(No Model.) 2 Sheets—Sheet 1.

A. H. WETHEY.

STIRRING DEVICE FOR CALCINING FURNACES.

No. 565,313. Patented Aug. 4, 1896.

Fig: 1.

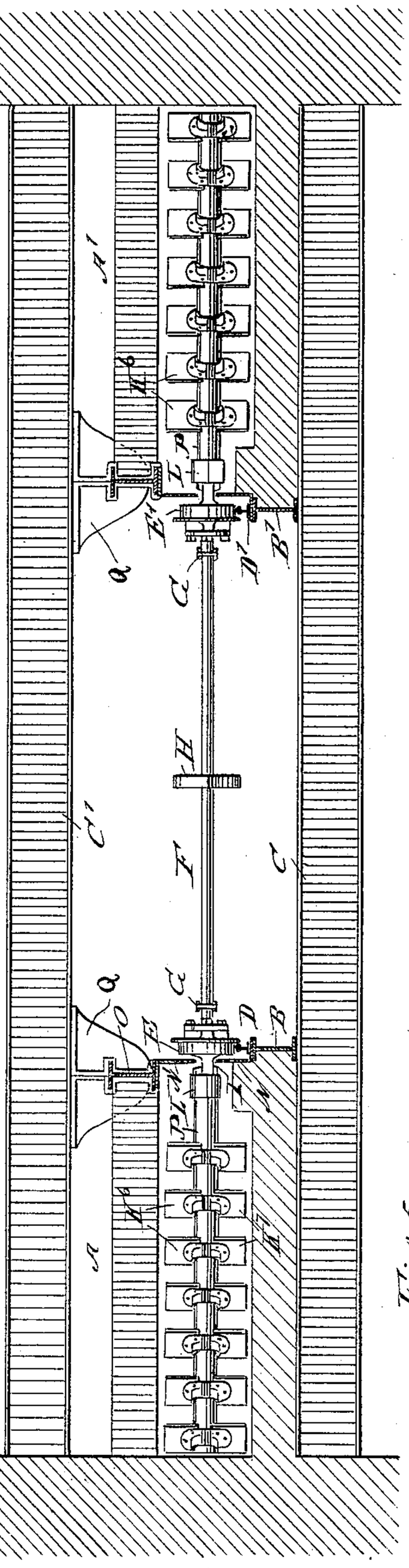
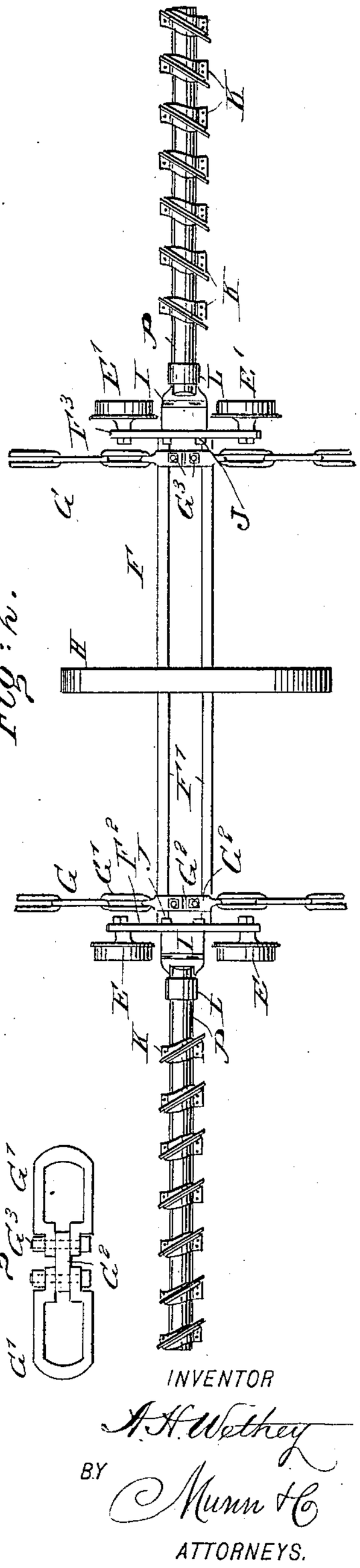


Fig: 2.



