No. 730,934. PATENTED JUNE 16, 1903.

J. C. LEARY.

SHAVING FEEDER FOR FURNACES.

APPLICATION FILED MAR. 31, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

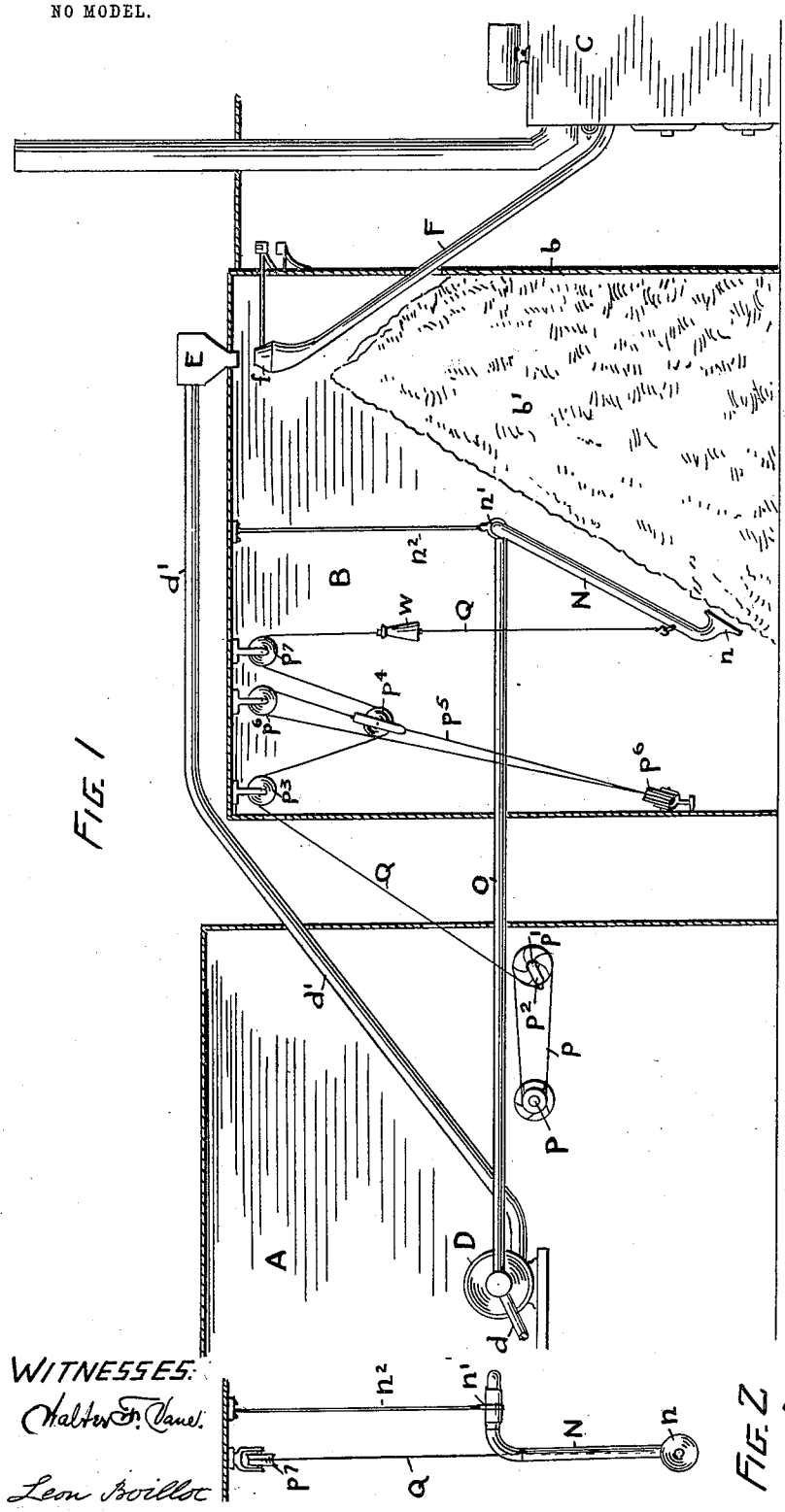


FIG. 1

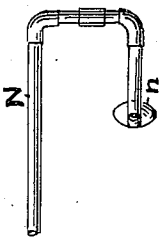


FIG. 3

FIG. 2

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

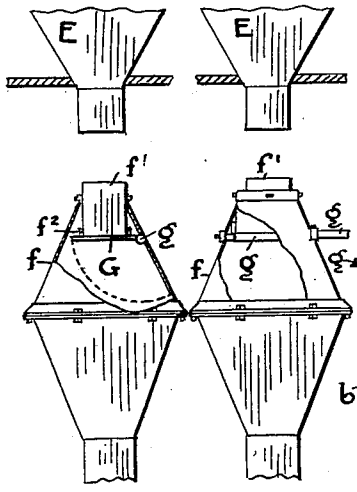


FIG. 5

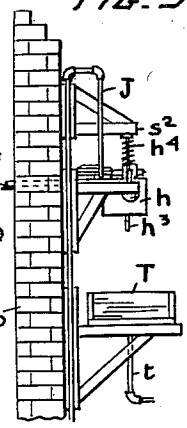
