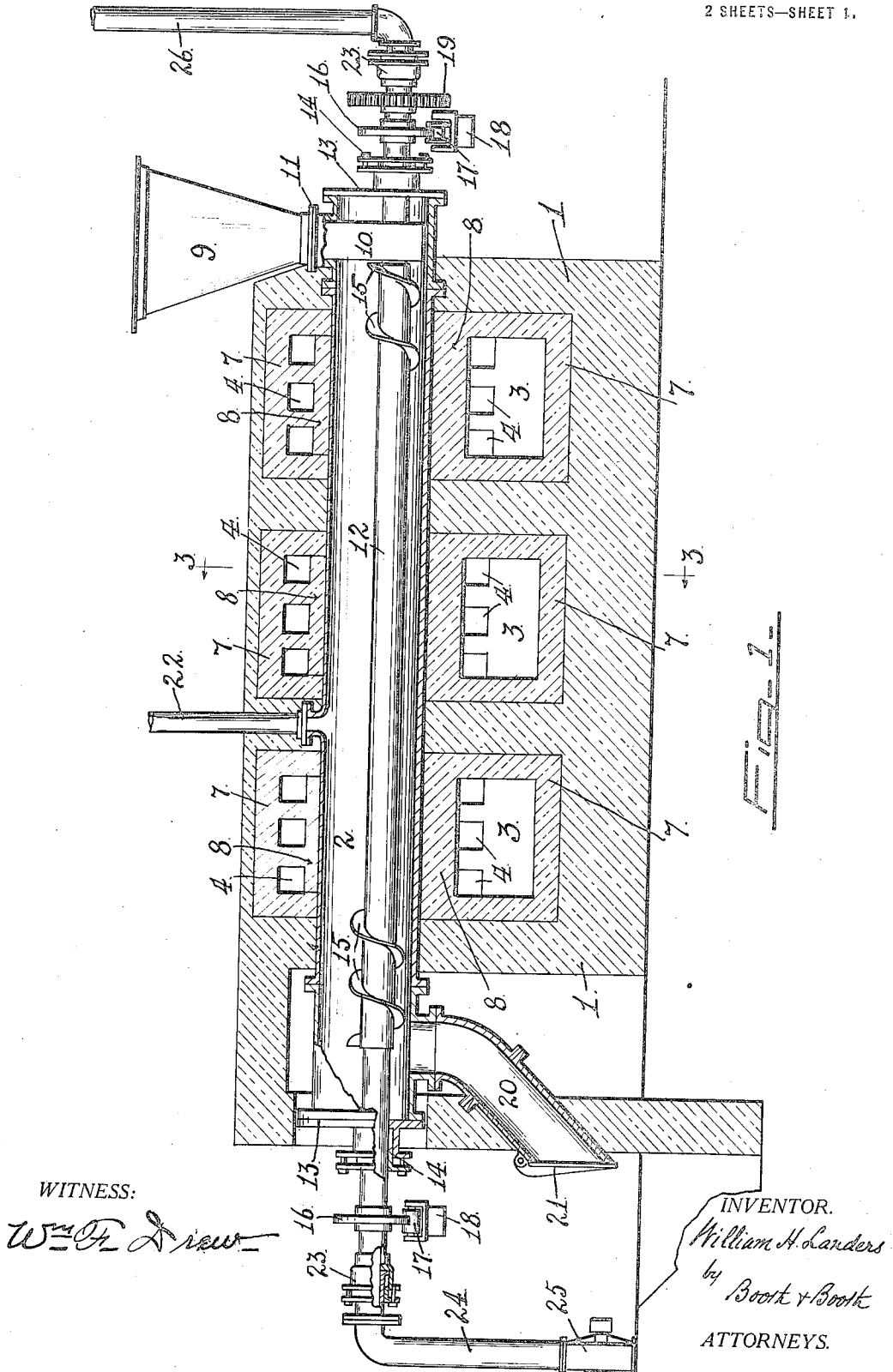


W. H. LANDERS.
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 APPLICATION FILED APR. 16, 1917.

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 2 SHEETS—SHEET 1.



