Nov. 13, 1945. J. R. DUBSKY 2,389,033

ELECTRODE COOLER FOR ELECTRIC ARC FURNACES

Filed March 18, 1944 2 Sheets-Sheet 1

Fig. 1.

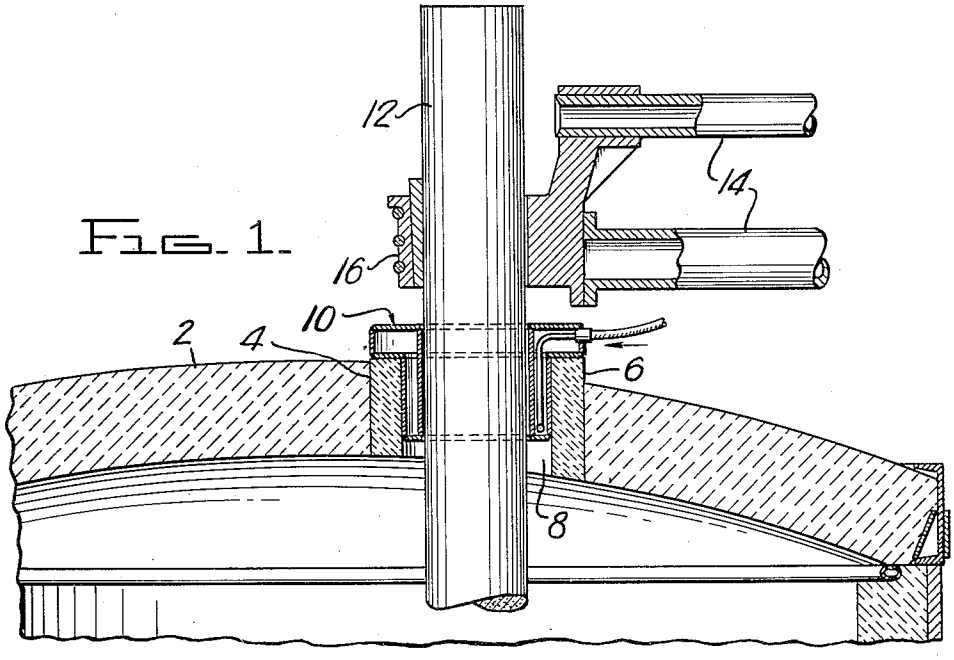
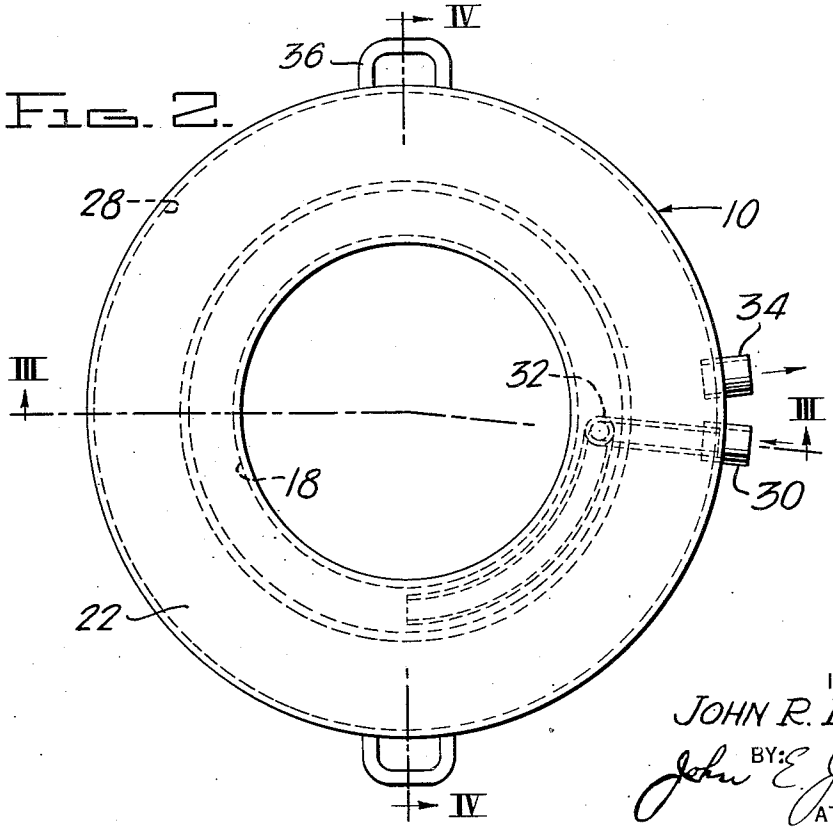


Fig. 2.