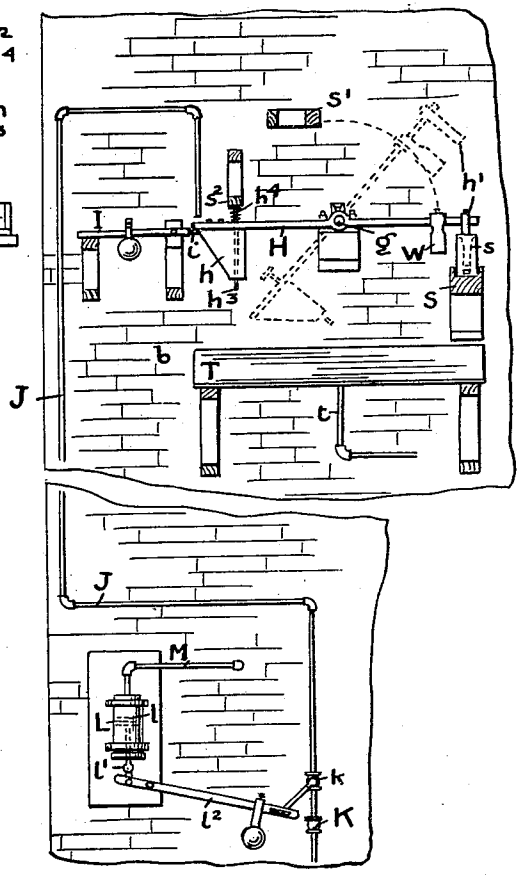
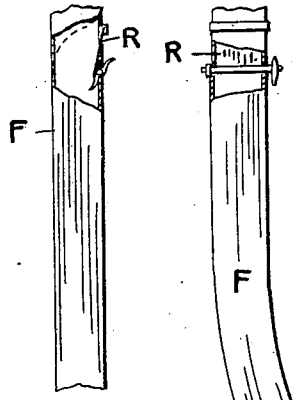


FIG. 4





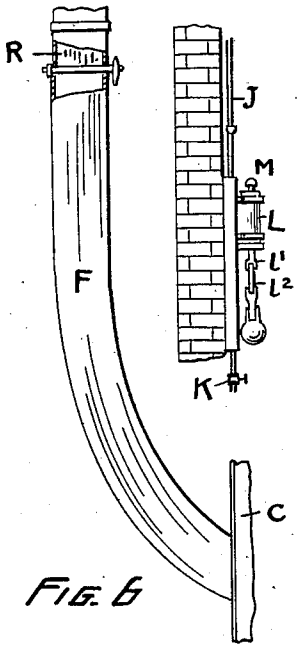


FIG. 7

FIG. 6

FIG. 8

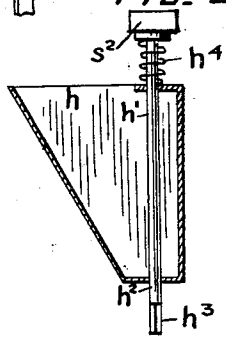
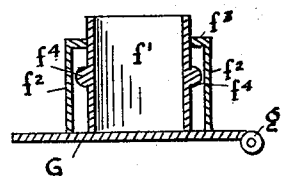


FIG. 9



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No. 730,934. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

JOHN C. LEARY, OF SAN FRANCISCO, CALIFORNIA.

