

No. 635,586.

Patented Oct. 24, 1899.

O. W. MARTIN & A. J. PETTER.  
ASSAYING FURNACE.

(Application filed Dec. 24, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

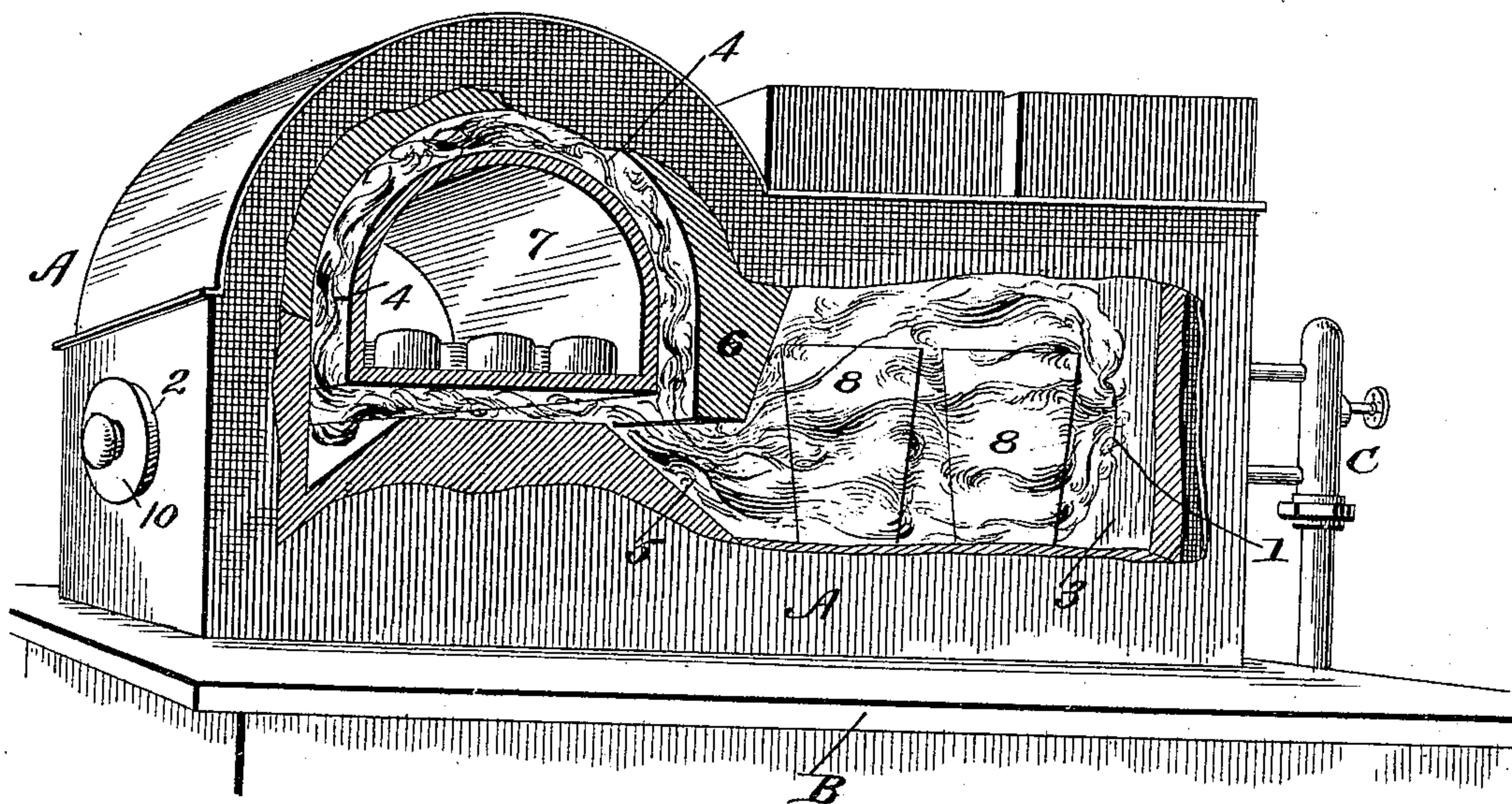
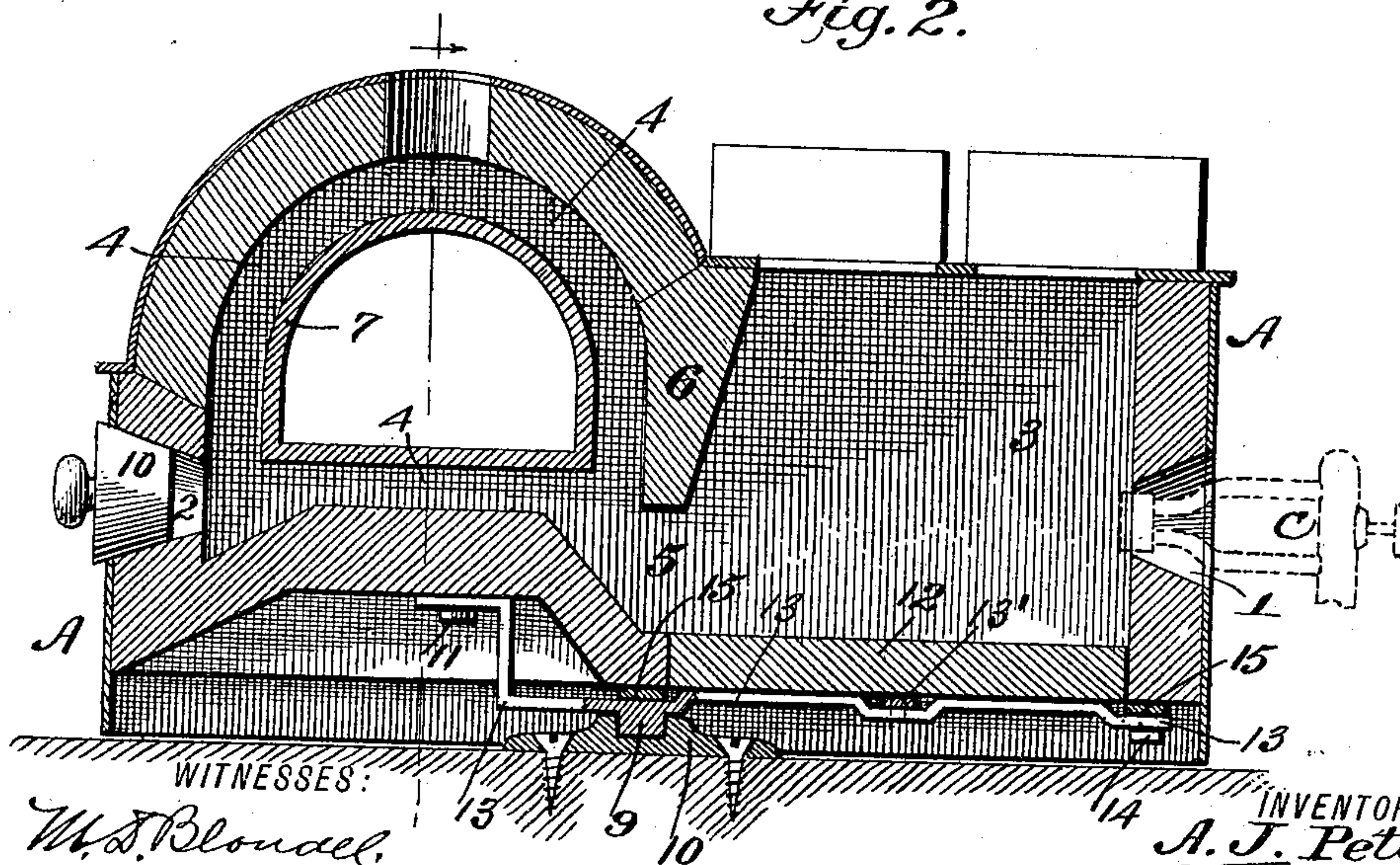


