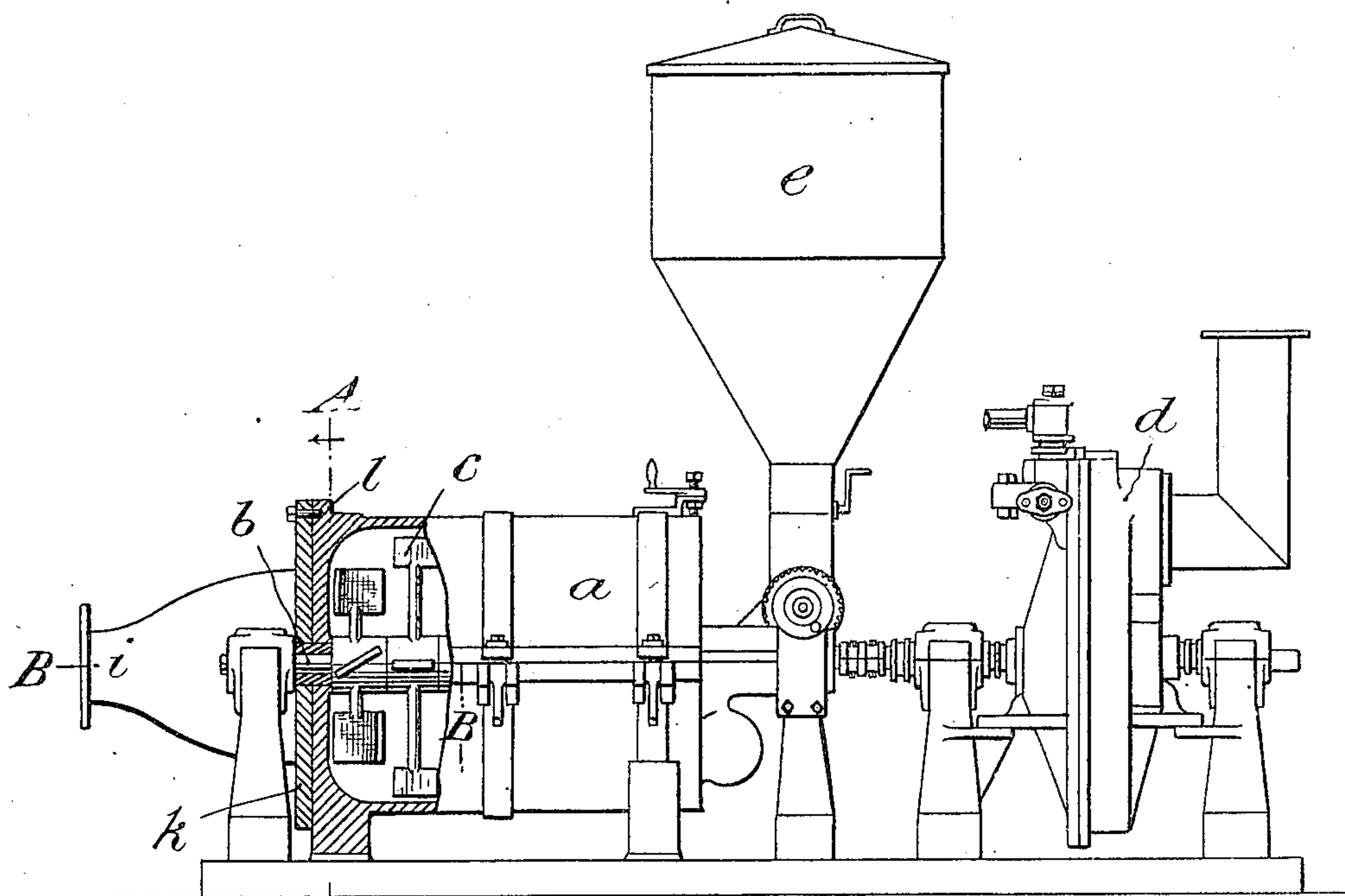


No. 804,158.

