

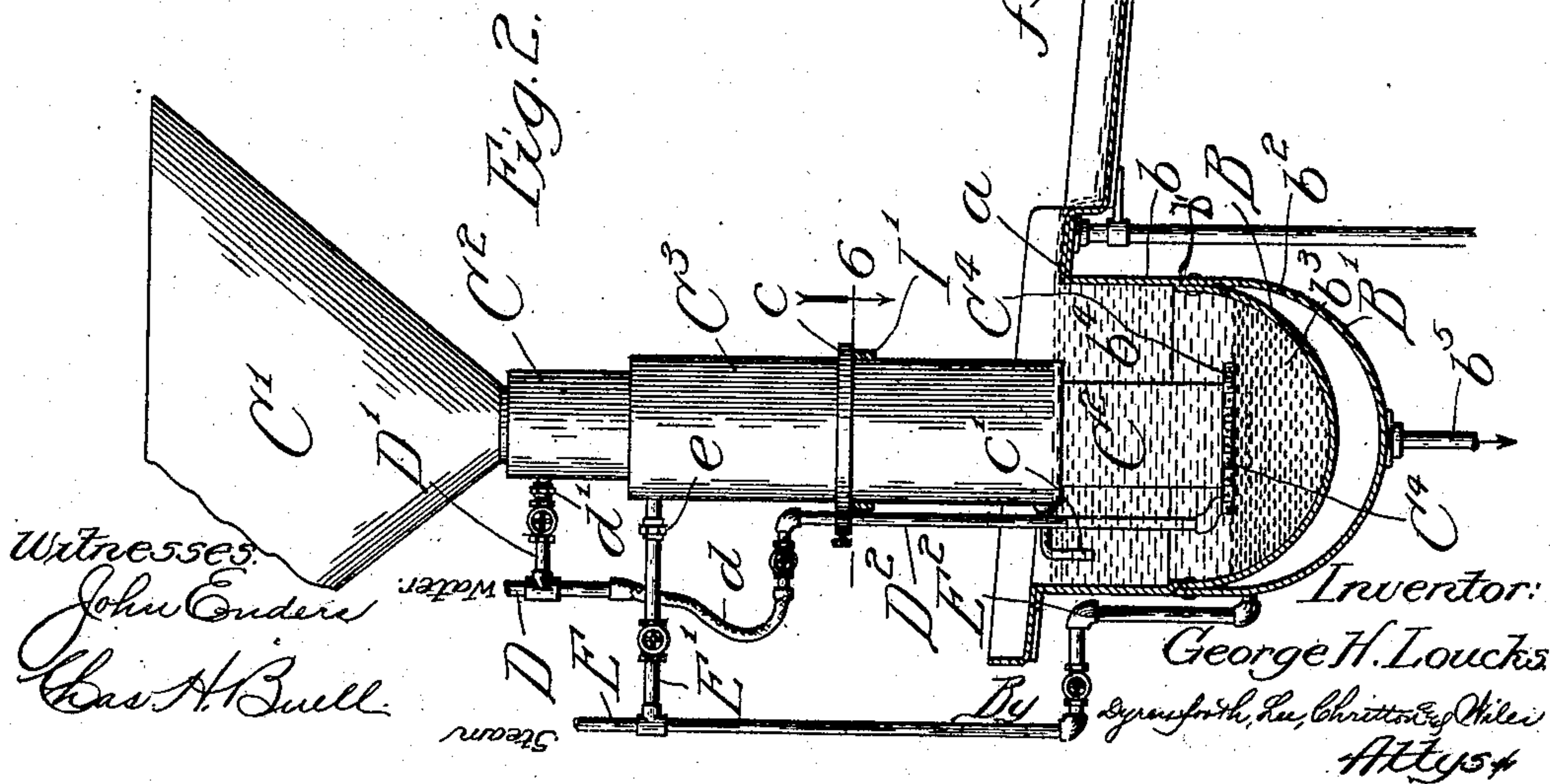
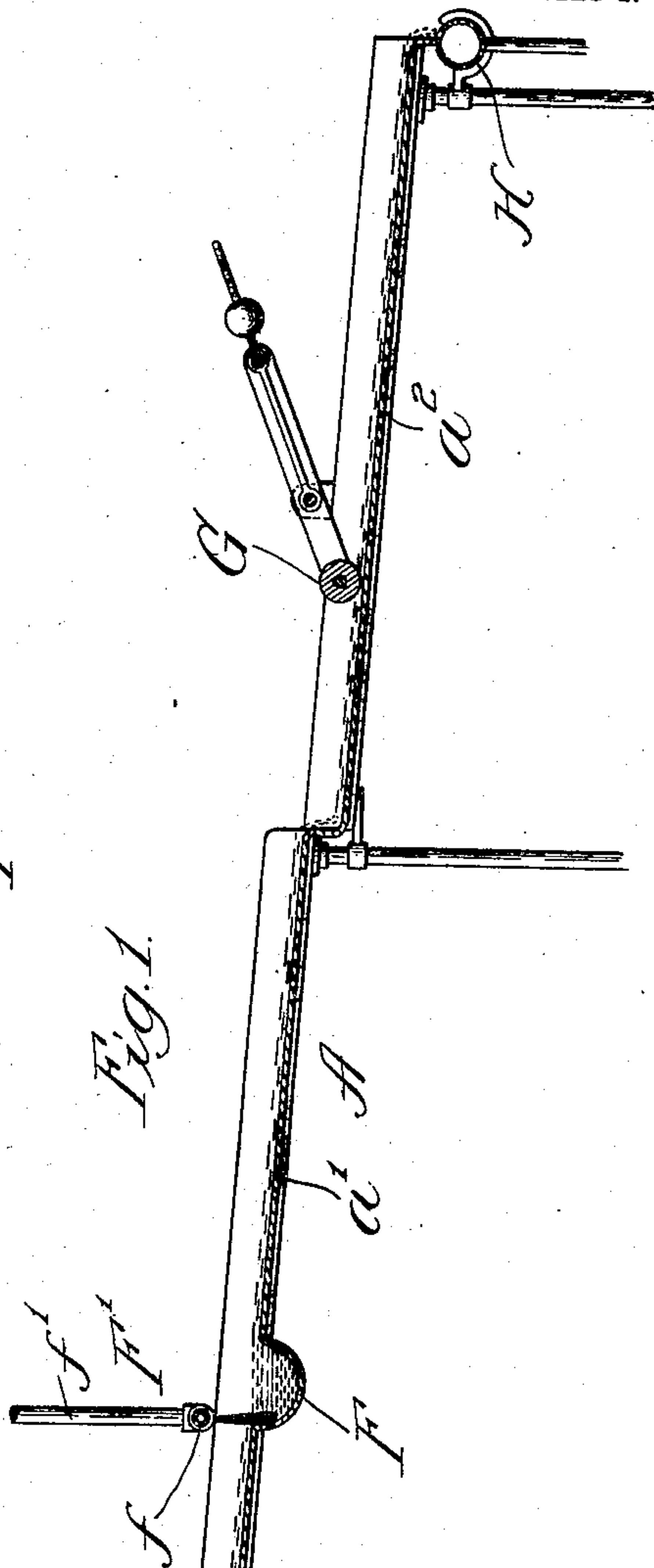
