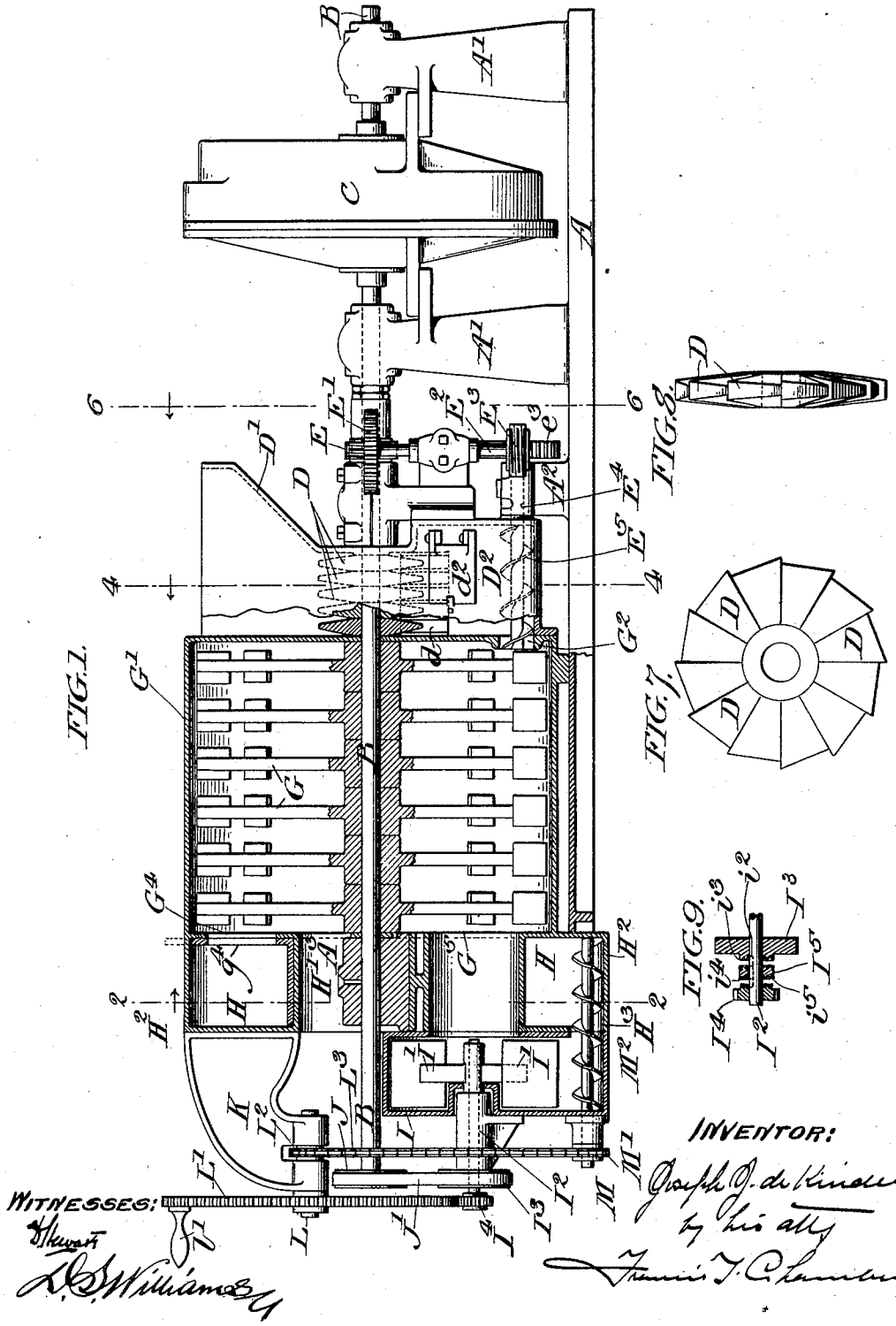
No. 728,935. PATENTED MAY 26, 1903.

