No. 680,010. Patented Aug. 6, 1901.

J. H. TAYLOR.

FURNACE FOR HEATING BARS OF METAL.

(Application filed Feb. 18, 1901.)

(No Model.) 3 Sheets—Sheet 1.

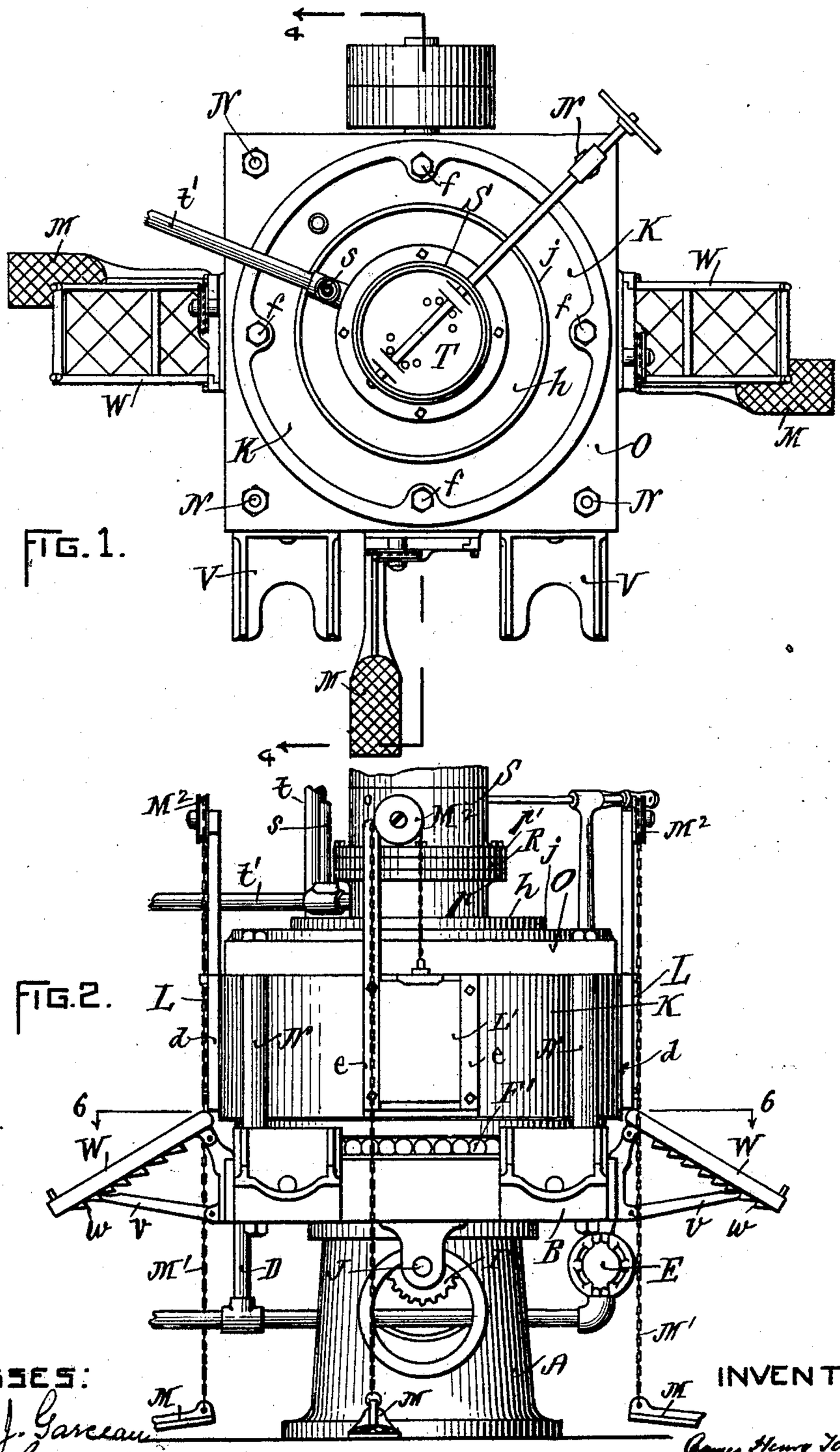

FIG. 1.