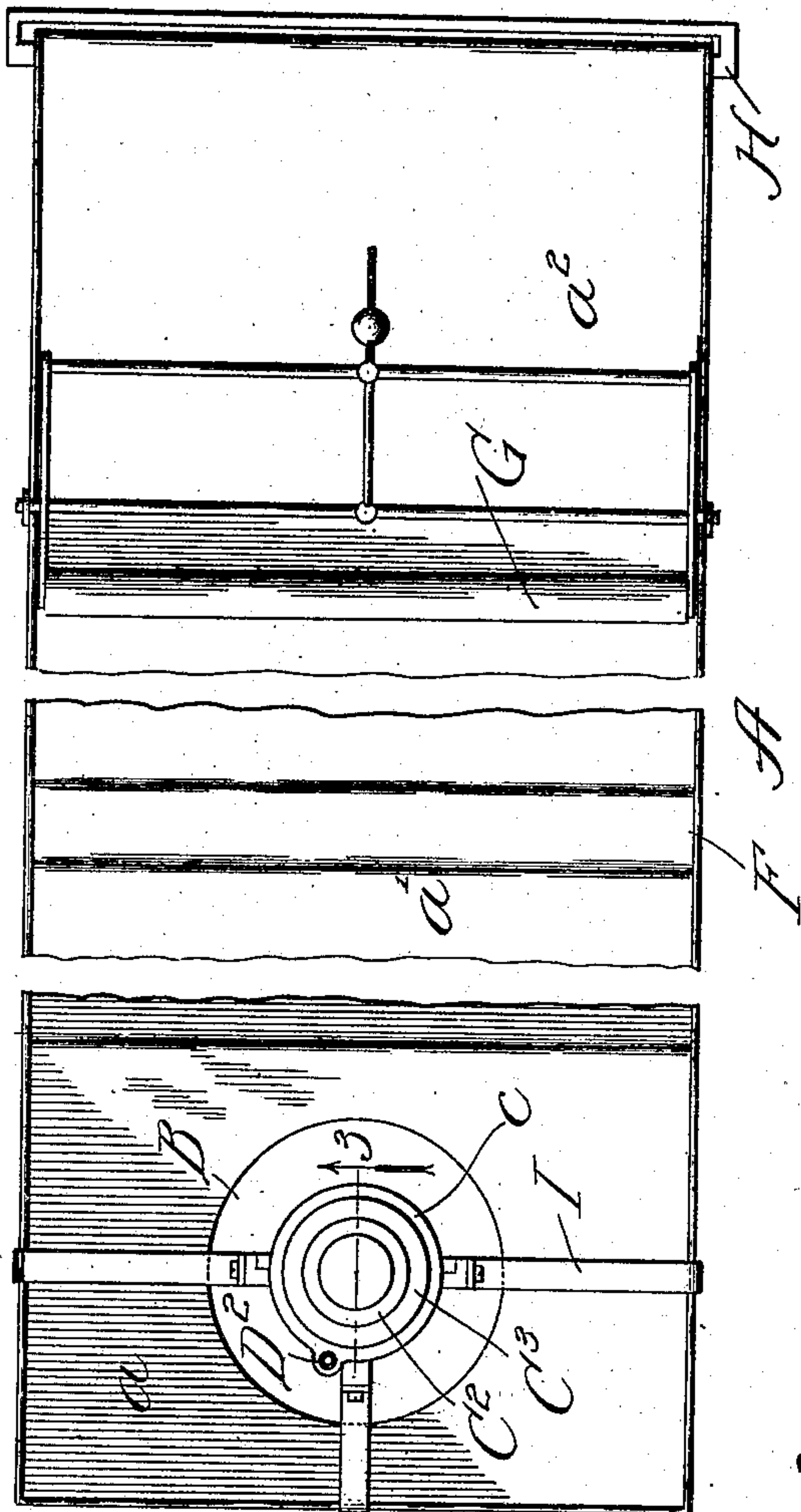
G. H. LOUCKS.
AMALGAMATOR.

