

W. F. BRUNSWICK.
FURNACE AND STOVE STRUCTURE.
APPLICATION FILED DEC. 10, 1909.

1,024,826.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

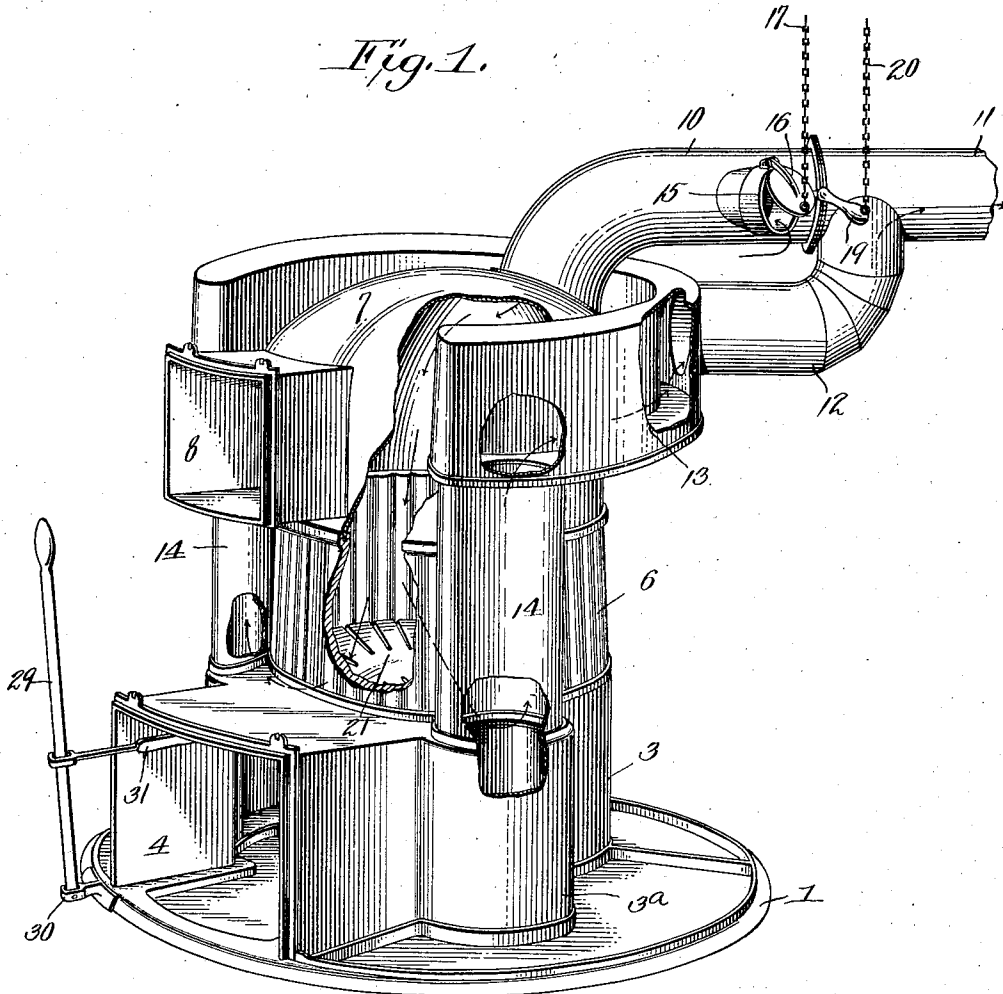
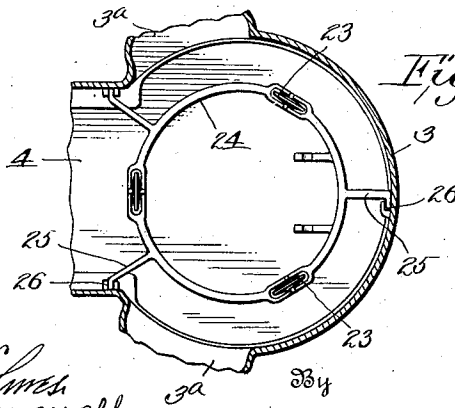


Fig. 4.



