

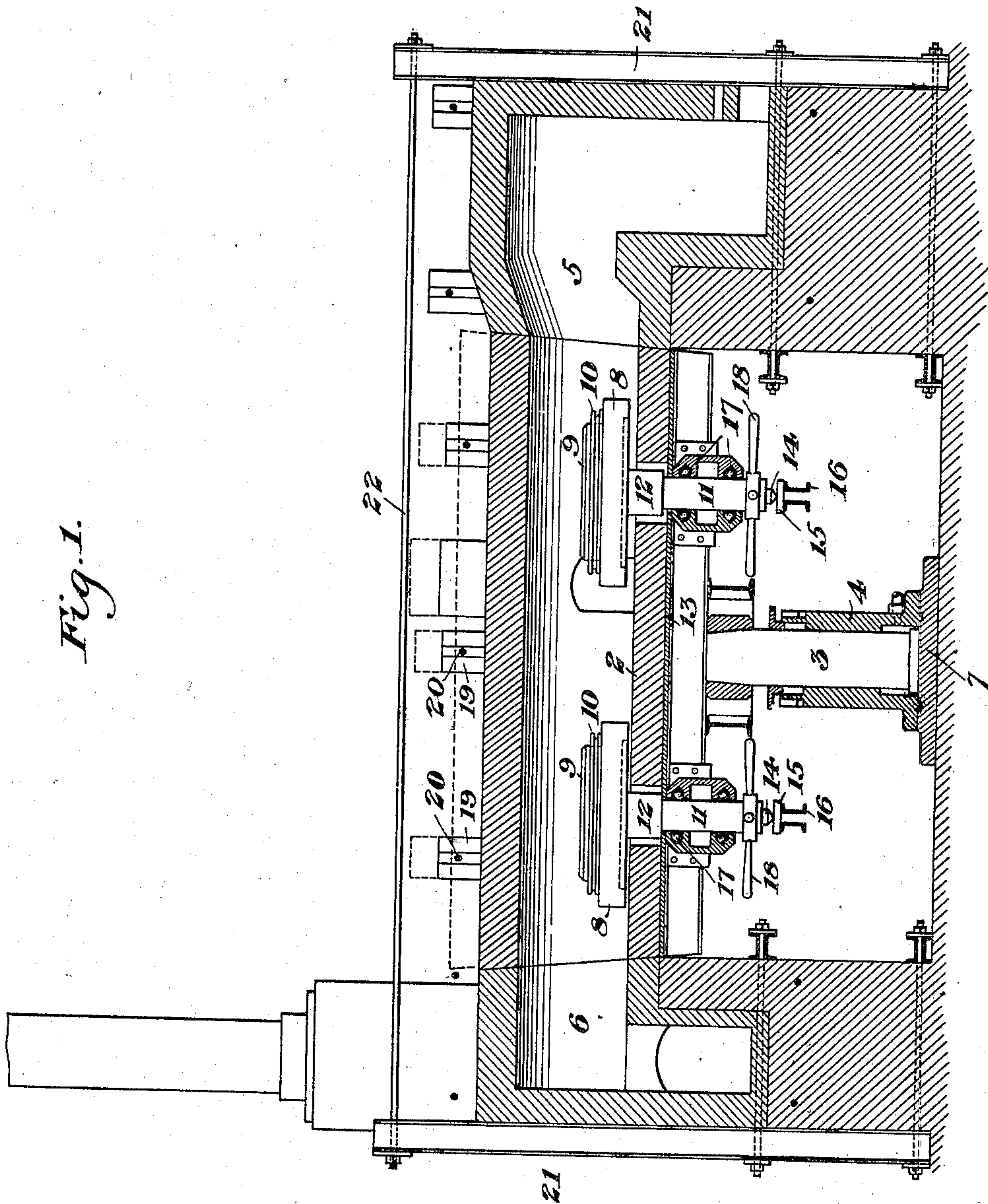
No. 726,556.