APPLICATION FILED MAY 11, 1908.

920,880.

Patented May 4, 1909.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

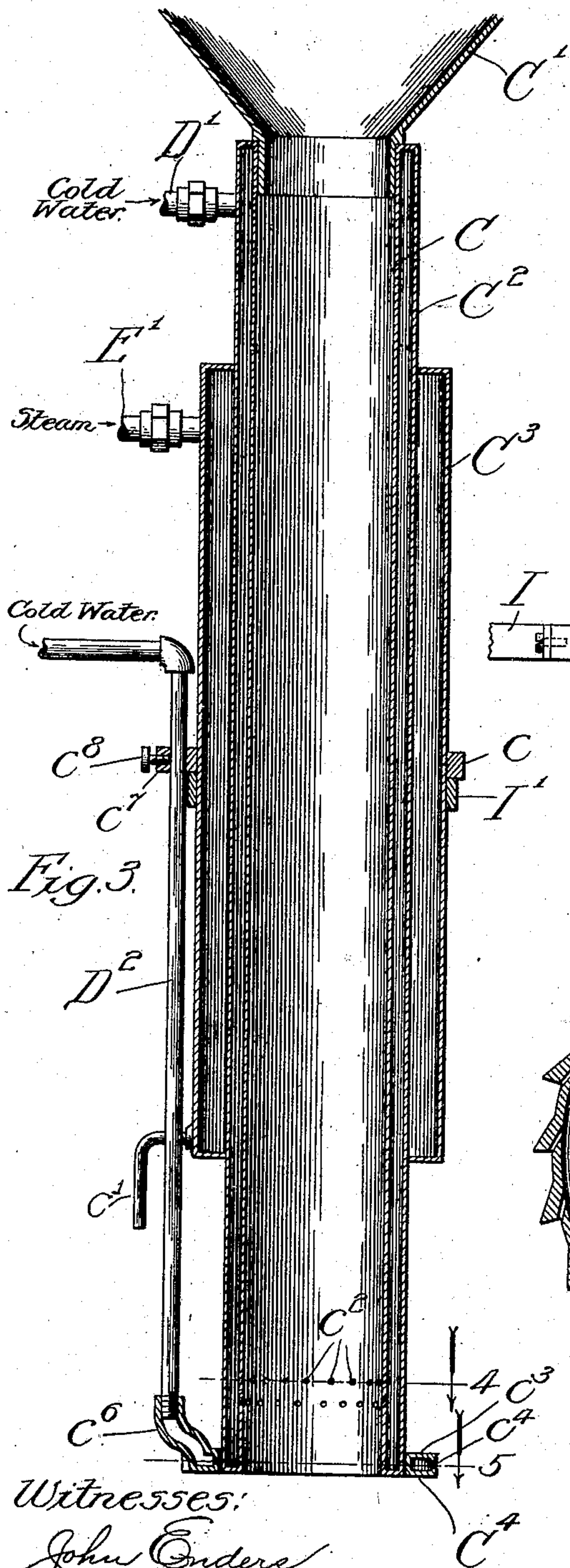


Fig. 3.

