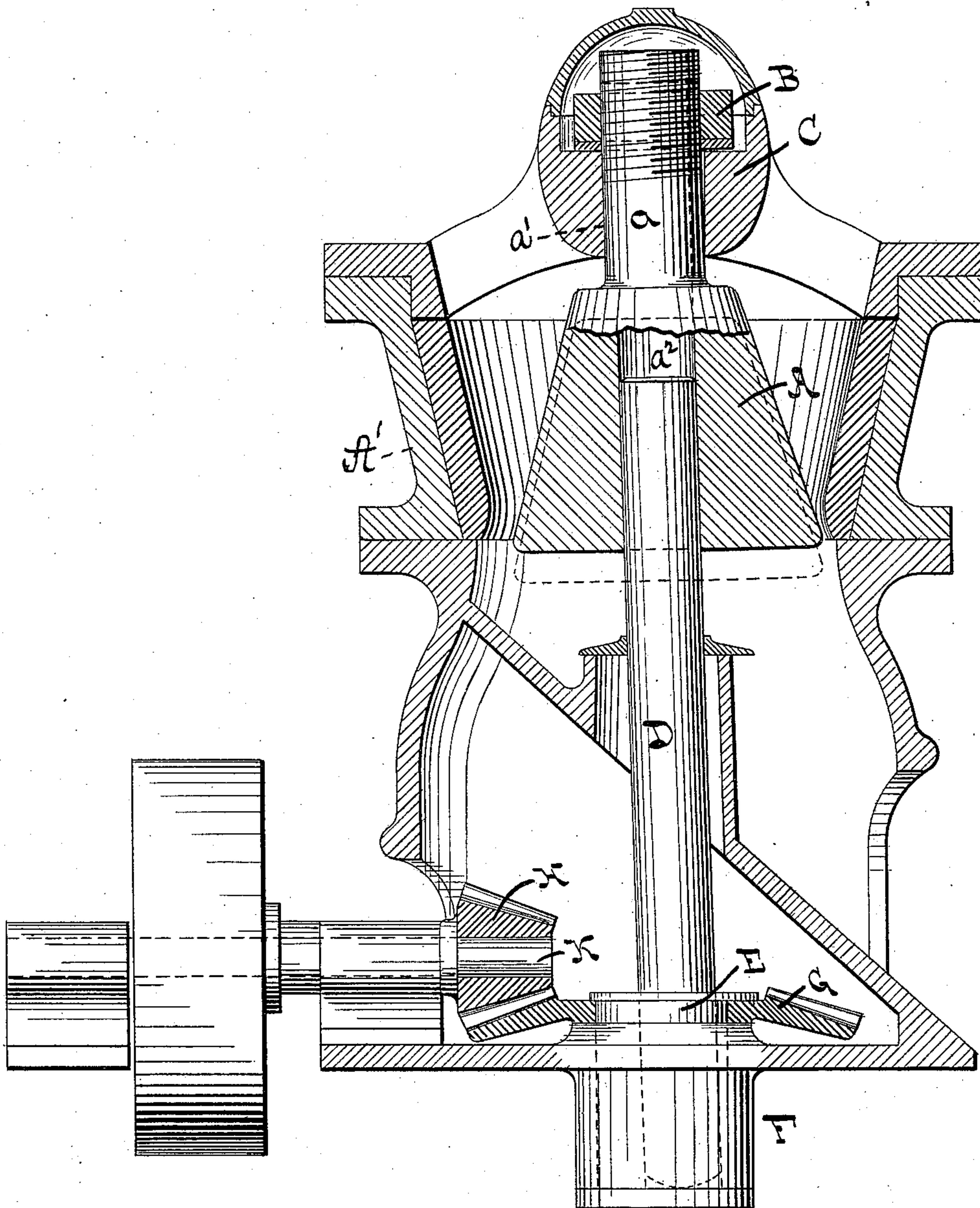


(No Model.)

K. H. TERNSTEDT.
GYRATORY CRUSHER.

No. 575,014.

Patented Jan. 12, 1897.



WITNESSES:

J. H. Templin.
Leslie Griscom

INVENTOR

Klas H. Ternstedt
BY *Wm N. Bates*

UNITED STATES PATENT OFFICE.

KLAS HILLER TERNSTEDT, OF BIRDSBOROUGH, PENNSYLVANIA, ASSIGNOR
TO THE DIAMOND DRILL AND MACHINE COMPANY, OF SAME PLACE.

GYRATORY CRUSHER.

SPECIFICATION forming part of Letters Patent No. 575,014, dated January 12, 1897.

