(No Model.) 2 Sheets—Sheet 1.

T. W. JENKINS.

FEEDING SHAVINGS TO FURNACES.

No. 542,477. Patented July 9, 1895.

Fig. 1.

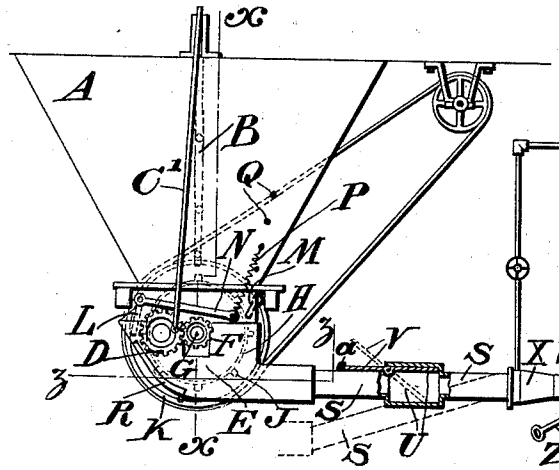


Fig. 7.

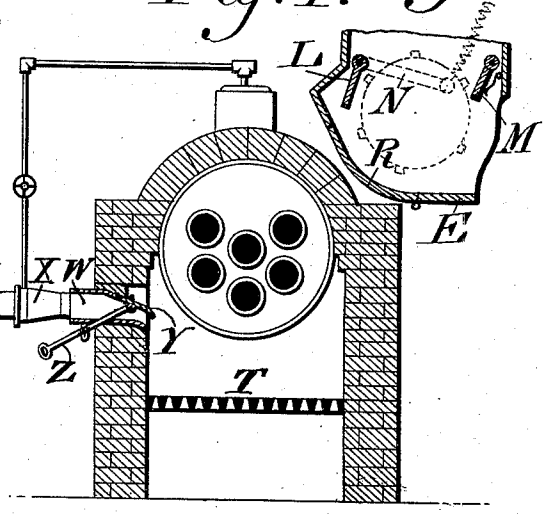


Fig. 2.

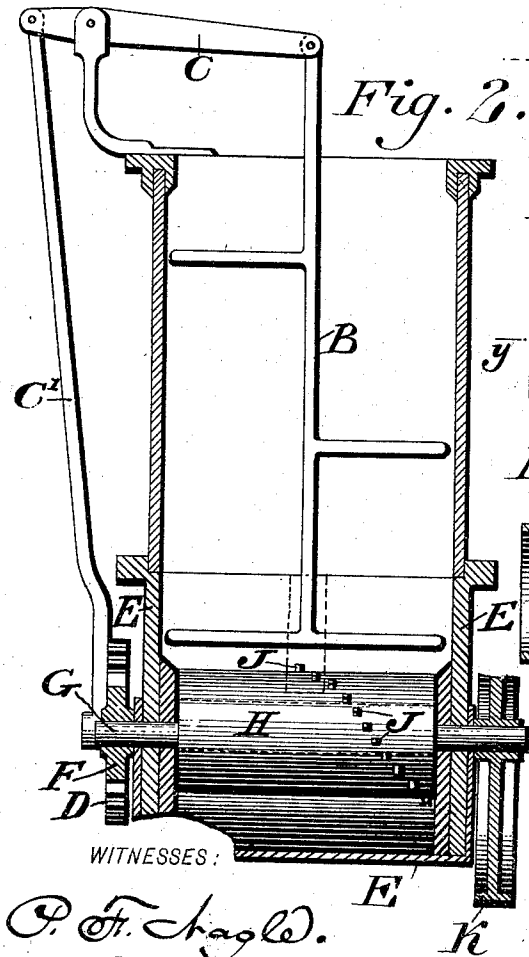


Fig. 3.

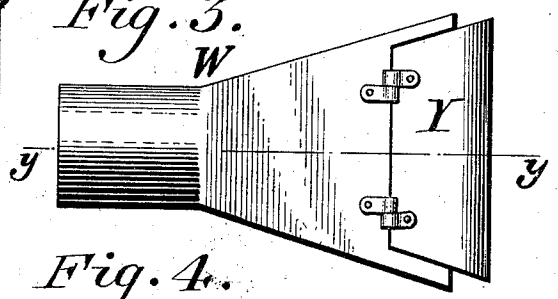


Fig. 4.

