

(No Model.)

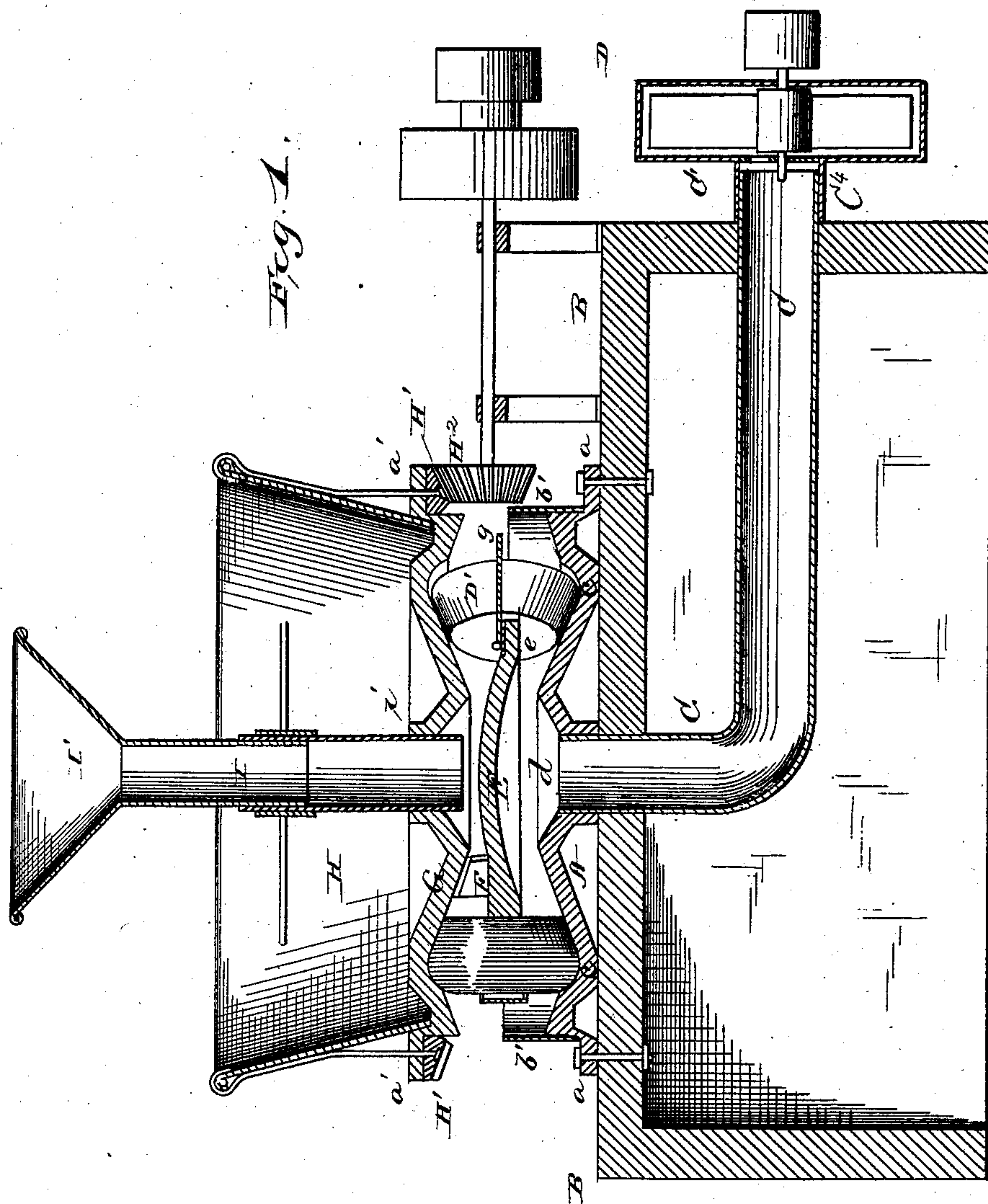
2 Sheets—Sheet 1.

J. B. SWEETLAND.

MACHINE FOR CRUSHING AND PULVERIZING QUARTZ.

No. 258,822.

Patented May 30, 1882.



Witnesses.
Edmond L. Yerville.
J. J. McCarthy.

