

E. HINCKLEY.
Amalgamators.

No. 149,127.

Patented March 31, 1874.

Fig. 1.

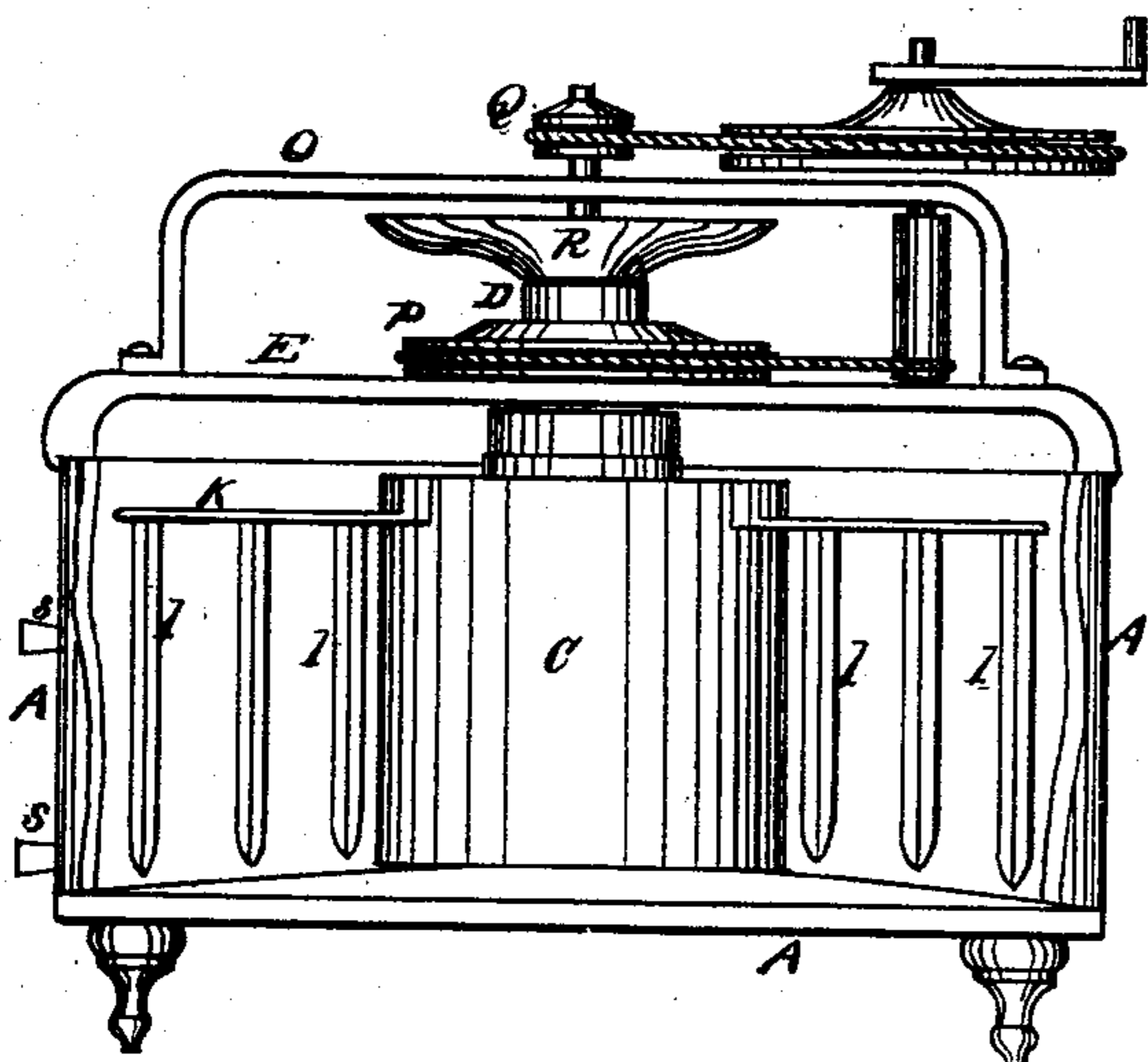


Fig. 2.