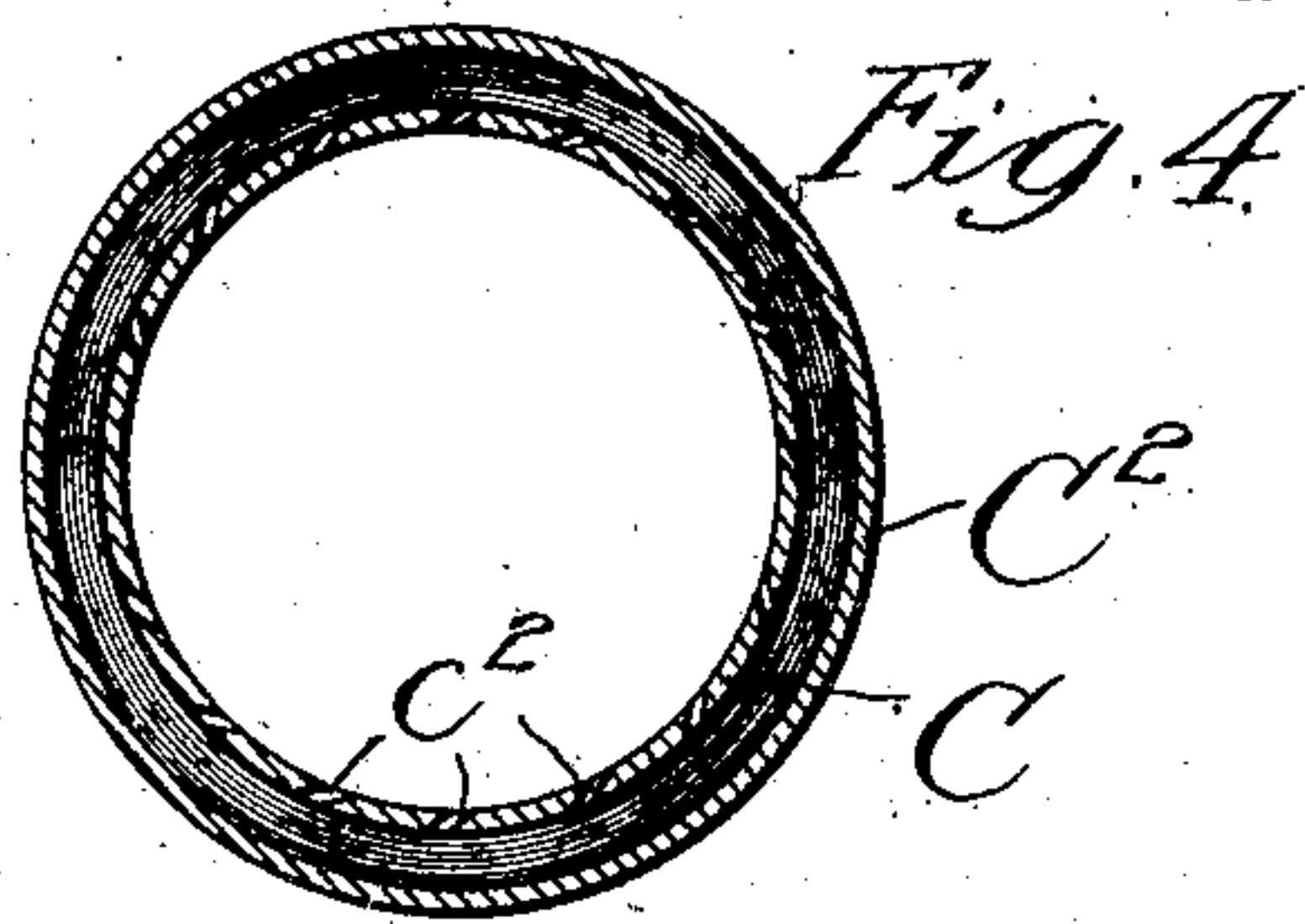


Fig. 4.

