

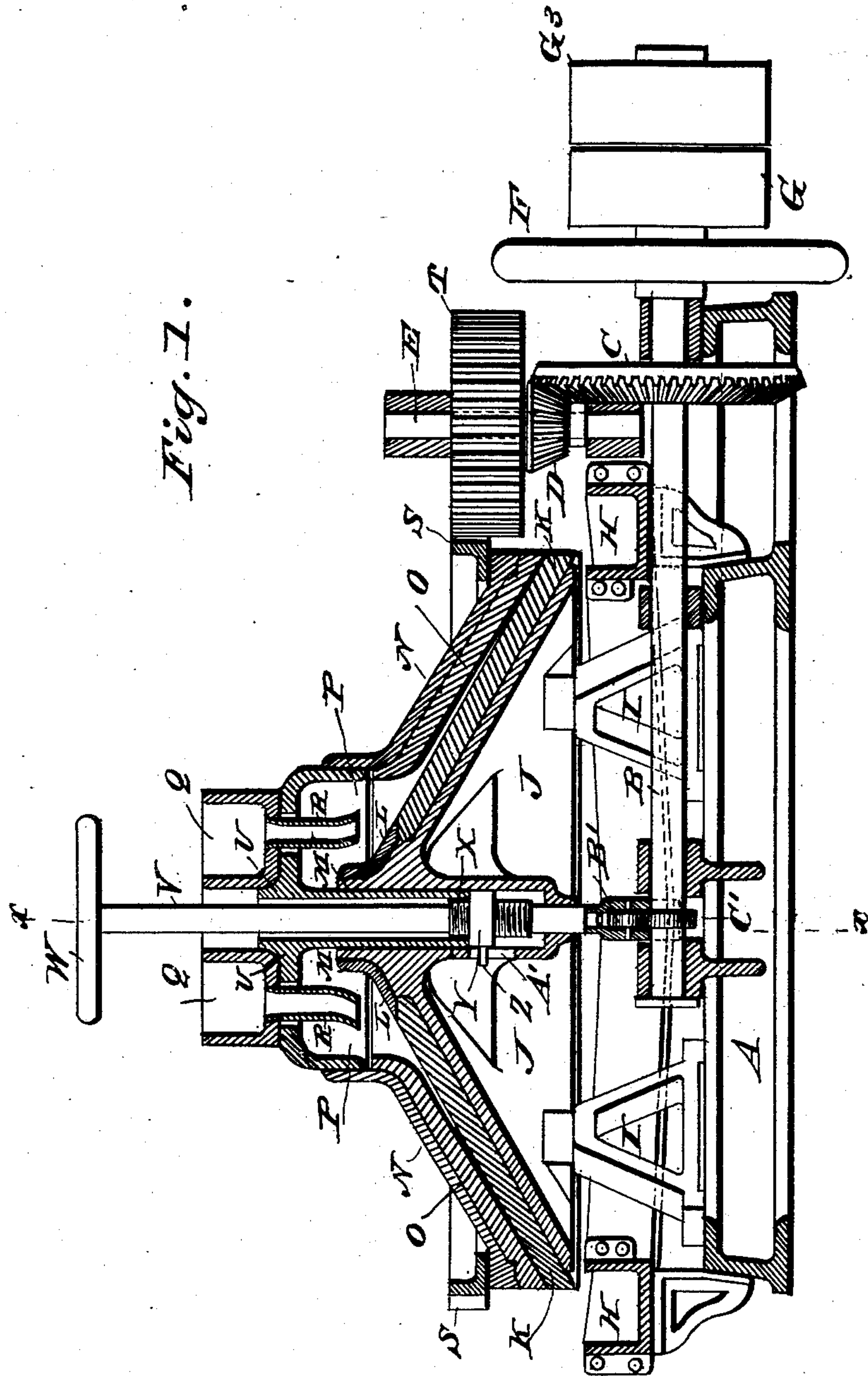
(No Model.)

3 Sheets—Sheet 1.

C. J. HODGE.
QUARTZ MILL.

No. 317,359.

Patented May 5. 1885.



WITNESSES:

Ad. S. Dietrich
Wm. Bagger

Charles J. Hodge,
INVENTOR.

by: Louis Bagger & Co.
ATTORNEYS.

(No Model.)

