S. G. GREENAWALT.

STOKER.

APPLICATION FILED JUNE 1, 1916.

1,225,802.

Patented May 15, 1917.

3 SHEETS—SHEET 1.

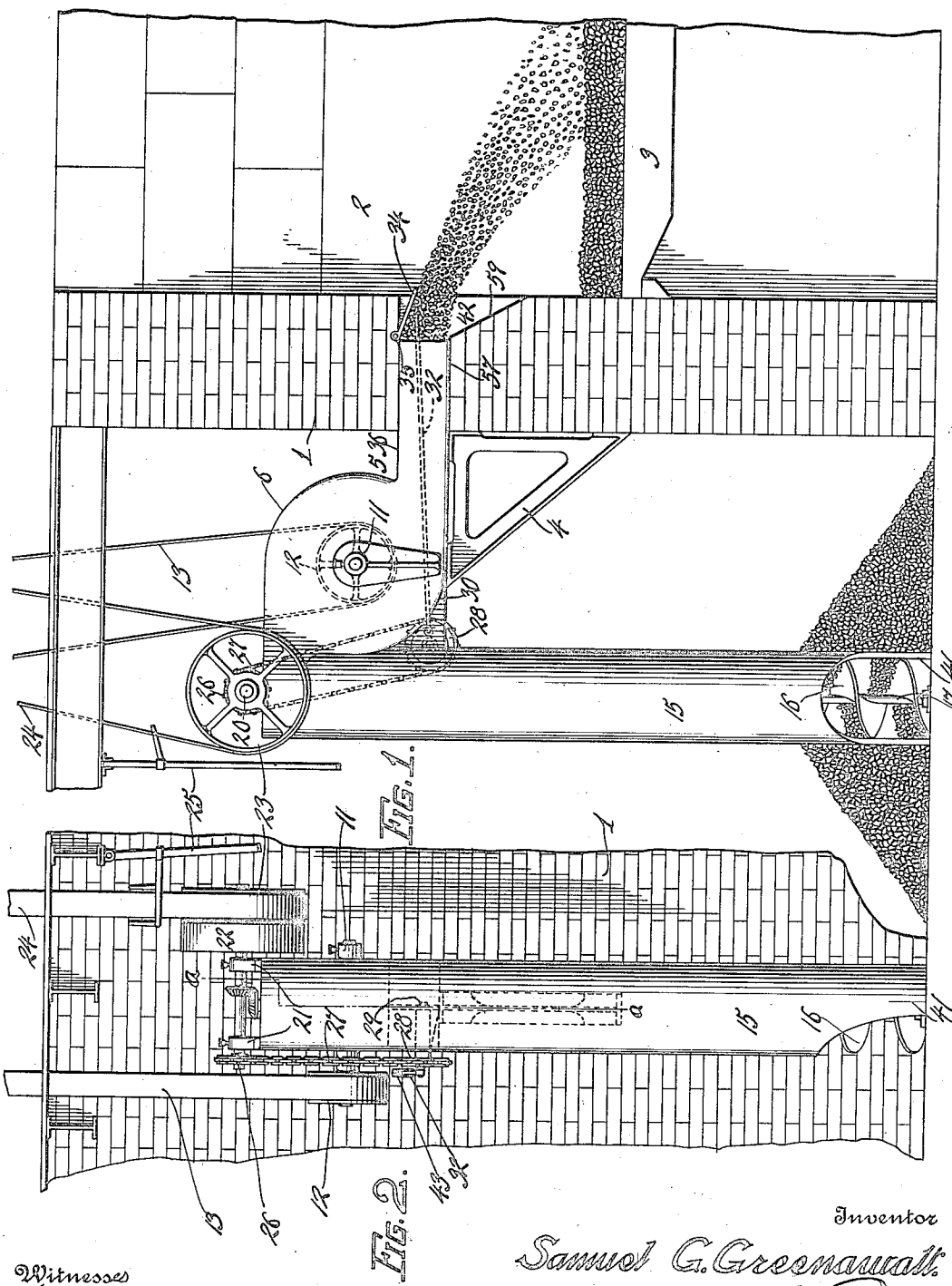


FIG. 1.