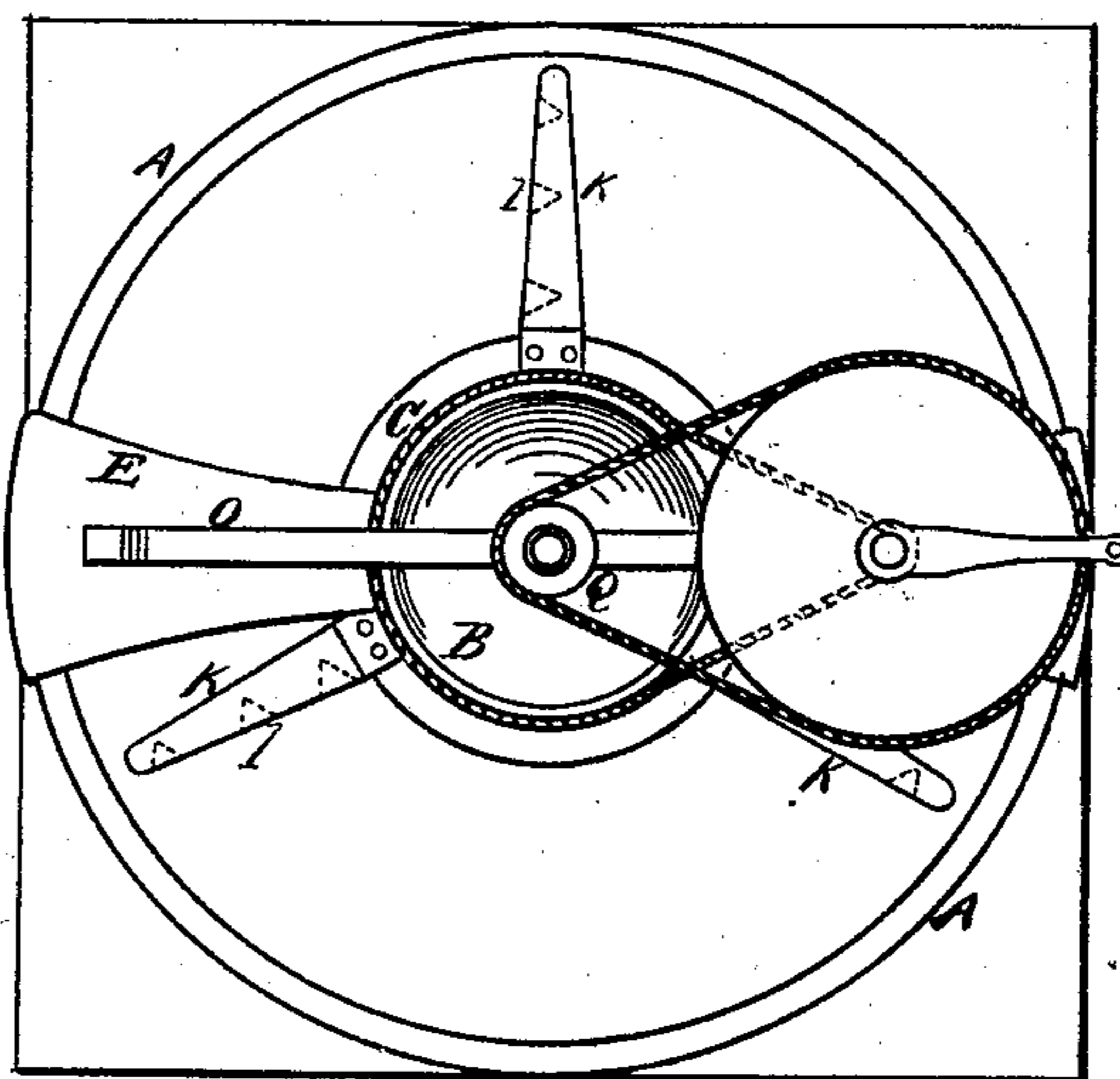


Fig. 3.

