

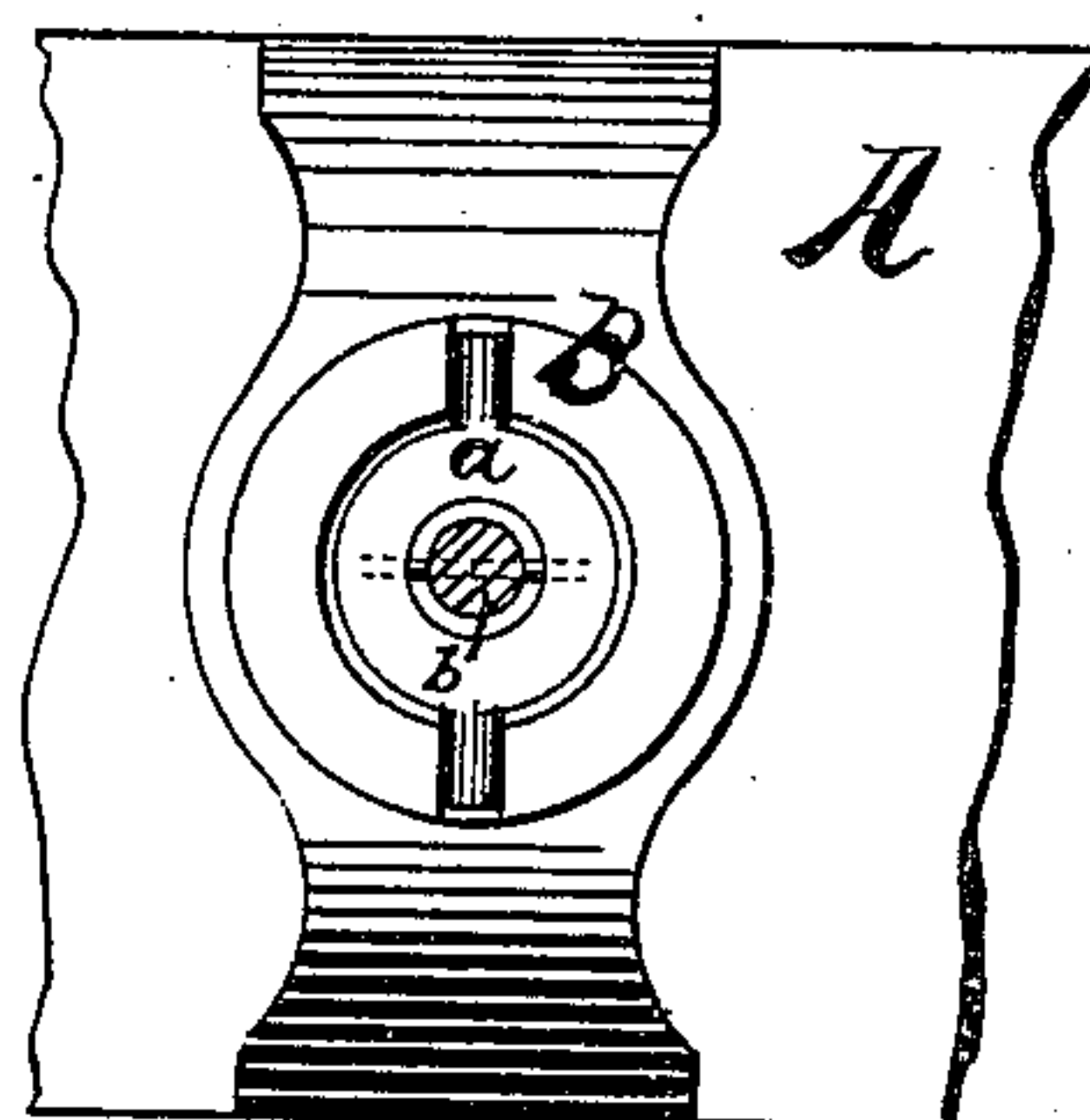
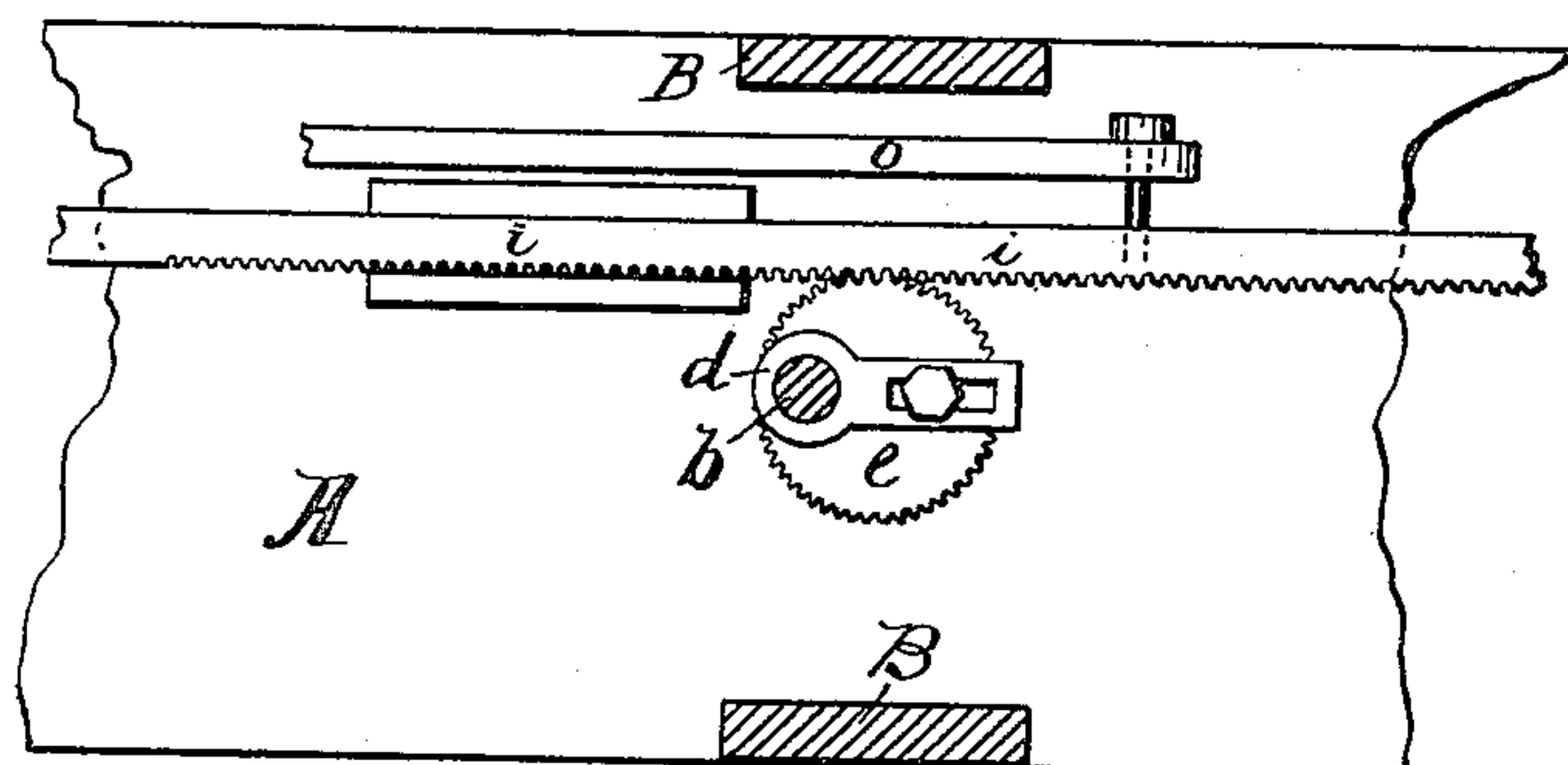
