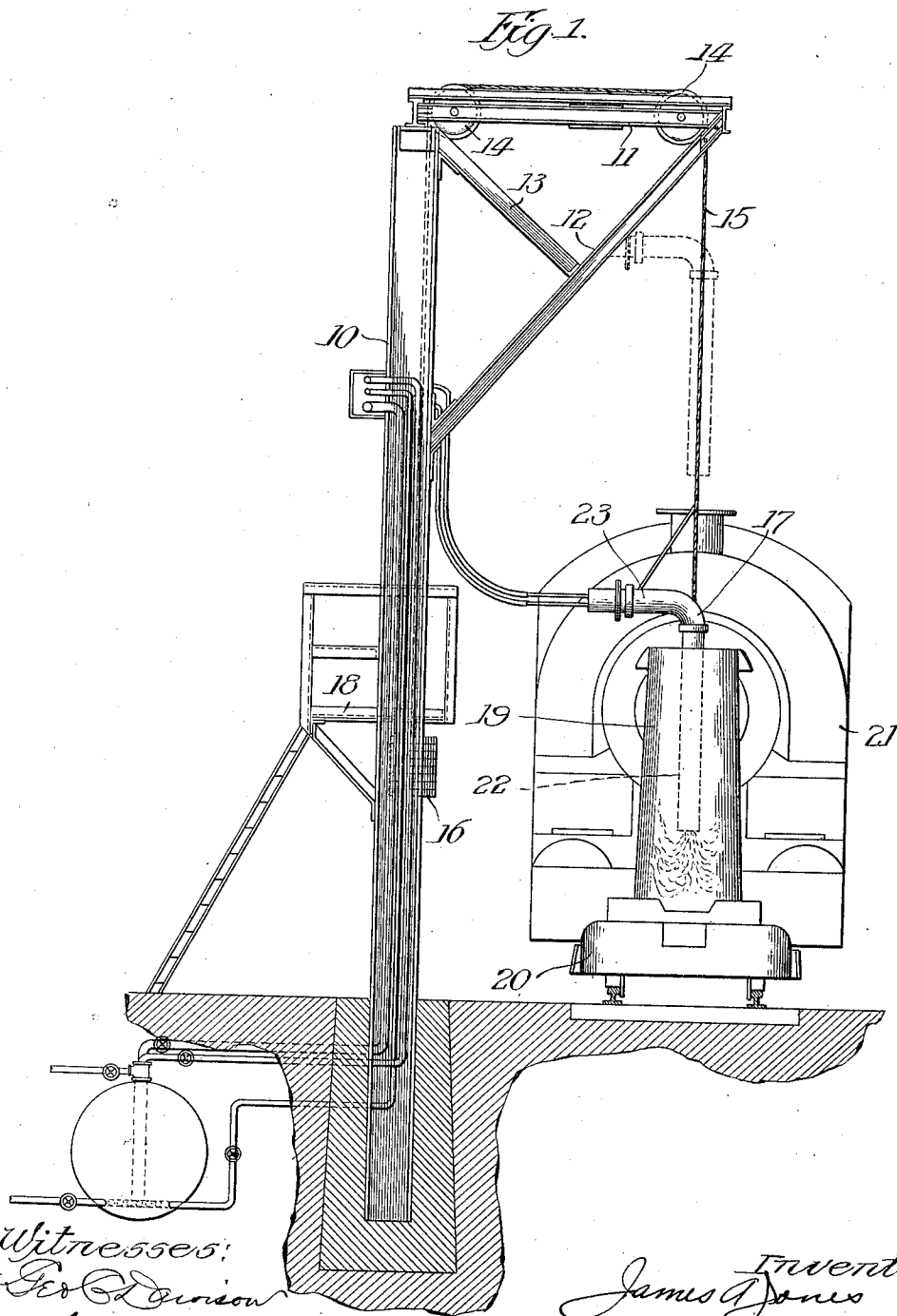


1,037,013.

J. A. JONES.
 APPARATUS FOR DRYING MOLDS.
 APPLICATION FILED FEB. 18, 1911.

Patented Aug. 27, 1912.
 2 SHEETS—SHEET 1.



