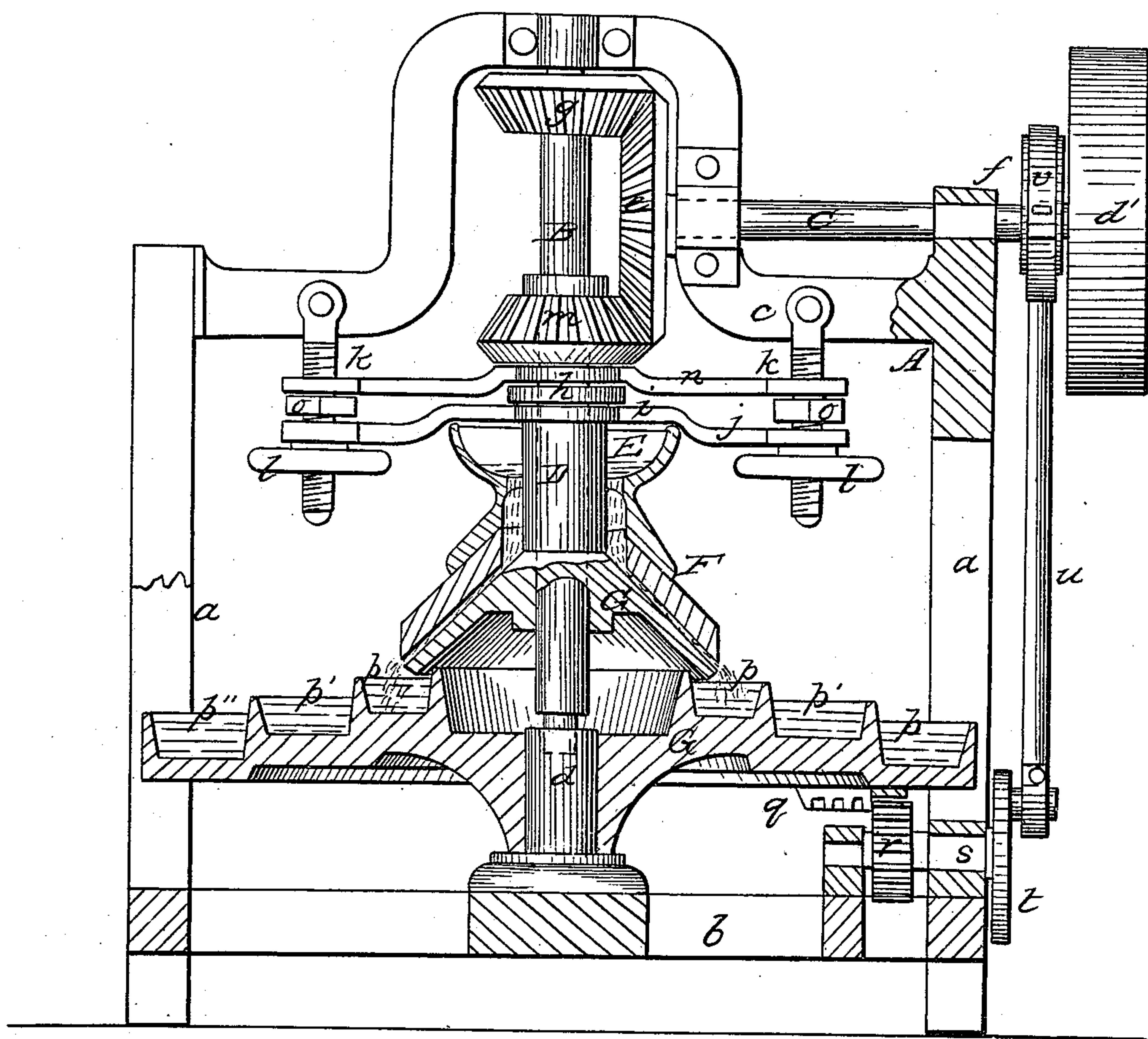


W. H. HOWLAND.

Ore Amalgamator.

No. 25,933.

Patented Oct. 25, 1859.



Witnesses:
E. F. King
G. T. Boulden

Inventor:
W. H. Howland

UNITED STATES PATENT OFFICE.

W. H. HOWLAND, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO HIMSELF AND JOHN O. HANSCOM, OF SAME PLACE.

AMALGAMATOR.

Specification of Letters Patent No. 25,933, dated October 25, 1859.

