

Nov. 22, 1927.

1,650,508

P. GOEBELS

COMPOUND MILL

Filed Oct. 15, 1926

3 Sheets-Sheet 1

Fig. 1

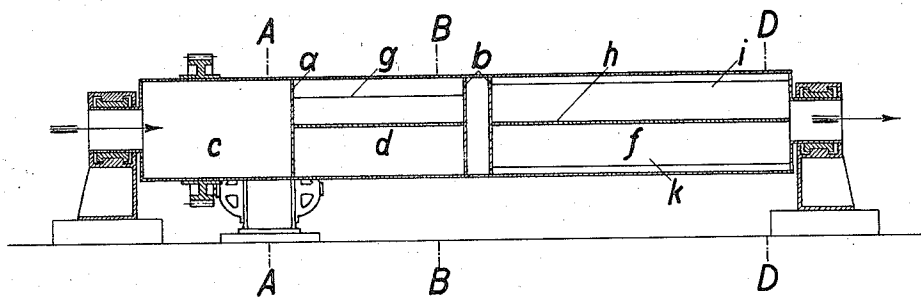


Fig. 2

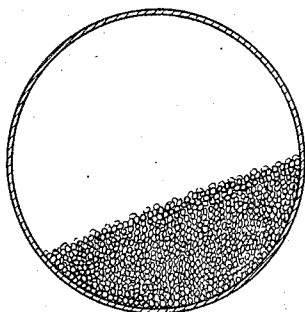


Fig. 3

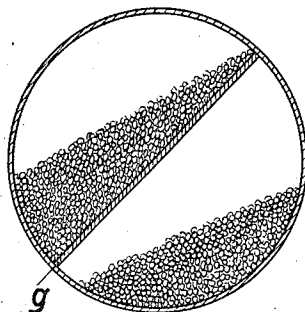
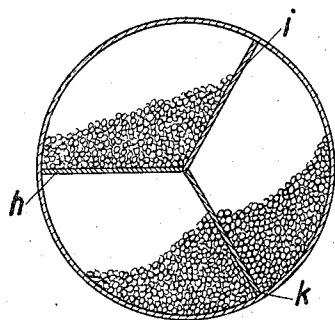


Fig. 4



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Fig. 5

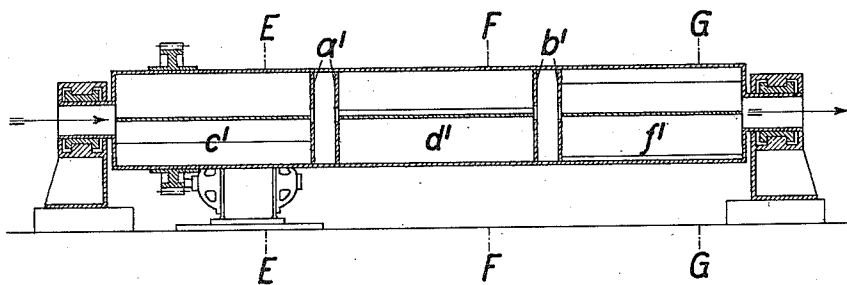


Fig. 6

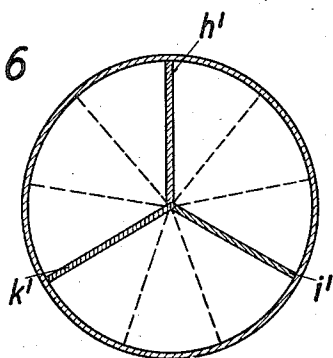


Fig. 7

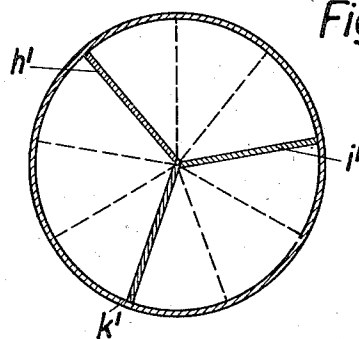
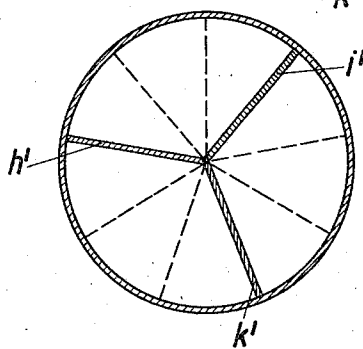


