

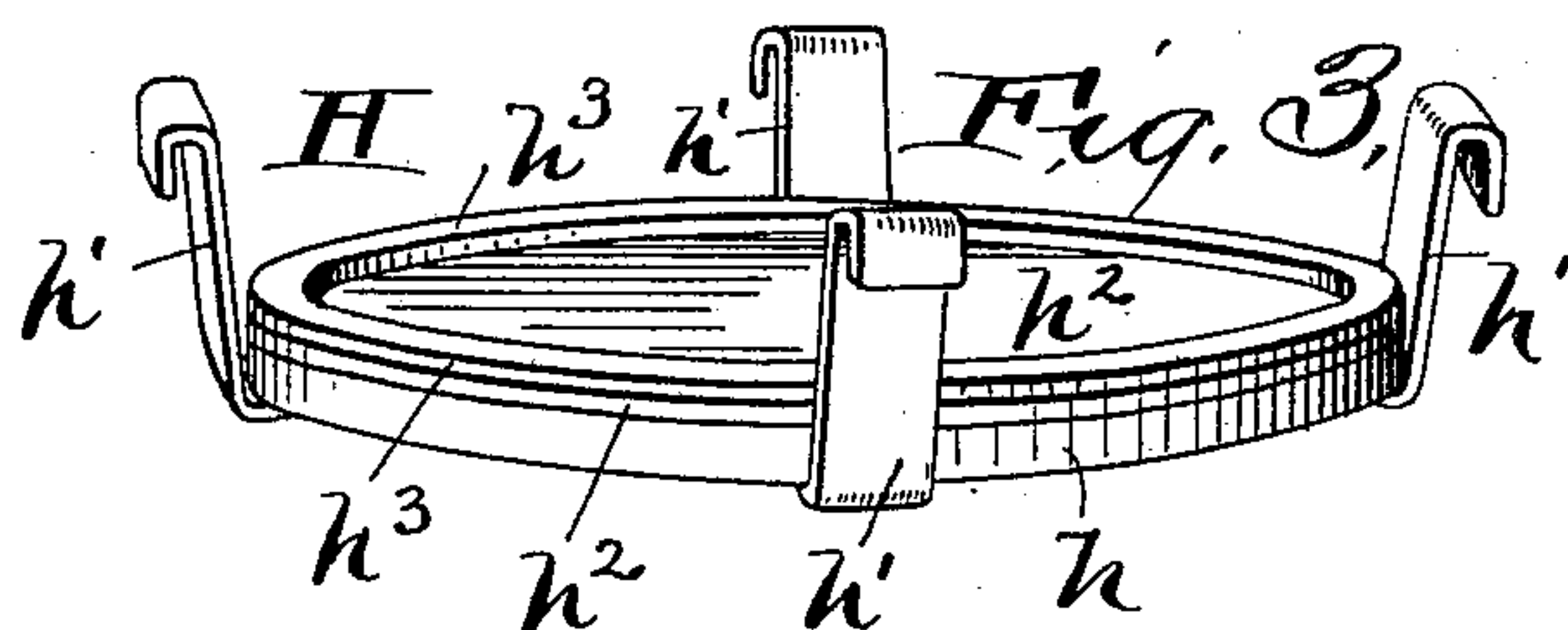
