

No. 818,590.

PATENTED APR. 24, 1906.

G. S. WELLES.

APPARATUS FOR FEEDING PULVERIZED FUEL.

APPLICATION FILED MAY 10, 1905.

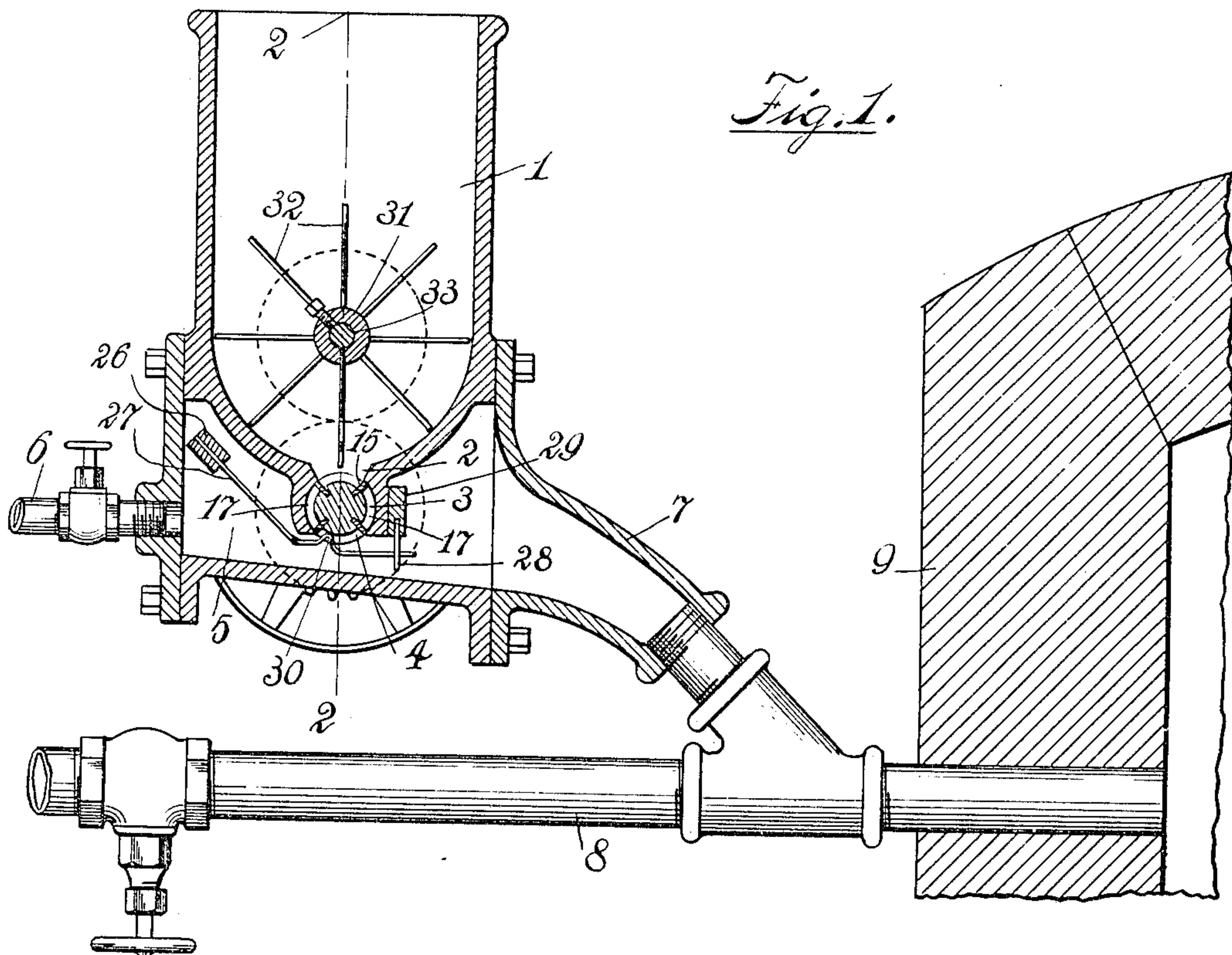


Fig. 1.