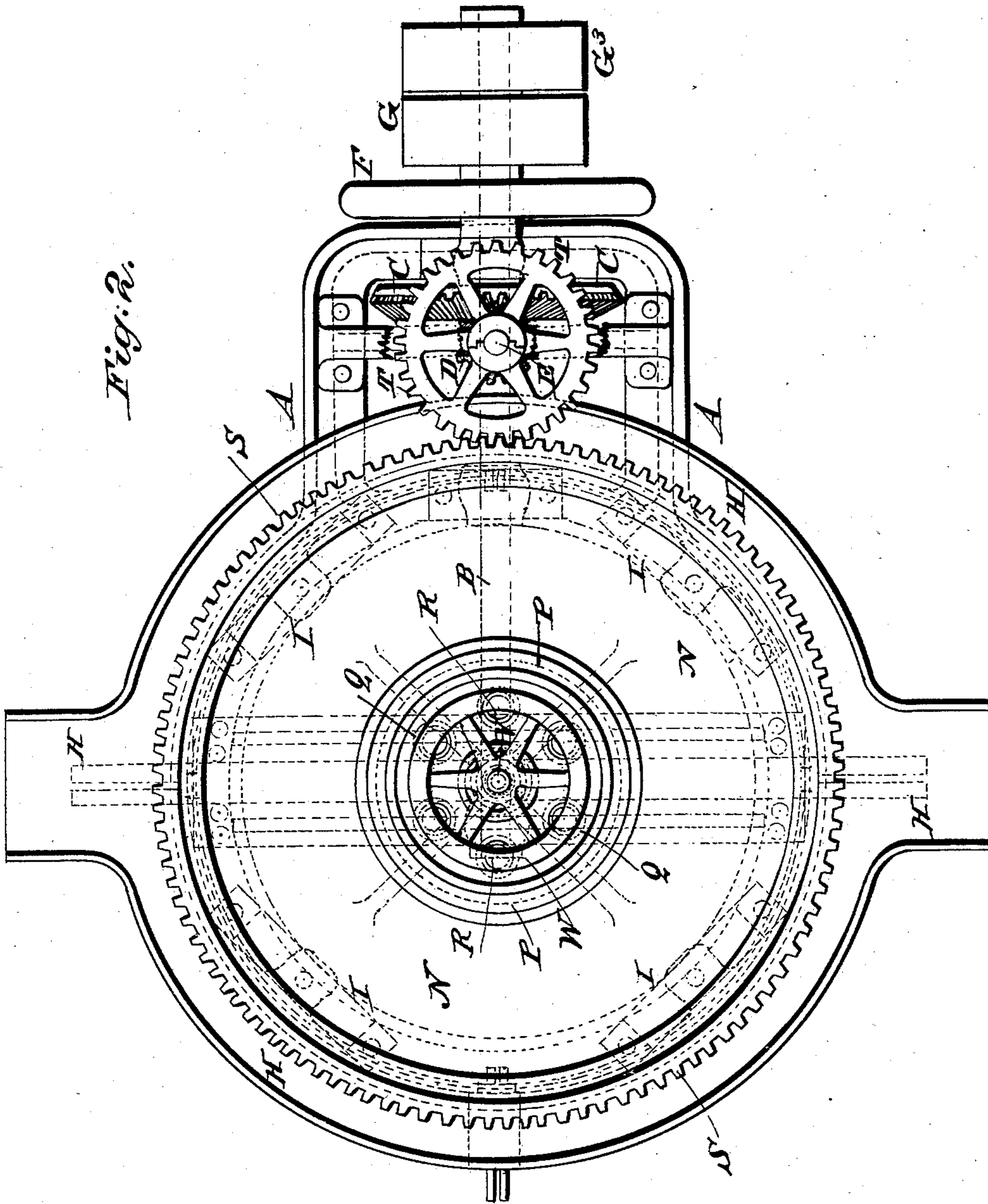
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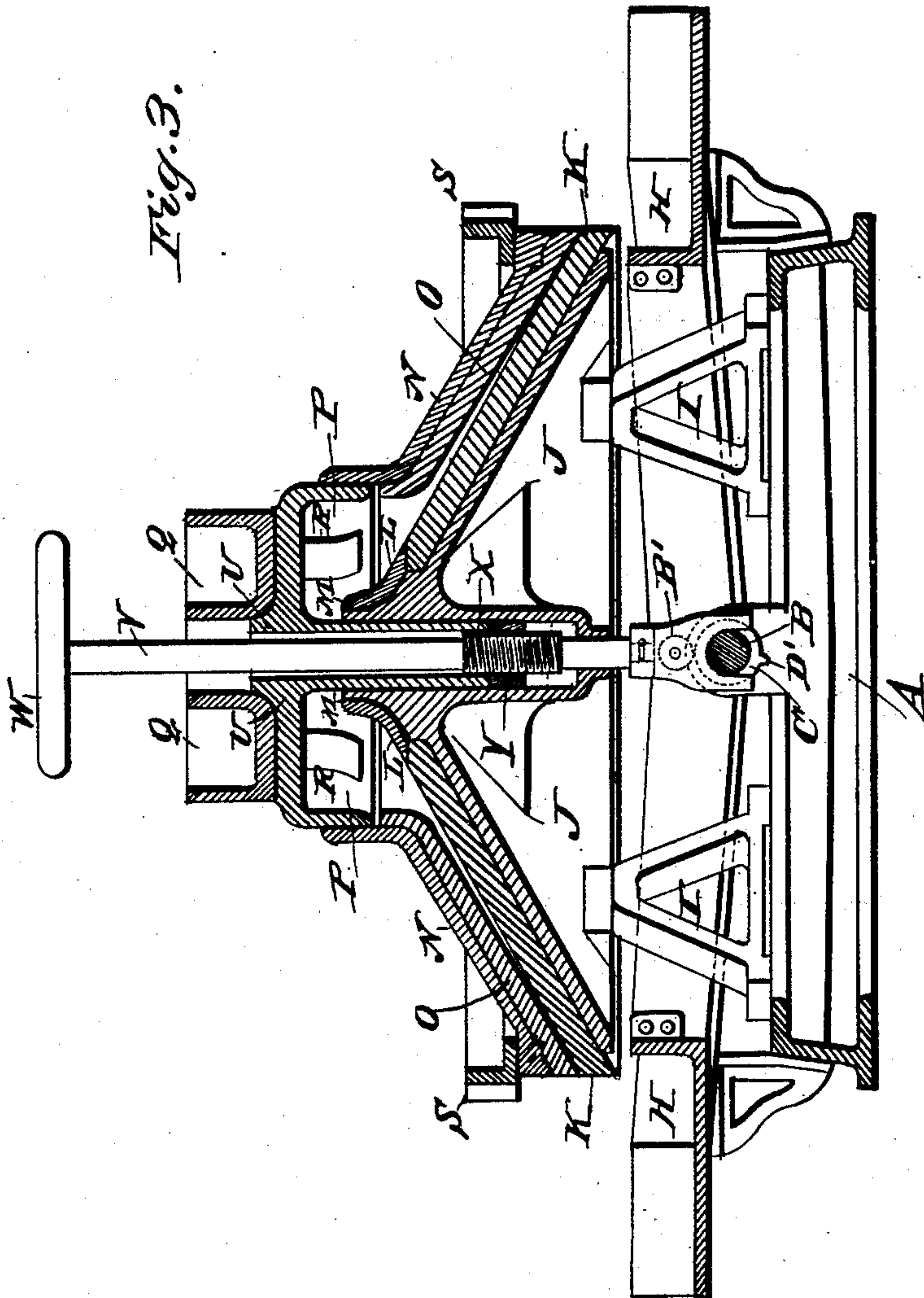
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UNITED STATES PATENT OFFICE.

