May 30, 1939. J. MARTIN 2,160,026

ASH REMOVING DEVICE

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Fig. 1

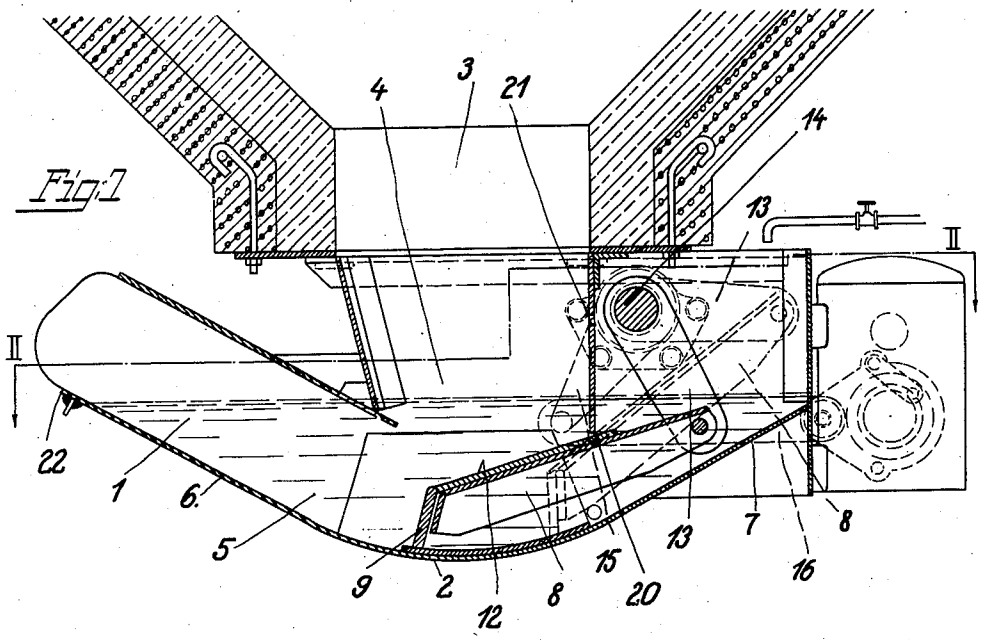
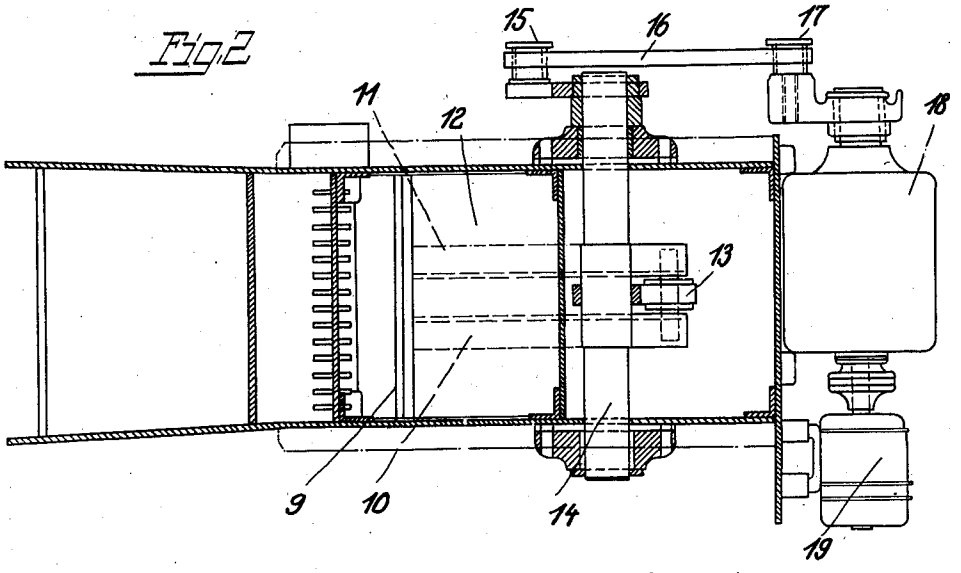


Fig. 2



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ASH REMOVING DEVICE

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In Germany July 4, 1936

1 Claim. (Cl. 110—171)

The invention relates to improvements in devices for the removal of the residuary products of combustion, as ashes and clinkers, from furnaces and in which the said residuary products of combustion are quenched. In particular, the invention is directed to a device in which a water receptacle, located beneath the discharge chute of the furnace, is provided with a curved bottom for slidably supporting a reciprocating plunger, which is adapted to push the residuary products of combustion out of the receptacle. It has been proposed heretofore, to reciprocate the plunger in its curved path by means of a rack and pinion drive, but such an arrangement is expensive in production and maintenance, since these parts are subject to wear and have to be replaced periodically.

It is now an object of the invention to provide novel means of simpler and cheaper construction for reciprocating the plunger along the curved bottom of the receptacle.