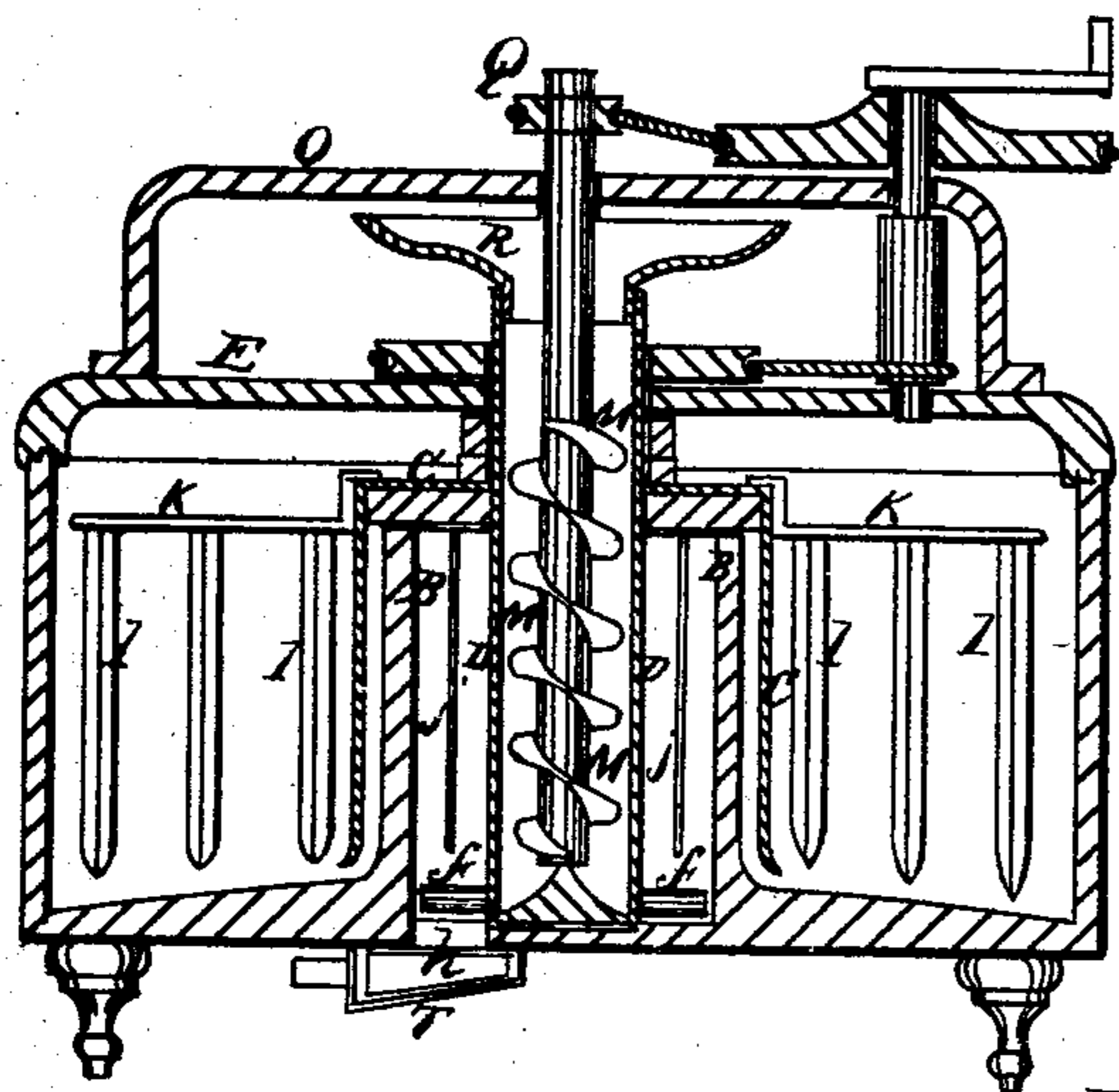


Fig. 4.

