J. E. KENNEDY.

DUST GUARD FOR GYRATORY CRUSHING AND PULVERIZING MACHINES.

APPLICATION FILED SEPT. 19, 1913.

1,176,834.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 1.

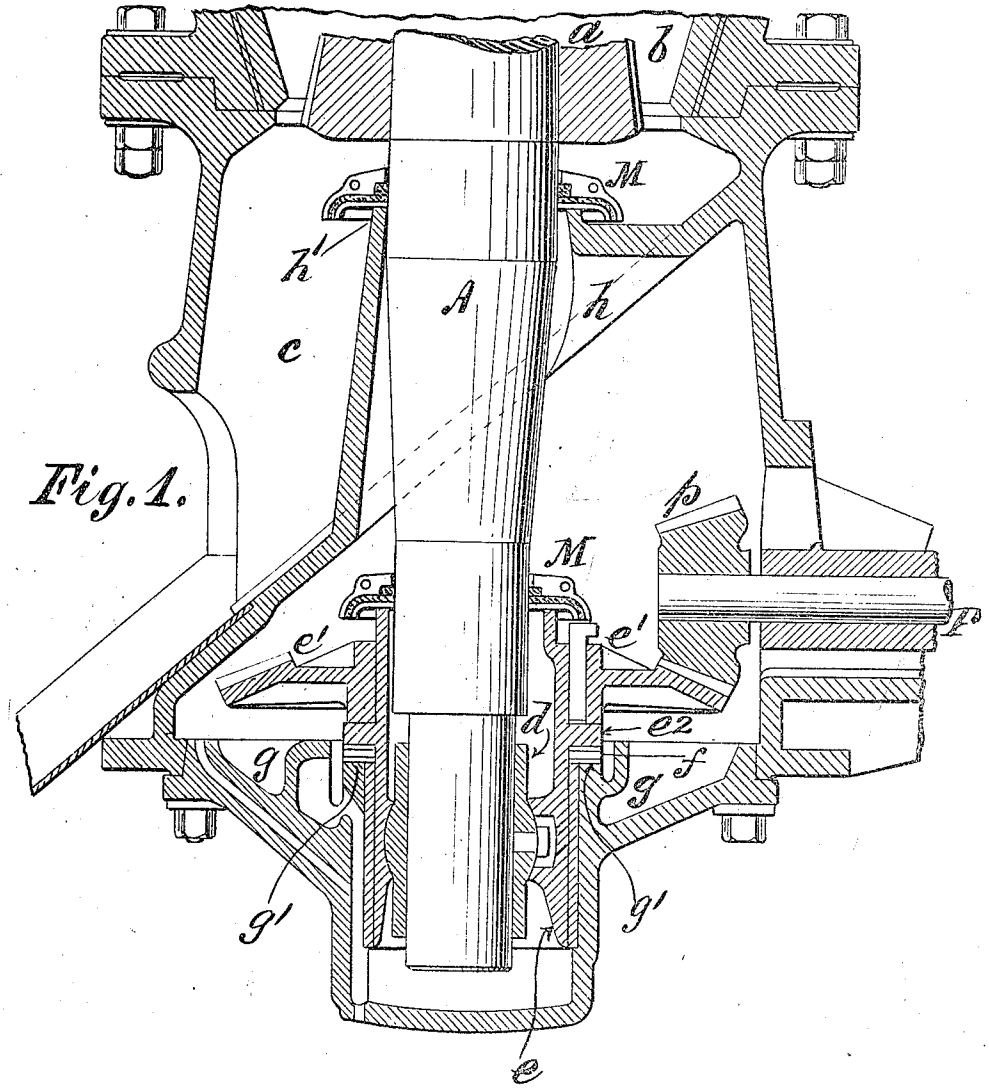


Fig. 1.

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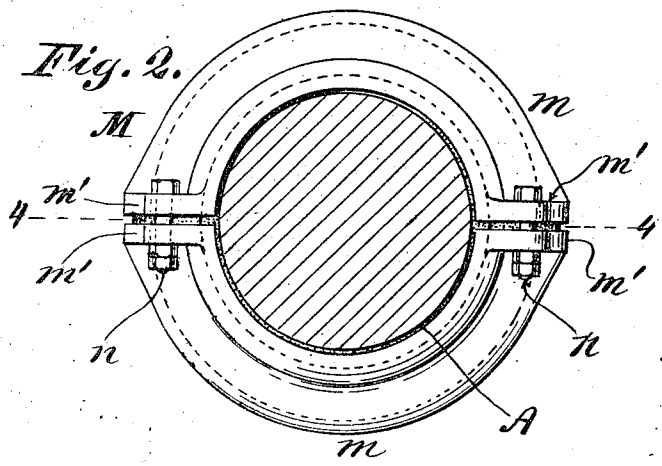
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2 SHEETS—SHEET 2.

