

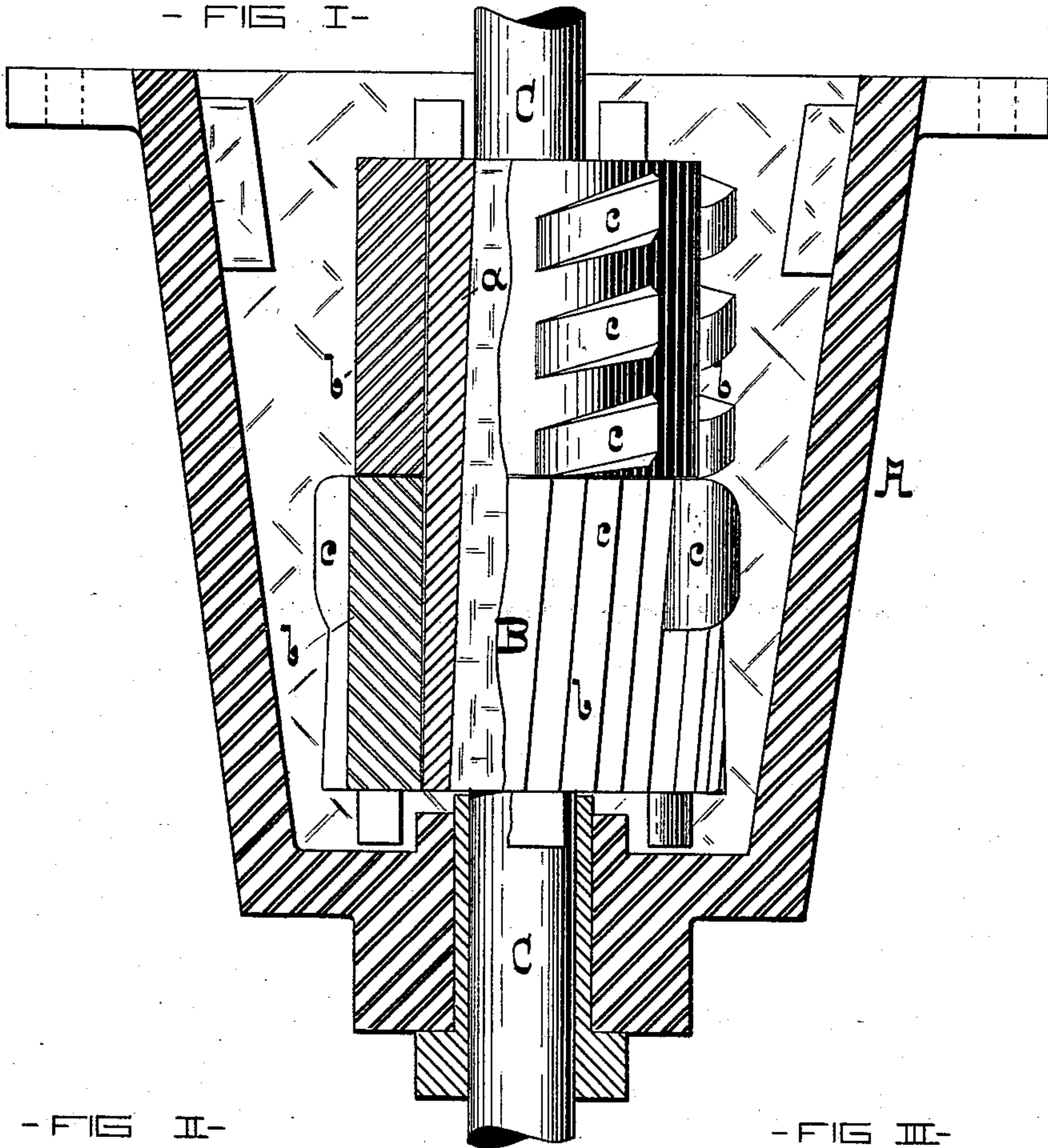
(No Model.)