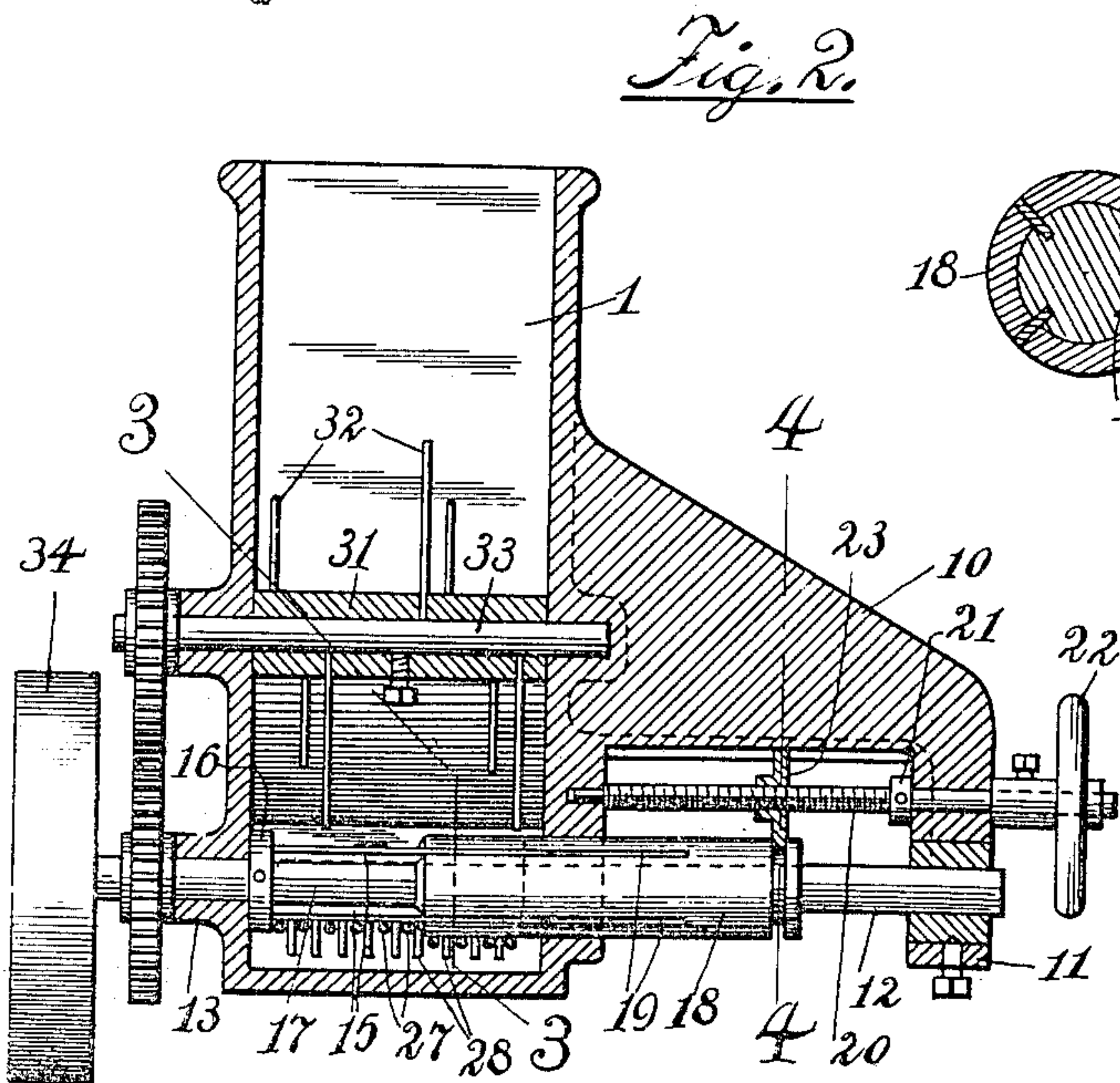


Fig. 2.