Inventor.
Jerome B. Sweetland.
By C. M. Alexander,
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

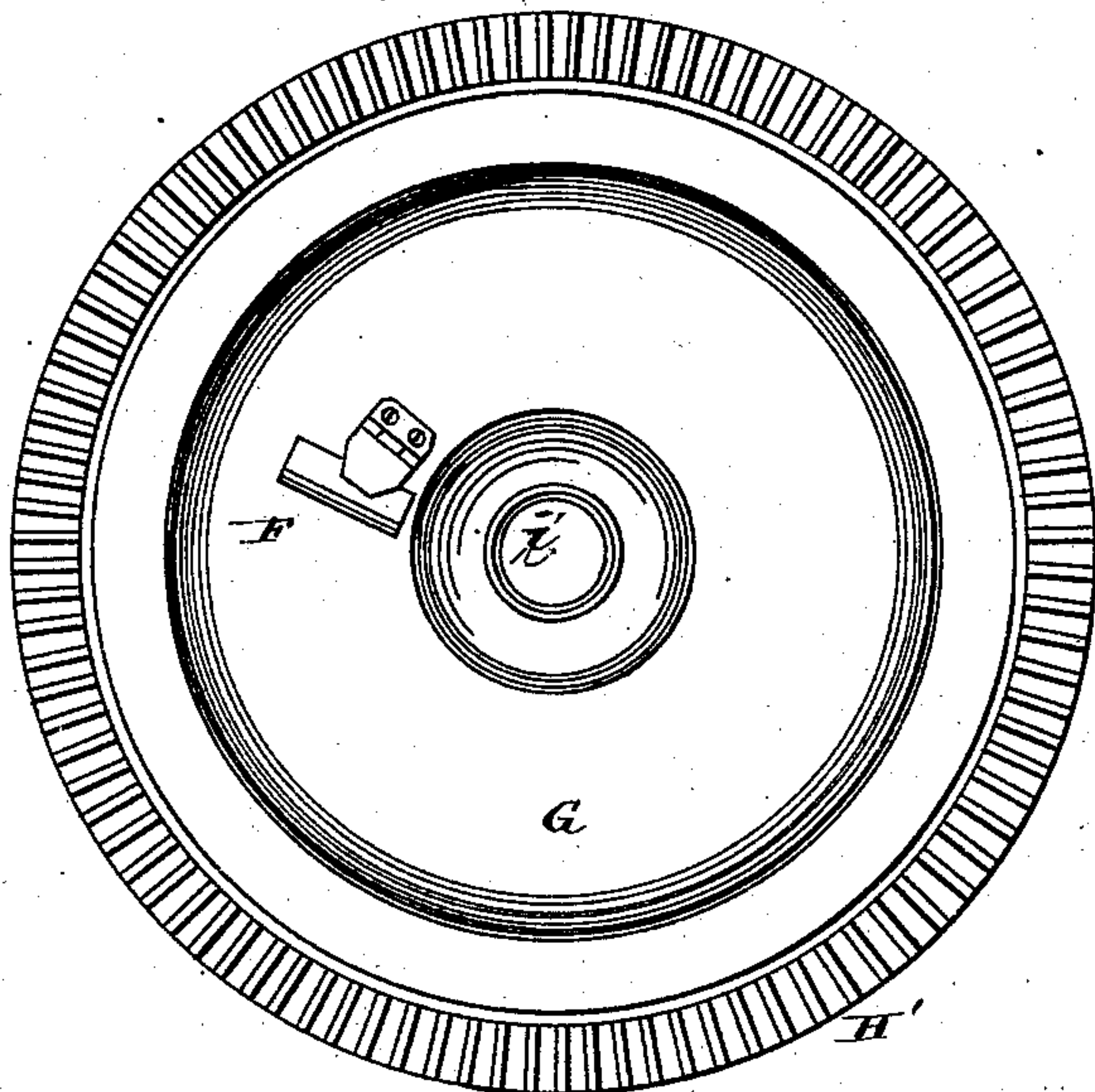


Fig. 4.

