July 12, 1938. P. CHRISTIANSEN, JR 2,123,462

CLINKER LOOSENING MEANS FOR COAL STOKERS

Filed April 13, 1937 2 Sheets-Sheet 1

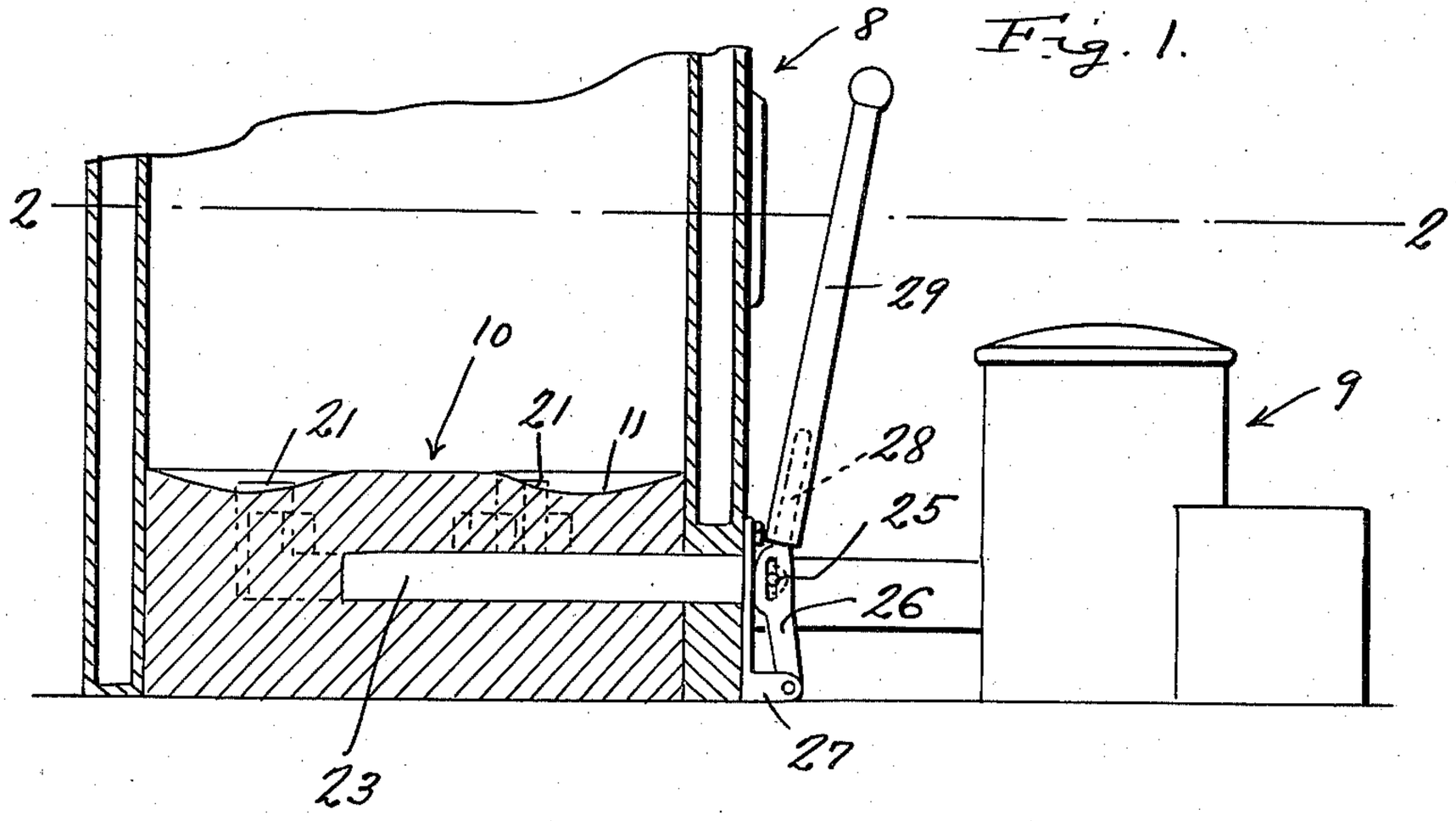

Fig. 1.

