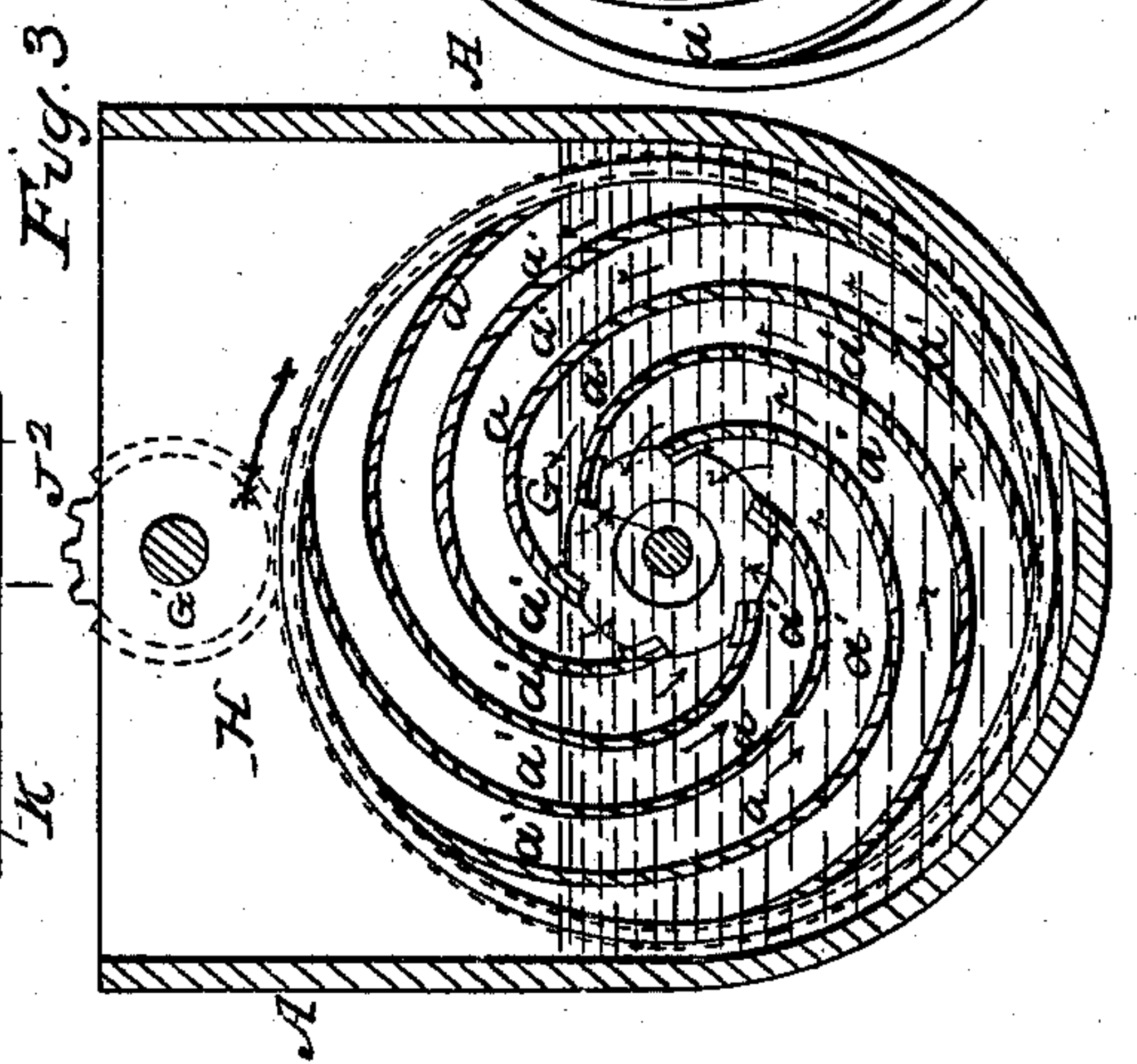