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FUEL FEEDING MECHANISM.

APPLICATION FILED NOV. 24, 1900. RENEWED DEC. 24, 1902.

NO MODEL. 2 SHEETS—SHEET 1.



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NO MODEL. 2 SHEETS—SHEET 2.

FIG. 2.

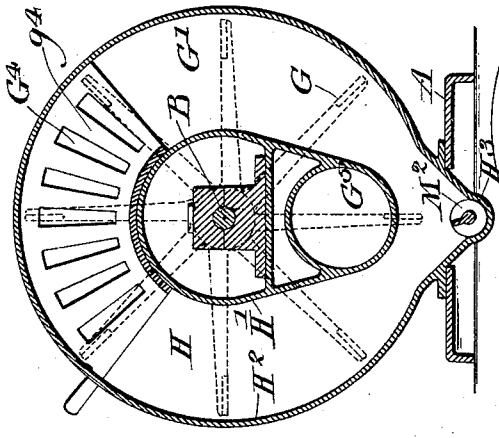


FIG. 6.

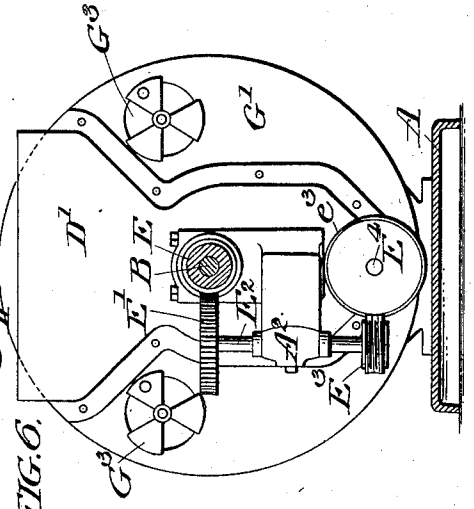


FIG. 5.

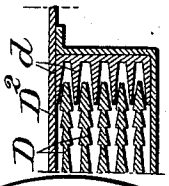


FIG. 4.

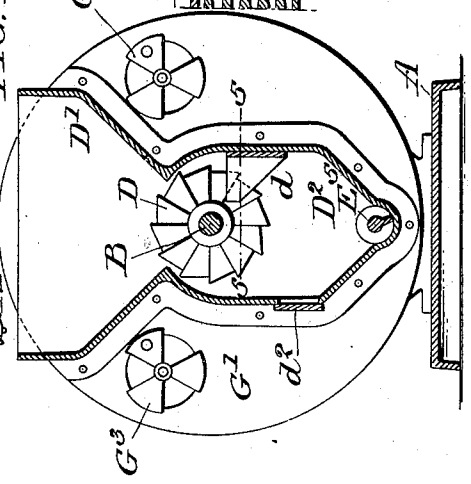
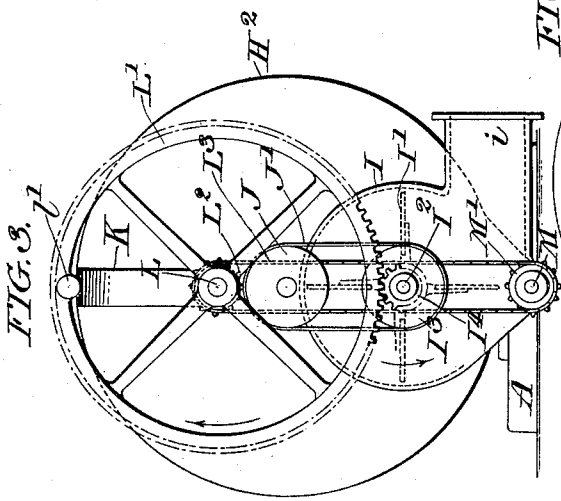


FIG. 3.



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No. 728,935. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

JOSEPH J. DE KINDER, OF PHILADELPHIA, PENNSYLVANIA.