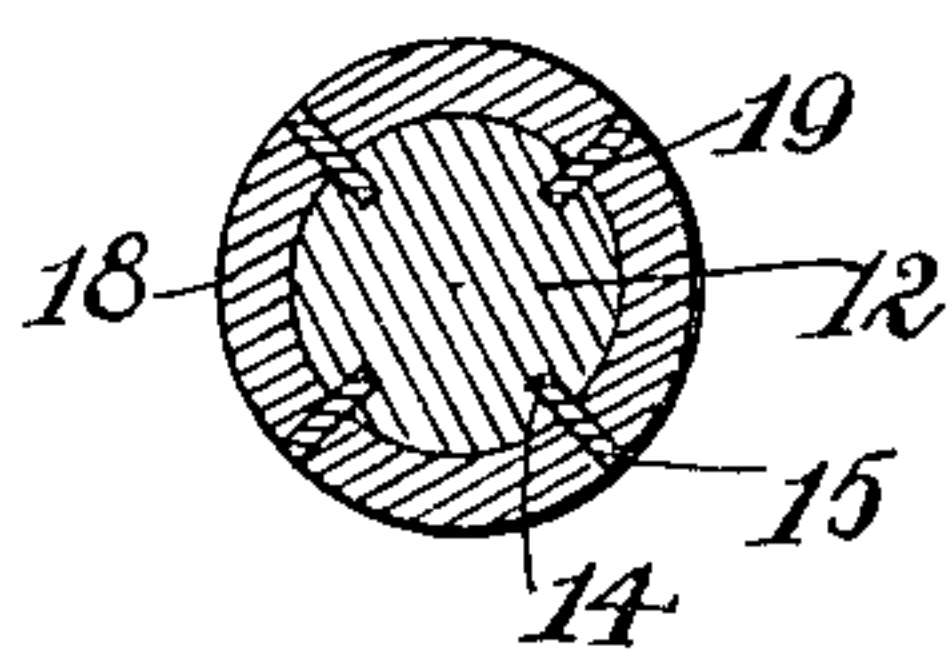


Fig. 3.

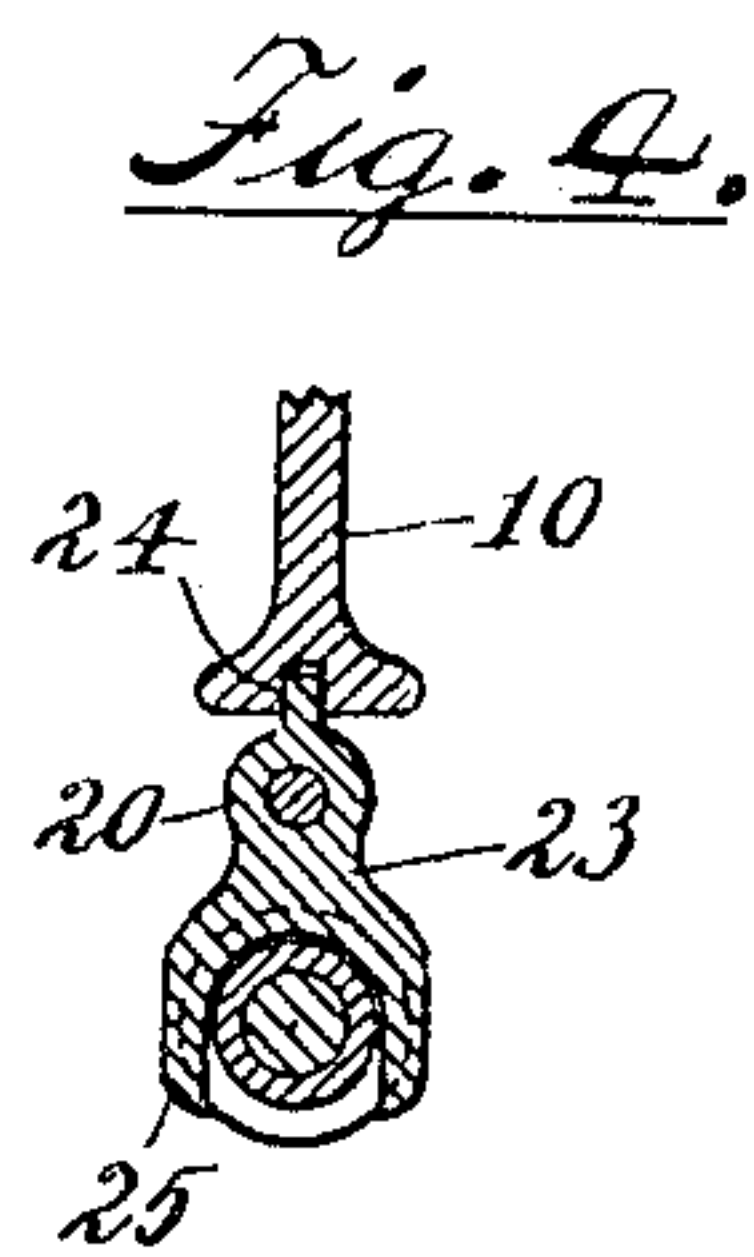


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE SILL WELLES, OF CHICAGO, ILLINOIS.