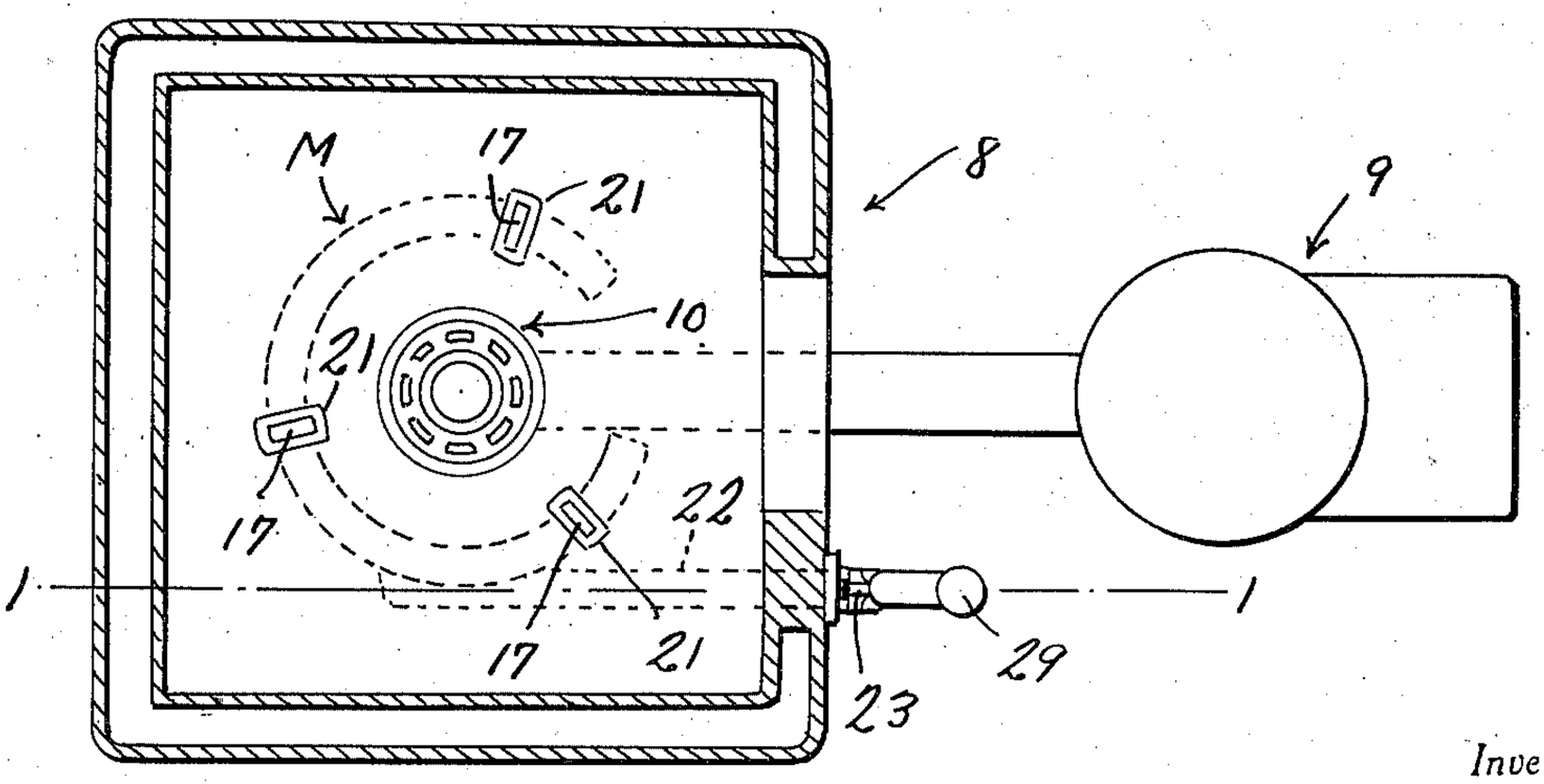

Fig. 2.