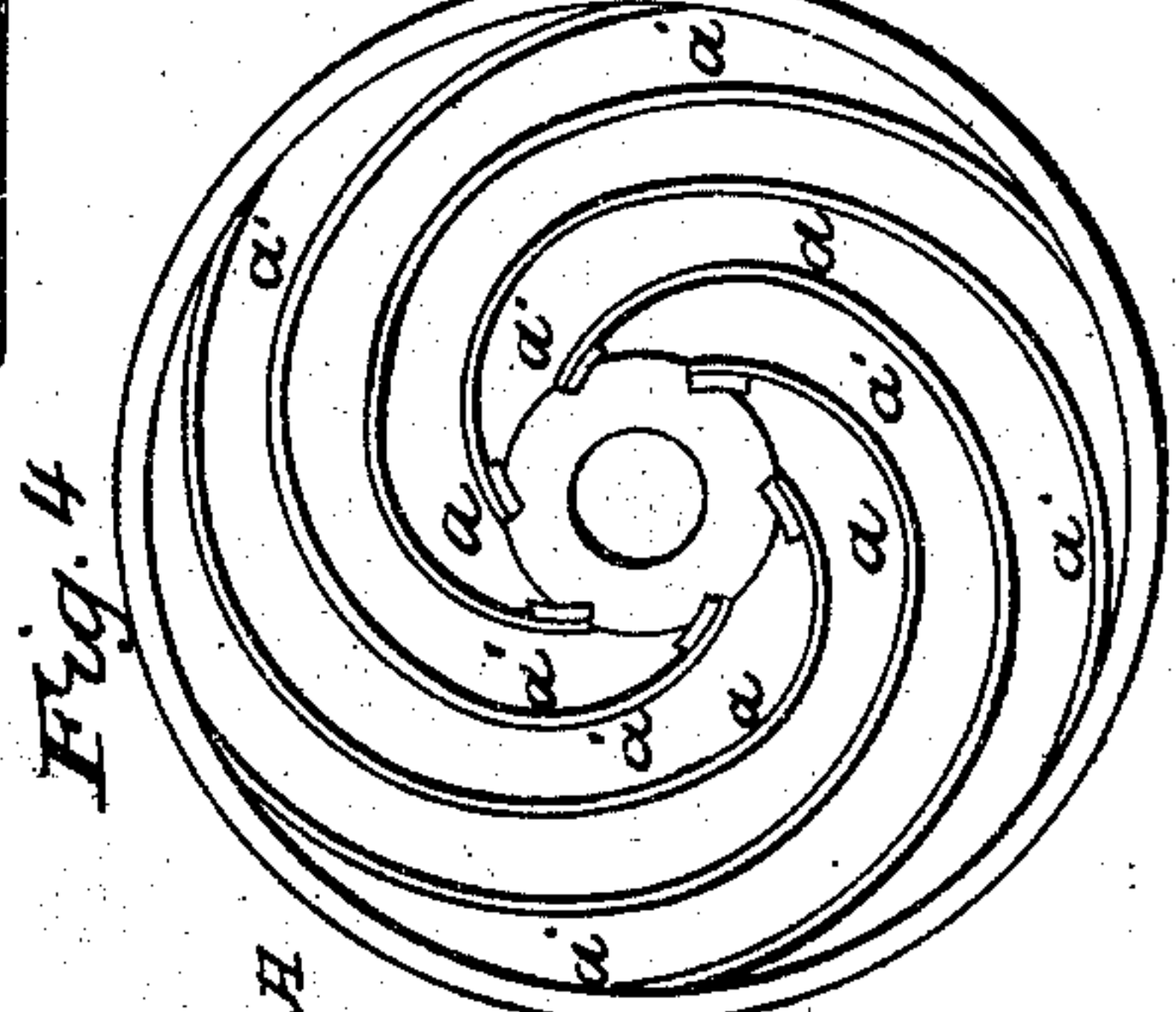