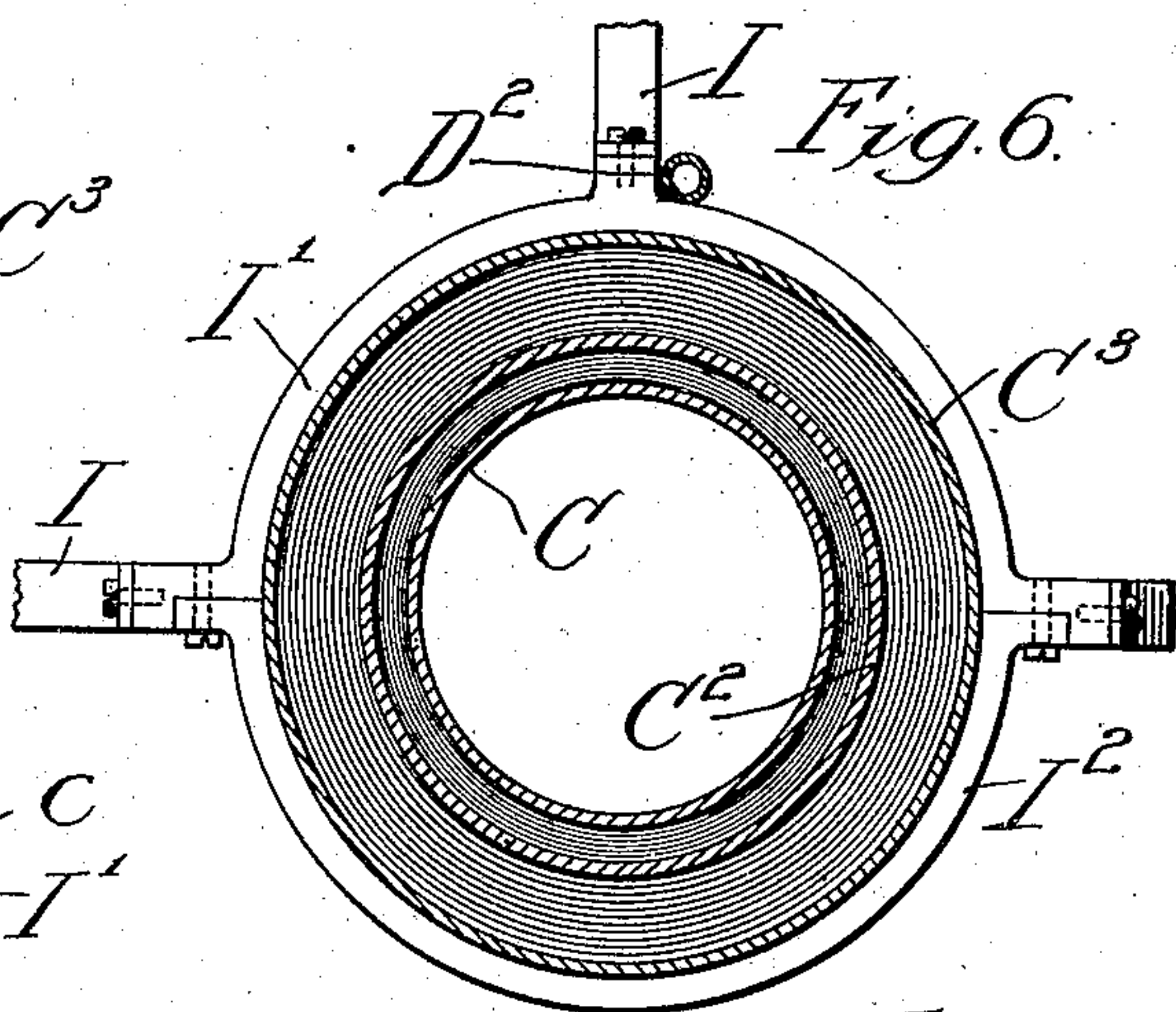


Fig. 5.