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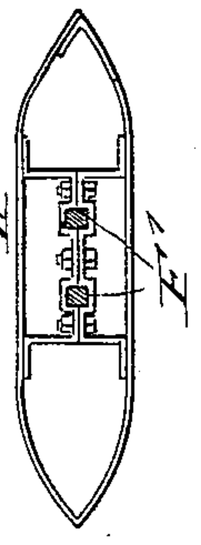

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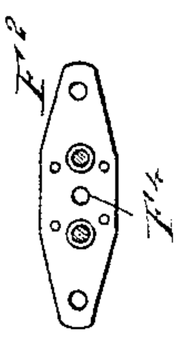

Fig: 5.

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(No Model.) 2 Sheets—Sheet 2.

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STIRRING DEVICE FOR CALCINING FURNACES.

No. 565,313. Patented Aug. 4, 1896.

Fig: 6.

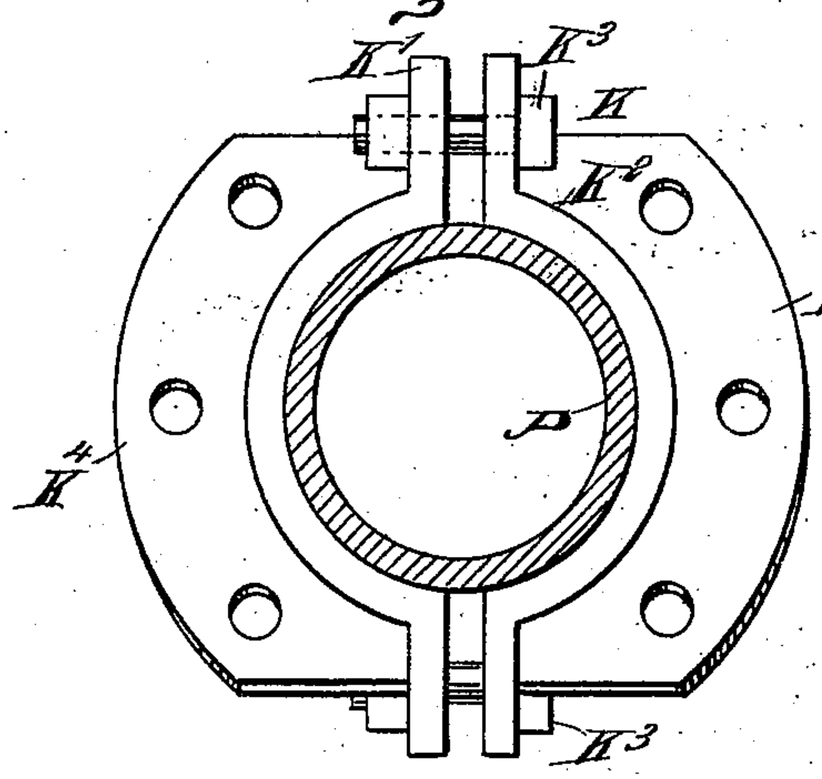


Fig: 7.

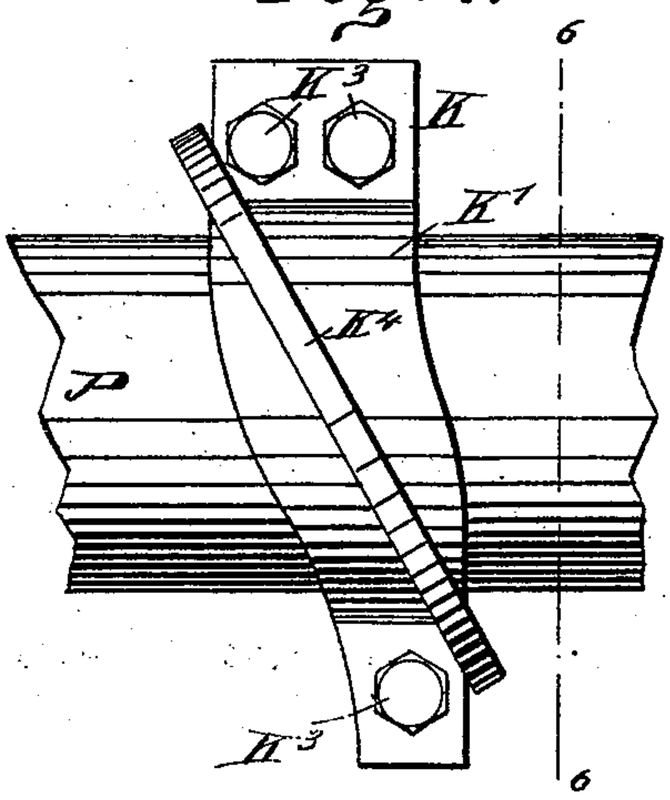


Fig: 8.