Application filed August 21, 1896. Serial No. 603,481. (No model.)

To all whom it may concern:

Be it known that I, KLAS HILLER TERNSTEDT, a citizen of the United States, and a resident of Birdsborough, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Gyratory Crushers, of which the following is a specification.

So far as I am aware in gyratory or compound movement rock and ore crushers the crushing head or cone has been fitted to some part of the shaft and rigidly secured thereto by means of keys, nuts, or similar fastening means. By this arrangement and means the shaft and cone are made practically one piece, so that to hold the cone or head in any fixed vertical relation to the crushing-chamber it is necessary to do so by means of the shaft, which has been supported by various means, either from above or below the cone. In either means for adjusting the cone or head to produce a coarser or finer product required an adjustment of the shaft. Furthermore, in these prior mechanisms the combined weight of the cone and shaft, increased by the consequent pressure arising from the action in the process of crushing, has been imposed on a single part of the supporting mechanism, and removal of or repair to either the cone or shaft necessitated the removal of both. To remove these defects and difficulties and to more evenly distribute the weight of the parts and lessen the strain thereof, I have invented and devised a new and useful method of disposing and supporting the cone and shaft in their relative operative connections, which consists in suspending the crusher head or cone from its upper end, making it independent of and independently adjustable in its relation to the shaft and crushing-chamber.

I have illustrated in the accompanying drawing an adaptation of my invention to a crushing-machine of the kind mentioned, and, reference being thereto had, A' designates a crushing-chamber mounted on a suitable support, and A designates a conically-shaped crusher head or cone, shown partly in vertical central section and formed or provided with a vertically-projecting stem a , preferably round in cross-section, as shown. The upper end portion of this stem is provided

with screw-threads, on which is fitted a threaded nut B, whereby the head may be adjusted to a higher or lower position.

C designates a support of any suitable construction mounted centrally across the top of the machine and formed with a vertical opening a' to take in the stem a and form a bearing therefor in the same vertical plane throughout its entire length, the relation between the set angle of the head and the vertical bearing-plane remaining the same in all the positions assumed by the head during its gyrations. Through the opening a' is passed the projection a , and at any determined point in the vertical bearing-plane the fulcrum for the head may be fixed.

The center of the head or cone A is bored out vertically, as at a^2 , the bore, if desired, extending into the stem a , and in this bore or socket is loosely inserted the upper end of the operating-shaft D, the lower end thereof being eccentrically stepped in a bushing E, having a vertical bearing in a downward-extending part F, formed in the base of the machine-frame. The step-bearing for the shaft D, as stated, is bored out eccentric to the center line of the head, so that the determined angle of the crusher-head is maintained when the shaft is resting in its step-bearing and disposed in the socket in the head, and so that when the head A is raised or lowered it moves up or down the shaft, and the shaft itself always remains unchanged in the same relative position assumed when arranged in the lower bearing. On the bushing E is mounted a bevel gear-wheel C, meshed by a pinion H, mounted on a driving-shaft K, by which motion is imparted to the machine. It will be perceived that as the bushing E is caused to rotate it carries with it the shaft D, which in turn makes the head gyrate, and at the same time the head is allowed perfect freedom to revolve.

It will readily be perceived from the foregoing that since the weight of the crusher-head is supported from above and the weight of the shaft is maintained in the bushing a distribution of weight and pressure not heretofore attained is effected, and that the downward pressure due to the crushing is imposed on the head alone, and its support, besides

the adjustment and removal of the head, requires less power than when the head and shaft are rigidly secured together. It will be further observed that when adjustment is required or desired the head alone is moved, leaving the shaft undisturbed in the bearing below, thus insuring better running action, and the danger of heating is greatly reduced.

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

1. The combination of the crushing-chamber, the crushing head or cone loosely and revolubly suspended therein and formed with an axial bore, the driving-pinion, the bushing therein, and the gyrating shaft having its lower end eccentrically supported in said

bushing and its upper end loosely inserted in the bore of the crushing-head.

2. The combination of the crushing-chamber, the crushing head or cone loosely and revolubly suspended therein and vertically adjustable, and formed with an axial bore, the driving-pinion, the bushing therein, and the driving-shaft eccentrically stepped in said bushing and having its upper end loosely inserted in the bore of the crushing-head.

Signed at Birdsborough, in the county of Berks and State of Pennsylvania, this 14th day of August, A. D. 1896.

KLAS HILLER TERNSTEDT.

Witnesses:

J. H. TEMPLIN,
ALBERT FRITZ.