Sept. 28, 1926. 1,600,987

J. N. MAHER

SHREDDER RING FOR PULVERIZING MACHINES

Filed April 16, 1925

Fig. 1.

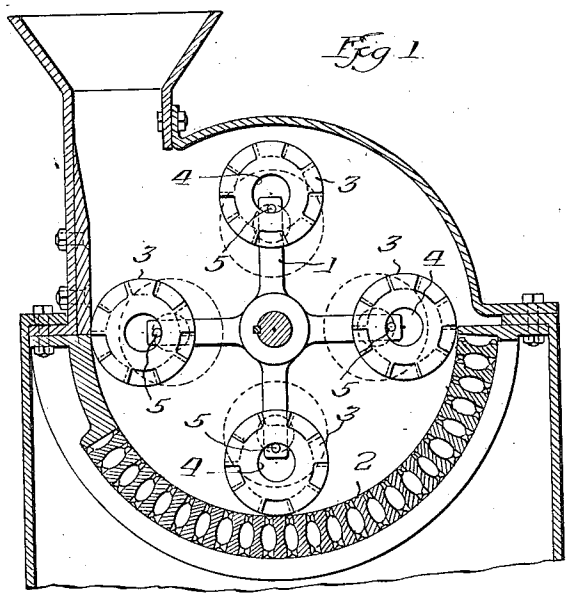


Fig. 2.

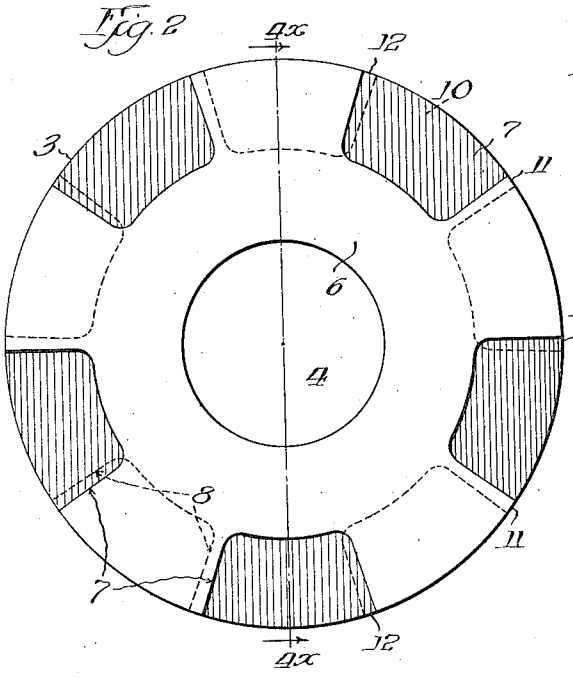


Fig. 3.

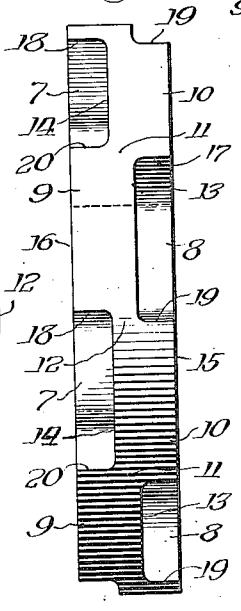
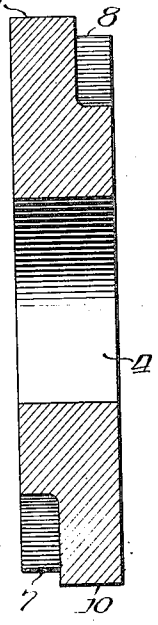


Fig. 4.



Witness:

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UNITED STATES PATENT OFFICE.

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SHREDDER RING FOR PULVERIZING MACHINES.

Application filed April 16, 1925. Serial No. 23,464.

This invention relates to the construction of rings intended to serve as the hammering or beating elements of a reel revolving over an arcuate series of grate bars in an ore mill or pulverizing machine, and has for its object to provide a ring which while presenting ample peripheral rolling surfaces to the material to be reduced, will also afford transverse edges and faces of substantial extent that will serve to pick up or dislodge the reduced material, which, when damp, tends to pack over the grates under the treads of the rolls instead of escaping through the grates. Accordingly, the invention consists in a ring having at circumferentially spaced intervals, lateral recesses or pockets extending to the circumference of the ring and defined by substantially straight lines extending approximately in the direction of the circumference and transversely thereto; the axial dimension of the ring and the depth of the recesses relative thereto being such that the periphery of the ring is left with a circumferentially continuous rim portion of sufficient width or dimension in the direction of the axis of the ring to develop substantial crushing effect; and in addition to this circumferentially continuous rim portion, one or more circumferential series of tread portions of substantial and efficient crushing area, offset laterally from the circumferentially continuous tread portion and spaced apart by the lateral recesses, so that while peripheral crushing efficiency is maintained in the ring, the pick-up or loosening effect afforded by the defining walls of the recesses is also present. Preferably, the recesses are located on opposite sides of the circumferentially continuous portion of the ring, and the resultant spaced offset tread portions on one side are alternated in position with or come approximately opposite the spaces on the other side, so that the efficiency of the dislodging or pick-up element of the ring is proportionately increased and, by reason of the alternation of the recesses, rendered approximately continuous around the ring. The ring is provided with an enlarged central opening to adapt it to be mounted on the rods of the reel with considerable play, as has long been customary in the construction of rotary beater pulverizing machines, and the effect of its new working surface is such as to adapt it to be substituted for rings and hammers of varying design, or to be used in connection with other forms, as may seem desirable.

