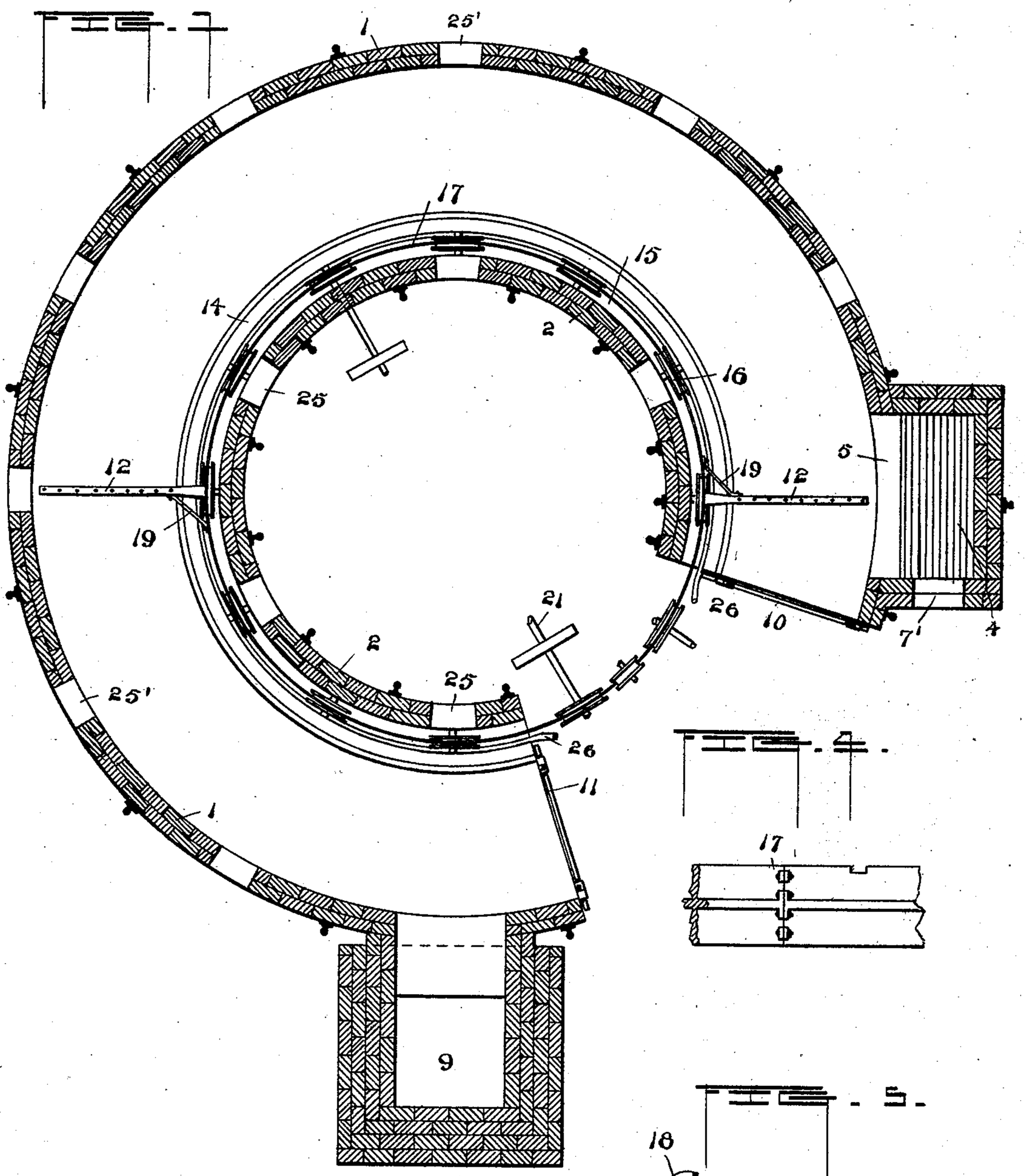
(No Model.) 2 Sheets—Sheet 1.

A. H. KELLER.

ROASTING FURNACE.

