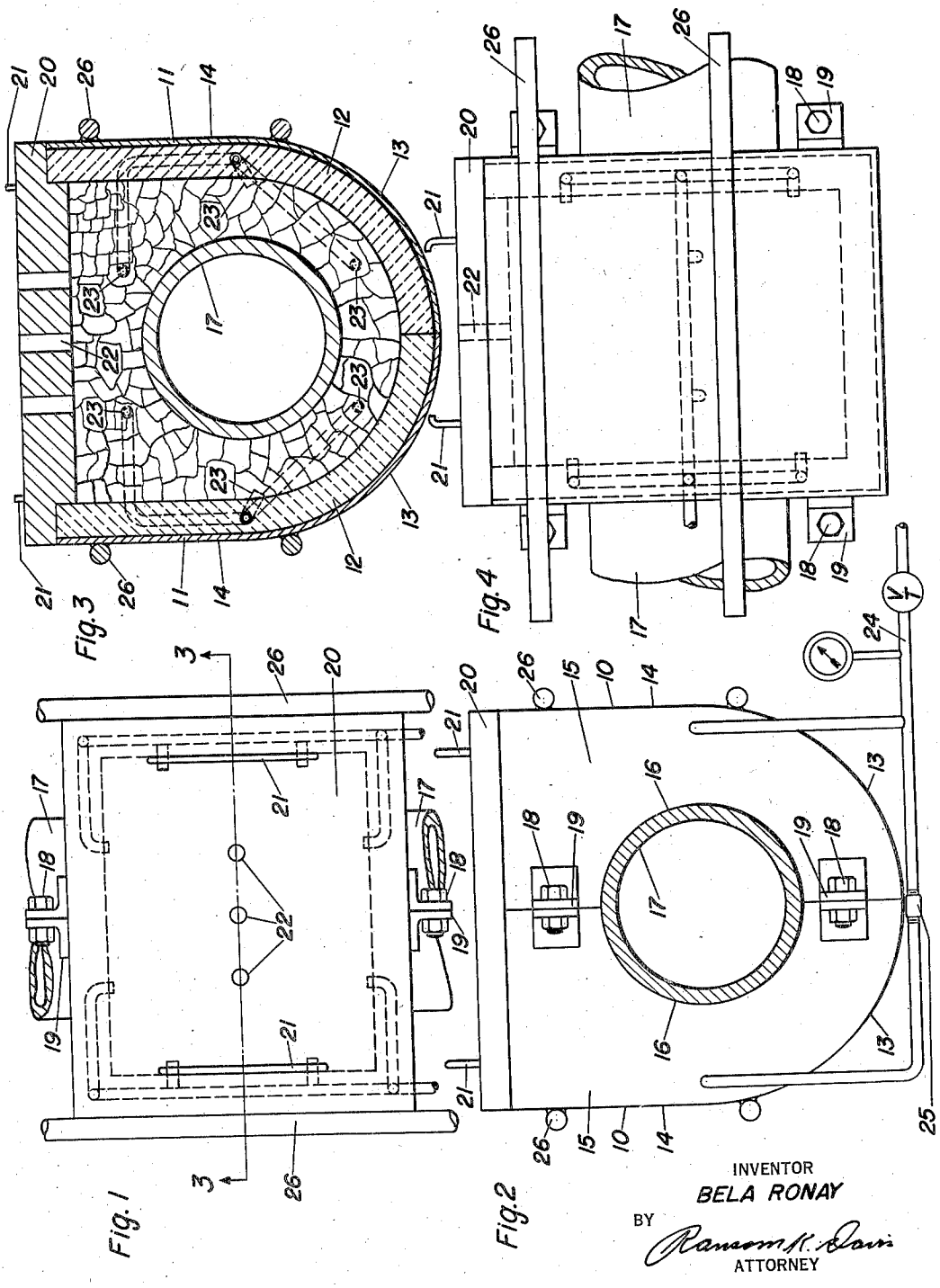
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PIPE JOINT ANNEALING FURNACE

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PIPE JOINT ANNEALING FURNACE