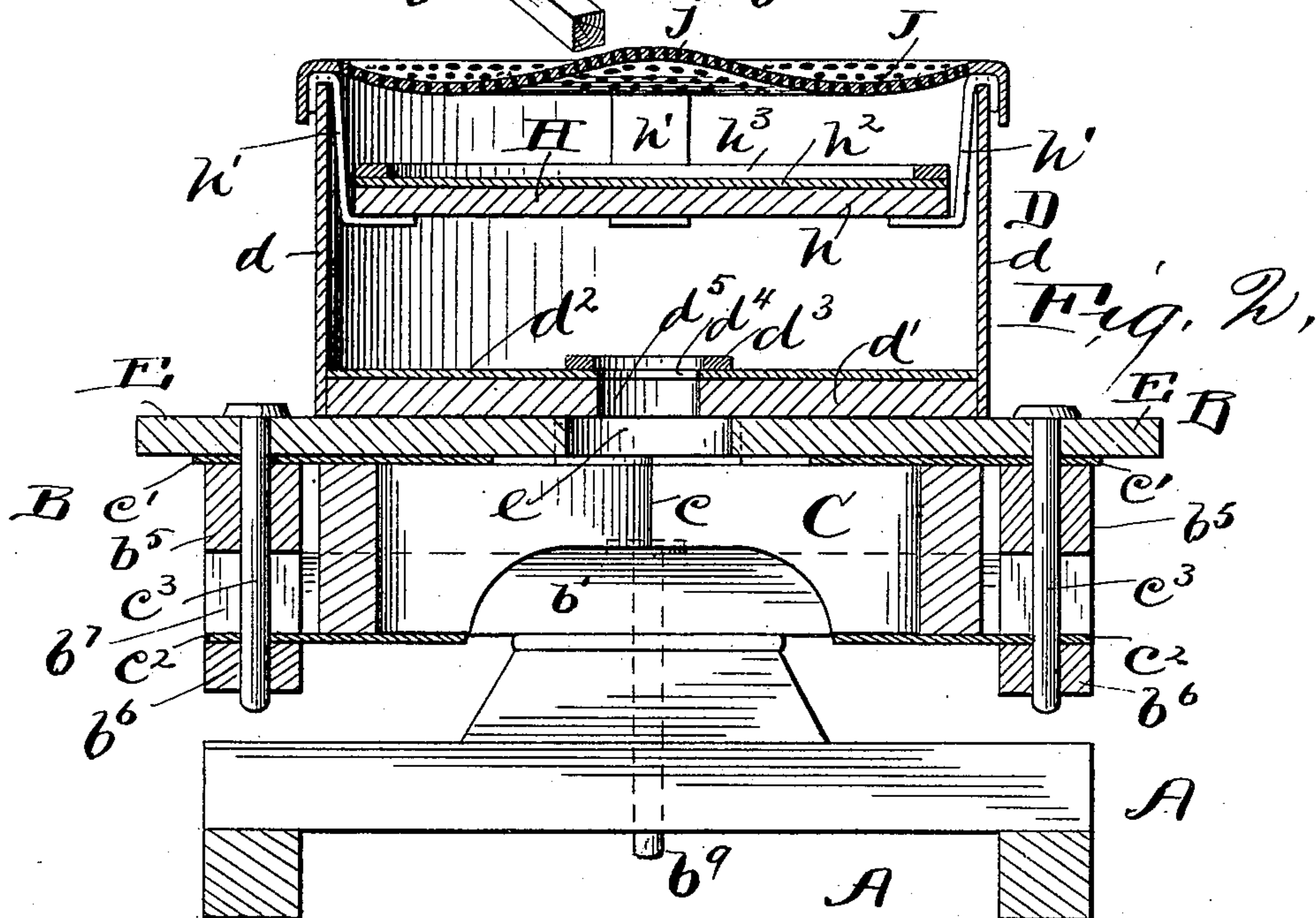
