A. JONES.

SMELTING FURNACE.

APPLICATION FILED MAY 28, 1917.

1,334,459.

Patented Mar. 23, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

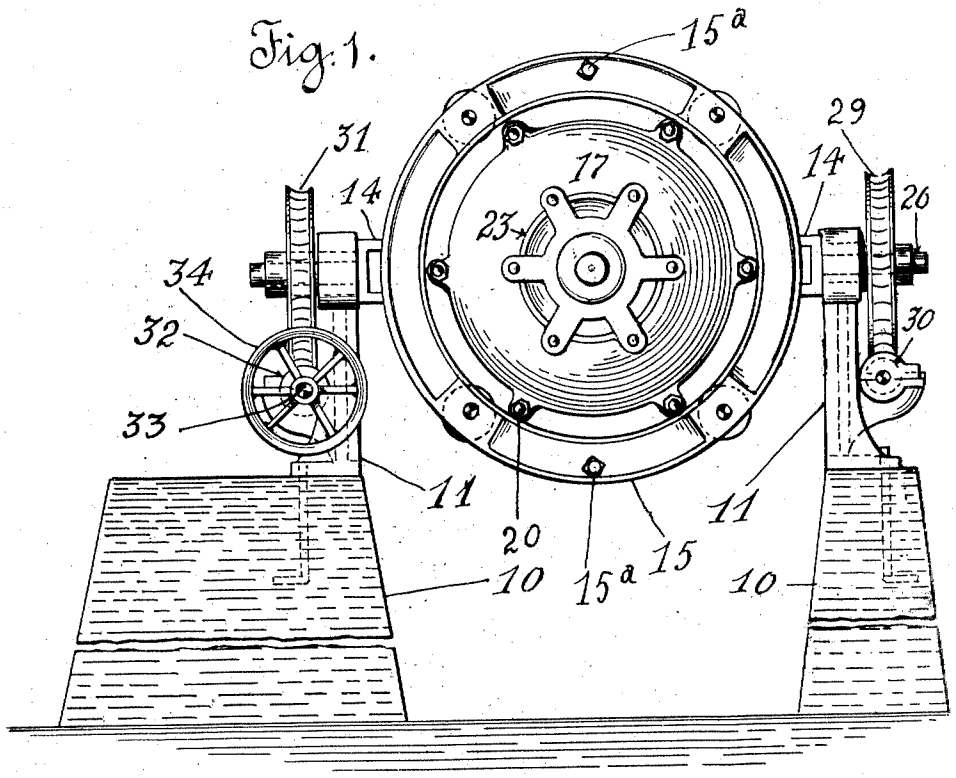
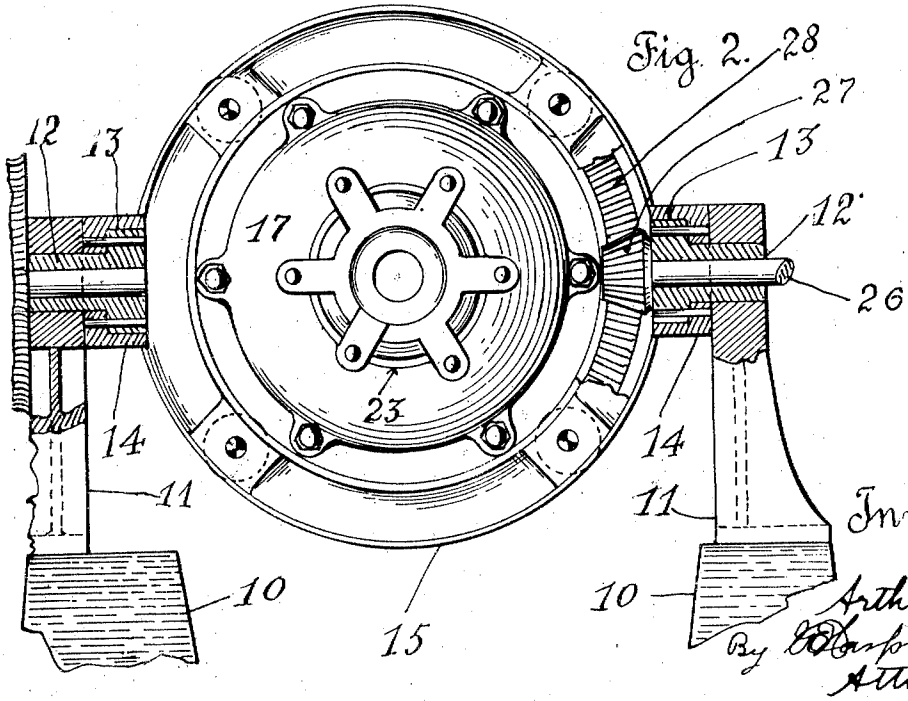


Fig. 2.