Witnesses

Olive M. Holmes
Harriet B. Cornwall

Inventor

W. F. Brunswick

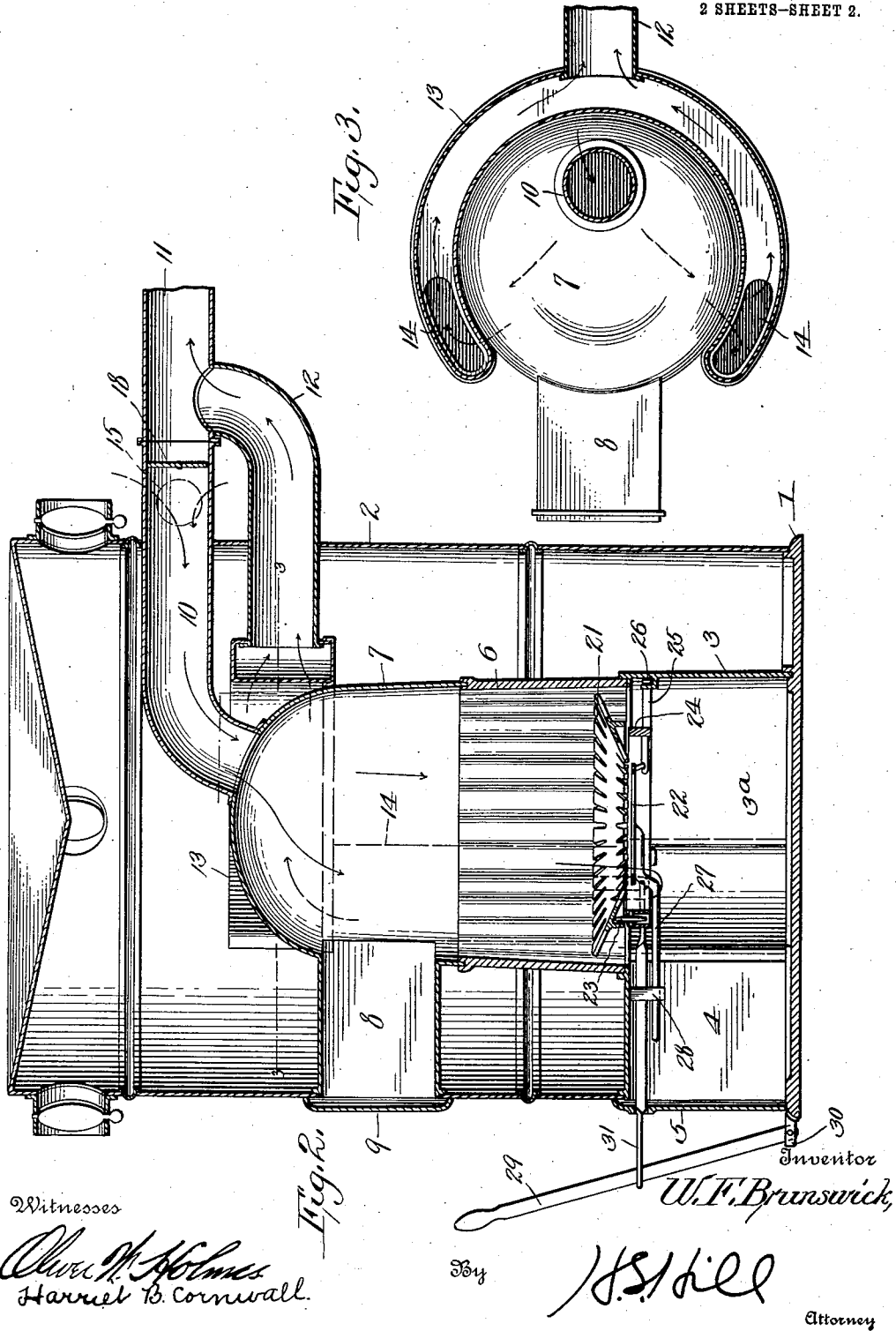
J. S. Hill
Attorney

W. F. BRUNSWICK.
FURNACE AND STOVE STRUCTURE.
APPLICATION FILED DEC. 10, 1909.

1,024,826.

Patented Apr. 30, 1912.