Fig. 8

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Fig. 9

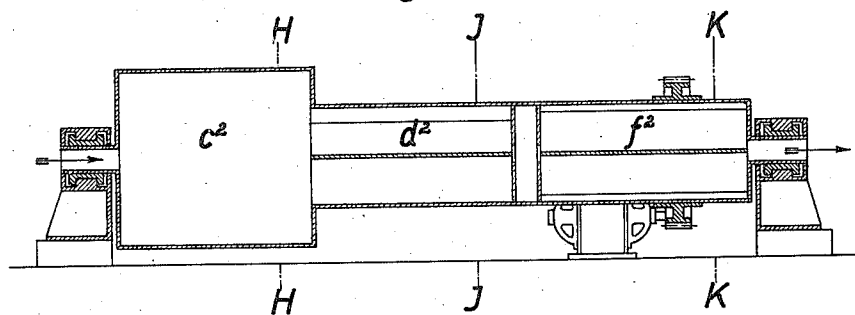


Fig. 10

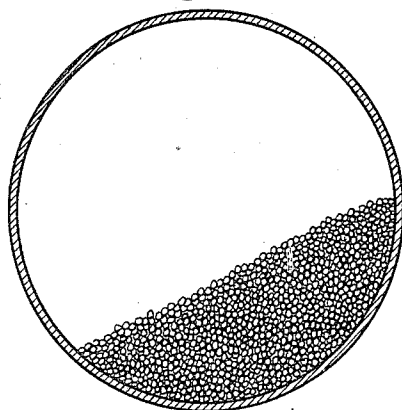


Fig. 11

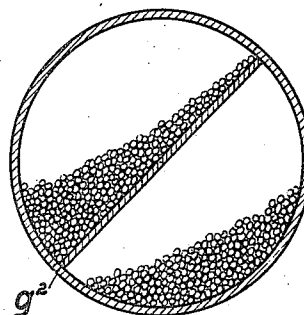
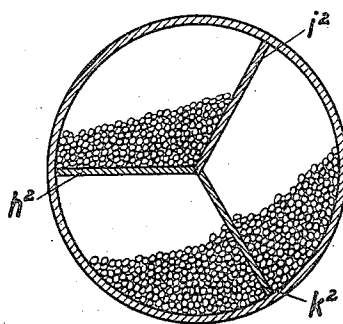


Fig. 12



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UNITED STATES PATENT OFFICE.

PAUL GOEBELS, OF DESSAU, GERMANY, ASSIGNOR TO THE FIRM G. POLYSIUS, OF DESSAU, GERMANY, A PARTNERSHIP.

COMPOUND MILL.

Application filed October 15, 1926, Serial No. 141,818, and in Germany May 17, 1926.

The latest endeavours to improve the art of grinding aim at utilizing still more the space available in the so-called compound mills. The first way in the direction to that aim or object consisted in subdividing the grinding space in its longitudinal direction by means of transverse walls, or partition walls respectively, whereby the grinding space was subdivided into two, three or more chambers located one after the other in the longitudinal direction of the mill. Another means for the purpose in view consisted in providing partition walls extending parallel to the axis of the mill, the grinding space being, thus, subdivided around this axis.

The grinding space available in a mill of the type stated can be utilized to the utmost possibility by combining the two contrivances above mentioned, that is to say, that the space is subdivided in the present improved mill longitudinally, as well as at right angles thereto. In connection therewith the grinding bodies employed in the several and consecutive grinding chambers are chosen according to the degree of fineness of the substance or material to be ground in the respective chamber or chambers. The fact has been ascertained that by the said combined subdivision of the grinding space of the mill, an essentially larger output can be attained.

My present invention consists essentially therein that the compound mill is provided with longitudinal as well as cross partition walls, whereby a plurality of grinding spaces is obtained which are arranged in such a manner with respect to each other that the longitudinal partition walls of one space are displaced or staggered with respect to the longitudinal partition walls of another space of the mill. My invention further consists in so designing a compound mill of this kind that the preliminary grinding space is of a larger diameter than the subsequent grinding spaces.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings on which Figure 1 is a longitudinal section through a mill designed according to this invention; Figures 2, 3 and 4 are cross-sections in the planes A—A, B—B and C—C of Fig. 1; Figure 5 is a longitudinal section through a modified constructional form, and Figs.

6, 7 and 8 are cross-sections in the planes E—E, F—F and G—G of Fig. 5; Figure 9 shows another modification and Figs. 10, 11 and 12 are cross-sections in the planes H—H, J—J and K—K of Fig. 9, the Figures 2, 3, 4, 6, 7, 8, 10, 11 and 12 being drawn to an enlarged scale.

Referring to Figs. 1–4 there are in this example three co-axial grinding spaces c , d and f which are formed by cross partition walls a and b , and are subdivided by longitudinal partition walls g , h , i and k , the wall g being located in the space d , and the walls h , i , and k in the space f . The first or preliminary grinding space is not subdivided by longitudinal walls, but the others are, the space d into two chambers and the space f into four.

In the modification shown in Figs. 5–8 the grinding space is subdivided by cross-partition walls a' and b' and each of the three spaces c , d' and f' is subdivided by three longitudinal partition walls h' , i' and k' (like Fig. 4), but these walls are located in staggered arrangement in the three spaces c , d' , f' , as appears from those partition walls that are indicated merely by dotted lines in Figs. 6, 7 and 8, and indicate the walls located in the other grinding spaces, as will be clear without a further explanation. Owing to this arrangement shocks that might result from the operation of the mill are perfectly prevented. The mill operates perfectly uniformly. I wish it, however, to be understood that each grinding space (c' , d' , f') may be subdivided into more than three chambers by a corresponding number of longitudinal partition walls, and there may also be provided more than three grinding spaces by the provision of a corresponding number of cross partition walls.

The diameter of the grinding spaces need not be the same in all these spaces. For certain substances or materials it may be advantageous to give the first or preliminary grinding space a larger diameter than the other grinding spaces, in other words, to give these other spaces a smaller diameter than the first. A constructional form of this kind is shown in Figs. 9–12 in which the diameter of the grinding spaces d^2 and f^2 is smaller than that of the grinding space c^2 which is not subdivided by one or more

longitudinal partition walls. g^2 denotes the one longitudinal partition wall of the grinding space d^2 , and h^2 i^2 k^2 denote the three walls of the space f^2 .

I claim:

1. A compound mill for the grinding of substances and materials of all kinds, comprising in combination a rotary mill casing, cross partition walls subdividing the interior of said casing into a plurality of grinding spaces, and longitudinal walls subdividing said grinding spaces except the first, into grinding chambers, said longi-

tudinal partition walls of one of said spaces being angularly displaced relatively to the longitudinal partition walls of the other of said spaces.

2. A compound mill, as specified by claim 1, wherein the several grinding spaces are of different diameter so as to provide a preliminary grinding space having a larger diameter and one or more subsequent grinding spaces having a smaller diameter.

In testimony whereof I affix my signature.

PAUL GOEBELS.