In the accompanying drawing—

Figure 1 is a vertical transverse section of a known type of pulverizing machine to which the ring of the present invention is applicable.

Figure 2 is a side view of one of the rings disclosed in Figure 1, drawn on an enlarged scale.

Figure 3 is an edge view of the same; and

Figure 4 is a section on the line 4^x—4^x of Figure 2.

1 represents a hammer-carrying reel revolving over an arcuate grate 2 in a known type of pulverizing machine, and 3 represent hammer rings having enlarged central openings 4 through means of which they are mounted upon the longitudinal rods 5 of the reel 1 in such numbers as will insure desired efficiency in attacking and reducing mineral matter introduced into the machine.

As more clearly shown in Figures 2, 3 and 4, each ring 3 comprises an annular body portion 6 in which is formed the central opening 4, and the axial dimension of which preferably corresponds to the entire thickness of the ring. The periphery of the ring is constructed with two annular series of recesses 7 and 8 extending radially inward from the tread of the ring to the annular body 6 and leaving between the recesses of each series solid tread portions 9 and 10; and these recesses 7 and 8, as well as their intervening tread portions 9 and 10, are alternated in position upon opposite sides of the ring 3 so that a recess on one side is opposite a solid tread portion on the other side; but the depth of the recess, measured in the direction of the axis of the ring, does not extend to the medial plane of the ring, and, therefore, the tread surfaces 9 and 10 are left connected by means of narrow tread portions 11 and 12. Another effect of the described arrangement of tread surface interrupted by recesses extending radially inward therefrom and inwardly from the two faces of the ring, is to develop a series of circumferentially extending cutting edges 13 and 14 which simulate the slicing effect of normal marginal circumferential edges 15, 16, but act in planes axially offset from those of the marginal slicing edges, also a series of short dislodg-

ing or pick-up edges 17, 18, 19 and 20, which act upon the subdivided material beneath the rings when, under the presence of moisture in the material, it becomes packed upon the grates instead of escaping between the grate bars. All of the edges referred to are preferably approximately straight, the dislodging or pick-up edges being substantially transverse to the circumferential edges.

A ring constructed as herein described will not only have the effect of presenting to the mineral that is being attacked, reducing faces and edges which severally simulate various different kinds of reducing elements heretofore commonly used, but the effect of presenting to a fragment of mineral several different types of reducing surfaces or edges, simultaneously, and with the result that the piece of mineral encounters in many instances the particular kind of reducing element that its peculiar shape requires; and the effect of the substantially rectangular recesses and the edges which define them is particularly beneficial in stirring up the material in the bottom of the casing when the material, owing to the contained moisture tends to cake or pack upon the grates instead of passing through the same.

I claim:

1. A ring for pulverizing machines, having a tread consisting of a circumferentially continuous portion and approximately rectangular recesses extending inwardly from the side of the ring to the circumferentially continuous portion and subdividing the remainder of the tread into spaced tread portions offset laterally from the circumferentially continuous portion.

2. A ring for pulverizing machines having a tread constructed with substantially rectangular recesses at circumferentially spaced intervals and alternately on opposite sides of a medial plane of the ring; the recesses extending inwardly from the faces of the ring less than one-half the width of the ring and leaving a circumferentially continuous tread.

3. A ring for pulverizing machines having a tread recessed at circumferentially spaced intervals and alternately on opposite sides of a medial plane of the ring; the recesses extending inwardly from the faces of the ring less than one-half the width of the ring and leaving a circumferentially continuous tread, composed of a circumferential series of relatively broad tread portions alternated on opposite sides of the medial plane and connected by relatively narrow tread portions.

4. A ring for pulverizing machines having a tread recessed alternately on opposite sides of a medial plane of the ring, leaving two circumferential series of tread portions on the respective sides of said plane, with the tread portions on one side in axial alignment with recesses on the other side; the inner walls of the recesses providing at their intersection with the periphery of the ring, circumferentially extending cutting edges.

5. A ring for pulverizing machines having a cylindrical tread provided with two circumferential series of recesses extending radially inward from said tread but terminating on opposite sides of the medial plane of the tread; end walls of said recesses meeting the tread surface to form transverse pick-up edges.

6. A ring for pulverizing machines, constructed with two circumferential series of recesses extending inwardly from its tread, said recesses leaving intervening crushing surfaces, and the recesses on one side corresponding in position to the crushing surfaces on the other side; the walls of the recesses constituting circumferentially extending cutting edges and transverse pick-up edges at the ends of the circumferential cutting edges.

Signed at St. Louis, Mo., this 9th day of April, 1925.

JOHN N. MAHER.