(No Model.) 2 Sheets—Sheet 1.

J. J. BREWIS.

STONE CRUSHER.

No. 525,401. Patented Sept. 4, 1894.

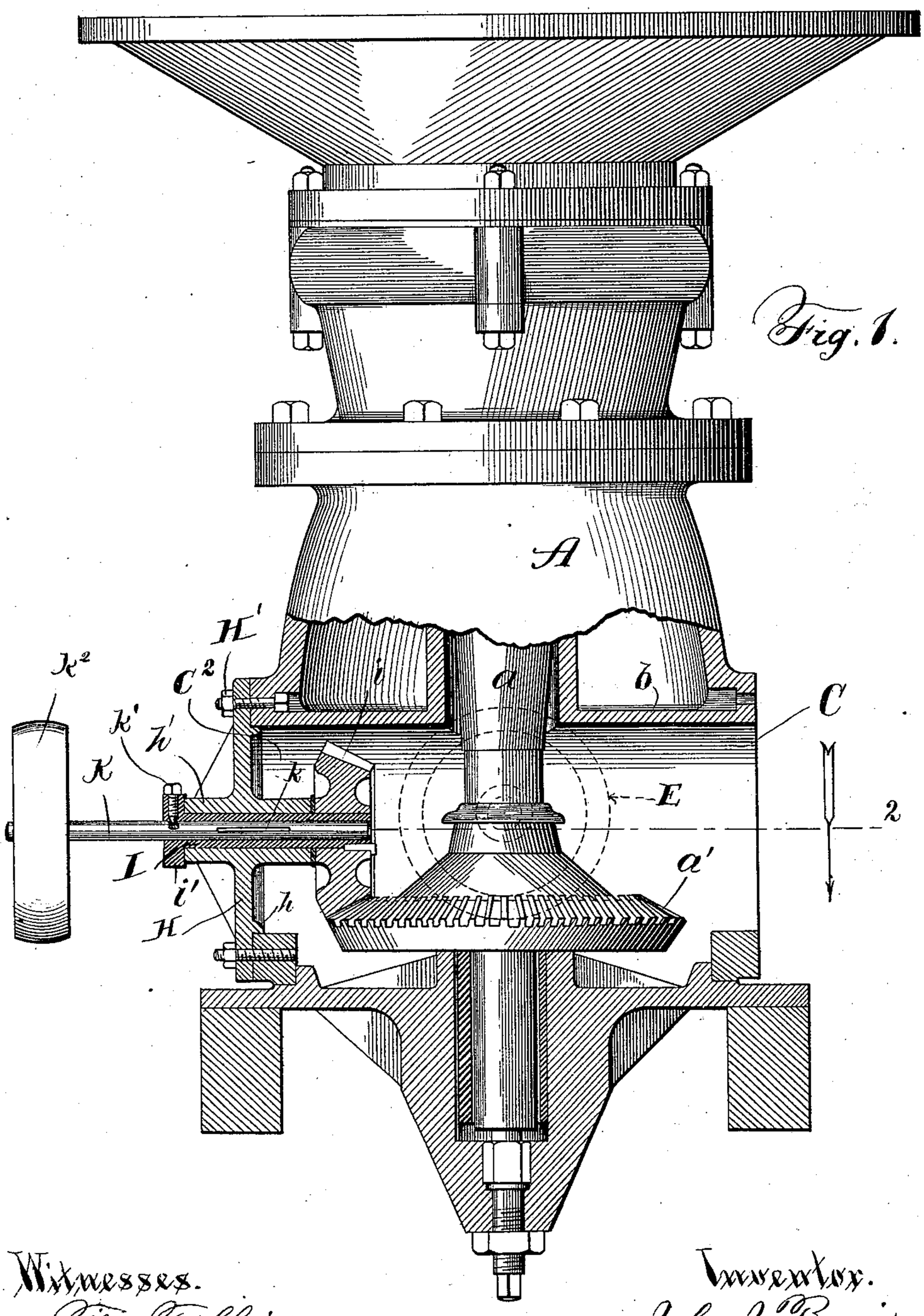

Fig. 1.

Witnesses.
Thos. F. Sheridan
L. Alter

Inventor.
John J. Brewis
By Banning & Banning & Payson.
Attys.

(No Model.) 2 Sheets—Sheet 2.

J. J. BREWIS.

STONE CRUSHER.

No. 525,401. Patented Sept. 4, 1894.

