

J. G. McAULEY & W. WEST.
Feeder for Pulverized Fuel.

No. 227,176.

Patented May 4, 1880.

Fig. 1.

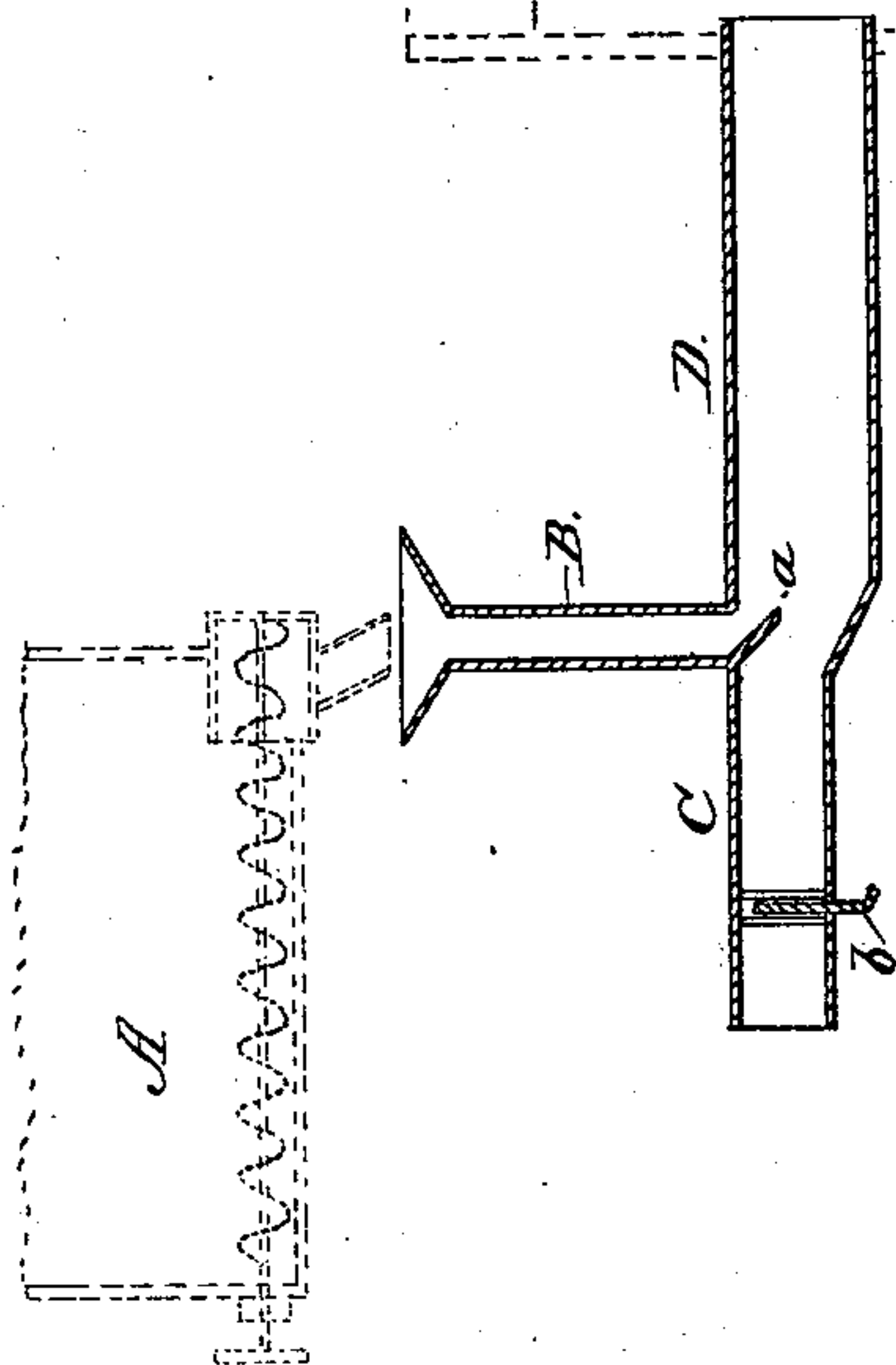
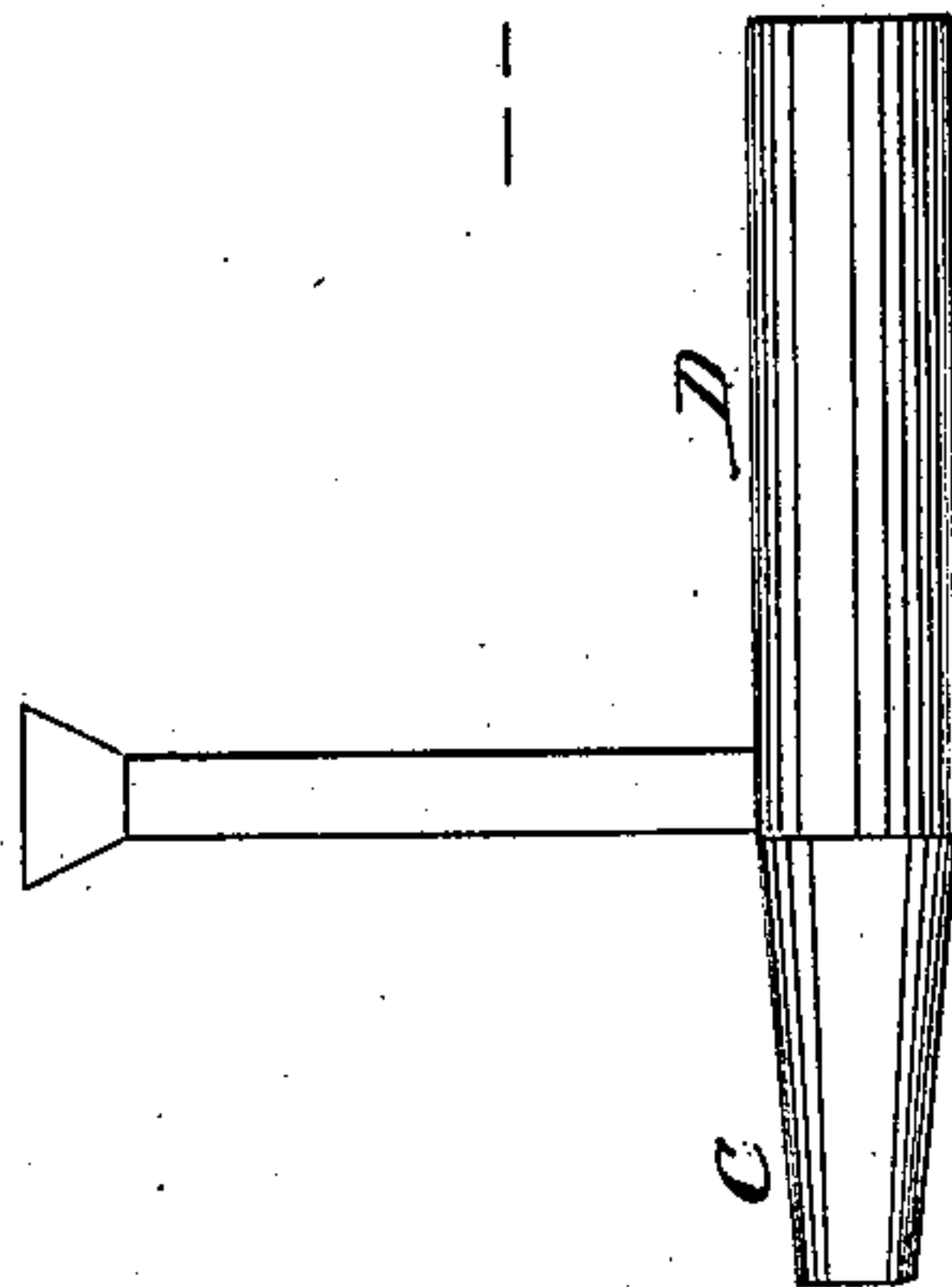


