

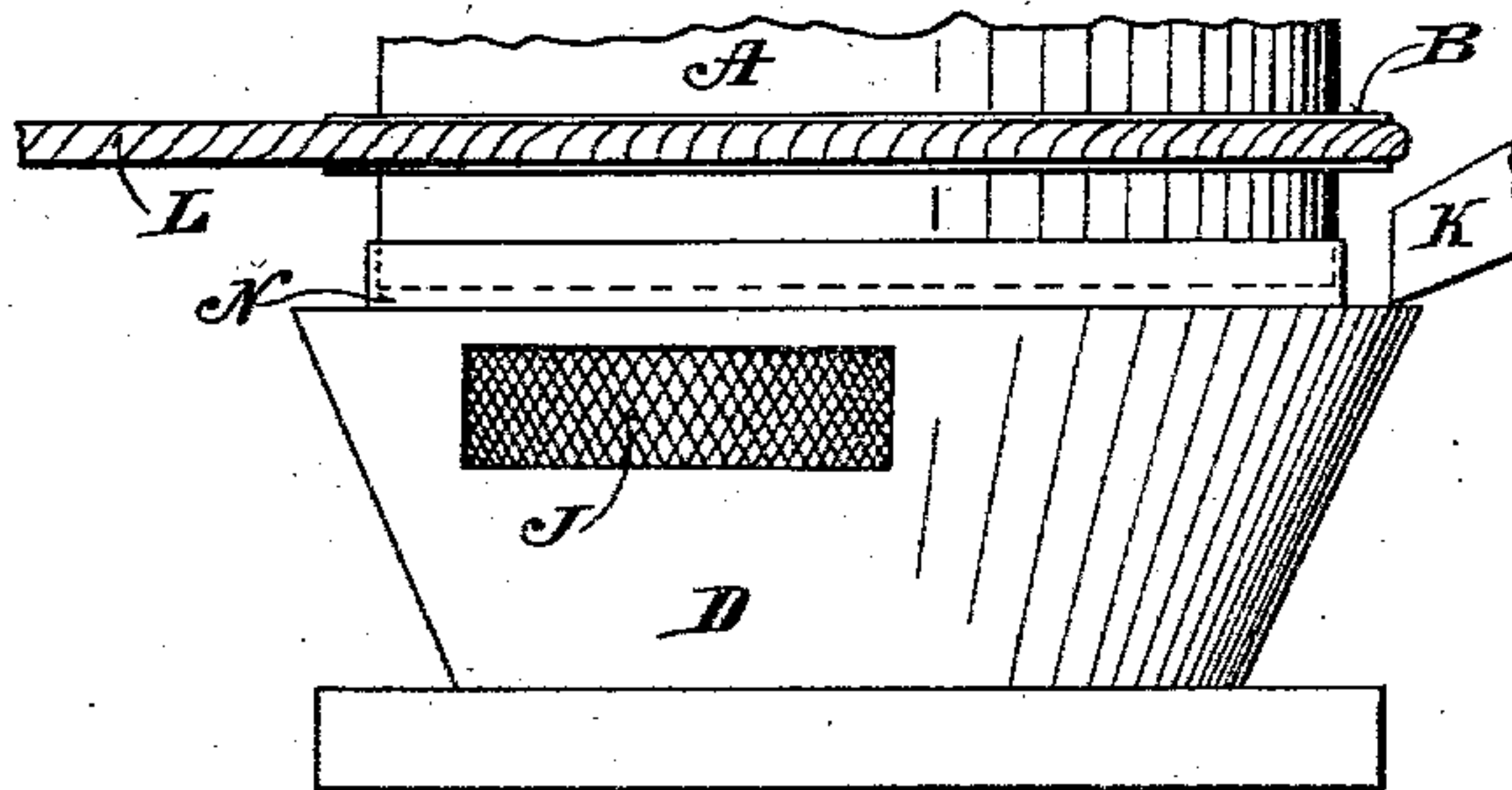
No. 745,710.

PATENTED DEC. 1, 1903.

