

R. BERNHARD.

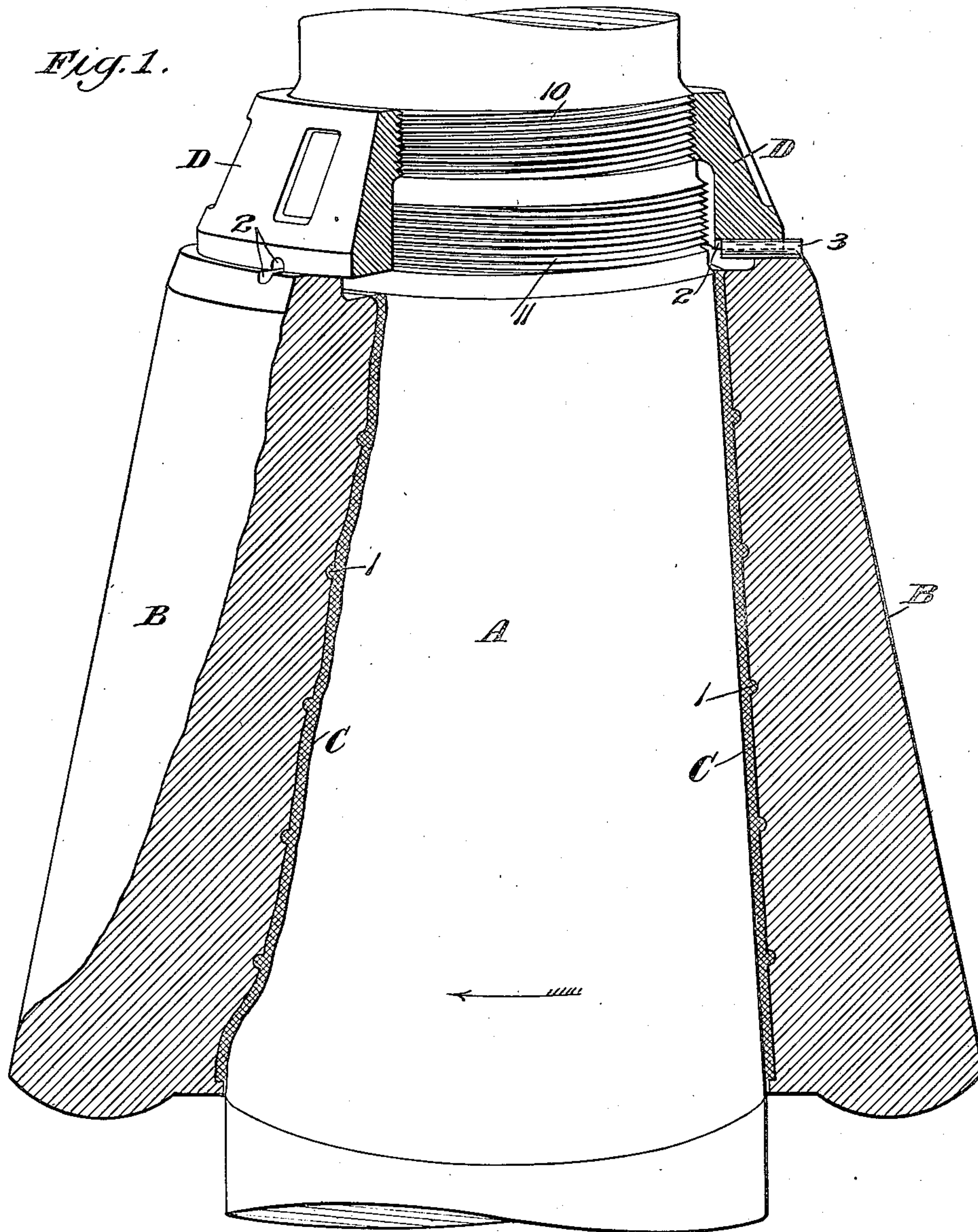
CRUSHER HEAD.

APPLICATION FILED APR. 28, 1908.

938,546.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.



Witnesses.