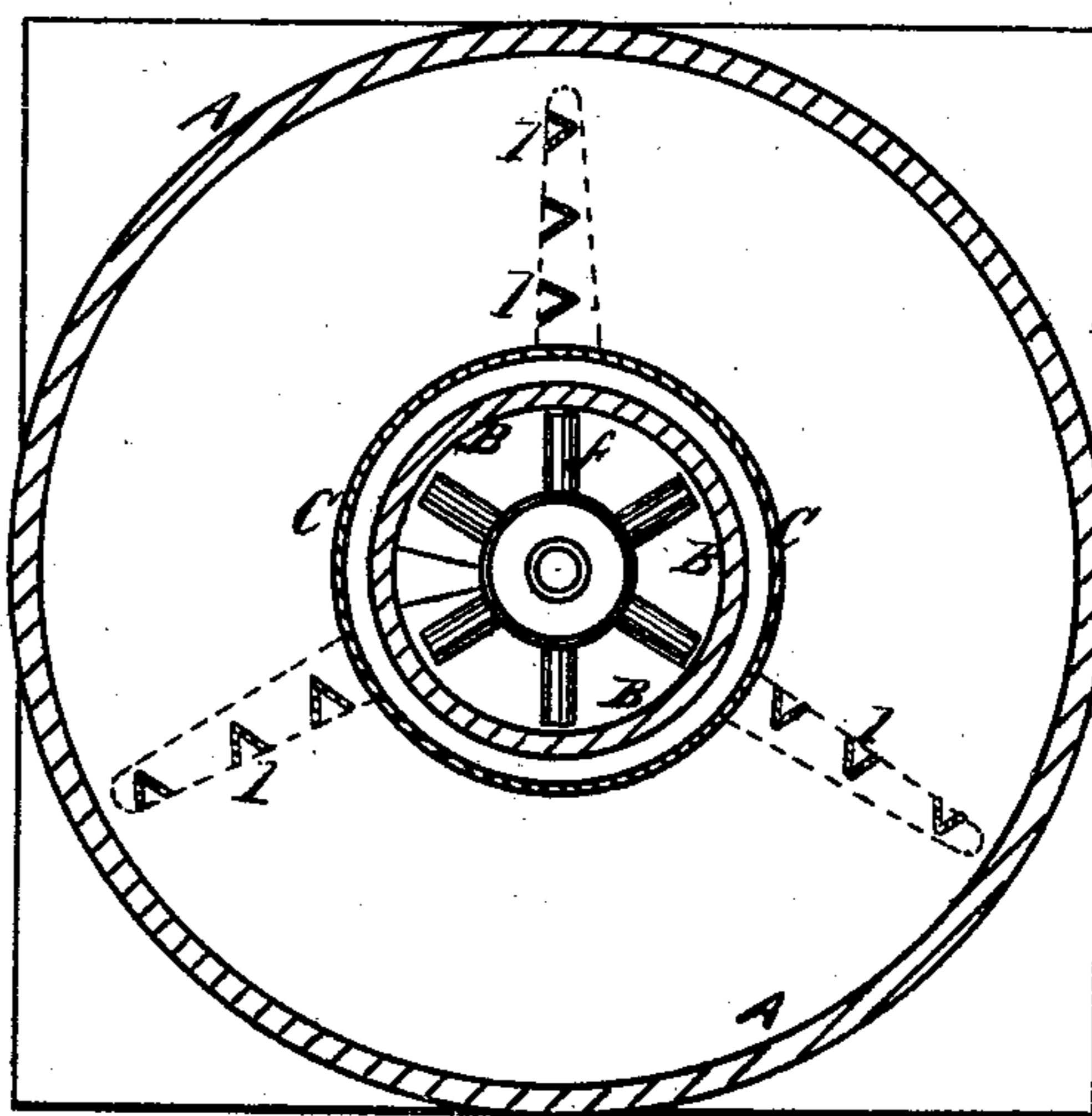


Fig. 5.