Fig. 2.



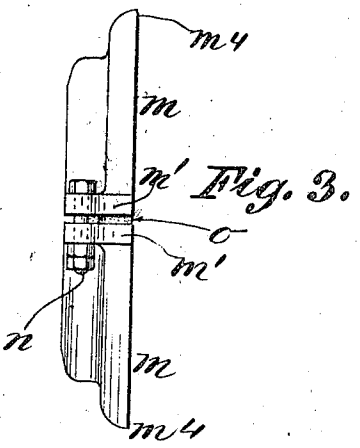


Fig. 3.

Fig. 4.

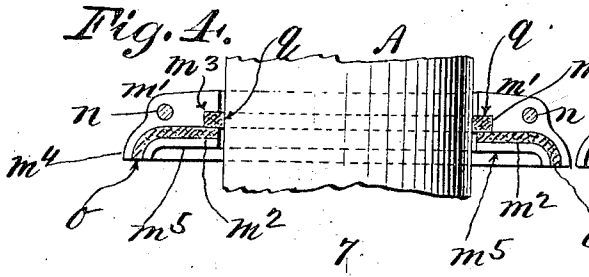


Fig. 5.

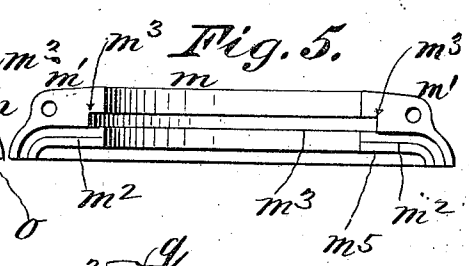
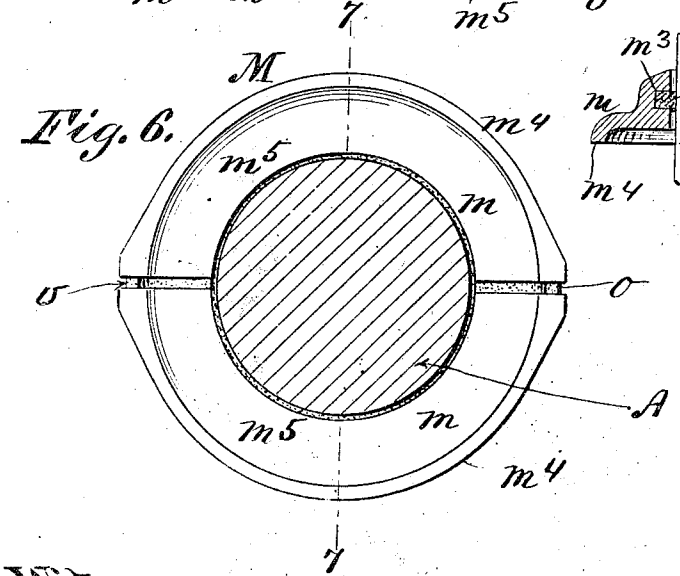


Fig. 6.



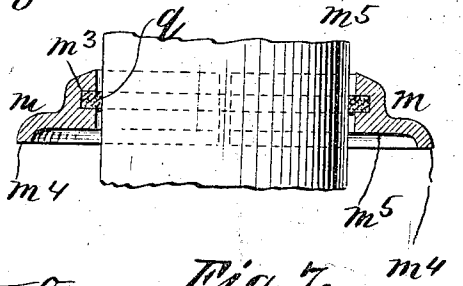


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOSEPH E. KENNEDY, OF NEW YORK, N. Y.

DUST-GUARD FOR GYRATORY CRUSHING AND PULVERIZING MACHINES.

1,176,834. Specification of Letters Patent. Patented Mar. 28, 1916.

Original application filed May 31, 1913, Serial No. 770,833. Divided and this application filed September 19, 1913. Serial No. 790,735.

