July 11, 1950 R. R. SHAFTER 2,514,675

GYRATORY CRUSHER MANTLE

Filed Dec. 15, 1945

Fig. 2

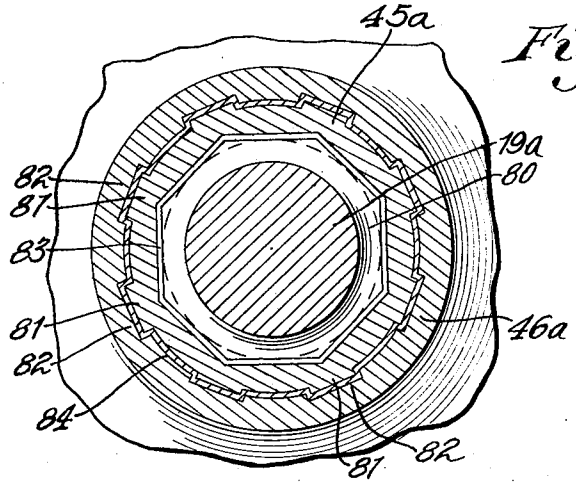
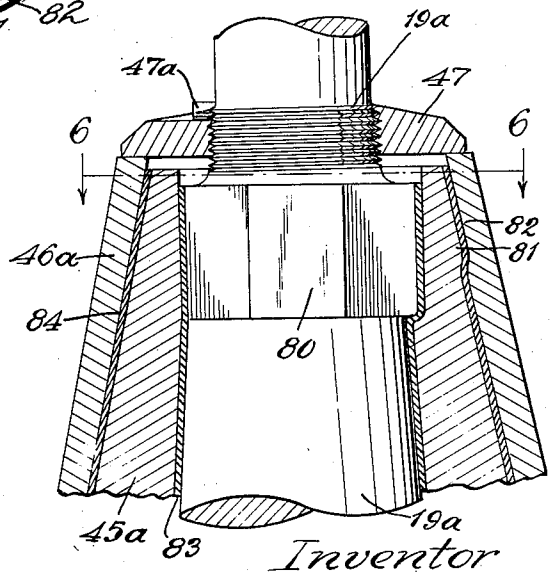


Fig. 1



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GYRATORY CRUSHER MANTLE

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1 Claim. (Cl. 241—293)

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My invention relates to an improvement in gyratory crushers and has for one purpose to provide a gyratory crusher of simple and efficient structure.

Another purpose is to provide an improved crusher head and mantle structure, and means for securing it on the shaft.

Other purposes will appear from time to time in the course of the specification and claim.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is a vertical section illustrating in detail a method of application of the head of a gyratory crusher to the shaft and of the mantle to the head; and

Figure 2 is a section on the line 2—2 of Fig. 1.

Like parts are indicated by like symbols throughout the specification and drawings.

In the drawing, I diagrammatically illustrate a main crusher shaft 19*a* as having an upper portion which departs from the circular cross section of the lower portion. I illustrate for example an octagonal portion 80 formed of converging faces. Whereas eight faces are employed, it will be understood that any other non circular polygonal contouring may be provided which will prevent relative rotation of the shaft 19*a* and the head 45*a*. The head, in turn, is provided, at least at its upper end with a plurality of outwardly extending ribs or flutes illustrated at 81 in Figure 2. These are received in corresponding depressions 82 in the mantle 46*a*. It will be observed that the flutes 81 of the head 45*a* are disposed in corresponding relation to the corners of the octagonal portion 80 of shaft 19*a* so that the irregular interfitting portions between the shaft, and head, and the head and mantle are disposed respectively in corresponding relationship with each other, to minimize weakening of the respective parts. The parts are preferably so proportioned as to provide sufficient clearance to permit zinc or an equivalent material to be poured, as at 83 and 84, between the interpenetrating parts of shaft and head and head and mantle respectively.

In assembling the head it is slipped on to the main shaft and is held, by the non circular contours of the opposed surfaces against relative movement. The zinc or other material poured into the system provides the necessary close fit. The octagonal or otherwise non circular form of the upper part of the shaft may be rough forged which makes it sufficiently accurate for the purpose. The mantle is slipped over the head and similarly zinced on. The mantle may be held

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down against the head, and the head locked downwardly in position by the employment of any suitable nut 47 which is normally spaced from the head so as to engage the mantle only. The nut may be held against relative rotation by any suitable means such as the horizontal dowel 47*a*.

It will be realized that, whereas, I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative or diagrammatic rather than as limiting me to my precise showing.

The use and operation of the invention are as follows:

The structure of Figures 1 and 2 illustrates a simple and efficient method of a structure for securing the head to the shaft and the mantle to the head. This has an advantage of preventing any tendency of the mantle to rotate in relation to the head. Where the mantle is permitted to turn, and to turn the lock nut with it, the nut, in many cases, becomes so tight and is turned so tightly as to cause severe damage to the threads 19*a* on the shaft. This may necessitate filling the threads by welding, and then recutting the threads. It is usual for the mantle to expand under the crushing action, and as the metal flows upwardly, automatically to tighten the nut. Should the flow of material extend downwardly only and should there be any tendency for the mantle to become loose on the head it is a simple matter to tighten the lock nut occasionally. It may even necessitate periodically backing up the nut to accommodate the extension, if the mantle expands upwardly. The structure is simple and efficient and any necessity of adjustment of the nut 47 is readily observable from above, through the top of the crushing cavity.

I claim:

A main crusher shaft, the body of which is generally cylindrical but which has adjacent its upper edge a polygonal portion and which has above said polygonal portion a reduced screw-threaded portion; a conic head surrounding the crusher shaft and having an interior generally cylindrical portion about a substantial part of the crusher shaft but conforming (in shape above said cylindrical portion) to the shape of the polygonal portion of the crusher shaft; a conic mantle surrounding said head, the head and mantle including interfitting portions to prevent their relative rotation, and the interfitting parts

of crusher shaft and head and of head and mantle being spaced apart sufficiently to permit the pouring therebetween of a ductile metal; both head and mantle extending upwardly beyond the polygonal portion of the crusher shaft, and the mantle extending upwardly beyond the upper end of the head; and locking means on the shaft adapted to engage the mantle only, and thereby to hold the mantle and the head against undesired upward movement along the shaft.

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