Inventor,

Arthur Jones

By Dorsey Harpham

Attorneys

A. JONES.

SMELTING FURNACE.

APPLICATION FILED MAY 28, 1917.

1,334,459.

Patented Mar. 23, 1920.

2 SHEETS—SHEET 2.

Fig. 3.

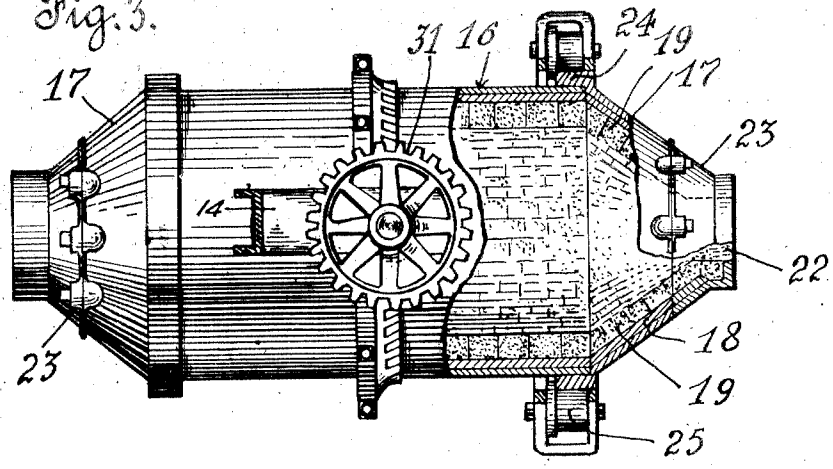


Fig. 4.

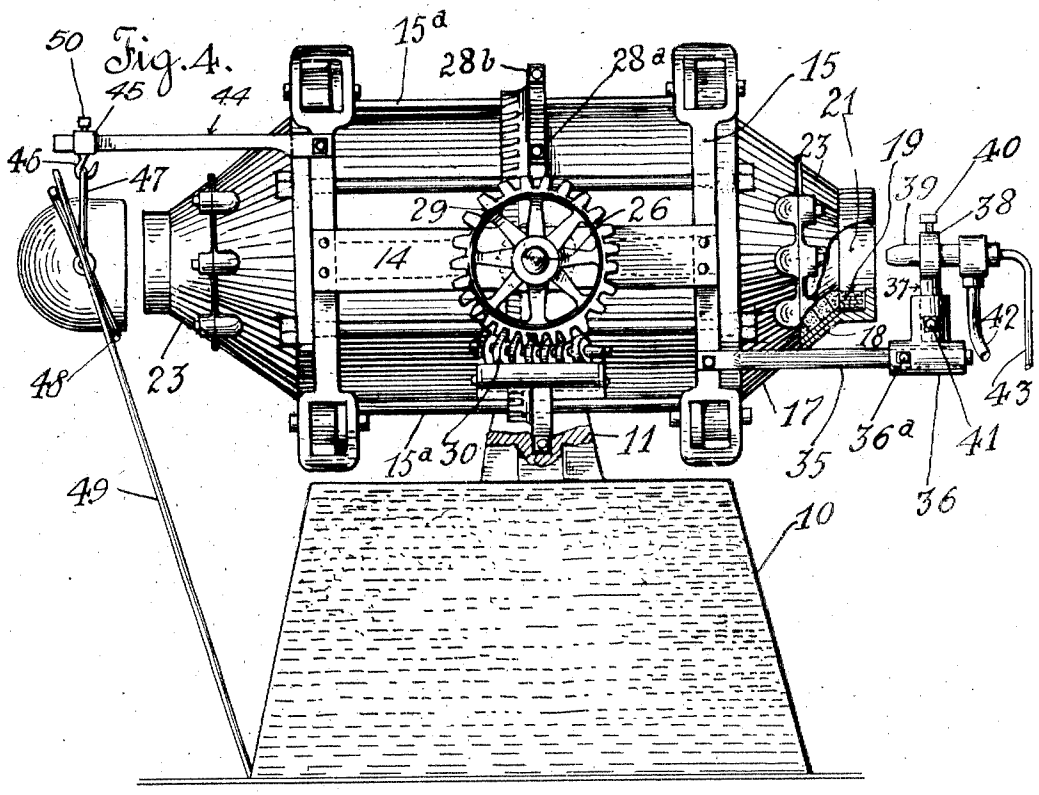
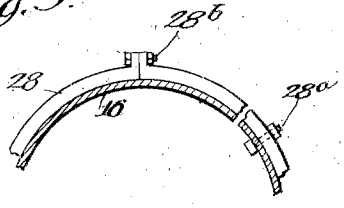


Fig. 5.