FIG. 2.

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(No Model.) 3 Sheets—Sheet 2

FIG. 3.

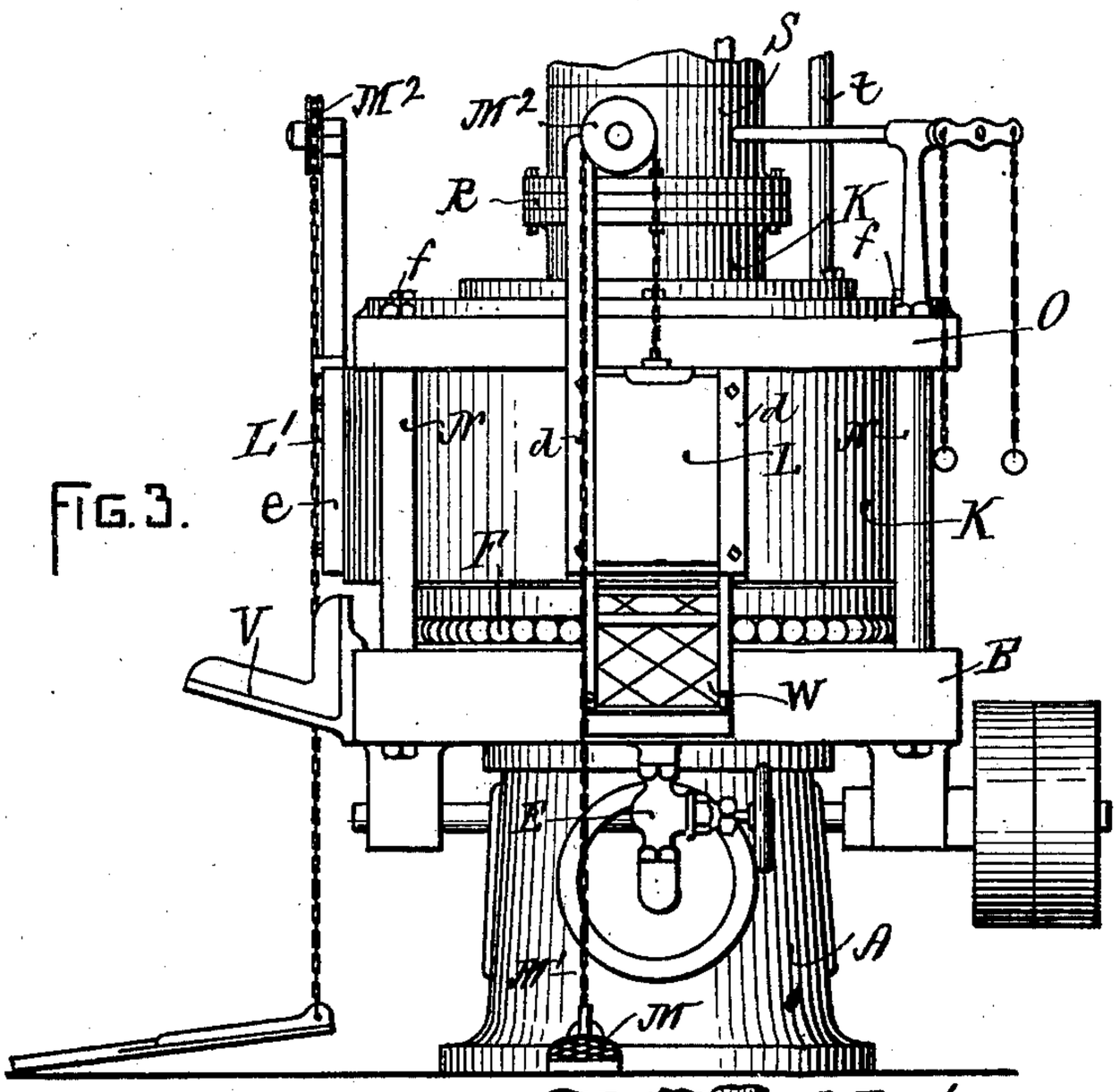

FIG. 4.

