Nov. 16, 1926. 1,606,820

J. VAN BRUNT

FURNACE

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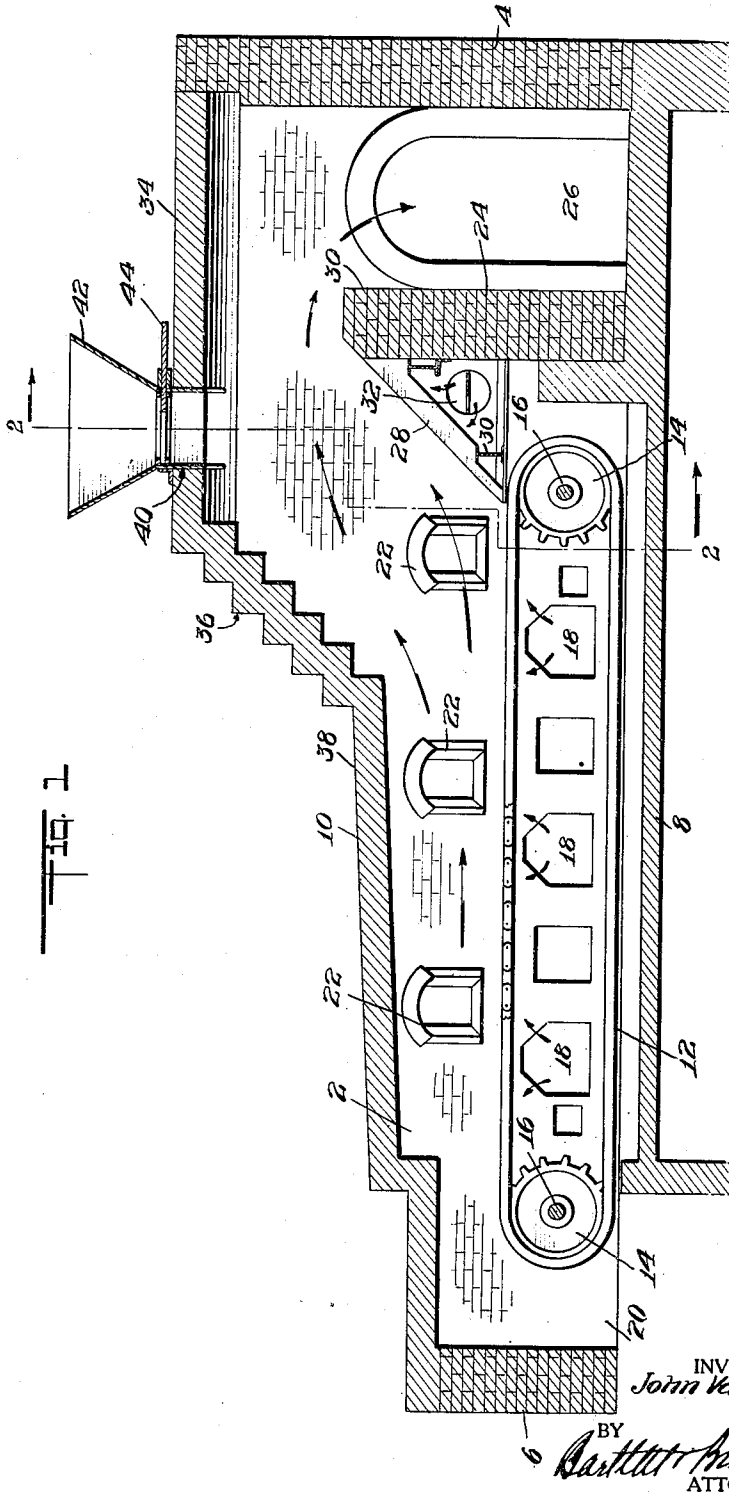