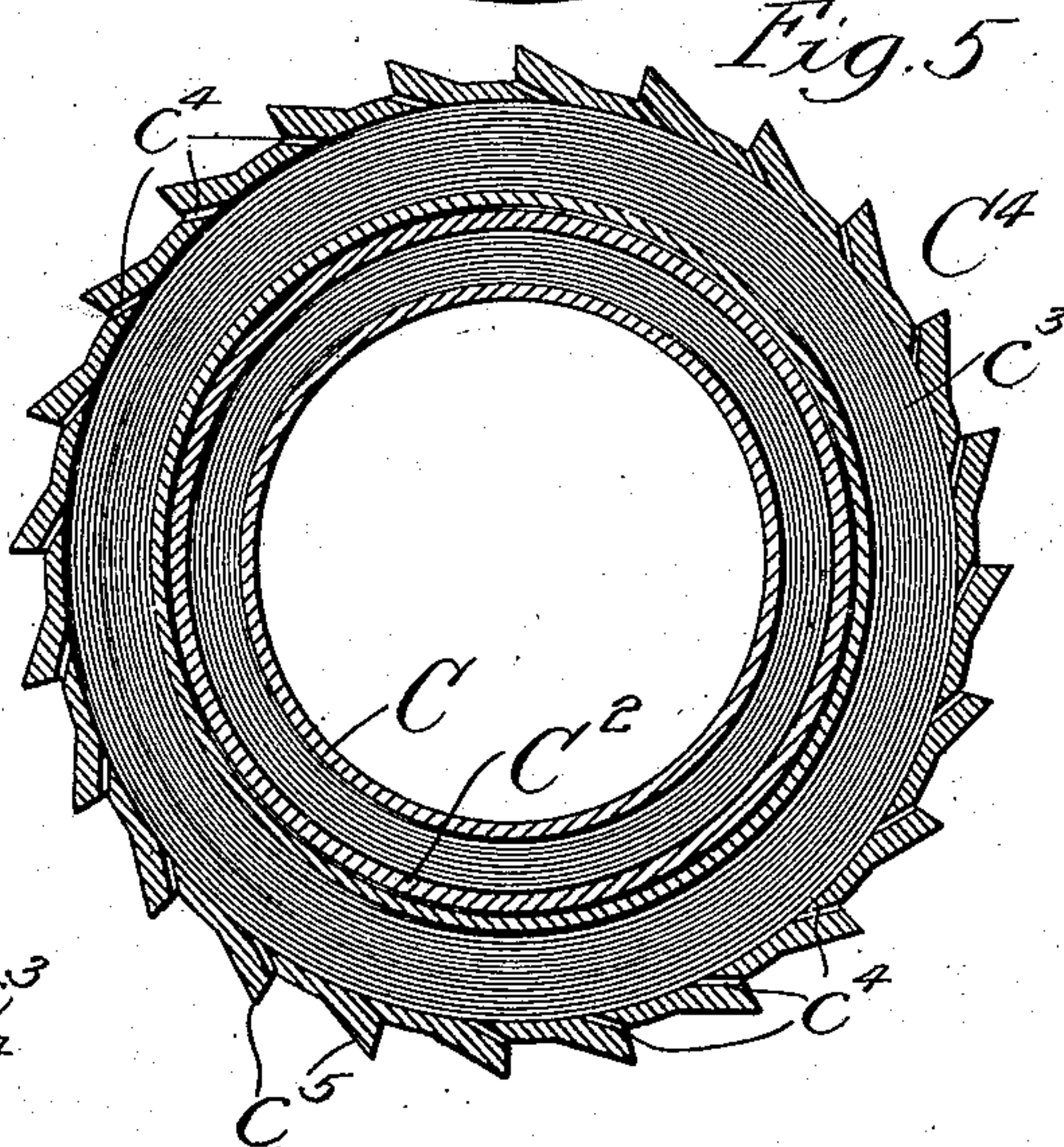


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE H. LOUCKS, OF CHICAGO, ILLINOIS.

AMALGAMATOR.

No. 920,880.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed May 11, 1908. Serial No. 432,237.

To all whom it may concern:

Be it known that I, GEORGE H. LOUCKS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Amalgamators, of which the following is a specification.

My invention relates particularly to amalgamators for use in connection with free milling ore; and my primary object is to provide an amalgamator of high capacity, size considered, and one which is capable of saving a higher percentage of the values than amalgamators heretofore known.

My invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 represents a vertical longitudinal section of an amalgamator constructed in accordance with my invention, the hopper and attendant parts being shown in elevation; Fig. 2, a broken plan view with the hopper removed; Fig. 3, an enlarged broken vertical sectional view showing the ore-chute and attendant parts; Figs. 4 and 5, sections taken as indicated at the corresponding lines on Fig. 3; and Fig. 6, a broken plan view of the bracket which supports the vertically disposed ore-chute employed and the attendant parts.