PATENTED APR. 28, 1903.

C. MERCADER.
COIL HEATING FURNACE.
APPLICATION FILED DEC. 27, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

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J. M. Corwin

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No. 726,556.

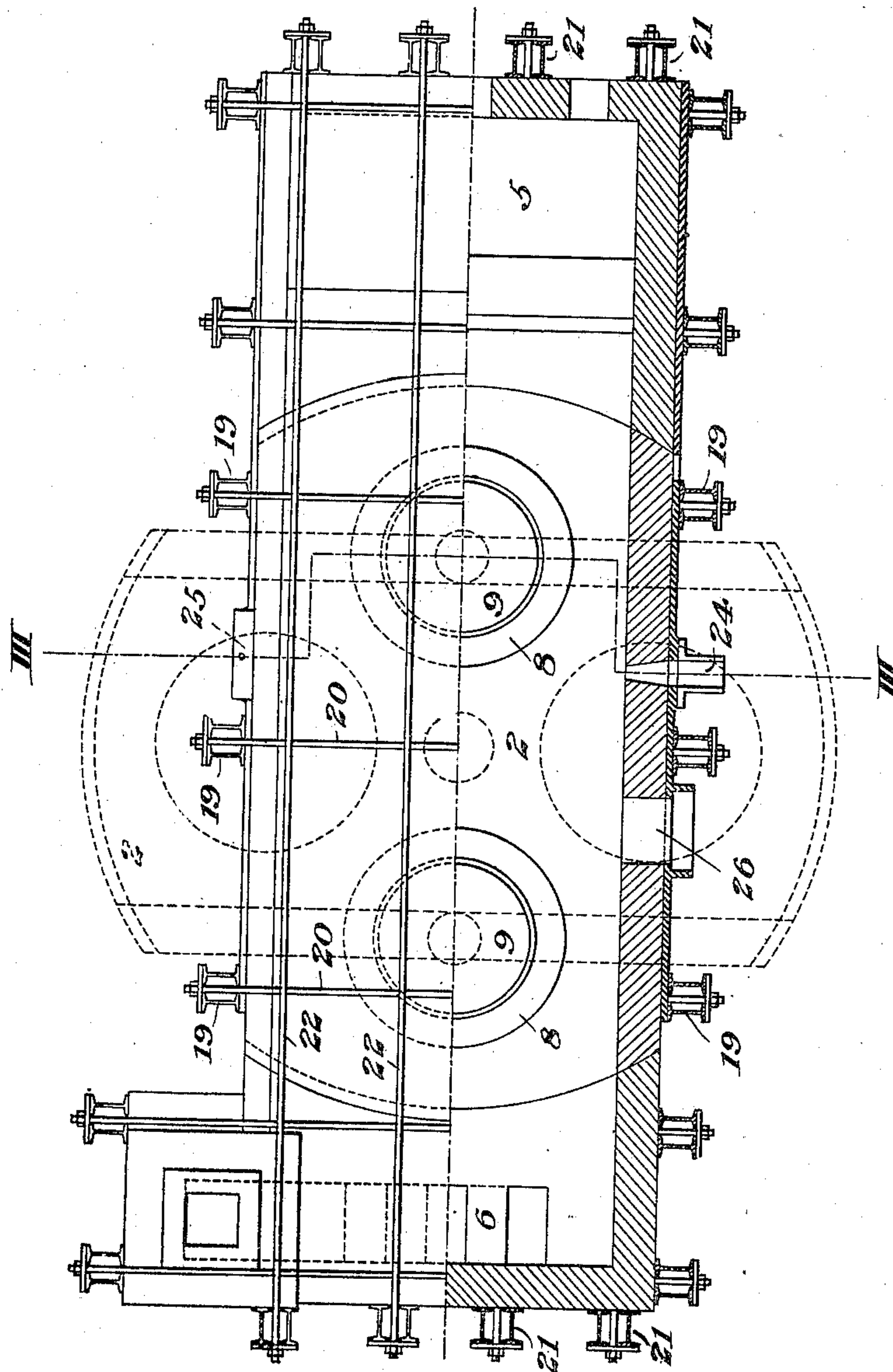
