Feb. 2, 1926. 1,571,612

W. WARD

STOKER

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Fig. 1.

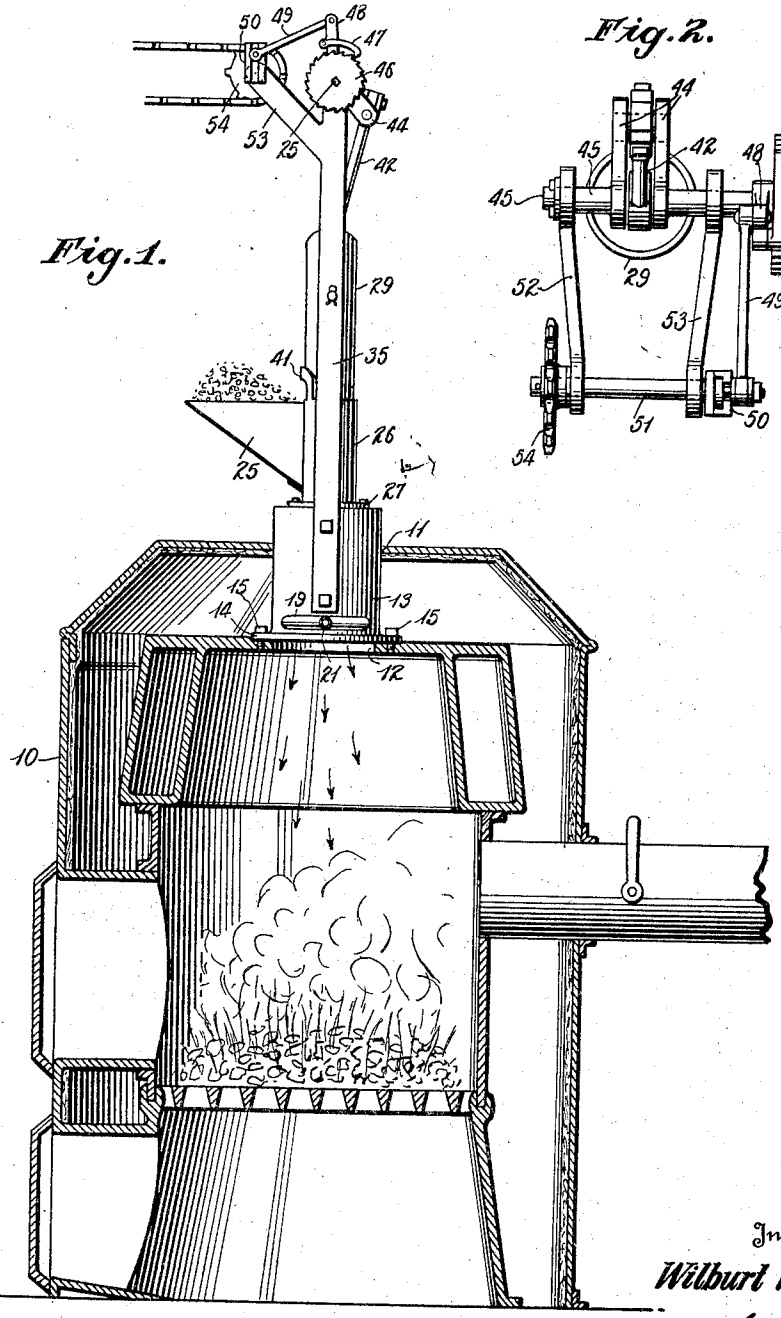


Fig. 2.

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Fig. 3.