In the construction illustrated, A represents an inclined table, or chute, over which the gangue, or tailings, pass; B, a mercury well, or basin, connected with the upper or front end section of said table and equipped with a steam-jacket B¹; C, a vertically disposed ore-chute located above the well B and equipped at its upper end with a removable hopper C¹; C², a water jacket surrounding said ore-chute; C³, a steam-jacket surrounding said water-jacket, or a considerable portion thereof; D, a water-pipe equipped with a branch D¹ communicating with the water-jacket C² and with a branch D² communicating with the mercury well; E, a steam-pipe equipped with a branch E¹ communicating with the steam-jacket C³ and with a branch E² communicating with the steam-jacket B¹; F, a mercury pocket extending transversely across the intermediate section of the table; F¹, means located above the mercury pocket F for directing a sheet, or stream, of water thereinto, thereby to force the ore through the mercury in said pocket; G, an amalgam roller located above the rear or lower section of the table; H, a chute or receptacle at the

rear end of the table, into which particles of amalgam passing with the tailings may fall.

The table may be of any suitable construction. As shown, it comprises a front end section *a* centrally of which the mercury well B is located; an intermediate section *a*¹ in which the transverse mercury pocket F is located; and a rear end section *a*² above which the amalgam roller G is disposed.

The mercury well B is suspended from the lower side of the section *a* of the table, the section *a* being provided with a large circular perforation through which the ore-chute C depends. The preferred manner of constructing the mercury well and its steam-jacket is to provide a large sheet-metal basin-shaped member *b* which is flanged at its upper end and connected with the underside of the table-section *a* in any suitable manner, offset said basin-shaped member peripherally at an intermediate portion, as indicated at *b*¹, and provide a somewhat shorter basin-shaped sheet-metal member *b*² which extends some distance beneath the lower end of the member *b* and whose upper end is connected with the member *b* at the offset portion mentioned. Mercury *b*³ may be placed in the basin *b*, and, in operation, water *b*⁴ will fill the basin above the mercury and overflow, passing down the inclined table A. The steam-jacket B¹ is equipped with a return pipe *b*⁵, which is shown brokenly.

The ore-chute C, the surrounding jackets, and the hopper may be of any suitable construction. The lower end of the ore-chute is adapted to depend into the mercury in the mercury well, and the lower end of the ore-chute is encircled by an agitator, or spraying device, C⁴ adapted to float upon the mercury and which forms an outlet for the branch-pipe D². The chute and its surrounding jackets pass through a bracket I having a ring-portion I¹ provided with a removable section I². The jacket C³ is equipped with a collar *c* adapted to rest upon the ring I¹ of the bracket I. The chute C and the jackets C² and C³ are virtually integral with each other, so that they may be lifted together from the bracket I when it is desired to remove the amalgam from the well B. The jacket C³ is equipped at its lower end with a drain-pipe *c*¹ adapted to discharge into the well B. Said drain-pipe may be equipped with a stop-cock (not shown). The inner wall of the jacket C², which constitutes the wall of the chute C, is provided near its lower end with

two circular rows of perforations, or ports, c^2 , through which water may be discharged upon the descending pulverized ore from all sides. The perforations slope downwardly and inwardly, so that the force of the water will tend to force the pulverulent ore through the mercury bath. The agitator C^4 comprises a hollow ring c^3 adapted to slide longitudinally with relation to the ore-chute, the outer vertical wall of said ring being provided with a series of perforations c^4 , which preferably incline upwardly and outwardly somewhat, as shown in Fig. 3. The perforations c^2 preferably extend obliquely through the wall of the chute C (inner wall of the water-jacket C^2), as shown in Fig. 4, so that the issuing water encountering the falling particles of ore will give a whirling motion thereto. As shown in Fig. 5, the perforations c^4 likewise extend obliquely through the outer vertical wall of the agitator C^4 , the obliquity being in a direction opposite the obliquity of the perforations c^2 , so that the issuing water will intensify the rotation of the particles of ore, or gangue, as they rise from the mercury bath. As appears from Fig. 5, the outer vertical surface of the hollow ring c^3 is equipped with teeth c^5 which shelter the perforations c^4 .

The hollow ring c^3 of the agitator C^4 is equipped with a tubular boss, or nipple, c^6 with which the branch-pipe D^2 connects. The branch-pipe D^2 passes through a guide c^7 with which the collar c is equipped, and a set-screw c^8 is provided thereat for securing the branch-pipe D^2 when it is desired to remove the ore-chute and attendant parts from the mercury well. Interposed in the course of the branch-pipe D^2 is a flexible section, or hose, d , which permits the lower section of the pipe and the agitator C^4 to rise or fall, according to the height of the mercury. The several branch pipes D^1 , D^2 , E^1 and E^2 are equipped with valves, as shown. The branch pipes D^1 and E^1 are equipped with unions d^1 , e , respectively, permitting the pipes to be disconnected from the jackets C^2 and C^3 . The hose d may be disconnected when it is desired to lift the ore-chute and attendant parts from the mercury well. The means F^1 for delivering a stream or sheet of water at the mercury pocket F comprises a horizontally disposed pipe f provided at its lower side with a slot, and a pipe f^1 through which water is supplied to the pipe f . The amalgam roller G is adjustably weighted, or counterbalanced, as shown.