SHAVING-FEEDER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 730,934, dated June 16, 1903.

Application filed March 31, 1903. Serial No. 150,371. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. LEARY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Shaving-Feeders for Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of furnace fuel-feeders, and is especially intended for feeding shavings, sawdust, and other mill refuse.

The objects of my invention are, broadly stated, to automatically control the supply of shavings or similar fuel and to draw on the surplus or overflow pile as occasion requires.

My invention consists in the novel construction, arrangement, and combination of parts, which I shall hereinafter describe by reference to the accompanying drawings, in which—

Figure 1 is a view showing in side elevation those parts of the apparatus designed for taking the shavings from the overflow-pile in the shaving-house and returning them to the blower in the mill to be again sent to the separator, said view also showing somewhat diagrammatically the relative position of the mill, shaving-house, and furnace, and indicating the feeder-pipe leading from the separator to the furnace. Fig. 2 is a front view detail of the suction-pipe of Fig. 1, adapted to recover the shavings from the pile. Fig. 3 is a plan view detail of same. Fig. 4 is an elevation of one of the walls of the shaving-house, showing the devices for operating the controlling-gate of the feeder-pipe. Fig. 5 is an end elevation of the operating devices on the wall of the shaving-house. Fig. 6 is a view of the feeder-pipe in elevation, partly broken, and indicating the overlying separator. Fig. 7 is a front view, partly broken, of the feeder-pipe and overlying separator. Fig. 8 is a detail of the safety-valve in the automatically-discharging water-bucket. Fig. 9 is a detail showing the adjustable sleeve f^2 of the charge vessel f'.

Referring first to Fig. 1, A represents the mill structure, B the shaving-house, and C the furnace in the fire-room. In the mill A is a blower D, to which a suction-pipe d leads from the machines which make the shavings. From this blower issues the discharge-pipe d', which leads to the separator E on top of the shaving-house. This separator is a "hopper-like box," so called, because in it the air escapes and the shavings drop down through its base. Directly under the separator is the receiving-head f of the feeder-pipe F, which passes down through the end wall b of the shaving-house and down to the furnace C.

The parts thus far described are common to shaving-feeders, and their operation may be briefly described. The shavings are taken from the machines through pipe d to the blower D and by said blower are driven through pipe d' to the separator E, in which, freed of the air, they fall through into the pipe F and are conveyed to the furnace, the overflow of shavings falling down into the shaving-house and forming the shaving-pile, which I have indicated by b'.

Referring now to Figs. 6 and 7, the novel features of the feeder-pipe will be described. It is best in practice to supply the shavings to the furnace in stated charges at given intervals instead of constantly. The head f of the feeder-pipe is provided with a charge vessel f', the open bottom of which is controlled by a gate G, secured to an oscillating shaft g, which passes out through the wall b of the shaving-house. When the gate is closed up to the charge vessel, the shavings will fill it and remain in it until the gate is dropped, when they will fall through in a stated charge. The gate then closes again for a second charge. In order to provide for intervening obstructions, such as knots, preventing the gate from closing, I have, as shown in Fig. 9, a guard-sleeve f^2 loosely fitted around the lower end of the charge vessel and suspended freely by a top flange f^3, engaging a bead f^4 on the charge vessel. This sleeve follows down by gravity as the gate drops until arrested by bead f^4, and as the gate rises to its fully-closed position it simply pushes the guard-sleeve up; but if the gate cannot, by reason of an obstruction, fully close the sleeve drops down to meet it, and thus effects a sufficient closure.

In order to operate the controlling-gate G by oscillating the shaft g, I employ devices

seen in Figs. 4 and 5. In these figures, *b* is the end wall of the shaving-house. Secured to the outwardly-projecting end of shaft *g* is a lever H, carrying at one end a bucket *h* and at the other an adjustable counterbalance-weight W. In the horizontal position of this lever the gate G is held closed, and said lever is limited in its stroke at the horizontal by a fixed stop S and at the vertical by a fixed stop S'. To prevent a noisy contact with stop S, I provide an air-cushion formed by a piston *h'* on the lever end entering an air-well *s* in stop S. The lever H is locked temporarily in its horizontal position by an ordinary beveled spring-latch *i* in the end of a pivoted adjustably-weighted lever I.