Inventor,
Arthur Jones
By [illegible]
Attorney

UNITED STATES PATENT OFFICE.

ARTHUR JONES, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO U. S. SMELTING FURNACE COMPANY, OF BELLEVILLE, ILLINOIS, A CORPORATION OF ILLINOIS.

SMELTING-FURNACE.

1,334,459. Specification of Letters Patent. Patented Mar. 23, 1920.

Application filed May 28, 1917. Serial No. 171,413.

To all whom it may concern:

Be it known that I, ARTHUR JONES, a citizen of the United States, residing at the city of Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Smelting-Furnaces, of which the following is a specification.

My invention relates to a furnace primarily designed for smelting and refining scrap metal in a brass foundry and the object thereof is to provide a furnace of simple construction and great efficiency and economy in operation in which scrap and other metal may be readily smelted and refined and poured out of the furnace. Other objects will be hereafter described and pointed out in the claims.

In the drawings forming a part of the application;

Figure 1 is a rear end elevation of the furnace with the rotating driving mechanism omitted.

Fig. 2 is an enlarged rear end view of the furnace with parts broken away and parts in section.

Fig. 3 is a side elevation of the smelting chamber with parts broken away for clearness of illustration and to show portions of the frame, and the rods connecting the ends being omitted.

Fig. 4 is a side elevation of the other side of the furnace chamber with parts of the frame broken away and some parts in section.

Referring to the drawings, 10 are masonry piers which support standards 11 secured thereto. In tops of standards 11 are revolubly mounted hollow trunnions 12 having heads 13 (see Fig. 2) which are secured to the side members of the frame. The frame consists of side members 14 and the annular end members 15 which surround the ends and are connected by rods 15^a. The smelting chamber consists of an outer cylindrical sheet metal casing 16, having tapered cast metal heads 17 which are connected by rods 20. Adjacent to the casing and in contact therewith is a layer of heat insulating compound 18 which is preferably composed of wool asbestos and powered silica in equal parts made plastic with water when positioned for use. Adjacent to compound 18 are fire bricks 19. One end of the smelting chamber has the inlet port 21 and the other, the outlet port 22. Each end is provided with a removable section 23 which is lined with fire brick or fire clay. By the use of removable sections the ports may be readily changed. This is desirable as there is more wear on the ends than in the other portions. The size of the ports can also be changed by putting on new sections. By lengthening the chamber casing the capacity of the furnace can be increased.

The outer surfaces of the heads form tracks 24 for the flanged rollers 25 that are carried by the end members 15 of the frame. The flanges of the rollers 25 engage tracks 24 on the face and sides thereof so as to prevent any end movement of the smelting chamber. Extending through one of the hollow trunnions 12 (see Fig. 2) is a shaft 26 which on its inner end carries a bevel pinion 27 that meshes with a bevel gear 28 secured upon casing 16 by bolts 28^a. This gear is in two sections held together by bolts 28^b so the gear can be removed if desired. On the other end of shaft 26 is a worm wheel 29 which engages worm 30. Worm 30 is driven by any suitable power, not shown, and when revolved causes the rotation of the smelting chamber. The other trunnion extends through its standard and has secured thereto a worm wheel 31 which engages a worm 32 on shaft 33. Shaft 33 has an operating wheel 34 by means of which the worm can be rotated thereby causing the frame and smelting chamber to be revolved in a vertical plane to pour the metal from the smelting chamber or to dump the slag. Frame 15 carries a rod 35 on the end of which is slidably and revolubly mounted a T-fitting 36 which is held positioned thereon by set screw 36^a. In the other outlet of the fitting is slidably and revolubly mounted a rod 37 having an eye 38 on its upper end through which passes a burner 39 held in position therein by set screw 40. Rod 37 is held positioned by set screw 41. Burner 39 is supplied with an expansible fluid such as air or steam through pipe 43. The oil or gas is supplied through pipe 42. The supply of fuel is regulated in the well known manner and is not further described. Fitting 36 and rods 35 and 37 permit the burner to be adjusted to suit the work required of the furnace and permit the burner to be turned out of the way when the furnace is charged or the contents