Inventor

Peter Christiansen Jr.

By Clarence A. O'Brien

Hyman Berman

Attorneys

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Filed April 13, 1937 2 Sheets-Sheet 2

Fig. 3.

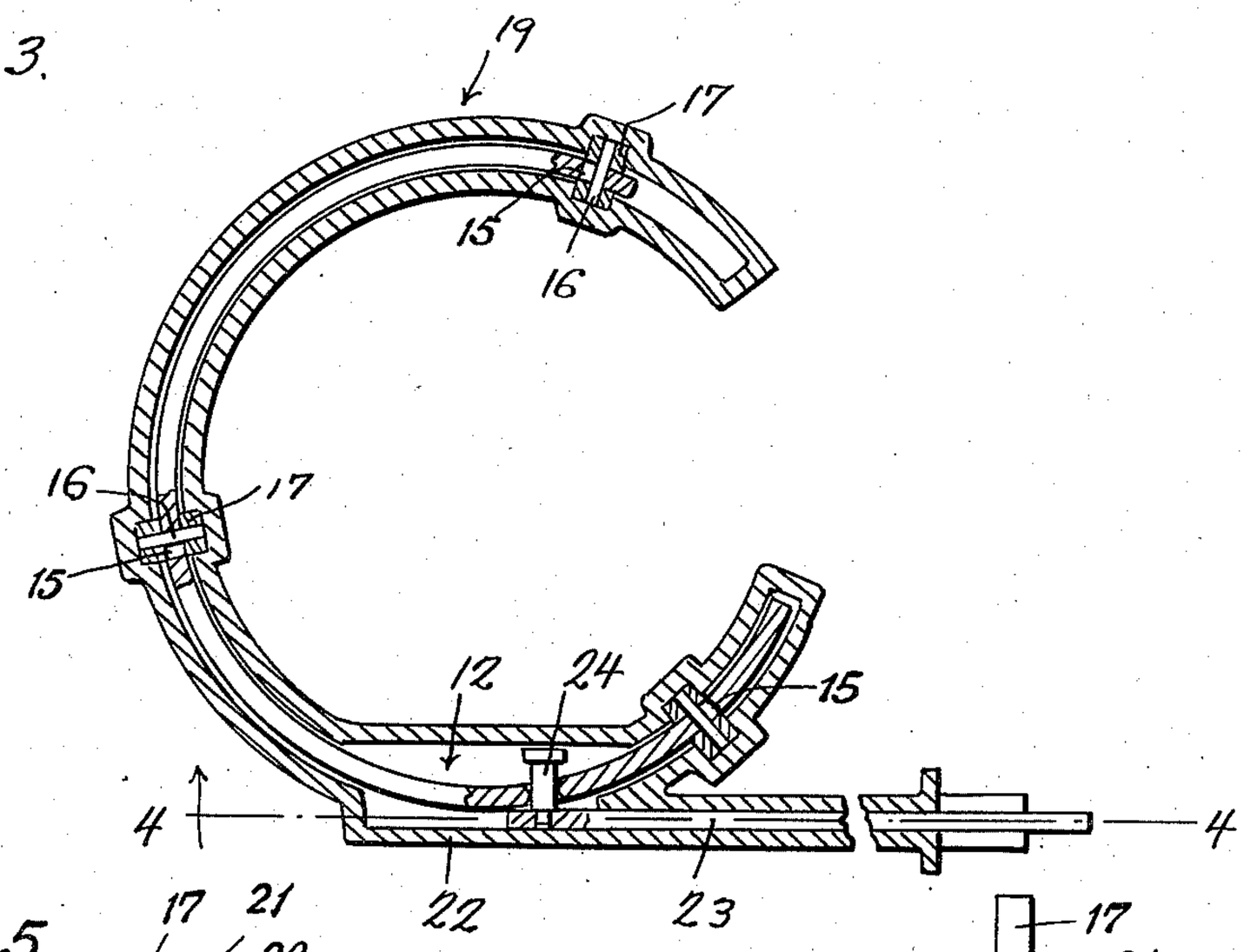


Fig. 5.

