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TUBE MILL

Filed April 19, 1929

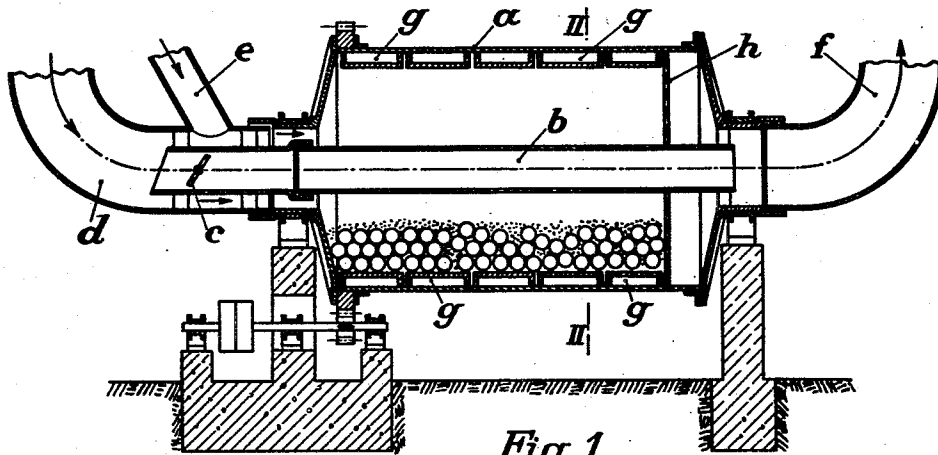


Fig. 1

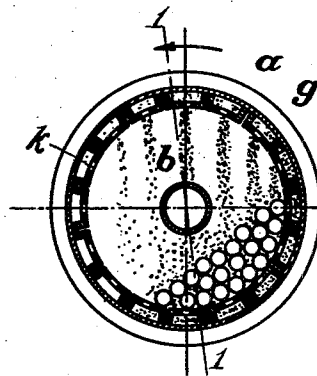


Fig. 2

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UNITED STATES PATENT OFFICE

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TUBE MILL

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This invention relates to means for regulating the quantity of air and the velocity of the air in tube mills with internal sifting means. The invention consists more particularly in this, that the air introduced into the mill is divided, when entering, into two streams, one of which conveys the material to be ground into the mill and sifts it there and the other is conveyed directly into the delivery pipe. Through suitably distributing these two streams of air, the sifting action of the mill may be regulated as desired.

For carrying the idea underlying the invention into effect a pipe is for instance provided inside the mill, which is open at both ends, and which can be closed at one end by a throttle. The said pipe is mounted in the middle in such a manner that it has one end extending beyond the inlet branch for the material into the air inlet pipe and the other end opening into the outlet pipe for the material. Thus, by adjusting the throttle, the strength of the stream of air, where it enters the mill, can be adapted to the weight of the material to be broken up, so that material of less specific gravity will also be deposited by the stream of air near the inlet end of the mill.

Preferably for this purpose mills of a known kind employing internal sifting will be used, which operate in such a manner that the comminuted material falls into pockets provided in the peripheral space surrounding the tube mill, is raised by the said pockets and then falls through the slots in the pockets back into the peripheral space, the fine dust being conveyed away by the stream of air passing through the mill, while the coarser particles are subjected to further comminution.

The invention is illustrated in the accompanying drawing, in which Fig. 1 shows a sectional elevation of a tube mill according to the present invention on the line 1—1 of Fig. 2, and Fig. 2 shows a cross section of the drum of the mill on the line 2—2 of Fig. 1, Fig. 3 is a cross section on the line 3—3' of Figs. 1 and 2. In the tube mill *a* a nonperforated pipe *b* is mounted

axially, which is open at both ends and is provided at one end with a throttle *c*. The said pipe has one end extending into the air inlet pipe *d* beyond the branch *e*, where the material enters. The other end of the pipe *b* is connected to the delivery pipe *f* for the material. Part of the stream of air entering at *d* can thus, according to the adjustment of the throttle *c* be conveyed through the pipe *b* directly to the delivery pipe *f*, while the other part of the stream of air, the strength of which is regulated by the throttle, conveys the material entering at *e* into the drum and delivers the fine dust which is held in suspension by pockets *g* provided with slots *h* or other suitable means beyond the delivery wall *k*.

What I claim is:

1. In a tube mill, the combination with a rotatable drum, having an inlet and an outlet and containing loose grinding members, with means for introducing the material to be operated upon and for introducing a stream of air for withdrawing the ground material from the interior of the mill through the said outlet, of communicating means in open communication with the said outlet arranged inside the said drum and adapted to receive a portion of the stream of air introduced into the drum and to conduct it directly to said outlet, and adjustable controlling means inside said communicating means for regulating the flow of air through said communicating means so as to divide the inflowing air into two parts, with the flow of one of said parts adjustable relatively to the flow of the other, one of said parts serving for introducing the material to be treated into the mill and sifting it in the same, and the other of said parts proceeding directly to the outlet of the mill, as and for the purpose set forth.

2. In a tube mill, the combination with a rotatable drum, having an inlet and an outlet and containing loose grinding members, with means for introducing the material to be operated upon and for introducing a stream of air for withdrawing the ground material from the interior of the mill through the said outlet, of a pipe in open communication with

the said outlet arranged inside the said drum and adapted to receive a portion of the stream of air introduced into the drum and to conduct it directly to said outlet, and a throttle valve inside said pipe for regulating the flow of air through said pipe so as to divide the inflowing air into two parts, with the flow of one of said parts adjustable relatively to the flow of the other, one of said parts serving for introducing the material to be treated into the mill and sifting it in the same, and the other of said parts proceeding directly to the outlet of the mill, as and for the purpose set forth.

3. In a tube mill, the combination with a rotatable drum, having an inlet and an outlet and containing loose grinding members, with an air inlet pipe connected to said inlet for introducing a stream of air into the drum, means connected to said air inlet pipe for introducing thereto material to be operated on, a communicating pipe arranged inside said drum and extending into said air inlet pipe beyond the point of entry thereto of the material to be operated on, said pipe extending to the said outlet so as to be capable of establishing direct open communication between the air inlet pipe and the outlet for receiving a portion of air introduced into the air inlet pipe and an adjustable throttle in said communicating pipe, as and for the purpose set forth.

4. In a tube mill, the combination with a rotatable drum, having an inlet and an outlet and containing loose grinding members, with means for introducing the material to be operated upon and for introducing a stream of air for withdrawing the ground material from the interior of the mill through the said outlet, of communicating means in open communication with the said outlet and adapted to receive a portion of the stream of air to be introduced into the drum and to conduct it directly to said outlet, so as to divide the inflowing air into two parts, one of said parts serving for introducing the material to be treated into the mill and sifting it in the same, and the other of said parts proceeding directly to the outlet of the mill, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification.

WILHELM JAEDEL.

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