Fig. 2.



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Fig. 3.

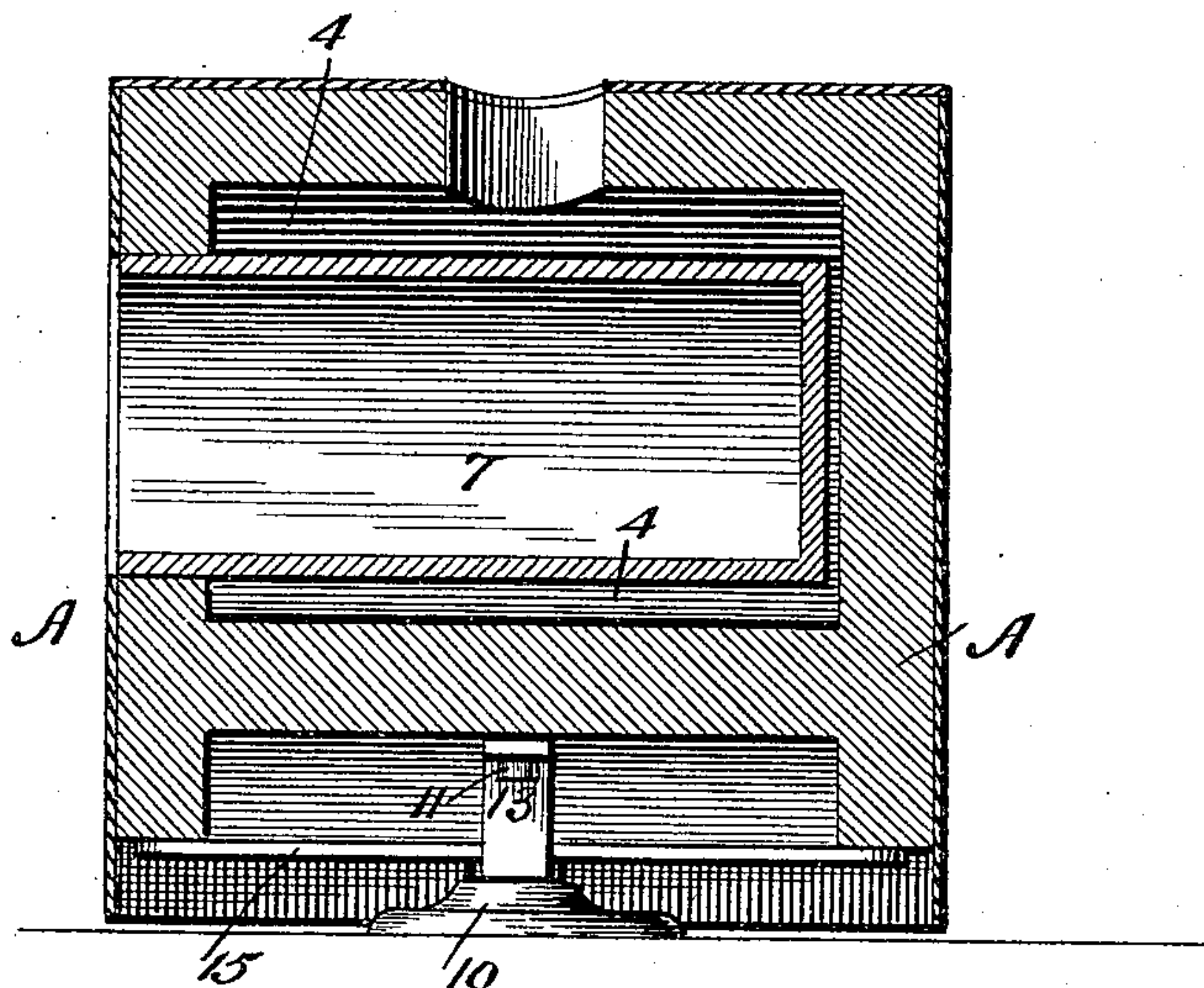
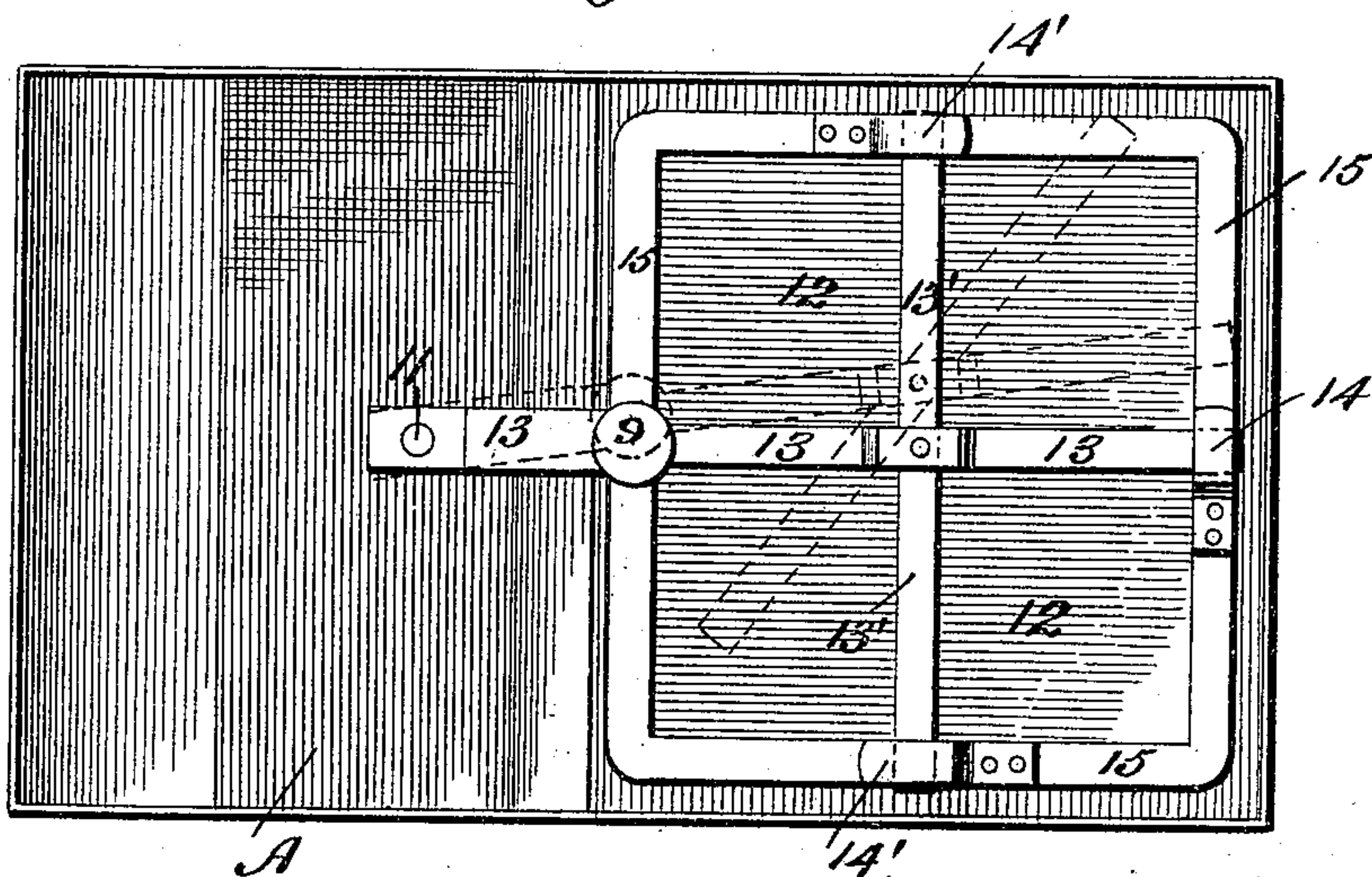