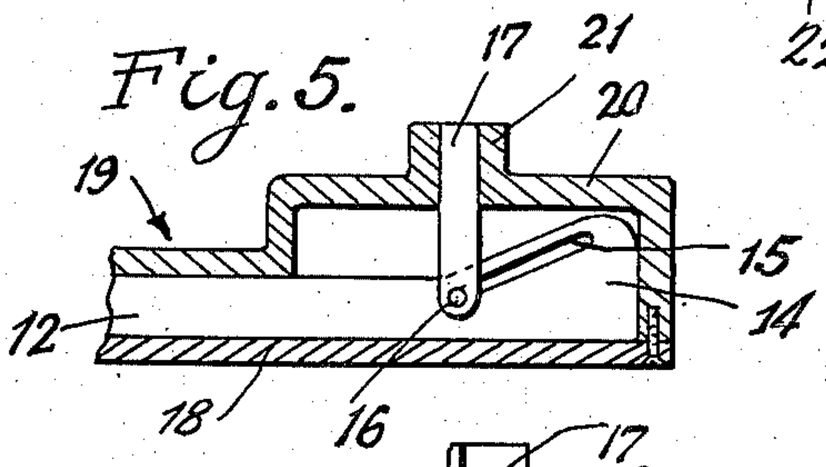


Fig. 6.

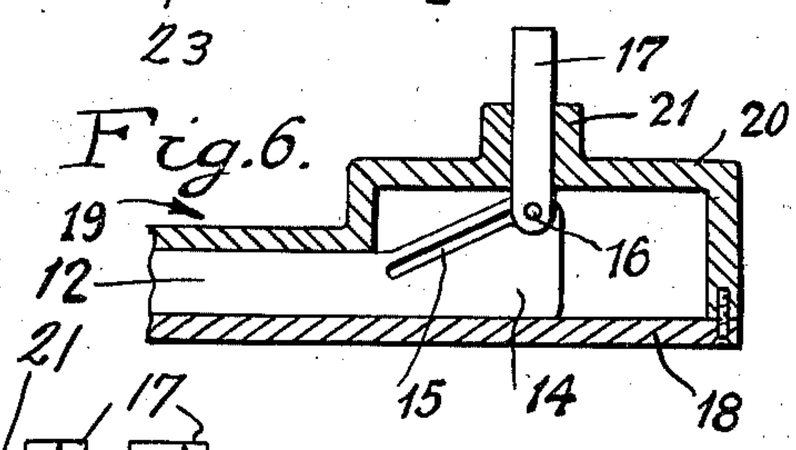


Fig. 4.

