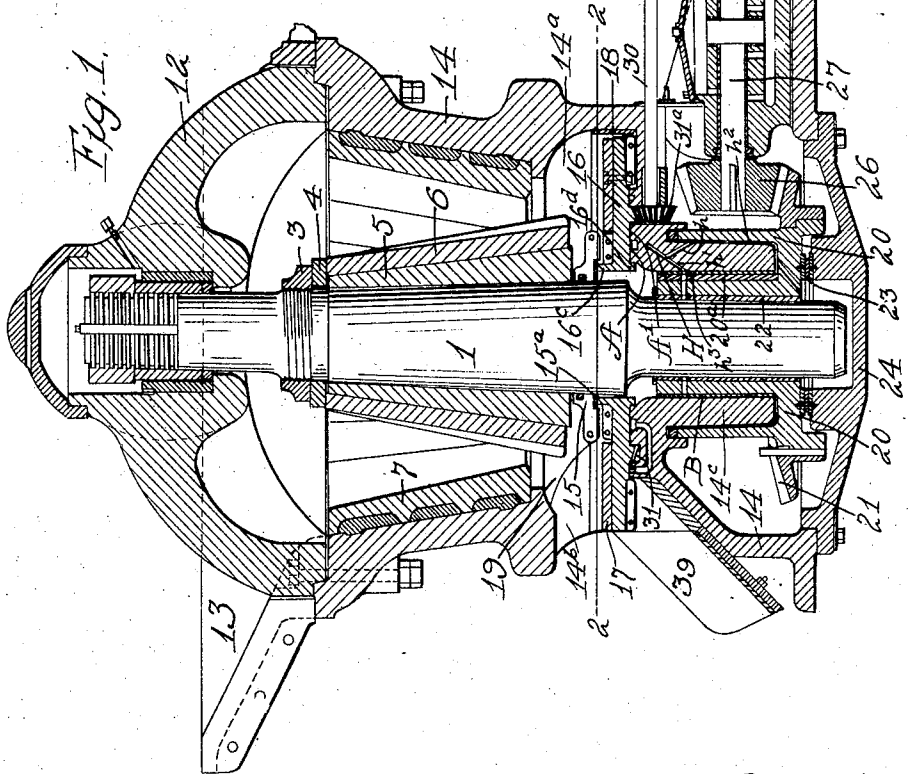
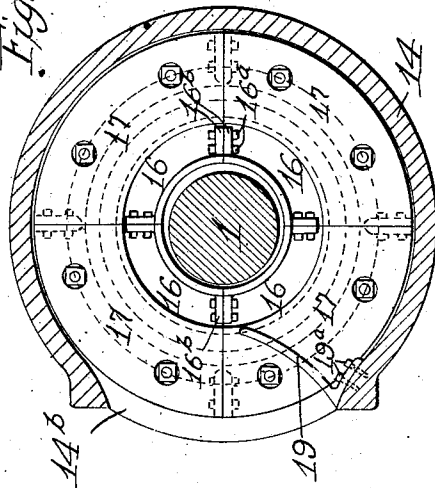


1,047,859.

Fig. 2.



Attest:
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Smith

UNITED STATES PATENT OFFICE

BRUCE W. TRAYLOR, OF NEW YORK, N. Y., ASSIGNOR TO TRAYLOR ENGINEERING AND MANUFACTURING CO., A CORPORATION OF DELAWARE.

GYRATORY CRUSHER.

1,047,859.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed December 7, 1911. Serial No. 664,448.

To all whom it may concern:

Be it known that I, BRUCE W. TRAYLOR, citizen of the United States, residing at New York, N. Y., have invented certain new and useful Improvements in Gyratory Crushers, of which the following is a specification.

My present invention relates to improvements in gyratory crushers, and has for its object to provide an apparatus of greatly increased strength and durability, and one in which a very short shaft may be used, and the bearing for the lower end of the shaft brought close to the crushing point, thereby removing the danger of the springing of the shaft when operating upon hard rock or in case of foreign substances getting into the crusher.

With this and other objects in view, the invention includes the novel features of construction and arrangement and combination of parts hereinafter described and particularly defined in the appended claims.

A crusher constructed in accordance with my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a transverse vertical section; and Fig. 2 a horizontal section on line 2—2 of Fig. 1.

Referring by reference characters to this drawing, the numeral 1 designates the crusher shaft, the upper end of which is journaled in a suitable bearing in a spider 12 supported by the main frame or body 14 of the crusher, said body also supporting a hopper 13 for the reception of the ore to be crushed which passes therefrom between the arms of the spider 12. The shaft 1 carries the mantle head 6 of truncated conical shape supported by the core 5 tapered upon its outer surface and held in place by nut 3 bearing on washer 4. This mantle head coacts with the lining 7 of the body in the manner common in these gyratory crushers, so that further description thereof is deemed unnecessary. The body of the crusher is widened or hollowed out just below the crushing surface to form an ore receiving chamber 14^a, and provided with a delivery opening 14^b at one side. The main frame or body of the crusher is extended inward below this ore chamber and is provided with an integral downwardly extending annular flange 14^c, which forms the bearing for the eccentric at the lower end of the shaft. The floor or bottom of the ore chamber is formed