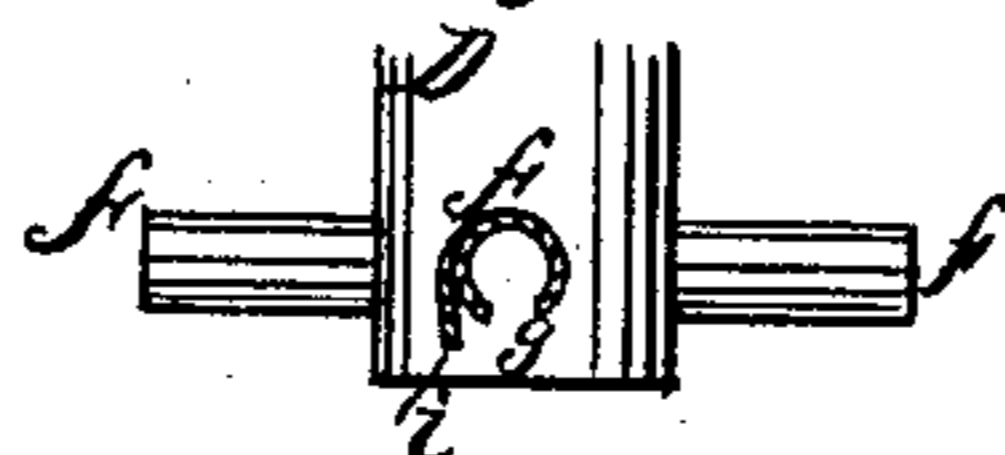
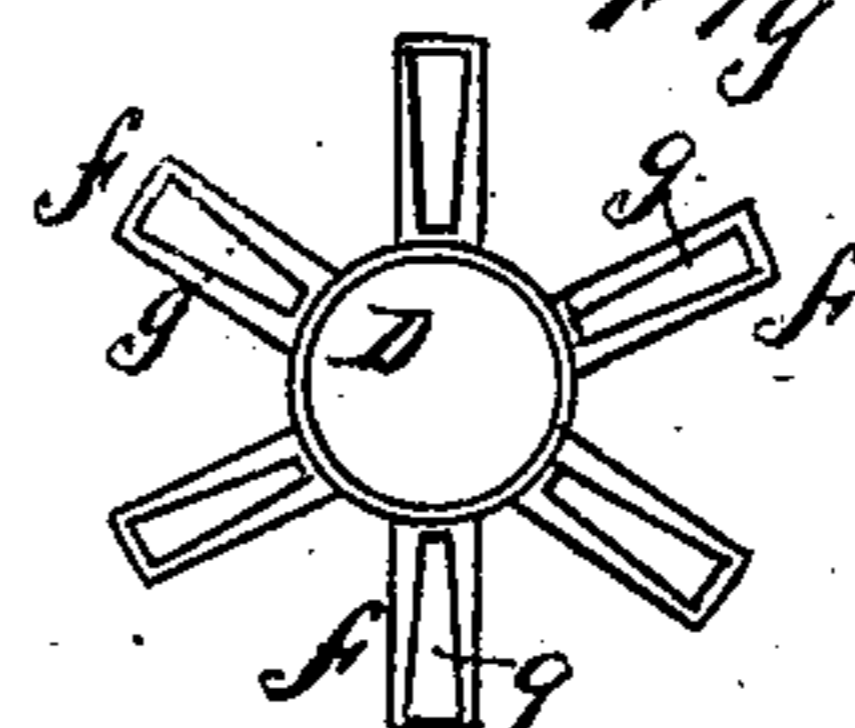


Fig. 6.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **149,127**, dated March 31, 1874; application filed February 16, 1874.

To all whom it may concern:

Be it known that I, EZRA HINCKLEY, of San Francisco city and county, State of California, have invented an Improved Amalgamator; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to that class of amalgamators wherein the pulverized ore is fed by a central screw into an internal chamber or cylinder, and after partial amalgamation the lighter particles float over into an external cylinder, and there are again subjected to amalgamation; and it consists of certain details of construction, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 is an elevation with the side broken away to show the interior. Fig. 2 is a plan view. Fig. 3 is a vertical section. Fig. 4 is a horizontal section. Figs. 5 and 6 are views of hollow tube D and its arms.

A is a large tank or vessel, having a small tank, B, inside of it, which is lower than the main or outside tank. C, Fig. 3, is an open bottomed vessel, which is large enough to pass down over the inside tub or tank B, and leave a small annular space between them. This vessel C is supported in its covering position by a central tube, D, which serves both as a vertical shaft, and as a feed-opening, through which the pulverized ore is fed into the machine. The shaft or tube D is secured in the center of the closed top of the vessel C, so that its lower end will extend a short distance below its bottom edges. Thus, when the lower end of the vertical shaft or tube D rests upon the bottom of the inner tub or tank C, it will be supported with its lower edges a short distance above the bottom of the main vessel A, outside of the tub B. The upper end of the tube D extends to a short distance above the top of the covering-tank C, and is secured by a yoke or bridge piece, E, whose ends rest upon the opposite edges of the tank A, and through the middle of which the upper end of the shaft passes. The lower end of the tubu-

