L. K. FLANAGAN.

SMOKE CONSUMER.

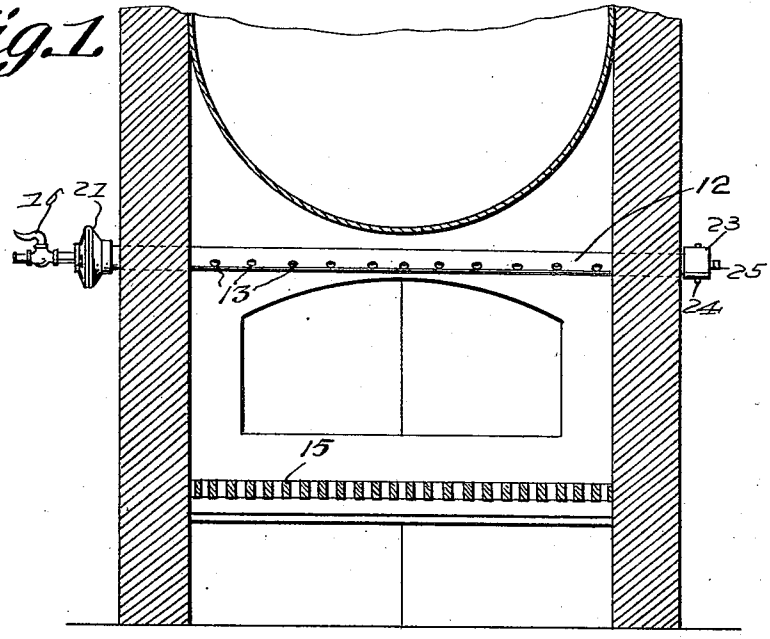
APPLICATION FILED NOV. 25, 1919.

1,421,200.

Patented June 27, 1922.

2 SHEETS—SHEET 1.

Fig. 1.



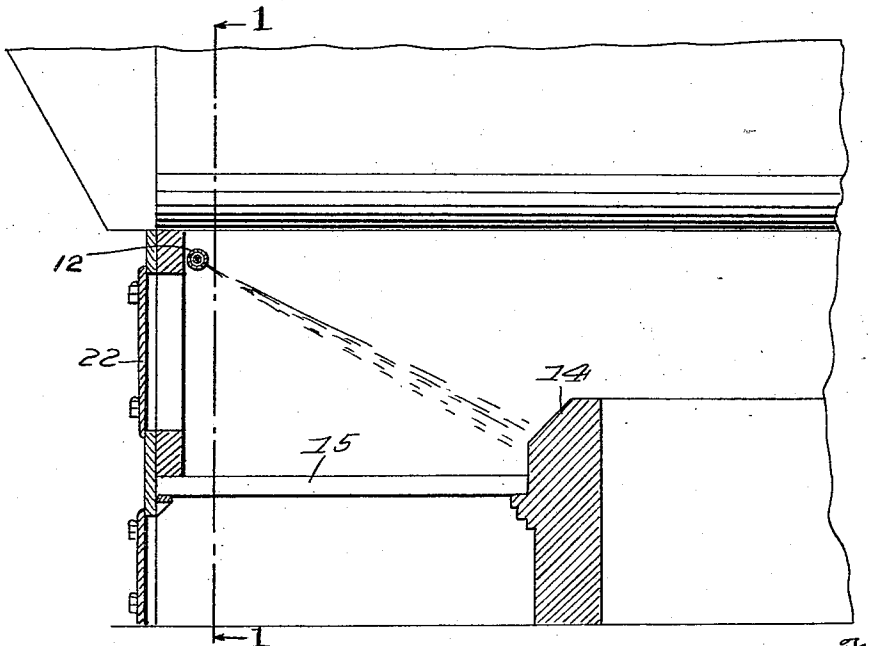


Fig. 2.

Inventor

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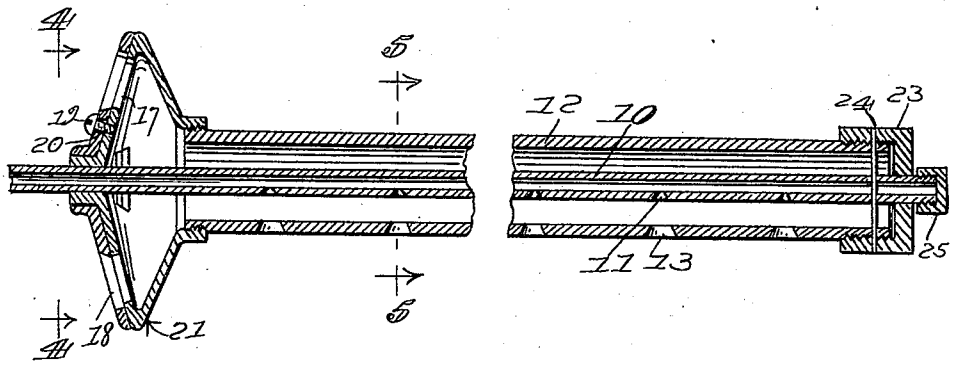
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2 SHEETS—SHEET 2.