J is a water-pipe leading from any suitable source. It is in practice best to lead it from the mains or tank and to terminate its connection in the heater or pump, so that no water need be wasted. This pipe leads in suitable course, as shown in Fig. 4, to a point where it will discharge into the bucket *h* of lever H. When the bucket receives enough water to overcome the locking-lever I, it will descend, thereby tilting lever H and rocking shaft *g*, whereby gate G is opened and the charge of shavings dropped. When the bucket reaches a certain point, its water will be spilled out into a receiving-tank T, from which a pipe *t* leads to the heater or pump. Then the lever H will return and close the gate G. In order to insure the accurate operation of lever H, I have fitted to its bucket *h* what may be termed a "safety-valve." This consists of a longitudinally-slidable rod *h'*, (see Fig. 8,) which passes down through an outlet in the bottom of the bucket. The round portion h^2 of this rod will when the rod is pressed down fill the outlet and stop it up; but the square portion h^3 under the round part will when it is in the outlet leave the latter open. The head end of the rod is provided with a spring h^4, which tends normally to hold the rod up to keep the outlet of the bucket open. Now if the lever H returns to its full horizontal position, so that the gate G is closed fully, then the head of the rod *h'*, as seen in Fig. 4, will press up under a fixed stop s^2, which will push the rod down and close the bottom outlet of the bucket, and said bucket will then fill with water; but if for any reason the lever H does not reach its full horizontal position or drops back therefrom the spring h^4 will hold the rod up, so that the safety-outlet of the bucket is open and the water will simply run through it, and the governing mechanism will not operate.

The hand control of the water-supply of pipe J is represented by the valve K. In case it be desired to render this control automatic and dependent on the needs of the boiler I have, as shown in Fig. 4, upon the wall *b* a cylinder L, in which is a piston *l*. To the cylinder, above the piston, is admitted a steam-pipe M from the boiler. To the piston-rod *l'* is suitably connected a counterbalanced lever l^2, which is connected, as shown, with a valve *k* of the pipe J. A second gate, such as R, Figs. 6 and 7, may be placed in feeder-pipe F and used to close said pipe when the upper portion has to be removed or repaired.

Returning now to Fig. 1, I will describe the means for disposing of the surplus in the shaving-pile. Of course according to the number of machines working the shaving-pile will be greater or smaller. There are times when the demands of the furnace will just equal the shaving-supply, and at times it may exceed said supply and at other times be less than said supply. In the last-named case the pile will increase from the overflow. In the second case the pile may be drawn upon to fill the deficit. To thus draw upon the pile, I have a suction-pipe N, Figs. 1, 2, and 3, having an enlarged nozzle-head *n*. This pipe is pivotally hung at *n'* from a hanger n^2, adapting it to swing to and from the shaving-pile. This movement, it must be stated, is a constant one, for it is only when the suction-nozzle is approaching to or receding from the pile that the shavings can be drawn in. Therefore the pipe N constantly swings to and from the pile. With this suction-pipe communicates a pipe O, extending to the blower D. The movement of the suction-pipe is effected by a block and tackle, which will permit its adjustment in accordance with the increasing or diminishing size of the pile.

P is a shaft, to which power is led. From this shaft extends a belt *p* to a counter-shaft *p'*, carrying a crank-pin p^2, from which a line Q extends to and over a pendent block p^3, thence down to an idler-block p^4, secured in a second line p^5, mounted between blocks p^6, and thence over a block p^7 and down to its connection with the suction-pipe N. A weight *w* in the final fall of line Q serves to take up any slack just short of the suction-pipe. By these means the shavings can be returned from the pile to the blower and once more sent around to the separator and feed-pipe. By means of the second line p^5 the suction-pipe can be adjusted properly relatively to the pile and can be thrown wholly out of use when desired by removing it far enough away.