INVENTOR:
JOHN R. DUBSKY,
BY: John E. Jackson
ATTORNEY.

Nov. 13, 1945. J. R. DUBSKY 2,389,033

ELECTRODE COOLER FOR ELECTRIC ARC FURNACES

Filed March 18, 1944 2 Sheets-Sheet 2

Fig. 3.

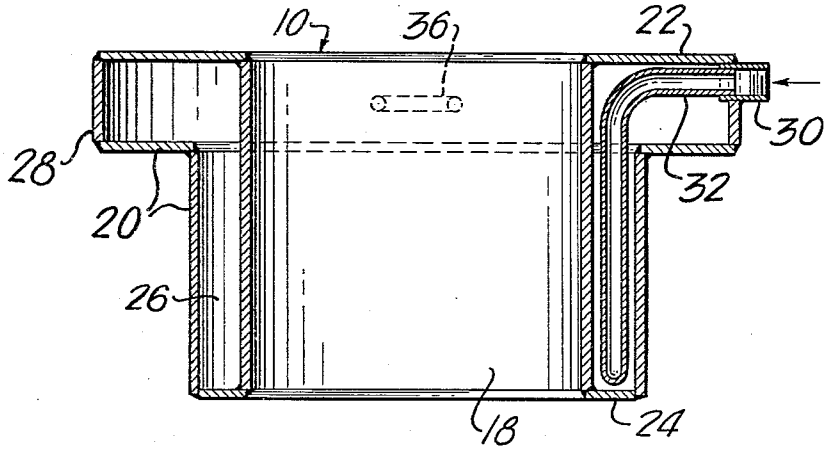
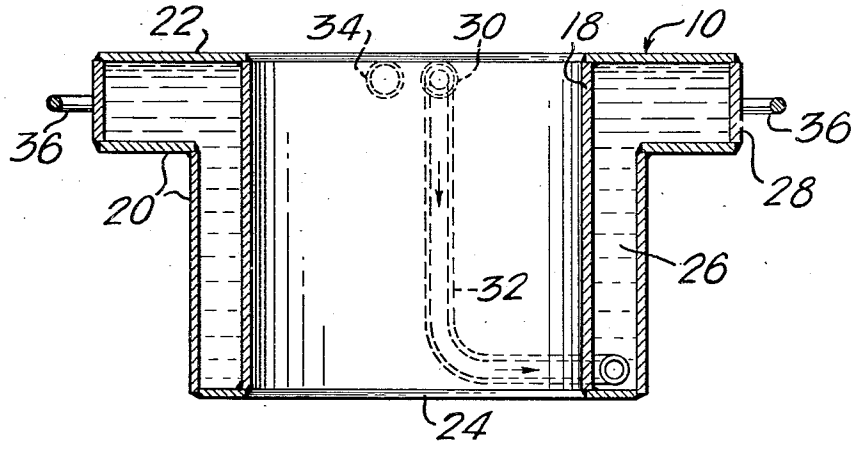


Fig. 4.



INVENTOR:
JOHN R. DUBSKY,
BY:
John E. Jackson
ATTORNEY.