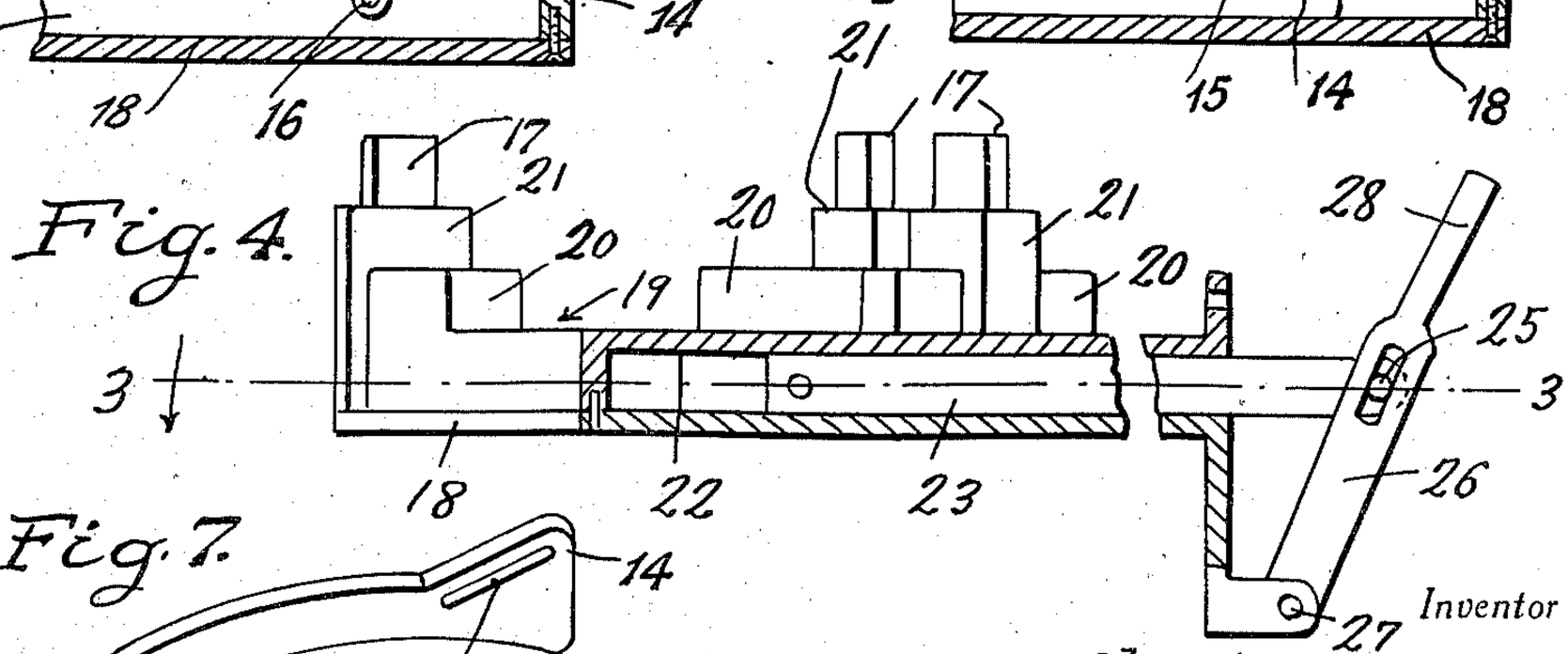
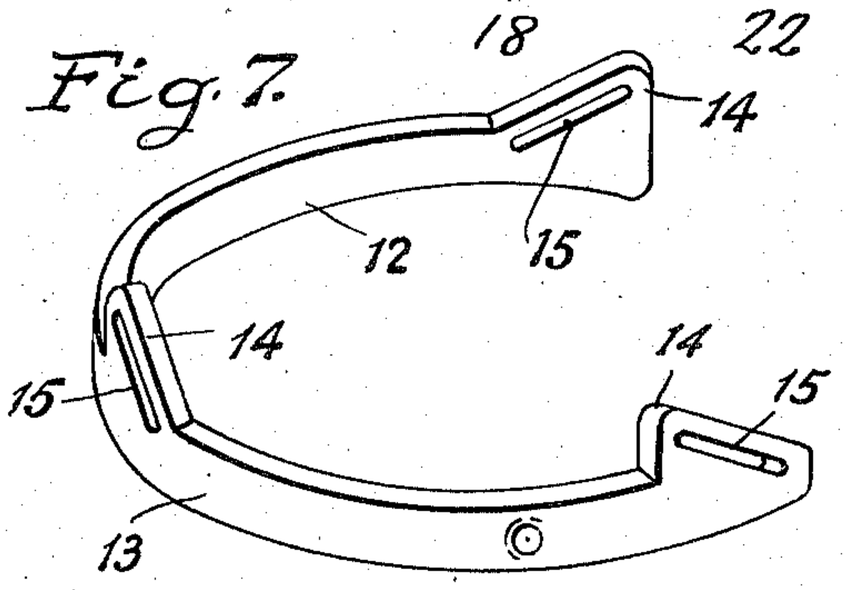


Fig. 7.



