(No Model.)

A. J. GATES & L. J. HEWES.

STONE BREAKER OR CRUSHER.

No. 507,118. Patented Oct. 24, 1893.

Fig. 2.

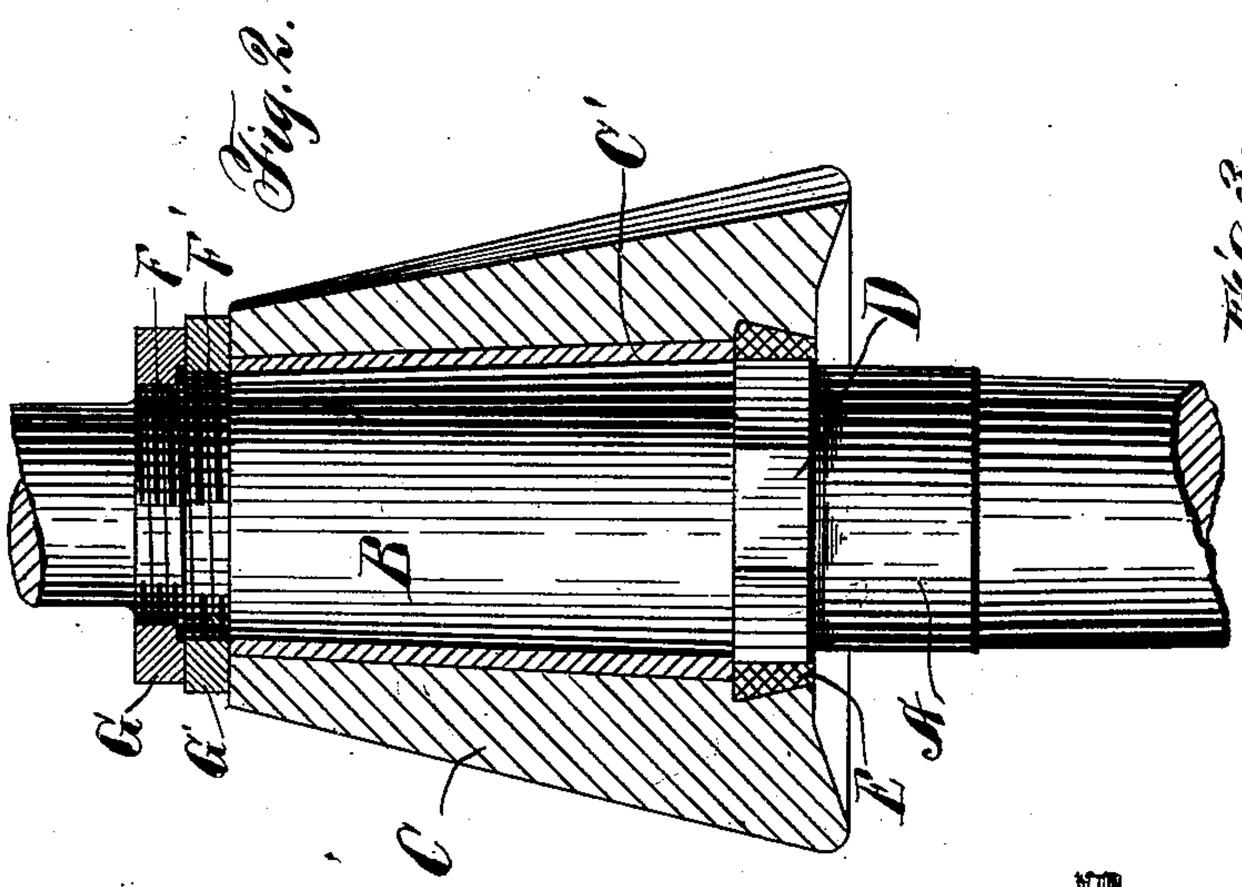


Fig. 3.