FUEL-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 728,935, dated May 26, 1903.

Application filed November 24, 1900. Renewed December 24, 1902. Serial No. 136,500. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. DE KINDER, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Feeding Mechanism, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to mechanism for pulverizing fuel and feeding the pulverized fuel to furnaces, my object being to provide for the operation of the feeding device both in connection with and independently of the pulverizer and generally to so construct the apparatus as to adapt it for successful practical use.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is a side elevation, partly in central section, of a fuel pulverizer and feeding apparatus provided with my improvements. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1. Fig. 3 is an end view looking toward the left of Fig. 1. Fig. 4 is a cross-sectional view on the line 4 4 of Fig. 1. Fig. 5 is a cross-sectional view through the cutter on the line 5 5 of Fig. 4; Fig. 6, a cross-sectional view on the line 6 6 of Fig. 1; Fig. 7, a side elevation of the cutter on an enlarged scale; Fig. 8, a face view of the cutter, and Fig. 9 a view illustrating a preferred modification.

A indicates the base-plate of the apparatus, supporting directly or indirectly bearing-posts A′ A′ A^3 for the main shaft, also a bearing-post A^2 for one end of the shaft, (indicated at E^4.)

B indicates the main shaft of the apparatus; C, a rotary motor, indicated as a steam-turbine secured to said shaft so as to directly actuate it.

D is a rotary cutter situated in the bottom of a hopper D′, having the function of cutting and breaking up lumps of coal dumped into said hopper, in which work the cutters D coact with stationary fingers *d*, the finely-divided coal falling into the chamber D^2, of which d^2 indicates a door.

E is a worm-wheel on the shaft B in operative engagement with another worm-wheel E′, secured to a shaft E^2, which through a worm-wheel E^3 drives another worm-wheel e^3, secured to the end of a shaft E^4, to which is attached the conveyer, (indicated at E^5,) situated in the bottom of the chamber D^2 and operating to feed the pulverized fuel into the casing G′ of the rotary pulverizer through an opening G^2, G G, &c., indicating the rotary arms of the pulverizer secured to and actuated by the shaft B, G^3 G^3 indicating regulable openings for the admission of air into the rotary pulverizer, G^4 a series of slotted openings connecting the interior of the casing G′ with the storage-chamber H, g^4 indicating a register-like valve by which these slotted openings are closed or opened at will.

G^5 indicates an opening from the casing G′ to the fan-chamber, (indicated at I.) The inner wall of the storage-chamber H is indicated at H′ and the outer wall at H^2, H^3 indicating an opening from the bottom of the chamber H into the fan-chamber I.

I^2 indicates a shaft situated in the fan-chamber I and independent of the shaft B, I′ indicating the fan-blades attached to the shaft I^2, I^3 a belt-wheel attached to the shaft, and I^4 a gear-wheel also attached to the shaft. Preferably, however, instead of attaching the wheels I^3 and I^4 to the shaft, as indicated in Fig. 1, I journal them on the shaft, so that they will turn freely thereon, providing each of them on their opposing faces with clutches, as indicated at i^3 and i^4, and securing to the shaft between them a clutch I^5, having a feather i^5, engaged with a slot i^2 in the shaft I^2, so that the clutch can be moved into engagement with either of the clutches i^3 or i^4, this preferred construction being indicated in Fig. 9.

J, Fig. 1, is a pulley-wheel attached to the end of the shaft B and connected, by means of a belt J′, with the pulley I^3.

K is a bracket supporting in its end the horizontal shaft L, to which, as shown, is attached a gear-wheel L′, of large diameter, which is engaged with the gear-wheel I^4, l'

indicating a handle for turning the gear. Also attached to the shaft L is a sprocket-wheel, (indicated at L^2,) which by means of a chain L^3 is operatively connected with a sprocket-wheel M′ on a shaft *m*, extending through the bottoms of the fan-chamber I and storage-chamber H and having secured to it a conveyer, as indicated at M^2, so that pulverized fuel stored in the chamber H can be fed to the fan-chamber I. This fan-chamber I has a delivery-passage (indicated at *i*, see Fig. 3) through which the pulverized fuel is delivered to the furnace. (Not shown.)