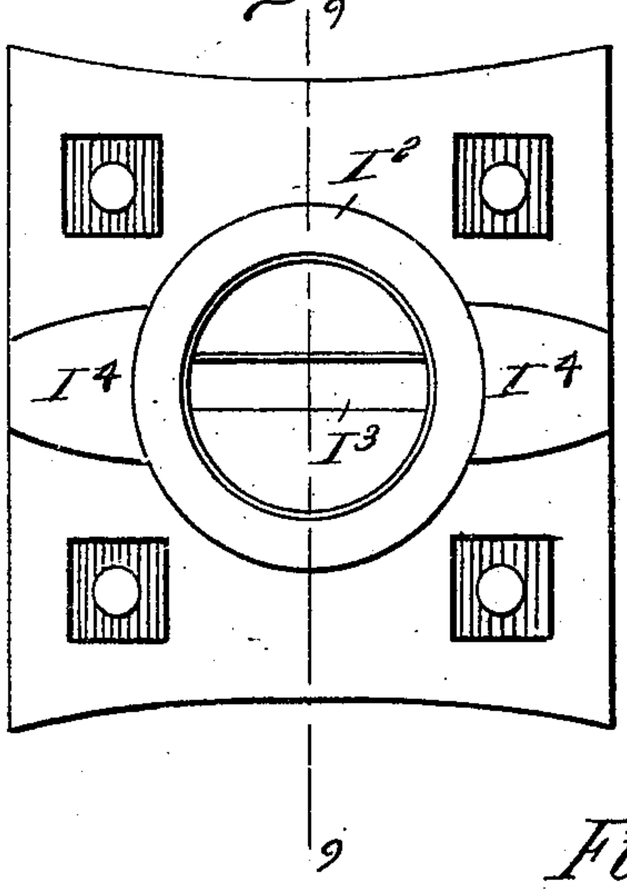


Fig: 9.

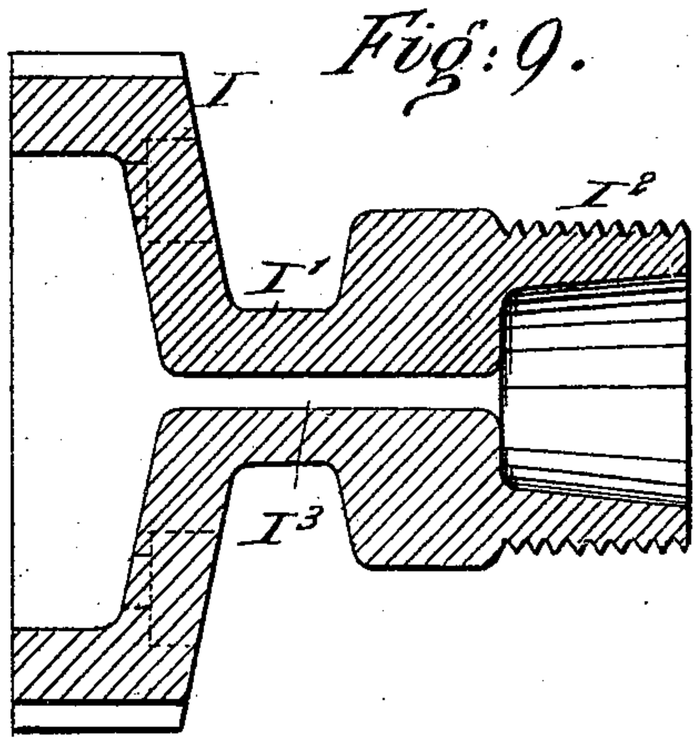
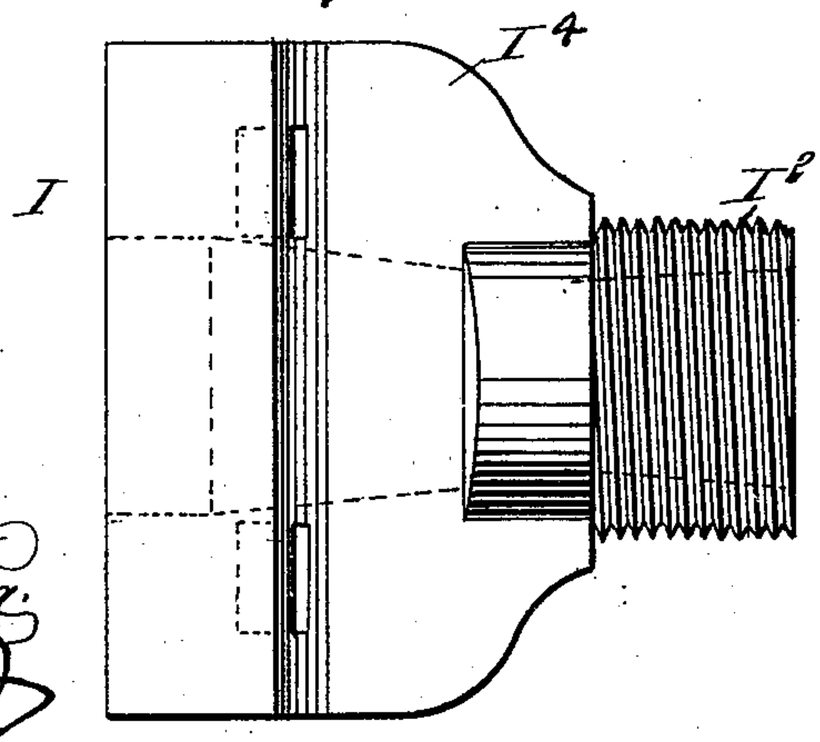