Patented Nov. 13, 1945

2,389,033

UNITED STATES PATENT OFFICE

2,389,033

ELECTRODE COOLER FOR ELECTRIC ARC FURNACES

John R. Dubsky, Chicago, Ill., assignor to Carnegie-Illinois Steel Corporation, a corporation of New Jersey

Application March 18, 1944, Serial No. 527,086

2 Claims. (Cl. 13—17)

This invention relates to an electrode cooler for electric arc furnaces. Heretofore, such coolers consisted of flat circular tanks with a hole in the center of sufficient size to permit free movement of the electrode. This cooler was placed on the furnace roof over the hole in the roof to receive the electrode and cooling surfaces were provided only to the top portion of the roof covered by the cooler and that portion of the electrode which extended through the cooler. The roof brick in the electrode area was not cooled and the brick would spall and burn resulting in a roof life of approximately forty heats.

It is an object of this invention to provide an electrode cooler which will cool the furnace roof brick in the electrode area.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a section at the furnace roof showing the cooler installed;

Figure 2 is a plan view of the cooler;

Figure 3 is a sectional view taken on the line III—III of Figure 2; and

Figure 4 is a sectional view taken on the line IV—IV of Figure 2.

Referring more particularly to the drawings, the reference numeral 2 indicates the roof of an electric arc furnace having an opening 4 therein for receiving a refractory tile 6 which supports the cooler of this invention. This tile has an opening 8 therein for receiving the cooler 10 through which the electrode 12 passes into the furnace. Current is supplied to the electrode 12 through the usual bus tubes 14 and the electrode is supported by an electrode holder 16.

The electrode cooler 10 consists of an inner ring 18 having an internal diameter of sufficient size to accommodate the electrode 12 and an inverted L-shaped cooling ring 20 spaced therefrom, the two rings being connected by means of an upper plate 22 and a lower plate 24, this forming a cooling chamber 26. To the outer portion 28 of the ring 20 is welded a pipe coupling 30 to which is attached a pipe 32. This pipe is bent and extends downwardly to the bottom of the cooling chamber 26 as shown in Figures 3 and 4, and then along the bottom of the chamber as shown in Figures 2 and 4. A second coupling 34 and handles 36 are also welded to the ring portion 28.

The operation of the device is as follows:

The cooler 10 is placed in position on the tile 6 as shown in Figure 1, the handles 36 being adapted to receive crane hooks to facilitate handling of the cooler. Cooling water is provided to the bottom of the cooling chamber 26 through the coupling 30 and bent pipe 32 and discharged from the cooler through the outlet 34, thus assuring maximum cooling water circulation. It will be seen that the cooling chamber extends substantially through the entire thickness of the roof, this giving complete cooling effect for the entire thickness of the roof in the electrode area and also cooling a much greater portion of the electrode. The tile 6 is in contact with the horizontal leg of the ring 20, thus providing additional cooling of the tile. The increased cooling of the roof brick prevents spalling and burning thereof and has increased the number of heats obtained per roof compaign to seventy.

While one embodiment has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. An electrode cooler for electric arc furnaces having a refractory roof comprising an inner ring having an internal diameter of sufficient size to accommodate the electrode, an inverted L-shaped cooling ring spaced from the inner ring, means for connecting the two rings to form an inverted L-shaped cooling chamber extending substantially around the electrode, the inverted leg of the cooling ring being adapted to extend for a substantial distance through the furnace roof and the horizontal leg being supported by the furnace roof, and means for circulating a coolant through the cooling chamber, said means including a pipe extending substantially to the bottom of the chamber and being bent to follow the circumference of the chamber with its outlet at the end of the bent portion.

2. An electrode cooler for electric arc furnaces having a refractory roof comprising an inner ring having an internal diameter of sufficient size to accommodate the electrode, an inverted L-shaped cooling ring spaced from the inner ring, means for connecting the two rings to form an inverted L-shaped cooling chamber extending substantially around the electrode, the inverted leg of the cooling ring being adapted to extend for a substantial distance through the furnace roof and the horizontal leg being supported by the furnace roof, a pipe for supplying coolant to the cooling chamber, said pipe extending substantially to the bottom of said chamber and being bent to follow the circumference of the chamber with its outlet at the end of the bent portion, whereby the coolant is given a circumferential movement, and means adjacent the top of said chamber for removing coolant therefrom.

JOHN R. DUBSKY.