

No. 653,284.

Patented July 10, 1900.

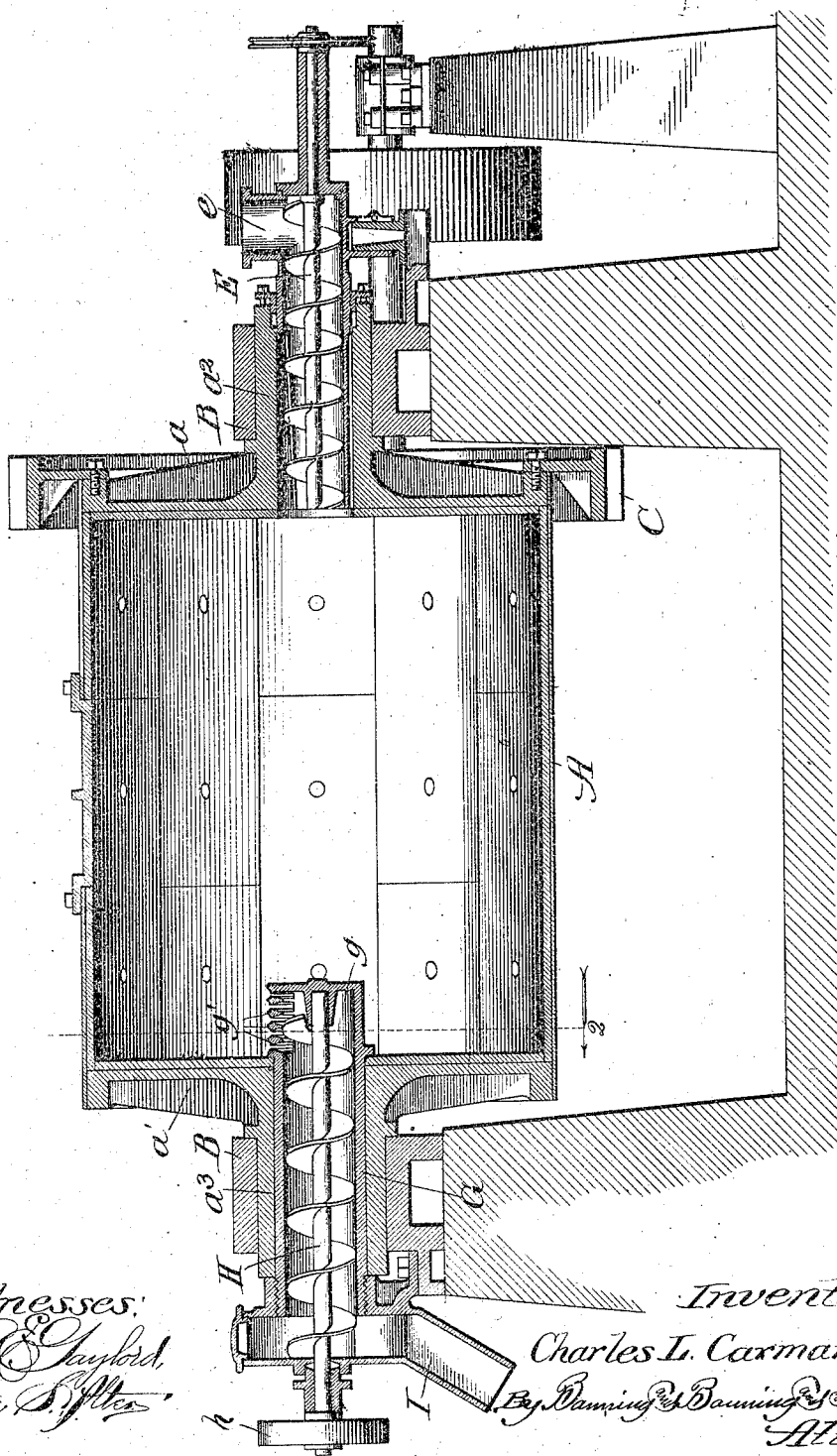
C. L. CARMAN.
TUBE OR PEBBLE MILL.

(Application filed July 29, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
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2 Sheets—Sheet 2.

Fig. 3.

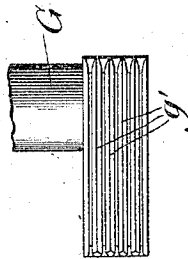
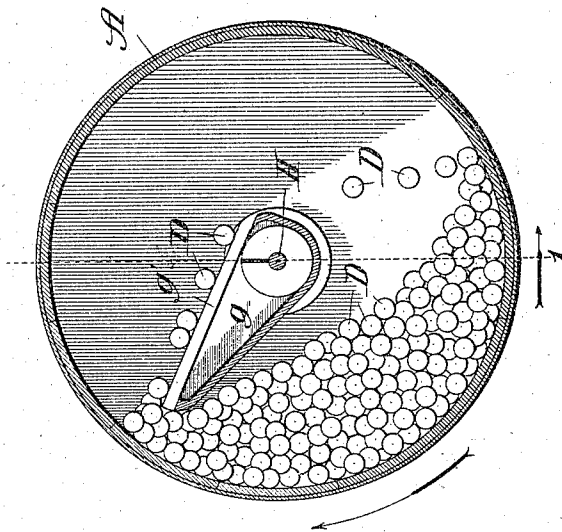


Fig. 2.