2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

WILLIAM F. BRUNSWICK, OF AKRON, OHIO, ASSIGNOR TO THE REVERSE DRAFT
FURNACE CO., A CORPORATION OF OHIO.

FURNACE AND STOVE STRUCTURE.

1,024,826.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed December 10, 1909. Serial No. 532,371.

To all whom it may concern:

Be it known that I, WILLIAM F. BRUNSWICK, citizen of the United States of America, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Furnace and Stove Structures, of which the following is a specification.

The present invention relates in general to improvements in the construction of stoves and furnaces, and more particularly to that type of stoves and furnaces in which the draft is caused to pass downwardly through the mass of burning fuel, thereby assuring a thorough consumption of the gases of combustion and carbon particles, and preventing the same from escaping through the chimney.

The object of the invention is the provision of a furnace of this character embodying novel features of construction whereby the heat of the fuel is utilized to the best possible advantage, and which will consequently consume much less fuel than an ordinary furnace of the same heating capacity.

The invention further contemplates a reverse draft furnace which is simple in its construction and which comprises few and durable parts well adapted to withstand the destructive influences to which they are ordinarily subjected.

With these and other objects in view, the invention consists in certain arrangements and combinations of the parts, the novel features being pointed out in the appended claims.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings in which:—

Figure 1 is a perspective view of a reverse draft furnace constructed in accordance with the invention, the outer casing being removed and parts being broken away. Fig. 2 is a vertical sectional view through the furnace. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig 2, and Fig. 4 is a horizontal sectional view showing the frame upon which the grate is mounted.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Specifically describing the present embodiment of the invention, the numeral 1 designates the base plate upon which both the furnace proper and the usual outer casing 2 are mounted. The ash pit 3 is supported directly upon the base plate 1 and communicates at the front of the furnace with a passage 4 which extends through the outer casing 2 and through which the ashes are designed to be removed, the said passage being normally closed by a door 5. Superposed upon the ash pit 3 is a fire pot 6 which is preferably formed with numerous and comparatively deep corrugations, the said corrugations tending to promote the circulation of air at the edges of the burning fuel and to produce an intense combustion adjacent to the walls of the combustion chamber so as to cause the same to become highly heated and to diffuse heat into the surrounding air. The top of the combustion chamber is closed by a dome 7 which communicates at the front of the furnace with a passage 8 through which fuel is designed to be placed in the furnace, the said passage extending through the outer casing 2 and being normally closed by a door 9. Communicating with the top of the dome 7 at a point toward the back of the furnace is a direct and indirect draft inlet pipe 10, the said pipe being in the form of an elbow and comprising a horizontally disposed arm which communicates with the smoke pipe 11. An indirect draft pipe 12 also communicates with the smoke pipe 11 and is also in the form of an elbow. This indirect draft pipe is formed with a horizontal arm which is located under the direct draft pipe and leads to the middle portion of a U shaped radiator 13 which partially surrounds the upper portion of the dome 7, the two arms of the radiator communicating with the vertical flues 14 which extend upwardly from the pockets 3^a formed in opposite sides of the ash pit.

An indirect draft inlet opening 15 is formed in one side of the direct draft pipe 10 and a swinging valve gate 16 is provided for controlling the opening, the said valve gate being normally closed by the action of gravity but being capable of being opened to any desired extent by means of a chain 17 which may extend to a regulator upon the first floor of the residence. Arranged between this indirect draft inlet opening 15

and the smoke pipe 11 is a tight fitting damper 18 which is normally held in a closed position by means of a weighted arm 19 projecting from the axis thereof. However, this damper 18 can be opened when desired through the medium of a chain 20 which is connected to the said weighted arm.

The grate of the furnace comprises a frusto-conical section 21 and a horizontal section 22, the former being rotatably mounted upon rollers 23 journaled in the grate supporting frame 24 while the latter is hinged to the said grate supporting frame at the back of the furnace. The frame 24 is itself held in position by means of a number of arms 25 which radiate therefrom and engage the sockets 26 upon the walls of the ash pit. A handle 27 which is secured to the horizontal section 22 of the grate projects forwardly therefrom and is designed to engage a keeper 28 pendent from the top of the passage 4 for the purpose of holding the said grate section normally in a horizontal position. However, when it is desired to tilt the grate section, the desired result can be accomplished by releasing the handle 27 from engagement with the keeper 28. For the purpose of rotating the upper frusto-conical section 21 of the grate, an upright lever 29 is provided upon the exterior of the furnace, the lower end of the lever being pivoted upon a bracket 30 projecting from the base plate 1 while the intermediate portion of the lever is connected by a rod 31 to one side of the grate section 21. It will thus be obvious that by reciprocating the lever 29 the grate section 21 can be oscillated upon the rollers 23.