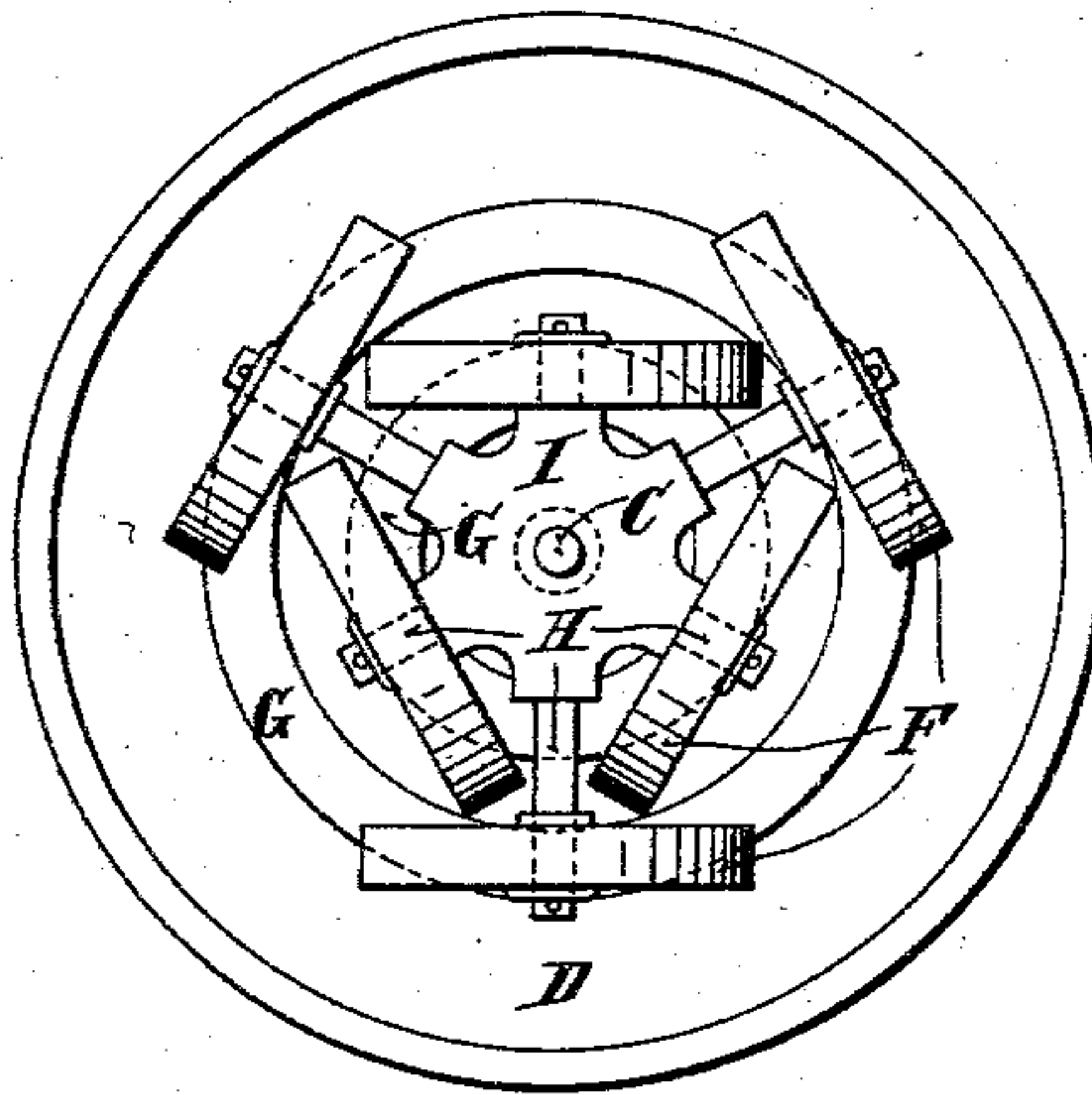
H. YARNELL.  
ORE CRUSHING MACHINE.  
APPLICATION FILED MAR. 21, 1902.

NO MODEL.