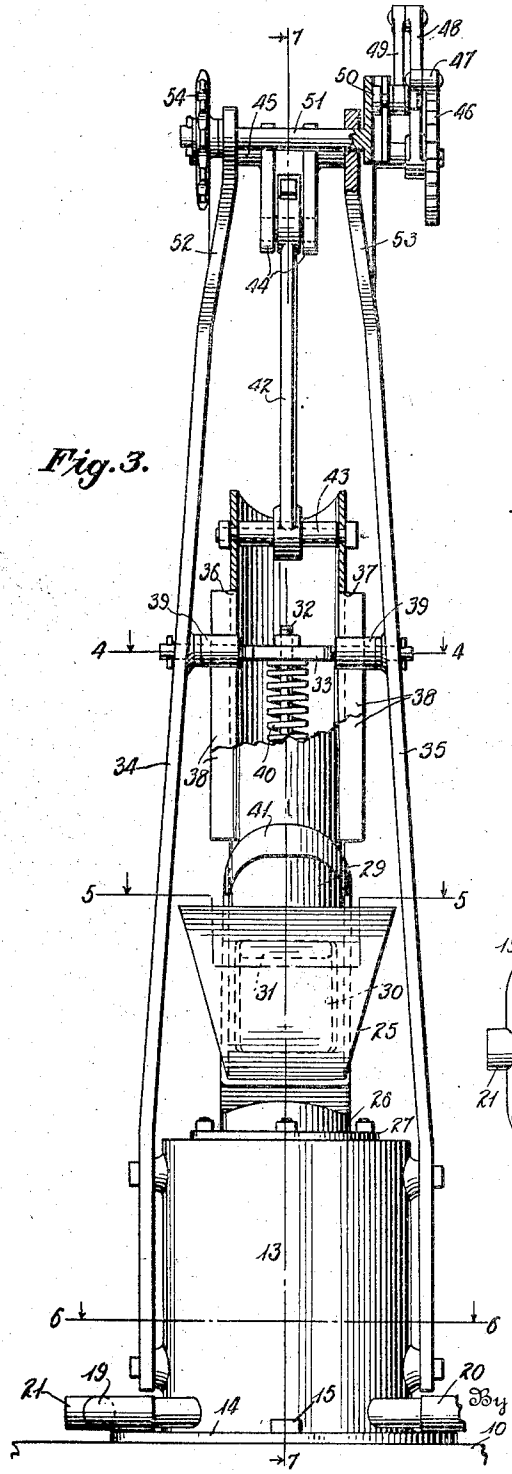


Fig. 4.

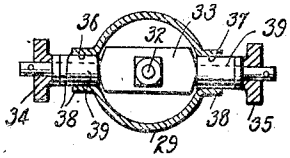


Fig. 5.

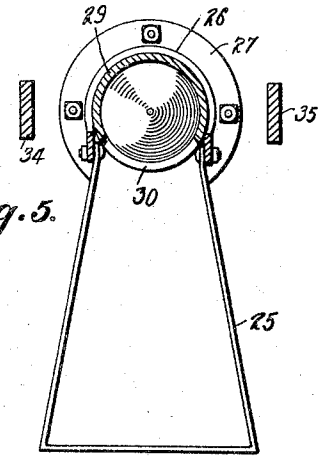
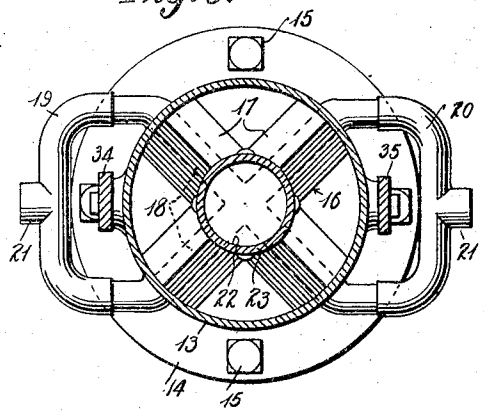


Fig. 6.



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Fig. 7.