*W. H. Kennedy.
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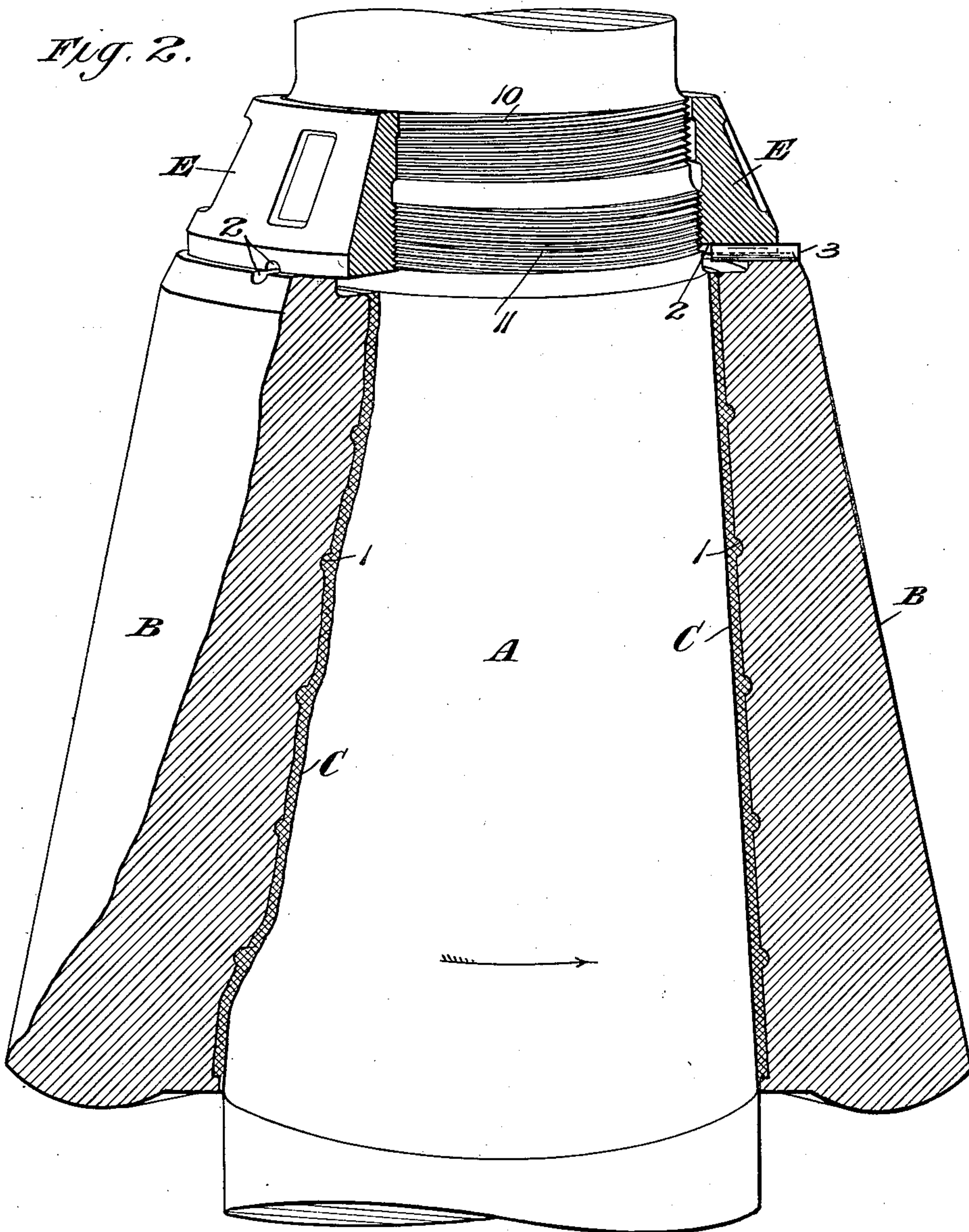
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2 SHEETS—SHEET 2.

Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

RICHARD BERNHARD, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO POWER AND MINING MACHINERY COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CRUSHER-HEAD.

938,546.

Specification of Letters Patent.

Patented Nov. 2, 1909.

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To all whom it may concern:

Be it known that I, RICHARD BERNHARD, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented certain new and useful Improvements in Crusher-Heads, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates particularly to that class of crushers for stone, ore and the like, known as gyratory crushers, the especial object of the invention being to provide a fastening for the crushing head which shall be self tightening so as to keep the head tight upon the shaft. In this class of crushers, it is difficult to bore the heads so as to make a perfect fit. It has been customary, therefore, to zinc the head on the shaft so as to fill up any spaces, but this leads to difficulty on account of the zinc shrinking in cooling, thus loosening the head. In the operation of these gyratory crushers, also, there is liability of loosening the head on the shaft, whether the head is zined on the shaft or not.