FIG. 2.

Witnesses

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3 SHEETS—SHEET 2.

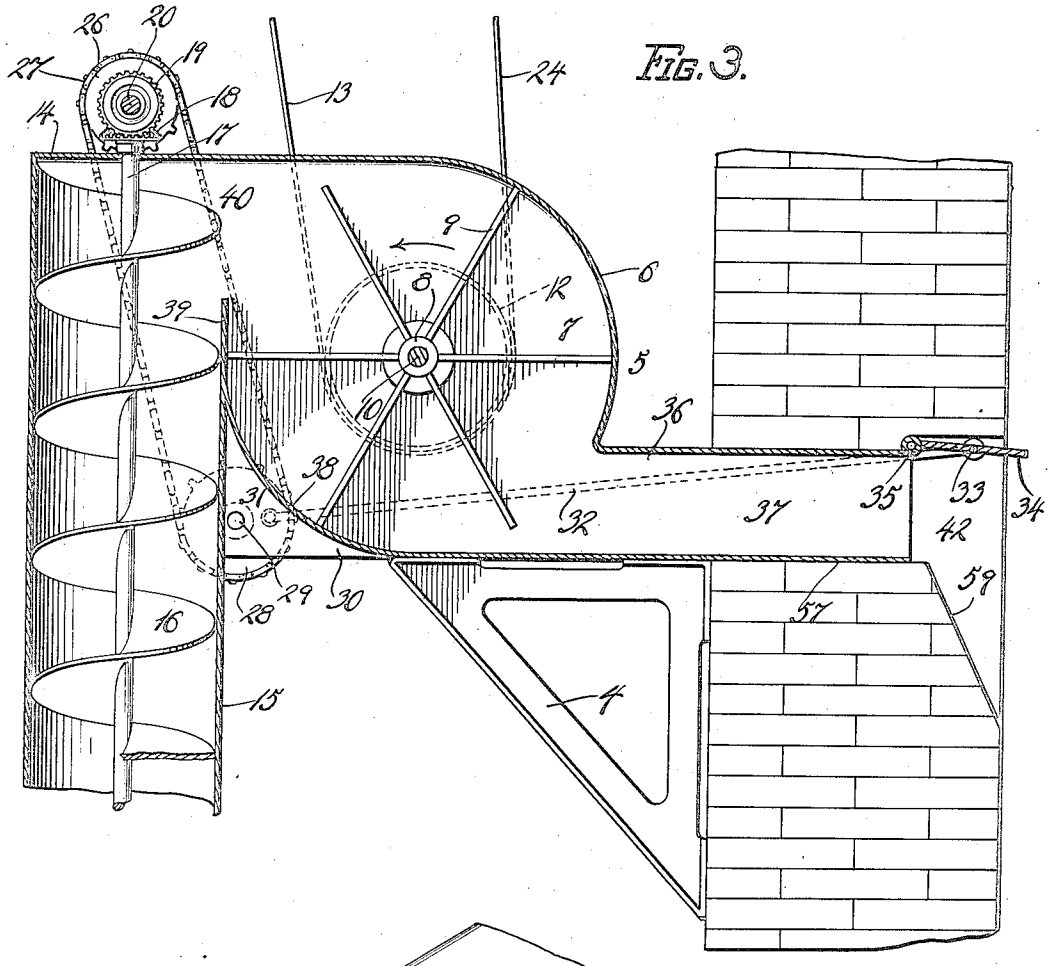


FIG. 3.

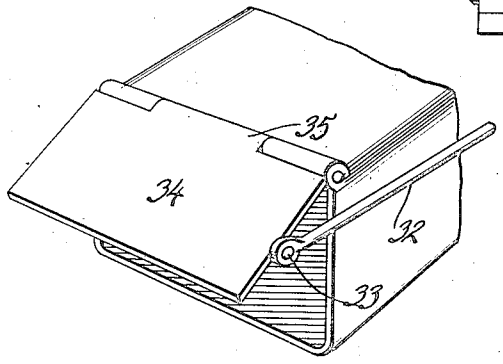


FIG. 4.

Witnesses,
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3 SHEETS—SHEET 3.