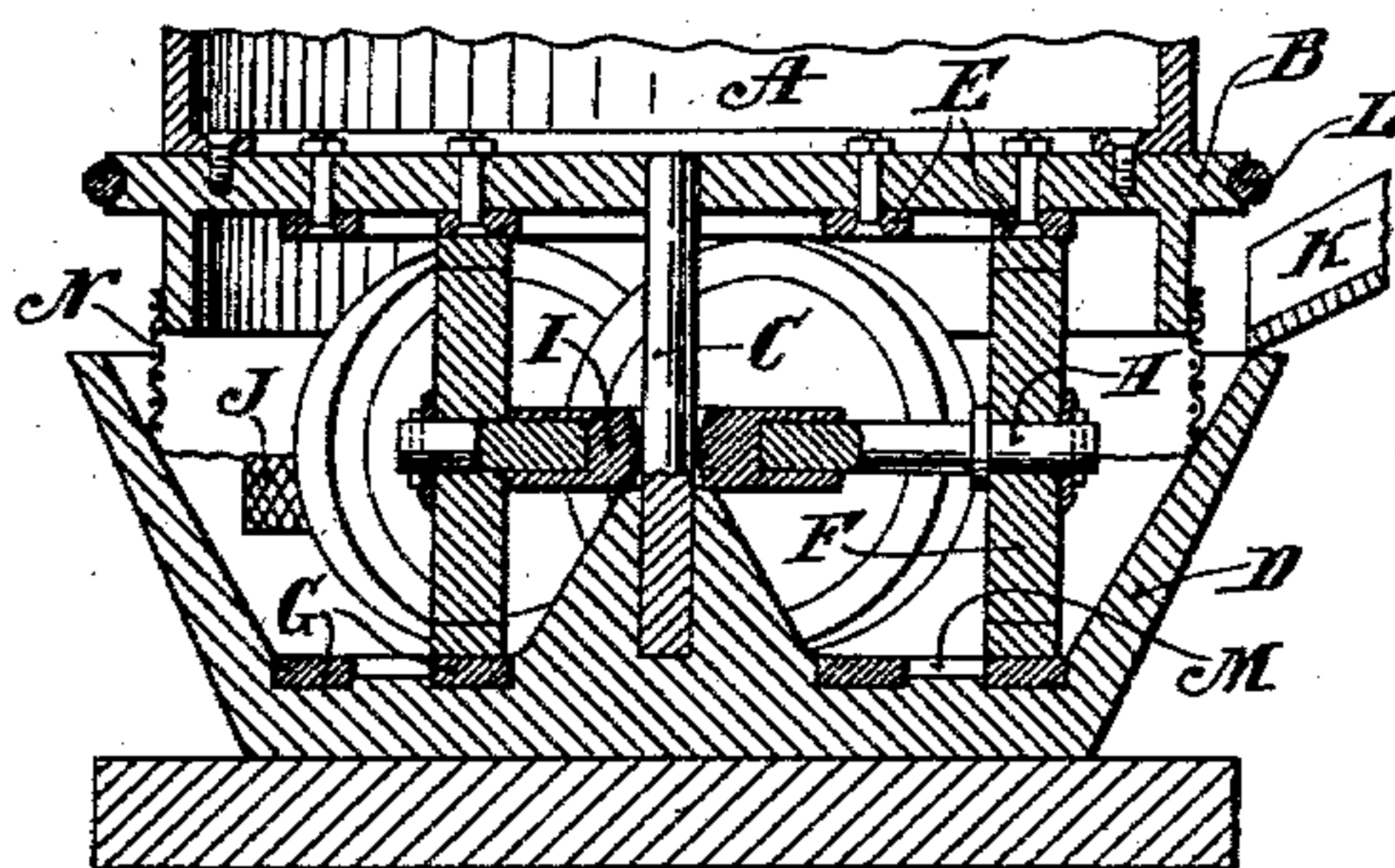
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES

Chas. L. Hyde.  
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# UNITED STATES PATENT OFFICE.

HARRISON YARNELL, OF PASADENA, CALIFORNIA.

## ORE-CRUSHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 745,710, dated December 1, 1903.

Application filed March 21, 1902. Serial No. 99,362. (No model.)