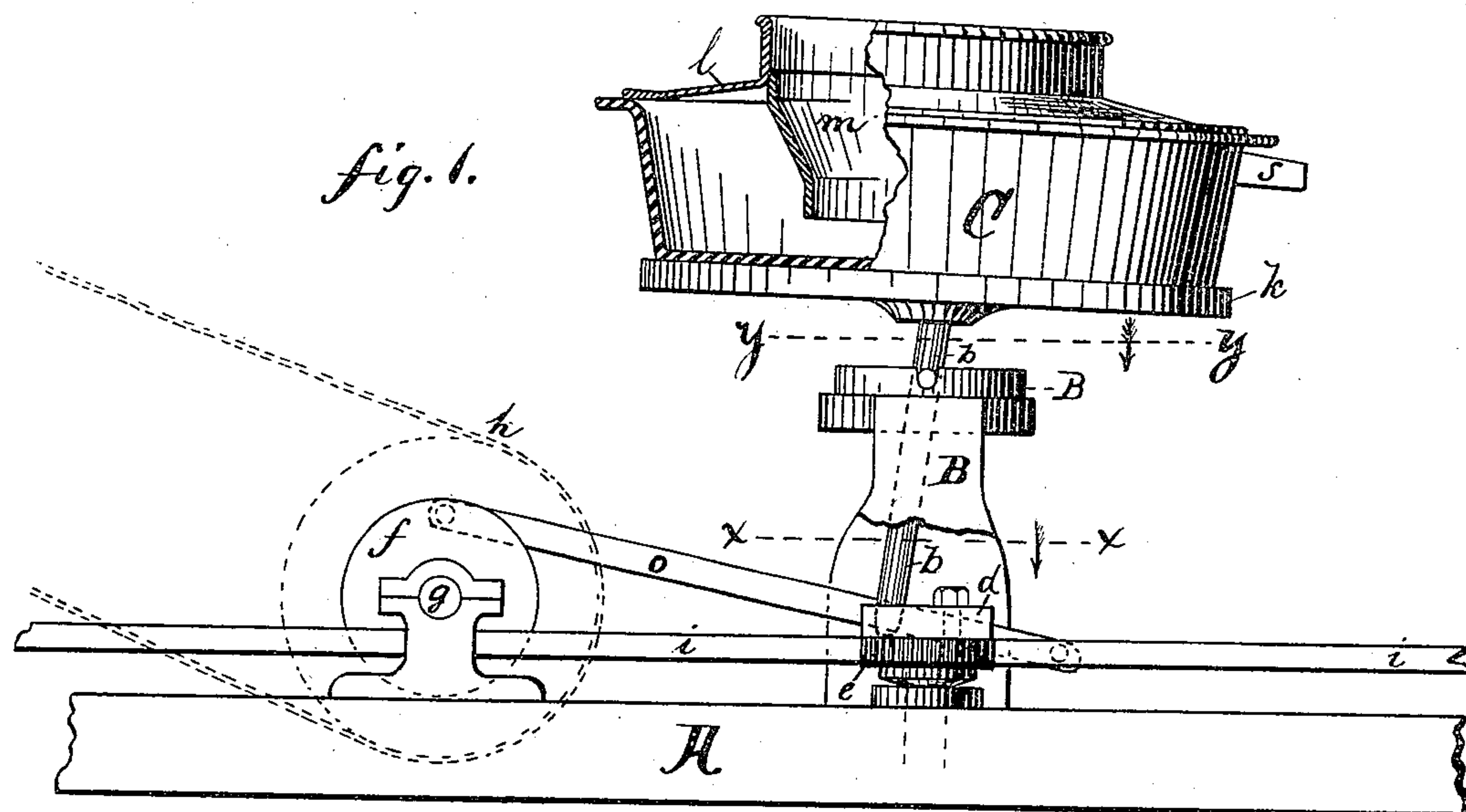
(No Model.)