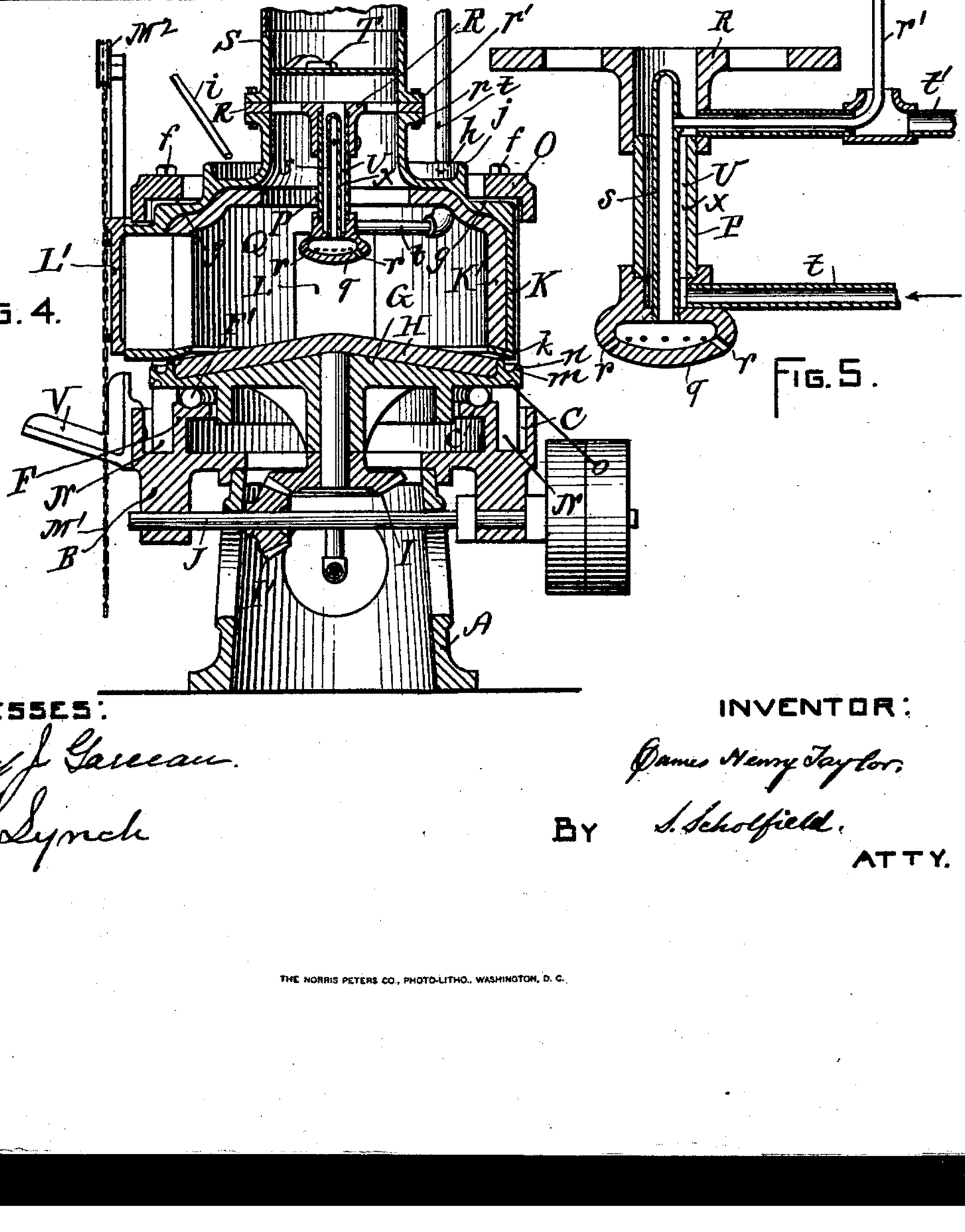

FIG. 5.

