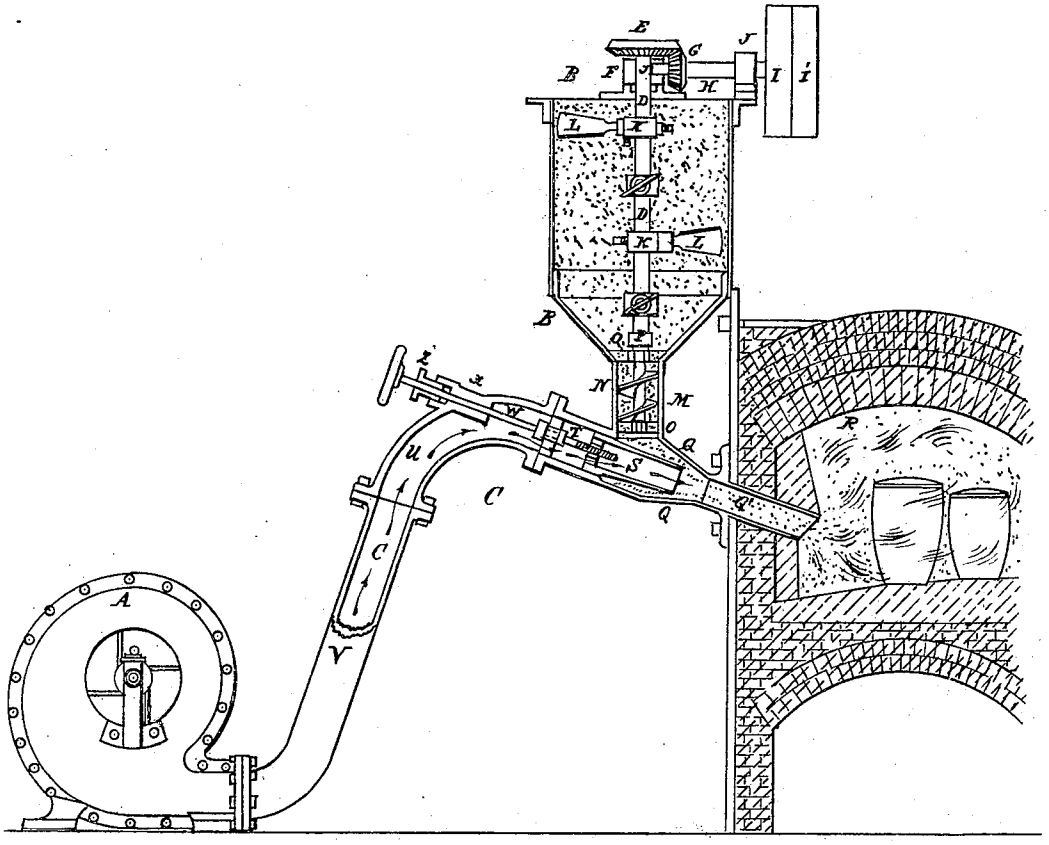
(No Model.)

J. D. AVERELL.

MECHANISM FOR FEEDING FINE FUEL.

No. 245,427. Patented Aug. 9, 1881.



Witnesses,
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UNITED STATES PATENT OFFICE.

JOHN D. AVERELL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO F. W. SEWARD, OF ELIZABETH, NEW JERSEY.

MECHANISM FOR FEEDING FINE FUEL.

SPECIFICATION forming part of Letters Patent No. 245,427, dated August 9, 1881.

Application filed December 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. AVERELL, of the city, county, and State of New York, have invented certain new and useful Improvements in Mechanism for Feeding Fine Fuel, of which the following is a specification.

In coal-dust blasts heretofore the feeding of anthracite-coal dust has been difficult and very irregular, as the blast, if sufficiently powerful for the furnace, would cause a pressure of air in the hopper, and consequently prevent the feeding of a light material, such as the dust of anthracite coal.

The object of this invention is to construct the blast with provision to cause a partial vacuum or reduced pressure in the hopper-discharge, to have provision for regulating the supply of dust, and to stop the said supply entirely before and after operation of the air or blast. I attain these objects by the mechanism illustrated in the accompanying drawing, which represents a vertical section of the furnace, hopper, and blast-pipe.

