H. A. WALDEN.

GRATE DUMPING AND HANDLING APPARATUS.

APPLICATION FILED MAR. 12, 1919.

1,313,142.

Patented Aug. 12, 1919.

2 SHEETS—SHEET 1.

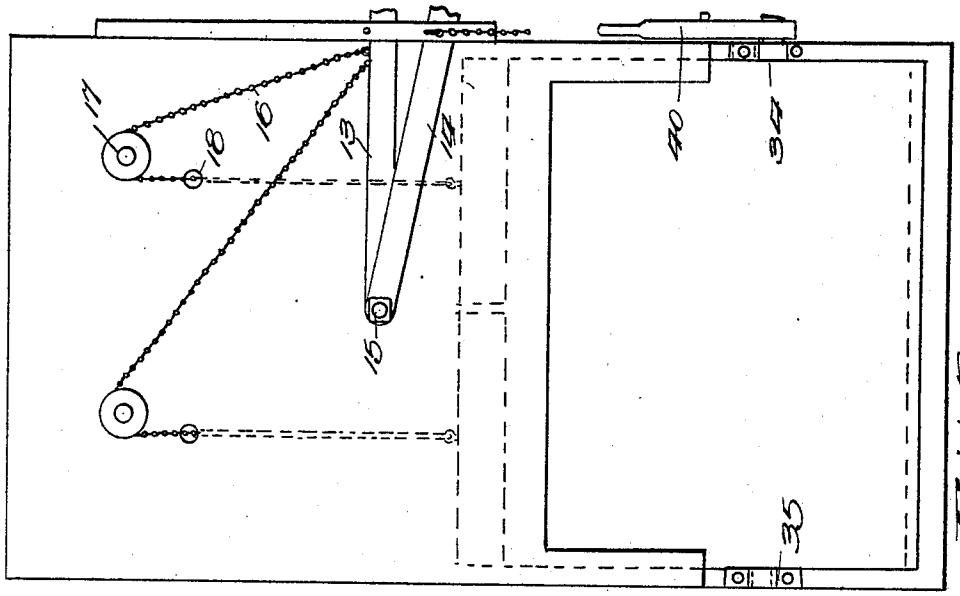


Fig. 2.

