G. F. DE WEIN.

COAL FEEDER.

APPLICATION FILED OCT. 20, 1911.

1,023,418. Patented Apr. 16, 1912.

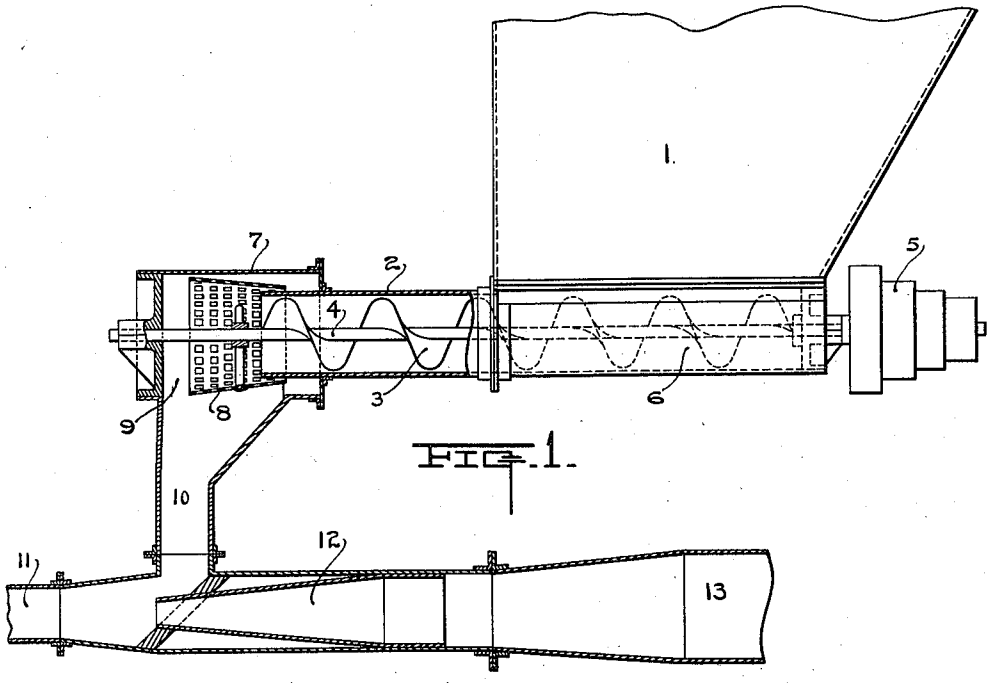

FIG. 1.

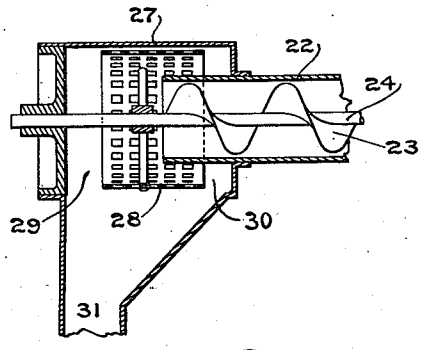

FIG. 2.

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COAL-FEEDER.

1,023,418. Specification of Letters Patent. Patented Apr. 16, 1912.

Application filed October 20, 1911. Serial No. 655,699.

To all whom it may concern:

Be it known that I, GEORGE F. DE WEIN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Coal-Feeders, of which the following is a specification.

This invention relates to improvements in the construction of feeding devices particularly adapted to feed a continuous charge of pulverized or partially pulverized, fuel to the combustion chamber of a kiln or furnace.

The object of the invention is to provide a feeding device adapted to feed a continuous charge of pulverized fuel or similar substances to the combustion chamber of a furnace or the like, which is simple in construction and efficient in operation.

Another object of the invention is to provide a feeder which can be freely substituted for the various forms of fuel feeders now in use, by slightly changing the inclosing casing and, possibly, the driving mechanism.

A clear conception of several embodiments of the invention can be had by referring to the accompanying drawing forming part of this specification, in which like reference characters designate the same or similar parts in different views.

Figure 1 is a fragmentary central vertical section through a powdered fuel feeding device and blast pipe of a type used for feeding pulverized coal to the combustion chamber of cement kilns. Fig. 2 is a fragmentary central vertical section through the discharge end of a modified form of feeding device.

The feed hopper 1 is provided at its lower end with a semi-circular inlet trough 6, one end of which connects with a horizontally outwardly projecting circular casing 2 formed of sheet metal or similar material. The outer free end of the circular casing 2 terminates near the mid-portion of the interior of the screen casing or housing 7. The discharge conduit 10 connects the lower end of the screen casing or housing 7 with a horizontally disposed blast pipe 11. The air inlet pipe 13 terminates within the nozzle 12, which nozzle is directed toward the discharge end of the blast pipe 11 in line with its axis.

