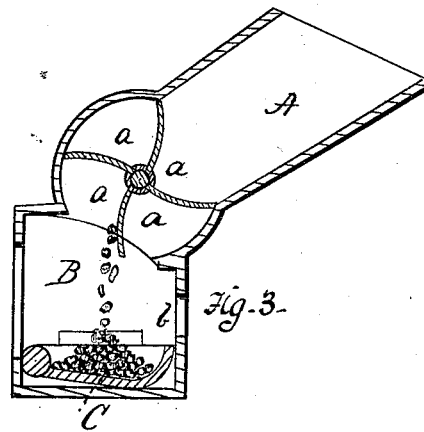
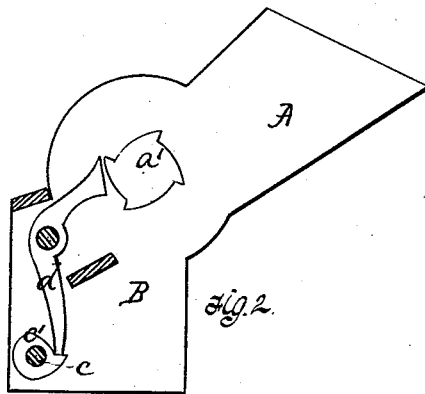
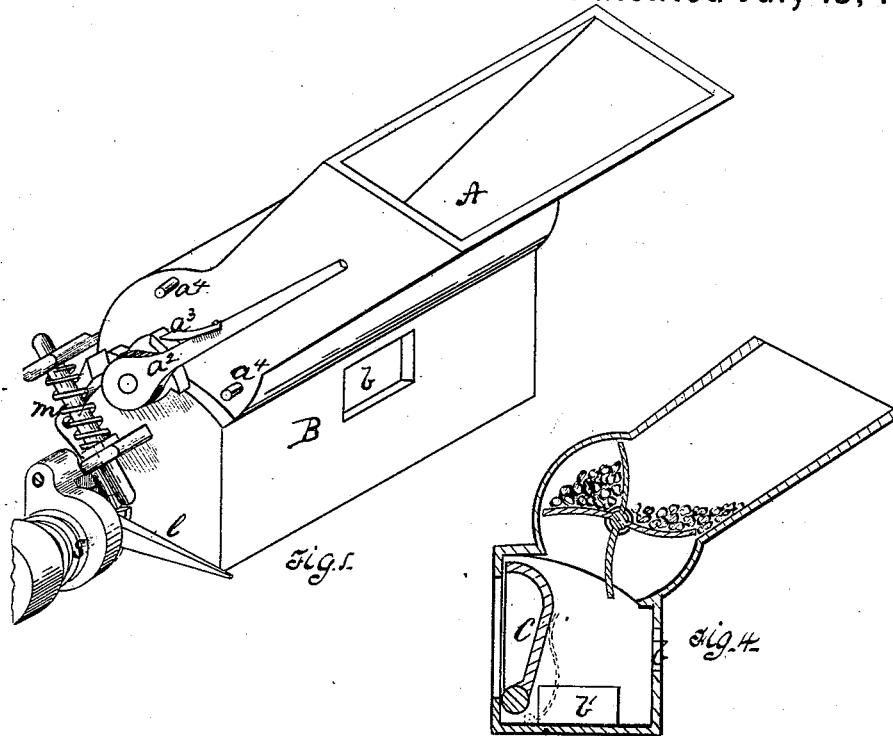


H. SWINDELL.  
Fuel-Feeder for Furnaces.

No. 217,654.

Patented July 15, 1879.



Witnesses  
John Smith  
L. C. Fitter.

Inventor.  
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Attys

# UNITED STATES PATENT OFFICE.

HENRY SWINDELL, OF ALLEGHENY, PENNSYLVANIA.

## IMPROVEMENT IN FUEL-FEEDERS FOR FURNACES.

Specification forming part of Letters Patent No. **217,654**, dated July 15, 1879; application filed April 2, 1879.

*To all whom it may concern:*

Be it known that I, HENRY SWINDELL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fuel-Feeders for Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of devices embodying my invention. Fig. 2 is an end view, showing the position of the mechanism the instant before charging the fuel into the furnace. Fig. 3 is a transverse section, showing the position of the parts before charging the fuel; and Fig. 4 is a similar view, showing the position of the parts just after charging.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of devices for supplying fuel to furnaces, &c.; and consists, mainly, in a pivoted injecting-table adapted to receive the fuel and discharge or inject it into the furnace; and, secondarily, in details of construction, hereinafter more specifically set forth.