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FURNACE FOR HEATING BARS OF METAL.

(Application filed Feb. 18, 1901.)

(No Model.) 3 Sheets—Sheet 3.

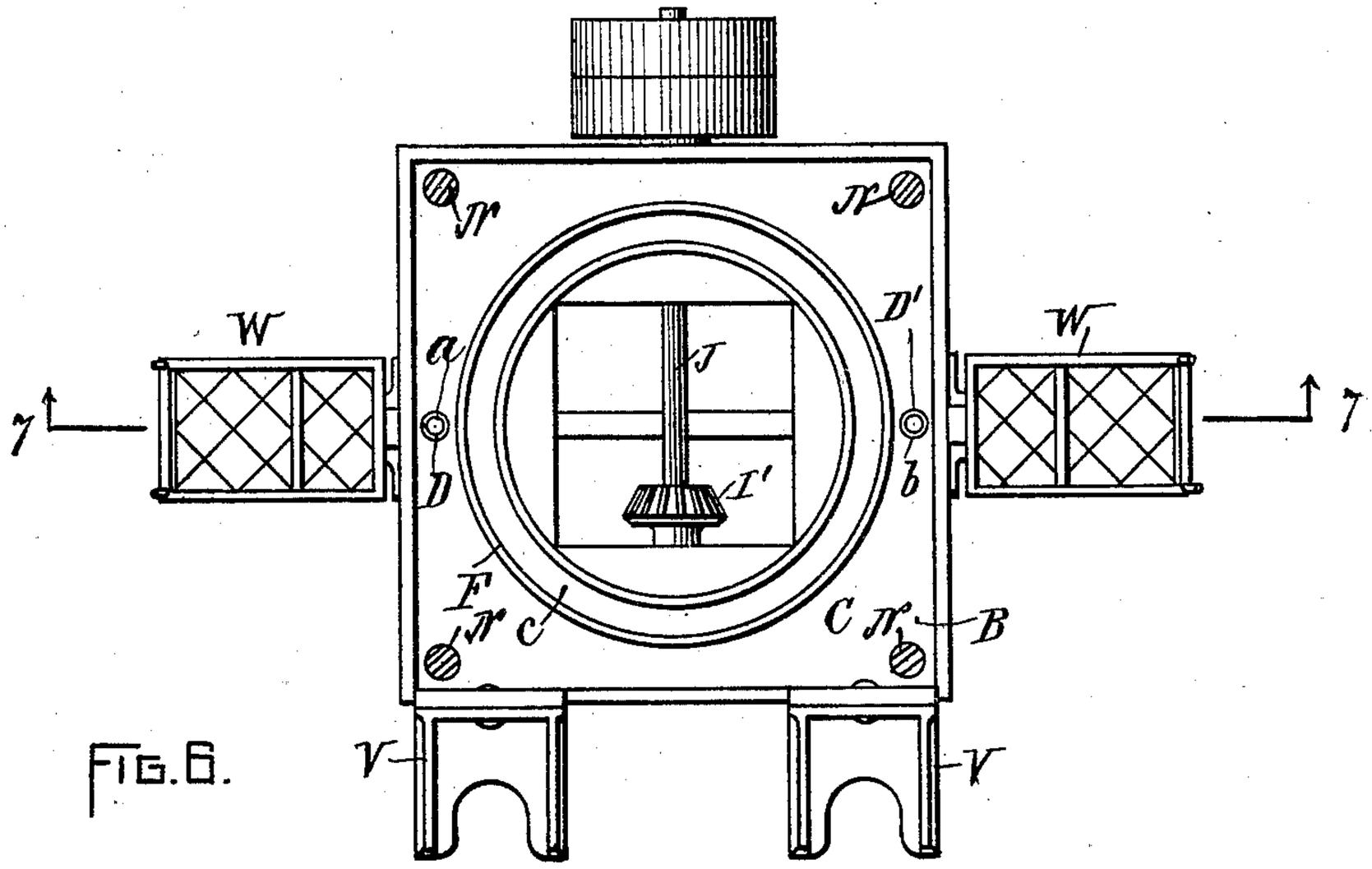

FIG. 6.

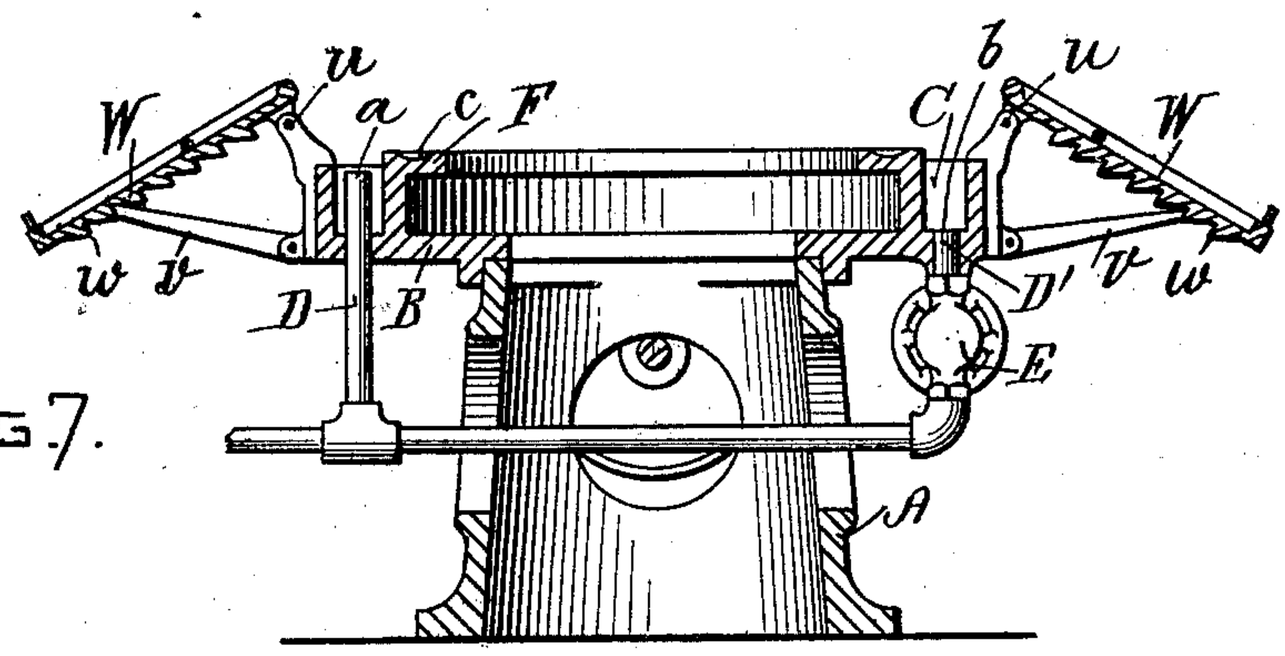

FIG. 7.

WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES HENRY TAYLOR, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO RICHARD ROSCOW, OF SAME PLACE.

FURNACE FOR HEATING BARS OF METAL.

SPECIFICATION forming part of Letters Patent No. 680,010, dated August 6, 1901.

Application filed February 18, 1901. Serial No. 47,886. (No model.)

