

(No Model.)

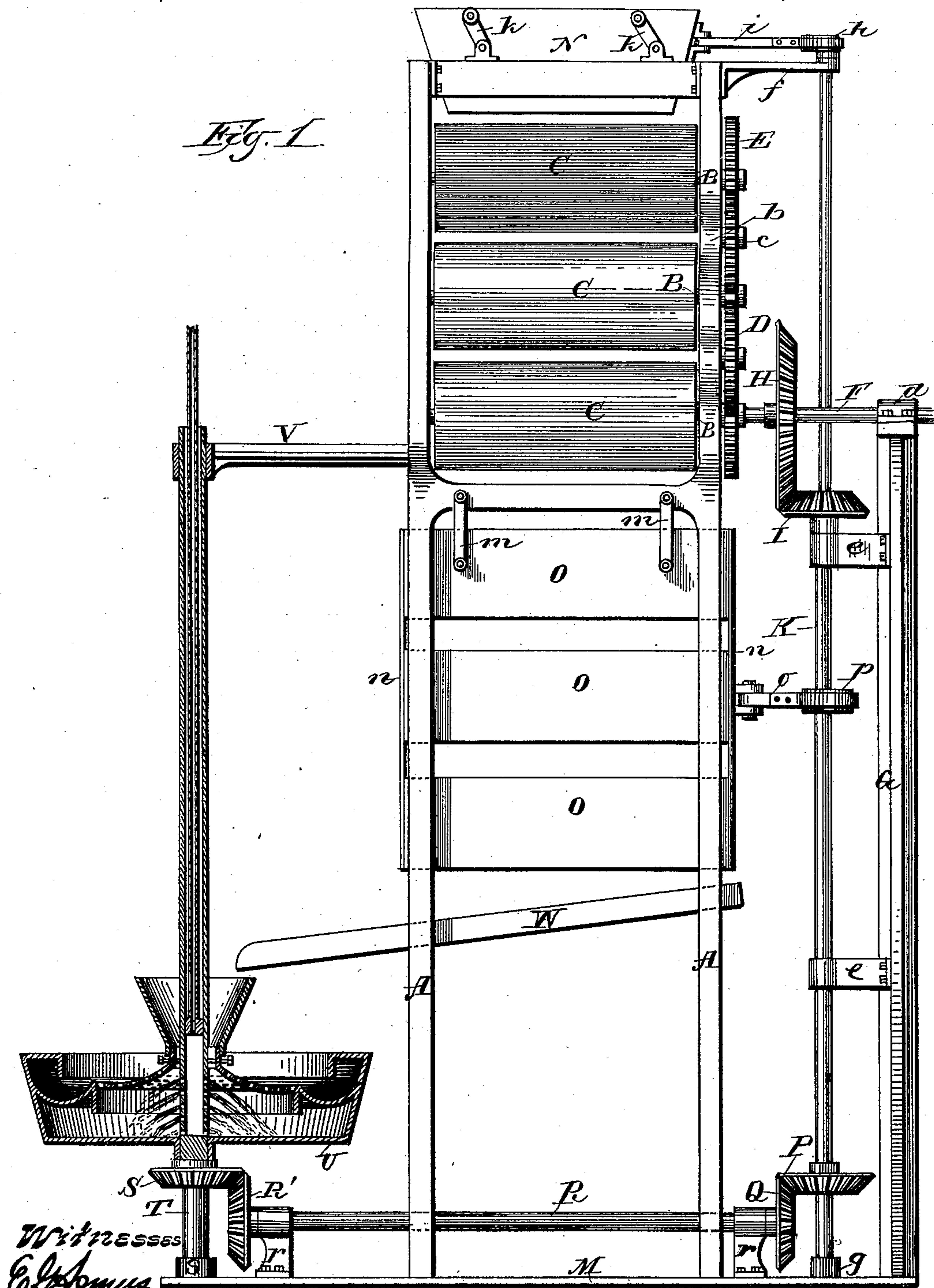
2 Sheets—Sheet 1.

J. E. PARAMORE.

MACHINE FOR CRUSHING AND SCREENING QUARTZ.

No. 358,292.

Patented Feb. 22, 1887.



Witnesses
Ed. J. P. P.
H. E. Phipps

Inventor:
John E. Paramore
By Stout & Underwood
Attorneys

(No Model.)