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Charles L. Carman,
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UNITED STATES PATENT OFFICE.

CHARLES L. CARMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GATES
IRON WORKS, OF SAME PLACE.

TUBE OR PEBBLE MILL.

SPECIFICATION forming part of Letters Patent No. 653,284, dated July 10, 1900.

Application filed July 29, 1899. Serial No. 725,485. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. CARMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tube or Pebble Mills, of which the following is a specification.

My invention relates to that class of mills in which there is combined a rotatable tubular portion having a grinding-chamber provided with a plurality of balls or pebbles, so that during the rotations of the tubular portion any material which may be in the mill is crushed and ground to the desired degree.

The invention relates particularly to the means by which the material is discharged from the mill, all of which will more fully hereinafter appear.

The principal object of my invention is to provide a tube or pebble mill with means for economically and efficiently discharging the pulverized material.

Further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists in the features, combinations, and details of construction herein-after described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a mill constructed in accordance with my improvements, taken on line 1 of Fig. 2; Fig. 2, a cross-sectional view of a portion of the mechanism, taken on line 2 of Fig. 1; and Fig. 3, a plan view of a portion of the mechanism through which the ground material is discharged.

In constructing a mill in accordance with my improvements I make a tubular portion A of the desired size and strength and provided with a grinding-chamber adapted to hold the material and mechanisms for grinding. This tubular portion is provided with heads a and a' , having central tubular journal portions a^2 and a^3 , upon which the mill is rotatably mounted in pillow-blocks B. One of these head portions is provided with a spur-gear C, by which power and motion are transmitted to the rotatable mechanism.

In use the mill is provided with a plurality of balls or pebbles D, adapted during the ro-

tation of the tubular portion to be raised on one side so that they fall down continuously and grind or crush any material which may be contained in the mill.

To feed the material into the mill, the opening of the journal a^2 is provided with a feed-screw E, so arranged that when material is fed in through the opening e the rotations of the screw serve to force it into the grinding-chamber.

It is desirable that some simple and efficient means be provided for withdrawing the ground and crushed material from the mill when it has been ground to the desired degree. In order to accomplish this result, I provide a discharge-tube G, which projects through the hollow journal a^3 and into the grinding-chamber and at its inner end provide it with a receptacle or pocket g , having an inclined upper surface g' , formed of a plurality of ribs, bars, or the like, constituting, as it were, an inclined grate or grid, down which the balls and ground material may slide during the rotations of the tubular portion. As shown in Fig. 2, the bars provide such a mesh that the balls will pass entirely over the grate or grid surface, while the ground material passes therethrough into the discharging-tube. To facilitate the discharge of the ground material, a helical screw H is provided and mounted in the discharging-tube, so as to be rotated by the pulley h and during its rotations to force the ground material into the discharge-spout I. While I prefer to use the bars, so as to form a grate or grid, it will be understood that I arrange them for the purpose of forming a screen and that any desired screen may be used, although I consider the one herein shown and described as being the best fitted for this particular use.

While I have shown and described my improvements as attached to a mill having hollow journals, it will be clearly apparent to those skilled in the art that they are applicable to all mills of this type, and particularly to those mounted on rolls, without departing from the spirit of my invention and that I do not, therefore, desire to be limited thereto unduly or any more than is pointed out in the claims.

I claim—

1. In a mill of the class described, the combination of a rotatable tubular portion provided with a grinding-chamber and an axial
5 discharge-opening at one end of the tubular portion, an inclined screen arranged inside the grinding-chamber of the tubular portion adjacent to the axial discharge-opening over
10 through which the balls or pebbles may pass and screened so as to be discharged through the axial discharge-opening, substantially as described.

2. In a mill of the class described, the combination of a tubular portion provided with
15 a hollow journal at one end, a tube projecting through the hollow journal and provided with a pocket on its inside portion in the grinding-chamber, an inclined upper surface
20 formed of a plurality of ribs or bars forming a screen on the pocket over which the balls or pebbles may pass and through which the

materials may be screened so as to be discharged out through the tubular portion thereof, substantially as described. 25

3. In a mill of the class described, the combination of a tubular portion provided with a hollow journal at one end, a tube projecting through the hollow journal and provided
30 with a pocket on its inside portion in the grinding-chamber, an inclined upper surface formed of a plurality of ribs or bars forming a screen on the pocket over which the balls or pebbles may pass and through which the
35 materials may be screened so as to be discharged out through the tubular portion thereof, and a helical screw in the discharge-tube for forcing the ground material out through the tube, substantially as described.

CHARLES L. CARMAN.

Witnesses:

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