To all whom it may concern:

Be it known that I, JAMES HENRY TAYLOR, a subject of the King of Great Britain, residing at Pawtucket, in the State of Rhode Island, have invented a new and useful Improvement in Furnaces for Heating Bars of Metal, of which the following is a specification.

My invention relates to a furnace adapted for heating the metal blanks to be fed to horseshoe-machines or for other purposes; and it consists in the improved construction of the rotary hearth of the furnace and the combination of a hydrocarbon-burner therewith and in the improved water-jacket for lowering the temperature of the casing of the furnace-chamber, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents the top view of a furnace embodying my improvement. Fig. 2 represents a side elevation taken in front of the feeding-door of the furnace. Fig. 3 represents a side elevation taken in front of one of the delivering-doors. Fig. 4 represents a section taken in the line 4 4 of Fig. 1. Fig. 5 represents an axial section of the hydrocarbon-burner for the furnace. Fig. 6 represents a section taken in the line 6 6 of Fig. 2 to show the water-tank, the casing of the furnace-chamber and the rotary hearth being removed. Fig. 7 represents a section taken in the line 7 7 of Fig. 6.

In the drawings, A represents a hollow standard, upon the top of which is placed the table B, provided with the recess C, adapted to form a water-tank, the said tank being provided with the overflow-pipe D, having a raised orifice *a*, and with the pipe D′, having a lower orifice *b*, through which, by means of the stop-cock E, the water may be drawn entirely out of the tank when required. The table B is provided with the raised annular rim F, having the annular groove *c*, in which are placed a series of antifriction-balls F′, which serve to support the rotary hearth G, the said hearth being provided with a lining of fire-brick H and rotated by means of the bevel-gear I, secured to the hub or shaft of the rotary hearth, and the bevel-pinion I′, secured to the driving-shaft J. Above the rotary hearth G is arranged the casing K, provided with the lining of fire-brick K′ and with the doors L L and L′, the door L′ being employed for the purpose of passing the bars of metal to be heated into the furnace and the doors L L employed to remove the heated bars, whereby the furnace may be adapted for heating the blanks to be fed to two machines, one of which is located at one side and the other at the opposite side of the furnace, the delivering-doors L L being arranged diametrically opposite each other. The doors L L are arranged to slide up and down in the guideways *d d* and the door L′ to slide in the guideways *e e*, the said doors being operated by means of the pedals M and the chains M′, which pass over the elevated pulleys M^2. The casing K is supported above the rotary hearth by means of the posts N N, which serve to connect the table B with the circumscribing top plate O, the casing K being secured to the said top plate by means of the bolts *f f*, but leaving a narrow passage *g* all around the casing K, whereby the water will be allowed to flow outward and downward in a thin sheet between the top plate and the attached casing. The casing K is provided with an annular recess *h*, into which a stream of water is led from the pipe *i*, and when the said recess is filled the water will flow over the rim *j* and downward between the top plate *o* and the casing K and downward in a thin stream at all sides of the casing to the lower edge *k* of the same, from whence the water will drop into the annular groove *m* around the rotary hearth to cool the said edge, from whence the water will flow over the edge *n* of the hearth and drop to the tank C, from whence it may pass outward through the overflow-pipe D, a groove *o* or a downwardly-extending flange being formed at the edge of the hearth G to prevent the inward flow of the water from the said edge, and by means of this constant downward flow of water the outer casing of the furnace will be kept at a comparatively low temperature, so that the workmen will not be overpowered by the heat, as in the use of an ordinary furnace. The rotary hearth G is made in conical form, as shown in Fig. 4, in order that the bars of metal to be heated may lie upon the hearth in an advantageous inclined position for being seized by the tongs for removal

from the furnace. The hydrocarbon-burner P is supported within the chamber Q of the furnace by means of the plate R, which is clamped between the flanges $p\,p'$ of the casing K and the flue-pipe S, within which pipe is placed the damper T. The burner P is provided with a head q, having the outwardly-directed perforations $r\,r$, and with an upwardly-extending feed-pipe s for the hydrocarbon. The burner P is provided with a water-jacket U, the water for cooling the burner being forced into the chamber x through the pipe t, and from thence flowing upward in the said chamber and out of the overflow-pipe t'.