APPARATUS FOR FEEDING PULVERIZED FUEL.

No. 818,590.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed May 10, 1905. Serial No. 259,790.

To all whom it may concern:

Be it known that I, GEORGE SILL WELLES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Feeding Pulverized Fuel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in an apparatus for feeding pulverized coal or other fuel into the path of a gaseous vehicle by means of which it is carried into a furnace, the object being to provide a device of this character by means of which the fuel is fed in variable measured quantities; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a central vertical longitudinal section of an apparatus constructed in accordance with my invention. Fig. 2 is a central vertical transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is a detail section on the line 3 3 of Fig. 2. Fig. 4 is a detail section on the line 4 4 of Fig. 2.

In burning pulverized coal or other fuel in furnaces the same burns like gas, and, like the latter, must be fed substantially uniformly in measured quantities in order to produce the best results. This has been found to be difficult of accomplishment, owing to the fact that such pulverized fuel has a tendency to pack and form small lumps and is, generally speaking, difficult to handle.

The essential objects of my invention are, first, to provide means for feeding pulverized fuel in uniform measured quantities, and, second, to provide means for varying or adjusting the quantities fed to increase or decrease the same to regulate the temperature in the furnace.

Other objects of my invention are to provide simple, efficient, and durable apparatus suited to the purpose.

My said apparatus comprises a hopper 1, having a substantially semicylindrical bottom provided with a central longitudinal slot

2. Below said hopper is a horizontally-disposed cylindrical chamber 3, the walls of which are integral with said hopper and which is provided in its lower end with a longitudinal slot 4. The said bottom of said hopper 1 and said chamber 3 project into an air or gas chamber 5, connected by a valve-controlled pipe 6 with a source of supply of air or gas under pressure and at its other end terminates in a delivery-spout 7, connected with a valve-controlled pipe 8, likewise connected at one end with a source of supply of air or gas under pressure and at its other end with the furnace 9. Said hopper 1 is provided at one side with a bracket 10, having a downwardly-extending projection 11 at its free end, in which one end of a shaft 12 is journaled, the latter passing centrally through said cylindrical chamber 3 and being journaled at its other end portion in a bearing 13 in a side wall of the chamber 5. The said shaft 12 is provided in that portion thereof lying within the chamber 3 with a plurality of longitudinal grooves 14, in which radially-disposed plates 15 are mounted, the latter being secured at one end to a collar 16 on said shaft, the said plates being adapted at their free ends to brush against the inner surface of said chamber 3 and provide a plurality of pockets 17 to receive the fuel from said hopper 1. Loosely mounted on said shaft 12 is a sleeve 18, having one end tapered and provided with a plurality of longitudinal slots 19, corresponding in number and location with said plates 15 and beginning at said tapered end and terminating adjacent the other end of said sleeve. The said sleeve 18 is adapted to enter and fit said chamber 3, and the slots 19 therein are adapted to receive said plates 15, so that as said sleeve is moved longitudinally on said shaft it will obviously serve to increase or reduce the size of said pockets 17. The said plates 15 serve to cause said sleeve to revolve with said shaft, and to move same longitudinally on the latter I provide a screw-shaft 20, extending parallel with said shaft 12 and journaled at one end in said projection 11 and at its other end in the side wall of said hopper 1, said shaft 20 being held against longitudinal movement by means of a collar 21 and a hand-wheel 22, by means of which it is revolved. On said

screw-shaft 20 is a member 23, movable longitudinally thereon and thereby and having an upper projection 24 entering a guide-groove in the bracket 10 and provided at its lower end with a fork 25, entering an annular groove in the sleeve 18 to impart longitudinal movement to the latter. Secured at one end to a bar 26 in the chamber 5 are a plurality of parallel springs 27, the free ends of which project between guide-fingers 28 on a bar 29, secured to one side of the chamber 3, said springs being bent between their ends to provide projections 30, normally held in position to enter said pockets 17 and adapted to be depressed at regular intervals by the plates 15. Said springs are also adapted to be forced downwardly and held out of position to enter said pockets by the tapered end of said sleeve 18, so that only a number of springs corresponding with the width of the pockets 17 are in action at any time. In the bottom of said hopper 1 is a stirring and agitating device 31, comprising a hub having a plurality of radial arms 32 and which is mounted on a horizontal shaft 33, which is geared to the shaft 12, the latter being geared to a source of power by means of the pulley 34 or in any other suitable manner.