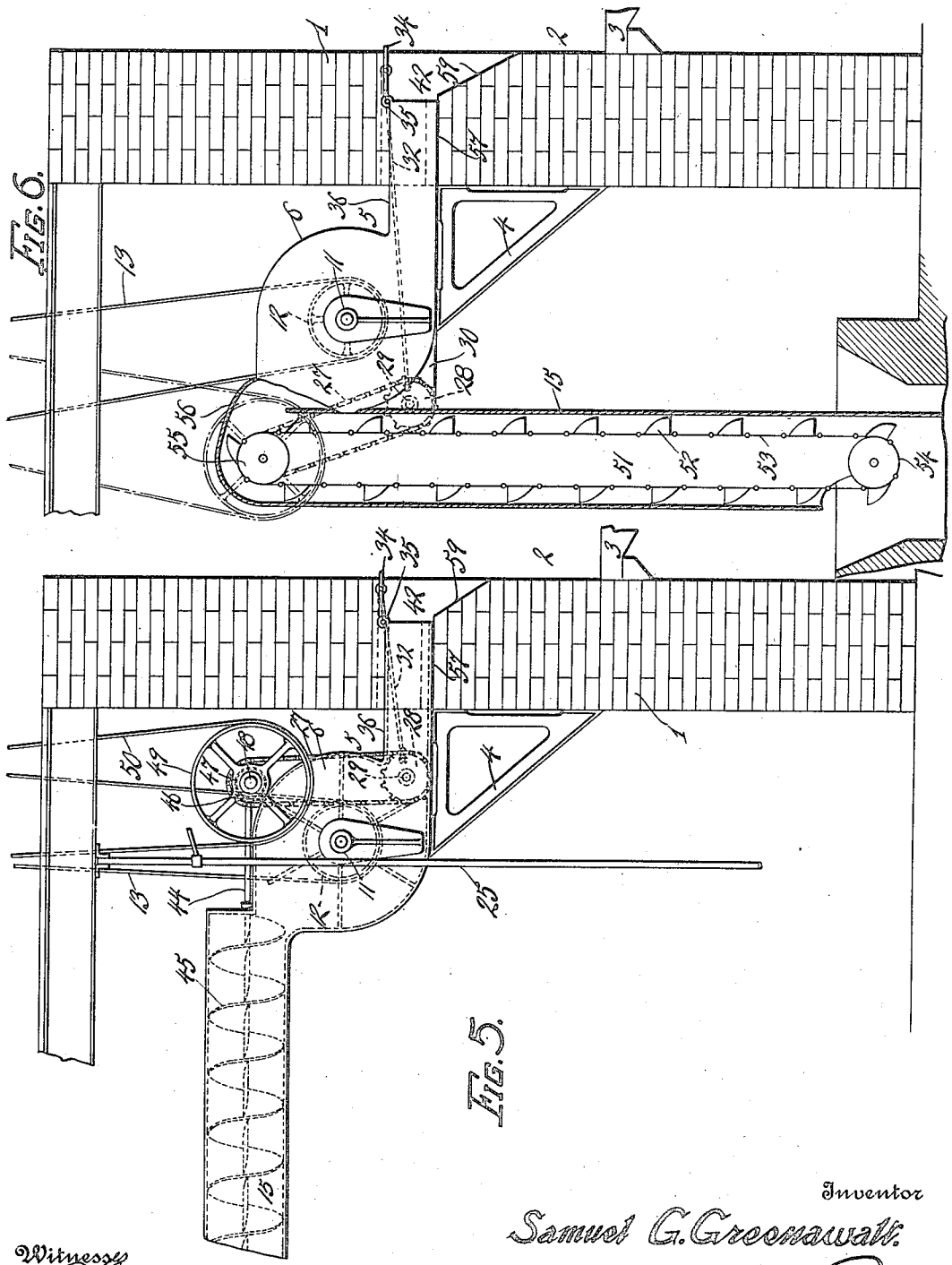


FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE.

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STOKER.

1,225,802. Specification of Letters Patent. Patented May 15, 1917.

Application filed June 1, 1916. Serial No. 101,018.