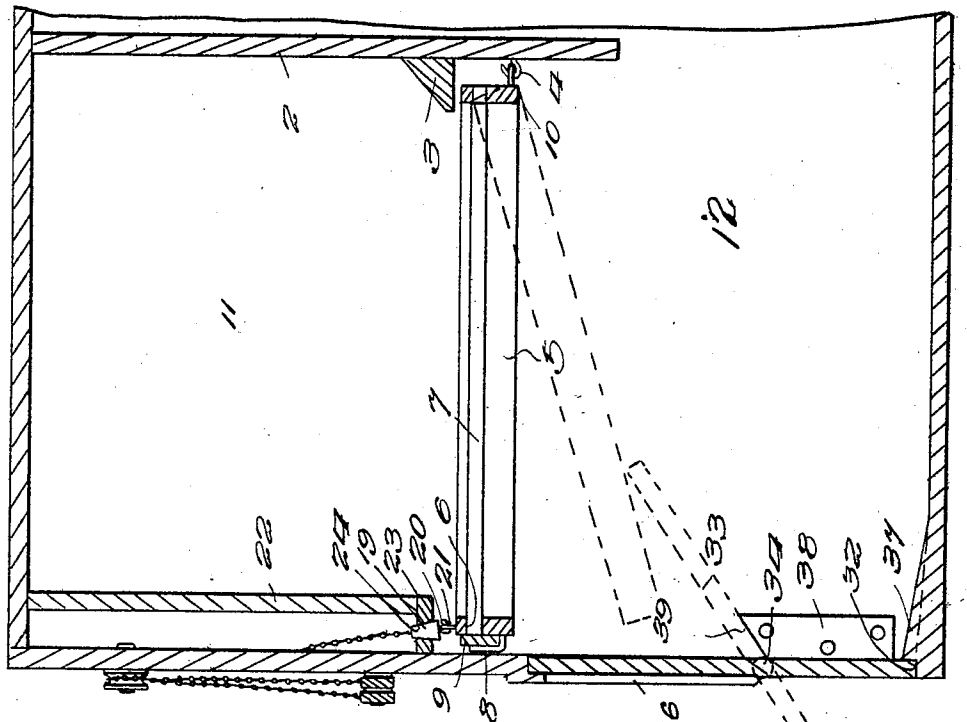


Fig. 1.

H. A. Walden Inventor

By Geo. P. Kimmel

Attorney

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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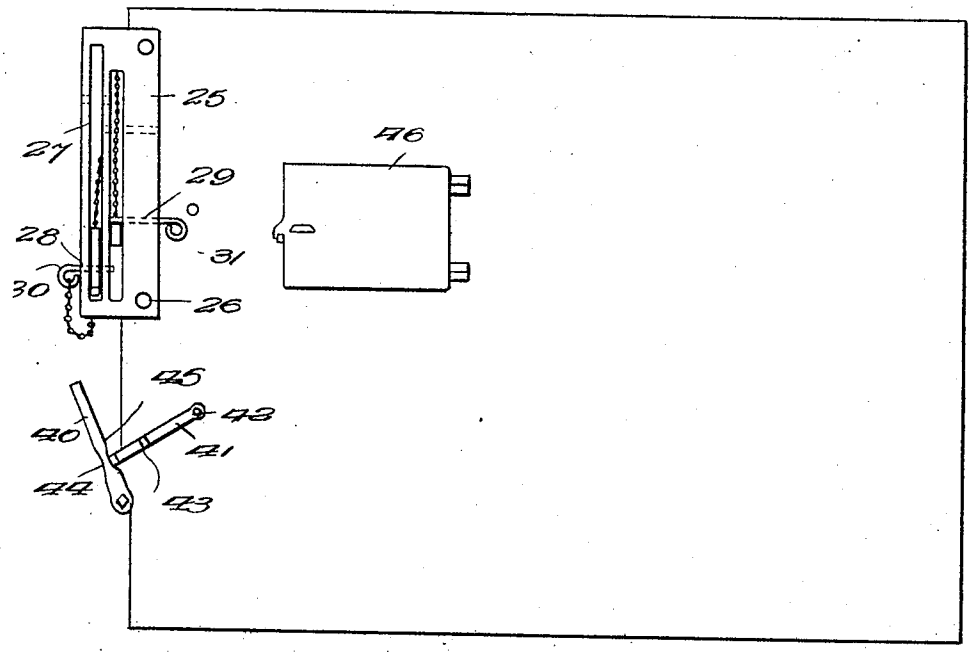


FIG. 3

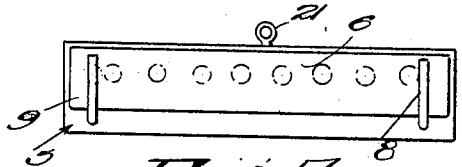


FIG. 4

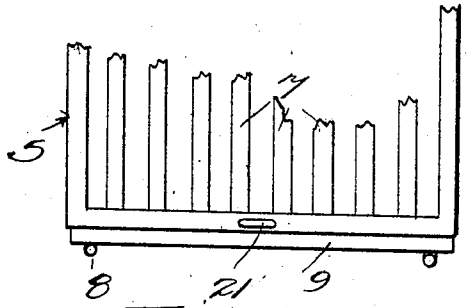


FIG. 5

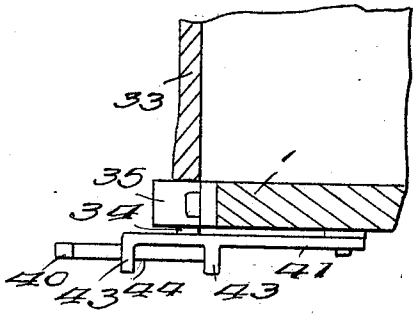


FIG. 6

H. A. Walden
Inventor

By Geo. P. Kimmel
Attorney

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARLEY A. WALDEN, OF WEST TERRE HAUTE, INDIANA.