stirred. In casting, the metal is run from the smelting chamber into a pouring pot. This pot must be heated before the metal is poured into it. Heretofore it has been necessary to have a separate fire to heat such pot. In my improved furnace I provide a rod 44 which is secured to the frame. On rod 44 is a sleeve 45 which carries a hook 46. The pouring pot has a bail 47 which is received in the hook to support the pouring pot when turned as shown in Fig. 4 in register with the outlet port of the furnace. Before positioning the pot the usual pouring handle 48 is placed on the pot and when the bail is put in the hook, the pot is turned so that the opening therein is in register with the outlet port. A brace or rod 49 is passed through the pouring handle and one end rests on the floor which prevents the pot from turning over. A set screw 50 in the sleeve holds the pot at any desired distance from the outlet port. The pot may be used to entirely close the outlet port, which is desirable in case the molds are not quite ready when the metal in the furnace chamber is melted.

By moving the pot toward or away from the outlet port the draft through the smelting furnace is regulated. By this construction I have found in practice that the pouring pot is thoroughly heated and forms an efficient damper for regulating the heat in the smelting chamber, thereby saving the expense of an extra fire to heat the pouring pot and it is always in proper condition for use when the metal is to be poured. Any other form of damper may be used instead of the pouring pot.

It will be observed that by removing the flanged rollers at one end the furnace chamber can readily be removed and if desired, a new one inserted in a few minutes. This is especially desirable in case of accident to the chamber as a reserve chamber is inexpensive and can be kept on hand. By lengthening the side members of the frame a smelting chamber of greater length and consequently greater capacity can be used without changing the other parts.

Having described my invention, what I claim is:

1. In a smelting furnace, the combination with a cylindrical body provided with refractory lining, of a pair of conical ends removably secured to said body and also provided with refractory lining, said ends each carrying at its inner part a supporting track and being provided at its outer part with a central opening.

2. In a smelting furnace, the combination with a cylindrical body provided with refractory lining, of a pair of conical end pieces removably secured together and to the body by connecting rods extending from one end piece to the other, said end pieces being also provided with refractory lining.

3. In a smelting furnace, the combination with a cylindrical body provided with refractory lining, of a pair of conical end pieces removably secured together and to said body by connecting rods, said end pieces being also provided with refractory lining, each of said end pieces comprising two separable parts the outer of which is provided with a central opening.

4. In a smelting furnace, the combination of standards; a frame mounted for vertical movement in said standards; means to move said frame vertically; a smelting chamber having ports in its opposite ends, said chamber being revolubly and detachably mounted in said frame, said frame encircling said chamber near the ends thereof, rods secured to said frame, one at each end projecting away therefrom; a burner adjustably mounted on one of said rods; and a damper adjustably mounted on the other of said rods.

5. In a smelting furnace, the combination with standards, of a smelting chamber frame mounted in said standards to revolve in a vertical plane, a smelting chamber detachably and revolubly mounted in said frame, said chamber having ports in its ends, a rod mounted on said frame and projecting therefrom, and a damper mounted on said rod to move with said chamber frame.

6. In a smelting furnace, the combination of standards; a smelting chamber frame mounted in said standards to revolve in a vertical plane; a smelting chamber detachably and revolubly mounted in said frame, said chamber having ports in its ends; a rod mounted on one end of said frame and projecting away therefrom; with a damper mounted on said rod to move toward or away from said chamber and adapted to close one of the ports thereof.

7. In a smelting furnace, the combination with standards, of a frame mounted in said standards to revolve in a vertical plane, a smelting chamber with ports in its ends and revolubly mounted in said frame, said frame encircling the ends of said chamber, a rod secured to said frame and projecting therefrom, and a pouring pot mounted on said rod with its mouth opposed to said chamber.

8. In a smelting furnace, the combination of standards; a frame mounted in said standards to revolve in a vertical plane; a smelting chamber having ports in its ends revolubly mounted in said frame, said frame encircling the ends of said chamber; a rod secured to said frame at one end and projecting away therefrom; a pouring pot adjustably mounted on said rod; and means to hold said pot with its mouth opposed to a port in said chamber.

ARTHUR JONES.