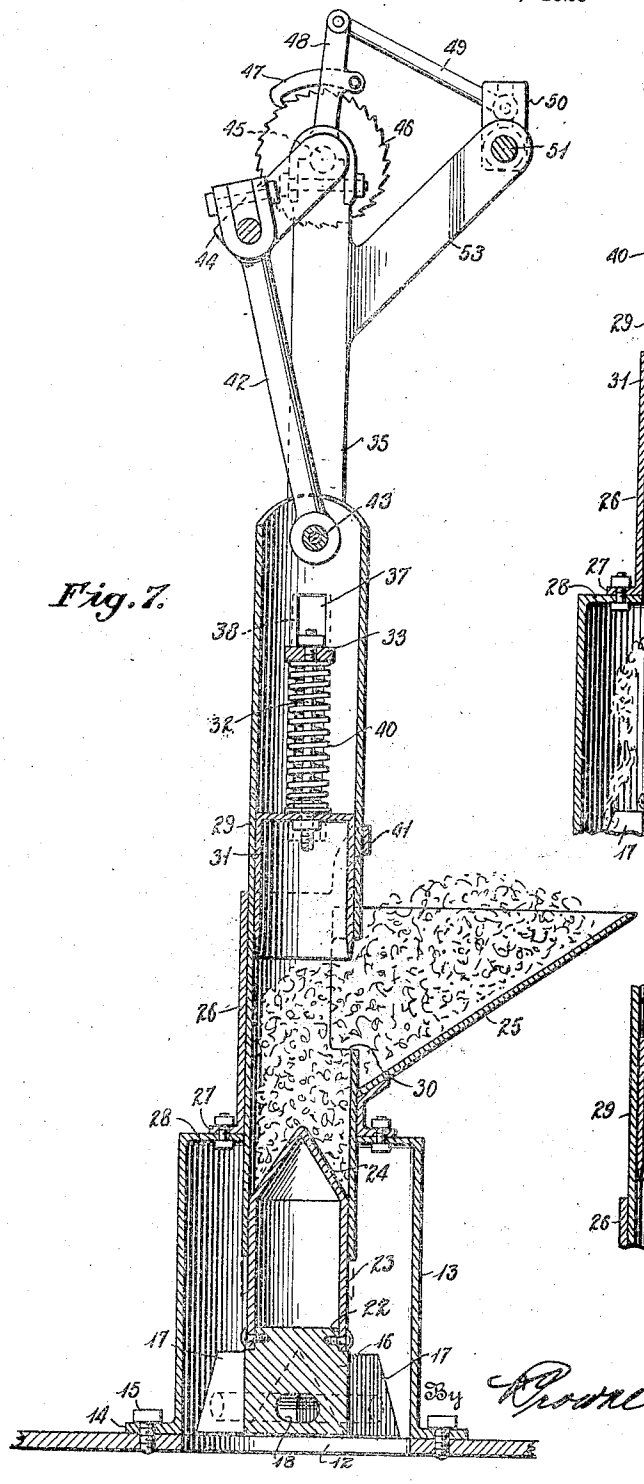


Fig. 8.

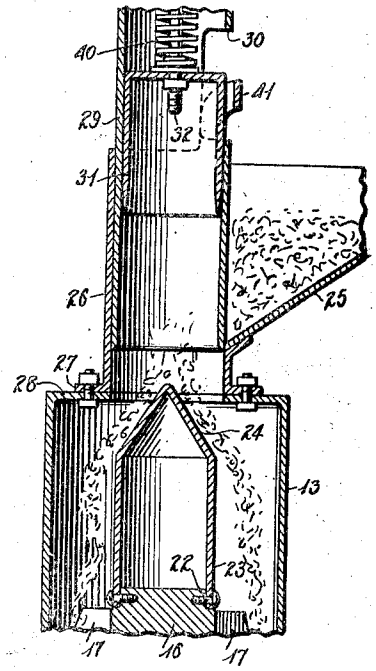
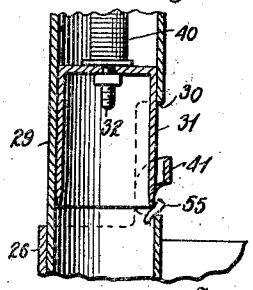


Fig. 9.



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Patented Feb. 2, 1926. 1,571,612

UNITED STATES PATENT OFFICE.

WILBURT WARD, OF STE. GENEVIEVE, MISSOURI.

STOKER.

Application filed August 24, 1925. Serial No. 52,002.

To all whom it may concern:

Be it known that I, WILBURT WARD, a citizen of the United States, residing at Ste. Genevieve, in the county of Ste. Genevieve and State of Missouri, have invented certain new and useful Improvements in Stokers, of which the following is a specification.

The invention relates to stokers, and has as an object the provision of a stoker which may be applied to domestic heating furnaces or the like.

A further object of the invention is the provision of a stoker having means to prevent the stalling of the device when a piece of hard substance, such as iron or slate is caught by the cut off means.

A further object of the invention is the provision of a stoker having the portion exposed to the fire provided with cooling means.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawing showing an illustrative embodiment of the invention and wherein—

Fig. 1 is a central vertical section of a hot air heating furnace with a stoker applied thereto, and shown in side elevation.

Fig. 2 is a plan view of the stoker upon an enlarged scale.

Fig. 3 is a front elevation of the stoker upon a larger scale than that shown in Fig. 1.

Figs. 4, 5 and 6 are horizontal sections on lines 4—4 and 5—5 respectively of Fig. 3.

Fig. 7 is a vertical section on line 7—7 of Fig. 3.

Fig. 8 is a detail section corresponding to Fig. 7, showing a different position of parts, and

Fig. 9 is a detail section showing the action of the device when a hard substance is caught by the cut-off device.

As shown in Fig. 1, the device is applied to a hot air furnace 10 by being installed in an opening 11 in the casing of the furnace, and feeding through an opening 12 in the wall of the furnace above the grate.

In the form shown the stoker comprises a cylindrical portion 13 having an annular flange 14 adapted to be secured as by cap screws 15 to a wall of the furnace. Within the cylinder 13 a fuel spreader 16 is shown in the form of a central portion, with arms 17 extending therefrom. The arms are preferably formed with a triangular section having the apex directed upwardly for the purpose of spreading the fuel. The ends of the arms 17 are secured to the walls of the cylinder 13 for purpose of support of the spreader. Channels 18 are formed in the arms of the spreader with which channels pipes 19, 20 are shown, as connected, each having a collar 21 to which a supply of cooling medium may be attached, which medium may be either air or water.

Attached to the upper portion of the spreader 16, which is made cylindrical at 22 for the purpose, there is shown a cylindrical member 23 having a conical upper end 24.

