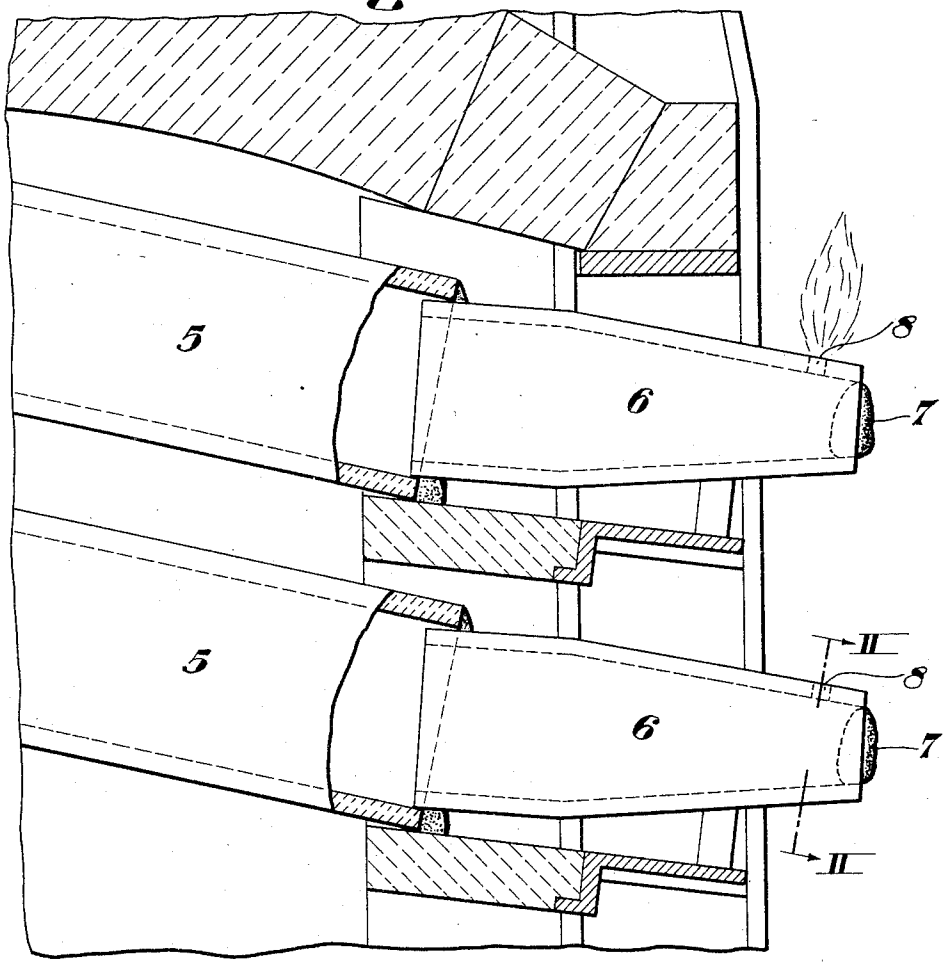
Dec. 15, 1931. M. C. SKINNER 1,837,138

SPELTER FURNACE CONDENSER

Filed Dec. 24, 1930

Fig. 1.



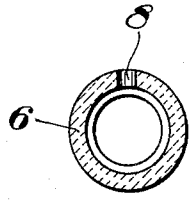


Fig. 2.

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UNITED STATES PATENT OFFICE

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SPELTER FURNACE CONDENSER

Application filed December 24, 1930. Serial No. 504,592.

This invention relates broadly to zinc distillation or spelter furnaces and more particularly to an improved type of condenser for use in such furnaces.

The present condenser is an improvement over the hollow cone form of condenser most commonly used in zinc distillation furnaces of the horizontal retort type. As will be understood by those having a knowledge of the art, the larger end of this type of condenser is fitted into the mouth of the retort to receive the vapor and is sealed around the outside to prevent the entrance of air, which would tend to oxidize the vapor and prevent condensation to metal. The smaller end of the condenser is formed with an opening which serves as a tap-hole for withdrawal of the metal and the escape of gases which are generated in the retort (principally carbon monoxide).

In order to prevent the metal from running out of the condenser between drawing periods, and also to maintain proper working conditions within the condenser, the smaller end of the latter is plugged with a suitable material, usually culm coal, through the top of which a small hole is formed for the escape of the retort gases. This hole, commonly termed the "spiess hole", has a tendency to become clogged with zinc oxide, and as such clogging creates undesirable pressure within the condenser, thereby lowering its efficiency, an effort is made to keep the hole open by frequent "spiessing" with an iron rod.

This practice is open to numerous objections, among which may be mentioned, first the danger to attendants, for it often happens that at the moment of spiessing the stuffing fails to hold and the metal suddenly bursts from the condenser and splashes onto the floor, subjecting the attendant to the risk of being burned; second, the metal which runs out in this manner as well as that which gradually leaks out of the spiess hole forms scrap which must be gathered up and remelted or, in the case of smaller particles of which there is considerable, it must be redistilled with a consequent second-treatment loss; third, an opening maintained in this manner cannot be kept uniform at all times, with the result that the pressure in the condenser fluctuates and the efficiency of the condenser is lowered; fourth, as the time for tapping out the metal approaches, the condenser is quite full of metal and spiessing is neglected because of the risk of the metal bursting through the stuffing. At such time the vapor forces its way through the seal at the mouth of the retort and some of its condenses in the luting material or combines with it in a manner which renders the daily removal of the condenser very difficult and tends to increase breakage.

The foregoing objectionable features are eliminated in the present improved type of condenser by providing a special opening for the escape of exhaust gases, said opening being located at a point on each condenser where the burning gases will serve most effectively to prevent the formation of bluepowder in the condenser thereabove.

For an understanding of the preferred construction of the improved condenser, reference is had to the accompanying drawings, wherein:

Figure 1 is a sectional elevation through a portion of a spelter furnace, showing the improved condensers in position therein, and Figure 2 is a sectional view taken on the line II—II, Figure 1.

The reference numeral 5 designates the furnace retorts, into the mouths of which the condensers 6 are fitted and sealed around the joint to prevent the entrance of air. The stuffing of culm coal in the small end of the condensers is indicated at 7.

In the top of each condenser an opening 8 is formed and this opening serves for the escape of exhaust gases from the condenser instead of the spiess hole heretofore used for this purpose and which was formed in the tap-hole stuffing 7. This opening is located so that the burning jet of carbon monoxide gas issuing therefrom may be directed against the under surface of the condenser above at a point where the heat from the flame will most effectively serve to prevent the formation of bluepowder.

Practical experience has demonstrated that

this type of condenser is greatly superior to the old types, a uniform flow of gases being maintained even when the condenser is filled nearly to capacity with metal. The improved condenser may be stuffed in the ordinary way and the stuffing need not be disturbed during the interval between tappings, thus reducing the amount of scrap to be remelted or redistilled and the danger encountered by an attendant during the spiessing operation.

What is claimed as new is:—

1. A condenser for spelter furnaces provided with an opening in its side wall for the escape of retort gases therefrom, said opening being so located when the condenser is installed that a jet of burning gas therefrom will be directed on the lower side of the condenser thereabove.

2. In the manufacture of zinc, the steps which consist in directing the vapor of distillation from a substantially horizontal retort into a condenser the tap-hole of which is closed between tapping periods, and delivering the retort gases from the condenser through the top wall thereof so that a jet of flame produced by the burning thereof will be directed onto the under surface of the condenser thereabove at a point where it will most effectively prevent the formation of bluepowder.

In testimony whereof, I have hereunto set my hand.

MARION CHESTER SKINNER.