CHARLES J. HODGE, OF HOUGHTON, MICHIGAN.

QUARTZ-MILL.

SPECIFICATION forming part of Letters Patent No. 317,359, dated May 5, 1885.

Application filed December 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HODGE, a citizen of the United States, and a resident of Houghton, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Quartz-Mills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of my improved quartz-mill. Fig. 2 is a plan view of the same. Fig. 3 is a detail sectional view taken on the line *x x* in Fig. 1.

The same letters refer to the same parts in all the figures.

This invention refers to mills for grinding quartz and like substances; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, A designates the bed or frame of the machine, which is provided with bearings for a transverse shaft, B, which is the main shaft of the machine. The said main shaft is provided at or near one end with a bevel-gear, C, by which motion is imparted through the medium of a pinion, D, to a shaft, E, which is mounted vertically in suitable brackets or hangers to the side of the frame. The said main shaft is provided with a fly-wheel, F, and with fixed and loose pulleys G G³, to receive motion from suitable operating machinery.

The bed-frame is constructed with an annular circular trough, H, at its upper outer edge, and it is provided with suitable inwardly-extending brackets, I I, supporting the lower or inner grinding-cone, J, the face of which is provided with hard-iron grinding-plates K, the upper ends of which are overlapped and protected by means of supplementary plates L, suitably secured to the upper end of the hub or central portion, M, of the said inner cone.

