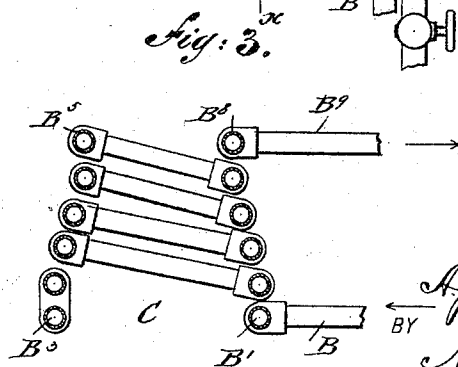
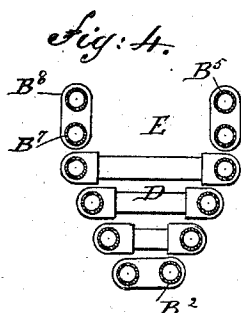
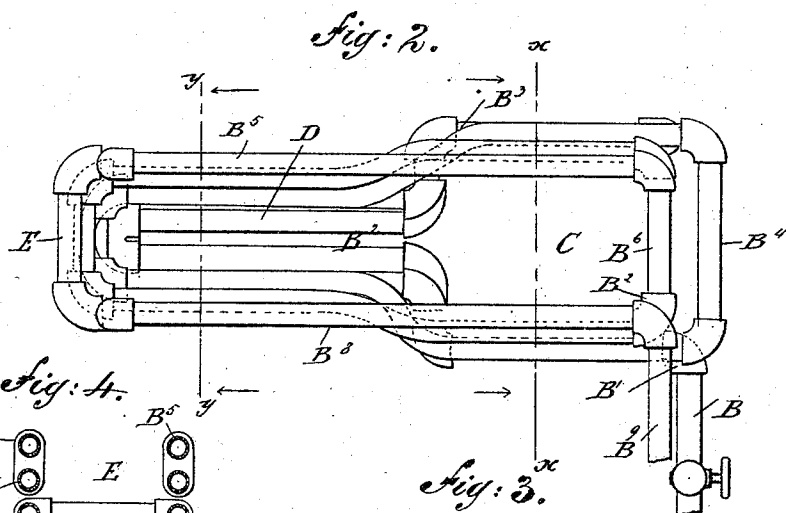
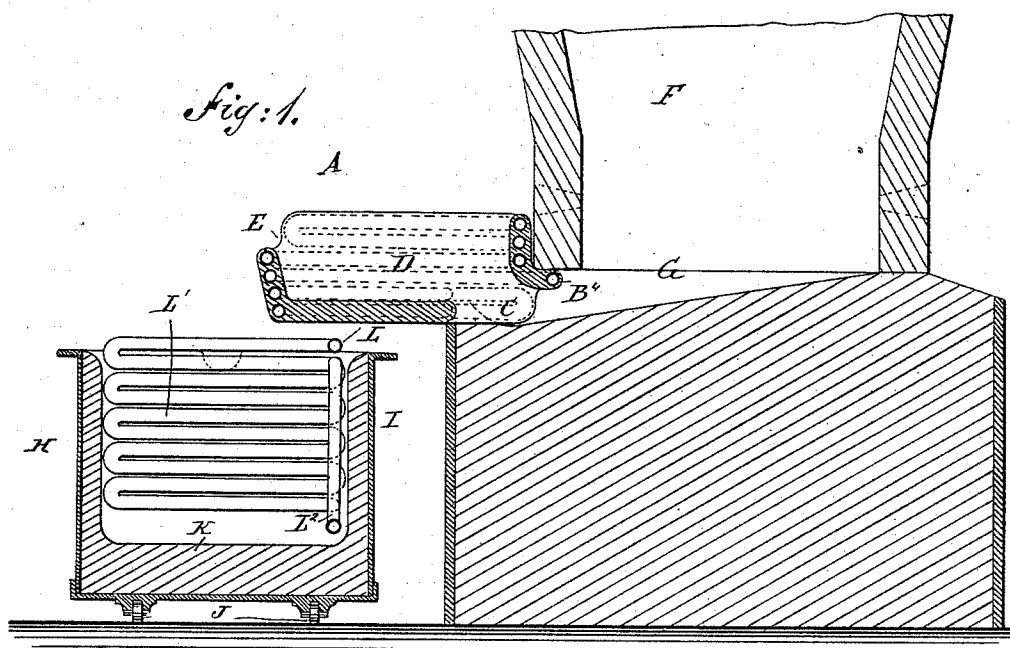


(No Model.)

A. J. SCHUMACHER.
DISCHARGE TROUGH FOR SMELTING FURNACES.

No. 470,511.

Patented Mar. 8, 1892.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

ADAM J. SCHUMACHER, OF BUTTE CITY, MONTANA.