In operation the shaft B is driven by the motor C, the shaft directly actuating the cutters D and the rotary arms G of the pulverizer also, through the connections described, actuating the conveyer E^5 and the fan I′. The fuel fed into the hopper D′ is broken up into fine particles, delivered into the chamber D^2, and fed therefrom into the pulverizer, where they are further broken into a fine powder, which passes through the opening G^5 to the fan-chamber I and thence through the passage *i* to the furnace. By having the fan I secured to an independent shaft I am enabled to regulate its size with greater freedom and also to provide for any desirable variation in its speed of rotation, a feature which is not of course existent where the fan is directly secured to shaft B, as in former constructions.

At some period during the operation of the pulverizer I open the register-valve g^4, so that the chamber H will fill up with pulverized fuel, which as the conveyer M^2 is not in operation will rapidly occur. Having this body of pulverized fuel in reserve, when I again desire to start the apparatus, if I am not supplied with steam for actuating the motor C, I can do so by turning the wheel L′, acting through the gear-wheel I^4 on the shaft I^2, and causing the fan to rotate, while at the same time the rotation of the wheel communicates motion to the shaft L and through the sprockets L^2 and M′ and the chain L^3 to the conveyer M^2, feeding the pulverized fuel from the chamber H into the fan-chamber, from which it is delivered by the action of the fan through the conduit *i*.

Where both the pulley-wheel I^3 and gear-wheel I^4 are attached to the shaft I^2 and where the connections are simple and direct, as shown in Fig. 1, the wheel L′ will be rotated whenever the fan is in motion, though it is quite practicable to disconnect the shaft B from the shaft I^2 by removing the belt J′ from the pulley-wheels, so that the fan can be rotated by hand or otherwise without actuating the shaft B. It is preferable, however, to make the two devices for actuating the fan entirely independent of each other, and this can readily be accomplished by the simple device indicated in Fig. 9, by which the wheels I^4 and I^3 run loosely on the shaft I^2 and are coupled alternatively with it by the shifting of a clutch I^5.

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

1. In a machine for pulverizing fuel the combination of a rotary pulverizer having blades secured to a shaft with a suction and delivery fan secured to an independent shaft, said fan's casing being connected with the interior of the pulverizer and with a delivery-conduit, a reservoir for pulverized fuels, a conveyer, as M^2, connecting said reservoir with the fan-casing, a shaft, as L, and means for driving it independent of the pulverizer-shaft, means for driving the fan and conveyer actuated by shaft L and means for driving the fan actuated by the shaft of the pulverizer.

2. In a machine for pulverizing fuel the combination of a rotary pulverizer having blades secured to a shaft with a suction and delivery fan secured to an independent shaft, said fan's casing being connected with the interior of the pulverizer and with a delivery-conduit, a reservoir for pulverized fuels, a conveyer, as M^2, connecting said reservoir with the fan-casing, a shaft, as L, and means for driving it independent of the pulverizer-shaft, means for driving the fan and conveyer actuated by shaft L, and disconnectible means for driving the fan actuated by the shaft of the pulverizer.

3. In a machine for pulverizing fuel the combination of a rotary pulverizer having blades secured to a shaft with a suction and delivery fan secured to an independent shaft, said fan's casing being connected with the interior of the pulverizer and with a delivery-conduit, a reservoir for pulverized fuels, a conveyer, as M^2, connecting said reservoir with the fan-casing, a shaft, as L, and means for driving it independent of the pulverizer-shaft, means for driving the shaft and conveyer actuated by shaft L, the connection between the shafts L and the fan-shaft being severable at will and disconnectible means for driving the fan actuated by the shaft of the pulverizer.

JOSEPH J. DE KINDER.

Witnesses:
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D. STEWART.