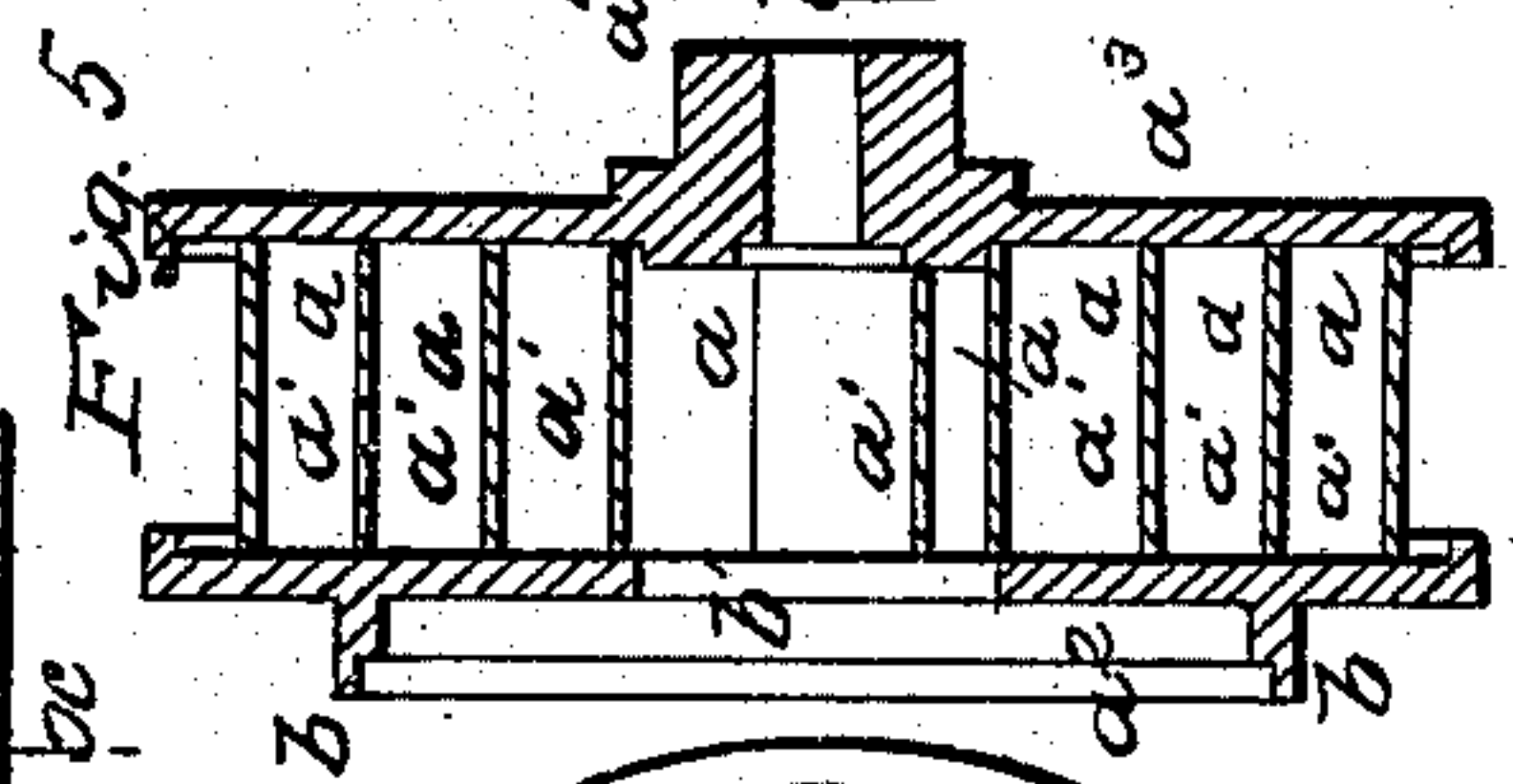
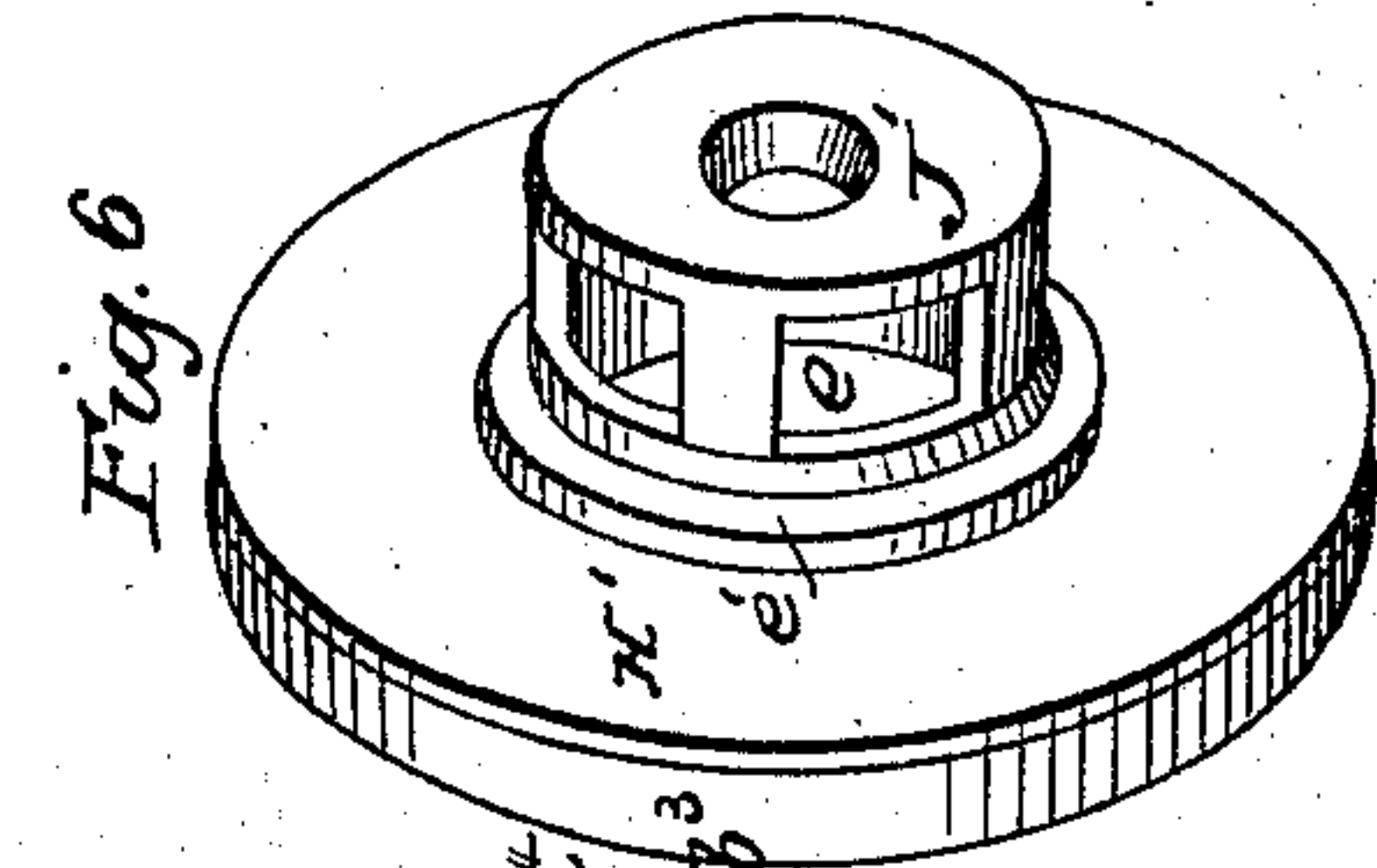