lar shaft D is closed, and serves as a step or bearing for the shaft to rotate upon. Two or more radiating tubular arms, *f*, Fig. 3, extend outward a short distance above the lower end of the shaft, and these arms are each provided with a longitudinal slot, *g*, on their under side. These arms serve to distribute the ore which is forced down through the tubular shaft, as will be more fully described hereafter. The bottom of the tub B, surrounding the lower end of the vertical tube or shaft, is covered with copper plate, and an opening, *h*, leads through the bottom of the tank to a pocket below. A scraping-edge, *i*, is formed on one or more of the radiating arms, so that as the arms revolve, this edge will scrape the bottom of the tank, and force the amalgam which is deposited on the bottom into the opening which leads to the pocket. A number of stirring-rods, *j*, extend downward into the vessel B, being secured in the top of the covering-vessel, so that they move with it. Secured to the top of the covering-vessel C, and outside of it, are one or more radiating arms, K, each of which carries a series of depending stirrers, *l l*, which are carried around with the covering-vessel C, moving in the annular space between the inner and outer tanks. Inside of the tube or vertical hollow shaft D, I place a screw, M, the lower end of which bears upon the closed bottom of the tube or hollow shaft D, while its upper end is supported by an upper bridge or yoke, O, which is secured upon the bridge E. A pulley, P, is secured upon the upper end of the hollow shaft D, which is driven by a belt connection with any suitable power, so that the central tube or shaft, with its radiating slotted arms, and the covering-vessel, with its stirring-rods *j* and outside stirrers *l l*, are given a rotary motion inside of the two tubs or vessels A B. A small pulley, Q, is secured to the upper end of the screw M, by which the screw is driven at a high rate of speed from the same power that drives the covering-vessel. A saucer-shaped flange or hopper, R, is secured around the upper end of the tube D, into which the pulverized ore is fed.

The operation of my amalgamating apparatus is as follows: A body of mercury is placed in the inner tub or vessel B. The covering-vessel is then placed in position, and motion is

given to both the covering-vessel and screw. The pulp or pulverized ore is then fed by suitable means into the saucer-shaped flange or hopper R, from which it passes into the tube, and is forced by the screw down to the lower end of the tube, and out through the slots in the radiating arms into the body of quicksilver, where it is subjected to the stirring operation of the rods *j*, so as to bring every particle of the ore or pulp in contact with the mercury. The lighter or valueless portions of the ore or pulp will gradually rise until it pours over the upper edge of the inner tub B, and passes down between the sides of the tub B and covering-vessel C, whence it passes out beneath the vessel C into the annular space between the two tubs. Here the gangue or tailings are thoroughly stirred and settled, so that any heavy particles that escape the inner tub will be caught in the annular space. The tailings can be drawn off from the tank A through holes S, which are kept closed by plugs. The amalgam which forms in the inner tub or vessel will settle upon the galvanized floor, and be carried by the scraper or scrapers *i* to the opening *h*, through which it will settle into the pocket T below. This pocket is a simple rotary tube with an opening upon one side. When this tube is turned so as to bring its opening in line with the opening *h* in the bottom of the tank, the mercury and amalgam will settle into it. By turning this tube around, the connection with the tub is cut off, and the opening brought into position to permit of the removal of the accumulated amalgam.

By this arrangement I am able to subject every particle of the pulp to the action of the quicksilver, and thus save the gold or silver which is contained in it.

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

1. The concentric vessels A B, in combination with the covering open-bottomed vessel C, with its supporting hollow shaft D and feed-screw M, substantially as and for the purpose above described.

2. The hollow supporting-tube D with its radiating arms *f*, each of which is provided with a slot, *g*, in combination with the screw M and stirring-rods *j j*, substantially as and for the purpose above described.

3. The inner vessel B, with its opening *h* and pocket T, in combination with the scrapers *i*, substantially as and for the purpose above described.

4. An amalgamator consisting of the concentric vessels A B, covering-vessel C, central tube D, feed-screw M, stirring-arms *j*, and outside stirrers *l l*, all combined and arranged substantially as and for the purpose above described.

In witness whereof I hereunto set my hand and seal.

EZRA HINCKLEY. [L. S.]

Witnesses:

JOHN L. BOONE,
C. M. RICHARDSON.