Sept. 6, 1927. 1,641,545

J. J. McCOY

SELF FEEDING BURNER

Filed Feb. 18, 1926 2 Sheets-Sheet 1

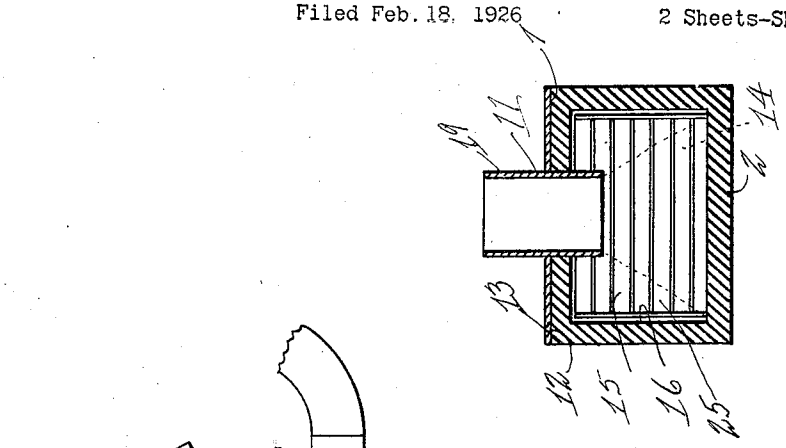


Fig. 2

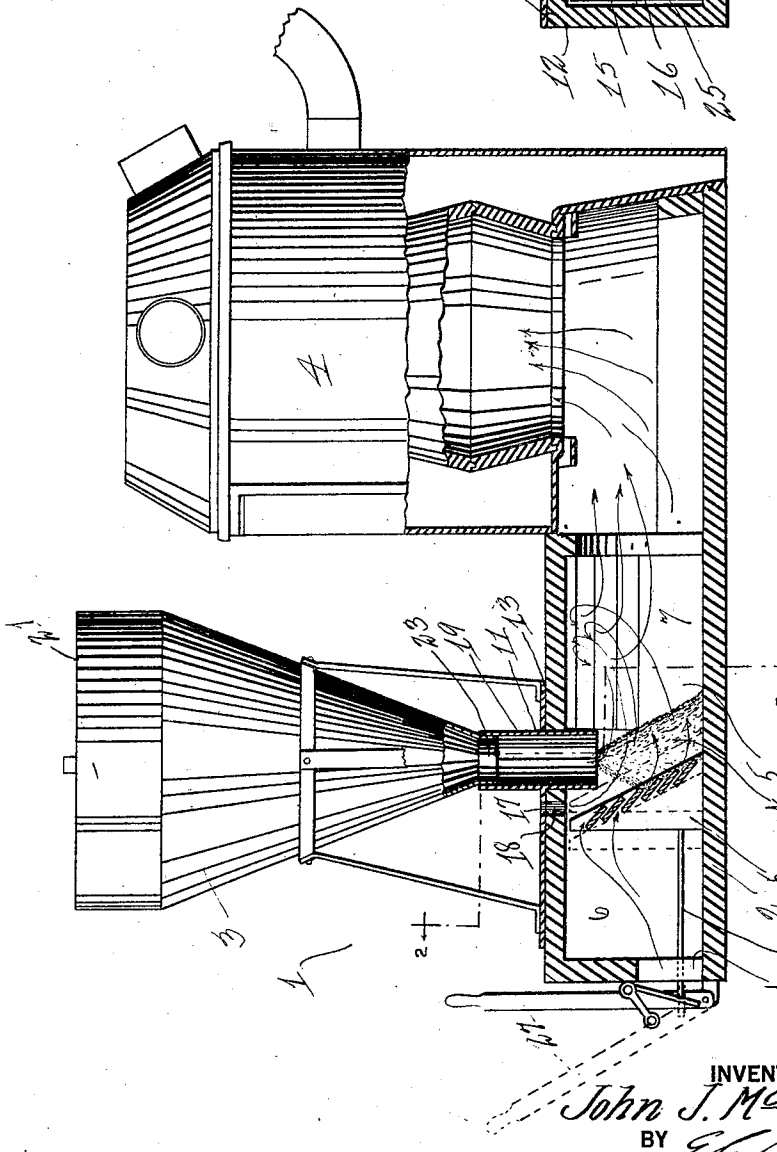


Fig. 1

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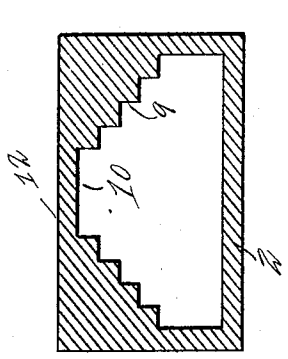


FIG. 5

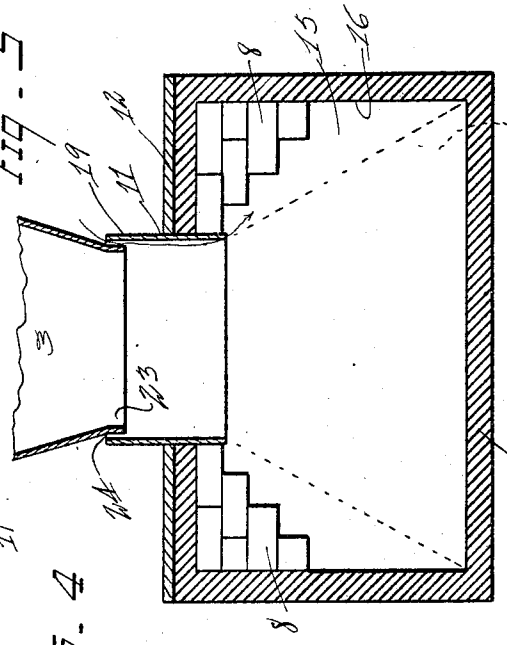


FIG. 6

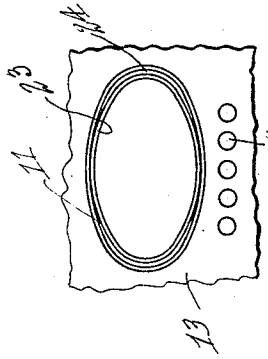


FIG. 4

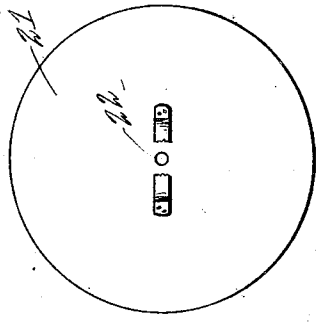


FIG. 7

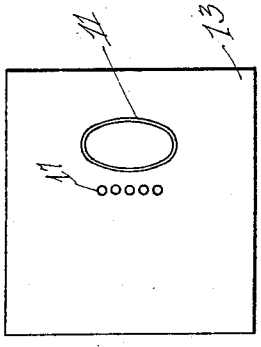


FIG. 3

INVENTOR

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Patented Sept. 6, 1927. 1,641,545

UNITED STATES PATENT OFFICE.

JOHN J. McCOY, OF MILTON, OREGON.

SELF-FEEDING BURNER.

Application filed February 18, 1926. Serial No. 88,985.

This invention relates to self feeding burners and has as one of its objects to provide a combustion chamber that may be attached to or connected with furnaces and the like.

Another of the objects of this invention is to provide a self feeding burner that is adaptable to fuel of various kinds, such as sawdust, fine coal, and the like.

A further object of this invention is to provide a self feeding burner that will automatically feed itself.

A further object of this invention is to provide a self feeding burner having a means for regulating the combustion.

A further object of this invention is to provide a self feeding burner that is adaptable to waste products or matter, and that is economical in combustion.