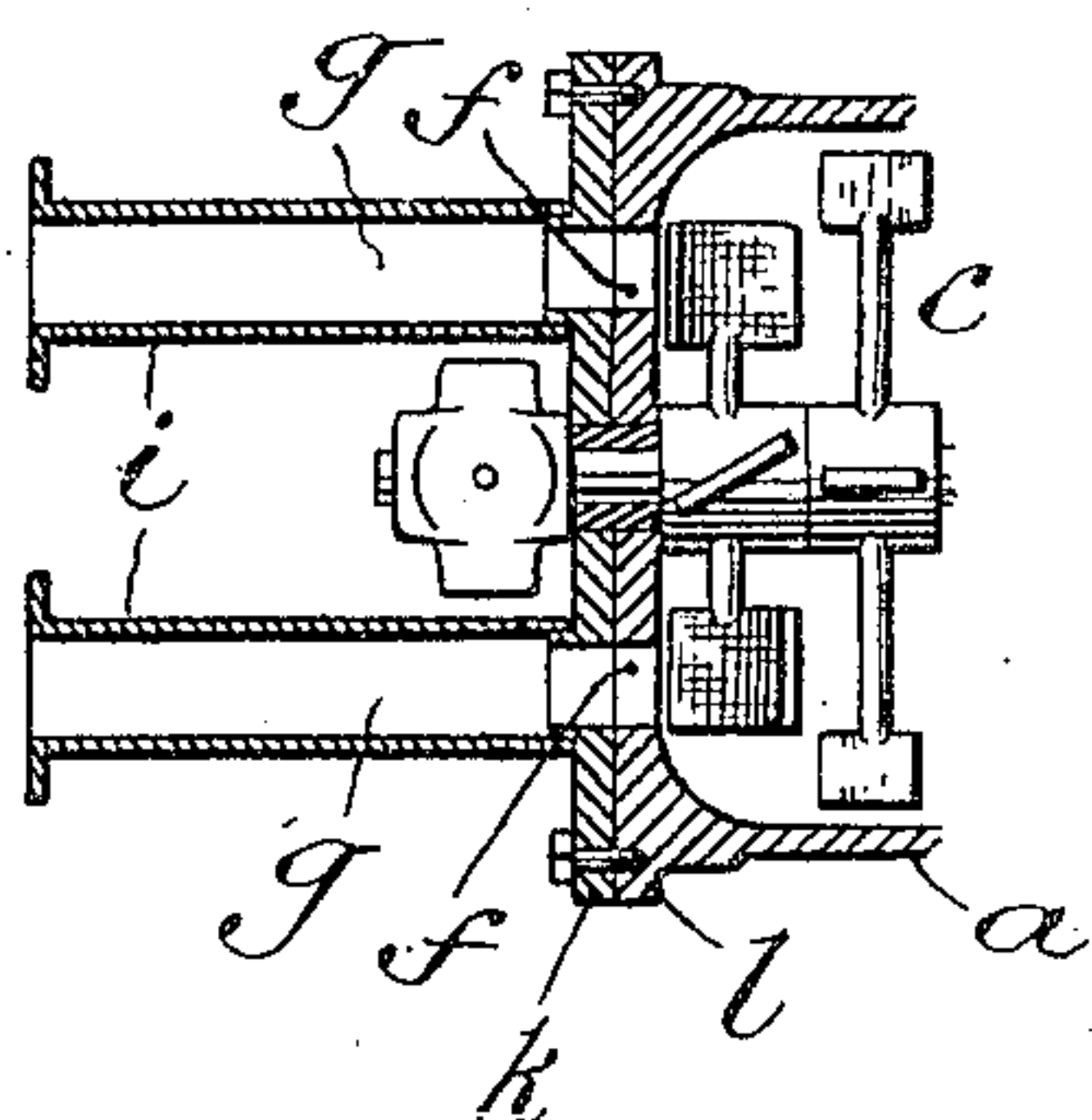
PATENTED NOV. 7, 1905.

