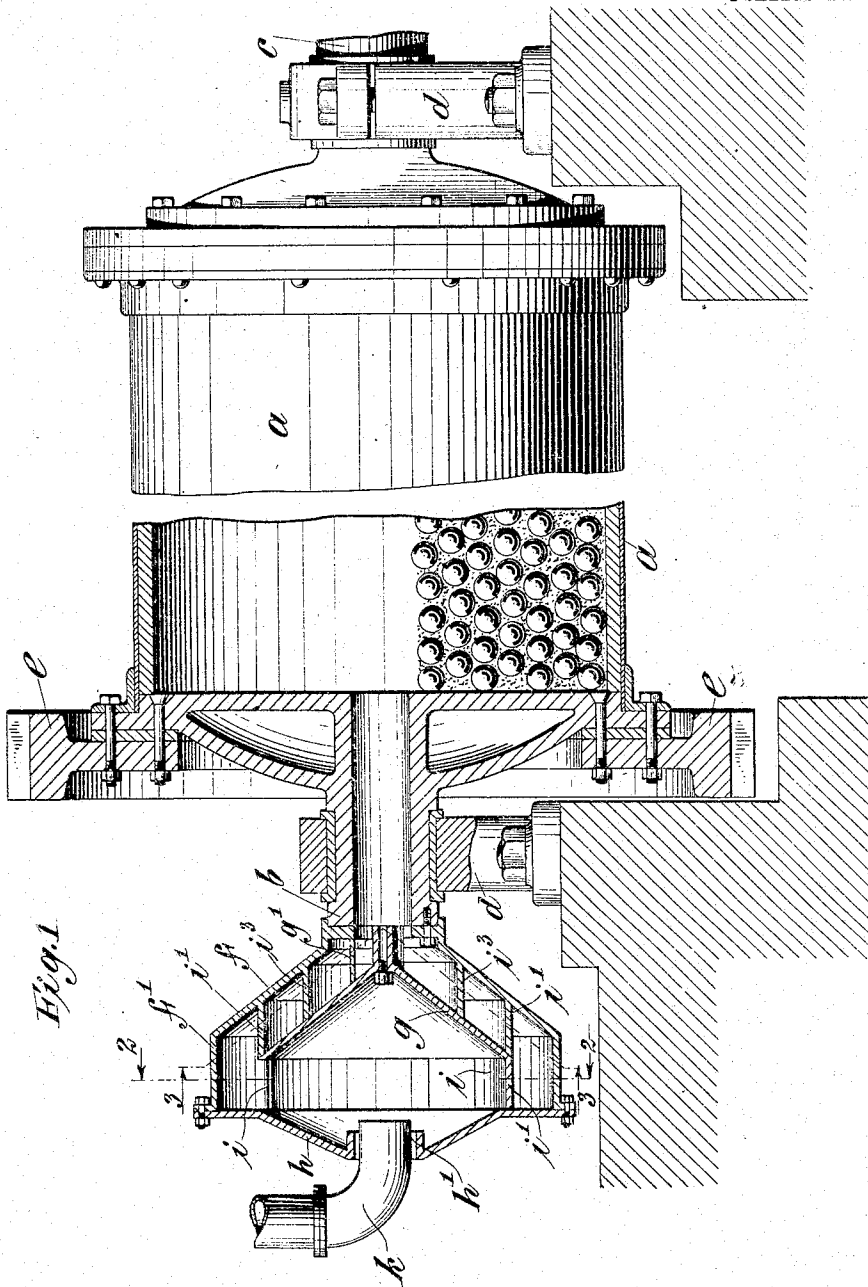


P. T. LINDHARD.
TUBE MILL, &c.
APPLICATION FILED SEPT. 25, 1908.

939,044.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.



WITNESSES:
Ella J. Kruger
Minnie Riedling

INVENTOR
Paul T. Lindhard
BY
Redding, Greeley & Austin
ATTORNEYS

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2 SHEETS—SHEET 2.

Fig. 3.

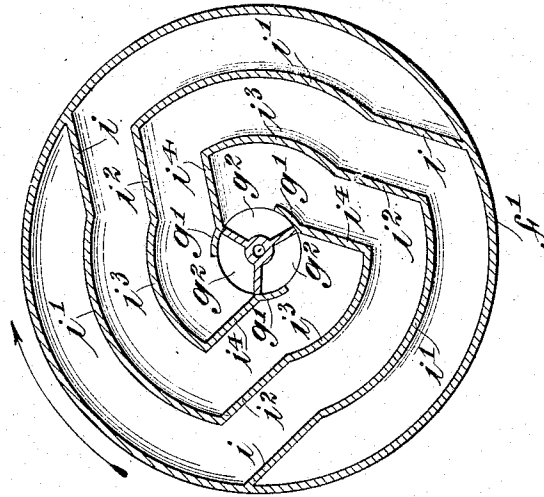
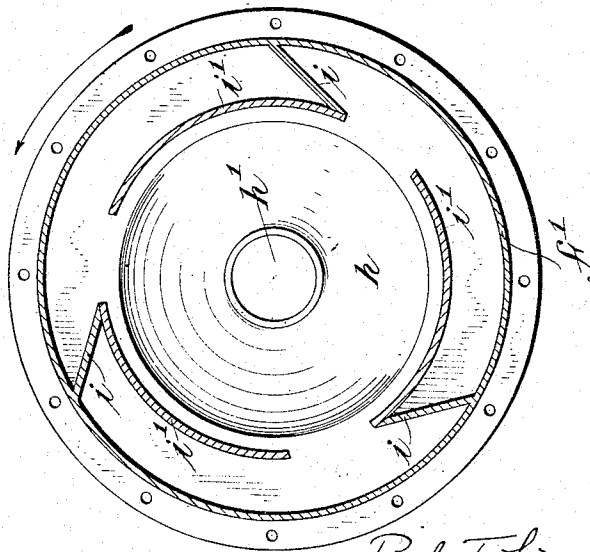


Fig. 2.



