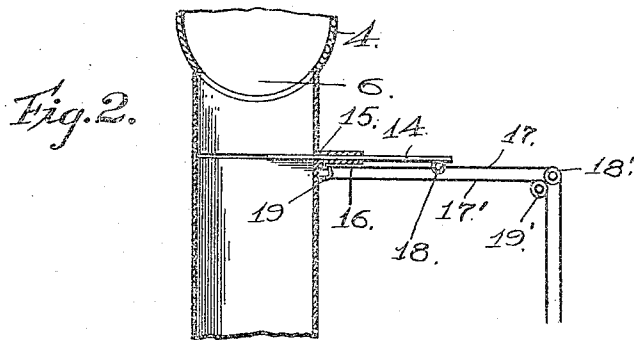
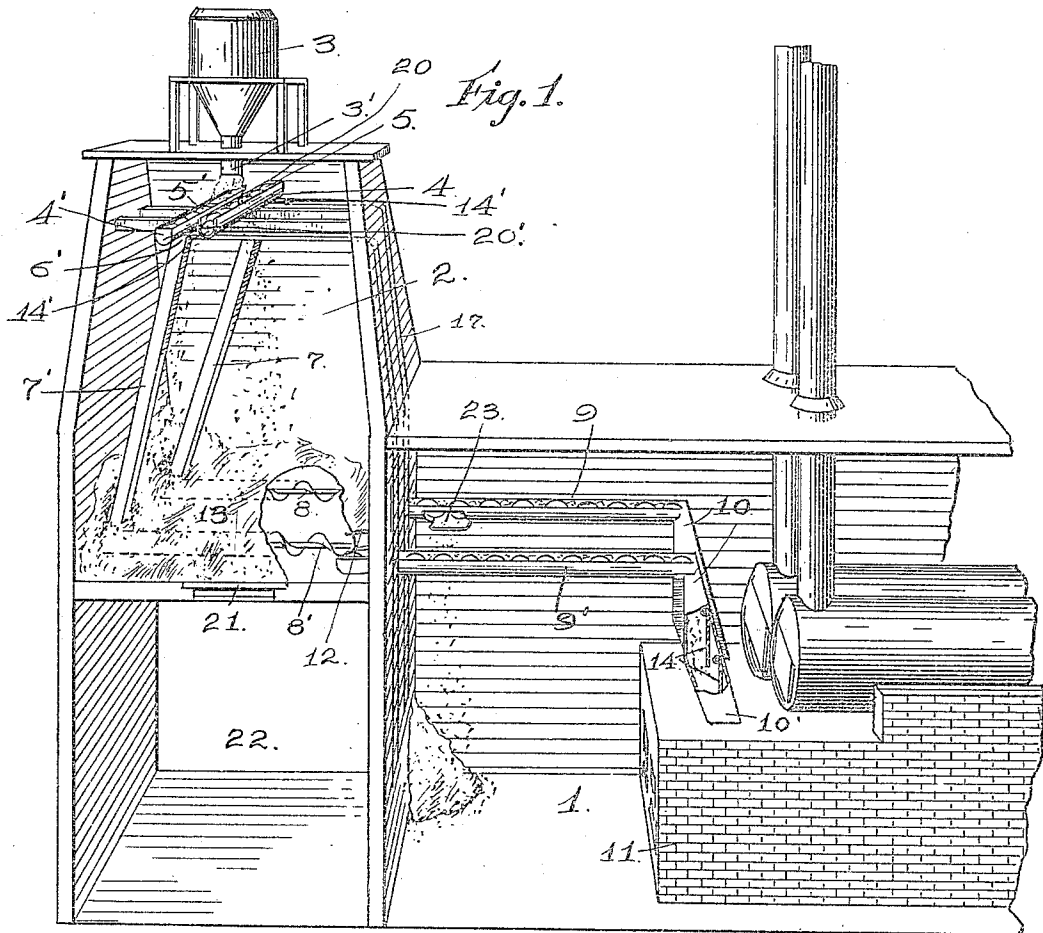


L. P. BOLANDER.
FEEDER FOR FURNACES.
APPLICATION FILED MAY 13, 1909.

957,184.

Patented May 10, 1910.



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UNITED STATES PATENT OFFICE.

LOUIS P. BOLANDER, OF SAN FRANCISCO, CALIFORNIA.

FEEDER FOR FURNACES.

957,184.

Specification of Letters Patent.