No. 506,511. Patented Oct. 10, 1893.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

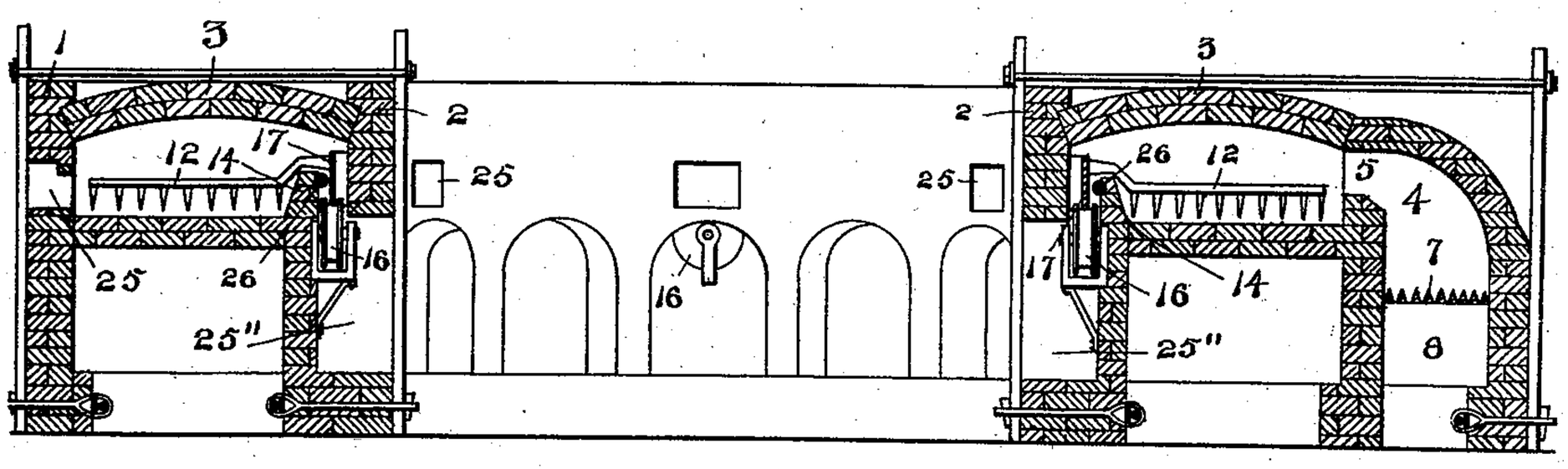


Fig. 3.

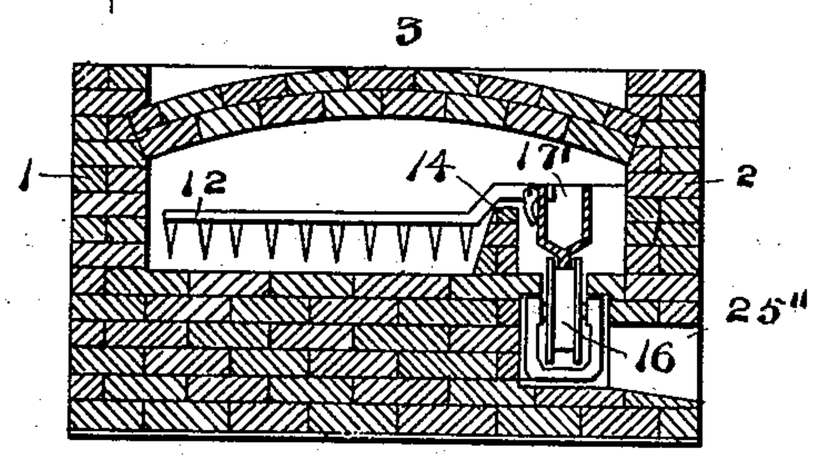


Fig. 6.