Another object of the invention is to construct the novel means for reciprocating the plunger in such a manner that the plunger follows accurately the curvature of the bottom of the receptacle and remains with its upper face at a substantially uniform distance from the lower edge of the chute which extends into the receptacle.

These and other objects of the invention are obtained by a crank drive which actuates an oscillating link assembly pivoted to one end of the plunger, while the other end of the plunger engages slidably the bottom of the receptacle. An oscillating lever or link guides the plunger during its reciprocating movement in such manner that the plunger remains always at the same distance from the lower edge of the chute.

In the drawing:

Fig. 1 is a vertical sectional view of the lower portion of a furnace provided with the device of the present invention and illustrating both end positions of the reciprocating plunger, and

Fig. 2 is a horizontal sectional view of the device substantially on the broken line II—II of Fig. 1.

The device is provided with a receptacle 1 having a curved bottom 2 and spaced parallel side walls. The ash and clinker discharge passage 3 of the furnace is arranged directly above the curved bottom 2 of the receptacle 1 and is provided with a chute 4 which extends downwardly into the receptacle 1 a sufficient distance so that the lower edge of the chute 4 lies below the level of the water bath 5 in the receptacle 1. At one end the bottom 2 of the receptacle 1 is connected with an upwardly slanting discharge trough 6, while the other end of the curved bottom 2 merges into a straight bottom portion 7. The plunger 8 is provided at its forward end with a transverse push bar 9 which is positioned beneath the chute 4 and rests upon the curved bottom 2 of the receptacle and is guided by the latter. The plunger 8 includes two bars 10 and 11 to which the transverse push bar 9 is attached and which are provided with a cover plate 12. The rear ends of the bars 10 and 11 extend over the straight bottom portion 7 and are pivotally connected with a lever arm 13. This lever arm 13 is attached to a horizontal shaft 14 and extends downwardly therefrom. The shaft 14 extends transversely through the receptacle, is supported in bearings attached to the side walls of the same and is provided on its outer end with a crank 15 connected by a connecting rod 16 with a rotating crank 17 driven by a motor 19 through a reduction gearing 18.

When the motor 19 is set in operation the push bar 9 of plunger 8 is reciprocated within the limits of the curved bottom 2 of the receptacle. Fig. 1 shows in full lines the plunger 8 in its foremost position, while the rearmost position is indicated in dotted lines. The angular relation of the lever arm 13 with respect to the bars 10 and 11 is selected in such manner, that the plunger 8, whose front portion engages slidably the curved bottom 2 of the receptacle 1, is moved by the lever arm 13 to remain at a substantially uniform distance from the lower edge 20 of that wall of the chute 4 which is directly above the plunger. The distance variations which are admissible between this edge 20 and the upper face of the plunger 8 should not exceed approximately $\frac{3}{16}$ of an inch, to prevent the entrance of clinker pieces in the gap and to avoid jamming. Satisfactory reciprocative movement of the plunger, avoiding undesirable vertical movements of the same relative to the edge 20, is obtained by arranging the lever arm 13 with respect to plunger 8 so that the angle between the longitudinal axis of the lever arm 13 and the longitudinal axis of the plunger 8 during the entire range of movement continually remains an acute angle.

The plunger 8 executes its strokes slowly and pushes the quenched ashes and clinkers, dropping from the chute 4 into the receptacle 1, upwardly into the trough 6, over whose upper edge 22 the ashes and clinkers are discharged from the device.

Any wear of the device will principally occur in the joints of the lever assembly, but those joints

are provided with bushings which can be replaced easily and at very little cost.

What I claim as my invention is:

In an ash removing device, an ash discharge chute, a receptacle adapted to be partly filled with water, said receptacle comprising two spaced parallel side walls and a curved bottom wall terminating at one end in an upwardly inclined portion, the upper edge of which is positioned in a higher plane than the lower edge of the discharge chute, said discharge chute having a wall extending downwardly below the normal water level in said receptacle, a reciprocating plunger in sliding engagement with said curved bottom and adapted to push the ashes dropping onto the bottom of the receptacle toward said upwardly inclined portion, said plunger being provided with a top wall positioned directly below said discharge chute when the plunger has completed its discharge stroke, means for reciprocating said plunger including a horizontal shaft, means for oscillating said shaft about its own axis, and a lever arm on said shaft pivotally connected to the rear end of said plunger, said shaft extending transversely through said receptacle and being positioned adjacent said downwardly extending wall in a plane above the plane in which said plunger is reciprocated, said lever being attached to said shaft to extend downward therefrom, and to form an acute angle with respect to the plunger during its reciprocating movement for causing said top wall of said plunger to move past the lower edge of said downwardly extending wall of said chute with limited clearance during the entire movement of the plunger to prevent the entrance of clinker and the like between said lower edge and said top wall.

JOSEF MARTIN.