by a horizontal rotary table 16 made in two or more sections, which can be put in through the opening 14^b in the side of the crusher body, and after insertion, be bolted together by bolts 16^a passing through lugs 16^b. This table is provided, on its under side, with a smooth bearing surface A, which rests upon a corresponding annular track A' formed by an annular flange carried by the main frame or body of the crusher, and being practically an upward extension of the flange 14^c. This flange is provided with an annular oil groove or channel which is kept filled with oil so that this bearing surface is kept properly lubricated, and the table turned with a minimum of friction. The table is provided at its inner edge with upwardly and downwardly projecting flanges 16^c and 16^d, the latter of which depends below the surface of the bearing just described, and thus prevents the possibility of any pulverized rock or dust working through this bearing, while access of such material to this space is further guarded against by a split collar 15 surrounding the shaft with a dust proof joint and provided, upon its lower side, with fiber rings or plates 15^a which rest upon the top of the flange 16^c, so that during the gyratory motion of the shaft 1, these plates play back and forth over the surface of the flange 16^c of the table, maintaining always a tight joint therewith. The table is provided on its lower face with an annular rack 31 with which engages the gear 31^a operated by shaft 30 from any convenient source of power whereby the table is rotated. The table is provided with an annular wear plate 17 secured thereto by countersunk bolts for the purpose of taking the wear off from the table, and a lining ring or band 18 is provided for the wall of the ore receiving chamber in line with the table to protect the body of the crusher from wear at this point. At 19 is shown an unloading apron or deflector which is bolted to the body of the crusher, as indicated at 19^a, and extends inward across the surface of the table, so that as the table rotates with the ore thereon which has dropped through from between the crushing surfaces, the said ore is scraped from the table by the apron or deflector and delivered into a delivery spout 39.

Heretofore, so far as I am aware, the de-

livery from crushers of this type has been entirely by gravity, which requires a large amount of space to get the proper inclination, and hence necessitates a tall structure, requiring a long shaft with the lower bearing a long distance removed from the crushing point. The result of this is great liability of springing the shaft, especially when encountering large lumps or pieces of foreign matter. By my improved construction the eccentric bearing is brought exceedingly close to the point where the work is done. It will be further observed that the eccentric bearing now to be described more in detail turns within the flange 14^c heretofore described, which is an integral part of the body of the crusher, thus giving additional strength. In gyratory crushers heretofore made of which I am aware, this lower bearing has been formed on or carried by a bottom casting bolted to the body of the crusher, which casting is difficult to secure firmly in place under the great strain to which it is subjected. This bearing flange 14^c is lined with a steel bushing B, which is removable when worn out. The eccentric sleeve is indicated at 20, and is provided with a surfacing of Babbitt metal 20^a turning within the steel bushing B, while between the eccentric sleeve 20 and the lower end of the shaft 1 is located a bronze bushing 22, which is made heavier on one side than on the other, as shown. As this eccentric rotates, it imparts to the lower end of the shaft the gyratory motion customary in crushers of this type. This eccentric is supported at its lower end upon the thrust bearing rings 23, a preferred form of bearing being to provide an upper ring of steel made fast to the bottom of the eccentric, and a lower ring of steel made fast to the bottom piece 24 of the frame, the interposed ring being of bronze and being a floating ring. The eccentric is driven by means of the annular rack 21 secured thereto, and with which meshes the bevel gear 26 carried by shaft 27 and rotated from any convenient source of power, as, for instance, by means of belt pulley 28. I prefer to drive the shaft 30 which rotates the table by means of a gear 36 meshing with a gear 37 on the shaft 27.

In order to efficiently lubricate the eccentric bearing, I provide a passage H in the flange or portion 14^c to which may be connected by a suitable pipe connection a sight feed oil cup (not shown) this passage con-

necting by branches h and h' so that the oil may not only pass down around the outside of the sleeve and in at the bottom of the bearing by passage h², but may also pass direct to the surface of the babbitt by passage h³.

I claim as my invention:—

1. In a gyratory crusher the combination 65 with the stationary and moving crushing members, of a rotating table receiving ore therefrom, and a stationary scraper removing the crushed material from said table.

2. In a gyratory crusher, a body or frame 70 having an annular stationary crushing member, a shaft suitably journaled at its upper end and carrying an annular crushing member cooperating with said stationary member, said body having an ore receiving 75 chamber below said crushing members, a bearing sleeve or ring below said chamber and integral with said body and encircling the lower end of the shaft, a table rotatably mounted upon the upper end of said sleeve, 80 means for removing ore from the table as it rotates, an eccentric sleeve between said bearing sleeve and the shaft, means for rotating said eccentric sleeve, and means for rotating the table. 85

3. In a gyratory crusher, a body or frame having an annular stationary crushing member, a shaft journaled at its upper end and carrying an annular member cooperating with said stationary member, said body having 90 an ore receiving chamber below said crushing member, a bearing ring or sleeve carried by said body below said chamber, and encircling the lower end of the shaft and spaced therefrom, an eccentric sleeve 95 interposed between said bearing sleeve and the shaft, and having a horizontal annular portion extending upward beneath the lower edge of said annular sleeve or ring, said annular portion having an upwardly 100 extending annular flange encircling the bearing sleeve or ring, an annular rack carried by said upwardly extending annular flange, a driving gear meshing with said rack, and means for removing ore from the 105 ore receiving chamber, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

BRUCE W. TRAYLOR.

Witnesses:

LOUISA E. SIMSON,
FRANCES R. CRISFEN.