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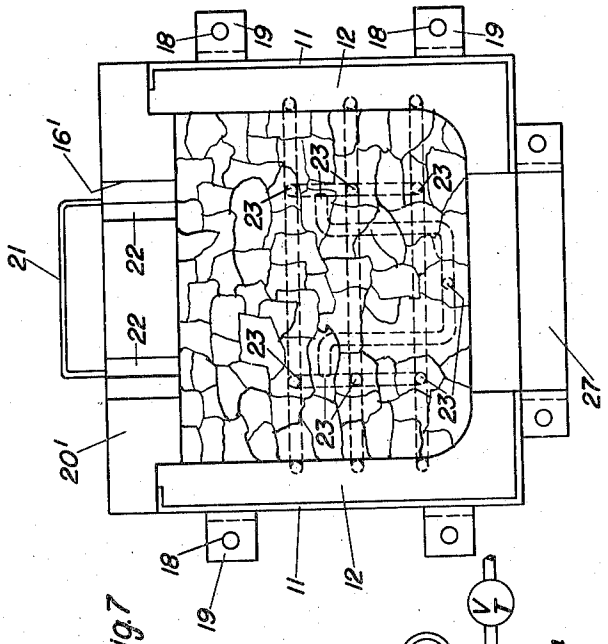


Fig.7

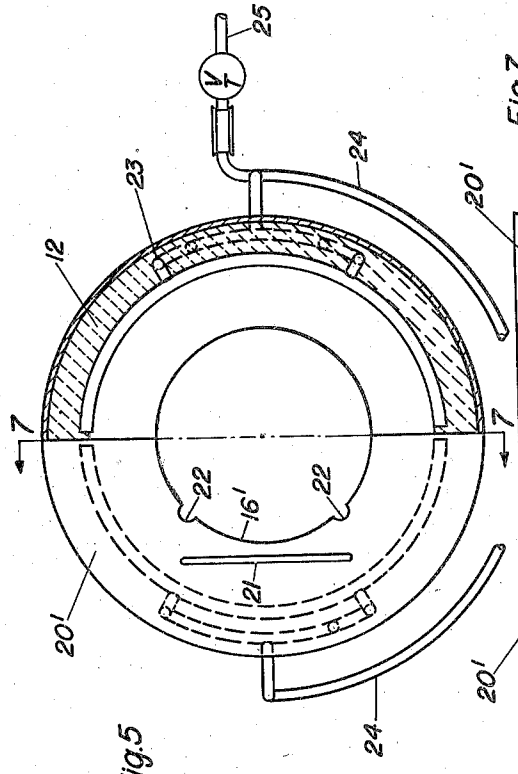


Fig.5

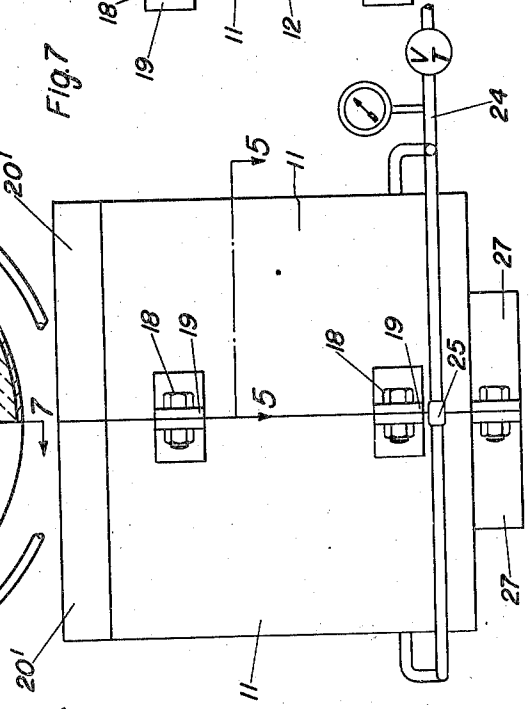


Fig.6

INVENTOR
BELA RONAY
BY
Ransom K. Davis
ATTORNEY

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PIPE JOINT ANNEALING FURNACE

Bela Ronay, Annapolis, Md.

Application April 11, 1938, Serial No. 201,279

1 Claim. (Cl. 263—4)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to furnaces and it has a particular relation to furnaces of the portable type for annealing the welded joints in a pipe line and especially pipe lines extending through walls of bulkheads where the ends are inaccessible.

The principal object of this invention is the provision of a portable furnace, of the character described, which can be mounted around a pipe to enclose a welded joint therein for containing a fire of charcoal or other fuel, the furnace being provided with a plurality of tuyères at intervals around the joint for directing air blasts in different directions so as to obtain substantially uniform combustion and temperature circumferentially of the joint.

Another object of the invention is the provision of a furnace, of the type indicated, which may be closed to the outer atmosphere after the temperature of the joint has reached a predetermined degree so as to retard the rate of cooling of the coals or products of combustion, thus to obtain a properly annealed welded joint.