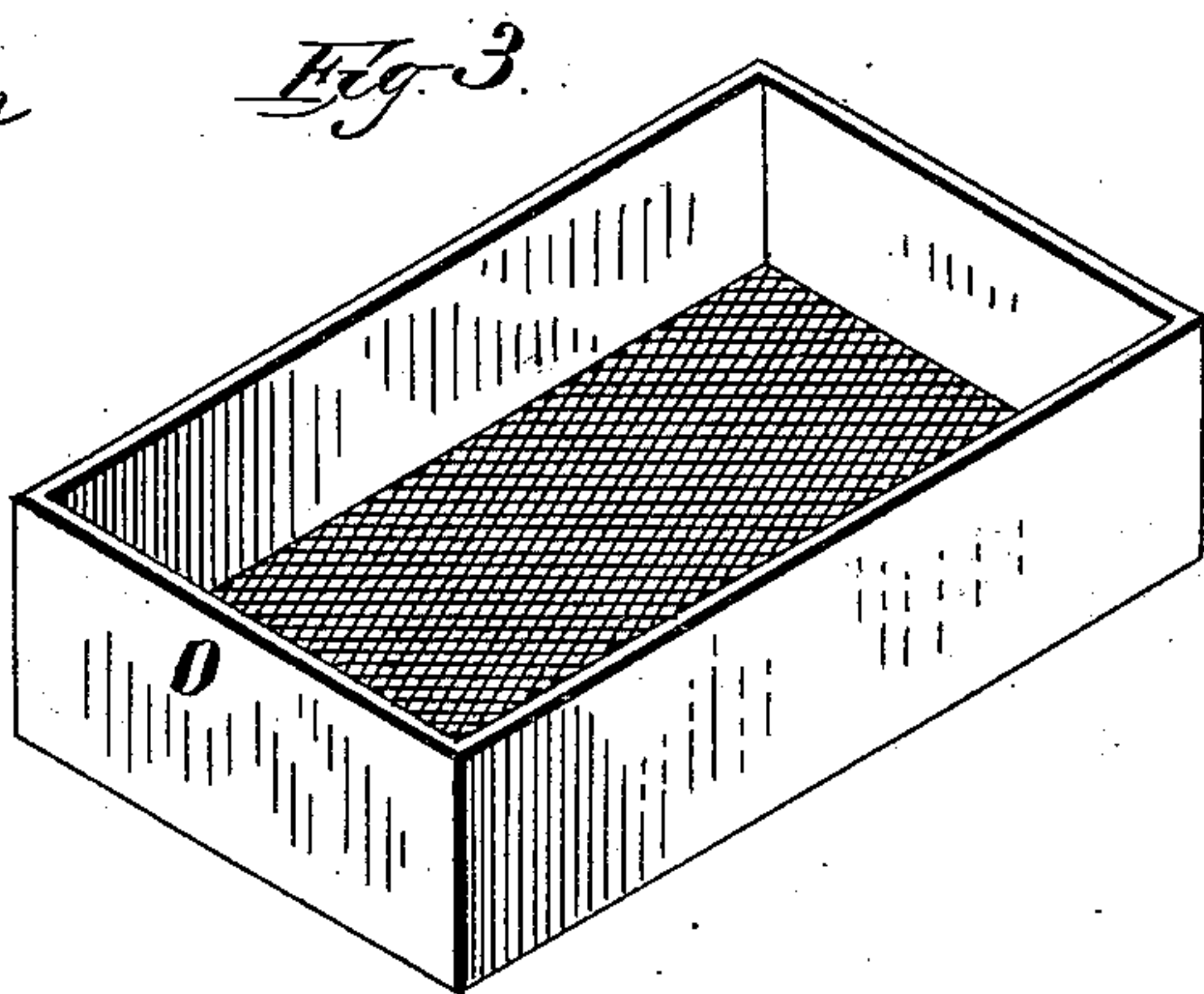
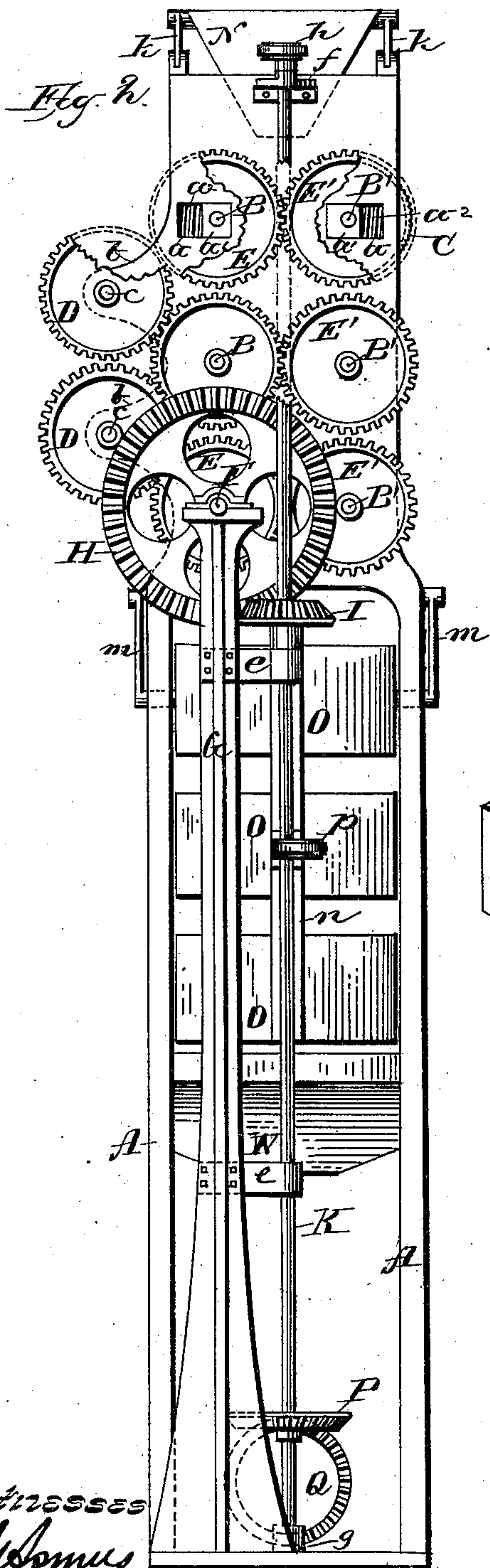
2 Sheets—Sheet 2.

