

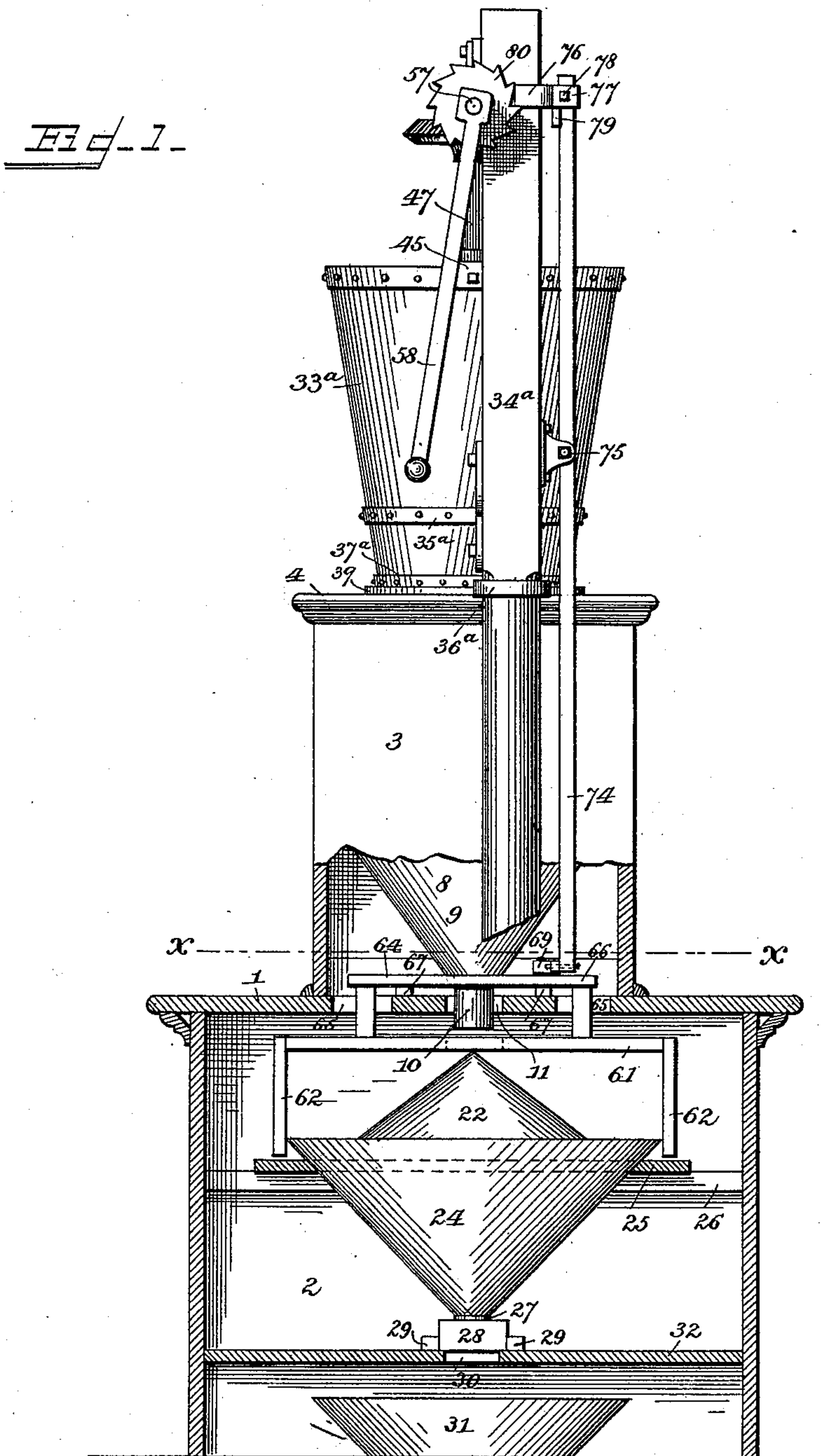
(No Model.)

3 Sheets—Sheet 1.

H. H. SCHUMAN.
DRY GOLD SEPARATOR AND AMALGAMATOR.

No. 539,549.

Patented May 21, 1895.



Inventor

Witnesses

Chas. H. Ourand
D. P. Falhaupst.