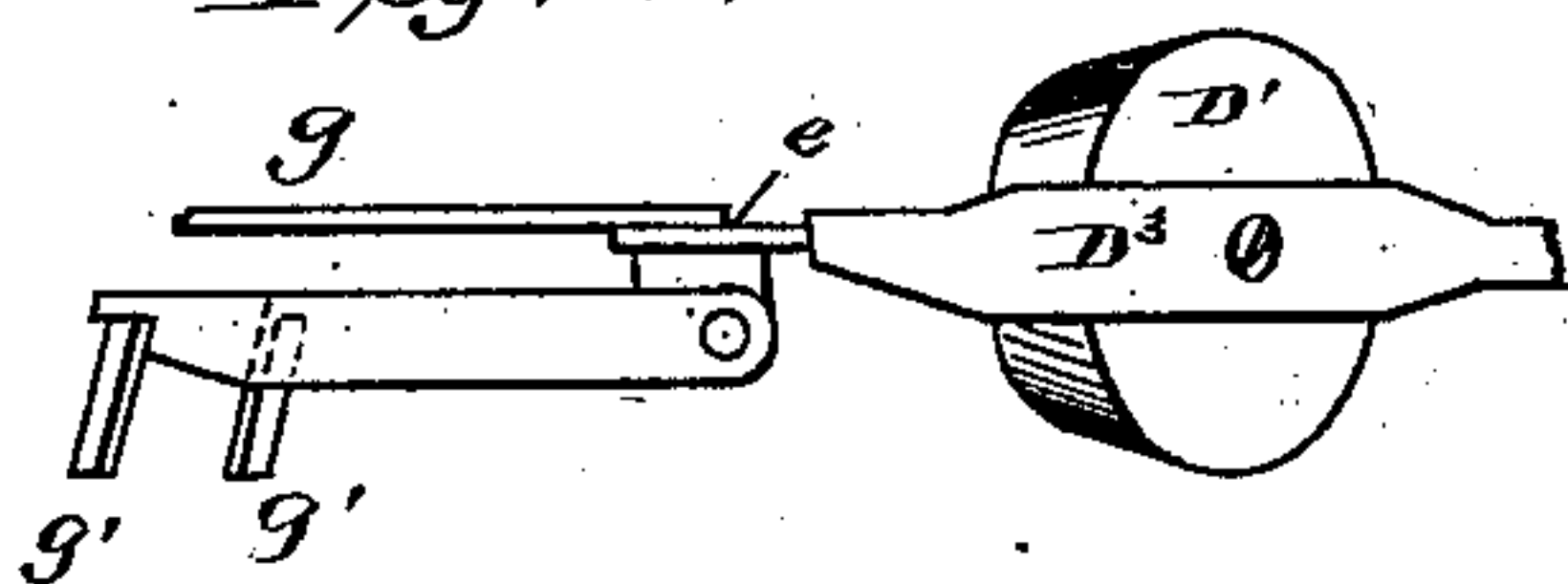


Fig. 3.

