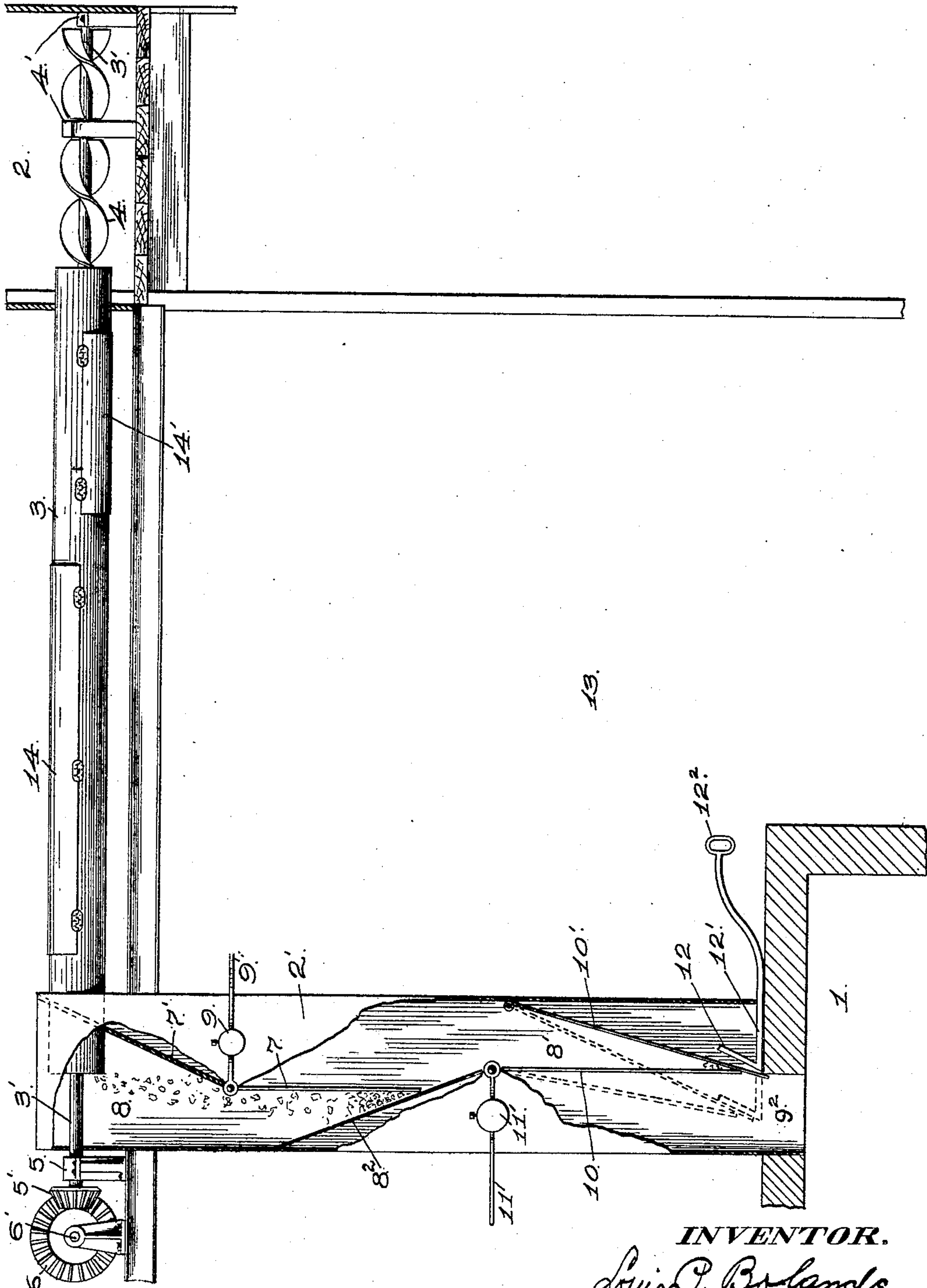


L. P. BOLANDER.
FEEDER FOR FURNACES.
APPLICATION FILED FEB. 24, 1908.

931,258.

Patented Aug. 17, 1909.



WITNESSES.

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UNITED STATES PATENT OFFICE.

LOUIS P. BOLANDER, OF SAN FRANCISCO, CALIFORNIA.

FEEDER FOR FURNACES.

No. 931,258.

Specification of Letters Patent.

Patented Aug. 17, 1909.

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To all whom it may concern:

Be it known that I, LOUIS P. BOLANDER, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Feeders for Furnaces, of which the following is a specification.

The invention relates more particularly to an improved feeder for automatically delivering shavings to what is known as a "Dutch oven," or that type of oven wherein the furnace is located in advance of the boiler, although the feeder is equally as well adapted for the delivery of shavings to furnaces generally.