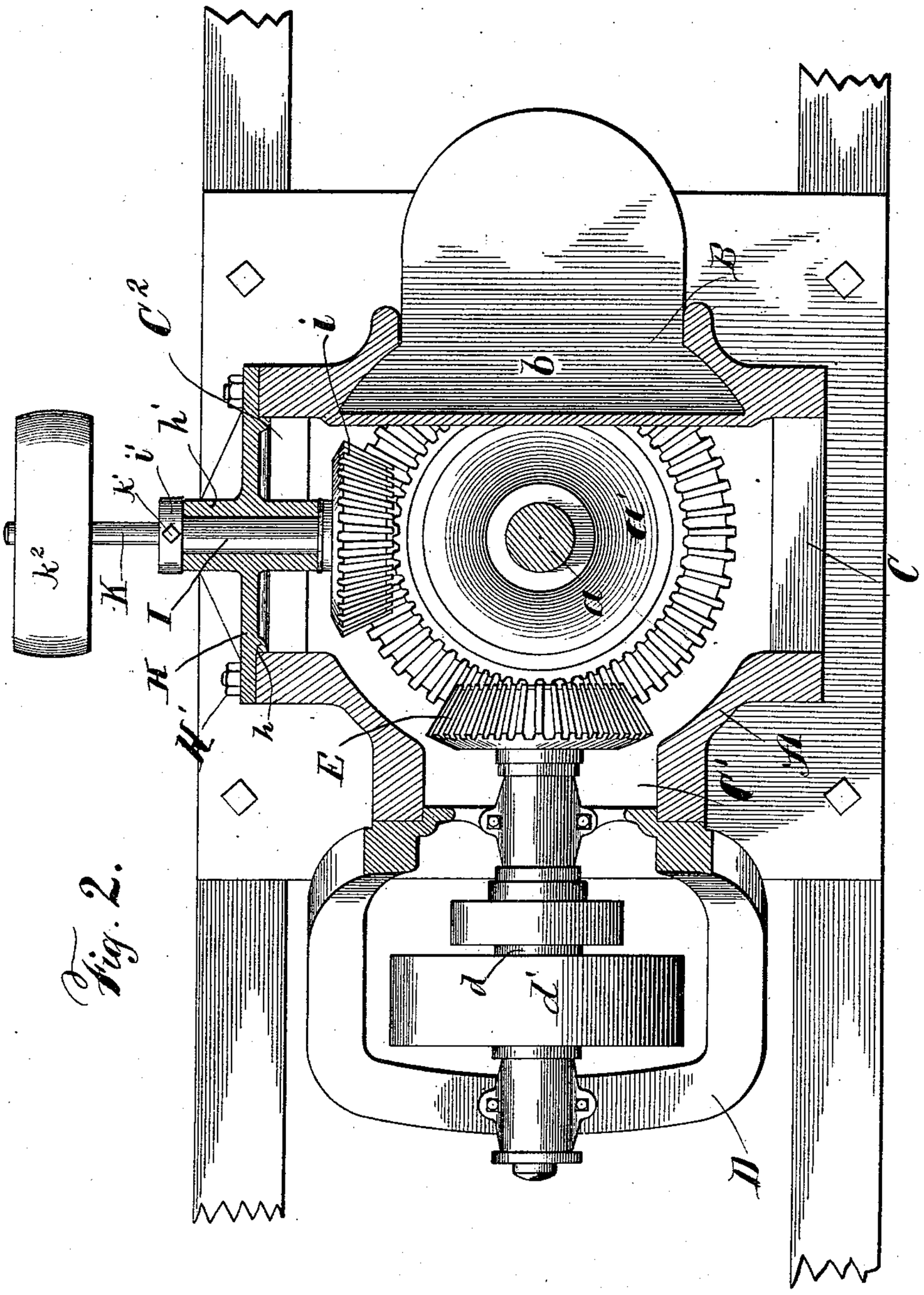

Fig. 2.

Witnesses:
Chas. E. Gaylord.
L. Alter

Inventor:
John J. Brewis.
By Banning & Banning & Payson,
Attys.

UNITED STATES PATENT OFFICE.

JOHN J. BREWIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GATES IRON WORKS, OF SAME PLACE.

STONE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 525,401, dated September 4, 1894.

Application filed October 24, 1893. Serial No. 489,005. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. BREWIS, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Stone-Crushers, of which the following is a specification.

My invention relates particularly to the method of operating the crushing mechanism and the transmission of power for same to auxiliary mechanisms which may be located adjacent to the stone crusher; and has for its object the providing of suitable mechanism and attaching it to the crusher frame, so that it may be operated directly by the mechanism which operates the crusher; and it consists in the features, combinations and details hereinafter described and claimed.

In the drawings, Figure 1 is a vertical elevation, partly in section, showing my improved mechanism engaging with and adapted to be operated by the driving mechanism of the crusher; and Fig. 2 a horizontal transverse section, taken on line 2 of Fig. 1 looking in the direction of the arrow.

In the use of stone crushers, especially that class provided with gyrating shafts and crushing heads, it is customary to drive the beveled gear attached to the gyrating shaft by means of a beveled pinion inserted through an opening in the crusher frame at a point opposite and in line with the discharge opening. The line shaft for driving the shaft which carries this beveled pinion is generally located parallel therewith, so that when it is necessary to drive auxiliary mechanism, which has its operating shaft at right angles to the driving shaft for operating the crushing mechanism, beveled gears are generally employed, one attached to the outer end of the shaft carrying the driving mechanism, and the other to a supplemental shaft, both supported by framework attached to and supported by the base which supports the driving mechanism, or a quarter turn belt is interposed between the line shaft and the auxiliary mechanism. This mechanism has been found to be cumbersome and expensive in construction.