A represents the blower, of a proper capacity to furnish the desired quantity and pressure of air.

B represents the hopper, containing a suitable quantity of coal-dust, which is renewed to suit the operation.

C represents the blast-pipe which conducts the air from the blower, passing the discharge of the hopper in a diverging direction, as shown. Centrally in the hopper is arranged a vertical shaft, D, which has on its top end a conical gear-wheel, E, and below said gear-wheel it is guided in a bearing, F, secured on the top of the hopper. Said wheel E is engaged by a bevel-gear pinion, G, which is secured upon the horizontal shaft H.

On the outer end of the shaft H is provided the fast driving-pulley I and the loose pulley I′, and said shaft H is held in bearings J J, to turn readily. Said vertical shaft D has upon it several collars, K, in each collar of which is fitted a horizontal flat wing or arm, L, which is secured by a round shank in the collars by a set-screw, and at a suitable inclination to cause, by its revolution in the hopper, the feed of the dust downward toward the bottom or lower end, M, of the hopper, which is contracted to a small diameter, as shown. In said end M is arranged a central vertical propeller-screw, N, guided at its top and bottom ends in bearings made in the cross-pieces O O. The top end of the shaft of this propeller-screw has a square socket, P, in which the lower end of the vertical shaft D is fitted so as to turn said propeller-screw with the shaft D.

Below the end M is provided a conical chamber, Q, the narrow end of which joins the discharge-pipe Q′, leading the dust into the furnace R. Said chamber is arranged in the diverging direction central with the air-pipe mouth-piece S, and the large end of said chamber joins a cylindrical chamber, T, into which said mouth-piece is fitted to slide.

To the rear of the chamber T is attached the elbow-pipe U, which connects with the blower A by means of a suitable air-pipe, V, so that the air from the blower follows through the pipe V, the elbow U, the chamber T, mouth-piece S, and the pipe Q′ into the furnace, as shown by arrows, and as soon as the mouth-piece S is withdrawn to allow a passage from the conical chamber Q into the pipe Q′ the dust is drawn by partial vacuum in the chamber Q into the pipe Q′ and is blown into the furnace.

The mouth-piece S has a cross-bar in its rear end, and said bar has a central eye, which is threaded, and in it is fitted the screw-rod W, and this arbor passes through a hub, X, on the elbow U, in which it is guided. Said rod is also guided in a cross-bar cast in the elbow. The hub X has a stuffing-box, Z, around the rod, which is furnished with a hand wheel or crank for turning it on its outer end. Said rod has a shoulder or collar on each side of the cross-bar, in which it revolves, so that by turning the rod its thread causes the mouth-piece to slide and close or open more or less, suitable to regulate the aperture between its end and the chamber Q and regulate the supply of dust, or to stop said supply and entirely cut off the coal or dust in the hopper from the discharge-pipe, as requisite in case of stopping the blast in order to prevent the furnace from setting fire to the hopper. By the propeller-screw the dust is forced into the chamber Q, from which it is extracted by the air and the suction caused therein. By this blast a plentiful supply of

dust is obtained, notwithstanding how light the dust may be. Anthracite-coal dust and sawdust may be fed by it and successfully burned in the furnace.

What I claim as my invention is—

1. The combination, in a mechanical fuel-feeder, of an air-blast, a conical chamber, through which the fuel passes, a hollow sliding mouth-piece, and operating mechanism for regulating the feed-supply, said mouth-piece forming a nozzle through which the air passes for drawing and forcing the fuel into the furnace, substantially as described.

2. The combination, in a mechanical fuel-feeder, of the hopper B, having adjustable arms L and propeller-screw N, conical chamber Q, hollow sliding mouth-piece and nozzle S and its operating mechanism, and air-blast pipe C, all constructed and arranged to operate substantially as described.

In witness whereof I hereunto set my hand this 13th day of December, 1880.

JOHN D. AVERELL.

In presence of—
R. BOEKLEN,
H. V. I. HOYT.