To comprehend the invention reference should be had to the accompanying sheet of drawings, wherein is illustrated a side elevation of the feeder, shavings bin, feed stack, and furnace, the parts, excepting the casing for the worm feed shaft, being part sectioned.

In the drawings the numeral 1 is used to designate the furnace proper, and 2 the bin for the shavings, which bin is located a distance from the furnace and at a higher elevation. Immediately above and communicating with the interior of the furnace is situated the feed stack 2', into which the shavings are delivered from the bin 2. Connection between the stack 2' and the shavings bin 2 is made by means of the casing 3, within which casing works the shaft 3', carrying the spiral blades 4. This shaft with its blades constitutes a worm shaft for forcing by its rotation shavings through the casing 3. One end of the said worm feed shaft is extended into the shavings bin 2, being supported therein by the bearing brackets 4'. The opposite end of the shaft 3' is extended through the stack 2', and is supported by the bearing bracket 5, located outside of the said stack 2'. To this end of the shaft 3' is secured the pinion 5', which pinion meshes with the gear 6 secured to the drive shaft 6', which shaft is driven to impart rotation to the worm feed shaft by any suitable form of drive mechanism.

To prevent possible back firing of the flame from the furnace through the stack 2' into the shavings bin 2, there is located within the said stack 2' an upper hinged gate 7, which gate is suspended from the

lower end of the inclined plate 7' within the stack. This gate normally holds closed the upper chamber 8 of the passage-way 8' for the shavings, the lower end of the said gate resting on the fixed inclined deflector plate 8², which plate is arranged at an opposite inclination to the plate 7'. The gate 7 is held against the plate or wall 8² by means of the weight 9, adjustable on the arm 9', outwardly extended from the hinged gate 7.

To the lower edge of the deflector plate 8² is hinged the gate 10, which normally rests against the face of the inclined plate 10' to close the lower portion of the passage-way 8'. This plate 10' is arranged at an opposite inclination to the plate 8², consequently a staggered passage-way is formed for the travel of the shavings through the feed stack 2'. Like the hinged gate 7, there is extended from the hinged gate 10 an arm 11, on which is adjustably secured the weight 11'. It will be noted that the inclined walls will serve to break the fall of the fuel and coact with the hinged gates to prevent back firing. The inclined plate 10' is hinged to the inner face of the stack 2', and the lower edge portion thereof rests or bears against the inclined shouldered portion 12 of the slide plate 12', which plate works through a suitable guide opening in the stack 2', and rests on the upper surface of the furnace 1. This slide plate 12' controls the feed opening leading into the furnace 1. The said slide plate 12 is moved inwardly and outwardly by the handle 12², extended into the furnace room 13. The weights 9 and 11' are so adjusted relative to the arms 9' and 11, as to slightly overbalance the hinged gates 7 and 10, in order to hold the same normally in a perpendicular position to close the chamber 8 and the lower portion of the passage-way 8', respectively against the escape of shavings, until the weight of the accumulated shavings is sufficient to overcome the action of the weights 9 and 11', when the said gates are forced open to permit the shavings to escape.

In order that the casing 3 for the worm shaft may be readily cleaned in case the same becomes clogged or choked, there is provided a hinged section 14, which, when opened permits of a suitable tool being employed to free the stoppage. Said casing is also pro-

vided with a downwardly swinging hinged section 14', which, when opened permits of a small quantity of shavings falling from within the casing 3 onto the floor of the furnace or fireroom 13, to be used by the fireman as a kindling by which to start the fire within the furnace 1.

It will be observed that the portion of the worm feed shaft extended within the bin 2 works freely within the mass of shavings contained therein, no housing or boxing being provided for such exposed portion of the said worm feed shaft. By thus allowing of such portion of the worm feed shaft working free within the mass of shavings, the same forms its own shell—so to speak—and overcomes clogging at such point, which would occur in case of a housing or boxing being employed, due to the fact that small blocks of wood contained in the mass of shavings jamming within such housing or boxing, which, if permitted, damages the blades of the worm feed shaft. As such portion of the worm feed shaft is free within the shavings bin, blocks of wood too large to be carried through the casing 3, are forced to the bottom of the bin 2 through the body of shavings, and are thus prevented from entering into the receiving end of the casing for the worm feed shaft. The shavings delivered by the worm feed shaft from the shavings bin 2, through the casing 3 are gradually and slowly deposited into the upper chamber 8 of the stack 2', being confined therein until the weight of the accumulated mass is sufficient to force open the hinged gate 7, when the load or charge is deposited into the passage-way 8', being guided by the inclined plate 10' against the rear face of the gate 10. As soon as the shaving deposited from the receiving chamber 8 into the passage-way 8' is sufficient in weight to overcome the resistance offered by the swinging gate 10, the said gate is forced open and the shavings are released and escape into the furnace 1 through the controlled feed opening 9'. The resistance offered by the respective gates 7 and 10 is so regulated that one gate is held closed while the other gate is opened, which provides an obstructed passage-way and prevents the flame from the furnace back-firing into the shavings bin 2.