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

1. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from said chamber, a rock-shaft on which the gate is mounted, a swinging counterbalanced lever secured to said shaft and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, and means for supplying said bucket with water.

2. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from said chamber, a rock-shaft on which the gate is mounted, a swinging counterbalanced lever secured to said shaft and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, a temporary lock to hold the lever while the bucket is being filled with water and to release it when filled, and means for supplying said bucket with water.

3. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from said chamber, a rock-shaft on which the gate is mounted, a swinging counterbalanced lever secured to said shaft and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, means for supplying said bucket with water, and means for controlling the supply of water.

4. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from said chamber, a rock-shaft on which the gate is mounted, a swinging counterbalanced lever secured to said shaft and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, means for supplying said bucket with water, and means controlled by the pressure of the boiler-steam for automatically controlling the water-supply.

5. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from said chamber, a rock-shaft on which the gate is mounted, a swinging counterbalanced lever secured to said shaft and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, means for supplying said bucket with water, and means controlled by the pressure of the boiler-steam for automatically controlling the water-supply consisting of a valve, a steam-pipe from the boiler, a cylinder connected with said pipe, a piston in the cylinder operated by the pressure of steam in said pipe and connections between said piston and valve.

6. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, a charge vessel in the receiving end of the feeder-pipe, a swinging gate controlling the lower end of said charge vessel, a vertically-movable guard-sleeve loosely suspended from the lower end of the charge vessel and adapted by contact with the gate to insure a closure of the charge vessel, and means for operating said gate.

7. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from the chamber, a rock-shaft carrying the gate, a swinging counterbalanced lever secured to said shaft, and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, means for supplying water to the bucket, a temporary lock for holding the lever in position to fill its bucket, a valve controlling a safety-outlet in the bucket, means for holding said valve closed while the lever is locked in position to permit its bucket to be filled, and means for opening said valve when the lever is unlocked.

8. In a furnace fuel-feeder of the class described, and in combination with the blower and connections for supplying the material, a feeder-pipe to receive said material and conduct it to the furnace, said pipe having a charge-chamber, a gate controlling the discharge from the chamber, a rock-shaft carrying the gate, a swinging counterbalanced lever secured to said shaft, and having a water-bucket adapted to swing the lever and to discharge its own contents by the swinging of said lever, means for supplying water to the bucket, and an air-cushion stop to limit the return of the lever.

9. In a furnace fuel-feeder of the class described, the combination of a blower and connections for supplying the material, a feeder-pipe disposed with relation to said blower connections as to receive therefrom a part of the material, the remainder or surplus overflowing into a pile, said feeder-pipe being adapted to conduct the part it receives to the furnace, a movable suction-pipe, means for vibrating said pipe toward and from the overflow or surplus pile to cause it to draw the material therefrom, and a pipe connection between said suction-pipe and the blower whereby the material from said pile is returned through the blower to the feeder-pipe.

10. In a furnace fuel-feeder of the class described, the combination of a blower and connections for supplying the material, a feeder-pipe disposed with relation to said blower connections as to receive therefrom a part of the material, the remainder or surplus overflowing into a pile, said feeder-pipe being adapted to conduct the part it receives to the furnace, a suction-pipe pivotally hung in the vicinity of the overflow or surplus pile and communi-

cating with the blower, and a haulage-tackle connected with said suction-pipe for vibrating it to and from the pile to cause it to draw the material therefrom and direct it to the blower whereby the material from said pile is returned through the blower to the feeder-pipe.

11. In a furnace fuel-feeder of the class described, the combination of a blower and connections for supplying the material, a feeder-pipe disposed with relation to said blower connections as to receive therefrom a part of the material, the remainder or surplus overflowing into a pile, said feeder-pipe being adapted to conduct the part it receives to the furnace, a suction-pipe pivotally hung in the vicinity of the overflow or surplus pile and communicating with the blower, the haulage-tackle connected with the suction-pipe for vibrating it to and from the pile to cause it to draw the material therefrom and direct it to the blower whereby the material from said pile is returned through the blower to the feeder-pipe, and the second tackle for adjusting the haulage-tackle and the suction-pipe.

In witness whereof I have hereunto set my hand.

JOHN C. LEARY.

Witnesses:
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D. B. RICHARDS.