J. F. DE NAVARRO.  
FUEL FEEDING APPARATUS.  
APPLICATION FILED MAR. 3, 1905.

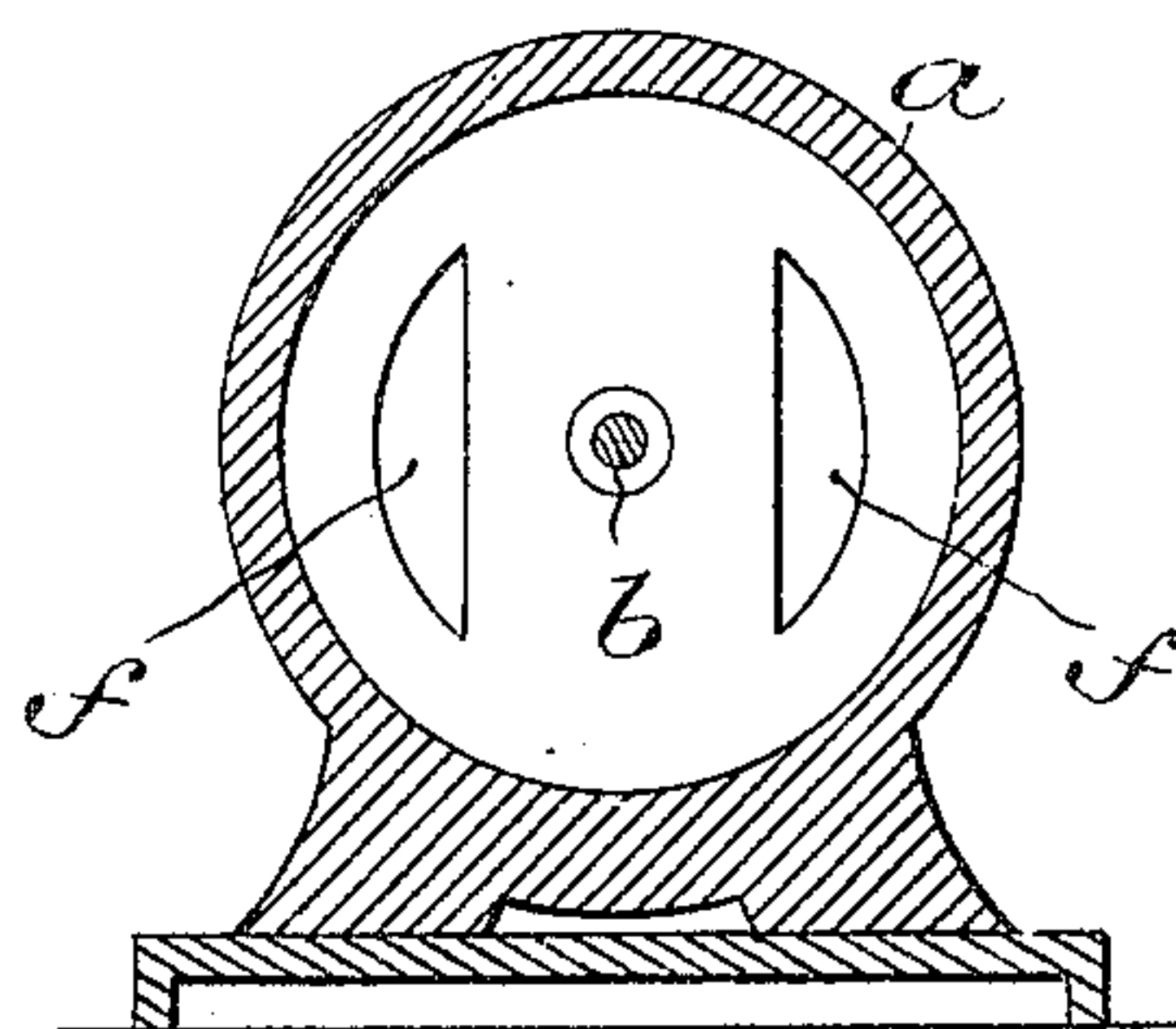
*Fig. 1.*



*Fig. 3.*



*Fig. 2.*



*Witnesses:*  
*J. George Barry,*  
*Henry Whieme,*

*Inventor:*  
*Jose F. de Navarro*  
*by attorneys*  
*Amundson*

# UNITED STATES PATENT OFFICE.

JOSÉ F. DE NAVARRO, OF NEW YORK, N. Y., ASSIGNOR TO HERBERT J. TRAVIS, OF BROOKLYN, NEW YORK.

