

F. W. ALLES, A. FLETCHER AND G. E. HITCHENS.

GAS BURNER FOR DRYING LADLES.

APPLICATION FILED AUG. 30, 1919.

1,342,932.

Patented June 8, 1920.

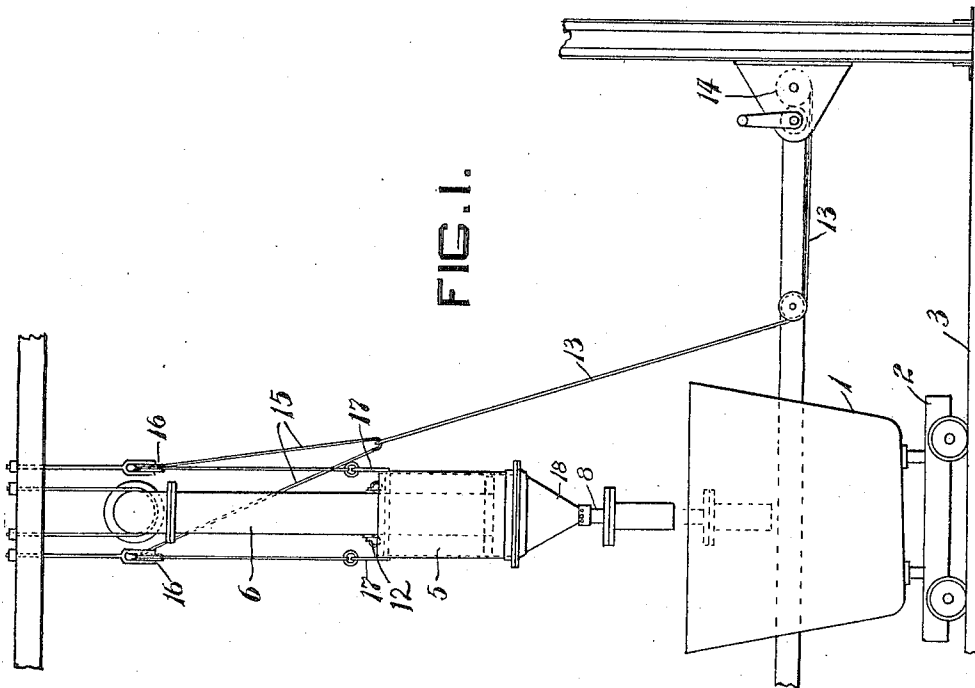


FIG. 1.

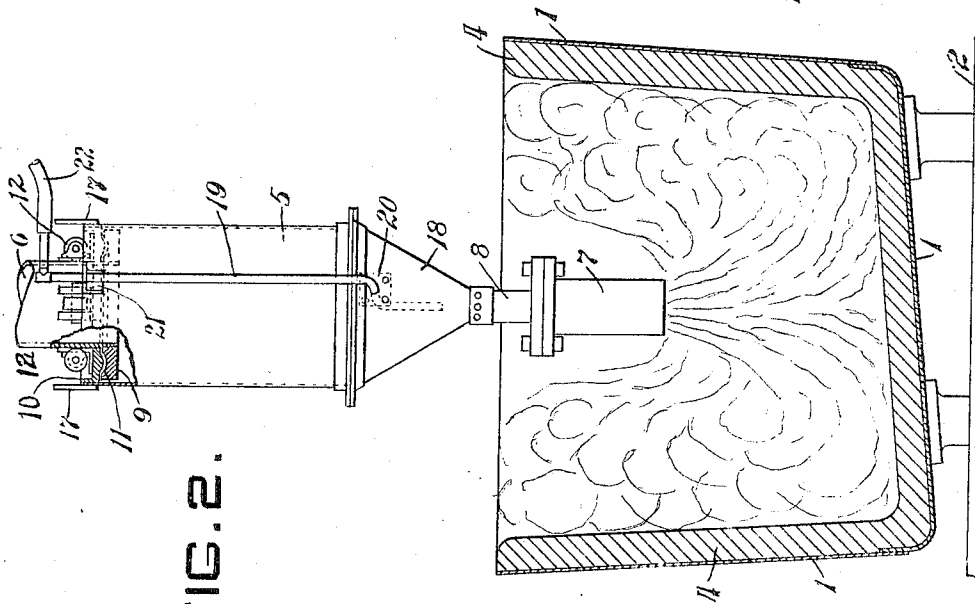


FIG. 2.

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GAS-BURNER FOR DRYING LADLES.

1,342,932.

Specification of Letters Patent.

Patented June 8, 1920.

Application filed August 30, 1919. Serial No. 320,863.

To all whom it may concern:

Be it known that we, FRED W. ALLES, ALEXANDER FLETCHER, and GEORGE E. HITCHENS, all citizens of the United States, and all residents of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Burners for Drying Ladles, of which the following is a specification.

Our invention relates to a gas burner, and particularly to a gas burner for drying the refractory linings in ladles used as containers for molten metal.

In preparing ladles for use in receiving molten metals, the metallic shell of the ladle is lined with fire brick or with a refractory clay or composition of relatively great thickness. The refractory clay lining is applied to the interior of the shell in a moist or plastic state, and is then best dried by the direct application of heat and flame. As the ladles are used in handling and conveying molten metal, it is obvious that they must be thoroughly dried and all moisture driven off before being put into service.