Fig. 1

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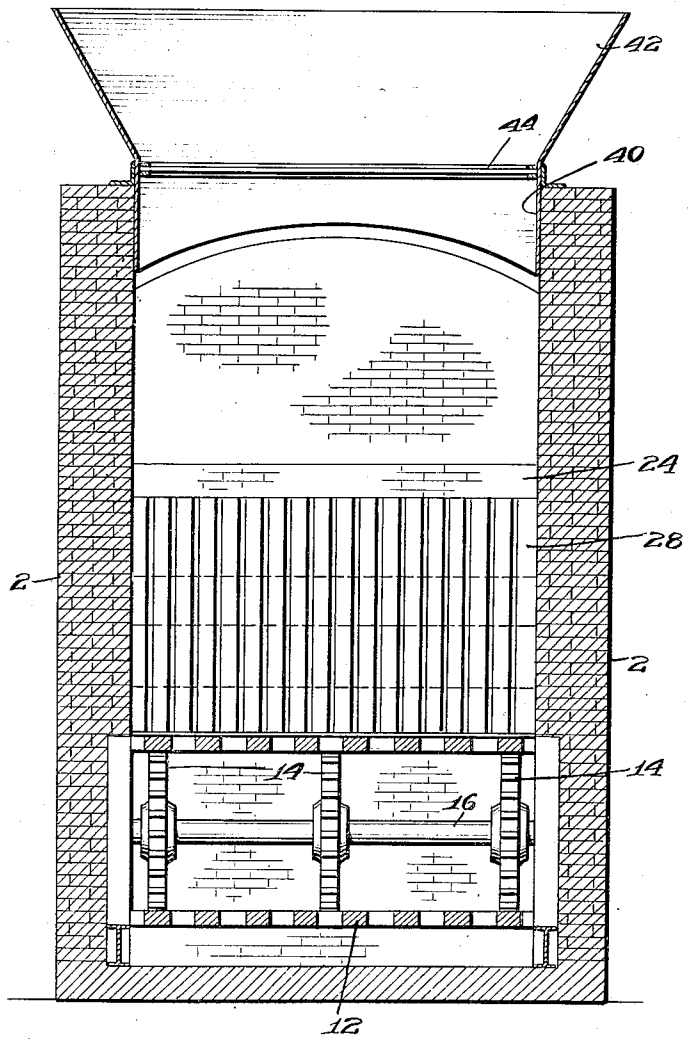
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Fig. 2



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UNITED STATES PATENT OFFICE.

JOHN VAN BRUNT, OF FLUSHING, NEW YORK, ASSIGNOR TO COMBUSTION ENGINEERING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

FURNACE.

Application filed December 3, 1923. Serial No. 673,160.

My invention relates particularly to garbage burning furnaces of the stoker type, and has for its object to provide a furnace of this character which is simple in construction and efficient in operation.

The following is a description of my invention reference being had to the accompanying drawings in which,

Figure 1 is a longitudinal sectional view of a garbage burning furnace embodying the features of the invention in their preferred form; and

Fig. 2 is a sectional view on an enlarged scale taken substantially on the line 2—2 of Fig. 1.

The fire box of the furnace illustrated in the drawings is provided with side walls 2, a front wall 4, a rear wall 6, a bottom wall 8 and a top wall 10. A traveling chain grate 12 is mounted in the fire box on sprocket wheels 14 which are carried by shafts 16 extending between the side walls. Air under pressure is adapted to be supplied to the fuel supporting surface of the chain grate throughout its length through damper controlled air inlet openings 18 in one of the side walls, the openings leading into the space between the runs of the chain. The rear end of the chain grate is spaced from the rear wall of the fire box to provide an ash pocket 20. One of the side walls of the fire box is provided with a plurality of doors 22 arranged slightly above the fuel supporting surface of the grate so as to enable access to be had to the fuel supported by the grate.

In the illustrated construction a bridge wall 24 is mounted on the bottom wall of the fire box and is spaced a distance in front of the forward end of the grate. One of the side walls of the fire box is provided with a flue opening 26 which is located between the bridge wall and the front wall 4 of the fire box and has its upper end spaced below the top surface of said bridge wall, the flue being connected with the furnace chimney. The bridge wall 24 extends a distance above the fuel supporting surface of the chain grate. A downwardly and rearwardly inclined grate structure 28 comprising a series of grate bars arranged side by side and provided with air spaces between them are so located that their upper ends are arranged adjacent the upper portion of the bridge wall and their lower ends overlie the forward end portion of the chain grate, the fuel supporting surfaces of the grate bars being at an angle of substantially 45° to the surface of the chain grate.

The grate bars are supported by I-beams 30 extending between the side walls of the fire box. Air is supplied to the fuel supporting surfaces of the grate bars through a damper controlled air opening 32 in one of the side walls.