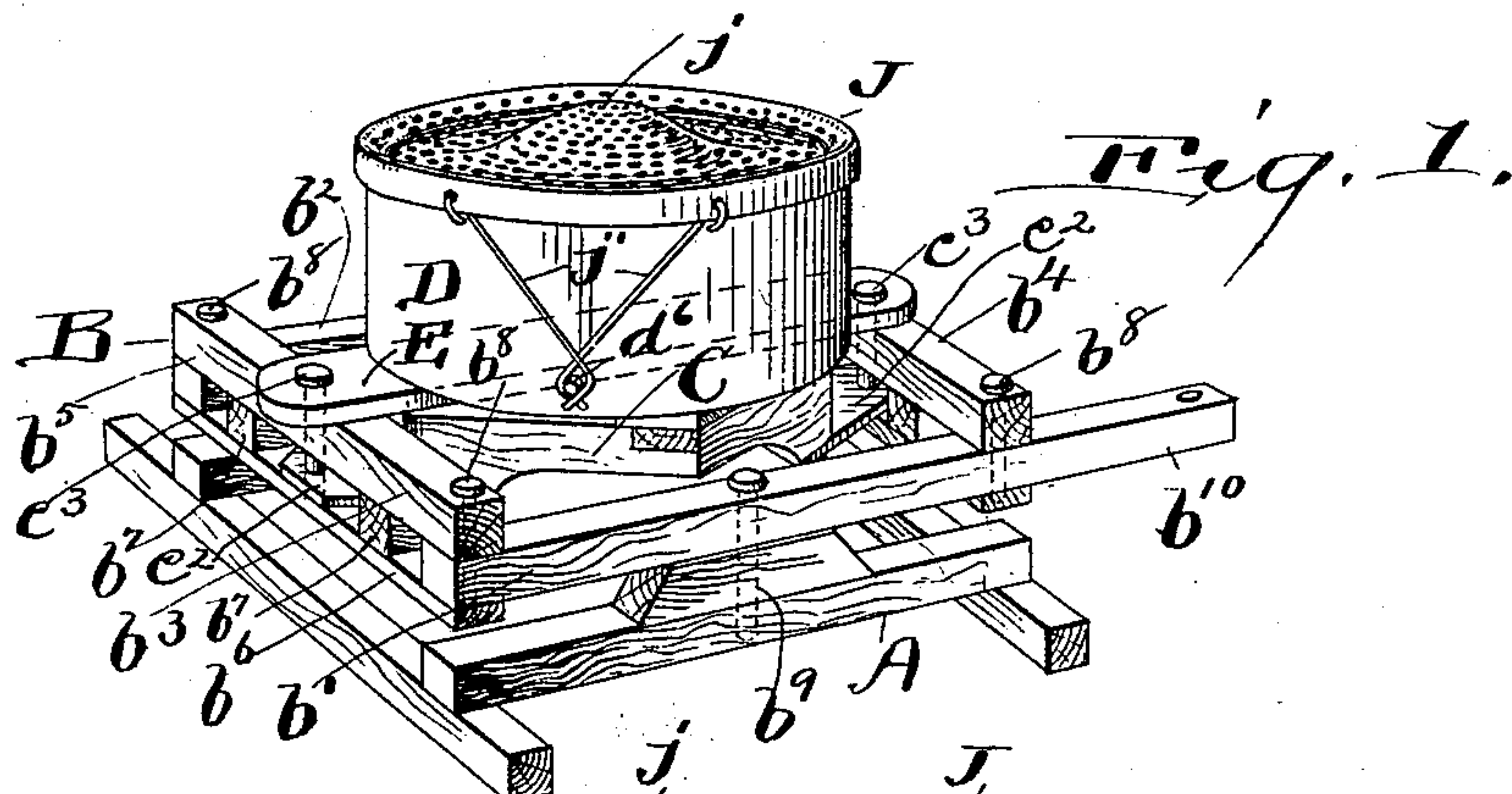
No. 632,032.