The object of the invention is to provide a gas burner so mounted that it may be raised to permit a ladle to be introduced into position beneath it without tilting of the ladle, and which may be lowered into operative position in the ladle for drying the lining thereof. A further object of the invention is to provide a burner, having the advantages mentioned above, which is substantially gas tight and which furnishes a combustible mixture sufficient to rapidly and thoroughly dry the lining of the ladle.

Figure 1 is an elevation of the apparatus showing the gas burner in its raised position for permitting the ladle to be run into position there beneath; and Fig. 2 is a fragmentary elevation showing the gas burner in operative position in the ladle.

In the drawings the numeral 1 designates the metallic shell of the ladle, which is mounted on a suitable wheeled truck 2 arranged to run on the tracks 3. The shell 1 of the ladle is provided on its inner surface with the refractory lining 4, which previous to the drying operation is in a moist and plastic condition. The gas burner proper comprises the mixer hood 5, which is mounted on the gas main 6, preferably a low

pressure main; and the combustion chamber 7, located beneath the mixer hood and joined to it by means of the short connecting pipe 8.

The gas main 6 is supported above the ground or working floor in any suitable manner at such height as to provide a vertically extending portion of considerable length. The mixer hood 5 is, throughout the greater portion of its length, cylindrical and of greater diameter than the gas main by which it is supported and on which it is arranged to telescope. At its lower extremity the gas main 6 is provided with an annulus 9 screw-threaded to the outer surface of the main; and to the inner surface of the mixer hood, adjacent its upper extremity, is bolted an annulus 10. The annulus 10 is arranged to rest upon the annulus 9 in the most fully lowered position of the mixer hood, and the annuli are mutually provided with a matching sand filled joint 11 to prevent escape and ignition of the gas in this position of the parts. The annulus 10 of the mixer hood 5 surrounds the vertical portion of the gas main loosely and is provided with a plurality of rollers 12 bearing directly against the main. The mixer hood 5 is raised and lowered on the gas main 6 by means of the cable 13; which is on the winch 14, and which is forked to provide a plurality of cables 15 passing over suitably supported overhead sheaves 16 and secured at their extremities to the lugs 17 on the mixer hood.

The combustion chamber 7 is of simple tubular form and is secured to the connecting pipe 8, which is of lesser diameter than the combustion chamber and which is in turn secured to the lower and smaller end of the funnel shaped portion of the mixer hood. Extending into, or to a position slightly above, the connecting pipe 8 is an air supply pipe 19, which leads from a suitable source of air pressure supply, such, for instance, as a bessemer blowing engine. The air blast pipe 19 enters the funnel shaped portion 18 of the mixer hood by being welded into the plate 20 thereon to form a gas tight connection at its point of entry, and is held in position by means of the angle plate 21 on the upper portion of the mixer hood 5. Since the air pipe 19 is rigidly secured to the mixer hood for vertical

movement therewith, it is provided at some point throughout its length with a flexible connection, such as the flexible tubing 22. The current of gas and air passing through the constricted passage provided by the pipe 8 can expand rapidly in the combustion chamber and ladle to fill the interior of the ladle with the products of combustion.

In use of the apparatus the mixer hood and combustion chamber are raised on the gas main, by means of the winch and cable, a distance sufficient to permit the ladle to be run into position beneath the burner. The burner is then lowered so that the combustion chamber extends into the ladle a distance sufficient to cause the products of combustion to reach all portions of the ladle lining when the gas is turned on and ignited. When the lining of the ladle has been thoroughly dried, the burner is again raised into such position that the combustion chamber is above the rim of the ladle and the ladle may be run out from its position beneath the burner.

The permanent nature of the burner mounting permits the delivery of a relatively great volume of a fluid fuel sufficient to completely dry the lining of a ladle, while its vertical adjustability permits the ladle to be placed in operative relation to the burner without disturbing the upright position of the ladle with consequent injury to its lining. Further advantages of the invention will be appreciated by those skilled in the art to which the invention pertains.

As a number of modifications may be made in the apparatus without departing from the spirit of the invention; no limitations, other than those contained in the appended claims, are to be imposed.

What we claim is:

1. In combination a ladle mounted for horizontal movement and a fluid fuel burner comprising a conducting main, a mixer hood mounted for vertical movement on said main, a combustion chamber on said mixer

hood, and means for introducing air under pressure into said mixer hood.

2. In combination a ladle mounted for horizontal movement and a burner for fluid fuel comprising a conducting main, a mixer hood arranged to telescope on said main, a combustion chamber and air inlet in said hood, and means for raising said burner on said conducting main to permit introduction of the ladle there beneath and for lowering it into said ladle.

3. In combination a ladle mounted for horizontal movement and a burner for fluid fuel comprising a conducting main, a mixer hood arranged to telescope on said main, a combustion chamber and air inlet means in said mixer hood, means for raising the mixer hood on said conducting main to permit introduction of the ladle and for lowering the mixer hood and combustion chamber into operative position in said ladle, and means on said conducting main and mixer hood for limiting the downward movement of said mixer hood and supporting it in its lowered position.

4. A drying apparatus of the class described, comprising, in combination, a vertically disposed fuel supply main, a mixer hood telescopically supported on said main, a combustion chamber on one end of said hood, means for introducing air under pressure to the hood, and means for adjusting said hood lengthwise on said main.

5. A drying apparatus of the class described, comprising, in combination, a vertically disposed fuel supply main, a mixer hood telescopically supported on said main, a combustion chamber on the hood, and means for introducing air under pressure to said hood.

In witness whereof we have hereunto signed our names.

FRED W. ALLES.
ALEXANDER FLETCHER.
GEORGE E. HITCHENS.