The furnace is provided at the side of the feeding-door L′ with the stationary inclined racks V V, upon which the bars to be fed to the furnace may be placed, and in front of the doors L L are placed the pivoted racks W W, which are made adjustable upon their pivots $u\,u$ by means of the catches $v\,v$ and notches w, and these racks are adapted for holding the heated bars.

In operating the improved furnace the hearth G is caused to rotate by means of the bevel-pinion I′ upon the driving-shaft J and the bevel-gear I upon the hub or shaft of the hearth. The oil for combustion is supplied to the burner P through the feed-pipe a and is kept cool by means of the water-jacket U until it arrives at the perforated burner-head q. The bars to be heated are fed to the furnace by an attendant through the opening of the feeding-door L′ and are removed therefrom through the openings of the doors L L at either side of the feeding-door, and while the furnace is in operation a stream of water is caused to flow down on all sides of the casing to prevent the excessive radiation of heat, which would interfere with the operation of the workmen.

By the employment of my improved furnace the blanks for feeding into a horseshoe-machine may be rapidly and uniformly heated and two or more machines may be fed with heated blanks from the same furnace, and by my improvement the casing of the furnace will be so reduced in temperature by the external downward flow of the water that the furnace may be operated with comparative comfort even in the hottest weather.

I claim as my invention—

1. In a furnace, the combination of a table provided with a grooved annular flange, a water-tank surrounding the said flange, a series of antifriction-balls in the groove of the flange, and a rotary hearth supported by the antifriction-balls, substantially as described.

2. In a furnace, the combination of a conical rotary hearth, delivering-doors arranged opposite each other, and an intermediate feeding-door, with the hydrocarbon-burner provided with a water-jacket, and located in the furnace above the hearth, substantially as described.

3. In a furnace, the combination of a casing provided with a recess at its upper portion arranged to receive water for cooling the casing, with a circumscribing plate extending inwardly from the upper edge of the casing, and leaving a passage between the edge of the plate and the casing for the flow of water onto the exterior surface of the said casing, substantially as described.

4. In a furnace, the combination of a casing provided with a recess at its upper portion, arranged to receive water for cooling the casing, with a circumscribing plate extending inwardly from the upper edge of the casing, and leaving a passage between the edge of the plate and the casing for the flow of water onto the exterior surface of said casing, and a rotary hearth provided with an annular groove, arranged to receive the water from the exterior surface of the casing, substantially as described.

5. In a furnace, the combination of a casing provided with a recess at its upper portion arranged to receive water for cooling the casing, with a circumscribing plate leaving a passage between the edge of the plate and the casing for the flow of water onto the exterior surface of said casing, a rotary hearth provided with an annular groove, arranged to receive the water from the surface of the casing to cool the edge of the hearth, a table provided with a water-tank below the hearth, and means for removing the water from the tank, substantially as described.

6. In a furnace, the combination of a casing provided with an annular recess at its upper portion, arranged to receive water for cooling the casing, with a circumscribing plate extending inwardly from the upper edge of the casing, and leaving a passage between the edge of the plate and the casing for the flow of water onto the exterior surface of said casing, the rotary hearth provided with an annular groove arranged to receive the water from the exterior surface of the casing, the table, and the posts which serve to connect the circumscribing plate with the table, substantially as described.

7. In a furnace, the combination of the feeding-door, and the stationary inclined racks upon which the bars to be fed may be placed, with the opposite delivering-doors, and the pivoted racks adapted for holding the heated bars, substantially as described.

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Witnesses:

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JOHN S. LYNCH.