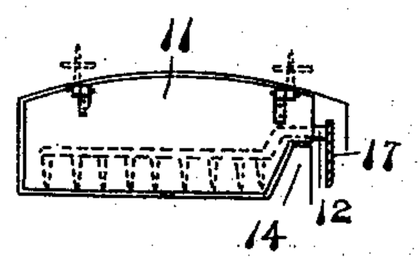
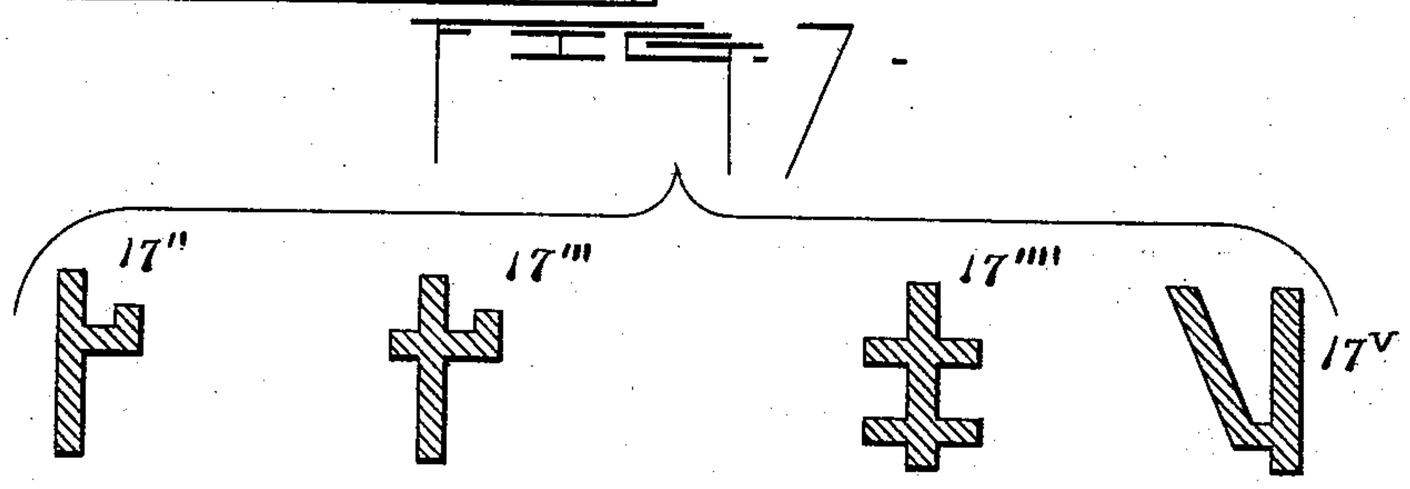


Fig. 7.



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UNITED STATES PATENT OFFICE.

ARTHUR H. KELLER, OF DURANGO, COLORADO.

ROASTING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 506,511, dated October 10, 1893.

Application filed April 21, 1893. Serial No. 471,262. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. KELLER, a resident of Durango, in the county of La Plata and State of Colorado, have invented certain new and useful Improvements in Roasting-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to furnaces for roasting ores and like purposes and has for its object to provide an efficient, convenient and economical apparatus primarily intended for desulphurizing or chloridizing ores; and it consists in the construction hereinafter described and particularly pointed out.

In the accompanying drawings Figure 1 is a plan of a furnace with the roof removed. Fig. 2 is a vertical central section of Fig. 1. Fig. 3 is a partial vertical section of a modification. Fig. 4 is a partial elevation of a ring on an enlarged scale. Fig. 5 is a similar view of a stirring device. Fig. 6 is an elevation of a swinging door; and Fig. 7 includes sections of modified rings.

Numeral 1 denotes an exterior and 2 an interior side wall of an approximately annular chamber having a roof 3 and communicating with a fire place 4 by means of a flue 5.

A grate which may be of any suitable character or dimensions is denoted by 7 and 8 is an ash pit.

9 denotes a chimney adapted to draw the products of combustion and gases from the fire place and the annular chamber and discharge them into the external air.