To deliver fuel to the cylinder 13 there is shown a hopper 25 joining a cylindrical portion 26 provided with a flange 27, by means of which it is secured to the annular wall 28 of the cylinder 13.

To deliver successive charges of fuel to the fire a reciprocating cylinder 29 is shown fitting within the cylindrical portion 26 of the hopper, and in its lowest position telescoping with the cylindrical member 23 of the spreader. Fuel may be admitted to the cylinder 29 through an opening 30 in its wall, which opening at the lowest position of reciprocation of the cylinder 29 stands slightly below the inclined portion of the hopper 25.

To close the opening 30 in the cylinder 29, there is shown a cylinder 31 supported within the cylinder 29 by means of a bolt 32 suspended from a cross bar 33, secured between the side arms 34, 35 of the stoker frame. The bar 33 is shown as projecting through slots 36, 37 in the walls of the cylinder 29, the material of the cylinder 29 being turned outwardly to produce the slots, and to provide wings 38 which coact with rollers 39 mounted upon reduced portions of the cross bar 33 to lessen friction.

The cylinder 31 suspended by the bolt 32 is resiliently held in its lowermost position by means of a spring 40 abutting against the cross bar 33 and against the top of the cylinder 31. A strap 41 is shown extending upwardly and transversely from the wall of the hopper to guide the cylinder 29 in its reciprocation.

To cause reciprocation of the cylinder 29 a connecting rod 42 is shown attached to the cylinder 29 by means of a cross bar 43, and at its upper end connected to a crank 44 carried by a drive shaft 45 journaled in the upper end of the arms 34, 35. The shaft 45

is adapted to be driven by means of a ratchet wheel 46, through the medium of a pawl 47 mounted upon an arm 48 loosely journaled on the drive shaft 46 and having a link 49 connected to its upper end and to a crank 50 secured upon a shaft 51, journaled in arms 52, 53. A sprocket wheel 54 is shown mounted upon an end of the shaft 51, which may be driven by any suitable motive power.

In operation, continuous rotation of the sprocket wheel 54 will cause oscillation of the arm 48 through the medium of the link 49, which will cause intermittent movement of the ratchet wheel 46, producing a slow rotation of the shaft 45 and cause reciprocation of the cylinder 29. When the cylinder 29 is in its lowermost fuel receiving position the lower end of the cylinder will telescope with the cylinder 23, whereby to effectually prevent the escape of gas through the fuel distributing cylinder 13. Upward movement of the cylinder 29 will cause closure of the opening 30 by coaction with the lower edge of the cylinder 31 just prior to the separation of the cylinder 29 from the cylinder 23. In the uppermost position of the cylinder shown in Fig. 8, the opening 30 is entirely closed and fuel may flow from the cylinder 29 down into the cylinder 13 about the fuel spreader, and thus fall upon the grate.

In the event of a hard substance being caught between the lower edge of the opening 30 and the end of the cylinder 31, as indicated at 55, Fig. 9, the spring 32 will be compressed and the cylinder 31 will be carried up with the cylinder 29 without damage to the mechanism. Upon the next downward stroke the particle 55 will in most cases be passed to the fire.

Minor changes may be made in the physical embodiment of the invention without departing from its spirit.

I claim:

1. A stoker comprising, in combination, a hollow reciprocating member adapted to deliver successive charges of fuel to a grate, and having a fuel receiving opening, means to deliver fuel to said opening, means in the path of said member adapted to telescope therewith to prevent escape of gases while said opening is receiving fuel and other means telescoping with said member to close said opening while said member is delivering fuel to the grate.

2. A stoker comprising, in combination, a fuel spreader, a hollow reciprocating member adapted to deliver successive charges of fuel over said spreader to a grate, and having a fuel receiving opening, means to deliver fuel to said opening, a plug carried by said spreader adapted to telescopically close said member while said opening is receiving fuel, and means to close said opening while said member is delivering fuel over said spreader.

3. A stoker comprising, in combination, a fuel spreader, a hollow reciprocating member adapted to deliver successive charges of fuel over said spreader to a grate, and having a fuel receiving opening, means to deliver fuel to said opening, a plug carried by said spreader adapted to telescopically close said member while said opening is receiving fuel, and means supported normally stationary within said member to close said opening while said member is delivering fuel over said spreader.

4. A stoker comprising, in combination, a hollow reciprocating member adapted to deliver successive charges of fuel to a grate, and having a fuel receiving opening, means to deliver fuel to said opening, means in the path of said member adapted to close the same to prevent escape of gases while said opening is receiving fuel, normally stationary means resiliently held within said member to close said opening while said member is delivering fuel to the grate, said last named means adapted to move with said reciprocating member when a hard substance is caught between the edge of said last named means and of said opening.

WILBURT WARD.