From the description given, the operation will be readily understood. Free milling ore is passed in a stream from the ore-chute C , and is struck by water issuing from the jacket C^2 through the perforations c^2 as the ore is about to encounter the mercury. The momentum of the falling ore and of the water which issues under considerable force

from the perforations c^2 is sufficient to cause the ore to descend into the mercury in the well B , from which the ore and water rise to overflow over the inclined table A . As noted, the obliquity, or spiral arrangement, of the perforations c^2 serves to give to the ore and water a whirling motion as they enter the mercury, thus insuring a thorough intermingling with the mercury. The upward inclination and spiral arrangement of the perforations c^4 of the agitator C^4 tend to increase the whirling motion and also to assist the ore particles in rising from the well. The water is kept at a high temperature by means of the steam admitted to the jacket C^3 and the jacket B^1 , so that the ore particles will be caused to crumble and become subdivided into minute particles, so that particles of gold will be liberated which would otherwise escape contact with the mercury. It will be understood, therefore, that my improved machine not only may be operated to pass the ore quickly through, but that a higher percentage of the values will be saved than by the usual methods. When it is desired to remove the amalgam from the well B , the valves may be closed to stop the passage of water and steam, the hose d may be disconnected, the branch pipes D^1 and E^1 may be separated at the unions d^1 and e , the set-screw c^8 may be turned to clamp the lower section of the branch-pipe D^2 , and the section I^2 of the bracket ring I^1 may be removed to enable the ore-chute and attendant parts to be removed, thereby giving free access to the mercury well.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation should be understood therefrom.

What I regard as new, and desire to secure by Letters Patent, is:

1. In an amalgamator, the combination of a mercury well, an ore-chute having its lower end presented thereto, a floating hollow annular member at the lower end portion of said chute having perforations through which water may issue, and a water supply-pipe connected with said hollow member.

2. In an amalgamator, the combination of a mercury well, an ore-chute disposed above said well, a water-jacket surrounding said ore-chute, and having oblique ports through which water may pass from said jacket to the interior of said chute, a steam-jacket surrounding said water-jacket, a hollow annular member encircling the lower portion of said chute and provided with ports, and a supply pipe connected with said hollow member.

3. In an amalgamator, the combination of a mercury well, a supporting member located some distance above the mercury well, an ore-chute removably supported on said supporting member and depending into said

mercury well, means for delivering water to said ore-chute, a hollow annular member encircling the lower portion of said ore-chute and provided with ports, a water-supply pipe connected with said last-named member, and means connecting said hollow annular member and the supply pipe thereof with said ore-chute, for the purpose set forth.

10 4. In an amalgamator, a receptacle forming a mercury-well, a substantially vertical ore-chute extending into said well, a water-jacket surrounding said chute and communicating with the interior of said chute, a
15 steam-jacket surrounding said water-jacket, water and steam supply pipes disconnectibly joined to said jackets, and a supporting bracket provided with a separable ring encircling said last-named jacket, for the purpose set forth.

20 5. In an amalgamator, the combination of a table, a mercury-well sunk therein, a substantially vertical ore-chute depending into said well, a water-jacket surrounding said chute and communicating with the interior of said chute, a steam-jacket surrounding said water-jacket, water and steam supply pipes disconnectibly joined to said jackets, supporting means disconnectibly joined

to said chute and the above-mentioned attendant parts thereof, a transverse mercury-pocket in said table, and means for delivering a sheet of water upon the pulp near the upper edge of said transverse mercury-pocket.

30 6. In an amalgamator, a receptacle forming a mercury-well, a substantially vertical ore-chute depending into said well, water-jackets surrounding said chute and communicating with the interior of said chute, a
40 steam-jacket surrounding said water-jacket, water and steam supply pipes disconnectibly joined to said jackets, an annular agitator at the lower portion of the ore-chute within said mercury-well, a water supply pipe connected with said agitator, a bracket having
45 a ring encircling said steam-jacket and equipped with a removable section, and a guide carried by said bracket through which said last-named water-pipe extends, where-
50 by said agitator may be raised from the mercury-well after the removal of said chute and the jackets carried thereby.

GEORGE H. LOUCKS.

In presence of—

L. HEISLAR,
R. SCHAEFER.