

J. HAMILTON.
MACHINE FOR CRUSHING QUARTZ, &c.

No. 10,365.

Patented Jan. 3, 1854.

Fig. 2.

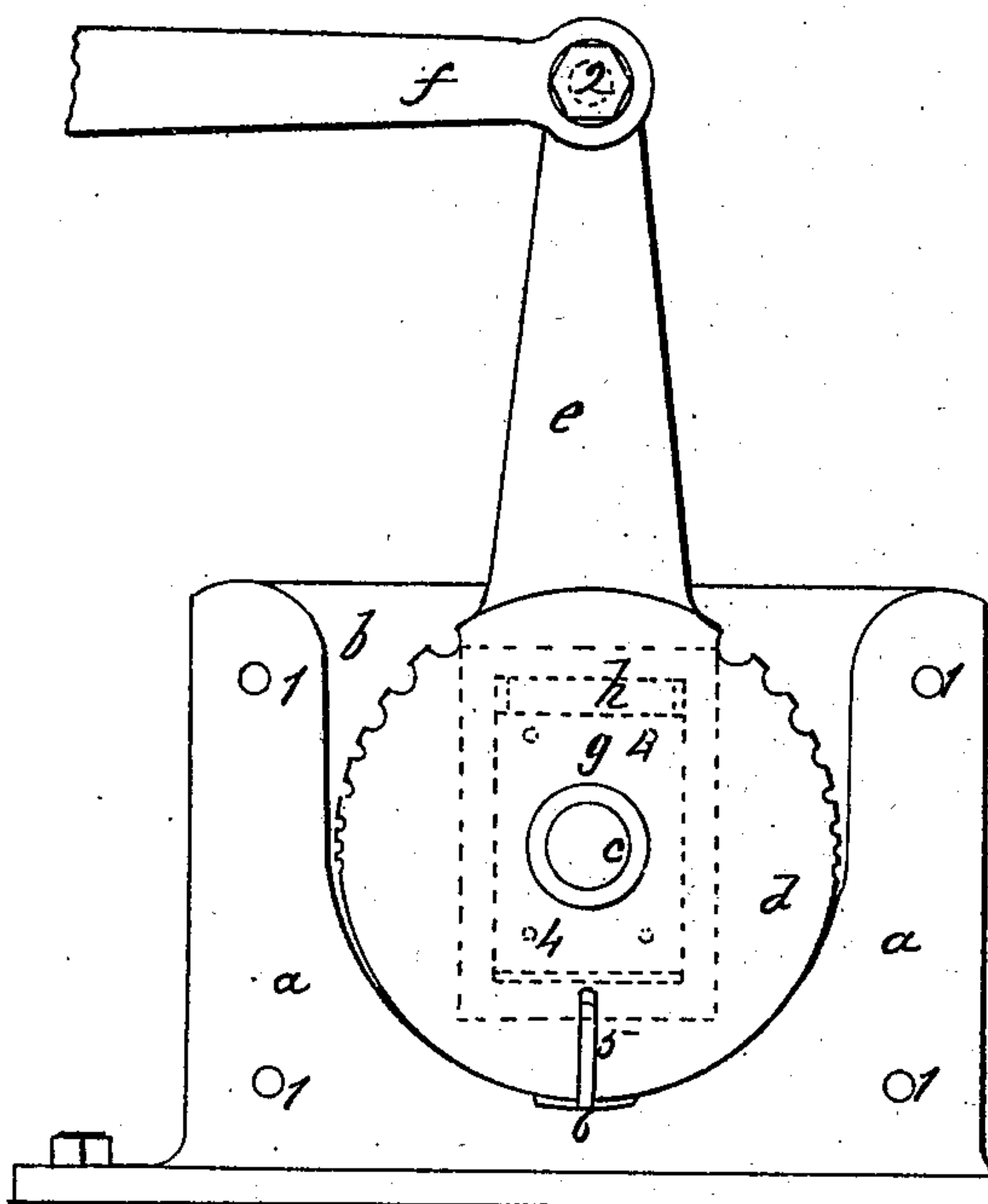


Fig. 3.