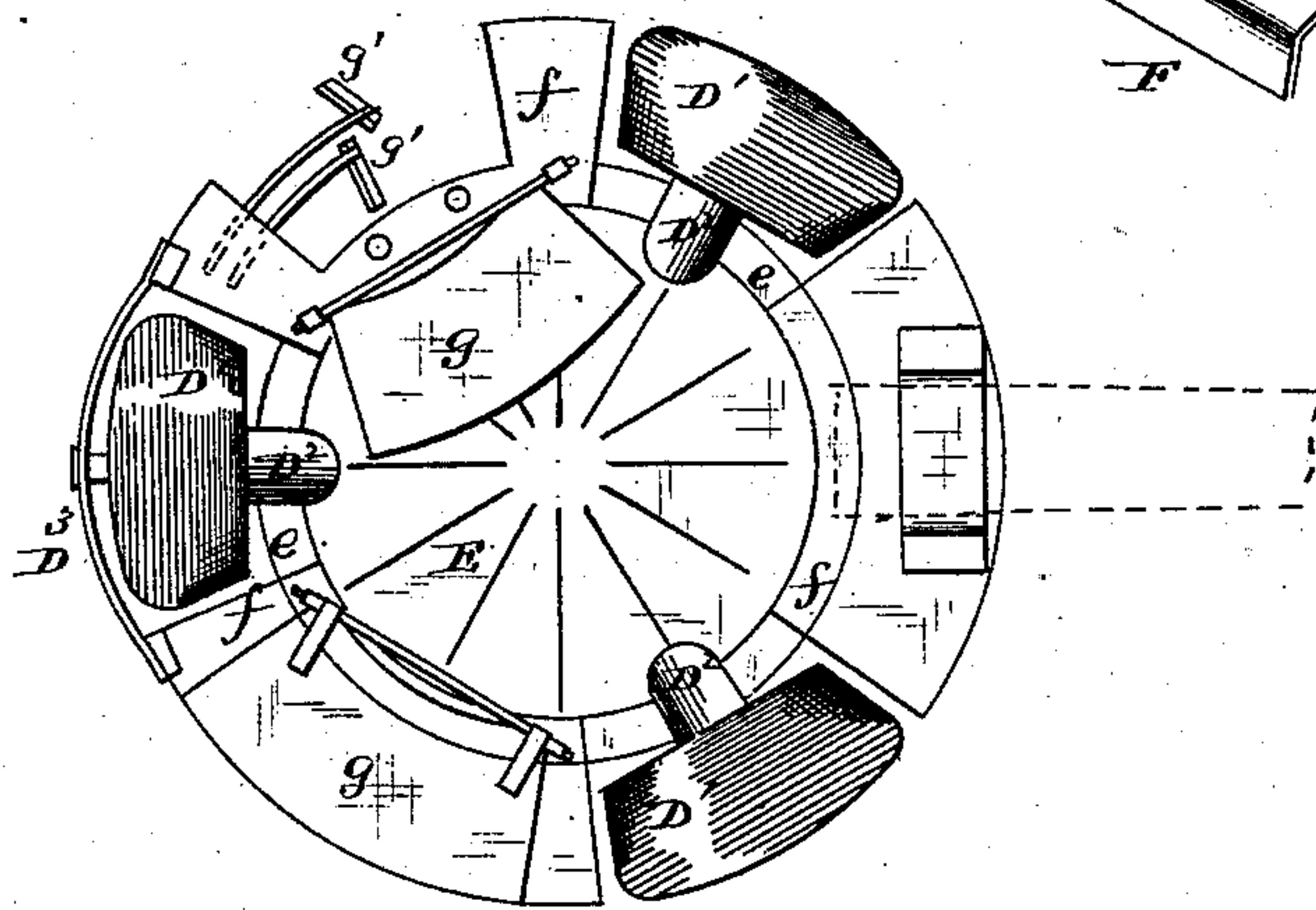
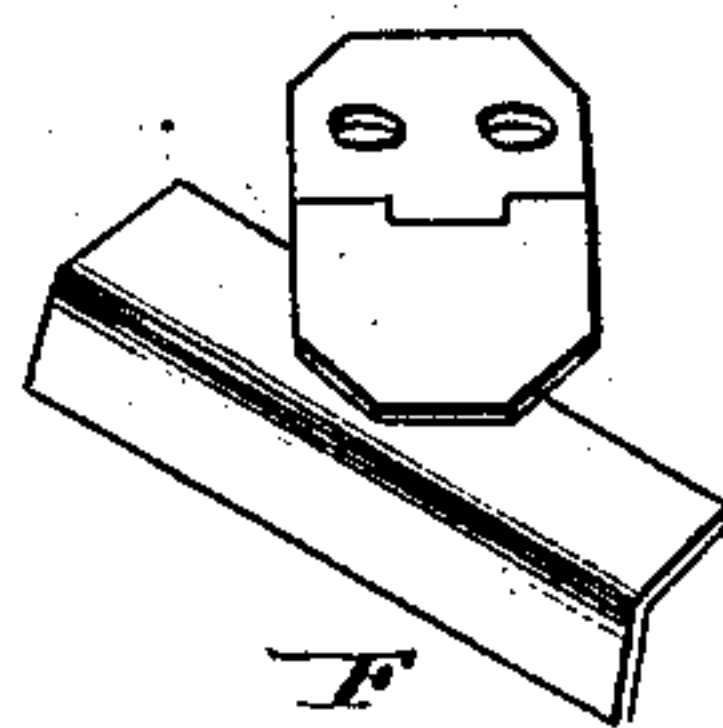


Fig. 5.



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UNITED STATES PATENT OFFICE.

JEROME B. SWEETLAND, OF PONTIAC, MICHIGAN.

MACHINE FOR CRUSHING AND PULVERIZING QUARTZ.

SPECIFICATION forming part of Letters Patent No. 258,822, dated May 30, 1882.

Application filed February 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, JEROME B. SWEETLAND, of Pontiac, in the county of Oakland, and in the State of Michigan, have invented certain
5 new and useful Improvements in Machines for Crushing and Pulverizing Quartz; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and
10 to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a vertical section taken centrally through the improved apparatus. Fig. 2 is a bottom view of the tank. Fig. 3 is a top view
15 of the convex distributor, showing one of the gates thrown back to expose the distributing-rakes. Fig. 4 is a detail showing part of the distributor and the rakes which are pivoted to its flange. Fig. 5 is a view of the scraper
20 which is hinged to the bottom of the tank.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to machines which are designed for crushing and pulverizing quartz
25 and other metal-bearing rocks for the purpose of separating the metallic portion from the mineral.