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN G. MCAULEY AND WILLIAM WEST, OF DENVER, COLORADO.

FEEDER FOR PULVERIZED FUEL.

SPECIFICATION forming part of Letters Patent No. 227,176, dated May 4, 1880.

Application filed September 20, 1879.

To all whom it may concern:

Be it known that we, JOHN G. MCAULEY and WILLIAM WEST, of Denver, in the county of Arapahoe and State of Colorado, have invented a new and Improved Feeder for Pulverized Fuel; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section, showing in dotted lines the application of our invention. Fig. 2 is a side view of a modification of our invention.

Our invention relates to a device for feeding coal-dust and other pulverized fuel to smelting or other furnaces, and it is an improvement upon that form of feeder in which a falling stream of the pulverized fuel, fed by a spiral conveyer or otherwise, is struck by a blast of air, which at the same time acts as a vehicle for the further transportation of the fuel to the fire-chamber, and supplies the necessary admixture of oxygen for its combustion.

In the patent to Wm. West granted November 7, 1876, is shown a type of this general construction, in which a vertical conduit receives the pulverized fuel as it is discharged by a spiral feeder, which vertical conduit opens into a horizontal pipe, which has an air-blast nozzle or smaller pipe extended past the point of entrance of the fuel, to avoid blowing up through the vertical conduit. In this form of feeder great difficulty has been found in steering between two difficulties in the practical working of the device, for if the blast be sufficiently powerful to properly disintegrate the agglomerations and mix the particles before admission to the furnace, the said particles acquire such a momentum as to pass entirely through the fire-chamber before being consumed, and lodge upon the opposite side of the bridge-wall of the furnace, which fails to secure the proper utilization of the combustible properties of the fuel. On the other hand, if the force of the blast be reduced sufficiently to obviate this objection, another difficulty is encountered, in that a proper dis-

integration and distribution of the fuel does not take place.

To obviate these objections is the object of our improved construction, which consists in constructing the feeder with a vertical conduit, through which the pulverized fuel drops, communicating with a horizontal pipe which is made of greater internal capacity just past the point of entrance of the fuel than it is back of this point, an inclined shelf being fixed at the bottom of the vertical fuel-conduit, to prevent the blast from striking upward and for assisting in the disintegration and distribution of the particles, as hereinafter described.

With this construction the air enters through the smaller tube at a high velocity and strikes the falling stream with this high momentum, breaking up, scattering, and thoroughly distributing and mixing the particles. Then, as it passes into the enlarged pipe, the area of this being greater, its velocity is consequently reduced in direct ratio to said enlargement, which causes the column of mixed air and coal-dust to enter the furnace at a sufficiently low velocity to be consumed without passing over the bridge-wall.

In the drawings, A represents, in dotted lines, a spiral conveyer or other equivalent device for effecting the gradual and uniform transfer of the coal-dust to the feeder. Just beneath the discharging end of this conveyer is arranged the vertical conduit B, which communicates with the horizontal pipe of our feeder. Just back of the point of entrance of the vertical conduit B the feeder is made of a given diameter, as at C, while in front of the conduit, and between the same and the furnace, it is made of a larger diameter, as at D, which increased diameter is continued to its discharging end into the furnace.

At the point where the air-blast pipe C enters the mixing-chamber D, and just beneath the conduit B, we arrange the shelf *a*, having closed connection with the upper portion of the feeder and dipping toward the furnace. Upon this shelf the particles of coal-dust, more or less agglomerated by dampness, fall, and are disintegrated by the impact, while the air-blast, issuing in full force up to this time,

strikes the said falling particles, and thoroughly distributes and mixes the same with the air, which then passes at a retarded rate, by reason of the greater area of the mixing-chamber D, into the furnace, where it is thoroughly consumed without being blown over the bridge-wall.

In modifying our invention the air-blast pipe C may enter the larger mixing-chamber D with a gradual taper, as shown in Fig. 2. For regulating the air-blast, a damper, *b*, may be fixed in the pipe C.

Having thus described our invention, what we claim as new is—

15 A feeder for pulverized fuel, consisting of an

air-blast pipe, C, and a mixing-chamber, D, made of greater transverse area than the air-blast pipe, combined with a vertical fuel-conduit, B, entering the feeder proper at a point between the air-blast tube and the mixing-chamber, and having an inclined shelf at its bottom for deflecting the blast and distributing the fuel, substantially as and for the purpose described.

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Witnesses:

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