O. C. WOOLSON.

VENTILATED INTERLOCKING CLINKER BAR FOR FURNACES.

APPLICATION FILED AUG. 10, 1916.

1,248,048.

Patented Nov. 27, 1917.

2 SHEETS—SHEET 1.

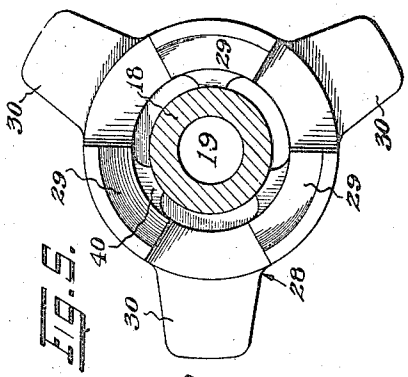


FIG. 5.

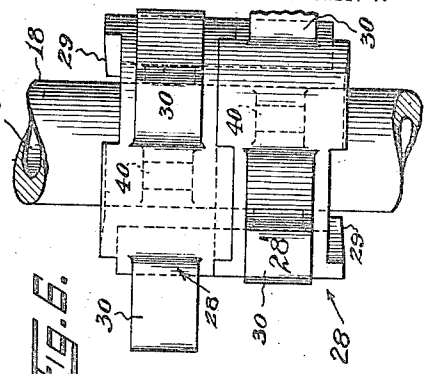


FIG. 6.

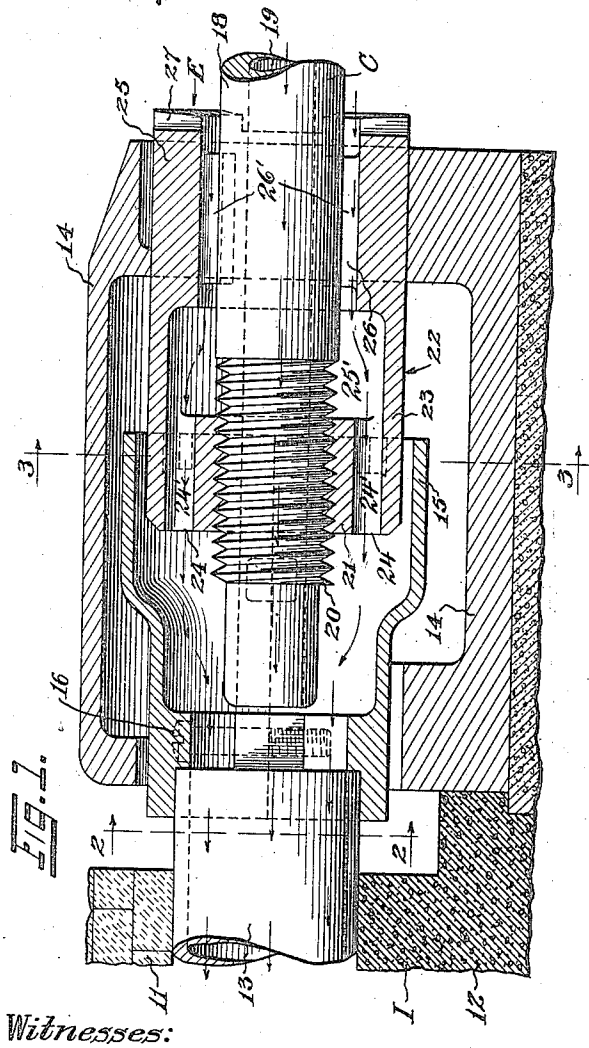


FIG. 1.

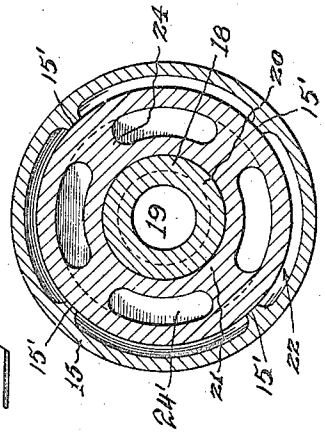


FIG. 3.

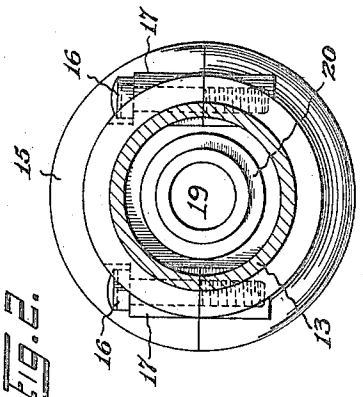


FIG. 2.