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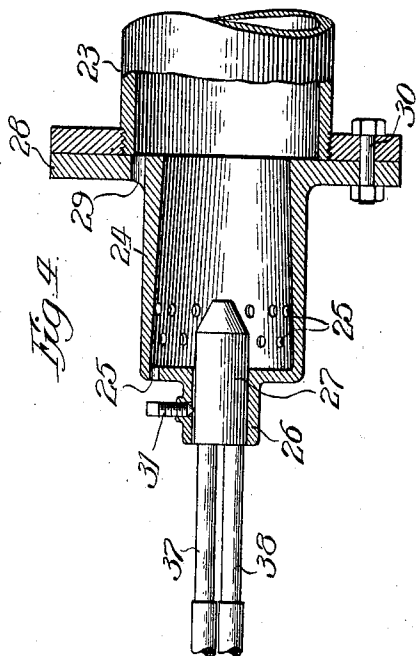


Fig. 3.

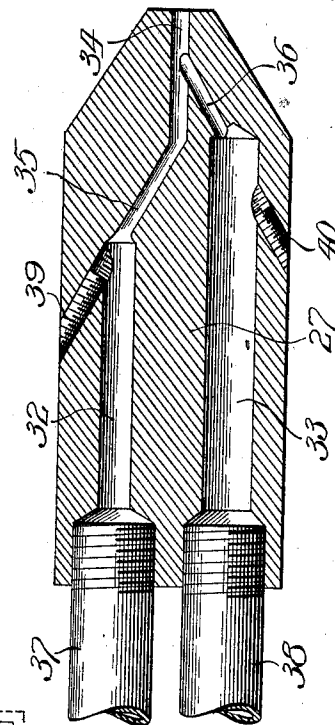
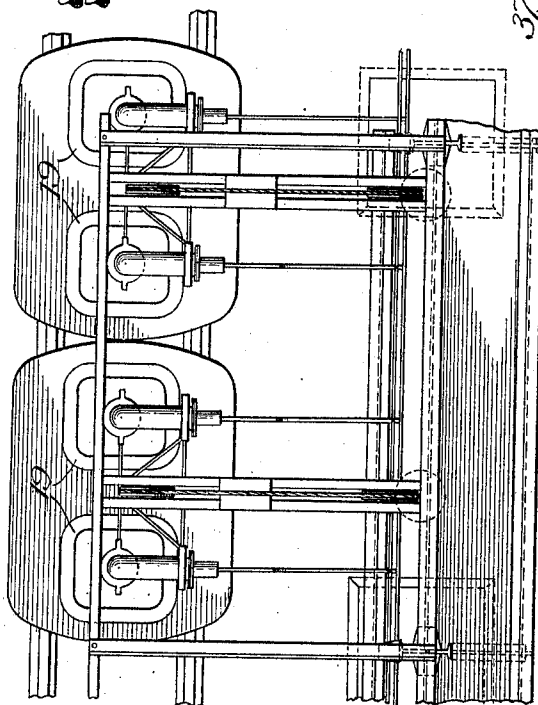


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES ALFRED JONES, OF CHICAGO, ILLINOIS.

APPARATUS FOR DRYING MOLDS.

1,037,013.

Specification of Letters Patent.

Patented Aug. 27, 1912.

Application filed February 18, 1911. Serial No. 609,523.

To all whom it may concern:

Be it known that I, JAMES A. JONES, of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Apparatus for Drying Molds, of which the following is a specification.

My invention relates to the manufacture of ingots and particularly to the drying of the molds in which ingots are cast.

It has been customary in many cases in the past to discontinue operations over Sunday or when repairs in furnaces are to be made and when operations are resumed the ingot molds which had been previously made or which are made at that time are cold and frequently wet. In certain instances attempts have been made to overcome this defect by drying the molds by burning wood therein but this is an unsatisfactory and expensive operation. It will be understood that the pouring of molten steel into a cold or wet mold in the manufacture of ingots is objectional, first, for the reason that it involves an element of danger to the workmen and second, for the reason that the quality of the steel is inferior. Tests have shown that there is a marked difference in the quality of rails produced from ingots cast in cold and hot ingot molds, this being shown in the rejections of the rails, the difference amounting sometimes to as much as 15 per cent. Therefore, it will be seen that the particular object of my invention is to provide means for quickly and economically heating the interior of the prepared molds. I have therefore devised an apparatus which is adapted to accomplish this result without undue loss of time.

In the preferred embodiment of my invention, I provide gangs of heating devices so arranged that a plurality of molds may be heated simultaneously. It will be understood that in the common practice the ingot molds are formed on small cars, two to each car and that these cars are handled in trains by an engine. I have therefore provided apparatus of a capacity whereby an entire train of molds may be heated simultaneously.