Patented May 10, 1910.

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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 in 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.

This invention relates to an improved feeder for automatically delivering shavings to furnaces generally, but more particularly to that class of furnaces known as "Dutch ovens;" the object of the invention being to reduce the expense incident to the firing of the furnace, to provide a safe, efficient, and simple feeder for the delivery of the shavings from a distant point to the combustion chamber of the furnace, and to provide against arching of the shavings to be delivered to the furnace, the arrangement being of such a character as to reduce fire risk to a minimum.

To comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a perspective view of the feeder mechanism applied to a furnace, the front side wall of the shaving bin and the furnace room being removed, portions of the housings in which the worm conveyers for delivering the shavings from the bin to the down stack communicating with the furnace being broken away, likewise the down stack. Fig. 2 is an enlarged broken sectional detail view of one of the chutes with cut-off slide applied thereto.

In the drawings, the numeral 1 is used to indicate the furnace room, and 2 the bin for the shavings, which bin is located a distance from the furnace room and at a higher elevation. The shavings are delivered into the bin 2 by the separator 3, which is located outside of the same and the spout thereof extended through the roof of the said bin.

A slight distance below the spout 3' of the separator 3, and within the bin 2, the troughs 4—4' are located, in which troughs work respectively the feed worms 5—5'. The feed worm 5 forces the shavings falling into the trough 4 toward the discharge outlet 6, through which they are delivered to the downwardly inclined chute 7; while the feed worm 5' forces the shavings falling into the trough 4' toward the discharge outlet 6', through which they are delivered to the downwardly inclined chute 7'. The chutes

7—7' receive the shavings from opposite ends of the troughs 4—4', and the shavings thus delivered into the said troughs from the separator 3 are distributed between the inclined chutes 7—7'.

The lower end of the chutes 7—7' are closed, and into such portion of the chutes extend respectively the longitudinally disposed parallel worm conveyers 8—8', the outer end of each worm conveyor terminating immediately above the troughs or housings 9—9', which extend outside of the bin 2 and into the furnace room 1, the outer end of each projecting within the inclosed downwardly extended delivery stacks 10, the lower end of which stacks rest within the feed opening 10' of the furnace 11.

The worm conveyers 8—8' are unhoused, excepting as to the cover plates 12, which inclose that portion of the said conveyers resting immediately above the inner end of the troughs or housings 9—9'. Such housing as may be required for the worm conveyers 8—8', is formed by the body of shavings 13 resting within the bin 2.

To provide against back firing of the flame from the combustion chamber of the furnace 11 into the shaving bin 2, each of the inclined stacks 10 is provided with the hinged plates or gates 14, which gates or plates are hinged to the inner face of the outer wall of said stack and swing inwardly and normally rest adjacent the opposite wall of the stacks to partially close the passage-way thereof. These gates form a contracted passage-way for the downflow of the shavings into the furnace, and they swing inwardly to close the passage-way of the stack on a back pressure exerted thereon by the back firing from the furnace, thereby preventing the flame running to the moving body of shavings. Such of the shavings as overflow from the troughs 4—4', fall into the bin 2 and gradually accumulate therein.

The delivery of shavings into the down spouts or chutes 7—7' may be cut out at any time by means of the slides or cut-off plates 14—14', which are slidable through openings 15 in the upper end portion of the said spouts or chutes 7—7'. These cut-off plates work in guides 16, and are moved inwardly and outwardly by the cords 17—17' extended within the furnace room 1, to be within convenient reach of the operator. The cords 17 are connected to an eye 18 and run over pulleys 18', so as to permit of the cut-off

plates being drawn outwardly; while the cords 17' connected to said eye, are thence run inwardly and under pulleys 19 secured below the guides 16 near the inner end thereof, and thence run outwardly over the pulleys 19', so that a pulling strain exerted thereon serves to force inwardly the cut-off plates to close the spouts or chutes 7—7' and stop the feed of shavings therethrough onto the worm conveyers 8—8'. The shavings will then be conveyed by the respective worms 5—5' past the outlets 6—6' to the open ends 20—20' of the chutes and delivered into the bin 2. As the overflow shavings accumulate within the bin 2, the same are withdrawn therefrom by opening the slide door 21 in the bottom thereof and permitting the same to fall into wagons passing through the passage-way 22, constructed beneath the bin for the removal thereof. Inasmuch as the shavings are derived from mills for the working of wood, there are at all times, as a rule, more shavings than required to serve as a fuel for the furnace operating the plant, and, as the surplus shavings are sold for other purposes, the bin 2 is never filled to its full capacity by the overflow accumulation.