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Inventor:

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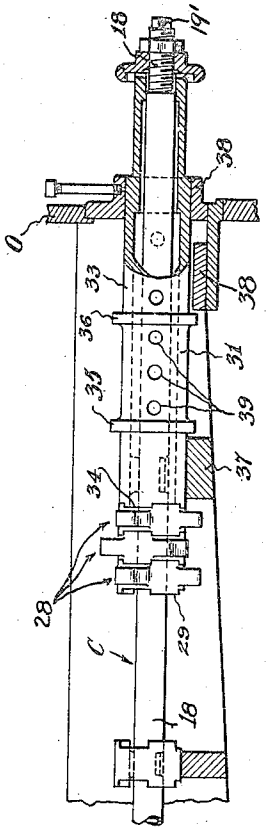


Fig. 7.

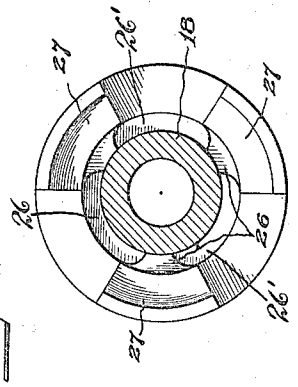


Fig. 4.

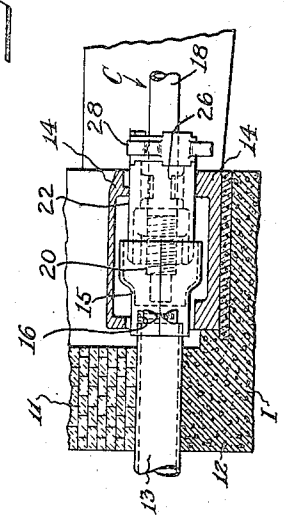


Fig. 5.

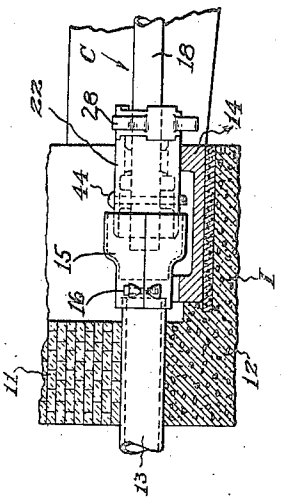


Fig. 6.

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UNITED STATES PATENT OFFICE.

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VENTILATED INTERLOCKING CLINKER-BAR FOR FURNACES.

1,248,048. Specification of Letters Patent. Patented Nov. 27, 1917.

Application filed August 10, 1916. Serial No. 114,117.

To all whom it may concern:

Be it known that I, OROSCO C. WOOLSON, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Ventilated Interlocking Clinker-Bars for Furnaces, of which the following is a specification.

This invention relates to clinker furnaces in general, and more particularly to ventilated clinker grinders.

The present invention contemplates an improved clinker furnace construction, comprising a supporting guide-bar, usually tubular or otherwise interiorly ventilated, sectional interlocking crushers, or toothed grinder rings, supported and vibrated or rotated upon said supporting guide-bar and spaced and centered thereon to form ventilating passages for said crusher or grinder members.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of specific embodiments illustrated in the accompanying drawing, in which—

Figure 1, is a fragmental view, partly in section, of the rear end of a furnace made in accordance with the present invention, which is shown applied thereto;

Fig. 2, is a rear end view of the air-shell for receiving the extreme end of the supporting guide-bar and clinker crushing and grinding construction;

Fig. 3, is a transverse section view in detail of the supporting air-shell crusher or grinder-nut and guide-bar construction taken on the line 3—3 of Fig. 1, looking from either end;

Fig. 4, is an end view of the air recessed crusher-bearing with the central supporting guide-bar in section, looking toward the left of Fig. 1;

Fig. 5, is an end view in detail, illustrating one of the crushers or grinder-members with the tubular supporting guide-bar disposed therein shown in section;

Fig. 6, is a fragmental side elevational view showing two crushers or grinder-members connected to one another and mounted upon the supporting guide-bar;

Fig. 7, is a schematic view, partly in section, showing the relative position of the several improved parts of the present clinker crushing or grinding device, with its ventilated driving-head and guide-bar clamping-nuts;

Fig. 8, is a schematic view, partly in section, showing the relative position of the several parts of a modified form of the improved clinker crushing or grinding furnace construction shown in the foregoing figures.

Referring to the drawings:

The embodiment illustrated in Figs. 1 to 7 inclusive, comprises essentially an inner wall of masonry I, an outer furnace-wall member O, and a crusher or grinder-bar construction C supported on said walls I and O.

The inner wall I is composed of a concrete-base 12 and a brick-work wall member 11, disposed above the same, between which the exhaust pipe or flue connection 13 extends. On the base 12 inwardly of the brick-work wall member 11 there is disposed the housing 14, into which the inner end of the crusher or grinder bar construction C extends, and also the shell 15 which encircles the inner end of the crusher or grinder bar construction C and is secured to the inner end of the pipe connection 13. The shell 15, as illustrated is preferably composed of two half sections, which are secured around the inner end of the exhaust pipe or flue connection 13, by means of the screws 16, for the reception of which suitable bosses 17 are formed on the shell sections 15.