With these and other objects in view, as well as other advantages that may be incident to the use of the improvements, the invention consists in the parts and combinations thereof hereinafter set forth and claimed, with the understanding that the several necessary elements constituting the same may be varied in proportion and arrangement without departing from the nature and scope of the invention, as defined in the appended claim.

In order to make the invention more clearly understood, there are shown in the accompanying drawings, means for carrying the invention into practical use, without limiting the improvements in their useful application to the particular construction, which, for the purpose of explanation, have been made the subject of illustration.

In the accompanying drawings:

Fig. 1 is a plan view of a portable welded pipe joint annealing furnace constructed in accordance with the invention and particularly designed for use in connection with horizontal pipes;

Fig. 2 is an end elevational view of the furnace shown in Fig. 1;

Fig. 3 is a vertical transverse sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a side elevational view of the structure shown in Fig. 2;

Fig. 5 is a view partly in plan and partly in horizontal section taken on line 5—5 of Fig. 6 of a furnace designed to anneal a welded joint in a vertically disposed pipe;

Fig. 6 is a side elevational view of the furnace shown in Fig. 5; and

Fig. 7 is a vertical sectional view taken on line 7—7 of Fig. 5.

Referring to the drawings, and particularly to Figs. 1 to 4 thereof, a portable furnace constructed in accordance with the present invention is shown as comprising two complementary sections or halves 10 together, forming a fire box adapted to contain a charge of burning charcoal or the like and each consisting of a sheet metal shell 11 and a refractory lining 12 and having curved bottoms 13, vertical side walls 14 and end walls 15, the latter having semi-circular notches or recesses 16 formed therein adapted to fit around a pipe 17 on each side of a welded joint to be annealed. The sections 10 are held in the positions shown, in which the bottom and sides thereof are disposed in spaced relation to the pipe, by means of clamping bolts 18 engageable with flanges 19 secured to the end walls 15 above and below the pipe. The furnace is provided with a one-piece refractory cover 20 adapted to bridge the sections 10 and is provided with lifting handles 21 and a plurality of openings 22 to permit of the escape of air and other gases during the heating stages.

A plurality of tuyères 23 are provided within the furnace and are so located as to direct jets of air under pressure into the furnace to support combustion uniformly circumferentially of the joint being annealed. These tuyères are connected with a main air supply pipe 24 which is separated into two portions, connected by a coupling 25 so as to permit the furnace to be mounted on the pipe and removed therefrom. Handles 26 are provided on the sections 10 of the furnace to facilitate handling.

In Figs. 5 to 7 there is shown a modified form of furnace structure designed for annealing joints in vertical pipes. This construction is substantially the same as that hereinabove described, with the exception that arcuate clamping straps 27 are provided beneath the furnace for gripping engagement with the pipe to provide a support for the furnace, and that the cover 20 is formed in two parts 20' having notches or recesses 16' formed therein to receive the pipe.

In operation, the sections of the furnace are assembled as shown and filled with previously ignited charcoal or other suitable fuel. The cover is then applied and the supply of air turned on. This causes the fuel to burn uniformly around the joint until the desired temperature is attained. The air supply is then turned off

and the coals and joint allowed to cool gradually to room temperature, during which time the stresses and strains developed in the point during the welding operation are relieved and equalized.

It will be apparent from the foregoing that a very convenient and efficient furnace is provided and one that may be assembled around a joint in a pipe, the ends of which are not accessible, such as a pipe extending through the bulkheads of a ship or the walls of a room and also a vertical pipe extending through the floor and ceiling of a room. If desired, the furnace may be formed in one piece with vertical notches in its end walls so as to permit the furnace to be positional around the joint. In such case, gates may be provided to close the portion of the notches not occupied by the pipe when the furnace is in its operative position.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of the invention and that various changes in construction, proportion and arrangement of the parts may be made within the scope of the appended claim without sacrificing any of the advantages of the invention.

The invention described herein may be manufactured and/or used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

A furnace for annealing welded pipe joints comprising a sectional fire box for containing a predetermined amount of burning charcoal or the like and having alined openings in opposite walls thereof; means for clamping the sections of said fire box around a pipe in a position to enclose a welded joint therein with the pipe extending through said openings; a cover for closing said fire box to the entry of substantial amounts of atmospheric air; and a plurality of tuyères disposed within said fire box and spaced around the axis of said openings for injecting a regulable supply of air into said fire box to control combustion circumferentially of the joints being annealed and the resulting rate and degree of heating and cooling.

BELA RONAY.