WITNESSES:
E. H. Kuger
Minnie Redding

INVENTOR
Paul T. Lindhard
BY
Redding, Greely & Austin
ATTORNEYS

UNITED STATES PATENT OFFICE.

POVL T. LINDHARD, OF NEW YORK, N. Y.

TUBE-MILL, &c.

939,044.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed September 25, 1908. Serial No. 454,696.

To all whom it may concern:

Be it known that I, POVL T. LINDHARD, a subject of the King of Denmark, residing in the borough of Manhattan, of the city of New York, in the State of New York, have invented certain new and useful Improvements in Tube-Mills, &c., of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to machines in which ores and other materials are pulverized, more particularly in a wet state, such machines comprising a drum which rotates upon a substantially horizontal axis and contains pebbles or other grinding bodies.

The invention is particularly concerned with the feed head through which the material to be pulverized is fed into the rotating drum, and it has for its object to improve the construction of such feed heads and make the feed of the material there-through more uniform than heretofore.

The invention will be more fully explained hereinafter with reference to the accompanying drawings in which—

Figure 1 is a view partly in elevation and partly in longitudinal section of so much of a tubemill with the improved feed head as is necessary to enable the nature of the invention to be understood. Fig. 2 is a detail view in section on the plane indicated by the line 2—2 of Fig. 1, looking toward the left, the scale of Fig. 2 being larger than that of Fig. 1. Fig. 3 is a detail view in section on the plane indicated by the line 3—3 of Fig. 1, looking toward the right, the scale of Fig. 3 being the same as that of Fig. 2.

In the machine represented in Fig. 1 of the drawings the cylindrical drum *a* in which the pulverization of the materials is carried on, is shown as having hollow trunnions *b* and *c* through which, respectively, the material to be pulverized enters the drum and the pulverized material leaves the drum, such trunnions being mounted in suitable pedestals *d*. The drum is also shown as having a gear *e* through which the drum may be rotated. Upon the extremity of the feed trunnion *b* is secured the feed head. This comprises an outer shell having a frusto-conical portion *f* and a cylindrical portion *f'*, an inner shell having a conical portion *g* and a cylindrical portion *g'*, and a cap *h*

having a central orifice *h'* through which the material to be pulverized may be introduced into the feed head. The space between the two conical portions *f* and *g* is partitioned off by webs which extend from one to the other, such webs forming a series of substantially parallel passages from the outer portion of the head, bounded by the cylindrical part *f'* of the outer shell, to the inner portion of the space between the two conical parts, each passage communicating with a corresponding opening *g'* formed in the cylindrical portion of the inner shell, so that material may pass through each of such passages into and through the cylindrical portion *g'* and thence into the trunnion *b* and drum *a*. Each of such webs or partitions is substantially spiral, the passages formed thereby being substantially spiral and parallel passages from the outer circumference of the feed head to the center thereof, but each of such partitions is preferably formed of a series of portions comprising each a portion *i* which is extended from the conical portion *f* to the cap *h* and is inclined inwardly from the cylindrical portion *f'* of the outer shell toward the center, joining the portion *i'* which follows the arc of a circle about the axis of the drum until it joins the portion *i''* which is parallel with the first portion *i*. Another portion *i'''*, also following the arc of a circle about the axis and parallel with the portion *i'*, joins the portion *i''* with a portion *i'''* which is inclined toward the center and parallel with the portion *i''*, itself joining the cylindrical portion *g'* of the inner shell or being continued by a portion *g'* which, although a part of the web or partition, virtually forms a cylindrical hub for the inner shell with opening *g''*.

It will now be understood that when the material to be pulverized is introduced within the feed head, as by a suitable feed pipe *k*, it falls to the lowest portion of the rotating feed head, resting on the cylindrical portion *f'* of the outer shell. As the feed head rotates with the drum the material is picked up by the then ascending portion *i* of one of the webs and, in the continued rotation of the head, is guided through the passage between such web and the opposite web, gradually approaching the center, until it is discharged through the corresponding openings *g''* in the hub *g'* into the trunnion *b* and

thence into the drum *a*. The material which is discharged into the feed head is thus delivered gradually and with uniformity into the drum, thus securing the conditions of feed of material which are most favorable to the operation of the mill with the highest efficiency.

I claim as my invention:

1. A feed head for tubemills comprising an outer shell adapted to be secured to the rotating drum of the mill and having a conical part tapering toward the drum and a cylindrical part at the base of the conical part and forming a receiving chamber; an inner shell comprising a cylindrical hub having openings and a conical portion tapering toward the drum, substantially spiral webs or partitions extending from one conical portion to the other and forming between them substantially spiral passages from the outer portion of the head to the center, and a cap secured to the outer shell and adapted

to permit the material to be introduced into the receiving chamber within the head.

2. A feed head for tubemills comprising an outer, conical shell adapted to be secured to the rotating drum of the mill and tapering toward the drum, an inner, conical shell tapering toward the drum, a plurality of webs or partitions extending from one shell to the other and consisting each of a succession of inclined and circular portions, the webs or partitions forming between them substantially spiral passages from the outer portion of the head to the center and a cap secured to the outer shell and adapted to permit the material to be introduced within the head.

This specification signed and witnessed this 21st day of September A. D., 1908.

POVL T. LINDHARD.

Signed in the presence of—

C. J. IVIMLY,
GEO. M. NEWCOMER.