To all whom it may concern:

Be it known that I, JOSEPH E. KENNEDY, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Dust-Guards for Gyratory Crushing and Pulverizing Machines, of which the following is a specification.

The object of my invention is to afford an effective dust guard especially adapted to the requirements of the type of crushing and pulverizing mechanism in which the lower extremity of a gyratory shaft is journaled in a rotatable eccentric bearing, situated in an inclosing gearing chamber, said shaft carrying a truncated conical crusher head positioned in an oppositely inclined concave crusher chamber from the lower portion of which the crushed and pulverized material escapes above the gear chamber, as set forth in my concurrent application No. 770,833, filed May 31st, 1913, of which the present application is a subdivision.

In this class of crushing mechanism the exclusion of dust from the gear chamber, and particularly from the lower eccentric bearing situated therein, is an important factor in the successful and economical operation of the apparatus,—said eccentric bearing and the rotatable sleeve in which it is seated being accurately and delicately fitted, and requiring special protection from grit which would speedily render them, and hence the machine, inefficient or useless. Heretofore dust guards have been used encircling the gyratory shaft and resting upon the edge of the shaft aperture at the top of the gear chamber, and upon the upper edge of the rotatable bearing sleeve, and these dust guards have consisted of continuous annular one piece metallic collars bored out to fit the shaft. As these dust collars moved back and forth, traveling with the shaft, steel against iron, it will be readily understood that in a short time they became sufficiently worn to allow the dust to pass between the shaft and the top dust collar into the gear chamber, and from there through the lower dust collar into the eccentric bearing, causing heating and wear and necessitating frequent rebabbitting, not to mention the loss in capacity of the machine due to diminished eccentricity. Furthermore the machines being particularly heavy, ranging in weight from 7 tons to as much as 350 tons each, it is obvious that the taking apart thereof for rebabbitting or renewal of parts, involves considerable labor and expense, irrespective of the loss of the output of the apparatus before it is again assembled and ready for use. Thus, for instance, in the case of a medium sized machine in which the spider weighs 15000 lbs., the top shell and concaves 25000 lbs., and the shaft alone 10000 lbs., the taking apart and putting together again would take at least a day and involve a cost of fifty dollars for labor and material alone.

I obviate these difficulties and insure continuous and effective operation for long periods of time by means of my present invention, which consists essentially in the combination with a gyratory crusher shaft of a dust guard of the specific construction herein described and claimed, the dust guard being utilized to seal the shaft opening at the top of the gear chamber, and the upper edge of the rotatable bearing sleeve as hereinafter more fully set forth, distinguishing features being the making of the guard in two semi-circular sections grooved for the reception of an annular gasket, and also for transverse gaskets sealing the abutting ends of said semi-circular sections, in conjunction with means for securing the parts together.

In the accompanying drawings, Figure 1, is a central vertical sectional elevation of the lower portion of a gyratory crusher illustrating the practical application of my invention; Fig. 2, is a sectional view of the gyratory shaft showing a top view of my improved dust guard; Fig. 3, an edge view of the dust guard; Fig. 4, a sectional elevation taken upon plane of line 4—4 Fig. 2; Fig. 5, an elevation of the inner side of one of the segmental sections; Fig. 6, a sectional view of the gyratory shaft and of the under side of the dust guard; Fig. 7, is a sectional elevation taken upon plane of line 7—7.

In the apparatus illustrated in the drawings the general arrangement and operation of the parts are substantially the same as in others of this type, consisting essentially of a truncated conical crushing head *a*, rigidly secured to the shaft A, and gyrated thereby in an oppositely inclined concave

crushing chamber b, from the lower portion of which the reduced material drops into the chute chamber c, in the usual manner.

The lower portion of the gyratory shaft A, is journaled in the eccentric bearing d, seated in the rotatable sleeve e, to which the driving gear e^1, is secured,—said driving gear e^1, being rotated by the pinion p on the power shaft P, as indicated in Fig. 1. The sleeve e, is formed with an annular flange e^2, by which it is rotatably supported on the lower casing or bottom plate g,—a floating ring f, being interposed between said annular flange e^2, and the actual rest or seat g^1.

In order to exclude all dust from the lubricant and operative parts to be protected thereby, I close the top of the sleeve e, and the top of the gear chamber h, by means of dust guards or collars M, M, of peculiar construction.