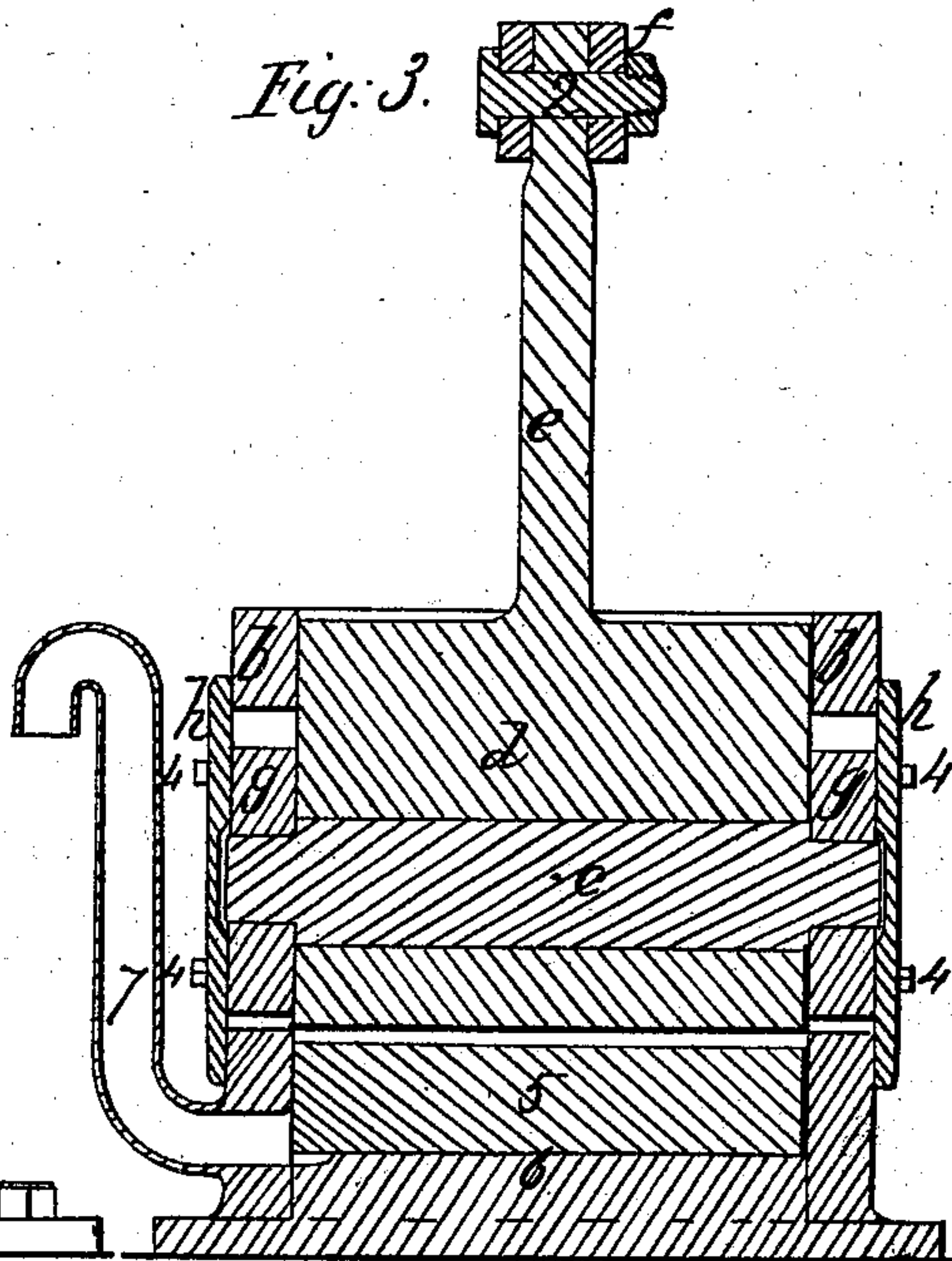