10 and 11 denote swinging doors to close the ends of the annular chamber whereby the circulation of air and gases is made to pass through the air inlet 7′ and up through the grate and through flue 5 and around the annular chamber to the chimney. The doors 10 and 11 are pivotally supported to swing freely and so that ore may be charged into the annular chamber near the chimney stack and after being moved around to the fire place be discharged without admitting an unnecessary quantity of air. The stirring and conveying of the ore is effected by the arms or rakes 12 having suitable stirring fingers or blades 13. These arms extend transversely across the annular flue at a suitable distance above its floor and at their inner ends are preferably bent upward and over a partition 14 between which and the main part of the wall is a channel 15. Within said channel are suitably journaled pulleys 16 adapted to support the stiff metal ring or band 17. This band, preferably made of sections of cast iron or steel secured together endwise, (see Fig. 4,) rests in the grooves of the numerous pulleys arranged in the channel and is intended to be revolved horizontally around its center and on said pulleys. To this traveling band the stirring arms are detachably secured (in the present instance) by means of detaching devices, such as indicated at 18 in Fig. 5, on the inner ends of said arms. Each of said arms is provided with a notch or slot to receive the upper edge of the ring. Adjacent to this slot is pivoted a clamping device having on its end next the ring an eccentric which can be made to bear against the ring and thus hold it and the arm in fixed relation to each other. The particular form or character of the clamp is however not essential. The arms are preferably joined to the band by braces 19, (see Fig. 1.) Motion is imparted to the band or ring 17 by one or more of the pulleys suitably revolved in any convenient manner. The invention is not limited however to the particular means of moving the ring, nor to a simple band ring. In some cases the ring is adapted to hold water as indicated at 17′ in Fig. 3 and 17″, 17‴, and 17^{V} in Fig. 7.

At 17^{IV} Fig. 7 is shown a section of a ring provided with a plurality of stiffening flanges on each side. As the ring is revolved its arms swing around the roasting chamber moving along and stirring the ore by fingers or blades 13. These may be made in the shape of small plows or shovels to increase their effect if desired. The rakes pass freely under the swinging doors and act continuously upon the ore from the time it is charged into the furnace near the chimney until it is discharged near the fire place. Between the ends of the ore chamber near the fire place and chimney respectively a space is left to give convenient access to either end of said chamber and to allow room for handling the ore before and after it is roasted.

Air ports 25 in the inner wall of the fur-

nace may supply air to prevent over heating of the ring. To further cool the same a water circulating pipe 26 can be placed within the partition 14.

25′ indicate air ports in the exterior wall 1 adjacent to the ring. These various ports may be closed with brick made removable at pleasure. Air ports to admit air to keep the pulleys cool are indicated by 25″. These may have various dimensions as indicated in Figs. 2 and 3.

The construction of the furnace and of the stirring devices is very simple and is also very durable. The stirring arms being most liable to injury are readily replaced by others when required.

The particular form of the fireplace, chimney, stack, stirring arms, pulleys, and propelling mechanism may be varied by mechanical skill without departing from the invention.

I am aware that roasting furnaces and drying chambers have been made with annular chambers and supplied with stirring arms extending radially from a central shaft and such construction is not of my invention. I dispense with the central shaft and support the stirring arms or rakes by a ring moving over suitable pulleys or wheels all being situated within the main walls of the annular chamber. The arms or rakes are thereby shortened and nearly their whole length filled with teeth and the raking device made much more compact and stiff than in prior apparatus.

Having thus described my invention, what I claim is—

1. In a hearth or furnace having a curved flue or chamber, a ring provided with stirring arms and suitably supported within the main walls of said flue and mechanism for moving the ring about its center and passing the arms through the chamber, the stirring devices being situated in the flue or chamber and entirely between its main walls, substantially as set forth.

2. In a hearth or furnace the curved chamber, the ring supported in said chamber and between its side walls and adapted to revolve horizontally about its center and the arms detachably secured to the ring within the chamber and extending across it, substantially as set forth.

3. In a hearth or furnace having a curved flue or chamber, a ring provided with stirring arms and mechanism for moving the ring about its center and passing the arms through the chamber and means for keeping the ring cool, substantially as set forth.

4. In a hearth or furnace having a curved flue or chamber, a ring provided with stirring arms mechanism for moving the ring about its center and passing the arms through the chamber said chamber having a door at each end and a fire place and chimney near its opposite ends, substantially as set forth.

5. In a hearth or furnace the curved chamber, the partition 14 inclosing a channel, the pulleys journaled in said channel, the ring adapted to travel on said pulleys and arms attached to the rings and extending across the chamber, substantially as set forth.

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

ARTHUR H. KELLER.

Witnesses:
F. MENTZEL,
W. S. DARROW.