

(No Model.)

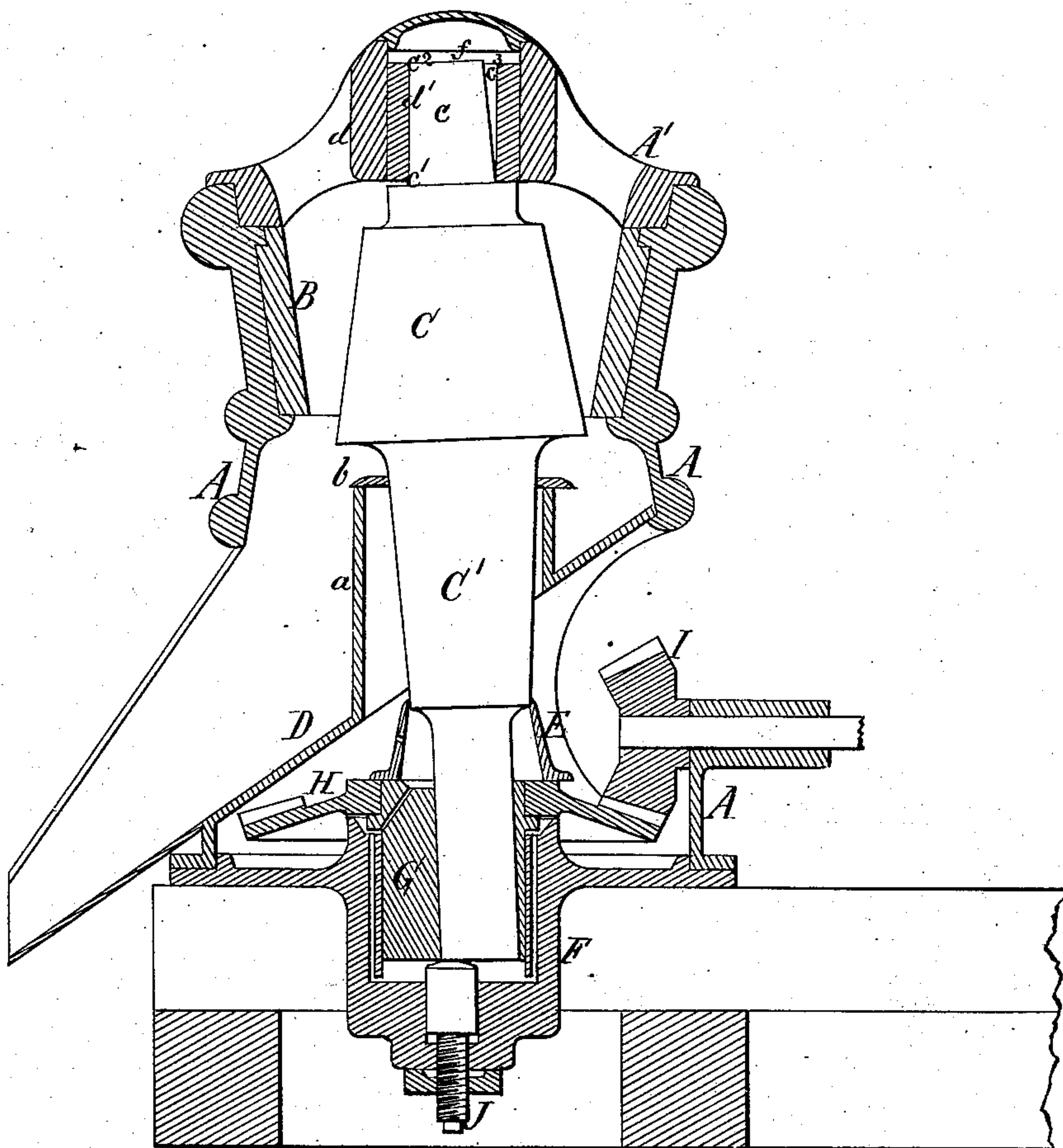
P. W. GATES.