Patented Aug. 29, 1899.

J. L. WEES.
CONCENTRATING AMALGAMATOR.

(Application filed Nov. 15, 1897.)

(No Model.)



Witnesses:
E. B. Gilchrist
Philip E. Knowlton.

Inventor:
James L. Wees,
By his Attorneys,
Thurston & Bates.

UNITED STATES PATENT OFFICE.

JAMES L. WEES, OF OREANA, IDAHO.

CONCENTRATING-AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 632,032, dated August 29, 1899.

Application filed November 15, 1897. Serial No. 658,571. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. WEES, a citizen of the United States, residing at Oreana, in the county of Owyhee and State of Idaho, have invented certain new and useful Improvements in Concentrating-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.

My invention is for a concentrating-amalgamator; and its object is to supply such a device which shall be adapted to receive gold-bearing or other ore, amalgamate the free metal therein, and concentrate the ore which does not at first amalgamate.

The invention is particularly adapted for amalgamating and concentrating the gold-bearing ore of placer-mines. When it is attempted to automatically amalgamate such ore, which is in various-sized lumps mixed with sand and gravel, the shaking action necessary to cause the loose particles of metal to amalgamate also causes the heavy parts, which may be rich in gold in their interior, to pass over unacted upon by the mercury. My invention effectively amalgamates the loose particles, concentrates and saves the heavy parts which do not amalgamate at once, and allows the light dirt and waste to pass off.

The invention is particularly concerned with the means I employ for giving a shaking motion to the amalgamating-trays. It may be best summarized as consisting in the combinations of parts hereinafter described, and as definitely enumerated in the claims; but I do not wish to be understood as limiting myself to the specific form I have shown and described.

The drawings clearly illustrate my invention. Figure 1 is a perspective view of the amalgamating-concentrator complete. Fig. 2 is a vertical central section of the same on an enlarged scale. Fig. 3 is a perspective view of the upper tray.

Similar letters of reference designate similar parts in each figure.

Specifically describing the embodiment of the invention shown in the drawings, A represents a base-frame of suitable construction, B what I term a "shaking-frame," and D the

amalgamating and concentrating box, which it is the purpose of the shaking-frame to oscillate. The shaking-frame is quadrangular in form, its four sides being joined together by pivot-pins b^8 . Two of these sides b^1 and b^2 are preferably simple beams and are pivoted to the base-frame by pivot-pins b^9 , while the other two sides b^3 and b^4 are preferably composite beams each composed of the upper bar b^5 , lower bar b^6 , and the interposed blocks b^7 . One of the simple side beams, as b^1 , projects beyond the quadrangle, as at b^{10} , and furnishes a convenient part for the attachment of a pitman, wherewith the frame is shaken. When the frame is so shaken or is oscillated by any suitable means, it assumes a diamond shape, then a square shape, then a diamond with its axis reversed, and so on. Supported by this quadrangular shaking-frame, being pivoted to the two sides b^3 and b^4 thereof, is the composite cross-beam C. This beam supports the amalgamating and concentrating box D and has an opening c through its center, through which the discharge from the box passes. The cross-beam consists, preferably, of the rigid diamond-shaped box-like structure shown, having plates c^1 and c^2 projecting in the line of its major axis from its upper and lower sides, respectively, and resting on the bars b^5 and b^6 of the sides b^3 and b^4 . The amalgamating-box D might rest directly on the cross-beam just described, but for convenience I attach a separate bar E to the bottom of the box, and the pivot-pins of the cross-beam C also pass through this bar E. The bar thus pivoted and resting upon the cross-beam C receives the same motion as that beam. The shell of the amalgamating and concentrating box D consists of the cylindrical drum d , secured to the bottom d' . This bottom constitutes the lower or concentrating tray.

The upper or amalgamating tray is represented by H. It is composed of a bottom plate h , a plurality of hangers h^1 , by which the tray may be suspended from the top of the cylindrical wall, a metallic plate h^2 , covering the upper surface of the bottom, and a ring h^3 , made, preferably, of rubber or leather, secured on the upper side of the metallic plate, at the outer edge thereof. This tray is designed to hold mercury, and the plate h^2 is

