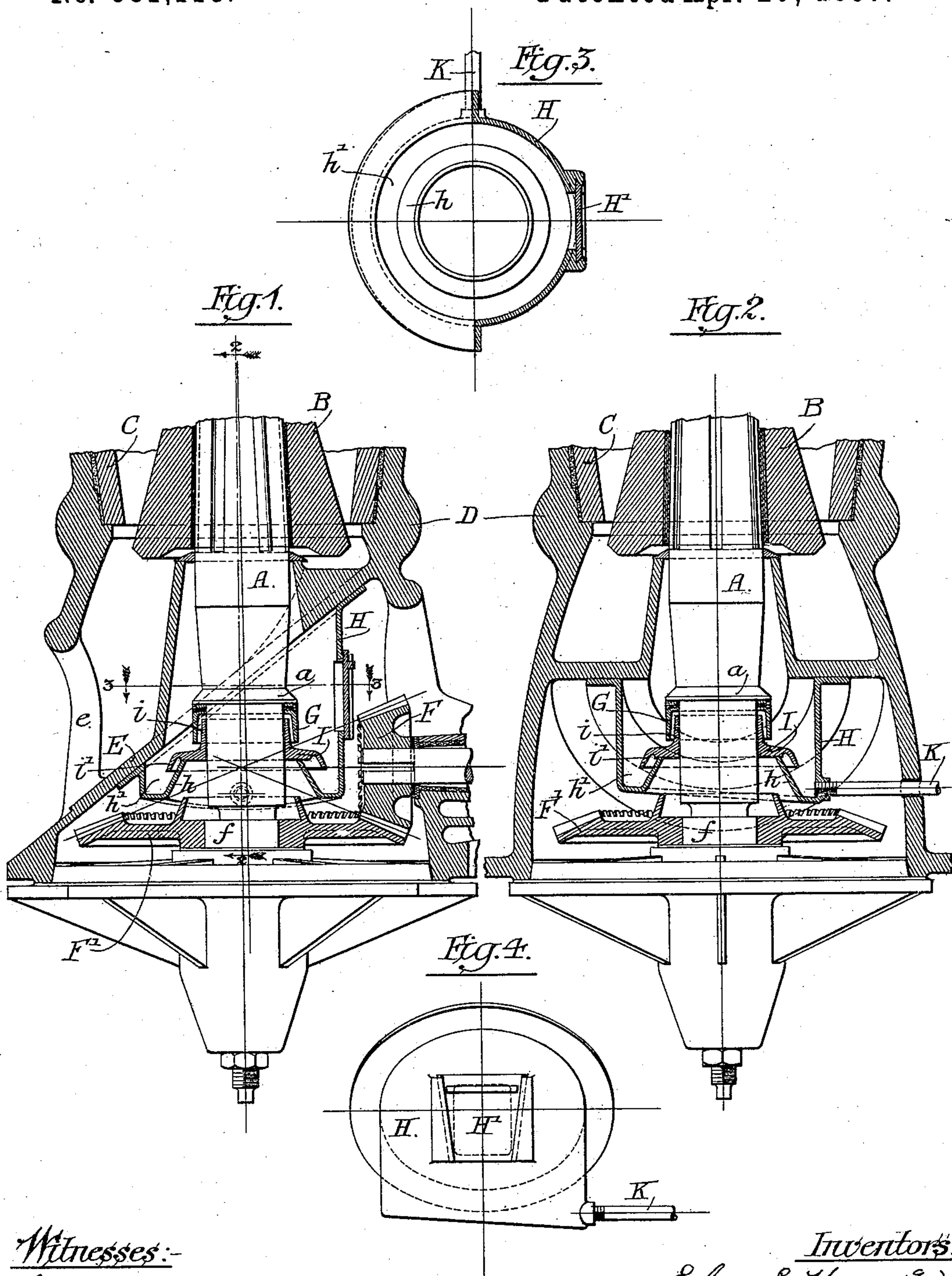


(No Model.)

E. E. HANNA & P. W. GATES.  
ROCK OR ORE CRUSHER.

No. 581,113.

Patented Apr. 20, 1897.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

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## ROCK OR ORE CRUSHER.

SPECIFICATION forming part of Letters Patent No. 581,113, dated April 20, 1897.

Application filed July 20, 1896. Serial No. 599,776. (No model.)

*To all whom it may concern:*

Be it known that we, ELMER ELSWORTH HANNA and PHILETUS WARREN GATES, citizens of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Rock or Ore Crushers, of which the following is a specification.

Our invention relates to that class of rock or ore crushers known as "gyrating" rock crushers, in which the movable shaft that carries the crushing mechanism gyrates around a fixed vertical center instead of rotating, and our invention has special reference to the mechanism for protecting the gyrating bearing portion from foreign substances.