*To all whom it may concern:*

Be it known that I, HARRISON YARNELL, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented new and useful Improvements in Ore-Crushing Machines, of which the following is a specification.

My invention relates to that class of ore-crushers in which the ore is crushed by means of rollers traveling over a tread, and the objects thereof is to provide a crushing-machine of that class that will be easily operated and will have great crushing efficiency. I accomplish these objects by the mechanism described herein and illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of my machine. Fig. 2 is a plan view of the crushing-rollers and mortar. Fig. 3 is a vertical section.

In the drawings, A is the weight-holding receptacle, which may be filled with rocks or other heavy material to give the rollers the necessary crushing power. It is attached to the upper surface of the driving-wheel B, which is revolubly mounted on the stationary vertical shaft C, affixed in the mortar D. Driving-wheel B is provided on its lower surface with annular steel rings E, which provide a removable bearing-surface that rests on the periphery of the crushing-rolls F, which may be replaced when worn too much. In the bottom of the mortar are placed removable steel rings G, which form treads on which the crushing-rolls travel. The crushing-rolls are provided with removable steel tires that can be removed and replaced when worn too much. They are revolubly mounted on axles H, which are affixed to hub I, which is revolubly mounted on the central shaft C. In the upper portion of the mortar are the usual screens J, which permit the pulverized ore to escape therefrom when reduced to the desired fineness.

In the operation of my machine the ore is fed into the mortar with the required amount of water through chute K. Motion is imparted to the driving-wheel by rope L, or a belt may be used thereon instead of the rope. As the driving-wheel rests upon the periphery of the crushing-rolls and is held in frictional contact therewith by the weight on the upper

surface thereof, it will be seen that the rolls are rotated with less power than if the power were applied to the axles of the crushing-rolls, as is the usual manner of applying power in ore-crushing machines of this class. It will also be observed that I have mounted the crushing-rolls in series of three to each tread, so that as they move thereon one set of rolls will cause the ore that it does not crush on the tread to be pushed into the path of the other set of rolls, thereby keeping the ore in the mortar constantly moving. The space M between the treads of the two sets of rolls may be filled with quicksilver for amalgamation and may be termed the "amalgamation-trough."

It will be observed that the outer set of rolls have a greater distance to travel than the inner ones and therefore travel much faster, which provides a combination of a high and low speed mill in one structure. The ore is kept from splashing out of the mortar by a canvas curtain N, affixed to the bottom of the driving-wheel. If desired, only one set of two or more rolls may be used. I prefer three to the set, as it enables any one of the rolls to pass over a lump of ore much easier than if four or more rolls were used. It will also be observed that the driving-wheel rests upon and is supported by the crushing-rolls and is provided with a steel bearing-surface which provides means whereby any ore which clings to the periphery of the crushing-rolls will be crushed between the bearing-surface of the driving-wheel and the roll, thereby crushing ore at both the top and bottom of the crushing-rolls at the same time.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An ore-crushing machine comprising a mortar having tapering sides provided with screens; a circular tread in the bottom of said mortar adjacent to the inner side; a circular tread in the bottom of said mortar adjacent to the outer side; an amalgamating-trough between said treads; two sets of revolving crushing-rolls adapted to travel on said treads, the set on one tread traveling intermediate the set on the other tread, whereby one set of crushing-rolls pushes uncrushed ore into the path of the other set of crushing-rolls; means



to drive said rolls comprising a weighted driving-wheel revolvably mounted therein having removable treads resting upon and supported by said rolls and adapted on the revolution thereof to impart motion to said rolls by contact with the periphery thereof.

5 2. In an ore-crushing machine two sets of revolving circular traveling crushing-rolls, traveling on treads of different diameter, one  
10 set traveling intermediate the other set,

treads for said rolls, an amalgamating-trough intermediate said treads, and means to impart motion to said rolls.

In witness that I claim the foregoing I have hereunto subscribed my name this 15th day of March, 1902.

HARRISON YARNELL.

Witnesses:

G. E. HARPHAM,

M. C. NICKELESON.