Fig. 4.



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# UNITED STATES PATENT OFFICE.

ORLAND W. MARTIN AND ADOLPH J. PETTER, OF LOS ANGELES, CALIFORNIA, ASSIGNORS OF TWO-THIRDS TO F. W. BRAUN & CO., OF SAME PLACE.

## ASSAYING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 635,586, dated October 24, 1899.

Application filed December 24, 1897. Serial No. 663,440. (No model.)

*To all whom it may concern:*

Be it known that we, ORLAND W. MARTIN and ADOLPH J. PETTER, of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Assaying-Furnace, of which the following is a specification.

It is the object of our invention to provide for assayers' use a combined melting and muffle furnace which shall be adapted for use of gas or a volatilizable hydrocarbon as a heating medium and require but one burner for both the melting and cupeling chambers. The furnace is made very compact, so as to be easily portable, and is also adapted to rotate on a central pivot to permit firing at each end by means of one burner. The bottom of the smelting or crucible chamber is also made removable to facilitate cleaning the chamber and recovering bullion without removal of any brickwork.

In the accompanying drawings, two sheets, Figure 1 is a perspective view, part being broken away, of our improved furnace. Fig. 2 is a vertical section of the same. Fig. 3 is another vertical section in a plane at a right angle to that shown in Fig. 2. Fig. 4 is a bottom plan view of the furnace.

The body A of the furnace is rectangular and oblong and pivoted centrally on a flat table or other base B. It is provided at its respective ends with holes 1 and 2 for introduction of a gas or other burner C. In this instance the burner is one adapted for burning a vaporizable hydrocarbon received from a tank, which may have a pump or other appliance for supplying oil, and preferably, also, one for compressing air on the surface of the oil to produce the required feed. The burner proper is an enlarged hollow head provided with a number of small vapor-orifices. The crucible and muffle chambers 3 and 4 are connected by a space 5, formed beneath a pendent portion or hanging wall 6, so that the flame and unconsumed combustible gas or other products of combustion may pass from the crucible or smelting chamber 3 directly into the muffle or cupeling chamber 4 and under and around the muffle proper, 7, therein, as shown in Fig. 1. Thus the same flame and

heat that act on the crucibles or melting-pots 8 act also on the muffle 7 and effect a great economy in the time and fuel required to complete an assay. When the melting is finished, the furnace A is reversed or rotated half-way on its central base-pivot 9, and the opposite end, with its hole 2, is brought around adjacent to the stationary burner C, and the assay process is completed by heating the muffle 7 to the required degree and for the required period. Thus a continuous process of melting and cupeling may be carried on by means of one and the same burner and furnace, whereas by the old means and method two burners, two furnaces, and double the quantity of fuel were necessary to produce the same result.

It is to be understood that one of the burner-holes 1 is stopped with a removable plug 10, Fig. 2, when the flame is being introduced at the other, also that either chamber may be used independently, if desired. It is to be further understood that if greater rapidity of work is desired a second burner may be used, so that the muffle 7 may be heated to the degree required for cupeling at the same time that the preliminary melting is going on in chamber 3; but even in this case the heat from the latter will continue to be utilized.

The furnace revolves upon a pivot 9, Fig. 2, which is set in a socket-plate 10. The pivot 9 is in this instance formed on an angular latch-bar 13, which is pivoted at 11 to the under side of the muffle-chamber and whose free end engages a catch 14, attached to the frame 15 on the base of the crucible-chamber. Another shorter latch-bar 13' is pivoted centrally to latch-bar 13, and its ends similarly engage latches 14' on the frame 15. The said latch-bars 13 13' support the bottom of the crucible or smelting chamber, which is made removable and constitutes practically a trap-door, which is located directly under the crucible-space in the chamber 3. It is obvious that when the said latches 13 13' are locked with the fixed catches 14 14', as shown by full lines, Fig. 4, the bottom 12 is supported and secured in place, as required for use, and that when the latches are swung out into the position shown by dotted lines the bottom 12



may be removed. By this means the detachment may be quickly effected, thus making it possible to recover a bullion spill in a very few minutes without disturbing the brick-work of the furnace proper.

The compactness and portability, the facility, and economy of heating, coupled with the convenience for cleaning, and the promotion of oxidation of the cupel charges particularly commend this furnace for use by miners and assayers proper.

What we claim is—

1. The combination with a vapor-burner fixed in position, of a pivoted furnace adapted to rotate horizontally, said furnace including a smelting or crucible chamber having a burner-hole, an adjacent cupeling or muffle chamber having a separate burner-hole, and an open passage between the two chambers, as shown and described, whereby both chambers may be heated by one and the same medium, or one of them independently, as required.

2. The combined furnace specified, comprising two firing-chambers arranged adjacently in the same structure or body, and connected by an open passage, and having independent burner-holes at either end, the body of the furnace being pivoted to adapt it for rotation, as and for the purpose specified.

3. The combination, with the body of the furnace having a removable raised bottom, inserted from beneath, of latches or latch-bars crossed upon said bottom and pivoted together centrally and a series of catches fixed on the rim of the furnace-body, and adapted to lock with said bars when the latter are swung horizontally into proper position, as specified.

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Witnesses:

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