The object of our invention is to provide a simple, economical, and efficient structure for protecting the gyrating bearing portions of a rock or ore crusher from dirt, dust, moisture, and foreign deleterious substances; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical elevation, partly in section, taken through the longitudinal center of the machine, showing only a portion of the machine; Fig. 2, a similar view taken on line 2 of Fig. 1; Fig. 3, a plan view of a portion of the machine, partly in section, taken on line 3 of Fig. 1; and Fig. 4, a rear elevation of the protecting mechanism removed from the machine.

In the art to which this invention relates it is well known that the rock or ore often contains considerable moisture and also often contains clay or other sticky substances, which necessitates the use of a stream of water under pressure to wash out same, thus causing a heavy splashing of the water, so that during the operation of crushing it runs down along the gyrating crushing-shaft, carrying with it minute particles of rock, quartz, or ore into the bearing portions, which foreign substances act like diamond or emery dust to grind or wear away the bearing portions with such rapidity that a machine is often disabled after a short run, thus necessitating new journals and bearing portions. The principal object of our invention, therefore, is to

remove this objection by providing mechanism that will deflect and catch this moisture, with the foreign substances contained therein, and allow the same to be drawn off or passed out before it can injure the bearing portions of the machine.

In the accompanying drawings, A is the gyrating crushing-shaft; B, the crushing-head thereon; C, the concave crushing-rings; D, the frame of the machine; E, the discharge-chute; *e*, the discharge-opening; F, the driving-pinion; F', the driven beveled gear that contains the gyrating journal-bearing *f*, which operates the gyrating shaft. To protect these gyrating bearing portions *f*, the shaft is provided with a flanged shoulder *a*, that deflects and carries the moisture or water out from the shaft-body, much as would the eaves of a house. Underneath this flanged shoulder portion is a removable cylindrical collar G, so secured and arranged with relation to the gyrating shaft as to leave an annular recess between it and the shaft. We further provide a cup portion H and secure it underneath the discharge-chute in line with the axial opening thereon and above and adjacent to bearings of the bevel-gear. This cup portion has an upward conical central projecting portion *h*, and intermediate this upward conical portion is a cap-collar portion I, that has a central projecting portion *i*, arranged between the cylindrical collar on the shaft and the gyrating shaft, and a downwardly-projecting eave portion *i'*, that incloses a portion of the central projecting portion of the cup. These portions are arranged together to form overlapping joints, so as to deflect the moisture into the cup, but at the same time to allow sufficient play between their longitudinal surfaces to accommodate or permit the gyratory movements of the shaft.

The operation of the new mechanism is as follows: Any moisture that runs down the gyrating shaft is deflected by the flanged shoulder *a*, drops down the cylindrical portion onto the cap portion, from which it is deflected into the recess *h'* of the cup portion, from which it passes off by means of the drip-pipe K. In order to get at the interior of the cup,



we prefer to provide the rear portion thereof with a door II', through which a sponge or other material may be inserted for wiping or cleaning out the interior thereof.

5 We claim—

1. In a machine of the class described, the combination of a gyrating shaft having a driving bevel-gear, a cup portion arranged above and adjacent to the gyrating bearing of the  
10 bevel-gear, and a set of overlapping collars interposed between the cup and the shaft to guide and deflect collect and retain the moisture, &c., in the cup portion, substantially as described.

15 2. In a machine of the class described, the combination of an inclined discharging-chute provided with a central opening, a gyrating shaft passed through such opening and provided with a driving bevel-gear, a cup portion  
20 secured to the machine in line with and so as to inclose the opening in the discharge-chute, above the bearing portion of the bevel-gear and provided with a centrally upwardly projecting bottom portion, a cylindrical collar  
25 lar removably secured to the gyrating shaft, and a cap-collar portion easily fitted to the gyrating shaft, inserted partially between the cylindrical collar and the shaft and ar-

ranged on the upward-projecting bottom portion of the cup, substantially as described. 30

3. In a machine of the class described, the combination of an inclined discharging-chute provided with a central opening, a gyrating shaft passed through such opening and provided with a driving bevel-gear, a cup portion  
35 secured to the machine in line with and so as to inclose the opening in the discharge-chute above the bearing portion of the bevel-gear and provided with a centrally upwardly projecting bottom portion, a cylindrical collar  
40 removably secured to the gyrating shaft, a cap-collar portion easily fitted to the gyrating shaft, inserted partially between the cylindrical collar and the shaft and provided with  
45 a downwardly-projecting flange portion overlapping the upward-projecting bottom portion of the cup, a door in the rear of the cup portion, and a drip-pipe, K, secure to the cup portion for drawing off moisture, water, &c., substantially as described.

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Witnesses:

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