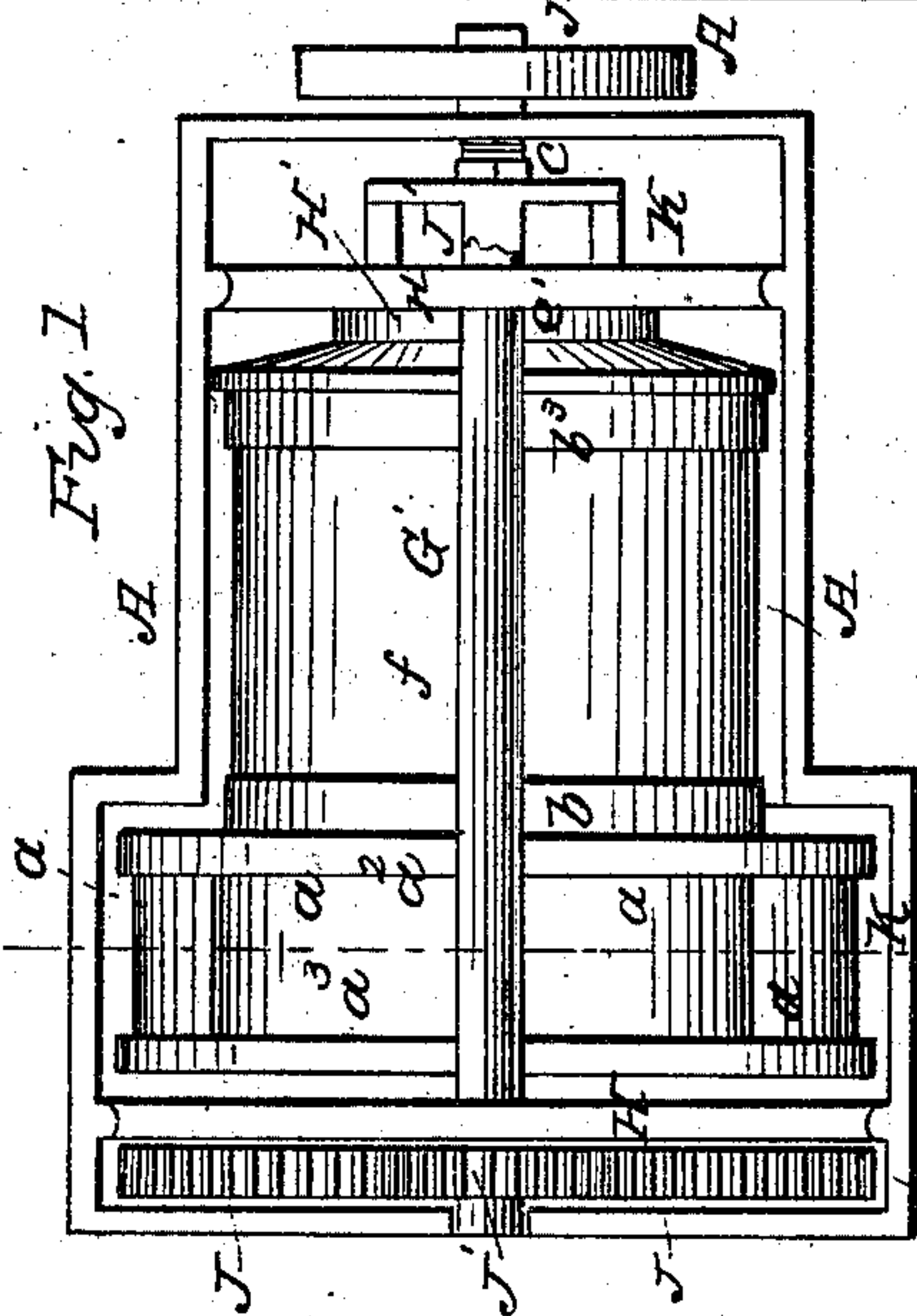