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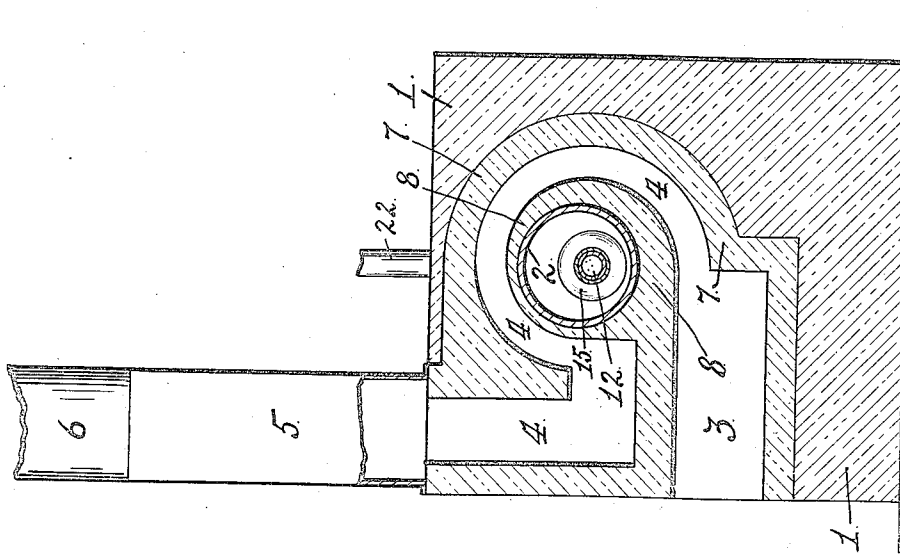


Fig. 3.

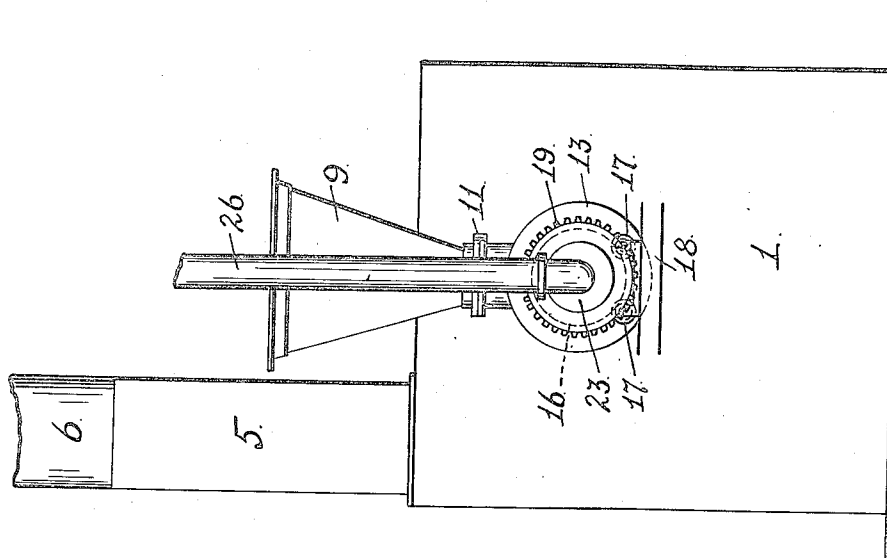


Fig. 2.

WITNESS:

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UNITED STATES PATENT OFFICE.

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CALIFORNIA.

CONTINUOUS RETORT FOR TREATING QUICKSILVER ORES.

1,256,703.

Specification of Letters Patent.

Patented Feb. 19, 1918.

Application filed April 16, 1917. Serial No. 162,261.

To all whom it may concern:

Be it known that I, WILLIAM H. LANDERS, a citizen of the United States, residing at New Almaden, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Continuous Retorts for Treating Quicksilver Ores, of which the following is a specification.

My invention relates to retorts for roasting quicksilver ores to drive off the mercury in the form of vapor, and more particularly to a retort for this purpose in which ore is continuously treated.

The object of the invention is to provide a retort through which the ore is continuously advanced and is subjected to the required temperature during its advance. The ore is thus continuously supplied to the retort at one end, and is continuously discharged from the other end, after having been roasted to drive off the mercury vapor. By so doing I am enabled to treat a larger quantity of ore in a given time and with the expenditure of less fuel than under the ordinary methods now known to the art. The roasting process need not be stopped during the charging and discharging of the retort, so that not only is time saved, but the heat ordinarily lost during the charging and discharging of the retort is also saved. Other objects and advantages of the invention will become apparent in the following description.

Although my invention relates primarily to a retort for treating quicksilver ores, it is to be understood that its use is not so restricted but that it may be employed in any process of heating or roasting of a like nature. The device as hereinafter described may be used for treating the ore, either as the same is received from the crusher, or as a concentrate, after having had the gangue removed by any well-known process.

The invention will be hereinafter described and is herewith illustrated in its preferred form, but it is to be understood that changes, within the scope of the claim here-to appended, may be made in the form and construction of the device without departing from the spirit of the invention.

With this in view, the invention will now be described in detail with reference to the accompanying sheets of drawings, wherein,

Figure 1 is a longitudinal sectional elevation of the retort.

Fig. 2 is an end elevation of the same viewed from the right-hand end of Fig. 1 and

Fig. 3 is a transverse section taken in the direction of the arrows on the line 3—3 of Fig. 1.