To all whom it may concern:

Be it known that I, W. H. HOWLAND, of San Francisco, in the county of San Francisco and State of California, have invented
5 a new and Improved Machine for Pulverizing Gold-Bearing Quartz and Amalgamating the Gold Therein Contained; and I do hereby declare that the following is a full, clear, and exact description of the
10 same, reference being had to the annexed drawing, making a part of this specification, said drawing being a vertical central section of my invention.

The object of this invention is to re-grind
15 the "tailings" of an ordinary "stamping quartz mill" so that the contained gold and quick-silver may be brought in contact and all the gold amalgamated and saved. In using the "stamping quartz mill" much gold
20 and quick silver is lost, the great divisibility of the said substances and a lack of proper union assisted by the presence of sulfate of iron, favoring their escape.

The within described invention consists
25 in the employment or use of a conical grinder in connection with a horizontal oscillating dish provided with annular chambers, the whole being arranged as hereinafter described, whereby the desired object is at-
30 tained as hereinafter described.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

A, represents a framing formed of two
35 side pieces *a, a*, a bottom cross piece *b*, and a top crosspiece or yoke *c*, the form of which is shown clearly in the drawing.

B, is a vertical shaft which is placed in the framing A, the lower end of said shaft
40 being stepped at *d*, and its upper end having its bearing in the yoke *c*.

C, is a horizontal shaft placed in the upper part of the framing, said shaft having a driving pulley *d'*, on its outer and a bevel
45 wheel *e*, on its inner end. An eccentric *f*, is also placed on said shaft. On the upper part of the shaft B, a bevel pinion *g*, is secured into which the wheel *e*, gears, and on the shaft B, a collar or sleeve D, is placed
50 loosely, said collar or sleeve having a hopper E; and hollow cone F, attached to it, the inner side of cone F, forming one of the grinding surfaces of the mill.

To the shaft B, a conical grinder G', is at-
55 tached, said grinder fitting within the ho-

low cone F, as plainly shown in the drawing. On the collar or sleeve D, near its upper end there is a flanch *h*, and this flanch is directly over an annular plate *i*, through which the collar or sleeve passes. The
60 plate *i*, is formed in a bar *j*, the ends of which are fitted on pendent screw rods *k, k*, attached to the yoke *c*, the bar *j*, resting on nuts *l, l*. On the upper part of the collar or sleeve D, a bevel pinion *m*, is placed
65 loosely and fitted thereto by a feather and groove. This pinion *m*, rests on a bar *n*, the ends of which are fitted on the pendent screw rods *k, k*, and are supported by nuts *o, o*. On the pintle which forms the step *d*,
70 of the shaft B, a circular dish G, is placed loosely. This dish has a series of concentric annular chambers *p, p', p''*, formed on its upper surface, the chambers being suc-
75 cessively lower, one a trifle more so than the inner one adjoining it, as shown clearly in the drawing. To the under side of the dish *h, G*, a segment rack *q*, is attached, and into this rack a pinion *r*, gears, said pinion be-
80 ing on a shaft *s*, which has a crank pulley *t*, on its outer end. The crank pulley *t*, has a connecting rod *u*, attached, the upper end of said rod being secured to the eccentric *f*, by a strap *v*.

The operation is as follows:—The "tail-
85 ings" or pulp is received from the stamping machine, the pulp passing into the hopper E, and the pulp is ground by the action of the cones F, G', which rotate in opposite directions, the pulp being ground as fine as
90 desired by adjusting the cone F, by means of the nuts *l*. The ground pulp passes from the cones into the first compartment *p*, and from thence into the second compartment *p'*, and from *p'*, it passes into *p''*, the worth-
95 less portions being conveyed from the chamber *p''*, by a spout attached to the dish. The dish G, is oscillated by means of the eccentric *f*, rod *u*, shaft *s*, and rack and pinion *q, r*. The pulp in consequence of being re-
100 ground or reduced to a more minute degree of subdivision by means of the grinding cones and also in consequence of having its parts by means of the grinding and the shake motion in dish G, well mixed or in-
105 corporated with each other, the quick-silver will be brought in contact with the gold and the latter amalgamated and thoroughly separated from the foreign substances of the
110 pulp.

I am aware that conical grinding mills have been long used and arranged in various ways and I therefore do not claim such device when separately considered, but,

5 I do claim as new and desire to secure by Letters Patent—

The combination of a pair of grinding cones F, G', revolving in different direc-

tions, with a horizontally oscillating chambered dish G, substantially as and for the 10 purposes herein shown and described.

W. H. HOWLAND.

Witnesses:

E. T. KING,

G. T. BOULDEN.