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3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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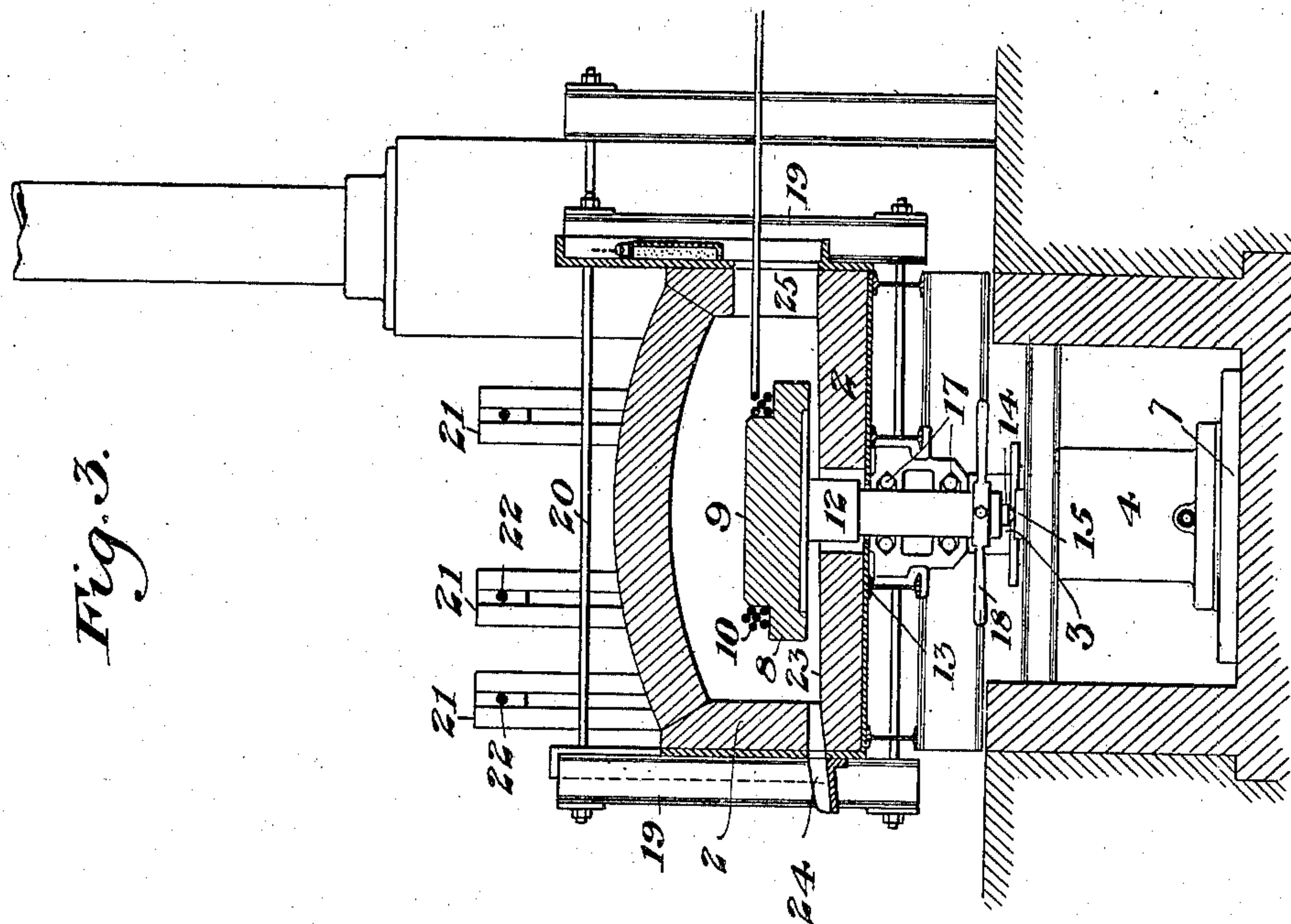
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

CAMILLE MERCADER, OF PITTSBURG, PENNSYLVANIA.