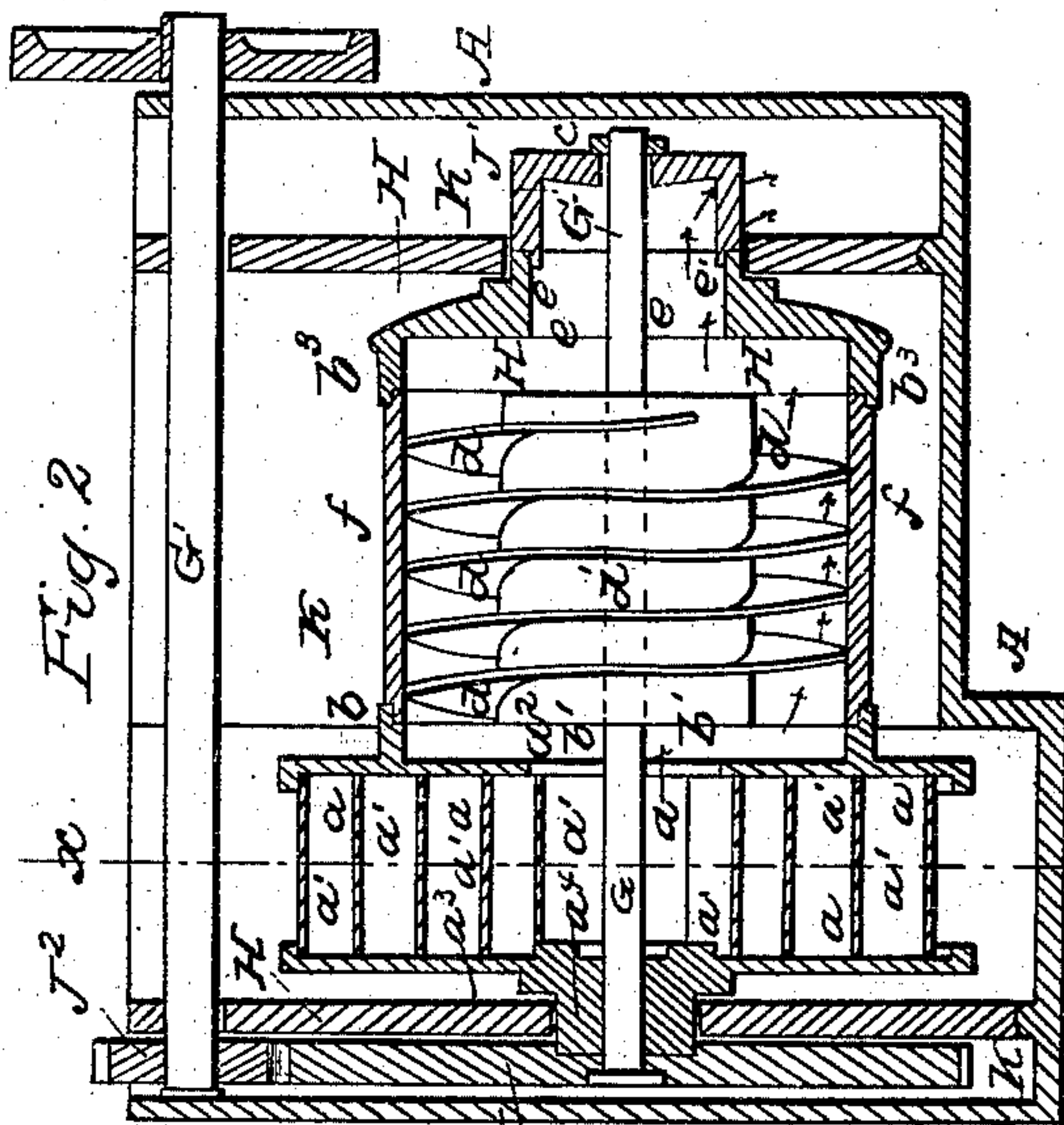