In feeding fuel to furnaces it is desirable to prevent as far as possible the introduction of cold air over the fuel, as thereby the furnace is chilled and caused to smoke, whereby fuel is lost; and it is also desirable to thoroughly scatter the fresh fuel introduced, so as to prevent the banking of the fuel, which would interfere with the introduction of succeeding charges. To accomplish these two ends several constructions have been devised—as, for instance, the fuel descending a chute or hopper has been delivered by a ribbed roller in front of a piston or plunger which pushed the fuel into the furnace, which construction, while it prevented the introduction of cold air, was objectionable in that it banked up the fuel. A second method, practically the equivalent of the one first recited, has been to use what is termed the “screw-feed”—viz., to force the fuel in by the flanges of a screw; but this is objectionable for the reasons before cited. A third method has been to comminute the fuel by means of crushing-rollers arranged in

the hopper or feed-chute, and to drive the fine fuel into the furnace by means of a fan-wheel arranged at the bottom of the chute, which latter is objectionable, first, because it is complicated and demands power; secondly, because it limits the nature of fuel to be employed; and, thirdly, because it will not evenly distribute the fuel.

The object of the present invention is to provide devices which will prevent the entrance of air to the furnace, will equally and uniformly distribute the fuel, will be adapted to the use of both coarse and fine fuel, and will be simple and efficient.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates a hopper, terminating below in a box, B, which parts may, if desired, be attached to or formed on the furnace, but preferably are hinged thereto and close the feed-hole in the same manner as the ordinary door, so as to permit of being thrown back when for any purpose it is desirable to get at the interior of the furnace.

*b b'* indicate ports for the inspection of box B, said ports being suitably closed to prevent the entrance of air when the devices are in use.

Arranged in the bottom of hopper A is a feed-wheel or a shaft having a series of rotary buckets, *a a a a*, (preferably four in number,) the shaft of the rotary buckets extending through the end of the hopper, and provided with a ratchet-wheel, *a'*, whose notches correspond in number and position with the rotary buckets. *a<sup>2</sup>* indicates a lever pivoted on the shaft of the buckets *a*, and provided with a spring dog or pawl, *a<sup>3</sup>*, which engages with the ratchet-wheel *a'*, the extent of the throw of lever *a<sup>2</sup>* being limited by pins *a<sup>4</sup>*, so that for each time the lever is thrown forward to operate the shaft through the ratchet-wheel *a'* one-quarter (or an other predetermined portion) of a revolution will be made, and one bucket *a* turned so as to discharge its contents into the box B below.

C indicates the injecting-table, arranged within the box B, and so set with relation to the feed-orifice that when suddenly turned up

it will throw or discharge its contents forcibly, so as to scatter the same uniformly on the bed of coals in the furnace.

The specific construction preferred by me is that shown—viz., the table journaled by one side, as shown, one journal, *c*, extending through the box B, and provided with a ratchet-wheel, *c'*, with which engages a locking-dog, *d*.

In order to give the throw to the table I provide a suitable spring, preferably a coiled spring, *s*, one end of which is secured to the shaft *c*, and the other to some point on box B; but it is evident that other mechanism can be employed in lieu of the spring *s*—as, for instance, a spring in the box B, below the table C, as indicated by dotted line, Fig. 4.

*l* indicates a lever made fast to the shaft or journal *c*, by means of which the shaft can be partially rotated to overcome the spring *s* and turn down and set the injecting-table C. In order to lock the injecting-table down against the force of the spring *s* a dog, *d*, is provided, pivoted on the box B, and so shaped that when the injecting-table is set one arm of *d* shall stand so that the dog will be tripped by the ratchet-wheel *a'*. *m* represents a spring-buffer, so secured to the box B that it will cushion the lever *l* and prevent injury to the injecting-table from the excessive action of spring *s*.

The operation of the devices is as follows: The hopper A being filled with fuel, the injecting-table C is turned down by means of the lever *l*, and locked in position by the dog *d*. The lever *a'* is then thrown forward and rotates the bucket-shaft, so as to turn down a bucket and discharge its contents upon the injecting-table C. When the shaft of the bucket-wheel has rotated sufficiently far to discharge the contents of a bucket upon table C, one of the projections on the ratchet-wheel *a'* comes in contact with and trips the dog or pawl *d*,

which permits the spring *s* to act, tilting the table C, and thus forcibly projecting the fuel into the furnace.

The advantages of my invention are, first, that no cold air can enter the furnace, as the rotary buckets and the fuel in the hopper practically seal the feed-opening; secondly, that as the fuel is thrown or projected into the furnace it will be so scattered as to prevent any banking up, which would interfere with the proper consumption of the fuel, or with the subsequent introduction of fuel; and, thirdly, the character of the feeding devices permits the use of either coarse or fine fuel, as desired.

I am aware that fuel has heretofore been injected into a furnace from a platform by means of a pivoted spring door or leaf which swept the surface of the platform, and do not claim such subject-matter; but,

Having thus set forth the nature and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a fuel-feeder for furnaces, &c., a spring tilting or injecting table provided with a ratchet and pawl, whereby it may be locked in position while receiving a charge of fuel, substantially as and for the purpose specified.

2. The combination, in a fuel-feeder, of rotary buckets having the ratchet-wheel on the shaft thereof, a tilting injecting-table having a ratchet-wheel on its shaft, a spring for tilting the table, and a dog interposed between the ratchet-wheels, substantially as and for the purpose specified.

In testimony whereof I, the said HENRY SWINDELL, have hereunto set my hand.

HENRY SWINDELL.

Witnesses:

JAMES I. KAY,  
J. K. SMITH.