Inventor

Peter Christiansen Jr.

By Clarence O'Brien

Hyman Berman

Attorneys

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CLINKER LOOSENING MEANS FOR COAL STOKERS

Peter Christiansen, Jr., Racine, Wis.

Application April 13, 1937, Serial No. 136,655

4 Claims. (Cl. 126—173)

The present invention relates to novel manually controlled mechanical means utilized as a clinker loosening structure, the same being especially, but not necessarily, adapted for use in so-called coal stokers for coaction with the bed of the fire pot, whereby to provide a satisfactory and dependable means to loosen clinkers sufficiently to facilitate handy and expeditious removal thereof.

It is common knowledge that the proper removal of clinkers around the retort of a coal stoker is and has been a constant impediment to the full efficiency of the stoker. In most instances clinkers are still being removed by hand, and while it is quite simple to lift out the clinker, the problem of loosening the clinker to facilitate such lifting is an entirely different problem. It follows, therefore, that with the present recognized disadvantages in mind, I have evolved and produced a simple and aptly fitted structural means which will initially loosen and dislodge the adhering clinker, whereby to permit it to be removed bodily or broken up in pieces to facilitate such removal.

In reducing to practice the principles of what may prove to be an innovation in this line of endeavor, I have found it expedient and practicable to utilize a comparatively simple coordination of parts wherein the structure, as a unit, is built in or imbedded in the concrete hearth, whereby to provide a readily available and efficient and reliable arrangement.

Other features and advantages, especially those of a specific structural nature, will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate the various identical or like parts throughout the views:

Figure 1 is a fragmentary view partly in section and partly in elevation, showing a stoker construction and illustrating the bed of the fire pot, and partially disclosing the clinker lifting means imbedded or built therein, the section being on the plane of the line 1—1 of Figure 2.

Figure 2 is a horizontal sectional view taken approximately on the plane of the line 2—2 of Figure 1.

Figure 3 is a section taken on the horizontal line 3—3 of Figure 4.

Figure 4 is a view partly in section and partly in elevation, the same being approximately on the plane of the line 4—4 of Figure 3.

Figure 5 is a fragmentary sectional and elevational view showing one of the projectible and retractible impact and lifting plungers in its normal out-of-the-way depressed state.

Figure 6 is a view based on Figure 5 showing the coaction of elements when the plunger is elevated to clinker lifting position.

Figure 7 is a perspective view of the horseshoe-shaped actuator for the circumferentially spaced, equi-distant lifting plungers or members.

By way of introduction to the detailed description, it is to be pointed out that the drawings show what may be called a preferred adaptation or exemplification of the invention. Obviously, other ways and means may be resorted to using the same basic principle as will be hereinafter evident from the concluding claims.