When starting a fire in the furnace, when removing the ashes therefrom, or at any time when it may be desirable to have a direct draft, the damper 18 is opened and the gate 16 closed. The air will then pass upwardly through the burning fuel from the ash pit to the top of the combustion chamber and then pass through the direct draft and indirect draft inlet pipe 10 to the smoke pipe 11 in the usual manner. Under normal conditions, however, the damper will be closed and the valve gate 16 opened. The air will then enter the direct draft and indirect draft inlet pipe 10 through the opening 15 and be led by the said pipe to the top of the combustion chamber. From thence the air will pass downwardly through the burning fuel, enter the pockets 3^a in opposite sides of the ash pit, rise through the vertical flues 14, pass through the respective arms of the U shaped radiator 13 to the indirect draft pipe 12 which will lead it to the smoke pipe 11. In this manner the heated air is caused to travel a comparatively long distance before entering the smoke

pipe and the flues and radiator through which it passes become thoroughly heated and provide a large surface for the diffusion of the heat into the surrounding air. Such a construction has the further advantage of causing a thorough consumption of all gases of combustion and carbon particles before they leave the furnace and enter the smoke pipe. Particular attention is also directed to the fact that by opening and closing the valve gate 16 the operator has complete control of the fire without the necessity of also adjusting a check damper, the latter being entirely absent in the present construction.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a combined direct and indirect draft furnace, the combination of an ash pit, a combustion chamber located over the ash pit, a smoke pipe, a direct draft and indirect draft inlet pipe leading from the top of the combustion chamber to the smoke pipe and provided at an intermediate point in the length thereof with an indirect draft inlet opening, valve means controlling the said indirect draft inlet opening, a damper arranged in the direct draft and indirect draft inlet pipe at a point between the draft inlet opening and the smoke pipe, a U shaped and horizontally disposed radiator extending around the combustion chamber, vertical flues leading from the arms of the U shaped radiator to opposite sides of the ash pit, and an indirect draft pipe leading from the curved end of the U shaped radiator to the smoke pipe, the before mentioned direct draft and indirect draft inlet pipe serving to convey fresh air to the combustion chamber when the device is used as an indirect draft furnace, and also serving to carry the products of combustion directly to the smoke pipe when the device is used as a direct draft furnace.

2. In a combined direct and indirect draft furnace, the combination of an ash pit, a combustion chamber located over the ash pit, a smoke pipe, a direct draft and indirect draft inlet pipe having an elbow formation, one of the arms thereof communicating with the top of the combustion chamber while the opposite arm thereof is substantially horizontal and leads to the smoke pipe, the latter mentioned arm being formed with an indirect draft inlet opening, valve means for controlling the said indirect draft inlet opening, a damper arranged in the direct draft and indirect draft inlet pipe at a point between the draft inlet opening and the smoke pipe, a U-shaped and horizontally disposed radiator extending around the upper portion of the combustion chamber, vertical flues leading from the arms of the U-shaped radiator to opposite sides of

the ash pit, and an indirect draft pipe arranged under the direct and indirect draft inlet pipe and also having an elbow formation, one of the arms of the indirect draft
5 pipe being substantially horizontal and communicating with the middle portion of the U-shaped radiator while the opposite arm thereof extends upwardly and communicates with the smoke pipe, the before mentioned direct draft and indirect draft inlet
10 pipe serving to convey fresh air to the com-

bustion chamber when the device is used as an indirect draft furnace, and also serving to carry the products of combustion directly to the smoke pipe when the device 15 is used as a direct draft furnace.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM F. BRUNSWICK.

Witnesses:

A. J. DIETRICH,

E. H. AREND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."