J. E. PARAMORE.

MACHINE FOR CRUSHING AND SCREENING QUARTZ.

No. 358,292.

Patented Feb. 22, 1887.



Witnesses
E. J. Somers
N. E. Oliphant

Inventor:
John E. Paramore
By Flint & Woodward
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN E. PARAMORE, OF WAUSAU, WISCONSIN.

MACHINE FOR CRUSHING AND SCREENING QUARTZ.

SPECIFICATION forming part of Letters Patent No. 358,292, dated February 22, 1887.

Application filed July 29, 1886. Serial No. 209,467. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. PARAMORE, of Wausau, in the county of Marathon, and in the State of Wisconsin, have invented certain new and useful Improvements in Machines for Crushing and Screening Quartz, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to a machine for crushing and screening quartz and other mineral-containing substances; and it consists in certain peculiarities of construction and combination of parts, as will be hereinafter described and claimed.

Figure 1 of the drawings represents a side elevation of my crushing and screening mechanism and a sectional elevation of a mining pan or settler used in connection therewith; Fig. 2, an end elevation of the crushing and screening mechanism, and Fig. 3 a perspective view of one of the sieves.

Referring by letter to the drawings, A A represent vertical standards that are suitably braced apart to form the main frame of my machine, said standards being provided with bearings for the shafts B B' of a series of horizontal crushing-rolls, C, vertically arranged in pairs. The vertical standards A A are also provided with brackets b, having journals c for gear-wheels D, the latter meshing with gear-wheels E, journaled to the shafts B of the crushing-rolls C. These gear-wheels E in turn mesh with gear-wheels E', journaled to the shafts B' of the other crushing-rolls, and by this arrangement of gearing the several crushing-rolls are made to turn toward each other.

The crushing-rolls C may be either smooth or corrugated upon their surfaces, or the upper pair of rollers may be corrugated and the lower pairs smooth, this latter construction being shown by Fig. 1.