The present invention provides means by which the head is forced down on the taper automatically in case the head becomes loose and rotates on the shaft, thus keeping the head tight upon the shaft, the zinc being expanded into the bore on the head, if zined on. I secure this result by providing the shaft with a screw thread and the head with a nut that rotates with the head and co-acts with the shaft thread to force the head onto the taper by the rotation of the nut. A single thread on the shaft may be used, as, for instance, when it is known during manufacture in which direction the machine will run and the head tend to rotate, and the invention broadly considered, includes constructions in which a single thread is used, but a specific feature of the present invention consists in providing the shaft with both right and left threads, so that a nut with either left or right hand thread may be used on the head to co-act with one of the shaft threads to tighten the head, according to the direction in which the crusher is to be operated.

A construction embodying the invention in a simple form will now be described in connection with the accompanying drawings, forming part of this specification, and

the features embodying the invention then specifically pointed out in the claims.

In the drawings:—Figure 1 is a sectional perspective of a portion of a crusher shaft and head, showing the invention with the head tending to move in one direction. Figure 2 is a similar view, with the head tending to move in the opposite direction.

Referring to the drawings, A is a gyratory shaft provided with the usual tapered portion for receiving the crusher head B, and C the usual zinc or similar soft metal filling, which is shown as kept in place by the series of grooves or dents 1 on the interior surface of the head. Immediately above the tapered portion, the shaft A is formed with two screw threads, one being a right hand thread and the other a left hand thread, the upper thread 10, in the construction shown, being the right hand thread, and the lower thread 11 the left hand thread.

Secured to the head in any suitable manner so as to rotate therewith is a nut, co-acting with one of the threads 10, 11, according to the direction in which the machine is operated and the head tends to turn.

In Fig. 1 the nut D is formed to co-act with the right hand thread 10; and in Fig. 2, the nut E is formed to co-act with the left hand thread 11, the heads B in the two figures tending to rotate in the direction shown by the arrows on the shafts.

The nuts D, E are faced on the bottom to fit the top of the head B, and are shown as pinned to the head, the top of the head and the bottom of the nuts being provided with semi-circular radial grooves 2 receiving pin 3. These grooves are sufficient in number and so arranged that, when the nut is tightened on the shaft in setting up the machine, one pair of these grooves will come in line to receive the pin.

The operation of the device is as follows:—The gyratory movement of the shaft tends to rotate the head on the shaft, which movement is prevented as long as the head is tight. If the head loosens and tends to rotate, it will cause the nut D in Fig. 1 or the nut E in Fig. 2 to rotate on the shaft in the direction in which the head moves, and thus screw the nut down on the shaft and force the head down on the taper and tighten the head on the shaft.

While the invention is shown as applied

to a solid head, it will be understood that it is applicable also to heads made with an inner center or core and an outer shell or mantle, as is common in this class of crushers, and the solid head, or the center or mantle, may be formed in any manner desired. The taper or wedge surface onto which the head is forced to tighten it may be provided in any suitable manner.

10 The invention is not limited to the use of the zinc or similar soft metal between the head and the shaft, although this is preferable and will usually be employed.

Many other modifications may be made
15 within the invention.

The invention is particularly applicable to gyratory crushers, but may be applied also to crushers of other classes in which the head is liable to loosen and rotate on
20 the shaft.

What I claim is:—

1. In a gyratory crusher or the like, the combination with a crushing shaft having a taper and a screw thread, of a head, and
25 a nut secured to the head to rotate there-

with on the shaft and co-acting with the shaft thread to force the head onto the taper and tighten the head.

2. In a gyratory crusher or the like, the combination with a crushing shaft having
30 a taper and right and left screw threads, and a head, of a nut secured to the head to rotate therewith and co-acting with one of the shaft threads to force the head onto the taper and tighten the head. 35

3. In a gyratory crusher or the like, the combination of a crushing shaft having a taper, a head on the shaft, and devices acting by pressure against the end of the head and actuated by the rotation of the head
40 on the shaft to force the head onto the taper and tighten the head.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

RICHARD BERNHARD.

Witnesses:

L. F. SNYDER,
F. G. BECKER.