners 151. Through this construction the core structure is supported in the body in spaced relation thereto, that is, so that the top 120 of the core is spaced from the bottom plate 63 of the head while the ends 122 of the core are spaced from the inner walls 51 of the body.

Further, in accordance with the invention, a heat shield is provided in the base below the burner D. In the drawings a flat horizontal shield 150' is shown located in the base C spaced below the burner D and spaced above the bottom 25 of the base. The shield plate 150' is shown carried by depending extensions 151' of the ends 122 of the core.

The floor plates H are shown as horizontally disposed perforated or apertured plates supported at the upper end of the base C to be flush with the top of the floor X, and there is a plate H at each side of the heater covering the side portions of the base C that would be otherwise open, since the base C is considerably wider than the heater structure that occurs in the wall. The floor plates H are apertured or perforated to allow free flow of air downward into the base C, and in the preferred form of the invention air directing fins 160 occur in the base and may be carried by the floor plates C to depend therefrom. The fins extend lengthwise of the heater and down in the base from the top thereof to about halfway between the top and bottom of the base, so that air is effectively directed into the lower portion of the base C before it enters the lower end of the core structure E or flows up at the exterior of the core.

There are two shells F, one at each side of the wall W, and each shell F in its preferred form involves top sections 163 that occur at the sides of the wall W and above the head of the body and side sections 164 that depend from the head sections down at the sides of the heater, clear of the body structure and of the core structure until they reach the level of the floor where they join the floor plates H.

The top sections 163 of the shell are alike and each involves a top plate 165 that extends out from the wall and a side plate 166 that depends from the top plate and is held by the flange 90 when it is turned up, as shown in Fig. 6 of the drawings. The section 163 is closed at its ends by end plates 167. The side sections 164 are alike and each involves an upper portion of perforated or apertured construction, and an imperforate lower portion. In the case illustrated the sections are substantially flat and are vertically disposed, and their upper edge portions are joined to the top sections 163 by suitable fasteners 180. The upper or perforated portions of the side sections 164 occur opposite the head of the body where the chambers in the head open at the sides of the heater so air from the head of the body discharges out through the side sections of the shell. The perforated or apertured portions of the side sections extend down to occur opposite the sides of the core. In accordance with the preferred form of the invention the upper apertured or perforated portion of each side plate 164 is about three times as high as the lower imperforate portion of the side section, as shown throughout the drawings. The lower imperforate portion of each side section is preferably of double wall formation, it being preferred to provide an inner wall portion 181 spaced from the outer wall portion 182 so that this lower or base portion of each side section 164 is, in effect, insulated.

From the foregoing description it will be apparent that I have provided a structure that can be advantageously incorporated in a building in the course of construction, and as the building is completed the final parts of the heater can be installed. The assembly or installation is simple and can be carried out without the exercise of great skill and without employing any special tools or equipment.

As the heater operates the air entering the base C through the flow plates is divided so some of it flows up through the end ducts of the body structure while some of it enters the lower end of the core structure to feed the flame occurring in the combustion chamber at the lower end of the core. Some of the air enters the mixer 33 of the burner and a portion of the air flows up at the outside of the core or into the upwardly converging spaces 190 that occur between the sides 121 of the core and the vertical side sections 164 of the shell. The air thus flowing up at the exterior of the core is effectively heated, as is the air that flows up through the end ducts of the body. The air circulated in the heater, at the exterior of or not within the core, serves to prevent overheating of any of the parts and effectively picks up the heat so that the overall operation of the heater is highly efficient. Further, it is notable that the exhaust gases or the products of combustion that flow up in the chamber 13 of the core are handled in the head structure of the body so that there is no escape of exhaust gases while at the same time

they are so handled or circulated as to dissipate a substantial portion of their heat before they enter the vent V. If desired an auxiliary air supply can be provided, for instance, an air duct **200** can be provided in the floor to open into the base C, and this duct can be provided with a valve or control **201** subject to operation by a suitable control member **202**, accessible at one of the flow plates H.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims:

Having described my invention, I claim:

1. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, a single air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure extending horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having side openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure, a discharge pipe projecting from the upper end of the core structure toward said gas discharging pipe, and a pair of shells, each having side sections detachably secured to the body structure directly outward of and in spaced relation to the respective side members of the core structure and each having openings to pass the air heated from the side members of the core structure, each end duct portion of the body structure including, a flat vertically disposed outer wall, a flat vertically disposed inner wall spaced from the outer wall, side walls between the vertical edges of and joining the inner and outer walls, and a partition between the walls dividing the end portion into two vertically disposed air conducting passageways open at the upper and lower ends of the body structure.

2. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, an air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure extending horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head structure and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having side openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure, a discharge pipe projecting from the upper end of the core structure toward said gas discharging pipe, and a pair of shells, each having side sections detachably secured to the body structure outward of and in spaced relation to the respective side members of the core structure and each having openings therein passing air heated from the side members of the core structure, the head structure of the body structure including flat horizontally disposed top and bottom plates and upper and lower horizontally disposed baffles defining a lower chamber, an upper chamber and an intermediate chamber, the bottom plate having an opening passing the discharge pipe projecting from the core structure, each end duct portion of the body structure defining an air passage extending from the lower end of the body structure and discharging into the intermediate chamber and an air passage extending from the lower end of the body structure and discharging into the upper chamber, the said gas discharging pipe conducting gases from the lower chamber to the vent in the wall.

3. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, an air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure extending horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head structure and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having side openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure, a discharge pipe projecting from the upper end of the core structure toward said gas discharging pipe, and a pair of shells, each having side sections detachably secured to the body structure outward of and in spaced relation to the respective side members of the core structure and each having openings therein passing air heated from the side members of the core structure, the head structure of the body including flat horizontally disposed top and bottom plates and upper and lower horizontally disposed baffles defining a lower chamber, an upper chamber and an intermediate chamber, the bottom plate having an opening passing the discharge pipe projecting from the core structure, each end duct portion of the body structure defining an air passage extending from the lower end of the body structure and discharging into the intermediate chamber and an air passage extending from the lower end of the body structure and discharging into the upper chamber, the said gas discharging pipe conducting gases from the lower chamber to the vent in the wall, the upper baffle being V-shaped and having its lowermost part adjacent the lower baffle.

4. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, an air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure extending horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head structure and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure toward said gas discharging pipe, a discharge pipe projecting from the upper end of the core structure, and a pair of shells, each having side sections detachably secured to the body structure outward of and in spaced relation to the respective side members of the core structure and each having openings therein passing air heated from the side members of the core structure, the head structure of the body structure including flat horizontally disposed top and bottom plates and upper

and lower horizontally disposed baffles defining a lower chamber, an upper chamber and an intermediate chamber, the bottom plate having an opening passing the discharge pipe projecting from the core structure, each end duct portion of the body structure defining an air passage extending from the lower end of the body structure and discharging into the intermediate chamber and an air passage extending from the lower end of the body structure and discharging into the upper chamber, a hood in the lower chamber guiding gases flowing therethrough, the said gas discharging pipe conducting gases from the lower chamber to the vent in the wall.

5. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, an air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure extending horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head structure and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having side openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure, a discharge pipe projecting from the upper end of the core structure toward said gas discharging pipe, and a pair of shells, each having side sections detachably secured to the body structure outward of and in spaced relation to the respective side members of the core structure and each having openings therein passing air heated from the side members of the core structure, the head structure of the body structure including flat horizontally disposed top and bottom plates and upper and lower horizontally disposed baffles defining a lower chamber, an upper chamber and an intermediate chamber, the bottom plate having an opening passing the pipe projecting from the core structure, each end duct portion of the body structure defining an air passage extending from the lower end of the body structure and discharging into the intermediate chamber and an air passage extending from the lower end of the body structure and discharging into the upper chamber, the said gas discharging pipe being vertically disposed and conducting gases from the lower chamber to the vent in the wall, all of the chambers being open at the sides of the heater, the lower baffle having depending side aprons forming a gas confining portion in said lower chamber.

6. A heater applicable to a floor and a wall projecting up from the floor and having spaced studs and a vent therein, including, an upwardly opening box-shaped base adapted to be arranged within the confines of the floor, an air ducting body structure adapted to be arranged in the wall and having an elongate air collecting head structure adapted to extend horizontally and adapted to be positioned between the studs of the wall, said body structure having vertical end duct portions communicating with and depending from the ends of the head structure and opening into the base, said body structure including a gas discharging pipe projecting through said head and engageable with the vent, the body structure having side openings adapted to open at each side of the wall, a core structure in the body structure defining a combustion chamber and opening downwardly into the base and having heat transferring side members respectively facing said side openings, a burner in the base at the open lower end of the core structure, a discharge pipe projecting from the upper end of the core structure toward said gas discharging pipe, and a pair of shells, each having side sections detachably secured to the body structure outward of and in spaced relation to the respective side members of the core structure and each having openings therein passing air heated from the side members of the core structure, the head structure of the body structure including flat horizontally disposed top and bottom plates and upper and lower horizontally disposed baffles defining a lower chamber, an upper chamber and an intermediate chamber, the bottom plate having an opening passing the pipe projecting from the core structure, each end duct portion of the body structure including, a flat vertically disposed outer wall, a flat vertically disposed inner wall spaced from the outer wall, side walls between the vertical edges of and joining the inner and outer walls, and a partition between two walls dividing the end portion into vertically disposed inner and outer air conducting passageways open at the upper and lower end of the body, said passageways discharging into the intermediate chamber and said outer passage discharging into the intermediate and upper chamber, the said gas discharging pipe conducting gases from the lower chamber to the vent in the wall, the upper baffle being V-shaped and having its lowermost part adjacent the lower baffle.

References Cited in the file of this patent

UNITED STATES PATENTS

734,460	Gilliland	July 21, 1903
2,160,264	Furlong	May 30, 1939
2,163,928	Andrews	June 27, 1939
2,482,369	Rhodehamel	Sept. 20, 1949
2,484,457	Marble	Oct. 11, 1949
2,487,776	Cartter	Nov. 8, 1949
2,491,664	James	Dec. 20, 1949
2,506,120	Turner	May 2, 1950
2,552,837	Blazer	May 15, 1951