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

1. In a fuel feeder of the character described the combination of a stack adapted to be applied to a furnace, a plate secured at its upper end to the inner wall of the stack and projecting inwardly and downwardly from said wall, an auxiliary plate secured at its upper end to the opposite wall of said stack at a point below the connection of said first mentioned plate, and projecting inwardly and downwardly from said oppo-

site wall, and an automatically operable movable gate bridging the space between said plates.

2. In a fuel feeder an elongated upright stack, a plurality of plates within the stack projecting alternately from opposite sides of the stack, and a plurality of gates, each gate being hinged near its upper end to one of said projecting plates and normally contacting at its lower end with the succeeding oppositely projecting plate below.

3. In a fuel feeder of the character described, the combination of a feed stack adapted to be applied to a furnace, an inclined plate projecting from one side of the stack and therewithin to a point beyond the center thereof, a similar inclined plate projecting from the opposite side of the stack and spaced vertically from the first mentioned inclined plate and overlapping the latter, and an adjustable gate extending from one plate to the other, and adapted to be operated automatically by the falling fuel.

4. In a fuel feeder of the character described, the combination with a furnace of a feed stack communicating therewith and having a plurality of oppositely inclined plates arranged at different horizontal levels therein and gates, each gate being hinged near its upper end to one of the said inclined plates and normally contacting at its lower end with the succeeding oppositely inclined plate below.

5. In a fuel feeder of the character described, the combination of a feed stack adapted to be applied to a furnace and having a plurality of oppositely inclined plates arranged at different horizontal levels therein, and gates, each gate being hinged near its upper end, to one of said inclined plates, and means for normally holding said gates in closed position while permitting the same to operate automatically to discharge the fuel content in the stack, said means including adjustable weights, one for each gate.

6. In a fuel feeder of the character described, the combination with a furnace of a vertically arranged fuel feed stack connected thereto, means for preventing back firing in the stack comprising a movable inclined plate mounted within the stack, and a movable gate also mounted within the stack, the plate and gate being constructed and arranged to contact and constitute together a closure for the stack, and the gate being automatically operable by the falling fuel to drop the contents, and means for adjusting the plate to regulate the delivery.

7. In a fuel feeder of the character described, the combination with a furnace of a feed stack communicating therewith and having a plurality of oppositely inclined plates arranged at different horizontal levels therein, and a plurality of gates, each

gate being hinged near its upper end to one of said inclined plates and normally contacting at its lower end with the succeeding oppositely inclined plate below, and the lowermost inclined plate being adjustable.

8. In a fuel feeder of the character described, the combination with a furnace of a feed stack communicating therewith and having a plurality of oppositely inclined plates arranged at different horizontal levels therein, and a plurality of gates, each gate being hinged near its upper end to one of the said inclined plates and normally contacting at its lower end with the succeeding oppositely inclined plate below, the lowermost inclined plate being adjustable and means extending without the stack for adjusting the same.

9. In fuel feeder of the character described, the combination with a furnace, of a fuel stack communicating therewith, of means for regulating the feed opening from the stack into the furnace, inclined plates arranged within the stack and projecting alternately from opposite sides of the stack and overlapping to form a staggered passage for the fuel through the same, hinged gates for controlling the flow of fuel through the staggered passage, said hinged gates being pivoted adjacent their upper ends to the inclined plates and contacting at their lower ends with the succeeding inclined plate below, adjustable devices for holding the said gates closed normally, and a worm feed shaft for supplying fuel from the holding receptacle to the feed stack.

10. In a fuel feeder of the character described, the combination of a feed stack, adapted to be applied to a furnace, inclined plates within the feed stack and projecting alternately from opposite sides of the feed stack and overlapping to form a staggered passageway for the fuel and automatically operable hinged gates one arranged intermediate each of said overlapping plates and contacting with the adjacent plate thereabove and therebelow for controlling the feed of fuel from one plate to the other.

11. In a fuel feeder the combination with a furnace, of a vertically arranged feed stack communicating with the furnace, a fuel storage bin, horizontally spaced from said stack and adjacent the upper end thereof, the stack and bin having alined openings in their adjacent walls, an elongated horizontally extending tubular casing sleeved in the said alined openings in the stack and bin, a screw conveyer in the casing extending therebeyond in the bin, an inclined plate within the stack arranged to extend beyond the discharge end of the horizontal case and in the path of the falling fuel, a gate pivoted at its upper end to said inclined plate and an oppositely disposed inclined plate within the stack with which the gate contacts.

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

LOUIS P. BOLANDER.

Witnesses:

N. A. ACKER,
D. B. RICHARDS.