# JOURNAL BEARING FOR STONE AND ORE CRUSHERS.

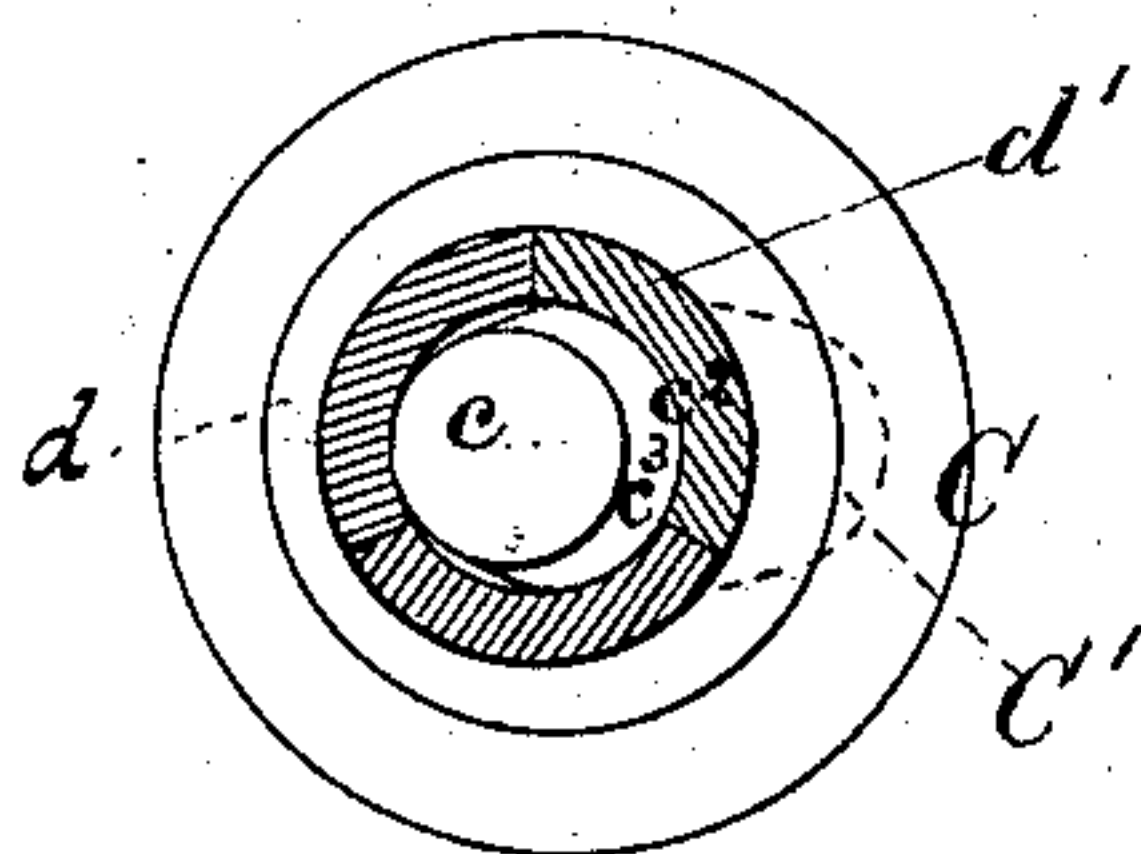
No.259,681.

Patented June 20, 1882.

*Fig 1.*



*Fig 2.*



*Witnesses:*

Witnesses:  
Robert L. Fenwick  
B. Carlyle Fenwick.

*Inventor:*

Inventor:  
Philetus W. Gates  
by his Attn  
Henwick Lawrence



# UNITED STATES PATENT OFFICE.

PHILETUS W. GATES, OF CHICAGO, ILLINOIS.

## JOURNAL-BEARING FOR STONE AND ORE CRUSHERS.

SPECIFICATION forming part of Letters Patent No. 259,681, dated June 20, 1882.

Application filed April 6, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, PHILETUS W. GATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Journal-Bearings for Stone and Ore Crushers, of which the following is a specification.

My invention relates specially to a shaft having a conical crusher-head between its ends, and which has its lower end connected to a revolving eccentric, which gives the shaft and conical crusher-head a revolving gyrating movement, while its upper end is fitted to move in a stationary journal-bearing; and the object of my invention is to secure a continuous straight bearing during the action of the crusher-head from the bottom to the top of the journal-bearing along the working-surface of the journal of the shaft, while the requisite accommodation for the gyratory movement of the shaft is afforded, and this object I attain by the means hereinafter described, represented in the accompanying drawings, and claimed.