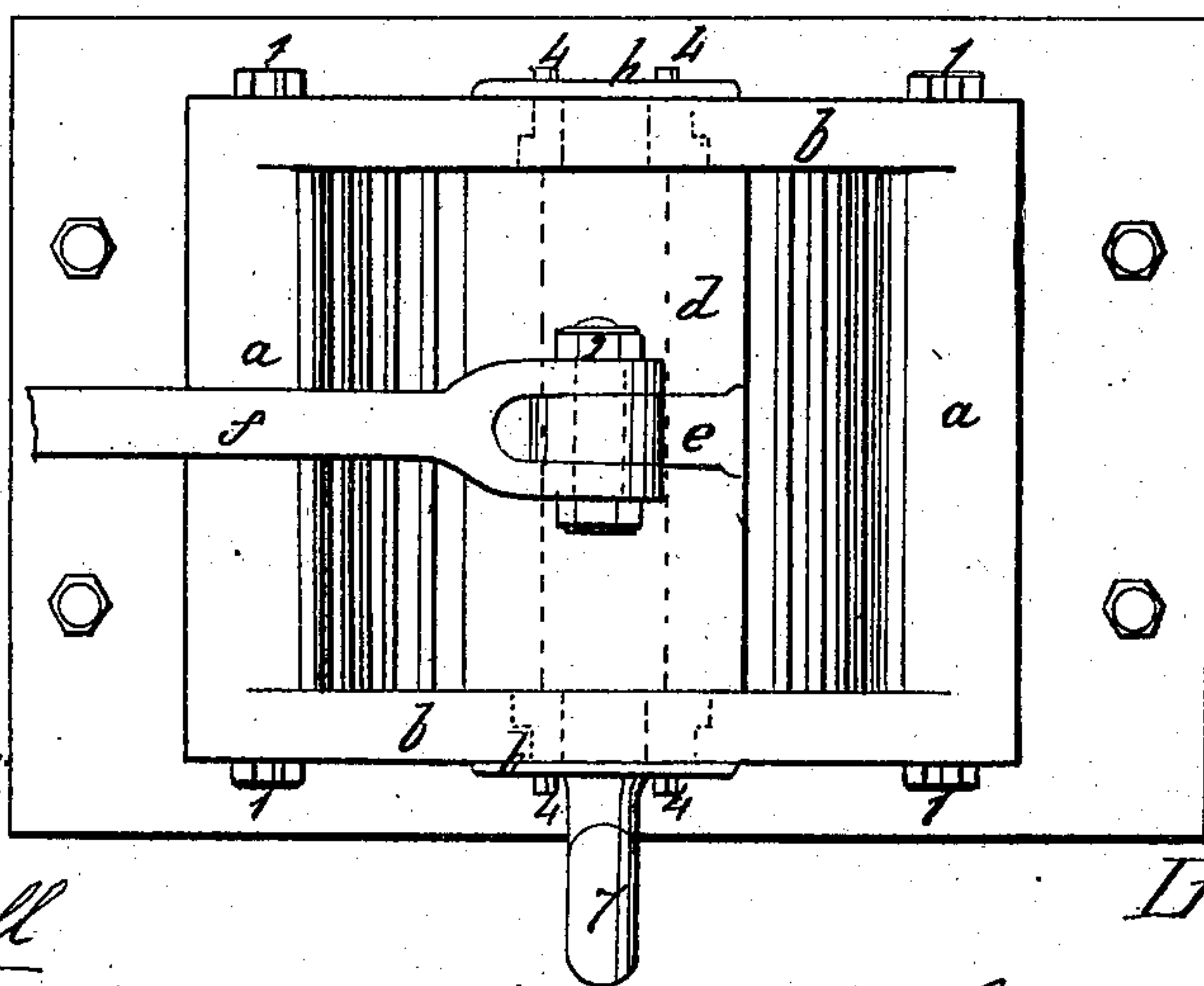