With these and other objects in view reference is now had to the accompanying drawings in which—

Fig. 1 is a side elevation of the self feeding burner, partly in section, shown attached to a furnace;

Fig. 2 is a cross section of the combustion chamber taken on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the top plate;

Fig. 4 is a plan view of the thimble showing the relative position of the collar of the hopper with relation to the thimble;

Fig. 5 is a cross section taken laterally through the furnace end of the combustion chamber;

Fig. 6 is a cross section taken laterally through the combustion chamber at the thimble; and

Fig. 7 is a plan view of the cover of the storage chamber.

Having reference to the drawings, like numerals refer to like parts throughout the several views, and the numeral 1 refers to the device as a whole, comprising in general a combustion chamber 2, and a storage chamber 3, and the device is shown in Fig. 1 of the drawings as applied to a heater 4, portrayed as a furnace for heating buildings.

The combustion chamber 2, is attached to the heater 4, in any suitable manner, or as shown, and consists of an elongated chamber 5, which is divided into two compartments, one of which, the front compartment is termed the cold compartment, designated by the numeral 6, and the second of which is termed the hot compartment, designated by the numeral 7.

The cold compartment 6, is so called as all draft entering the combustion chamber 2, enters through the cold compartment, as will be hereinafter explained, and the heat is carried on with the draft through the hot compartment 7, to the heater.

As the hot compartment is required to stand an intensive heat, it is constructed on its upper side with fire brick 8, or other suitable heat resisting material, and this construction is in the form of an arch 9, as shown in Fig. 5, and the arch is designed to provide a directing channel 10, at the top of the arch to direct the heated gases to the heater.

The arch 9, extends forward to approximately the center of the combustion chamber, and has its front end positioned adjacent to a thimble 11, that depends into the combustion chamber 2, between the cold and hot compartments and through which the fuel is fed thereinto.

The thimble 11, is oval in contour and is mounted on the top 12, of the combustion chamber by means of a supporting plate 13, that is preferably made integral with the thimble 11.

The thimble being oval is arranged so that its major axis is positioned laterally, or across the combustion chamber, while its minor axis is positioned longitudinally of the chamber and is arranged with its lower end depending into the chamber.

By this form and arrangement the fuel is deposited in the combustion chamber in a pile 14, with its greatest dimension positioned laterally in the chamber, and also in a manner that considerable space 15, is left on each side of the fuel between the fuel and the side walls 16, of the chamber, the purpose of which will be presently explained.

Draft holes 17, are formed in the plate adjacent to the front side of the thimble 11, and are in communication with the interior of the cold compartment 6, through complemental holes 18, left for the purpose in the top of the combustion chamber, and these act to supply a down draft to the fuel pile 14.

The thimble is also provided with an upward extension 19, that adds length thereto,

wherein a body of fuel is loosely confined, supported by the pile 14, below, until by consumption the size of the pile is decreased when the fuel therein will supply anew the consumed fuel.

Slidably mounted in this thimble and in communication with the combustion chamber is a fuel hopper or storage chamber 3, of the general form of an inverted frustum of a cone, on the top of which is provided a cover 21, in which is provided a vent hole 22, and on the bottom of which is a collar 23, that engages the thimble 11.

The upper part of the storage chamber is preferably circular and its form gradually changes from the circular to an oblong at said collar, the collar forming the outlet thereof.

The outlet is restricted and has shorter major axis than the thimble, its contour providing for a vent 24, at each end of the outlet, between it and the ends of the major axis of the thimble, by which means a current of air will pass downward through the loosely confined fuel in the thimble, and thus provide air lubrication for the passage of the fuel therethrough, the loose accumulation of the fuel in the thimble being accomplished by passing the fuel through the restricted discharge outlet 23, of the storage chamber.

The purpose of the vent hole 22, is to provide a means to prevent smoke and gases from the burning fuel from entering the storage chamber and, by coming in contact with the cold fuel, to become condensed to form a creosote or wood tar substance that by adhering to the side walls of the storage chamber, would change its smooth surface to a rough and adhesive surface by the accumulation thereon of the viscid substance, to which the fuel would adhere. This also applies to the vents 24, as both the vent hole 22 and the vents 24 provide for a down draft superinduced by natural upward draft through the heater and chimney (not shown).