COIL-HEATING FURNACE.

SPECIFICATION forming part of Letters Patent No. 726,556, dated April 28, 1903.

Application filed December 27, 1902. Serial No. 136,832. (No model.)

To all whom it may concern:

Be it known that I, CAMILLE MERCADER, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Coil-Heating Furnace, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of my improved heating-furnace. Fig. 2 is a top plan view partly in horizontal section, and Fig. 3 is a vertical cross-section on the line III III of Fig. 2.

My invention relates to the heating of coiled rod or bar material—such, for example, as is used in the making of bolts and rivets; and it is designed to provide an improved heating-furnace for such coils in which two or more coils are subjected to heat in a rotary-hearth furnace and in which the material is drawn out to the machine from a coil in the hotter part of the furnace while another coil is being heated in the further travel of gases. It is further designed to provide for the introduction of coils without the use of special openings or doors, the coils being inserted through the ends of the hearth when the same is swung out of registry with the inlet and outlet flues. It also provides for external hand-operated or hand-controlled mechanism for turning the rotary coil-support in either direction.

In the drawings, 2 represents a swinging or rotary hearth furnace mounted upon the upper end of the plunger 3 of a single-acting hydraulic cylinder 4. The ends of this furnace are of curved or convex form to fit the concave ends of an inlet-port 5 and an outlet-port 6, and the furnace ends are also preferably inclined or beveled vertically, so that as the hearth is lowered into place after swinging these ends will fit neatly against the correspondingly-inclined ends of the ports 5 and 6. When the hearth is lowered into the position shown, the lower enlarged end of the plunger 3 rests upon the lower head 7 of the cylinder, on which the weight of the hearth is carried, and when fluid is admitted to the cylinder the hearth-furnace is raised and may be easily turned, as it rests or floats on the body of liquid beneath the plunger. The

hearth is provided in its length with a series of revoluble bundle-supports 8 8, of which I have shown two, though any desirable number may be used. These supports are preferably formed of or covered with refractory material and are provided with upwardly-projecting cores or hub portions 9, around which the coils 10 are placed. Each revoluble support is carried upon a stem 11, having an upper enlarged portion 12, with a shoulder which rests upon the framework 13 of the hearth when the carrier is lowered. In the lower end of the stem is provided a hardened-steel pin 14, having a pointed or rounded lower end, which when the hearth is in the position shown rests upon a hardened plate 15, carried on a stationary support 16. The stem 11 is preferably provided with ball-bearings 17, mounted in the frame of the hearth, and below the bearing a hand-wheel 18 is secured, by which the bundle-support may be turned in either direction when its stem rests upon the bearing 15. I have shown the furnace as provided with side buckstays 19, which are connected across the top of the furnace by rods 20; but the particular construction of the reversible hearth, as well as that of the inlet and outlet flues or ports, may be varied widely without departing from my invention. The ends of the flues are, however, preferably provided with buckstays 21, connected at their upper ends by tension-rods 22, by which the ports may be drawn toward each other to prevent their sagging away.

The floor of the furnace is preferably inclined from one side toward the other, as shown at 23 in Fig. 3, and a slag-notch 24 is provided at the lower side for outlet of the cinder collecting during heating. 25 is the outlet-opening through which the heated rod or bar is drawn to the rivet-machine or other machine for working up the bar. One or more cleaning or inspection doors 26 may be provided in the side of the furnace.