J. S. MITCHELL.

ORE WASHER AND AMALGAMATOR.

No. 246,183.

Patented Aug. 23, 1881.



Witnesses
Charles. H. Pell
Chas. Herr.

Inventor
John S. Mitchell,
by
O. Drake.
Atty.

UNITED STATES PATENT OFFICE.

JOHN S. MITCHELL, OF NEWARK, NEW JERSEY.

ORE WASHER AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 246,183, dated August 23, 1881.

Application filed November 13, 1880. (No model.)

To all whom it may concern:

Be it known that I JOHN S. MITCHELL, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gold Washers and Amalgamators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to more perfectly and expeditiously concentrate and separate the gold and heavier particles from the light gangue in the process of extracting the above-mentioned metal from its ores.

It consists in combinations and arrangements of parts hereinafter fully described, illustrated, and finally claimed.

Heretofore pans worked by machinery have been defective in operating in such a manner as to allow the sand to pack, and thus the lighter particles were prevented from separating from the gold and heavier particles; but by my invention the pulp is kept constantly alive and the lighter sands have full opportunity to flow from the pan with the water.

Referring to the accompanying drawings, in which similar letters of reference indicate like parts in each of the several figures, Figure 1 is a side elevation, in which a portion of the yoke is broken away to show the parts more clearly. Fig. 2 is a section of the same, taken through line *x*; and Fig. 3 is a section taken through line *y*.

