(No Model.)

J. B. WARD.

MECHANICAL STOKER.

No. 446,274. Patented Feb. 10, 1891.

Fig: 1.

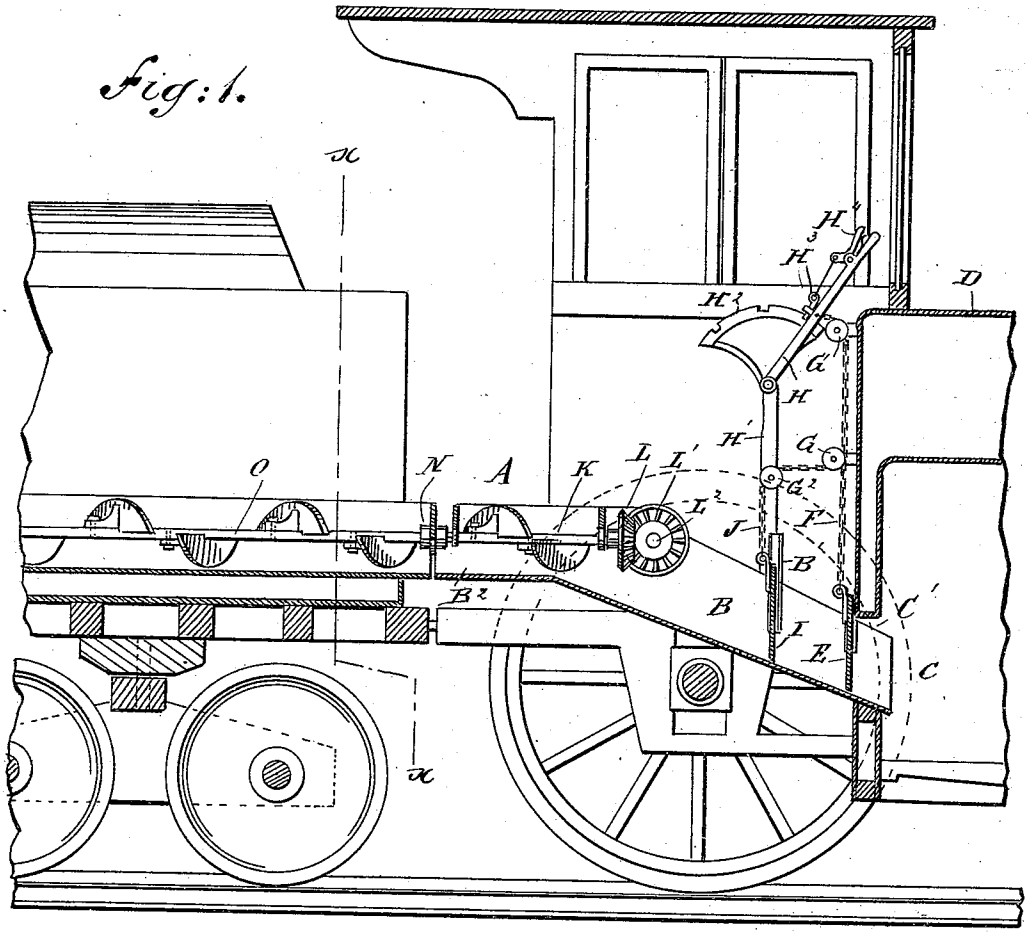


Fig: 3.

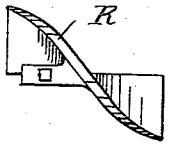


Fig: 2.

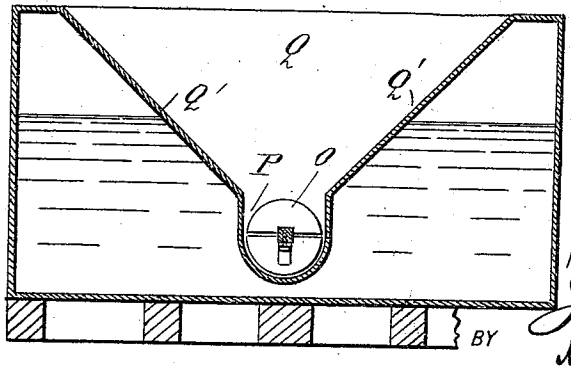
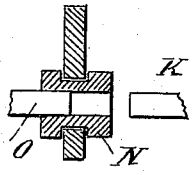


Fig: 4.



WITNESSES:

Chas. Wide.

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JOHN B. WARD, OF MINNEAPOLIS, MINNESOTA.

MECHANICAL STOKER.

SPECIFICATION forming part of Letters Patent No. 446,274, dated February 10, 1891.

Application filed May 15, 1890. Serial No. 351,913. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. WARD, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and Improved Mechanical Stoker, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved mechanical stoker, more especially designed for locomotives, to obviate the laborious work of charging the fire-box with fuel, and preventing the escape of heat.

The invention consists of an inclined chute leading to the fire-box, and provided with gates and a feed-screw having adjustable wings and connecting the fuel-store with the chute.

The invention also consists in certain parts and details and combinations of the same, as will be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is a transverse section of part of the same on the line x x of Fig. 1. Fig. 3 is a plan view of one of the feed-screw wings, and Fig. 4 is an enlarged sectional side elevation of the coupling.