In operating the furnace fluid is admitted to the hydraulic cylinder to lift the furnace slightly, and it is then swung into position where its open ends are exposed and out of registry with the ports. Two coils or bundles are then placed upon the bundle-sup-

ports and the furnace is swung back into registering position and lowered. When the bundle in the hotter portion of the furnace-chamber nearest the inlet for the flame and products of combustion is brought to proper temperature, the end of the bundle is drawn out through the opening 25 to the machine, which acts to gradually uncoil the bundle and withdraw it from the furnace.

When it is desired to turn either of the coils in order to bring different parts of the coil to an even temperature, the hand-wheel 18 may be turned the desired amount, and in case of breaking down of the machine when it is desired to draw back into the furnace, the outwardly-extending part of the rod being used, the hand-wheel may be turned to coil up the projecting portions and keep it heated until the machine is ready to start. When the coil has been entirely drawn out, the furnace is again raised and turned, another bundle is placed upon the empty bundle-support, and the furnace is reversed, thus bringing the heated bundle into the hotter portion of the furnace and the freshly-inserted bundle into the cooler portion, when the operation of drawing out the coil is repeated.

The advantages of my invention result from the use of the reversible turning hearth, whose ends may be brought into or out of registry with the supply and outlet flues. One coil is preheated while another coil is being gradually withdrawn, and the coils are inserted through the open ends of the furnace, thus doing away with the necessity for charging-doors. The coil-supports may be turned in either direction by the external hand-wheel or hand-controlled mechanism, and as the stems of the supports are lifted when the furnace is in normal position the carriers are easily turned. It will be noted that when the supports are lowered they are still held above the floor of the hearth, thus preventing their being frozen or cemented thereto by the cinder. The furnace is simple, easily operated, and economical. It may be used either with or without a regenerative reversing system and is easily turned by reason of its fluid-support when lifted. If the machine breaks down, the furnace can be turned to cut off the heat and prevent overheating and burning of the material.

The furnace may be turned either by mechanical connections or by hand, and many changes may be made in the form and arrangement of the furnace, flue connections, &c., and the furnace may be used for various purposes without departing from my invention.

I claim—

1. A horizontally-turning hearth-furnace, a plurality of revoluble bundle-supports therein and flues arranged to register with the open ends of the furnace; substantially as described.
2. A horizontally-turning hearth-furnace having opposite open ends, a plurality of revoluble bundle-supports mounted therein, mechanism for raising and lowering the furnace, and end flues normally registering therewith; substantially as described.
3. A horizontally-turning hearth-furnace, a revoluble bundle-support carried in the furnace, and mechanism for raising and lowering said support; substantially as described.
4. A horizontally-turning hearth-furnace having a series of vertically-movable and revoluble bundle-supports therein, registering end flues, mechanism for raising and lowering the furnace, and a support arranged to hold at least one of the bundle-carriers elevated when the hearth is lowered in registering position; substantially as described.
5. A furnace having a revoluble bundle-carrier and hand mechanism for turning the carrier in the reverse direction to wind up a projecting portion of the uncoiled rod; substantially as described.
6. A horizontally-turning hearth-furnace containing a plurality of revoluble bundle-supports, flues arranged to register with the ends of the furnace when in normal position, and external means for turning the supports; substantially as described.
7. A horizontally-turning furnace supported upon the movable element of a motive cylinder and containing a plurality of revoluble bundle-supports, and ports arranged to register with its opposite open ends; substantially as described.
8. A horizontally-turning furnace having a plurality of revoluble bundle-supports, ports arranged to register with its opposite open ends, and a sloping floor for the furnace having a cinder-outlet; substantially as described.
9. A horizontally-turning hearth-furnace having curved ends arranged to register with curved inlet and outlet ports at opposite ends, and a plurality of revoluble bundle-supports mounted in said furnace; substantially as described.

In testimony whereof I have hereunto set my hand.

CAMILLE MERCÂDER.

Witnesses:

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H. M. CORWIN.