To all whom it may concern:

Be it known that I, SAMUEL G. GREENAWALT, a citizen of the United States, residing at Shawinigan Falls, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Stokers, of which the following is a specification.

My invention consists of an improved form of mechanical stoker. One object of my invention is to provide a stoker which may be used in connection with lime kilns or furnaces of different types, and which will quickly and effectively operate to supply coal or other fuel to the fire boxes of the kiln or furnace.

One of the specific objects of my invention is to control the fuel as it is inserted within the fire box so as to distribute it evenly over the surface of the grate.

A further object is to construct my improved stoker in such manner as to require but a small amount of space and in which the several parts may be easily operated.

A still further object is to so make the main elements of my invention that the coal may be supplied thereto by any well known conveying means which may be deposited at different angles relatively thereto.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which

Figure 1 is a side elevation of my invention shown in connection with the fire box of a kiln, the latter being shown in section.

Fig. 2 is an end view of Fig. 1.

Fig. 3 is a fragmentary sectional elevation taken on the line *a*—*a* of Fig. 2, and drawn on an enlarged scale.

Fig. 4 is a fragmentary perspective view of a portion of my invention, and

Figs. 5 and 6 are side elevations showing modified forms of certain of the elements of my invention.

Referring to the drawing, 1 represents the wall of a kiln providing a fire box or chamber 2 having a grate 3 therein. A bracket 4 secured to the outer face of the kiln 1, supports a casing 5 having a hollow cylindrical portion 6 which forms a housing for a rotor 7 which consists of a hub 8 having secured thereon a plurality of paddles 9.

The hub 8 is secured to and rotatable with a shaft 10 which is mounted in suitable bearings 11 on the housing 6, and a pulley 12 is secured to the outer end of said shaft and is driven by a belt 13 from a countershaft (not shown) or any other source of power so as to give the rotor 7 a rotary movement in the direction of the arrow shown in Fig. 3.

The housing 6 is extended at 14 to provide a sleeve 15 in which turns a screw conveyer 16. The screw conveyer 16 has a shaft 17 which extends through the extension 14 of the casing 5 at its upper end, and has secured thereon a beveled gear 18 which meshes with another beveled gear 19 secured to a shaft 20, the latter being journaled in bearings 21 on the upper end of the casing 5.

The shaft 20 has thereon loose and tight pulleys 22 and 23 respectively, and an actuating belt 24 is movable by means of a belt shifter 25 to move the belt onto either of the pulleys 22 or 23, to either rotate or stop movement of the shaft 20.

The opposite end of the shaft 20 is provided with a sprocket 26 and a chain 27 operatively connects this sprocket with a sprocket 28 on a stud shaft 29, the latter being mounted in a web or connecting bracket 30 between the housing 6 and the sleeve 15.

The sprocket 28 has a crank pin 31 to which is pivotally secured one end of a link or connecting rod 32. The other end of the connecting rod is pivotally secured on a pin 33 which projects laterally from the edge of a deflector 34. The deflector 34 is hinged at its upper edge 35 to the inner end of a neck portion 36 of the casing 5.

The neck 36 provides a relatively narrow passage 37 which is in open communication with the interior of the housing 6, and the inner wall forming the bottom of the passage 37 is arranged at a tangent with the curved inner surface 38 of the housing 6.

A partition 39 is formed between the sleeve 15 and the housing 6, and this partition stops short of the upper part or extension 14 so as to provide a passage 40 between the interior of the housing 6 and the interior of the sleeve 15, so that fuel which is raised by the rotation of the conveyer 16, will pass upwardly, and after reaching the passage 40, fall on the paddles 9 of the rotor 6.

The lower portion of the sleeve 15 is open as at 41 (see Figs. 1 and 2), and the fuel may be stacked around the sleeve 15 and engage the bottom portion of the conveyer 16 which will carry it upwardly and discharge

it through the opening 40 onto the paddles as previously described.

The paddles moving in the direction of the arrow shown in Fig. 3 will convey the fuel as it is dropped thereon and inject it through the passage 37 and through the opening 42 into the fire box 2.