The top wall of the fire box is provided with a horizontal forward portion 34 that is spaced a distance above and extends over the bridge wall, the inclined grate structure 28, and the flue 26. The top wall is further provided with a downwardly and rearwardly inclined portion 36 that is arranged substantially parallel with the fuel supporting surface of the inclined grate structure 28, and with a portion 38 that extends over and is arranged substantially close to the rear portion of the chain grate and is inclined slightly upwardly and forwardly to the inclined portion 36.

The horizontal portion 34 of the top wall is provided with an opening 40 extending the width of the space between the side walls and located directly above the rear portion of the inclined grate structure 28. The opening 40 receives the lower portion of a garbage receiving hopper 42 which is adapted to be opened and closed by means of a sliding damper 44.

The garbage is supplied to the furnace through the hopper 42 from which it drops by gravity upon the grate bars 28, the grate bars being at a sufficient angle so as to cause the garbage to slide freely down upon the chain grate and to pile up thereon and against the grate bars. The grate bars which are of strong and rigid construction, absorb the shock of the material falling from the furnace hopper so that there is no danger of injury to the chain grate even though large pieces of iron or other hard and heavy material is dumped through the hopper. As the garbage is fed along by the chain grate all combustible material therein is thoroughly burned, the supply of air through the several air supply openings 18 ensuring thorough combustion throughout the length of the chain grate. The hot gases of combustion which arise from the burning material on the chain grate in passing to the flue opening 26 pass over and im-

pinge against the material that is piled up on the grate bars 28 which ensures thorough drying of this material before it reaches the chain grate, and the compressed air supply through the air inlet opening 32 effects partial combustion of this material on the grate bars. The arrangement of the several portions of the top wall of the fire box with relation to the chain grate and the grate bars, and the location of the flue opening 26 with its upper edge below the top surface of the bridge wall 24 all tend to direct the hot gases downwardly toward the material piled upon the grate bars and away from the hopper 42.

As will be evident to those skilled in the art my invention permits of various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. A furnace of the class described having, in combination, a traveling grate, a downwardly and rearwardly inclined active grate structure adjacent the forward end of said traveling grate for delivering fuel to the forward portion of said traveling grate, a closed wall extending over said traveling grate and said inclined grate and having its forward end spaced a distance in front of the forward end of said inclined grate, a hopper mounted in said top wall and from which fuel may drop directly down upon said inclined grate, and means for causing the waste gases to pass from the furnace at a point spaced a distance in front of the forward end of said inclined grate, and below the forward end of said top wall.

2. A furnace of the class described having, in combination, a combustion chamber having its top wall closed and having a flue opening in the forward end portion of one of the side walls and spaced a distance below the forward end of said top wall, a bridge wall extending between the longitudinal side walls and arranged in back of said flue opening, a traveling grate mounted in said combustion chamber and having its forward end arranged back of said bridge wall, a downwardly and rearwardly inclined grate structure extending from the upper portion of said bridge wall to the top surface of the forward end of said traveling grate, and a hopper mounted in said top wall and having its delivery end arranged directly above said inclined grate structure.

3. A furnace of the class described having, in combination, a chain grate, a bridge wall arranged in front of the forward end of said grate and extending a distance above the top of said grate, a downwardly and rearwardly inclined grate structure extending from the upper part of said bridge wall to the forward end of the fuel supporting surface of said chain grate, to permit material deposited thereon to slide by gravity downwardly upon said chain grate, a closed wall extending over said traveling grate and said inclined grate, and having the portion of the top thereof extending over the greater portion of said traveling grate in a plane spaced below substantially the upper end of said inclined grate, said closed wall having a flue leading from the interior thereof having its inlet end spaced in front of said bridge wall, and means for supplying air to assist combustion to said traveling grate and to said inclined grate.

4. A furnace of the class described having, in combination, a chain grate, a bridge wall arranged in front of said grate and extending a distance above the fuel supporting surface of said grate, a downwardly and rearwardly inclined grate structure extending from the upper part of said bridge wall to the forward end of the fuel supporting surface of said chain grate for permitting material deposited upon said inclined grate to slide by gravity downwardly upon said traveling grate, means for supplying air to said chain grate, independent means for supplying air beneath said inclined grate, and means for causing the waste gases of combustion to pass from the furnace at a point in front of said bridge wall.

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