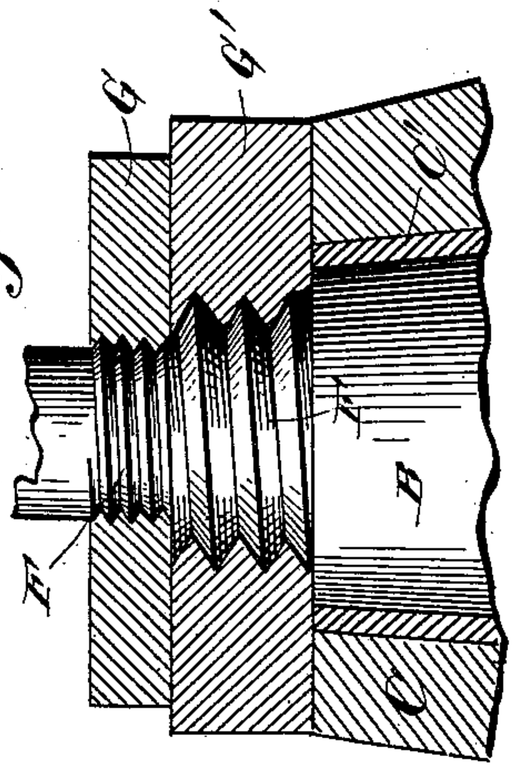
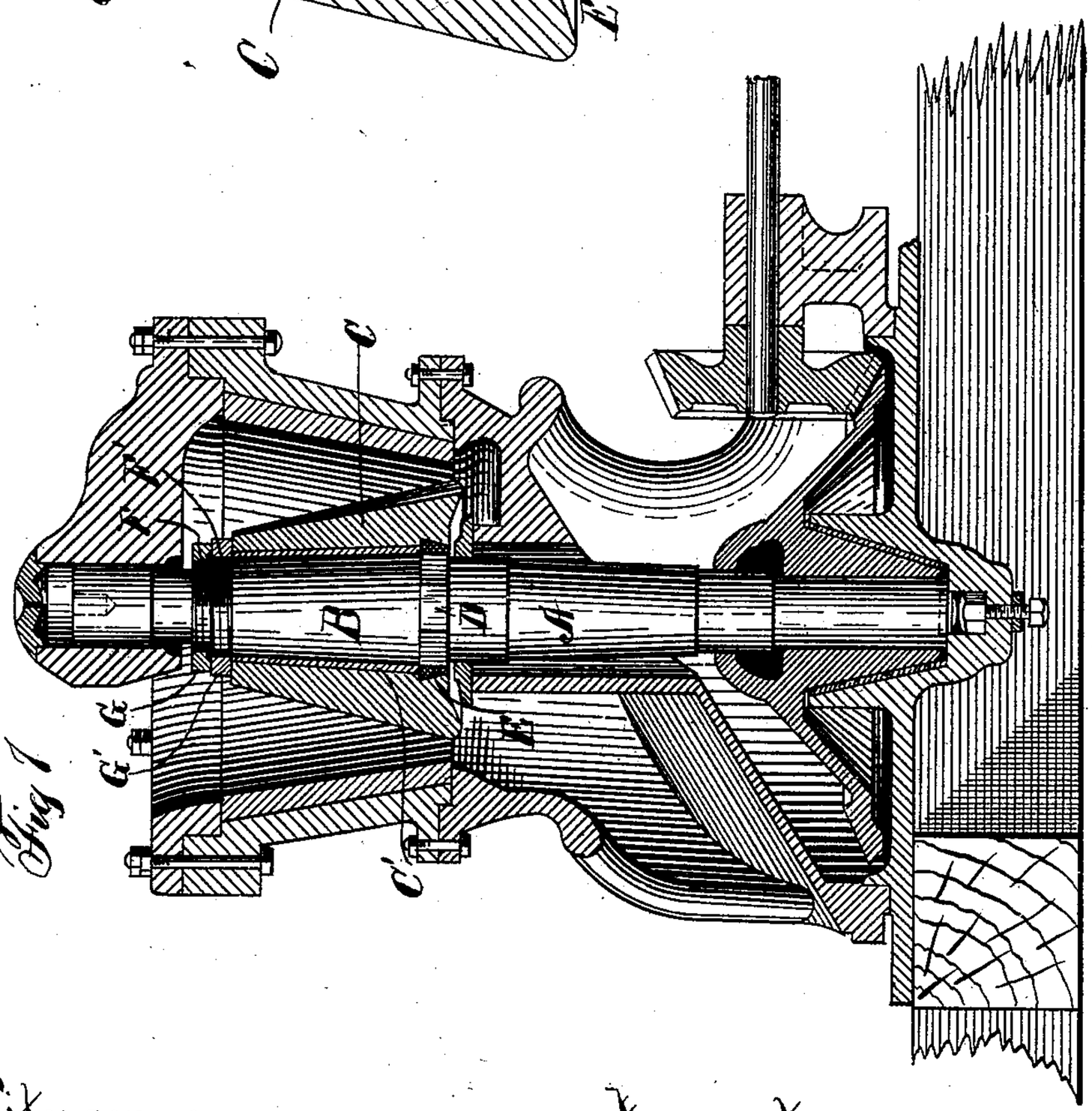


Fig. 1



Witnesses.
Thos. P. Sheridan,
Samuel E. Hibben

Inventors.
Albert J. Gates.
Louis J. Hewes.
By Bunning and Bunning and Payson.
Attorneys.