My invention will be more readily understood by reference to the accompanying drawings wherein—

Figure 1 is a side elevation of a device embodying my invention; Fig. 2 is a plan view of two sets of a gang of heating ap-

pliances; Fig. 3 is an enlarged cross section of the mixer or nozzle of my heating device and Fig. 4 is a fragmentary view, partly in section, showing the manner of securing the mixer of Fig. 3 within the burner.

Referring more particularly to the drawings it will be seen that I mount my improved heating device on vertical standards or columns 10 having supporting arms 11 extending at right angles thereto and having suitable braces 12 and 13. Sheaves 14 are mounted in the cross arm 11 on which is carried a cable 15 having a counterweight 16 on one end thereof and the other end being adapted to support the burner or drying member 17. The cable 15 supporting the burner is adapted for manual operation, the operator standing on the platform 18 provided therefor.

A series of molds 19 are placed upon cars 20 for transportation from place to place by means of the engine 21 shown in Fig. 1 or by any other suitable means.

Having described the general arrangement of my apparatus I shall now proceed to a description of the burner and the specific means for securing the best results with the greatest economy and operation.

The burner tube 22 shown in Fig. 1 as depending within the mold cavity and in dotted lines as raised above the plane of the engine 21, is connected to a portion 23 extending at right angles thereto and to which is connected a combustion chamber 24 having a series of perforations 25 therethrough. This chamber has on one end a hollow annular boss 26 within which is adapted to be seated nozzle 27 as best shown in Fig. 4. The reverse end of the combustion chamber is provided with an annular flange 28 having a series of perforations 29 therethrough the purpose of which is to provide additional air entrance spaces. Bolts 30 or other suitable means are employed for securing the combustion chamber to the portion 23 of the downwardly extending drying member. A set screw 31 seated in the hollow boss 26 is adapted to secure and provide adjustment of the nozzle 27. The nozzle 27 is preferably circular in cross section and is provided with a series of longitudinal openings or ducts 32, 33 and 34, the space 32 providing for the entrance of air, space 33 for oil and the portion 34 for the combined

oil and air. The portion 34 is connected with the openings 32 and 33 by suitable passage ways 35 and 36. Tubes 37 and 38 having flexible hose connections communicate
 5 with the passages 32 and 33 respectively, these flexible connections communicating with a suitable source of oil and air supply. In order to drill the diagonal passage ways 35 and 36 I provide openings in line there-
 10 with, which openings are later closed by screws 39 and 40.

It will be seen that by my improved nozzle the actual mixing of the oil and air is accomplished at a point very close to the
 15 point of exit and at a point which is very hot in view of the fact that the nozzle extends for some distance into the combustion chamber. This accomplishes more nearly perfect combustion than if the air is allowed
 20 to mix with the oil and cool the same thus preventing volatilization. It will be seen that the point of entrance of the combined air and oil into the combustion chamber may be regulated by means of the set screw 31.

25 After the combustion of the oil and air within the combustion chamber 24, the flames are forced downwardly through the tube into the mold and preferably at the lower end thereof. The heat, of course,
 30 then ascends and dries the entire interior of the mold cavity. This drying action is continued for a short period of time when the operator raises the burners from the molds of the entire gang and a new set of
 35 cold molds is placed thereunder.

Preferably, as shown in Fig. 2, I mount two burner tubes and their associated parts on the same cable and counterweight for the
 40 reason that the cars are usually adapted to contain two molds and as the molds are always centered on the car in proper relation,

the operation may be simplified by mounting the drying tubes in pairs.

While I have shown and described my invention as adapted for use with liquid fuel 45 such as oil, it is evident that a combustible gas may be used instead. It is also obvious that modifications in the particular structure herein shown may readily be made without departing from the spirit of my in- 50 vention.

I claim:

1. An apparatus for drying ingot molds comprising in combination a track, a horizontal series of fluid fuel burners suspended 55 vertically over the track in longitudinal alinement therewith and divided into pairs, the members of each pair being spaced according to the interval between a pair of ingot molds standing on a casting car, a flexible conduit leading from each burner to a source of fluid fuel, and means for raising and lowering each pair of burners to intro- 60 duce them into and remove them from ingot molds, substantially as described. 65

2. An apparatus for drying ingot molds comprising in combination a car track, a pair of fluid fuel burners suspended vertically over the track and alined longitudinally thereof and spaced according to the 70 interval between a pair of ingot molds standing on a casting car, a flexible conduit leading from each of the burners to a source of fluid fuel, and means for raising and lowering the burners to introduce them into 75 and remove them from ingot molds, substantially as described.

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