Instead of making the collar of a single piece of metal bored out to fit the shaft A, as heretofore, I make it in two semi-circular sections m, m, which are bolted together around the shaft, so as to be applicable thereto or removable therefrom at any time without the need of disassociating the parts as heretofore. The abutting ends of the segments m, m, are formed with flanges m^1, m^1, for the bolts n, n, and with grooves m^2, m^2, for the reception of the transverse packing strips o, o, which seal the joints and make them dust proof. The inner surface of each segment m, m, is also formed with a groove m^3, m^3, for the reception of an annular packing q, to bear against the shaft A, and prevent the passage of dust between it and the guard M. This split dust collar can be put in the machine after the shaft is in place so that if a dust collar should accidentally become broken or worn out, a new one could be put on without dismantling the machine. The intention is to insert in the gland m^3, a ring of packing q, that has a lesser inside diameter than the collar, with two transverse strips of packing o, o, set at approximately right angles to the circumferential packing, so that when the two parts are drawn together by the bolts, the circumferential packing is pressed hard against the shaft, while the iron is some distance back, and the transverse packing is clamped between the two seams so that no dirt can pass between the shaft into the gear chamber, through the top dust collar or through the bottom dust collar into the eccentric bearing. The transverse gaskets o, close the seams between the adjacent metal parts of the ring sections where joined together, so that no dust or dirt can get through in this way. This method of packing and attaching a dust collar above the eccentric not only positively excludes the dust, but it protects the portion of the shaft in contact with the dust guard from becoming grooved or worn by reason of the gyratory movement of the shaft. A dust collar, made in this way prevents dust from getting between the shaft and the dust collar into the gear chamber, and between the dust collar and the shaft into the eccentric bearing chamber. This insures long life to the eccentric without heating, and a diminished amount of power required to operate with a uniform movement of the shaft, which means an increased tonnage, for, as the eccentricity of a crusher is diminished, the tonnage, or capacity of the machine is diminished in proportion.

Provision is made for the lubrication of the lower bearing surfaces, &c., as set forth in my aforesaid concurrent application No. 770,833, or in any other manner that may be found expedient.

It is to be noted that my special construction of dust guard is hood-shaped in general configuration, the upper surfaces being all curved and inclined downward and the peripheral edge being in the form of a pendent apron m^4 extending below the central under bearing surface m^5, which latter is made broad enough to enable the dust guard, while contacting with the top of the sleeve e, and the neck h', of the gear chamber h, to conform freely to the gyratory motion of the parts. By this hood-like structure the dust and grit is shed downward away from the contacting surfaces, and is thus prevented from working in between the same. It is also to be noted that the only contact between the gyratory shaft A, and the dust guard is through the medium of the annular packing q, which spaces the inner edges of the segments m, m, away from the shaft so that they cannot wear upon the latter; and that the transverse gaskets o, o, effectually seal and render dust-proof the joints between the halves of the dust guard.

The dust guard constructed as herein set forth is obviously adapted only to the special requirements of a gyratory crusher of the class designated, and I do not seek to cover it for any other purpose or use.

What I claim as my invention and desire to secure by Letters Patent is,

1. In crushing mechanism of the character designated, the combination with the gyratory shaft and dust guard support, of a segmental dust guard, an annular packing seated therein, transverse packing seated in grooves in the abutting ends thereof and underneath said annular packing, and means for uniting the segments of the guard, for the purpose set forth.

2. In crushing mechanism of the character designated, the combination with the gyratory shaft and dust guard support, of an encircling dust guard comprising two inverse semi-circular segments the inner

faces of which are grooved for the reception of an annular packing for contacting with the shaft, and the abutting ends of which are recessed for the reception of packing, both annular and transverse packings, said annular and transverse packing, the transverse packing being positioned below the annular packing, and means for detachably uniting said abutting ends of the semi-circular segments, as and for the purpose described.

3. In crushing mechanism of the character designated, the combination with the gyratory shaft and dust guard support, of a segmental hood-shaped dust guard formed with a flat lower contact surface surrounded by a pendent peripheral apron, and comprising two inverse semi-circular segments the inner faces of which are grooved for the reception of an annular packing for contacting with the shaft, and the abutting ends of which are recessed for the reception of packing both annular and transverse, said annular and transverse packing, the transverse packing being positioned below the annular packing, and means for detachably uniting said abutting ends of the semi-circular segments, as and for the purpose described.

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