The crusher and grinder carrying bar construction C comprises essentially a supporting guide-bar 18, sometimes provided with a ventilating bore 19 extending from one end to the other thereof for the purpose of ventilating and cooling such guide-bar, by the free circulation of air therethrough. The inner end of such supporting guide-bar 18, is externally screw threaded, shown at 20, to engage the internal screw threaded portion 21 of the integral bearing and abutment member 22; the inner central rear hub-portion 21 of which is rigidly connected to

the cylindrical outer peripheral portion 23 of the member 22 by the webs 24, spaced from one another to form air passages 24′ between them, and the inner thick end portion 25 of the bearing member 22 also having inwardly extending like supporting webs 26 to serve as guides for the supporting guide-bar 18, the webs 26 being spaced from one another to form ventilating air passages 26′ between them, leading into an enlarged air-expansion chamber 25′.

From the foregoing it will appear that continuous longitudinal air passages are formed entirely through the bearing member or supporting sleeve 22, outside of the bar 18, even when the bar 18 is properly secured in the same. The shell 15 is spaced from the end of the bearing member 22 by lugs 15′ (Fig. 3) so that air or gases may pass from the inside of the housing 14 through the space between the shell 15 and housing into the exhaust pipe or flue 13, it being understood that the pipe connection 13 may form a communication from the interior of the shell 15 to the chimney, or otherwise. On the outer end of the bearing member 22, lugs 27, are formed for engagement with the coacting end-lugs 29, on the adjacent crusher or grinder-tooth section, such as section 28 illustrated in Figs. 5 and 6. On the supporting guide-bar 18 a plurality of such crusher or grinder tooth sections 28, are provided each having grinding arms or teeth 30 extending radially therefrom (usually three in number as shown) and also having on the ends interlocking securing lugs 29.

The sections 28, when disposed or strung on the supporting guide-bar 18, have their lugs 29 interlocked with one another, so that the rotary driving of one end section will drive all of the sections. The lugs 29 are staggered relative to the arms 30, and all of the lugs of the several crusher or grinder tooth sections are disposed in identically the same position relative to one another so that when the sections are disposed or strung on the supporting-guide-bar in interlocked position, (it being understood that the spaces between the lugs are adapted to receive the lugs of adjacent sections), the arms or crushing or grinding teeth 30 of the adjacent sections will be staggered relative to one another.

As forming a driving-sleeve for the crusher toothed interlocked grinding sections 28, there is provided the elongated-member 31, shown in Fig. 7, which has a diminished portion disposed on the outside of the wall O, and an enlarged portion 33 disposed on the inside of the wall O and revolubly mounted in an end journal-box 38 supported in such wall O. The enlarged portion 33 of the member 31 is provided with two annular peripheral collar portions 35 and 36, which serve as retainers or thrust bearings coöperating with the bearings 37 and 38 to prevent end thrust of the shaft 18 and grinder members 28. The inner end of the member 31 is provided with lugs 34 to engage the lugs 29 on the adjacent toothed grinder section 28. The member 31 is provided with openings 39 by means of which air may be permitted to pass through the member 31 and from there through the sections 28, each of the sections 28 being provided with centering webs 40, centering the same on the hollow supporting guide-bar 18, (Fig. 5), which webs are usually three in number as shown, and spaced from one another to form air passages 40′ between them; and when all are located upon the bar 18, forming a circuitous air-passage by way of 26′, 25′, 24′ and 15 to the exhaust pipe or flue 13.

By having the bar 18 round and with an unbroken periphery, and providing the ventilating spaces in the grinder sections themselves, no matter how badly the grinder sections may become warped or fused, they still may be made to rotate on the bar 18 for effecting their proper rotation, as when removing, replacing, or interlocking them.

When the shaft is made with a bore 19, as shown, air is admitted to said bore through the extreme outer end 19′, (Fig. 7), thereby forming an auxiliary cooling means for the shaft; but it is particularly noted that the invention is not limited to the tubular shaft, as this auxiliary cooling means is not necessary for the operation of the device.

In the modification illustrated in Fig. 8, the housing 14 is shown with its cap removed, and furthermore the bar 18, instead of being secured to the bearing member 22 by a screw threaded connection, is secured to such member 22 by means of a pin or key 44, which extends through said bearing member 22 and bar 18, as shown.

It is evident that various changes may be made in the details of construction, combination and arrangement of the several parts of the device without departing from the scope of my invention, and I do not intend to limit myself to the exact forms shown.