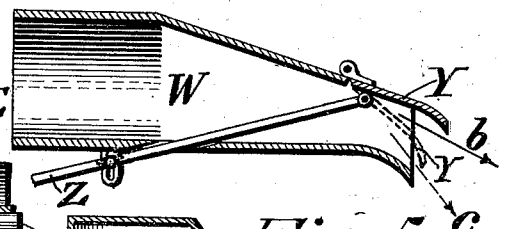
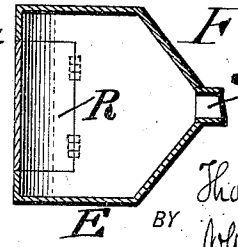


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

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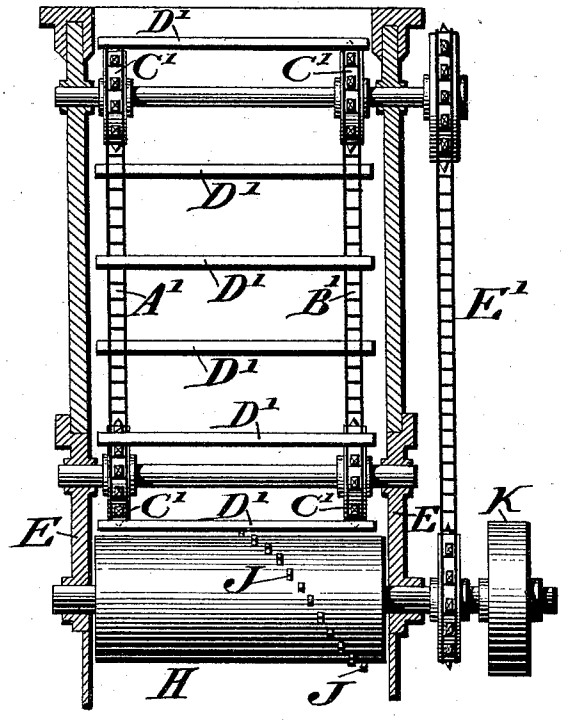
FEEDING SHAVINGS TO FURNACES.

No. 542,477. Patented July 9, 1895.

Fig. 6.



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FEEDING SHAVINGS TO FURNACES.

SPECIFICATION forming part of Letters Patent No. 542,477, dated July 9, 1895.

Application filed March 9, 1893. Renewed May 23, 1895. Serial No. 550,458. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. JENKINS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Devices for Feeding Shavings, &c., to Furnaces, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in devices for feeding shavings, &c., to furnaces; and it consists of novel means whereby fuel may be conveyed from a receptacle to a distant furnace.

It further consists of means for automatically closing communication between the furnace and the fuel-receptacle, so as to prevent the heat of the furnace from reaching the fuel when the injector of the device is not in operation.

It further consists of the combination of parts hereinafter claimed.

Figure 1 represents a partial side elevation and partial vertical section of the device embodying my invention. Fig. 2 represents a partial side elevation and partial vertical section on line *x x*, Fig. 1, on an enlarged scale. Fig. 3 represents a plan view of a detached portion. Fig. 4 represents a vertical section on line *y y*, Fig. 3. Fig. 5 represents a horizontal section of a portion on line *z z*, Fig. 1. Fig. 6 represents a partial side elevation and partial vertical section of a modification. Fig. 7 represents a vertical section of a detached portion, showing the valves in the hopper.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a hopper mounted on any suitable support, which latter is not shown in the drawings, and B designates a beater placed within the same and operated by a lever C, mounted on said hopper and connected by means of a rod C′ to a crank-wheel D on a casing E below the hopper A, said casing being adapted to receive the fuel placed in said hopper.

The crank-wheel D meshes with a pinion F on the driving-shaft G, which latter is journaled in the casing E and has mounted thereon a drum H, provided with spurs or studs J, preferably arranged on the same in the form of a spiral, so as to relieve said studs from unnecessary strain when the fuel in the hopper is being operated upon.

The shaft G has mounted thereon a driving-wheel K, which may be operated in any suitable manner.

In the discharge end of the hopper are the spring-actuated gates L and M. The former of these has connected with it a lever N, whose free end is provided with a spring P, one end of which is adapted to be inserted in any one of the openings Q, so as to regulate the space or passage between the gate L and drum H, it being evident that in case the fuel contains lumps which are too large to pass through said space, as adjusted, the gate L will yield and thus be permitted to open, thereby increasing said space and permitting the lumps of fuel to pass through the same and obviating the possibility of the fuel clogging at this point.

The gate M will yield and open should there be pressure thereon from above, due to the downward action of the beater.