DISCHARGE-TROUGH FOR SMELTING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 470,511, dated March 8, 1892.

Application filed March 4, 1891. Serial No. 383,689. (No model.)

To all whom it may concern:

Be it known that I, ADAM J. SCHUMACHER, of Butte City, in the county of Silver Bow and State of Montana, have invented a new and Improved Discharge-Trough for Smelting-Furnaces, of which the following is a full, clear, and exact description.

The invention relates to smelting-furnaces; and its object is to provide a new and improved discharge-trough which is simple and durable in construction, readily applied, serving for automatically discharging and separating the products of fusion from the furnace, and permitting of running the latter with greater continuity and less attention.

The invention consists of a pipe formed into a trough and connected with a water-supply to pass water through the said pipe.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is an enlarged plan view of the trough. Fig. 3 is a transverse section of the same on the line *xx* of Fig. 2. Fig. 4 is a like view of the same on the line *yy* of Fig. 2.

The improved trough A is provided with a pipe B, connected at one end with a suitable source of water-supply, so that a continuous stream of water can be passed through the pipe to keep the trough cool. The pipe is formed or bent in such a manner as to form the bottom and sides of the trough, at the same time forming in the bottom an inlet-opening C, into which the material passes from the furnace.

The opening C in the bottom leads to the main space D of the trough, the top of the latter being open, while the outer end wall of the trough is less in height than the sides, so as to form a discharge-outlet E on this outer end of the trough. The spaces between the several layers of the pipes are filled in with a suitable material—such as fire-clay—to prevent the products discharged from the fur-

nace from leaking between the several layers of pipe. One layer of the pipe extends under the front wall of the furnace F, as is plainly shown in Fig. 1, the outlet-opening G of the said furnace being inclined to the bottom opening C of the trough, so that the material from the furnace can pass down the inclined bottom G, pass into the opening C, through the space D, and out through the opening E into the fore-hearth H, located below the trough A, as is plainly shown in Fig. 1.

In order to construct the trough A of a single piece of pipe, the pipe B is first bent to form the part B', which is then bent inward and then forward and returned, as at B², in order to form the bottom opening C and with the returned part B² the bottom of the space D. The pipe is then bent outward and then parallel with the part B' to form the other side B³ of the opening C. The pipe is then bent upward and doubled onto the part B³ and passed over and returned over the part B², as is plainly shown in Fig. 4, and then extended over the part B' a suitable distance to the rear to pass transversely to the part B⁴, which extends under the edge of the furnace F, as is plainly shown in Fig. 1. The pipe is then bent forward and backward to form the walls of the trough, the last forward layer B⁵ being doubled up and not extended across the front end, so as to leave the front end lower than the sides of the trough, as previously mentioned. The doubled part of the pipe B⁵ extends transversely at the rear in the part B⁶, to then run forwardly to be bent over, as at B⁷ and B⁸, to finally connect at the rear end with the discharge-pipe B⁹. Thus water admitted into the pipe B can circulate through the several parts, to be finally discharged through the pipe B⁹, all the walls of the trough thus being kept in a cool condition.

The inlet-pipe is provided with a suitable stop-cock, as shown in Fig. 2, and serves to introduce detergents by means of a force-pump to clean the pipe of sediment whenever desired and without interrupting the work of the furnace.

The fore-hearth, previously mentioned, is provided with a tank I, preferably mounted on wheels J, so as to conveniently move the fore-hearth about. The interior of the tank

I is lined with a suitable refractory material, as at K. A pipe L, connected with a suitable source of water-supply, extends over the tank I and is then bent into a coil of pipe L'.

5 The operation is as follows: When the trough A and the hearth H are in position, as shown in Fig. 1, and it is desired to discharge the furnace F, then the fire-clay closing the bottom G of the furnace to the trough A is
10 opened in the usual manner, so that the molten mass from the furnace passes into the trough A to finally overflow or discharge through the opening E into the fore-hearth H. When the fore-hearth is filled to overflowing,
15 a thin coat of slack is allowed to chill on the surface, so as to form a cover. The top of the trough A is covered with a similar coat of chilled slack, so that the material readily
20 passes out through the discharge-opening E, as is previously mentioned. From the chilled-

slack cover of the fore-hearth up to the cover on the trough A the running stream of molten metal is inclosed, except a small opening left for observation in a refractory material built around the running stream, thus preventing
25 the cooling of the mass before separation.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

A discharge-trough for smelting-furnaces, 30 made of a continuous pipe bent so as to form the bottom, sides, and ends, the bottom having an inlet-opening, while one end is somewhat less in height than the sides, so as to form a discharge-opening, substantially as 35 shown and described.

ADAM J. SCHUMACHER.

Witnesses:

ROBT. BEVERIDGE,
T. Y. SMITH.