My improvement is designed to obviate these objections, and to provide a simpler and more efficient method of accomplishing the same, doing away with the necessity of a base for supporting the framework of either the driving or driven mechanisms, and to provide means by which auxiliary mechanism may be operated through a shaft which has a gear engaging directly with the driving mechanism of a gyrating shaft, which, in a measure, serves to balance the forces which tend to wear the driven gear unequally.

In constructing my improvement, I use a crusher frame, A, containing crushing mechanism, preferably of the class known as the "gyrating type," provided with the usual gyrating shaft, *a*, having the crushing mechanism of the well known form at the top; but as this forms no particular portion of my invention, I do not deem it necessary to describe it fully in detail. The non-gyratory revolving sleeve, in the eccentric bore of which is carried the lower end of the gyratory shaft, *a*, is provided with a beveled gear wheel, *a'*, the rotation of which gyrates such shaft, and is adapted to be operated by the driving mechanism. The lower portion of the crusher frame is provided preferably with four openings. The opening for discharging the crushed material, B, is provided with an inclined diaphragm or chute, *b*, and openings C, C' and C^2, are located preferably at equidistant points around the circumference of the crusher frame and adjacent to the beveled gear on the gyrating shaft. Secured preferably to the crusher frame, and in line with the opening, C', directly opposite the discharge opening is a bracket, D, provided with bearings in which is mounted a driving shaft, *d*, having its inner end provided with a beveled pinion, E, engaging with the beveled gear on the gyrating shaft, in such manner that the rotation of the driving shaft is imparted through the beveled gears and caused to operate the gyrating shaft. The shaft, *d*, may be supplied with an ordinary driving pulley, *d'*, or an ordinary spur gear may be used in place of the driving pulley and operated by a suitable train of gears to multiply the power or speed used for operating the crushing mechanism. The bracket D, may be secured to the crusher frame by bolts or nuts, or in any other well known manner.

To transmit the power for driving auxiliary mechanism through the driving shaft and

mechanism for operating the gyrating shaft, I provide a hub, H, having a portion, *h*, adapted to fit one of the openings, C^2, in the crusher frame, and secure it to the same by means of bolts and nuts, H′, so that it may be removed easily and secured to the crusher frame at and in line with any of the other openings, and having a bearing, *h*′, preferably at its central portion. Mounted rotatably in the bearing is a hollow shaft, I, carrying at its inner end a beveled pinion, *i*, engaging with and adapted to be operated by the rotations of the beveled gear on the gyrating shaft. The outside end of the hollow shaft is provided with a shoulder, *i*′, to take up or limit the endwise motion of such shaft. Secured in the axial opening of the hollow shaft is preferably a solid shaft, K, which may be provided with a feather, *k*, engaging with a corresponding feather-way in the hollow shaft so as to impart the rotation of the hollow shaft to the shaft, K. A set screw, *k*′, is inserted through the shoulder of the hollow shaft, so as to impinge against the shaft, K, and prevent endwise motion of the same—the power being imparted wholly through the feather to the feather-way. The shaft, K, is provided at its outer end with a pulley, k^2, which may be used to drive a belt engaging with any outside mechanism.

While I have described fully in detail this hollow shaft with its engaging shaft, I do not deem this necessary for the carrying out of my improvement, as this mechanism is intended to be used in such cases where it may be deemed necessary to leave the beveled pinion, *i*, in engagement with the gear on the gyrating shaft, and not to leave any mechanism projecting outward so as to be in the way of other mechanisms. A solid shaft might be used having its bearing in the hub, H, and provided with the beveled pinion on the inner end and the pulley on its outer end.

The bracket, D, with the driving mechanism, may be secured to the crusher frame at and in line with any of the openings, C, C′ or C^2, and the hub may be made in such manner as to be secured at any of these openings; and instead of transmitting power at right angles from the driving shaft, *d*, it may be used to transmit power directly in line with the same, say when the bracket, D, is secured at the opening, C.

While I have described the mechanism for driving and operating the gyrating shaft, I do not desire to be understood as claiming this as my invention, as I believe it to be the invention of other parties.

I claim—

In stone crushers, the combination of a crusher frame provided with openings around its circumference for the insertion of operating mechanism, crushing mechanism located therein with its driving gear adjacent to such openings, gear mechanism inserted in one of such openings and engaging with the gear of the eccentric box for operating the crusher mechanism, and means for transmitting power to auxiliary mechanism through the movements of the crusher mechanism, consisting of a hub removably secured to the crusher frame at and in line with one of its openings, a hollow shaft having its bearing in said hub, a gear mounted on its inner end and engaging with the gear of the gyrating shaft, means for taking up the endwise motion of the hollow shaft, and a solid shaft engaging with the hollow shaft so as to be rotated with it and provided with mechanism to transmit its rotation to other mechanisms, substantially as described.

JOHN J. BREWIS.

Witnesses:
PHILETUS WARREN GATES,
CHARLES L. CARMAN.