The casing E is provided with a door R to provide means for reaching the interior of the casing E from without the same when so required. Connected with the discharge end of the casing E is a pipe S, which forms a communication between the hopper A and a furnace T, said pipe being provided with a valve U, whose normal position is open, as shown in full lines in Fig. 1, thereby forming a communication between said hopper and the furnace and permitting the fuel in the hopper to reach the latter.

The valve U is formed with a stem V, which projects outside of the pipe S, so that when the valve is open said stem comes in contact with the outside of the pipe and is held against the same by a piece of wax, soap, &c., as at *a*, thus preventing the valve U from closing, except when an injector, to be hereinafter referred to, is not in operation. As long as said injector is in operation it will prevent the heat in the furnace from entering the pipe S, but as soon as the injector is shut off the heat in the furnace may enter the pipe S and reach the fuel in the hopper. In this case the wax, soap, &c., will melt and the valve U, being released, will drop and shut off the com-

munication between the furnace and hopper and thereby guard the fuel in the hopper from becoming ignited.

If desired the pipe S may be made to slant, as shown in dotted lines in Fig. 1, its highest point being connected with the furnace and its lowest point with the hopper, in which case the valve U may be dispensed with, as there would be no danger of the ascending heat from the furnace entering the pipe S when the injector is not in operation.

Interposed between the valve U and a chute W is an injector X adapted to create a suction in the pipe S, so as to draw the fuel from said casing to the injector, after which it is forced by the same through the chute W and into the furnace T. The chute W is provided with a gate Y, which may be adjusted by a rod Z, so as to change the angle thereof and direct the fuel to different parts of the furnace.

The operation is as follows: The fuel to be fed to the furnace is placed in the hopper, the valve V opened, and the apparatus started. The wheel D and intermediate parts impart a rising and falling motion to the beater within said hopper, by which means the fuel in the hopper will be kept constantly in motion and prevented from becoming packed. The spurs or studs J carry the fuel from the hopper into the casing E, from which it is drawn by suction in the pipe S and injected into the furnace.

As hereinbefore stated, when the injector is not in operation the hot air in the furnace naturally enters the pipe S, and if of a moderate degree will not affect the wax, soap, &c., which retains the valve U open. If, however, the heat is excessive, the same will melt the wax, soap, &c., and the valve will then close and prevent the heat from entering the pipe beyond this point.

When the temperature of the heat in the pipe is sufficiently reduced, or when the injector is again in operation, the valve U is opened, preferably by hand, and secured, and the communication between the hopper and furnace is re-established.

When the gate Y is opened to full extent the fuel is deflected by the same in the direction indicated by the arrow *b* in Fig. 4, and when the gate is partly closed, as shown in the same figure in dotted lines, the fuel will be deflected in the direction indicated by the arrow *c*. In this manner the fuel may be supplied to a portion of the fire adjacent to the chute W, or to that portion of the fire farthermost from said chute, or it may be directed to any intermediate point, if so desired, as conditions may require.

In the modification shown in Fig. 6 a conveyer consisting of endless chains A′ and B′, which pass around sprocket-wheels C′ and carry cross-pieces D′ and operated by a sprocket-chain E′, is employed in place of the beater B and mechanism for operating the same.

The other parts of the device are similar to those hereinbefore described.

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

1. In a fuel feeder, a hopper having therein a feeding device, a rising and falling beater, and means for operating said device and beater, said device being of the form of a drum with spurs thereon, substantially as described.

2. A fuel feeder having a hopper with spring actuated gates in its discharge end, a rotatable feed drum, and a casing with discharge pipe below said hopper, said drum having studs thereon, said parts being combined, substantially as described.

3. A fuel feeder having a hopper with an agitator therein, a feed drum with studs thereon, a casing below said hopper with a discharge pipe, an automatically operating valve in said pipe and an injector at the end of said discharge pipe said parts being combined substantially as described.

4. In a fuel feeder, a hopper provided with a beater, and a feed roller, a pipe leading from the hopper to a furnace, and provided with a valve to automatically shut-off the communication between the hopper and furnace, and an injector in combination with a chute communicating with a furnace and adapted to direct the fuel to different parts of the same, substantially as shown and described.

5. In a fuel feeder, a hopper, a feeding device, a pipe leading from said hopper to a furnace, an automatically-closing valve in said pipe, a chute with an adjustable valve in its discharge end, and an injector between the automatically-closing valve and the chute, said parts being combined substantially as described.

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