H. H. SCOVILLE, Jr.

Amalgamator.

No. 48,030.

Patented May 30, 1865.



Witnesses  
R. T. Campbell  
D. Schafers

Inventor  
H. H. Scoville, Jr.  
by his attys  
Mason & Co. H. A. H. A.



# UNITED STATES PATENT OFFICE.

H. H. SCOVILLE, JR., OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND  
E. C. PREBLE, OF SAME PLACE.

## IMPROVED AMALGAMATOR.

Specification forming part of Letters Patent No. 48,030, dated May 30, 1865.

*To all whom it may concern:*

Be it known that I, H. H. SCOVILLE, JR., of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Amalgamators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of my amalgamator. Fig. 2 is a longitudinal section taken in a vertical plane through the center of the amalgamator. Fig. 3 is a vertical transverse section taken through the mixing-chamber at the point indicated by red line *x x*. Fig. 4 is a face view of the scroll-bucket wheel. Fig. 5 is a diametrical section through Fig. 4. Fig. 6 shows the center discharging-hub of the scroll-bucket wheel.

Similar letters of reference indicate corresponding parts in the several figures.

The main object of my invention is to effect a separation of gold and silver from their gangue or matrix and other foreign substances by means of a machine which consists, chiefly, of a combination of scroll-shaped buckets arranged about a center in such manner that when the buckets are rotated each one will compel the ore to be immersed or to pass in a dry state through a bath of mercury or molten lead and be discharged into a separate chamber, as will be hereinafter described.

Another object of my invention is to conduct or force the ore directly from its point of discharge from the amalgamating-chamber through another chamber, and to discharge it into a vessel or kettle of melted lead or of mercury, as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a vessel, which is constructed with a semi-cylindrical bottom and vertical sides, and which is subdivided by the partitions into three vertical apartments, K K K. The partitions H H may be so applied to the vessel A that they can be removed whenever it is desired to remove the amalgamating machinery. I propose to construct the vessel A of metal, so that heat may be applied to it for keeping liquid