The bearings in the standards A A for the roller-shafts B B', either of the upper pair of rolls only or of all of said rolls, are slotted, as shown at a, and said shafts are provided with boxes a', against which impinge springs a'', also placed in the standards' slots. This construction serves to retain the rollers C in their normal position, but at the same time allows a yielding motion should any substance of more than ordinary size or hardness be fed thereto from the hopper.

The shaft B of one of the lowest crushing-rolls is extended to form a main shaft, F, an additional bearing, d, for the same being provided at the top of a vertical post, G. This main shaft F has keyed thereto a beveled gear-wheel, H, designed to mesh with a similar wheel, I, keyed to a vertical shaft, K, having its bearings in brackets e, secured to the vertical post G, a bracket, f, projecting from one of the frame-standards, and a socket, g, on a base-piece, M.

The upper end of the vertical shaft K is provided with an eccentric, h, having a rod-connection, i, with a hopper, N, loosely hung by links k to the main frame, so as to have a vibratory motion when said eccentric is operated, whereby the quartz or other substance in said hopper will be prevented from clogging on its passage to the rolls. Hung by links m to the main frame, a suitable distance below the crushing-rolls, are a series of horizontal sieves, O, united at their ends by vertical strips n, one of said strips being connected to the rod o of an eccentric, p, secured to the vertical shaft K.

In practice it may be found desirable to graduate the meshes of the sieves, giving the upper one the coarser, the lower one the finer, and the middle one an intermediate mesh. I have not specially illustrated this feature, nor do I make any claim to the same, it being a matter entirely of preference.

By the above-described connection a vibratory motion is imparted to the sieves when the vertical shaft is revolved. Near its lower end the shaft K has keyed thereto a beveled gear-wheel, P, that meshes with a similar wheel, Q, on the adjacent end of a horizontal shaft, R, that revolves in bearings r on the base-piece M. This shaft Q, at its other end, carries another beveled gear-wheel, R', that meshes with a like wheel, S, on the vertical shaft T of a settling-pan, U, employed in connection with the crushing and screening mechanism, said shaft T having its bearings in a socket, s, on the base-piece M and a bracket, V, the latter projecting from the main frame of my machine.

The settling-pan U and its shaft T are preferably of a construction similar to that embodied in my application for patent filed December 2, 1885, Serial No. 184,429, and further description thereof is not deemed necessary in

this application, inasmuch as a different construction of said parts may be employed with my crushing-machine. Suitably suspended in the main frame below the sieves O is a trough, 5 W, that conducts the tailings from said sieves to the settling-pan.

In the operation of my invention motion is imparted to the various parts of the machine through the medium of the main shaft F. The 10 quartz or other substance is fed from the vibrating hopper N to the crushing-rolls C, and from thence to the vibratory sieves O, where the coarser metallic particles are separated and retained, the residue passing on down to the 15 trough W, from whence it is conducted to the settling-pan U, to be acted upon by water, said pan being revolved at a high rate of speed to better accomplish a thorough washing of such residue or tailings from the crushing and 20 screening mechanism. By this washing of the residue or tailings, the heavier portions or metals that may have escaped through the sieves are freed from the surrounding substances, and being of greater specific gravity tend to remain 25 in the pan, while the lighter particles are carried off with the overflow of the water.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

30 1. A machine for separating metal from

quartz or other substance, comprising a main frame, a series of horizontal crushing-rolls vertically arranged in successive pairs, a vibratory hopper located above the rolls, a series of vibratory sieves arranged below the lowest pair 35 of rolls, and means, substantially as described, for simultaneously operating said rolls, hopper, and sieves, as set forth.

2. A machine for separating metal from quartz or other substance, comprising a main 40 frame, a series of horizontal crushing-rolls vertically arranged in successive pairs, a series of vibratory sieves beneath the lowest pair of crushing-rolls, a revolving settling-pan operatively connected to the frame, a trough ar- 45 ranged beneath the lowest sieve to lead to the pan, and means, substantially as described, for simultaneously operating said rolls, sieves, and pan, whereby the quartz or other substance is 50 successively crushed, screened, and washed by a single machine, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Wausau, in the county of Marathon and State of Wisconsin, in the presence of two witnesses.

JOHN E. PARAMORE.

Witnesses:

W. H. MYLREA,

JOHN TUTTLE.