The following description of my invention will enable others skilled in the art to fully understand it.
30

A designates the metal bed of the crusher, which is suitably secured upon the top of a curb or housing, B. This bed A is circular, and it is constructed as follows: *a* designates
35 an exterior horizontal flange, which surrounds an annular flange, *b'*, that is perpendicular to the flange *a*. Within the annular flange *b'* is an annular inclined plane, which is directed from near the center of the bed A downward
40 and outward. At the outer terminus of the said inclined plane is a flange, *b'*, which is annular. At the base of the said inclined plane is an annular concave track, *c*, which terminates at its upper end in a hole, *d*, made centrally
45 through the bed A. This hole *d* is adapted to receive or to communicate with a conduit, C, which communicates with an air-engine, D. The air-engine which I have shown in the annexed drawings is a fan adapted to be rotated
50 by any convenient prime motor, and inclosed in a case, C', which is detachable from the conduit C. The fan-case C' is constructed with a

tube or sleeve, C⁴, which fits tightly on the end of the conduit C, but can be removed by applying sufficient force.

It is obvious that any other air-engine which
55 will produce an exhaustion from the conduit C may be substituted for the fan which I show. For example, a common "exhausting-blower" may be substituted, or other suction
60 means.

D' D' D' designate crushing and pulverizing rollers, the perimeters of which are shaped to conform to the annular channel *c* in the bed on
65 which they travel, as shown in the annexed drawings, Fig. 1. These rollers or pestles turn around short axes D², which radiate from a concavo-convex plate, E, the outer portion of
70 which is shown in the drawings as having a horizontal flange, *e*. Upon this flange are bolted segments *f*, to which trap-doors *g* are hinged, so that they can be turned fully back to afford free access to the space which is below them. The outer ends of the short axes D², or the
75 peripheral sides of the crushing-rollers D', may have auxiliary bearings D³ suitably secured to the segments *f*. The segments *f* have pivoted to their bottoms the arms of gravitating blades *g'*, which serve as scrapers, clearers,
80 and distributors of the material deposited in the channels in which the rollers D' travel. The blades *g'* are directed, one outward and the other inward. They are accessible by raising the trap-doors *g* nearest them. These blades
85 *g'* are preferably arranged in pairs, as shown, and between each pair of crushing and pulverizing rollers a pair of blades *g'* may be arranged. They may or may not be made with tines.

The convex surface of the distributor E may
90 be smooth; or it may be serrated or grooved radially, or in any other suitable manner.

G designates the bottom of a tank, H, which is shown as flaring upwardly, and which may be made of boiler-iron. This tank is designed to
95 contain weights of any kind which will keep the rollers D down on their bed with the required pressure. The rocks from the quarries may be used for weights. The bottom G of the tank H may be cast from the same "pattern"
100 as the bed A was cast, so that a single pattern will serve (in the flasks) for the bed of the crusher and for the bottom of the loaded tank. From the eye *i* of the bottom of the tank rises

a tube, I, which is the throat of a feed-hopper, I'. It is through this channel that the material to be crushed and pulverized is fed upon the apex of the convex surface of the rotating distributor E. I show a hinged scraper, F, applied to and movable with the bottom G of the tank H, which scraper drags freely over the convex surface of the distributor E and aids in the centrifugal distribution of the gangue to the channel in which the crushing-rollers travel.

It will be seen that the tank H receives rotation from a spur-wheel, H², and that the crushing-rollers and the distributor E receive rotation about a vertical axis by the contact of the said rollers with the bottom of the tank H. In practice the crushing-rollers will sometimes slip, and hence will not move with the same speed as the tank. Hence the scraper F will sometimes move faster than the distributor and operate as above described.

By means of a sweep or horse lever applied to the distributor E, as indicated in detail, Fig. 3, this plate, with its rollers D, may be revolved around the vertical axis of the crusher. Instead of using horse-power, a rack, H', composed of a number of toothed segments, may be secured rigidly to the bottom of the flange a' of the bottom plate, G, of the tank H, with which rack a pinion, H², may be made to engage. The shaft of this pinion may be pro-

vided with a belt-wheel to be driven by steam or water power.

I have described my invention as especially applicable to the pulverization of rock and the carrying off from the bottom or bed plate of the machine of the finely-reduced material by means of air-currents induced by an exhausting fan or engine; but it is obvious that if the "wet process" be preferred in lieu of the "dry process," the fan may be omitted and water passed through the gangue and through the outlet-conduit during the disintegrating process.

Having described my invention, I claim—

1. The combination of the convex distributor E, having rollers and flanges applied to its circumference, with the bed A, the tank, the rollers D', and the hinged trap-doors f, applied to said flanges substantially as described.

2. The combination of a yielding scraper, F, with a revolving distributor, a revolving tank, to which said distributor is attached, crushing-rollers, and a bed on which these rollers revolve, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 13th day of February, 1882.

JEROME B. SWEETLAND.

Witnesses:

F. A. CRAWFORD,

MARY E. SWEETLAND.