the lead, if lead be employed instead of mercury, to effect the separation of the metal from its mineral gangue. Within the largest portion of vessel A is a wheel, which is constructed with a number of scroll-shaped passages, *a'*, leading from its circumference toward its center. These passages are formed by means of scroll-shaped plates *a a*, that are secured in any suitable manner between circular disks or heads *a<sup>2</sup> a<sup>3</sup>*, one of which, *a<sup>2</sup>*, has a hole, *b'*, through its center, which is the common discharge for all the scroll passages or buckets, and the other disk, *a<sup>3</sup>*, has a hub, *a<sup>4</sup>*, formed on it, which serves as a journal and a means for supporting one end of the scroll-bucket wheel upon the partition H, through which latter the hub *a<sup>4</sup>* passes, as shown in Fig. 2. The disk *a<sup>2</sup>* has an annular flange, *b*, cast on its outer surface, and surrounding concentrically the central discharge-aperture, *b'*. This flange receives or is received by a cylindrical case, *f*, which may be made as long as may be found convenient. The opposite end of the case *f* to that which connects with flange *b* is similarly connected to an annular flange, *b<sup>3</sup>*, which projects from a head, H', that partially closes this end of the case. The head H' has a central opening, *e*, through it and a hollow journal or hub, *e'*, projecting from it, as shown in Figs. 2 and 6, which journal passes through and has its bearings in the partition H. The heads of the scroll-bucket wheel, the case *f*, and the head of this case, together with a large spur-wheel, J, and a crab, J', may be all secured firmly together by means of a central through-bolt, G, which has its square head recessed into the spur-wheel J, and which receives on its opposite end a nut, *c*, as shown in Fig. 2. When the parts above mentioned are secured together and mounted within the vessel A, they may be rotated by means of the driving-shaft G' and pinion spur-wheel J<sup>2</sup>.

Within the hollow cylinder *f* is fitted a spiral flange, *d*, which is applied to the circumference of a cylinder, *d'*, through the axis of which the bolt G passes. The outer edges of the flange *d* are fitted snugly in contact with the inclosing-case *f*, for the purpose of preventing anything from escaping at these points and to compel the ore to pass through the spiral channel from one end of the cylinder *d'* to the other



end. It will be seen by reference to Fig. 2 that the spiral or screw conveyer is not quite as long as the distance between the two heads  $a^2 H'$ , and that chambers are left at each end of the cylinder  $d'$ . The object of leaving the chamber which is nearest the head  $a^2$  is that ore may have a free discharge from the scroll-passages of the amalgamator, and not be interrupted by the end of the spirally-flanged cylinder  $d'$ . The chamber is left at the opposite end of the conveyer to prevent the central discharge-aperture,  $e$ , from choking up with ore.

In the operation of my machine the scroll-bucket wheel, together with its conveyer, receives a rotary motion in a bath of liquid metal, upon which floats the pulverized or disintegrated ore. As the buckets of said wheel successively enter the bath, they carry down with them small portions of the ore, which are slowly forced from the mouths or receiving ends of the buckets toward the central discharge-aperture of the wheel, at which point all the buckets concentrate. By thus employing a number of buckets, all tending toward a common discharging-orifice, I not only compel the submersion of the ore into the bath, but bring every atom of the comminuted ore in contact with the liquid metal, and thus thoroughly amalgamize every atom of the precious metal, so that it can be easily separated from its matrix by subsequent operations.

One of the most important features of my improved amalgamator is that I am enabled to use a comparatively small quantity of liquid metal, (mercury or melted lead,) and to conduct

the ore a considerable distance through the bath before discharging it therefrom. Another great feature of my invention is that I am enabled to conduct the amalgamated mass of ore directly away from the discharge-aperture of the scroll-bucket wheel through a revolving chamber, the casing of which forms a continued passage from the said wheel to the receiving vessel or kettle, above described. By this arrangement the discharge will be commensurate with the supply, however rapid the latter may proceed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Projecting each bucket on a scroll from the discharging eye or hub of the axial shaft, substantially in the manner and for the purpose described.

2. The arrangement of the chamber  $f$  and screw  $d$ , or their equivalents, at the discharge of the scroll-chamber, substantially in the manner and for the purpose described.

3. The cylinder  $f$  and screw  $d$ , constructed and working together substantially in the manner and for the purpose described.

4. The mode of attaching the screw to the machine for submerging the quartz, substantially as herein described.

5. A machine which discharges the quartz from its scroll-submerging chamber directly into its screw-conveying chamber, substantially as and for the purposes herein described.

H. H. SCOVILLE, JR.

Witnesses:

A. D. STURTEVANT,  
JAMES QUIRK.