The rotatable conveyer shaft 4 is concentrically mounted within the trough 6 and casing 2 and carries the conveyer screw 3. The shaft 4 is adapted to be rotated at variable speed by means consisting of a driving belt taking over the cone pulley 5 fixed to the end of the shaft 4. The conveyer screw 3 extends from the end of the inlet trough 6 through the trough 6 and casing 2 terminating flush with the free end of the casing 2 within the housing 7. The screen 8 is slightly conical in shape and is mounted concentrically upon the conveyer shaft 4 within the housing 7, see Fig. 1. The portion of the screen 8 having smallest diameter surrounds and overlaps the free end of the casing 2, the end of the casing 2 projecting within the screen 8 for only a short distance. A relatively large discharge passage 9 exists between the end of the screen 8 and the end of the screen casing or housing 7.

In the modification, see Fig. 2, the conveyer shaft 24 which carries the conveyer 23 is rotatably and concentrically mounted within the casing 22. The screen 28 is cylindrical in form and is mounted concentrically upon the shaft 24, being adapted to rotate with the shaft. The casing 22 projects within the screen 28 to the mid-portion thereof, the screen 28, however, being of considerably larger diameter than the casing 22. Relatively large discharge passages 29, 30, exist between the ends of the screen 28 and the ends of the inclosing casing or housing 27. The discharge conduit 31 forms a connection between the discharge openings 29, 30, and the blast pipe, not shown.

During the operation of the device, see Fig. 1, air under pressure is admitted through the air pipe 13 and nozzle 12 to the blast pipe 11. Pulverized, or partially pulverized, fuel such as coal or other suitable material, is admitted to the hopper 1, falling directly into the path of the exposed portion of the conveyer 3 within the trough 6. The conveyer 3, which is given a rotary motion by means of suitable power applied to the cone pulley 5, gradually forces or advances the pulverized fuel toward the opposite free end of the cylindrical casing 2. Since the discharge from the end of the casing 2, due to the action of the conveyer screw, is more or less intermittent, and as it is desirable to have this discharge as uniform and regular as possible, means is provided in the form of

the rotary screen 8 for equalizing the discharge. As the fuel is discharged from the casing 2 to the interior of the revolving conical screen 8, the portion thereof which is of sufficient fineness to pass through the screen, passes directly into the discharge conduit 10 through the screen openings or perforations. Since all the material discharged from the end of the casing 2 cannot immediately pass through the screen 8, a portion thereof will be advanced by the action of gravity and due to the conical formation of the screen 8 and the rotation of said screen, toward the discharge passage 9. This advancing and subsequent distribution of the fuel over considerable longitudinal extent of the screen 8, causes a continual discharge of material to the blast pipe 11, since fuel will be discharged at numerous points along the length of the screen 8, and larger lumps of the substance which are unable to pass through the screen 8 will be discharged over the end thereof through the relatively large discharge opening or passage 9. The fuel discharged from the screen 8 to the conduit 10 passes by gravity to the blast pipe 11 through which it is carried by the injected air entering through the nozzle 12 to the combustion chamber of the kiln.

During the operation of the modified form of feeding device, see Fig. 2, the pulverized material passing through the cylindrical casing 22 by the advancing action of the conveyer screw 23 is discharged from the free end of the casing 22 to the mid-portion of the revolving cylindrical screen 28. A portion of the pulverized fuel thus admitted to the interior mid-portion of the cylindrical screen 28 passes directly through the screen perforations to the discharge conduit 31. Since the quantity of the material discharged from the casing 22 by the conveyer is too great to immediately pass through the screen 28, the entering material piles up within the revolving screen 28 and is spread over the entire longitudinal extent of the screen. This distribution of the material within the screen 28 produces a gradual discharge of fuel to the conduit 31 since fuel passes through the screen 28 at various points along the length thereof. The particles which are too large and hence unable to pass directly through the screen 28, are discharged over the two ends of the screen through the discharge passages 29, 30.

It should be noted that the device can be easily substituted for the ordinary feeder now in use, which consists of a conveyer screw discharging directly into a passage leading to the blast pipe without the interposition of a screen or similar device, by merely affixing the revolving screen 8, 28, to the conveyer shaft so that same slightly overlaps the end of the conveyer screw. It should also be noted that the use of a revolving, rather than a stationary screen, choking of the screen perforations is not as liable to occur.

It is not desired to be limited to the exact details herein shown and described since various modifications will appear to a person skilled in the art.

It is claimed and desired to secure by Letters Patent,—

1. In a feeder, a housing, a stationary casing communicating with said housing, a shaft rotatable within said casing, a conveyer fixed to said shaft, and freely mounted within said housing a circular screen fixed to said shaft adjacent the end of said casing, said casing being adapted to discharge to the interior of said screen.

2. In a feeder, a housing having a discharge conduit, a continuously rotatable round screen freely mounted within said housing, and means for delivering therewithin intermittent charges of material, said screen being free to discharge over its edge and said discharge conduit being adapted to receive said discharge and the material passing through said screen.

3. In a feeder, a casing, a shaft rotatable within and relative to said casing, a conveyer fixed on said shaft, a screen fixed to said shaft adjacent the end of said conveyer, and a housing for said screen said housing having a discharge conduit, the end of said screen being spaced from said housing whereby material delivered to said screen will pass therethrough and over the end thereof to said discharge conduit.

In testimony whereof, the signature of the inventor is affixed hereto in the presence of two witnesses.

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Witnesses:
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