Fig: 10.



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UNITED STATES PATENT OFFICE.

ARTHUR HARVEY WETHEY, OF BUTTE, MONTANA.

STIRRING DEVICE FOR CALCINING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 565,313, dated August 4, 1896.

Application filed February 15, 1895. Serial No. 538,508. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR HARVEY WETHEY, of Butte, in the county of Silver Bow and State of Montana, have invented a new and Improved Stirring Device for Calcining-Furnaces, of which the following is a full, clear, and exact description.

The invention consists principally of a carriage mounted to travel and supporting an axle carrying a series of shovels or plows.

The invention consists in certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied on a double furnace shown in cross-section. Fig. 2 is a plan view of the improvement. Fig. 3 is a side elevation of a shoe for opening the doors. Fig. 4 is a side elevation of the carriage connecting-plate. Fig. 5 is an enlarged side elevation of one of the carriage-clamps for the rail-and-chain connection. Fig. 6 is an enlarged transverse section of one of the shovel-supports, the section being taken on the line 6 6 of Fig. 7. Fig. 7 is a plan of the same. Fig. 8 is an enlarged face view of the plow-coupling. Fig. 9 is a sectional side elevation of the same, on the line 9 9 of Fig. 8; and Fig. 10 is a plan view of the same.

The device is applied on furnaces A A′, of a construction shown in detail in the application above referred to, so that further description of the same is not deemed necessary, it being sufficient to state that the furnaces are arranged opposite each other, and each is provided with a series of compartments located one above the other. On the inner sides of the furnaces A A′, for each pair of compartments, are arranged the longitudinally-extending I-beams B and B′, respectively, supporting at the top the rails D and D′, respectively, on which are mounted to travel the wheels E and E′, respectively, of a carriage F extending between the two furnaces, as plainly shown in the drawings, the said carriage supporting the shovels or plows extending into the compartments, as hereinafter more fully described.

The carriage F is provided with two parallel square bars F′, connected with each other at their ends by the connecting-plates F^2 and F^3, carrying the wheels E and E′, respectively. The bars F′ are connected by chain-clamps (see Fig. 5) to the adjacent links G′ of the chains G for pulling the carriage along in the manner more fully described in the application above referred to, it being understood that the chains, being endless, can receive a traveling motion by a suitable mechanism. The inner ends of the links G′ are connected with a plate G^2 by bolts G^3, so that the carriage can readily pass over the rails at the ends of the furnaces, as indicated in the application mentioned. The bars F′ also support, at or near their middle, a shoe H, forming part of the device for opening and closing the doors, as shown and described in an application for Letters Patent of even date herewith, Serial No. 538,506.

On each of the connecting-plates F^2 is fastened by bolts J a coupling I, having a reduced portion I′, provided with projections I^4, extending forward and rearward, Figs. 8 and 10, the coupling terminating in a threaded part I^2, adapted to abut against a similar end portion of a tube P, extending transversely into the respective compartments of the furnace A or A′, the said tube forming a support for the plows K, secured thereto. The connection between the couplings I and the tubes or supports P is made by means of ordinary internally-threaded sleeves or unions L, Figs. 1 and 2, fitting over the screw-threaded end of said couplings and supports. Each plow K, as shown in detail in Figs. 6 and 7, is formed with the two flanges K′ and K^2, connected with each other by bolts K^3, so as to be readily fitted onto the tube P. The shoulders K^4 and K^5 of the flanges K′ and K^2 are adapted to receive the shovel-blades K^6 and K^7, respectively, fastened by bolts to the said extensions.