Fig. 3.



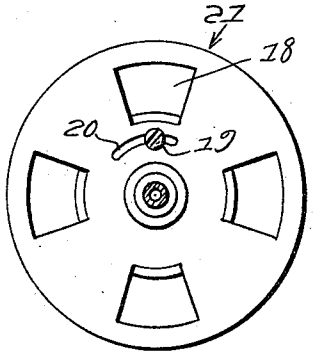


Fig. 4.

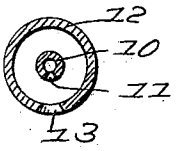


Fig. 5.

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UNITED STATES PATENT OFFICE.

LIBERTY K. FLANAGAN, OF KANSAS CITY, MISSOURI.

SMOKE CONSUMER.

1,421,200. Specification of Letters Patent. Patented June 27, 1922.

Application filed November 25, 1919. Serial No. 340,583.

To all whom it may concern:

Be it known that I, LIBERTY K. FLANAGAN, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented new and useful Improvements in Smoke Consumers, of which the following is a specification.

The object of the invention is to provide simple and efficient means for securing the combustion of the smoke and gases forming elements of the products of combustion in boiler furnaces and the like to the end that by reason of securing a more complete consumption of the combustible elements of the fuel an economy in the use of the latter may be effected without reducing the efficiency of the furnace, the means employed for the purpose indicated being such as to operate without having the effect of producing a forced draught and hence without inducing an increased rapidity in the consumption of the fuel, and with these objects in view the invention consists in a construction and combination of parts of which a preferred embodiment is shown in the accompanying drawing, wherein:

Figure 1 is a section on the line 1—1 of Figure 2.

Figure 2 is a central longitudinal section of a furnace with the apparatus in operative relation therein.

Figure 3 is a longitudinal section of the apparatus detached from the furnace.

Figure 4 is an inlet end view of the apparatus viewing the same from the position indicated by the dotted line 4—4 of Figure 3.

Figure 5 is a transverse section on the plane indicated by the line 5—5 of Figure 3.

The device consists essentially of a steam jet tube 10 provided with a plurality of orifices or jet openings or outlets 11 and arranged within an air conductor 12 consisting of a pipe of considerably larger diameter than the steam tube and having outlets 13 arranged in radial alignment or registration with the orifices of the jet tube to the end that steam under pressure supplied to the jet tube will be expelled through the outlets of the air conductor in the form of a spray which in practice is directed across the fire bed to impinge upon the fire wall or bridge wall 14 at the back of the grate 15 as shown in Figure 2. In other words the jet openings in the steam tube are disposed to face rearwardly and downwardly with relation to the fire bed at such an angle as to pass completely over the fire bed to the end that a curtain of steam in the form of a spray is projected through the smoke, gases and other products of combustion rising from the fire bed on the way to the outlet over the bridge wall. This discharge of the steam induces a flow of air through the conductor 12 so that the steam spray is intimately mixed with air to the end that the carbon of the smoke representing the unconsumed solid portion thereof is rapidly consumed with a resulting increasing intensity of the heat from a given quantity of fuel without inducing a more rapid consumption of the fuel in the grate.

Obviously the supply of steam may be regulated to suit the conditions under which the furnace is being operated as by a suitable valve 16 while the adjustable register 17 may be arranged to control the inlet 18 of the air conductor to the end that the mixture of steam and air escaping from the outlets 13 may be in the desired proportions, a set screw 19 connected with the register and operating through a slot 20 in the head 21 of the conductor serving to secure the parts in their adjusted relations. The encased steam tube is preferably located near the front wall of the furnace as above the fuel or feed door 22 where it is exposed to the least extent to the intensity of the heat within the fire box or combustion chamber and obviously the influx of cold air from the outside of the furnace incident to the jet action of the discharge from the orifices of the steam tube will tend to maintain the temperature which will prevent destructive heating of the apparatus, and in practice it is preferable not only to arrange the head 21 outside of the furnace wall as shown in Figure 1 but also to extend the opposite end of the same beyond the other wall where the air conductor may be fitted with a cap 23 engaged by a transverse pin 24 extending through the contained jet tube and the latter in addition may be extended through the cap 23 and fitted with a separate removable cap 25 to permit of blowing out should that operation become necessary.

What is claimed is:

An apparatus for consuming smoke in furnaces consisting of a steam jet tube and an encasing air conductor, the latter being provided at one end with a head having air inlet openings and an adjustable register for controlling the extent of exposure of said

openings, and having at the other end a removable cap having a transverse pin extending through said conductor and jet tube, said jet tube being extended axially through said head and cap and being fitted beyond the latter with a removable closure, and said jet tube and conductor being provided with transversely registering orifices to permit the discharge of steam and air through the corresponding orifices of the tube and conductor.

In testimony whereof he affixes his signature.

LIBERTY K. FLANAGAN.