I claim:

1. In a clinker-grinder, the combination of a cylindrical supporting guide bar; and a plurality of grinder members mounted on said bar and having inwardly projecting bearing lugs thereon whereby ventilating spaces are provided between the supporting bar and the members.

2. In a clinker-grinder, the combination

of a cylindrical supporting guide bar having an unbroken periphery; and a plurality of grinder members mounted on said bar and having inwardly projecting bearing lugs thereon whereby ventilating spaces are provided between the supporting bar and the members.

3. In a clinker-grinder, the combination of a supporting guide bar having an unbroken periphery; and a plurality of interlocking grinder members mounted on said bar and having inwardly projecting bearing lugs thereon whereby ventilating spaces are provided between the supporting bar and the members.

4. In a clinker grinder, the combination with supports, a pipe connection mounted in one of said supports, a sectional shell secured to the end of said pipe connection and forming an enlarged chamber, a guide bar, a plurality of sectional crushers mounted on said guide bar, one end of said guide bar and sectional crushers extending into the enlarged chamber of said shell, an end section mounted on said guide bar and interlocked with an end crusher of said plurality of crushers, said end section and guide bar extending through the other support, said end section being conformed to connect with driving means, the crushers being interlocked with one another so that the actuation of said end crusher will actuate all of said crushers, and there being ventilation passages formed between said crushers and said bar and a ventilation passage through said bar, said passages at one end being in communication with the outside of a support and at the other end in communication with the interior of said shell.

5. In a clinker grinder, the combination with a guide bar, a plurality of sectional crushers mounted on said guide bar, driving means connected to the end crusher of said plurality, the crushers being interlocked with one another so that the actuation of said end crusher will actuate all of said crushers, and webs formed on said crushers and in engagement with said guide bar, said webs being spaced from one another to form ventilation passages from one crusher to another.

6. In a clinker grinder, the combination with a guide bar, a plurality of sectional crushers mounted on said guide bar, driving means connected to the end crusher of said plurality, the crushers being interlocked with one another so that the actuation of said end crusher will actuate all of said crushers, webs formed on said crushers and in engagement with said guide bar, said webs being spaced from one another to form ventilation passages from one crusher to another, end members screw threadedly connected to said guide bar and when drawn tight securely locking the crushers with one another, and webs formed on one of the end members and extending toward said guide bar, the webs being spaced from one another to form passages for the air issuing from the ventilation passages of said crushers.

7. In a clinker grinder, the combination with supports, a pipe connection mounted in one of said supports, a sectional shell secured to the end of said pipe connection and forming an enlarged chamber, a guide bar, a plurality of sectional crushers mounted on said guide bar, an end member on said guide bar interlocking with an end crusher of said plurality and having an interior hub portion screw threadedly connected to said guide bar, said end member and guide bar extending into the enlarged chamber of said shell, an end section mounted on said guide bar and interlocked with an end crusher of said plurality of said crushers, said end section and guide bar extending through the other support, webs formed between said collar and said end member, the webs being spaced from one another to form passages therebetween, and webs formed on said crushers and in engagement with said guide bar, said webs being spaced from one another to form ventilation passages from one crusher to another and in communication with the passages in said end member.

8. A crusher or grinder-member having a central orifice to permit of mounting, disposing or stringing the same upon a guide-bar; spacing-lugs formed integral with such member, with air-passages between the same extending inward adapted to contact with the peripheral surface of the guide-bar; locking-lugs and lug-slots on either face of the guide-member adapted to lock the same on either side to like shaped adjacent members; and crusher or grinder-teeth formed integral with such member projecting from the periphery.

9. A crusher or grinder-member having a central orifice to permit of mounting, disposing or stringing the same upon a supporting guide-bar; spacing lugs formed integral with such member, with air-passages between the same extending inward, adapted to contact with the peripheral surface of the guide-bar; locking-lugs and lug-slots on either face of the member adapted to lock the same on either side to like shaped adjacent members; and a plurality of crusher or grinder teeth formed integral with such member projecting from the periphery; such grinder teeth of each member, when a plurality of same are mounted upon the rod, being staggered to the like teeth of either immediately adjacent abutting members.

10. In a clinker grinder, a cylindrical sup-

porting guide bar having an unbroken periphery, a plurality of sectional tubular toothed crusher or grinder members mounted thereon so as to rotate or vibrate freely thereon, said crusher or grinder members having inwardly projecting bearing lugs in contact with the unbroken periphery of the guide bar, whereby the same are spaced away from said guide bar thereby forming ventilating spaces between said crusher or grinder members and said guide bar, said bearing lugs having arcuate faces in contact with the periphery of the guide bar, whereby the grinder members may rotate on the guide bar without binding and thereby preventing a torsional strain on the guide bar.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."