It will be seen that the blades K^6 extend in an upward direction, as shown in Fig. 1, and obliquely across the tube P, while the other blades K^7 extend downwardly but in a like oblique direction to the blades K^6. Now it is

understood that when a traveling motion is given to the carriage F the said shovel-blades K^6 and K^7 move through the compartments of the furnaces A and A′, with the blades K^7 in action to move the material forward and agitate the same. When, however, the carriage F moves from this tier of compartments to the next lower one, as described in the application, Serial No. 498,921, above referred to, then the position of the blades K^6 and K^7 becomes reversed, that is, the blades K^6 will then be in a lowermost position to act on the material contained in the second tier of furnace-compartments, while the other blades K^7 are on top and are inactive.

The coupling I is formed with a longitudinal opening I^3, registering with a similar central opening F^4 in the carriage-plate F^2 or F^3, so that cold air can pass from the outside, that is, from the space between the two furnaces, into the tube P to keep the latter comparatively cool. The reduced part or neck I′ of each coupling for the furnaces A and A′ is adapted to pass through a narrow slot formed by the opposite edges of the angle-plates N and N′, used for closing the greater portion of the inner sides of the compartments, so as to prevent air from passing into the interior of the compartments. The angular plate N is supported on the I-beam B, while the angular plate N′ depends from an I-beam O, fastened by brackets Q to the main beam C′, located opposite and above the main beam C, carrying the I-beams B and B′.

Now it will be seen that when the endless chains G are set in motion the carriage F is pulled along between the two furnaces A and A′, with its wheels E and E′ traveling on the rails D and D′. The tubes or supports P, projecting from the ends of the carriage F, extend into the compartments of the furnaces and by their corresponding shovel-blades K^6 or K^7 agitate and push forward the material contained in the said compartments.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A stirring device for calcining-furnaces, comprising a carriage, connecting-plates thereon, two shovel-carrying supports parallel to each other and secured at their ends to said connecting-plates, pins secured at each end of the connecting-plates, a traveling wheel mounted on each pin, and clamps secured close to the ends of each support and adapted to receive connecting-chains, substantially as described.

2. The combination of the carriage, the support secured thereto, the clamp on the support provided with flanges surrounding the support and disposed obliquely in relation thereto, and shovel-blades secured to the said flanges, substantially as described.

3. A stirring device, comprising a hollow tube extending across the hearth of the furnace, a movable carriage for supporting one end of said tube, metal clamps in pairs, secured to each other, and surrounding said tube, with projecting flanges disposed obliquely to said tube and shovel-blades secured to said flanges, said clamps spaced on tube at suitable distances, substantially as described.

4. A carriage for stirring devices of calcining-furnaces, comprising a movable carriage, a coupling provided with one large square end secured to the carriage, said coupling being angularly reduced from the square end on opposite sides toward the center thereof, making an elongated neck, and said neck again increasing in thickness and decreasing in width, to form a circular hub at its other end, said hub having an external screw-thread, in combination with a hollow tube having metal clamps with projecting flanges disposed obliquely and surrounding said tube and secured to same and shovel-blades secured to said flanges, said tube also having an external screw-thread at one end, and an interiorly-screw-threaded sleeve for connecting the said tube to the said hub, substantially as described.

5. In a stirring device for calcining-furnaces, the combination of the carriage with the two parallel bars secured together at their ends by connecting-plates having pins in their ends and traveling wheels rotating on said pins, reduced necked couplings extending through slots of the furnace at both ends of carriage, and secured to the connecting-plates, and hollow shovel-bearing tubes extending over hearths and secured to hubs of said couplings, substantially as described.

6. The combination of two parallel furnaces separated by an open space and having two or more hearths over each other, and slotted side walls to each hearth, tracks arranged in the open space between said furnaces, a carriage provided with two parallel bars or rods and connecting-plates whereby the ends of the said plates are secured together, wheels mounted on pins at the ends of said plates to engage with said tracks, hollow shovel-bearing tubes secured to said connection-plates and extending through said slots at each end of the carriage, two endless chains passing through said open space, parted and secured close to both ends of each bar or rod of the carriage by clamps with flat link connecting the two clamps between the bars or rods, said chains, clamps and bars or rods being adapted to turn over grooved wheels situated at the ends of the furnace, and constructed to be rotated by suitable mechanism, substantially as described.

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