Slidably and adjustably mounted in the combustion chamber 2, and positioned in the cold compartment 6, is a grate 25. This grate may be designed in cross section as shown or may be of any design that will break up the draft from the draft door 26, into jets of air, and that will direct the jets around and over the surface of the fuel. The grate is adjusted by means of a lever 27, pivotally attached to the front of the combustion chamber, and is connected to the grate by a rod 28, whereby the grate may be moved forward and backward.

It will now be noted that there is a draft from the draft door 26, that passes in thin streams or jets over the surface of the fuel; that a down draft from the draft holes 17, in the plate 13, will direct jets of air over the upper surface of the fuel; and that the draft above mentioned as an air lubricant for the thimble, will pass over the top ends of the pile adjacent to the bottom of the thimble.

By this arrangement, and by providing draft openings throughout the height of the grate, and further by providing for an air space between the upper part of the pile and the side walls, an air current will surround the fuel (with the exceptions of where the fuel contacts the grate) and by this means will cause a constant combustion to take place. It may here be noted that it is understood that a certain amount of the air of the draft will obviously pass through the fuel, depending upon the shape and size of the particles forming the fuel.

In use the storage chamber is filled with fuel. Now as the fuel is placed in the storage chamber the pile 14, builds up beneath until it meets the bottom of the thimble, then the thimble and the storage chamber become full.

A lighted paper now placed at the draft door will be drawn by the draft against the front side of the grate and the flame will pass through the grate orifices and will ignite the fuel.

By drawing the grate away from the pile more openings thereof are exposed to direct additional jets of air against the fuel, which will obviously cause a hotter and more rapidly burning fire, and as the grate is advanced toward the pile the reversed action will be true.

As the outer part of the fuel is consumed, other fuel is permitted to drop and take its place, and through the shape of the storage chamber the fuel will fall from the sides to the center. And through the changing shape of the chamber there will be a slight change in the direction of falling as the shape changes from the circular to the oval, with the accompanying gradual change of the level of the fuel in the storage chamber.

This change prevents the fuel congesting and permits it to pass freely through the restricted discharge opening which permits the fuel to fall into the thimble and to retain its loose condition therein.

Having thus described my invention, I claim:

1. In a self feeding burner, a combustion chamber provided with a cold compartment and a hot compartment, said hot compartment being arched in cross section to provide a directing channel for the hot gases, a thimble mounted on said combustion chamber and depending into said chamber, a storage chamber provided with a restricted outlet, mounted in said thimble, said outlet having less dimensions than said thimble, thereby providing for air lubrication in said thimble, and a slidably mounted grate positioned in said cold compartment, and adja-

cent to said thimble, and in a manner to direct the draft over the surface of the fuel.

2. In a self feeding burner, a combustion chamber provided with a cold compartment, and a hot compartment, said hot compartment being arched in cross section to provide a directing channel for the hot gases, a thimble mounted on said combustion chamber in a manner to depend into said chamber, and positioned in said hot compartment, a storage chamber provided with a restricted outlet, and having a form gradually changing from the circular to an oval at said outlet, and slidably mounted in said thimble in a manner to form a vent at each end of said oval outlet to provide air lubrication in said thimble, and a slidably and adjustably mounted grate positioned in said hot compartment, and adjacent to said thimble, in a manner to direct a draft over the surface of the fuel.

3. In a self feeding burner, a combustion chamber provided with a cold compartment and a hot compartment, a plate mounted on said combustion chamber and provided with a depending thimble, said thimble being positioned in said hot compartment, a storage chamber provided with a restricted outlet having a form gradually changing from a circular to an oval at said outlet, and slidably mounted in said thimble in a manner to form a vent at each end of said oval outlet to provide air lubrication in said thimble, a slidably and adjustably mounted grate positioned in said combustion chamber, and adjacent to said thimble, in a manner to direct a draft on said fuel in conjunction with a draft from the lubricating air.

In testimony whereof I affix my signature.

JOHN J. McCOY.