Fig. 1.



Witnesses;

Samuel W. Ferrell
Thomas G. Harold

Inventor;

James Hamilton

UNITED STATES PATENT OFFICE.

JAMES HAMILTON, OF NEW YORK, N. Y.

QUARTZ-CRUSHING MACHINE.

Specification of Letters Patent No. 10,365, dated January 3, 1854.

To all whom it may concern:

Be it known that I, JAMES HAMILTON, of the city, county, and State of New York, have invented, made, and applied to use certain new and useful Improvements in Machinery for Crushing and Grinding Quartz or other Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1, is a plan, Fig. 2, is a side elevation with the side plate of the apparatus removed, and Fig. 3, is a cross section through the center of the machine.

The like marks of reference denote the same parts.

The nature of my said invention consists in the use of a cylindrical nut or pestle in a similarly formed basin, the pestle having a partial rotary and crushing motion communicated to it by means of a lever attached thereto.

a, is a basin the lower part of which is made circular and the sides parallel to each other.

b, b, are flat ends or heads secured to the basin by bolts 1, 1.

c, is a shaft carrying the cylindrical pestle *d*.

e, is a lever or arm attached to or formed with the pestle *d*, the upper end being connected by a joint 2, to a pitman passing to a crank, eccentric or other suitable mechanical contrivance to give the arm *e*, an oscillating movement and the pestle a partial rotary motion on its shaft *c*. The ends of this shaft *c*, are supported in journal boxes *g*, set in slides in the end plates *b*, to each of which slides a cap *h* is attached by screws 4, and the parts being properly faced slide nearly if not quite water tight, and at the same time allow the cylindrical pestle and shaft to raise up if required.

The pestle *d*, is provided with a slot in its lower side into which I place a scraper 5, and the basin *a*, has a slight recess 6, at its bottom in which the scraper 5, operates.

7 is a pipe attached to one side see Fig. 3. The operation of the parts is as follows: Quartz or other substances to be ground or pulverized are placed in the basin on each side of the pestle and this receiving the partial rotary motion described gradually breaks and crushes the material under operation, and the grooves shown in Figs. 1 and

2, across the upper surface of the pestle, which gradually grow smaller toward the level of the center of the pestle, operate on any large pieces cracking and breaking the same until they pass between the smooth parts of the pestle and basin—which both being circles one slightly smaller than the other—gradually approach together until they coincide at the bottom, thus I obtain first a crushing and then a gradual grinding and pulverizing operation, and the scraper 5, operating in the recess 6, stirs up the fine particles and carries them first to one side and then to the other to insure their being thoroughly pulverized.

In operating upon metallic ores which require water during the operation of grinding the pipe 7 is to be used to convey the same off but where substances are ground dry they are to pass off through an opening in the ends.

It will be evident that movable cheek pieces might be attached to the upper surface of the cylindrical pestle, provided with grooves; by which means new cheek pieces can be applied when the grooves are worn out, and if required the upper part of the insides of the basin may also be provided with grooves.

I do not claim the cylindrical pestle or roller in itself as it has been used on a flat surface, and I am also aware that the cylindrical pestle has been used in a concave dish or basin, but in this case so far as the rolling motion is concerned the same operates similarly to the ordinary rollers in oil mills &c., but the sliding motion is dependent on the weight of the pestle causing the same to slip on the inclined part and rub the ore, whereas in my machine the ore is first cracked by the grooved upper surface of the pestle which I am not aware has ever been before used, and the grinding is performed by a pestle set on a shaft and having a partial rotary motion which grinds the ore against the sides of the basin, without having any rolling motion at all, therefore

What I desire to secure by Letters Patent is—

The means herein described and shown for cracking and grinding metallic ores consisting of the cylindrical pestle (*d*) provided with grooves in its upper part to crack the lumps of ore, and set on a shaft (*c*) which it has a partial rotary motion and operating in connection with the basin (*a*)

in which said pestle moves to grind the ore into powder by the gradual approach of the sides of said basin to the cylindrical pestle, said pestle being also provided with a
5 scraper or agitator (5) in its lower surface to operate as specified.

In testimony whereof I have hereunto set

my signature this twentieth day of October one thousand eight hundred and fifty three.

JAMES HAMILTON.

Witnesses:

LEMUEL W. SERRELL,

THOMAS G. HAROLD.