UNITED STATES PATENT OFFICE.

ALBERT J. GATES AND LEWIS J. HEWES, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE GATES IRON WORKS, OF SAME PLACE.

STONE BREAKER OR CRUSHER.

SPECIFICATION forming part of Letters Patent No. 507,118, dated October 24, 1893.

Application filed September 22, 1892. Serial No. 446,526. (No model.)

To all whom it may concern:

Be it known that we, ALBERT J. GATES and LEWIS J. HEWES, citizens of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Stone Breakers or Crushers, of which the following is a specification.

Our invention relates particularly to the method of fastening and securing the crusher head to its shaft, and is intended to be an improvement upon the stone breaker and crusher shown and described in Letters Patent granted to Philetus W. Gates, No. 279,146, June 12, 1883, and it consists in the features and details of construction hereinafter described and claimed.

In the drawings, Figure 1 shows our improvement arranged in a stone breaker and crusher ready for use; and Fig. 2 is an enlarged, detailed, longitudinal section of the head attached to its shaft. Fig. 3 is an enlarged detailed sectional view of the threaded portion of the shaft.

In making our improved crusher head, we use a gyrating shaft A, having a taper portion B, upon which is fitted a hardened crusher head C, by means of its internal soft piece of metal C′, which is readily secured to the crusher head and closely fits the taper portion of the gyrating shaft. At the lower end of the taper portion is an octagonal shoulder D, which is a portion of the shaft and is arranged in a recess E in the crusher head somewhat larger than its diameter, and into which is poured molten metal, preferably zinc, so that when the head is in place, closely fitting the taper, this metal acts as a key, and prevents the head from having any lateral play. At the upper end of the shaft, and adjacent to the taper, are two threaded portions of the shafting, F F′, having suitable nuts, G G′, engaging the same, which, when screwed down into position, prevent any longitudinal motion of the head. These threads and nuts are not of the usual lock nut description. The threads F F′ have a different pitch—F having a fine thread or pitch and F′ a very coarse thread or pitch—thereby forming, what may be termed a "differential nut," so that if the shaft in its gyration should have a tendency to move the head C laterally, the nut G′, having the coarser pitch, would be moved longitudinally at a greater speed than the nut G, but having a greater pitch than the nut G it is locked in position, and prevented from having either a rotary or longitudinal motion until the nut G first is loosened.

It will thus be seen from the foregoing description of construction that the taper portion of the shaft holds the head in perfect alignment, the octagonal portion with the soft annular key prevents any lateral play, and the differential nuts G G′ serve to securely hold the head in its position, thereby preventing, during the operation of the stone breaker and crusher, any play whatever of this head upon its shaft.

We have entered into a more or less minute description of the details of our invention, but we do not desire to be limited to the same unduly, or any more specifically than is pointed out in the claims.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In combination with a stone breaking and crushing machine, a gyrating shaft having a taper portion for holding the crusher head in alignment, an octagonal shoulder for preventing the said head from having lateral play, threads and nuts of two pitches forming a differential nut to securely lock and hold the crusher head firmly on its shaft, and a crusher head C, substantially as described.

2. In combination with a stone breaking and crushing machine, a gyrating shaft having a taper portion for holding the crusher head in alignment, an octagonal shoulder entering a recess in the crusher head somewhat larger than its outer diameter, the recess being filled with soft metal and forming a key to prevent the crusher head from having any lateral motion, threads and nuts of two pitches forming a differential nut to securely lock and hold the crusher head firmly on its shaft, and a crusher head C having an internal ring of soft metal turned out and adapted to fit the taper portion of the shaft, substantially as described.

ALBERT J. GATES.
LEWIS J. HEWES.

Witnesses:
PHILETUS WARREN GATES,
SAMUEL E. HIBBEN.