In the drawings, the numeral 1 designates a body shell of masonry or other material of like nature, in which is held a horizontally disposed tubular chamber member 2 which constitutes the retort proper. Below the retort tube 2 is a series of fire boxes or combustion chambers 3, each having a number of flues 4 leading upwardly and partially surrounding the retort tube 2, said flues 4 all leading into a common header 5 from which a stack 6 extends upwardly for carrying off the smoke and products of combustion of the fuel.

The combustion chambers 3 and the flues 4 are lined with suitable heat resisting material 7, as for example, fire brick, which also surrounds the retort tube 2 as shown at 8. By this construction the retort 2, which is preferably constructed of iron or steel, is amply supported throughout its entire length and is also protected from the intense heat of the flame. Said retort tube 2 is, therefore, not only held in position and prevented from warping and getting out of line, but is also protected against rapid oxidation from the direct action of the flame. Furthermore, the heat is more evenly distributed by the lining 8 throughout the entire length of the tube 2 than would be the case if the tube were in direct contact with the flame.

At one end of the retort tube 2 is a feed hopper 9 into which the ore to be roasted is placed. The hopper terminates in a downwardly directed spout 10, supported in a collar 11, and extending into the retort tube 2.

Within the lower portion of the retort chamber is a conveyer 12, passing through the heads 13 of said retort and provided with suitable packing glands 14. The conveyer 12 is of the screw type being provided with a spiral thread or flange 15 adapted to advance the ore lineally through the retort tube 2. The weight of said screw conveyer 12 is borne by flanges 16 resting upon bear-

ing rollers 17 mounted in suitable brackets 18, outside said retort, the rollers at one end of the conveyer being flanged to take the end thrust reaction of the screw. Any desired means may be provided for rotating said screw conveyer 12, for example, a gear 19, to which the power is led.

At the opposite end of the retort tube 2 from the feed hopper 9 is located a discharge chute 20, normally closed by a swinging gravity gate 21. As will be readily understood, the ore introduced into the tube 2 at one end, through the feed pipe 10, is conveyed through said tube by the screw conveyer 12 and is discharged at the opposite end by gravity through the discharge chute 20, the gravity operated gate 21 opening only to permit the discharge of the material. The speed of the screw conveyer 12 is properly regulated with relation to the length of the retort and the size of the particles of ore to be treated, to enable said ore to be subjected to the required amount of heat to vaporize the mercury therein. A pipe 22 is led from the upper portion of the retort tube 2 and conducts away the mercury vapor to a condenser, not shown in the drawings.

The screw conveyer 12 is cooled to prevent over-heating. The temperature necessary to vaporize the mercury in the ore is high enough to raise the iron of said conveyer to a red heat if no means were provided for cooling, a condition which would soon result in the bending and distortion and finally the destruction of the screw conveyer. The conveyer 12 is therefore hollow and is adapted to have a cooling fluid passed there-through. Though water may be used I prefer to use air for this cooling for the reason that by so doing, I am enabled to cool the conveyer 12 enough to prevent its impairment or destruction, without unnecessarily reducing the temperature of the entire retort. At the ends of the conveyer tube 12 there are provided packed swivel joints 23, and at one end a pipe 24 is led from a blower 25 adapted to introduce air into the conveyer pipe. At the other end an exhaust pipe 26, is connected with said conveyer pipe 12 to

conveniently dispose of the heated air. The exhaust pipe 26 may even without the blower be used to create a cooling draft through the hollow axis of the conveyer. By this arrangement, the cooled air is introduced at the hottest portion of the conveyer pipe, namely, the discharge end thereof.

It will readily be understood that the action of my retort is continuous. The heat applied remains constant at all times and the ore is continuously supplied to the retort from the hopper 9. The screw conveyer 12 slowly advances the material through the retort and permits the discharge of the same through the discharge chute 20. During this passage of the ore through the retort it is heated to the proper degree and the mercury vapor is driven off and led away through the pipe 22, said pipe being the only outlet for the vapor, inasmuch as the gangue discharge chute 20 is closed by the gate 21, and the feed chute 10 is closed by the supply of ore therein. The ends of the retort chamber are closed, as before described by the heads 13 and the packing glands 14. Finally, by cooling the screw conveyer and by covering the retort tube with the refractory masonry jacket 8, the danger of these parts being injured by excessive heat is reduced to a minimum.

I claim:

A continuous retort comprising a body shell of masonry or the like formed with a series of fire boxes and a plurality of flues leading from each fire box, the walls of said flues being of fire brick or the like; a metallic member forming a roasting chamber, said member being surrounded by the flue walls; means for feeding the material to said chamber at one end and discharging it at the other end; and a conveyer for continuously advancing the material through said chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM H. LANDERS.

Witnesses:

J. R. CHASE,
C. BRONSON.