W. WARING.  
ORE CRUSHING MACHINE.

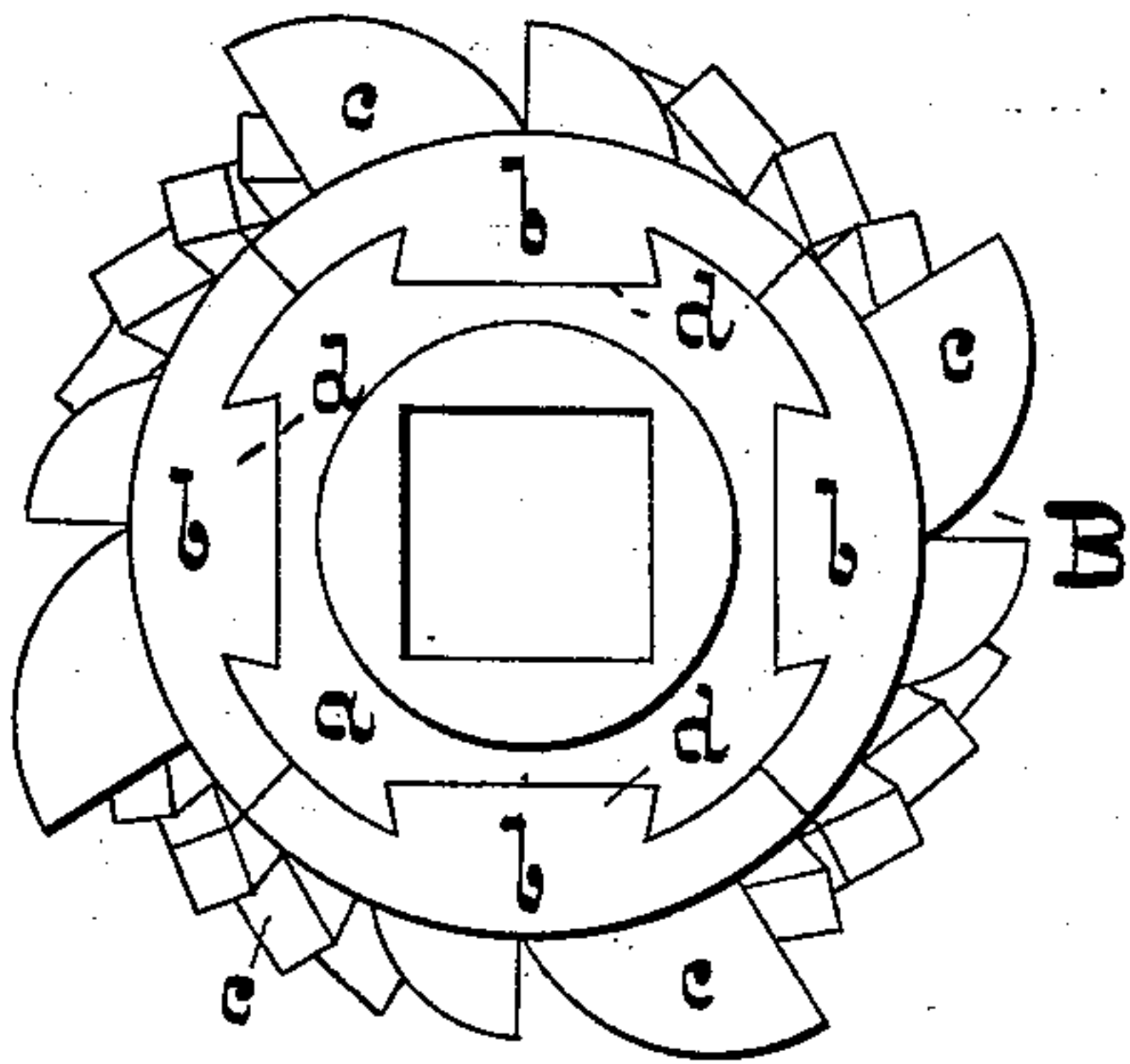
No. 324,197.

Patented Aug. 11, 1885.