GRATE DUMPING AND HANDLING APPARATUS.

1,313,142. Specification of Letters Patent. Patented Aug. 12, 1919.

Application filed March 12, 1919. Serial No. 282,079.

To all whom it may concern:

Be it known that I, HARLEY A. WALDEN, a citizen of the United States, residing at West Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Grate Dumping and Handling Apparatus, of which the following is a specification.

This invention comprehends generally improvements in that class of inventions known as furnaces and more particularly relates to a grate dumping and ash handling apparatus.

It is the primary aim and object of this invention to provide an apparatus of the above mentioned character designed to be associated with a puddling or other type of furnace, improved means being employed for movably mounting the grates within the body of the furnace while acting in conjunction therewith is improved manually operable means for raising and lowering the grate to permit of the dumping of the ashes therefrom at the time it is desired to start a new fire.

As an additional and equally important object this invention contemplates the provision of a device of the above mentioned character wherein the means for raising and lowering the grates or swinging them vertically is of improved construction embodying generally a manually operable lever positioned exteriorly of the body of the furnace and operably connected as by flexible elements with the grates, improved means being also employed in conjunction with the levers for releasably locking the levers to consequently releasably maintain the grates in a raised operative position.

The invention also embraces the provision of an apparatus of the above mentioned character wherein the door which establishes access to the ash pit or box is of improved construction being also mounted in an improved manner so to act as a deflector or chute for the ashes at the time the grates are dumped to consequently insure of the discharge of the ashes into an ash pit adapted to be positioned in the ground and in proximity to and beneath the outer end of the chute door.

More specific objects of this invention consist in the provision of an apparatus of the above mentioned character wherein the grates proper are of improved construction; to provide improved means for operating and holding the door in either of its adjusted positions: and to provide means on the body of the furnace for embracing the door when in its open and closed position.

Among the other aims and objects of the invention may be recited the provision of a device or apparatus of the above mentioned character with a view to compactness wherein the number of parts are comparatively few, the construction simple, the cost of production low and the efficiency high.

Other objects, as well as the nature, characteristic features and scope of this invention will be more readily apparent from the following description taken in connection with the accompanying drawings and pointed out in the claims, forming a part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a vertical longitudinal sectional view through a portion of the furnace showing the improved grate and its mounting means,

Fig. 2 is a front elevational view of the operating means for the grate and of the ash pit door,

Fig. 3 is a side elevational view of the furnace showing particularly the means for releasably locking the operating arms for the grates in a desired position,

Fig. 4 is an end elevational detail of one of the grates,

Fig. 5 is a fragmentary top plan view thereof, and

Fig. 6 is a fragmentary horizontal sectional detail of the means for mounting the door and for holding the door in the desired position of adjustment.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now, more particularly, to the accompanying drawings there is illustrated a furnace including a body 1 which may be

of a rectangular configuration while arranged medially of the ends thereof is a vertically and transversely disposed partition 2 in turn carrying on one face a transversely disposed beam and also carried by the same face are pairs of laterally projecting hooks 4 positioned in spaced relation beneath the beam 3 for a purpose which will presently appear.

With a view toward providing the improved grates each may be said to consist of a rectangular frame 5 the end portions of which are provided with opposed longitudinally alining openings 6 in which is removably fitted the ends of grate bars 7. Supports 8 of angular configuration are connected to the forward end bars of the grate and removably receive therein latching bars 9 which act to releasably hold the grate bars against displacement yet at the same time permit of the removal of the grate bars when the latter are injured. Spaced pairs of engaging elements such as eyes 10 extend from the inner or rear end bars of the grates 5 and are engaged with the adjacent hooks 4, this arrangement serving as a means for swingably mounting the grates vertically of the body of the furnace, the rear end portions of the grates being positioned beneath the beam 3 and when in a raised horizontal position these grates divide the forward end of the furnace into a fire box 11 and an ash pit or box 12, as is apparent.