As seen in Figures 1 and 2, the boiler or furnace is denoted by the numeral 8. The numeral 9, on the other hand, designates the hopper, motor and blower assembly, forming no part of the invention. The customary cement and brick hearth or base 10 has the fire pot or retort located in the center thereof as shown in Figure 2. Surrounding the centrally arranged fire pot or retort is the annular channel 11 in which the clinker, as a unit, seats itself and adheres, interfering with the operation of the burner until it is removed. It has already been pointed out that ordinarily this is done by hand. Hence, in the present instance it is the purpose of the invention to build into the hearth or base the mechanical clinker lifting means. An important feature of the means is what may be called a substantially horseshoe-shaped actuating unit, this being denoted by the numeral 12 in Figure 7. This includes a flat bottom edge 13 and at circumferentially spaced points it is provided with upstanding lugs or risers 14, these being provided with inclined cam slots 15. The cam slots serve to accommodate complemental cam and connecting pins 16 carried by the furcations on the lower ends of the projectible and retractible lifting fingers or plungers 17. That is to say, the lower ends of these fingers 17 are bifurcated and the furcations straddle the adapter risers 14 where they have cam coaction with the slots 15. This assembly comprising the oscillatory actuating unit 12 and plungers 17 is confined or contained in an inclosing casing of a corresponding outline. The casing includes a base portion 18 and a removable cover portion 19, the portion 19 being substantially channel-shaped in cross-sectional form to hood over the slidable actuator ring 12. The numerals 20 designate clearance portions to accommodate the slidable cam adapters 14. These features 20 are provided with guides 21 through which the pro-

jectible and retractible plungers 17 operate. On one side the means 19 is fashioned to accommodate the operating means. That is to say, and as shown in Figure 3, a special housing is formed at 22. This serves to accommodate the slidable operating push-pull rod or link 23, this being pivotally or otherwise attached as at 24 to the adjacent portion of the actuating ring or unit 12.

As seen in Figure 3, the workable end of the operating link 23 has pin and slot connection as at 25 with a lever 26, this being pivoted as at 27. The lever is formed with a suitable connection or handle as at 28, which may, if desired, accommodate an extension handle 29, as seen in Figure 1.

It is obvious that when the device is built into the fire brick 10, the receding and projectible plungers 17 are disposed at equi-distant circumferentially spaced points around the centrally located retort. Moreover, they are arranged in flush relationship so that when in the position seen in Figure 5, they do not interfere with the fire bed. When, however, the clinker has formed and adhered to the brick, all that is necessary is to rock the lever 26 back and forth, this serving to actuate the link 23. This in turn oscillates the ring or unit 12. Then, too, this brings into effect the cam coacting means 15 and 16 to raise and lower the plungers. Ordinarily a few hammering impacts of the plungers with the under side of the clinker will loosen it sufficiently to allow it to be broken up and removed.

It is to be observed that all moving parts are properly encased and effectively imbedded in the brick and cement, and are not subject to undue strain, stress or wear and tear. All parts may, if desired, be made of cast iron, like the retort, so that the rate of expansion and contraction of all parts would be about equal. As very little machining would be necessary, the cost should not prove prohibitive. By facilitating the complete removal of clinkers, the periodic replacement of burnt out retorts is materially lessened. Hence, the device should prove to be susceptible of unqualified endorsement by the trade and users in general. It is not, however, the purpose of this description to touch upon the commercial aspects and merits of the invention.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

1. In a structure of the class described, a furnace, a refractory base therein, guide means imbedded in said base, a plunger in said guide means, said plunger being projectible and retractible and normally flush with the top of the base, means in the base for raising and lowering the plunger, and additional means for controlling said plunger raising and lowering means from the exterior of a boiler.

2. In a device of the class described, a furnace including a base, a casing in said base, said casing including vertical guides, plungers mounted for reciprocation in said guides, actuating means in the casing slidably mounted, said actuating means including cam parts engaging parts of the plungers for reciprocating said plungers, and operating means for said actuating means including a hand controlled lever.

3. In a structure of the class described, a furnace including a base, a stoker retort in said base, vertically arranged guide means located in the base and circumferentially spaced equal distances from the retort, vertically arranged plungers supported for vertical movement in said guide means and means for moving the plungers vertically to loosen clinkers on the base.

4. In a structure of the class described, a furnace including a base and a coal stoker retort in said base, vertically arranged guide means in said base, vertically movable members guided for vertical movement by said guide means and means for reciprocating the movable members from the exterior of the furnace.

PETER CHRISTIANSEN, JR.