At the same time, the sprocket 28 will be rotated to cause a reciprocating movement of the connecting rod 32 which in turn will move the deflector 34 on its pivot, and since this movement causes the deflector to be moved at an angle to the path of movement of the fuel, as it is being injected into the fire box, the deflector will act as a guide to distribute the fuel over different portions of the grate. For example, if the deflector is in the position shown in Fig. 3, the fuel passing through the passage 37 will be thrown to the far portion of the grate, and as the deflector is moved downwardly into the position shown in Fig. 1, the fuel will strike the deflector and its direction will be defined by the angle of the deflector so that as the deflector gradually closes against the end of the neck 36, it will cause the fuel to be deflected to the near end of the grate.

The action of the rotor 7 is not only an action which by striking the fuel injects it into the fire box, but a current is set up within the housing so that there is in addition, a blowing action of the fuel into the fire box.

The wall of the kiln is provided with a slot 43 through which the connecting rod 32 passes, and this slot is made sufficiently large to allow a draft of air to be sucked therethrough due to the natural or partial vacuum being formed in the upper portion of the kiln and the connecting rod 32 and its several parts which are thereby kept relatively cool.

In the form of my invention shown in Fig. 5, instead of having the conveyer 16 in a vertical position, I have shown it in a horizontal position, which in some instances is desirable where the fuel is fed overhead and through the elevated hoppers. In this construction, the shaft 44 of the screw conveyer 45 is rotated by means of intermeshing beveled gears 46 and 47, the former being on the shaft 44, and the latter on a shaft 48 which is rotated by a pulley 49 through the medium of a belt 50.

In this instance, the sprocket 26 is rotated by the shaft 48, and the chain 27 connects the sprocket 26 with the sprocket 28 as previously described.

In the form of my invention shown in Fig. 6, I have shown a bucket conveyer 51 which may be made in any of the usual forms, and as illustrated consists of a series of buckets 52 which are connected and actuated by a chain 53 which passes over sprockets 54 and 55 (diagrammatically shown). In this form, the sleeve 15 is provided with a boot 56 through which the fuel passes, as it is dumped from the buckets 52, into the housing 6, and otherwise the drive is similar to that described in connection with Figs. 1 to 4 inclusive.

It will thus be understood that my invention may be used in connection with any general form of conveying means which is suitable to move the fuel through the passage 40 into the housing 6 so as to be conveyed and agitated due to the action of the paddles 9, and that as it passes through the passage 37, its direction after leaving said passage is controlled by means of a deflector to be evenly distributed throughout the surface of the grate.

The wall 1 has an opening 57 into which the neck 36 fits and this opening 57 is widened adjacent the inner surface of the fire box, this widening being produced by an inclined surface 59 which extends from the end of the neck 57 to the interior of the fire box, so that the fuel may readily be deflected to the near end of the gate when the deflector is moved toward the end of the neck portion.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of a furnace having an opening in its wall, a grate within said furnace and mounted below said opening, a casing providing a housing, a rotor in said housing having a plurality of paddles thereon, said casing having an elongated neck forming a complete inclosure and providing a relatively narrow passage communicating with the interior of said housing and extending partway into the opening, said opening having an inclined bottom extending directly from the lower inner edge of the neck toward said grate, means for rotating the rotor, a deflector hinged to the upper inner edge of said neck, and means for moving said deflector toward and from the inner end of the neck, said deflector being designed to deflect fuel, which is ejected through said neck by the rotor, directly on the inclined bottom of the opening and over the entire area of the grate, substantially as described.

2. The combination of a furnace having an opening through its wall, a casing forming a housing, a rotor therein, a neck on said casing providing a passage in communi-

cation with the interior of the housing, and projecting into said opening, means for actuating the rotor to cause fuel placed thereon to be passed through the passage in the neck, a deflector adjacent the open end of the neck to vary the direction of the fuel as it passes out of said neck, a sleeve having an opening communicating with the interior of the housing, a conveyer in said sleeve, two sprockets, a crank pin on one sprocket, a rod connecting said crank pin with the deflector and passing through an opening in the wall of the furnace, means for rotating the other of said sprockets and the conveyer, a chain operatively connecting the sprockets, and means for rotating said rotor, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL G. GREENAWALT.

Witnesses:

RHODA E. GILLIES,

CHAS. E. POTTS.