In order to raise and lower the grates improved operating means has been employed and in reducing this feature of the invention to practice operating levers 13 and 14 have their inner ends swingably connected by means of a pintle 15 to the front face of the body of the furnace, the levers being positioned parallel to the front face and designed for vertical swinging movement. Suitable flexible elements such as chains 16 are employed and have their outer ends connected to the levers and their main portions trained about pulley wheels 17 operably mounted on the front face of the body of the furnace and also trained through openings or passages 18 provided in the front end of the furnace, the opposite ends of the chains being connected to plugs 19 which in turn have depending therefrom hooks 20 designed for removable engagement with eyes 21 which rise from the upper edge of the front end bar of each of the grates.

To protect the operating means the fire box of the furnace is provided with a bevel front wall construction being provided by the provision of a partition 22 positioned vertically and transversely of the fire box and in closely spaced relation to the front wall. A cross bar or beam 23 closes the space between the partition and the front wall and in turn is provided with beveled openings 24 for receiving the plugs.

For the purpose of releasably latching the levers in either of their adjusted positions, a plate-like bracket 25 is employed and is connected by suitable fastening means 26 to one side wall of the furnace and extends laterally from the forward or front wall, the extending portion being provided with spaced vertically arranged slots 27 through which the outer projecting portions of the levers 13 and 14 are arranged. In addition, this plate is provided with transverse bores or passage ways 28 and 29 positioned near the upper and lower ends of the slots and intersecting the same, the passage ways opening at the marginal edges of the plate brackets being designed to removably receive locking pins 30 flexibly connected to the body of the furnace as by chains 31.

As intimated, improved means has been provided for establishing access to the ash pit or box and in reducing this feature of the invention to practice the lower portion of the end wall of the furnace immediately adjacent the ash pit is provided with an opening 32, this opening being preferably provided by removing the entire lower portion of the said front wall of the furnace. A door 33 is designed to removably close the opening and consists of a plate-like body from the opposite sides of which and slightly beneath the center extend opposed trunnions 34 which are journaled in brackets 35 mounted on the forward edges of the sides of the furnace body as indicated, this arrangement permitting of a vertical swinging of the door. Stop strips 36 are respectively carried by the front side walls of the furnace body and near the upper edge of the opening at the sides of the opening extending downwardly and inwardly, the side stops 36 terminating immediately above the brackets 35 and by this arrangement the upper portion of the door is prevented from having outward swinging movement. Coacting with the stops 35 and 36 is another stop strip 37 carried transversely and on the upper surface of the bottom of the ash pit 12, the forward edge terminating short of the forward edge of the ash pit bottom while the rear edge is inclined toward the bottom so as not to interfere with the removal of ashes therefrom. Opposed vertically arranged supporting bars are carried by the inner surface of the side walls of the ash pit and arranged in proximity to the forward edge thereof and provided with diagonally cut upper ends 39 for a purpose which will presently appear.

In order to operate the door 33 so that it will serve as a deflector or chute to facilitate the discharge of ashes received thereupon into a main receiving ash pit adapt-

ed to be positioned beneath the projecting end thereof, a handle 40 is connected to the elongated portion of one of the trunnions 34 to facilitate the swinging of the door inwardly until the door strikes the inclined shoulders 39. When in such position, the same may be removably held against accidental displacement.