therefore made of a material which will amalgamate therewith and one which will not rust. I prefer to use copper. The material of which the ring h^3 is made is chosen with reference to its capacity for retaining the mercury and amalgam and resisting the wearing action of the ore and water. The external diameter of the upper tray is smaller than the internal diameter of the drum, and thus room is provided for material to pass over off of the tray in the shaking thereof. As this material contains a certain amount of ore which is adapted to be amalgamated, but which did not get intimately mixed with the mercury on the tray H, I preferably make the lower tray also an amalgamating-tray, having a copper plate d^2 on its upper surface and a leather or rubber ring d^3 forming a wall about its exit. The exit in this case is through the center of the tray, being by means of the continuous holes d^4 d^5 and e through the copper plate, the bottom d' , and the bar E, respectively, and the opening c through the composite cross-beam C.

J represents a perforated cover or "grizzly" which fits over the box D. This grizzly rises in the center, as shown at j , thus causing material which is dumped upon its center to be more or less evenly distributed over its surface as it oscillates in the shaking of the frame B. The grizzly is secured to the rest of the amalgamating-box by means of two pairs of hooks j' on opposite sides of the box, which hooks take over a pair of pins d^6 , projecting from the box near its bottom.

In the operation of my concentrating-amalgamator in its preferred form mercury is placed in the two trays, the grizzly is secured in place by its hooks, and the shaking-frame is oscillated. Gold-bearing ore is then delivered from a sluice-box onto the center of the grizzly, together with sand, gravel, and water. These sift through the perforations in the grizzly onto the upper tray H, where the free particles of gold amalgamate with the mercury and the coarser parts are caused by centrifugal force to pass over the edge of the tray, falling onto the lower tray. Here centrifugal force causes these heavier parts to move to the outer edge of the tray, and hence be retained in the box by the shell, while the lighter particles are washed out with the water through the central hole. The lower tray thus acts to concentrate and save the valuable heavy parts, which from having the gold in their interior or otherwise did not amalgamate on the upper tray. The mercury in the lower tray serves to amalgamate any free particles of ore which passes over from the upper tray. The amalgam in the two trays sticks to the plates and is afterward scraped off. My invention would

work to advantage, though not so satisfactorily, if the mercury were omitted from the lower tray. It will also be observed that any other motion causing centrifugal force, such as a circular translation or a rotation, might be given to the amalgamating and concentrating box in place of the oscillation which my shaking-frame gives.

Having thus described my invention, I claim—

1. In an amalgamator, in combination, a box adapted to receive ore and amalgamate metal therein, and having provision whereby the shaking of the box causes the ore to travel therein, and a frame for so shaking the box, which frame is of quadrangular form, two of its sides supporting the amalgamating-box and the other two being pivoted to a base, said frame being adapted to change in shape whereby the box is shaken, substantially as described.

2. In an amalgamator, in combination, a horizontal base, a shaking-frame consisting of four members joined together by vertical pivots whereby the frame may change its shape, two of said members which are opposite each other being pivoted to the base by vertical pivots, and an amalgamating-box supported by the other two members, substantially as described.

3. In an amalgamator, in combination, the base A, the quadrangular shaking-frame B made of four sides pivoted together, two of said sides being pivoted to said base, the cross-beam C pivoted to the other two sides of said shaking-frame, and an amalgamating-box supported by said cross-beam, substantially as described.

4. A shaking-frame, consisting of two simple beams b' b^2 and two composite beams b^3 b^4 , said beams being pivoted to form a quadrangle, in combination with an amalgamator supported by two opposite beams of the frame, and a base which pivotally supports the other two beams of the frame, substantially as described.

5. In an amalgamator, in combination, a shaking-frame consisting of two simple beams b' b^2 , and two composite beams b^3 b^4 , said beams being pivoted to form a quadrangle, the cross-beam C having plates c' c^2 projecting from its ends and resting on members of the composite beams b^3 b^4 , and pivot-pins c^3 pivoting said plates to said composite beams, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES L. WEES.

Witnesses:

S. G. KING,
R. BLEDSO.