In the accompanying drawings, my invention is shown applied to a stone-breaker in common use, Figure 1 being a vertical central section of said machine and of my invention applied to the top of the same; and Fig. 2, a detail diagram, in horizontal section, of the lining of the upper journal-bearing with the journal end of the crusher-shaft in the same, the conical crusher-head below the said bearing being shown by full lines and the lower portion of the shaft below the cone represented by dotted lines.

The frame A, flaring concave B, conical crusher-head C and its shaft C', the inclined discharging and guarding chute D, with flange a and loose collar b, the oil-supplying hood or dust-excluding collar E, oil-step box F, eccentric bearing G, the bevel driving-wheels H and I, and adjusting-screw J are of ordinary construction, and operate in the usual manner and require no further description. Any other form, combination, and arrangement of these well-known parts may be adopted in connection with my invention so long as the same produce a revolving gyratory motion of the conical crusher-head.

The invention which I have made is the combination, with a journal-bearing of suitable form, of a revolving gyrating crusher-shaft, C', having a journal, c, of taper form at its upper end—that is, shaped from its base c' to its top c<sup>2</sup> to correspond to a truncated cone, as shown. This conical journal is provided with a cylindrical journal-bearing, d, which is formed within the cap portion A' of the frame A of the machine. The lining d' of this bearing may be of white or chilled metal or any other suitable metal, and it may be cast in segmental sections or in one piece, and the diameter of its bore is equal at all points to the base diameter of the conical journal, and larger at all other points than any other portion of said journal. In fitting it to the bearing d there may be a space, f, provided between its upper end and the top of the bearing d, in order to admit of its rising when the shaft C', with crusher C, is raised to regulate the size to which the machine shall break or crush the materials to be operated upon.

It might in some cases be practical to not line the bearing d, in which case the journal c would be constructed of a diameter to insure contact between it and the bearing when the cone is in the act of crushing or breaking stone.

From an inspection of the drawings it will be seen that the tapering journal c of the shaft C', at one portion of its periphery, stands parallel and in contact with the vertical surface of the lining d of the journal-box, on account of the eccentric having thrown the axis of the shaft C' out of a vertical line with the horizon, and that while this is so all other portions of this journal are inclined and out of contact with the bearing-lining, as indicated at c<sup>3</sup>. It will also be understood that the same character of bearing contact between every other portion of the tapering journal of the shaft will be secured during the revolution and gyration of the shaft by the eccentric. This bearing contact will not be at the same place upon the lining, but at different places around its entire cylindrical surface, accordingly as the conical crusher of the shaft is caused by the eccentric to move in a conical orbit from the right to the left side of the machine, and from the left to the right side around the vertical central axis of the concave in which the



crushing is performed. By my invention the most effective bearing is secured for sustaining the great resistance offered during the crushing of the stone, and much of the expense of making the ordinary chilled or hardened metal ball-and-socket bearings will be avoided, and at the same time every facility for adjusting the shaft and crusher-head is afforded.

10 The taper which is imparted to the journal of the gyrating crusher-shaft may be imparted to the bearing-surface of the journal-bearing, while a cylindrical instead of a tapering form may be imparted to the journal.

15 With this change in construction the operation and result of my invention will be substantially the same as with the special construction described and shown.

20 What I claim as my invention, and desire to secure by Letters Patent, is—

1. A gyrating crusher-shaft having the tapering journal *c*, in combination with a journal-bearing, whereby only a portion of said tapering journal stands parallel and in contact with the vertical surface of said bearing during the gyration of the shaft, substantially as described. 25

2. The combination of the journal-bearing *d*, adjustable lining *d'*, and the gyrating crusher-shaft having a journal, *c*, only a portion of which stands parallel and in contact with the journal-bearing during the gyration of the shaft, the whole constructed and operating substantially as and for the purpose described. 30

PHILETUS W. GATES.

Witnesses:

J. L. FARGO,

GEO. W. GATES.