In releasably latching the lever 40 in either of its adjusted positions the latch bar 41 is swingably connected as at 42 to one side of the furnace body and is provided near its outer end with spaced laterally extending stop plugs 42 designed to be arranged against the lever 40 so as to prevent swinging thereof. As noted upon reference to Fig. 2 the lever 40 is provided on opposite sides with recesses or notches 44 and 45, the outer lug 43 being engageable with the inner recess or notch 45 to lock the door closed. It is apparent that the lug may be swung out of engagement with the recess and the bar 41 raised to permit of swinging of the lever so as to move the door into open position while subsequently the bar may be swung downwardly so that the inner lugs 43 will swing into engagement with the notch or recess 44, thereby locking the door in an open position so that it will serve in the capacity of a chute or deflector.

Access is had to the fire box through the instrumentality of a fire door 46. This door is mounted on the side wall of the furnace body and of course causes the usual door opening.

In use, when it is desired to dump the ashes from the grates to permit of the building of a new fire, the handle 40 is swung so as to move the door into open inclined position whereupon the locking pins 30 are disengaged from the plate-like brackets 25 to permit of the levers 13 and 14 moving upwardly under action of the weight on the grates 5, the lower movement of the grates being limited by the door but as the grates are inclined the ashes will slide thereover and be received upon the inclined door which acts as a deflector for in turn discharging the material into the main receiving ash pit (not shown). When all of the coal or ashes have been removed the levers 13 and 14 are swung downwardly and by reason of the flexible connection, namely the chains 16, the grates will be drawn into a raised operative position to permit of the building of a new fire.

It is believed in view of the foregoing description that a further detailed description of the operation of the invention is entirely unnecessary. Likewise, it is believed that the advantages of the invention will be readily apparent.

Still further embodiments of the invention than those herein especially defined may be resorted to as conditions or preference may dictate, as may be in keeping with the hereto appended claims.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent is:—

1. In a furnace, the combination with a fire box, a partition in the box arranged in closely spaced relation to one wall of the fire box, a closure bar between the lower edge of the partition and the wall of the fire box provided with an opening therein, and a grate swingably mounted for vertical movement beneath the fire box, of a pivotally mounted lever on the wall of the furnace exteriorly of the fire box, a pulley wheel rotatably mounted on the furnace exteriorly of the fire box, a flexible element trained about the pulley wheel and having one end connected to the lever and also trained through the walls of the fire box so as to be positioned between the fire box and the partition, a plug carried by the opposite end of the cable, an operative connection between the plug and the outer end of the grate, the plug being engageable at times with the opening to limit the upward movement of the grate, and means for releasably locking the lever and consequently the grate in either a raised or lowered position.

2. In a furnace provided with a fire box and an ash pit, in combination, a vertically swinging grate, means for raising and lowering the grate, means for releasably holding the grate in either a raised or lowered position, a vertically swinging fire box door arranged beneath the grate and designed when swung inwardly to support the lower end of the grate and to act as a discharge chute, and means for supporting the door at an inclination.

3. In a furnace, the combination with a vertically swingable grate, of a vertically swingable ash pit door arranged beneath the grate designed at times to be swung inwardly and positioned at an inclination so as to support the grate at an inclination, and means for supporting the door at an inclination.

4. The combination with a vertically swinging grate, of a pivotally mounted operating lever, a rotatably mounted pulley wheel, a flexible element having one end connected to the lever and the main portion trained about the pulley wheel, an operable connection between the other end of the lever and the outer end of the grate, a slotted bracket through the slot of which the outer portion of the lever is arranged, and locking pins engageable in the bracket to intersect the slot so as to lock the lever in either a raised or lowered position to consequently maintain the grate in corresponding positions.

5. A grate including a frame of a rectangular configuration, the end portions of which are provided with opposed openings, a plurality of grate bars having adjacent ends reduced and seated in openings in one of the end bars with the main portions slidable through the opposed openings, brackets carried by the outer face of one of the end bars, and a latch bar movably arranged in the bracket to prevent displacement of the grate bars.

In testimony whereof, I affix my signature hereto.

HARLEY A. WALDEN.

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