## FUEL-FEEDING APPARATUS.

No. 804,158.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed March 3, 1905. Serial No. 248,280.

*To all whom it may concern:*

Be it known that I, JOSÉ F. DE NAVARRO, a subject of the King of Spain, and a resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Fuel-Feeding Apparatus, of which the following is a specification.

My invention relates to fuel-feeding apparatus, in which the fuel is finely pulverized or reduced to a powdered form and forced into a boiler by the rotary action of suitable beaters and an air-current, the rotary movement of the beaters and the air-current being induced by a motor independent of the engine which the said boiler is intended to supply power to.

The particular feature of my present invention is the structure for directing the pulverized or powdered fuel through the end of the casing to the combustion-chamber as distinguished from the side delivery heretofore in common use.

In the accompanying drawings, Figure 1 is a view of the apparatus in side elevation, partly in section. Fig. 2 is a transverse section in the plane of the line A A of Fig. 1, and Fig. 3 is a partial horizontal section in the plane of the line B B of Fig. 1.

The casing in which the pulverizer and beaters rotate is denoted by *a*. The shaft on which the beaters are secured and which extends centrally within the casing is denoted by *b*, the beaters themselves by *c*, the motor for rotating the shaft, in the present instance a steam-turbine, by *d*, and the hopper from which the material is fed to the beaters within the casing by *e*. These parts are preferably of the same general type as those shown, described, and claimed in Letters Patent No. 659,200, granted to Thomas Asencio October 9, 1900.

The shaft *b* is mounted in suitable supports exterior to the opposite ends of the casing *a*.

The discharge of the pulverized or powdered material from within the casing *a* takes place through one or more discharge-openings *f* in the end of the casing, in the present instance two openings located diametrically opposite each other on the right and left of the shaft *b*. These several openings *f* in the end of the casing *a* register with passage-

ways *g*, which passage-ways may lead directly to the combustion-chamber of a furnace. (Not shown.) The several passage-ways *g* are each conveniently formed by a tapered casting *i*, projecting from a base-plate *k*, arranged to set snugly against the end of the casing *a*. It is intended that the plate *k* shall have its periphery extended to correspond with the periphery of the end of the casing *a*, the latter being sufficiently larger than the casing to provide an annular flange *l*, through which the plate *k* may be bolted snugly to the casing. The entrance ends of the passage-ways *g* are in the plate *k*, and when the plate *k* is brought snugly against the end plate of the casing, with the ends of the passage-ways registering with the openings *f* in the end of the casing, the discharge-conduits are continuous from the interior of the casing outward. While I have shown two of these discharge passage-ways, it is obvious that the number might be more or less, as may be found desirable by experience, the object being to free the powdered or finely-pulverized material from the end of the casing as fast as it accumulates there, taking it in one or more constant jets from the pulverizers to the point where it is to be consumed. This structure also provides for placing the apparatus parallel with the longitudinal axis of the boiler to be fed and in alinement therewith, thereby accommodating the apparatus to positions where there is not sufficient room transversely of the boiler for its location—as, for instance, in railway-locomotives.

It is evident that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is—

The combination with the pulverizer-casing provided with an annular flange at its end, a rotary shaft extending through the casing, beaters carried by the shaft, means for actuating the shaft and means for feeding fuel within the casing, the said flanged end of the pulverizer-casing being provided with one or more openings therethrough, of a plate provided with openings corresponding to the



openings in the end of the pulverizer-casing  
and constructed to be secured to the end of  
the pulverizer and discharge passage-ways  
leading from the said plate forming a con-  
5 tinuation of the openings therethrough.

In testimony that I claim the foregoing as  
my invention I have signed my name, in pres-

ence of two witnesses, this 9th day of Feb-  
ruary, 1905.

JOSÉ F. DE NAVARRO.

Witnesses:

FREDK. HAYNES,  
C. S. SUNDGREN.