The operation of my said apparatus is as follows: The pulverized coal or other fuel in the hopper 1 is continually stirred and agitated to prevent packing thereof and drops into the pockets 17, each of which is adapted to receive an equal quantity thereof, such quantity being obviously regulated and determined by the position of the sleeve 18 and maintained equal by the wall of the chamber 3, which practically levels the contents of such pockets. As the shaft 12 revolves to invert said pockets, the projections 30 of said springs 27 enter the same and serve to loosen and agitate the contents of the same by jarring and scraping the same therefrom in an obvious manner, thus insuring the complete discharge of the entire contents of the pockets 17 into the chamber 5, whence said pulverized fuel is carried into the furnace. By moving said sleeve 18 longitudinally, the pockets will obviously be enlarged or diminished as desired in an obvious manner, but no matter how large or how small the pockets may be, the feed of fuel will obviously be uniform and measured, with practically no intermission in the feed inasmuch as the plates 15 are relatively very thin so that before all of the dust discharged from one pocket has been carried away the discharge from the succeeding pocket begins.

I claim as my invention—

1. In a fuel-feeding apparatus, an air or gas supply pipe or passage, a mixing-chamber into which said pipe or passage opens, an outlet-passage from said chamber, a pulver-

ized-fuel hopper having a mouth opening into said chamber in the path of the air or gas blast therethrough, and means at the hopper-mouth for continuously and uniformly supplying measured quantities of fuel from the hopper directly into the blast.

2. In a fuel-feeding apparatus, an air or gas supply pipe or passage, a mixing-chamber into which said pipe or passage opens, and an outlet-passage from said chamber, a pulverized-fuel hopper having a mouth opening into said chamber in the path of the air or gas blast therethrough, and a rotary means uniformly supplying measured quantities of fuel from the hopper directly into the blast.

3. In a fuel-feeding apparatus, an air or gas supply pipe or passage, a mixing-chamber into which said pipe or passage opens, and an outlet-passage from said chamber, a pulverized-fuel hopper having a mouth opening into said chamber in the path of the air or gas blast therethrough, a rotary means at the hopper-mouth for continuously and uniformly supplying measured quantities of fuel from the hopper directly into the blast, and means for varying the feeding capacity of said rotary means independent of the speed of rotation of the same.

4. In an apparatus for feeding pulverized fuel, the combination with a hopper having a delivery-slot, of a traveling carrier communicating therewith and with a point of delivery, a scraper for maintaining a given level of fuel on said carrier, and means for regulating the quantity of fuel carried by the latter.

5. In an apparatus for feeding pulverized fuel, the combination with a hopper having a delivery-slot, a chamber communicating therewith through said slot and having a delivery-slot, of a rotating carrier in said chamber having a plurality of peripheral pockets of equal dimensions, a sleeve longitudinally movable on said shaft one end of which forms one wall of each pocket, and means for imparting longitudinal movement to said sleeve for simultaneously varying the width of all of said pockets, and agitating devices disposed in the path of said carrier to release the fuel from said pockets.

6. In an apparatus for feeding pulverized fuel, the combination with a hopper having a delivery-slot, of a plurality of equal traveling pockets communicating successively with said delivery-slot at regular intervals, and means normally intersecting the path of said pockets to release the contents thereof at the point of discharge.

7. In an apparatus for feeding pulverized fuel, the combination with a hopper having a delivery-slot, of a plurality of equal traveling pockets communicating successively with

said delivery - slot at regular intervals, means disposed in operative relation to said pockets for simultaneously varying the capacity thereof, and means normally intersecting the path of said pockets at the point of discharge to release the contents thereof.

name in presence of two subscribing witnesses.

GEORGE SILL WELLES.

Witnesses:

RUDOLPH WM. LOTZ,
E. F. WILSON.

In testimony whereof I have signed my