In carrying out my invention I construct upon the bed-plate A the yoke B, in which is pivoted the oscillating collar *a*. Through said collar passes a short shaft, *b*, which is pivoted therein, as indicated in Fig. 3, thus making a universal joint for said shaft *b* to work in. Upon the upper end of the shaft is fastened a pan, C, arranged internally, as will be described hereinafter. The opposite end sets loosely into a socket in a slotted eccentric plate, *d*, adapted to be adjustably fastened to a gear-wheel, *e*, which engages with and receives motion from a sliding rack, *i*, which, in turn, receives its

motion from a crank-wheel, *f*, upon the shaft *g*, connected with the driving-pulley *h*, all of which will be understood by reference to Figs. 1 and 2. Both the gear-wheel *e* and sliding rack *i* are held into engagement by attachments upon the bed-plate, substantially as shown in Figs. 1 and 2. The pan C is fastened upon the end of the shaft *b*, or, more strictly in this case, upon a tablet, *k*, fastened thereon. Said pan is provided with a cover, *l*, having a central aperture, into which is soldered or otherwise fastened a wide-mouthed funnel, *m*, adapted to extend beneath the surface of the water, for a purpose hereinafter set forth. Said cover may have thereon a latch or other appropriate device for preventing displacement, and the pan may be similarly fastened to the tablet.

The operation of the invention is substantially as follows: The parts being arranged as shown and described, and the power applied, the shafting *g* is set in motion, which causes the crank-wheel *f* to revolve, which, in turn, by means of the connecting-rod *o*, actuates the sliding rack to a backward and forward motion, all of which will be evinced upon reference to Fig. 1. Said rack revolves the gear-wheel *e*, carrying the eccentric slotted and socketed plate *d*, which, in turn, causes the ends of the short shaft *b* to describe circles, while the pivotal intermediate portion of the same is to an extent stationary. The center of motion of the pan being always in a state of change, there is no opportunity for the sand to settle at any one point and pack, and thus prevent the thorough concentration of the sand. The cover *l* and funnel *m* contained therein are so arranged as to prevent the sweep of the water from carrying off the sand as it falls from the hopper without undergoing the desired concentrating process. The lower mouth of the funnel being beneath the surface of the water the sand is compelled to be submerged before it can pass off through the spout *s*, as will be understood.

It is evident that this invention can be used for an amalgamator, the same forces that are operative to concentrate the sand being well adapted to bring the mercury and gold into combination to produce an amalgam.

The mechanism can be used singly, or by extending the rack can be duplicated to any extent, all being operated by the same said rack.

I am aware that means for producing a progressive rotatory oscillation to a pan have been used in crushing and separating ores; but the said motion differs materially from the one produced by the means herein described, in that the latter has not a continuous progressive motion, but, on the contrary, the backward and forward action of the sliding rack, as will be evident, produces a responsive action upon the pan and intermediate parts. This backward and forward action, in connection with the rotatory oscillation, breaks the continuous sweep or "swash" of the water and more perfectly prevents the "packing" of the sand, hereinbefore referred to.

Having thus described my invention, what I claim, and wish to have secured by Letters Patent, is—

1. In washers and amalgamators, the combination, with a pan secured to or upon a shaft, *b*, and impelled thereby to a rotatory oscillation, of a rack, *i*, and means for imparting thereto a backward and forward motion, as and for the purposes set forth and shown.

2. The combination, with a pan, *C*, held upon a shaft, *b*, of a yoke, *B*, collar *a*, eccentric *d*, sliding rack *i*, and means for imparting thereto a backward and forward motion, as and for the purposes set forth.

3. In washers and amalgamators, a yoke, *B*,

having an oscillating collar, *a*, pivoted therein, a shaft, *b*, working in said collar, and having one end engaging with an eccentric plate, *d*, in combination with means for producing a backward and forward motion, substantially as and for the purposes set forth and shown.

4. In washers and amalgamators, a shaft, *b*, held in a yoke, *B*, and operated by an eccentric, *d*, in combination with means for producing a backward and forward motion, as herein described, for the purposes set forth.

5. In washers and amalgamators, the combination of the slotted plate *d*, provided with an eccentric socket, a gear-wheel, *e*, and shaft *b*, arranged and operating substantially as and for the purposes set forth.

6. In washers and amalgamators, the combination, with the shaft *b*, of the eccentric plate *d*, gear-wheel *e*, rack *i*, crank-wheel *f*, and driving-pulley *h*, arranged and operating as and for the purposes set forth.

7. In a machine for amalgamating or concentrating, as herein stated, the combination of the pan *C*, shaft *b*, yoke and collar *B a*, eccentric plate *d*, gear-wheel *e*, and rack *i*, actuated to a backward and forward motion, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of November, 1880.

Witnesses:

JOHN S. MITCHELL.

OLIVER DRAKE,

CHARLES H. PELL.