The hub of the lower or inner cone, which is designated by letter M, forms a bearing for

the central stem or hub of the outer or upper grinding-cone, N, the under or inner face of which is equipped with hard-iron grinding-plates O O, which converge toward the lower ends or edges of the grinding-plates K of the lower or inner cone. The upper end of the outer cone is constructed with an annular chamber, P, into which the upper ends of the lining-plates O O extend, and which serves to receive the material to be ground or pulverized from a hopper, Q, which is built or constructed upon the said outer or upper cone, and provided with a series of spouts, R R, extending down into the said chamber P. The lower edge or periphery of the outer or upper cone is provided with teeth or cogs S, engaging a spur wheel or gear, T, upon the upper end of the vertical shaft E, from which a rotary motion is thus communicated to the said grinding-cone. The stem or hub U of the outer or upper cone, N, is provided with a central bearing for a stem or shaft, V, the upper end of which has a hand-wheel, W, which enables it to be conveniently manipulated, and the lower end of which is screw-threaded, as at X, so as to fit in a collar, Y, arranged at the lower end of the hub U, and having a pin, Z, extending laterally into a vertical slot, A', in the sleeve or hub M, so that the said collar will remain stationary while the hub U, with the cone N, may turn or revolve. The extreme lower end of the stem V rests in a step, E', the lower part of which is bifurcated and provided with a friction-wheel, B', bearing upon or against a disk or wheel, C', mounted upon the transverse main shaft B. The said wheel or disk C' is provided with a small tooth or protuberance, D', which, once during each revolution of the said disk, serves to slightly raise or lift the stem V with its attachments.

From the foregoing description, when taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood. From the vertical shaft a rotary motion is imparted directly to the outer or upper cone, the upper end of which carries the hopper, into which the material to be ground or pulverized may be fed. The said material, on entering the chamber between the upper ends of the cones, encounters the parts of the grinding-surfaces

which are farthest apart, and is gradually worked down and reduced between the said surfaces until discharged into the trough H, which is constructed with suitable escape-
 5 spouts. By turning the stem V the upper or outer grinding-cone may be raised or lowered, so as to arrange the grinding-faces of the two cones at any desired distance apart; and by each revolution of the main shaft the step of
 10 the said stem, which is operated by the cam-wheel C', serves, by the action of the cam or tooth D' against the friction-roller B', to slightly raise or lift the said stem, together with the outer cone attached thereto, thereby enabling
 15 the ground material between the cones to be discharged without the slightest danger of clogging or injury to the grinding plates or faces.

In the practical construction of this machine
 20 several changes of details may be deemed expedient, and I would therefore have it understood that I do not limit myself to the precise construction herein shown, but reserve to myself the right to all such modifications as may
 25 be resorted to without departing from the spirit of my invention.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

30 1. In a pulverizing-mill, the combination of an inner stationary and an outer revolving cone and means for abruptly raising and lowering the outer cone, substantially as and for the purpose set forth.

35 2. In a pulverizing-mill, the combination of a stationary cone, a revolving cone, a non-revolving stem or spindle and a step for the latter, and a transverse shaft provided with a cam-wheel, whereby the said stem, with the grind-
 40 ing-cone connected thereto or supported thereby, is intermittingly raised and lowered, sub-

stantially as and for the purpose herein set forth.

3. In a pulverizing-mill, the combination of a
 45 bed or base, a stationary grinding-cone mounted thereon and having a central vertical hub, a revolving cone having a hub journaled in the hub of the stationary cone, a stem arranged in the hub of the revolving cone and having a screw-threaded portion at its lower
 50 end, a collar fitted upon the said screw-threaded portion and having a pin extending laterally into a vertical slot in the hub of the stationary cone, and a step for the said stem, substantially as and for the purpose herein set
 55 forth.

4. In a pulverizing-mill, the combination of a base, a grinding-cone mounted stationary upon the same, a revolving cone, a stem, a
 60 step, devices whereby said revolving cone may be vertically adjusted, and a revolving shaft mounted transversely in the base, and having a cam-wheel forming a bearing for the lower end of the said step, substantially as and for
 65 the purpose herein set forth.

5. In a pulverizing-mill, the combination, with a stationary cone, of a revolving grind-
 70 ing-cone, a central adjusting-stem, a bifurcated step, a friction-roller journaled in the fork of said step, and a transversely-mounted revolving shaft having a collar furnished with a protuberance on its circumference supporting said bifurcated step, whereby the latter is abruptly lifted intermittingly, substantially
 75 as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CHARLES J. HODGE.

Witnesses:

ALBERT R. GRAY,
 JOSEPH F. HAMDITZER.