The improved mechanical stoker, as shown in the drawings, is applied to a locomotive; but it may be equally well adapted to stationary boilers, furnaces, &c.

The mechanical stoker A is provided with an inclined chute B, passing at its lower end through the door-opening C′ into the fire-box C of the boiler D. A gate E passes into the chute B at the opening C′, so as to close the latter during the time the fire-box is not being charged with fuel. The gate E is hung on a chain F, extending upward and passing over pulleys G and G′, arranged at the end of the boiler B, as is plainly shown in Fig. 1. The upper end of the chain F connects with a lever H, fulcrumed on a bracket H′, secured on one side of the chute B, or on any other part of the cab of the locomotive, into which the lever H extends, so as to be within convenient reach of the fireman. The lever H is adapted to be locked on a segment H^3 by means of a pawl H^3, connected with the usual hand-lever H^4, pivoted on the lever H.

A gate I, similar to the gate E, is arranged a suitable distance from the gate E in the chute B. Said gate I is mounted to slide vertically in suitable guideways B′, formed on the sides of the chute B, as is plainly shown in Fig. 1. The upper end of the gate I is connected with a chain J, which passes over a pulley G^2, held on the bracket H′, and then the chain passes under the pulley G and connects with the chain F. When the lever H is in the position shown in Fig. 1, both gates E and I are closed; but when the operator throws the lever H to the left a pull is exerted on the chain F, which by being connected with the chain J raises both gates E and I simultaneously, so that the fire-box C can be charged. When the lever H is thrown to the right, the gates E and I close by their own weight. The gate I is arranged a suitable distance from the gate E, so as to prevent the fuel from passing onto the gate E, which when the fuel is burning in the fire-box C becomes very hot and would coke fuel resting on the gate. The fuel now accumulates in front of the gate I, which is protected from the heat of the fire-box by the gate E. The inclined chute B continues at its upper end into a horizontal extension B^2, in which is mounted to turn a feed-screw K, carrying on its shaft a bevel gear-wheel L, meshing into a similar gear-wheel L′, secured on the transversely-extending shaft L^2, mounted to turn in suitable bearings in the cab of the locomotive. The shaft L^2 is connected by suitable means with a motor of any approved construction, so as to impart a rotary motion to the said shaft, which by the gear-wheels L′ and L turns the feed-screw K. The outer end of the shaft of the feed-screw K connects by a coupling N with the shaft of the feed-screw O, extending into a channel P, formed in the bottom of the supply-store Q on the tender of the locomotive. The sides Q′ of the supply-store Q are inclined and lead to the side walls of the channel P, as is plainly shown in Fig. 2, so that fuel passes onto the feed-screw O, which when rotated causes the fuel to move forward to the feed-screw K, which discharges into the inclined chute B. The fuel discharged by the feed-screw K accumu-

lates in the upper part of the chute B in front of the gate I, and when a sufficient quantity of fuel has accumulated the rotary motion of the shaft L^2, and consequently that of the feed-screws K and O, is stopped. The operator then moves the lever H to the left, as previously described, so as to simultaneously raise the gates E and I to permit the fuel in the chute B to slide down into the fire-box C, so as to charge the latter with the proper quantity of fuel. As soon as the fuel has passed into the fire-box the gates E and I are again closed, as previously described, the shaft L^2 is again set in motion, so that the feed-screws O and K again fill the upper part of the chute B, as previously described. The fuel remains in the chute B until it is again necessary to charge the fire-box in the manner above described. The wings R of the feed-screws K and O are made in half-turn sections, held adjustably by screws or other means on the shafts of the feed-screws. The wings can thus be moved closer together or farther apart, according to the size of the fuel employed—as, for instance, for small coal the wings have to be closer together, while for larger coal they have to be farther apart.

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

1. In a mechanical stoker, the combination, with an inclined chute provided with two gates arranged one in front of the other, of a feed-screw discharging into the upper end of the said chute, substantially as shown and described.

2. In a mechanical stoker, the combination, with an inclined chute leading into the fire-box, of two vertically-reciprocating gates arranged one in front of the other in the said chute, one of the said gates closing the opening leading to the fire-box, and a lever common to both gates, substantially as shown and described.

3. In a mechanical stoker, the combination, with an inclined chute leading into the fire-box, of two gates arranged one in front of the other in the said chute, one of the said gates closing the opening leading to the fire-box, and means, substantially as described, for simultaneously raising or lowering the said gates, as set forth.

4. In a mechanical stoker, a feed-screw having wings adjustable longitudinally along the screw-shaft toward and from each other, substantially as shown and described.

5. In a mechanical stoker, the combination, with an inclined chute having a horizontal extension, of a feed-screw operating in the said horizontal extension and provided with adjustable wings of half-turns, substantially as shown and described.

6. The combination, with a locomotive having a tender the inner side walls of which incline downward and inward, terminating in a longitudinal channel, of a feed-screw working in said channel, and an inclined chute leading to the door of the fire-box above the grate-bars and receiving coal from said screw, substantially as set forth.

7. The combination, with a locomotive having an inclined chute leading to the fire-box and provided with a horizontal section at its upper end, and a feed-screw working in said section, of a tender having a channel registering with said chute-section and provided with a longitudinal screw, and a coupling uniting the adjacent ends of the two screw-sections, substantially as set forth.

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Witnesses:
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WILL JOHNSON.