May 5, 1925.

1,536,650

C. E. BETCHER

FURNACE ATTACHMENT

Filed May 2, 1924

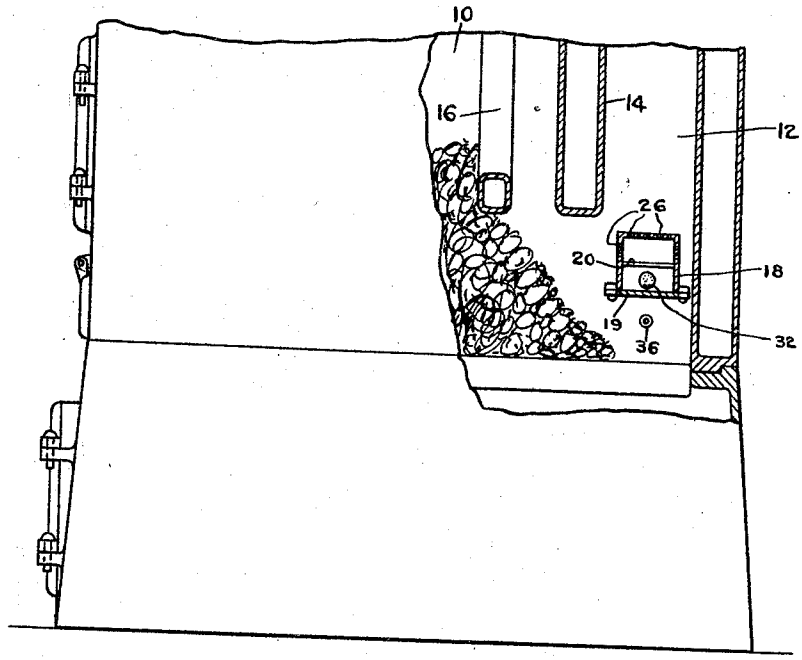



FIG. 1

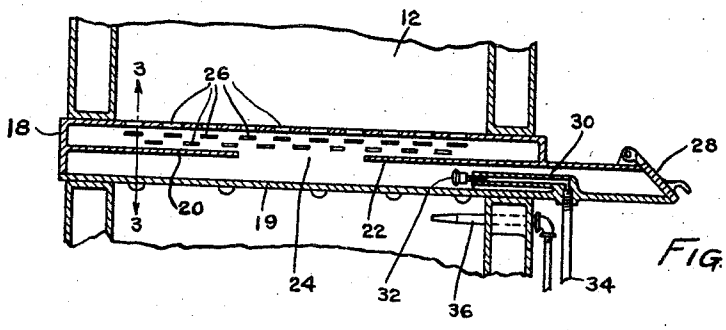



FIG. 2

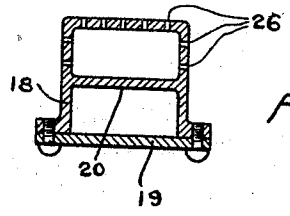



FIG. 3

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# UNITED STATES PATENT OFFICE.

CHESTER E. BETCHER, OF MINNEAPOLIS, MINNESOTA.

## FURNACE ATTACHMENT.

Application filed May 2, 1924. Serial No. 710,573.

*To all whom it may concern:*

Be it known that I, CHESTER E. BETCHER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Furnace Attachments, of which the following is a specification.

My invention relates to furnace attachments and an object is to provide an attachment for accomplishing thorough combustion of the fuel and thus preventing the discharge of smoke and soot from the furnace. In order to accomplish the objects of my invention, I provide a device by means of which water is introduced into the combustion chamber of the furnace and vaporizes therein to produce steam. My device preferably includes a spraying nozzle so arranged that the force of the spray causes air to be drawn in and mixed with the steam which is produced.

The full objects and advantages of my invention will appear in connection with the detailed description, and the novel features of my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings which illustrate one form in which my invention may be embodied, Fig. 1 is a fragmentary view of a furnace showing my attachment in place therein. Fig. 2 is a view showing the attachment in longitudinal section. Fig. 3 is a view of the attachment in cross section on the line 3—3 of Fig. 2.

My attachment is shown in connection with a furnace having a firebox 10 and a combustion chamber 12 which are partly separated from each other by a hollow firewall 14 and a vertical grate 16, but it will be understood that the attachment may be used in other types of furnaces. The attachment includes a tubular member 18 which is placed in the combustion chamber 12. In the form shown, the tubular member is square in cross section and the bottom member 19 thereof constitutes a hot plate. The end portions of the tubular member are provided with horizontal partitions 20 and 22 in alinement with each other but separated by a gap 24 of considerable extent. Above the gap and partitions, the tubular member is provided with a plurality of perforations 26 some of which are located in the top wall and some of which are located in the upper portion of the side walls. The tubular member is closed at one end and at the other end the portion below the partition 22 is extended outside the shell of the furnace and is provided with a door or damper 28 by means of which the intake of air is regulated. Located below the partition 22 is a small longitudinally extending tube 30, the inner end of which is provided with a spraying nozzle 32 and the outer end of which is connected with a water supply pipe 34. A gas or oil jet burner 36 extends into the combustion chamber underneath the tubular member 18 and this burner may be lit when the fire is low or is first started.

The operation and advantages of my invention will now be obvious. Water delivered by the supply pipe 34 is forced from the nozzle 32 in the form of a spray which is converted into steam by the heat in the tubular member. Any drops which form beyond the nozzle fall upon the hot plate which constitutes the bottom of the tubular member and these drops are immediately vaporized. The draft in the furnace in connection with the force of the spray of water entering the tubular member causes air to be drawn in if the damper 28 is opened and the combined steam and air pass out of the perforations 26 into the combustion chamber, the action being similar to that of a carbureter.

I claim:

1. A furnace attachment comprising a tubular member in the combustion chamber of the furnace, a horizontal partition extending for a portion of the length of said tubular member, a water supply pipe extending into said tubular member beneath said partition and a spraying nozzle on the end of said pipe, said tubular member having perforations above said partition for the escape of steam.

2. A furnace attachment comprising a tubular member in the combustion chamber of the furnace, two horizontal partitions extending inwardly from the ends of said tubular member and separated from each other by a gap, a water supply pipe extending into said tubular member beneath one of said partitions and a spraying nozzle on the end of said pipe, said tubular member having perforations above said partitions for the escape of steam.

3. A furnace attachment comprising a tubular member in the combustion chamber of the furnace, a horizontal partition ex-

tending for a portion of the length of said tubular member, a water supply pipe extending into said tubular member beneath said partition, and a spraying nozzle on the end of said pipe, said tubular member having an air entrance opening beneath said partition through which air is drawn and said tubular member having perforations above said partition for the escape of steam and air.

4. A furnace comprising a fire box, a combustion chamber, a fire wall between said fire box and said combustion chamber, and spaced above the bottoms thereof, a water supply pipe extending into said combustion chamber, and a hot plate upon which water from said pipe falls and is vaporized, said plate being positioned in said combustion chamber at the rear of said fire wall.

In testimony whereof I hereunto affix my signature.

CHESTER E. BETCHER.