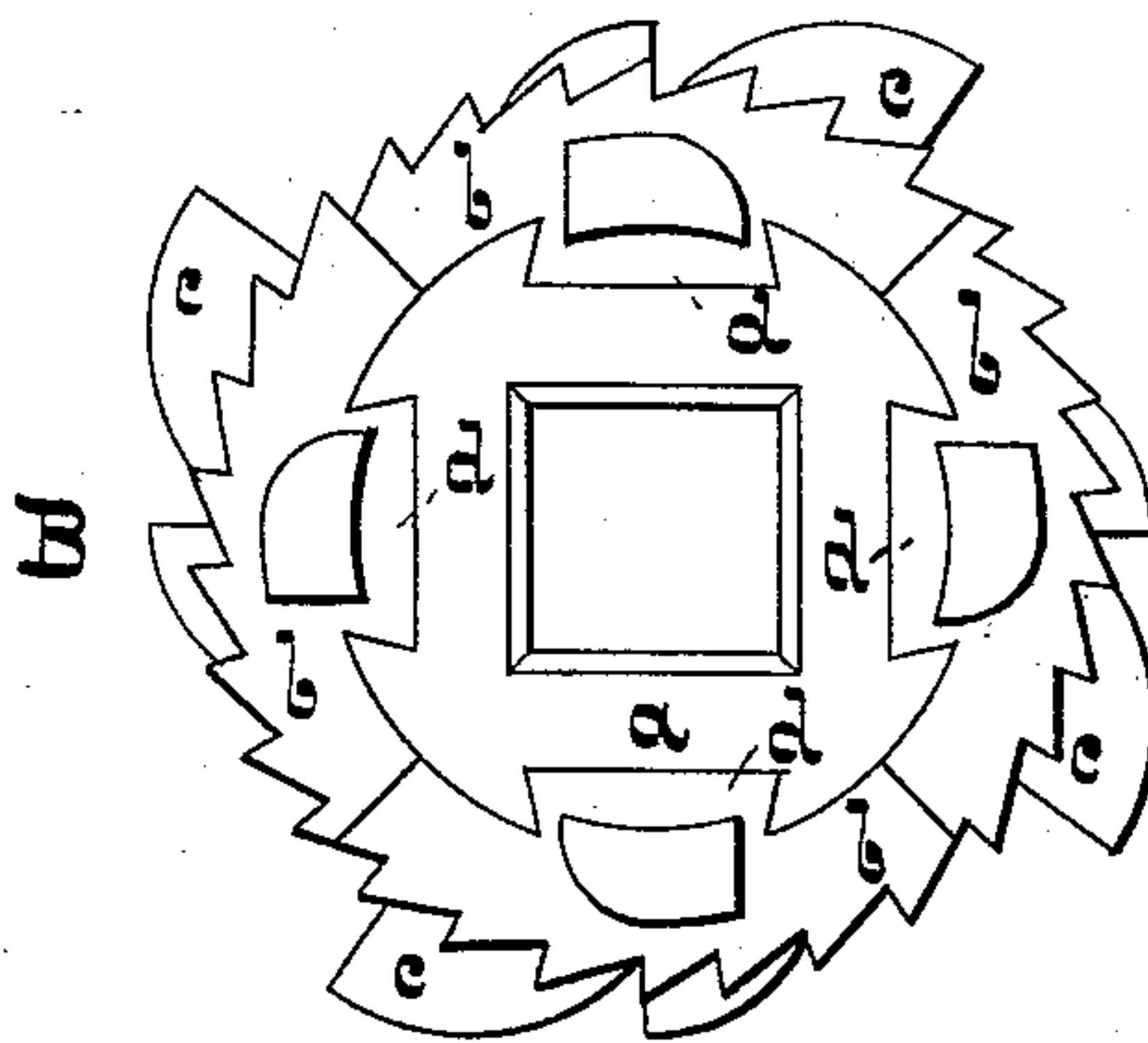
- FIG I -



- FIG II -



- FIG III -



- WITNESSES -

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# UNITED STATES PATENT OFFICE.

WILSON WARING, OF COLORA, MARYLAND.

## ORE-CRUSHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,197, dated August 11, 1885.

Application filed September 25, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILSON WARING, of Colora, in the county of Cecil and State of Maryland, have invented certain Improve-  
5 ments in Ore-Crushing Machines, of which the following is a specification.

This invention relates to certain improve-  
ments in machines for crushing ores, phos-  
phate-rock, and other hard substances, and  
10 specifically to a peculiar construction of the conical crusher-head, which is revolved within the shell, whereby the operative surface of the head, which is furnished with projections adapted to engage with others on the shell,  
15 may be easily renewed in case it becomes worn or broken, as hereinafter described.

In the description of the said invention which follows, reference is made to the accom-  
panying drawings, forming a part hereof, and  
20 in which—

Figure I is a vertical section of the shell and part section of the crushing-head. Fig. II is a top view of the crushing-head, and Fig. III a bottom view of the same.

25 A is the shell, which requires no special description herein, as it forms no part of my present invention.

B is the crusher-head, which consists of a cylindrical block, *a*, having a tapering central  
30 hole to admit of the attachment of the block to the shaft C. The operative surface of the crusher-head is formed of segments *b*, having the usual crushing projections, *c*. These seg-  
35 ments are tapered so as to give conical form to the head, and have dovetailed tongues,

which fit in similarly-shaped grooves extend-  
ing lengthwise of the block.

In the drawings the head has four segments only; but any convenient number may be em-  
ployed. These segments are shown as in two 40 parts each—that is to say, each segment is in two lengths. By this construction the surface of the head is composed of eight sections or parts, any one of which may be easily removed if broken and another substituted for it. 45

As the segments are applied to the central block by merely sliding their tongues in the grooves in said block, it will be seen that in the renewal of any of the segments it is not necessary to remove the head from the shell. 50 The tongues are slightly tapered to insure a close fit within the grooves.

The principal advantage of the construction here shown is, that the segments are each self-sustaining, no other devices being necessary 55 to hold them in place.

I claim as my invention—

In a crushing-head, a central cylindrical block having a series of tapered dovetailed grooves extending longitudinally thereof, combined 60 with a covering having an outer conical surface formed of segments, each one of which has a tapering dovetailed tongue adapted to fit in a groove in the said block, and provided exteriorly with the usual crushing projections, 65 substantially as specified.

WILSON WARING.

Witnesses:

D. G. WARING,

HORATIO J. SHEPPARD.