The reason for diverting a portion of the shavings into the feed worms, for the delivery thereof to the conveyer worms 8—8' through the chutes 7—7' rather than permitting the said conveyer worms 8—8' to take the shavings from the mass within the bin 2, is due to the fact that the weight of shavings become so great that they pack firmly and arch over the said conveyer worms to such an extent that the shavings fail to feed into the rotating worm conveyers, and it is this difficulty which the invention is mainly designed to obviate and which is successfully overcome by supplying the shavings to said worm conveyers in small quantities directed thereon in an agitated condition. Arching of the shavings is thus prevented, and a continuous regulated flow thereof delivered to the said conveyers. Inasmuch as the arched shavings within the bin form a housing for the worm conveyers, a complete passage-way for the shavings being conveyed from the chutes 7—7' is provided. Each housing 9—9' is provided with a gate section 23, which is used at the close of the day, when the feed mechanism is closed down, for freeing the said housings of its contents.

Inasmuch as any well known form of drive means may be employed for imparting motion to the various worms to cause travel of the shavings, illustration thereof in connection with the present drawings is deemed unnecessary for an understanding as to the workings of the parts.

By the use of the described invention the shavings are received by the rotary feed

means in small quantities and while in an agitated condition, and gradually delivered to the means for discharging into the furnace in a continuous flowing stream. The shavings are thus prevented from accumulating and arching, and the feed thereof is maintained in proportion to the requirements of the furnace. When the feed mechanism is not taking a portion of the shavings falling from the separator 3, as for instance, where delivery therefrom has ceased for any reason, then the supply may be drawn from the accumulated mass of shavings within the bin 2, but in such case the arch formed must be broken down in order that the shavings may be released so as to be taken up by the propelling means.

It is obvious that the construction of the working parts is not confined to the arrangement shown, inasmuch as the invention resides in diverting a portion of the mass of flowing shavings and delivering the same in a continuous stream to the means for discharging the same into the furnace.

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

1. In a feeder for the described purpose, the combination with a bin for the reception of shavings, means for delivering shavings thereto, a trough within the bin for receiving a portion of the said shavings delivered into the bin, a feed worm within said trough, a downwardly extended chute connected with said trough for receiving shavings from the feed worm, a conveyer worm located within the bin to receive the shavings discharged from the said chute, the housing for said conveyer worm being formed by the shavings overflowing into the bin, a chute or housing extended beyond the bin and into which the conveyer worm discharges, a worm within the housing for receiving such discharged shavings, and a downward extended stack with which said housing connects for receiving and conveying the discharged shavings to the furnace.

2. A feeder for delivering shavings to a furnace without permitting the arching thereof, the same comprising a bin for the shavings, rotating means arranged in the upper portion thereof for receiving a portion of the shavings delivered into the bin, a downwardly extended chute into which such shavings are discharged by the rotating means, a conveyer within the bin and below said rotating means at a point adjacent the discharge end of the chute for receiving the shavings from said chute and forcing the same through the bin, and means for receiving the shavings from the said conveyer and delivering the same to the furnace to be fired.

3. A feeder for delivering shavings to a

furnace without permitting the arching thereof, the same comprising a bin for the shavings, a plurality of rotating devices arranged in the upper portion of the bin for receiving a portion of the shavings delivered therein, a plurality of downwardly extended chutes into which the shavings are discharged by the rotating devices, a plurality of conveyers within the bin and below the rotating devices therein for receiving the shavings from the chutes and forcing the same through the arch formed by the shavings overflowing into the bin from the rotating devices, and means associated with said conveyers to receive the shavings therefrom and delivering the same to the furnace to be fired.

4. A feeder for delivering shavings to a furnace in proportion to the requirements thereof, the same comprising a receptacle

for the shavings, means for delivering shavings thereto, rotating mechanism for receiving and diverting a portion of the falling shavings, a downwardly extended chute into which the diverted shavings are discharged, and means for taking the shavings from the said chute and delivering the same to the furnace, the said means being located in said bin below the rotating mechanism and connecting with the discharge end of the chute, whereby the material may be constantly delivered through the arch formed by the overflowing shavings in the bin.

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

LOUIS P. BOLANDER.

Witnesses:

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A. K. DAGGETT.