By his Attorneys.

Henry H. Schuman

C. A. Snow & Co.

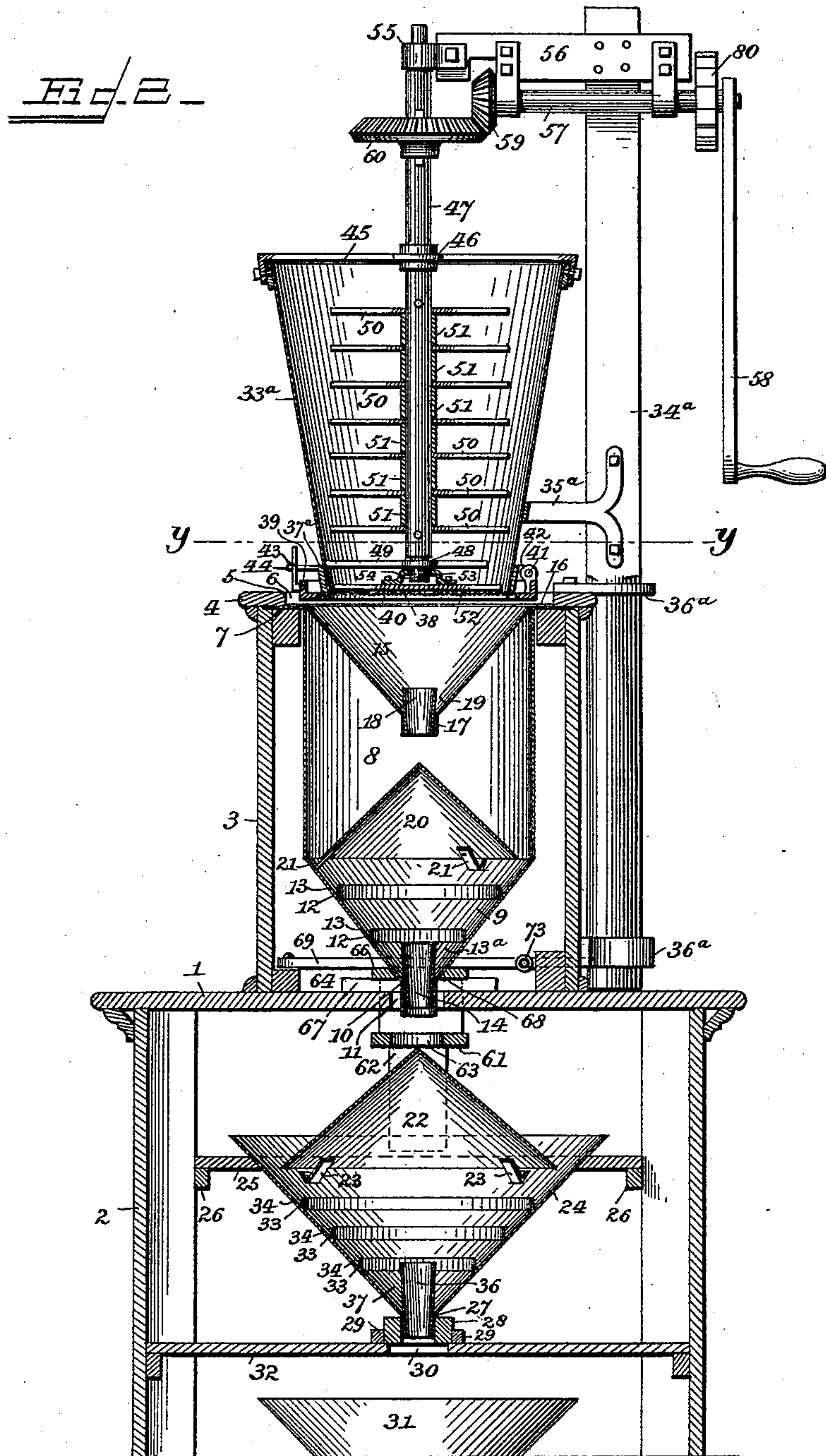
(No Model.)

3 Sheets—Sheet 2.

H. H. SCHUMAN.
DRY GOLD SEPARATOR AND AMALGAMATOR.

No. 539,549.

Patented May 21, 1895.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 3.

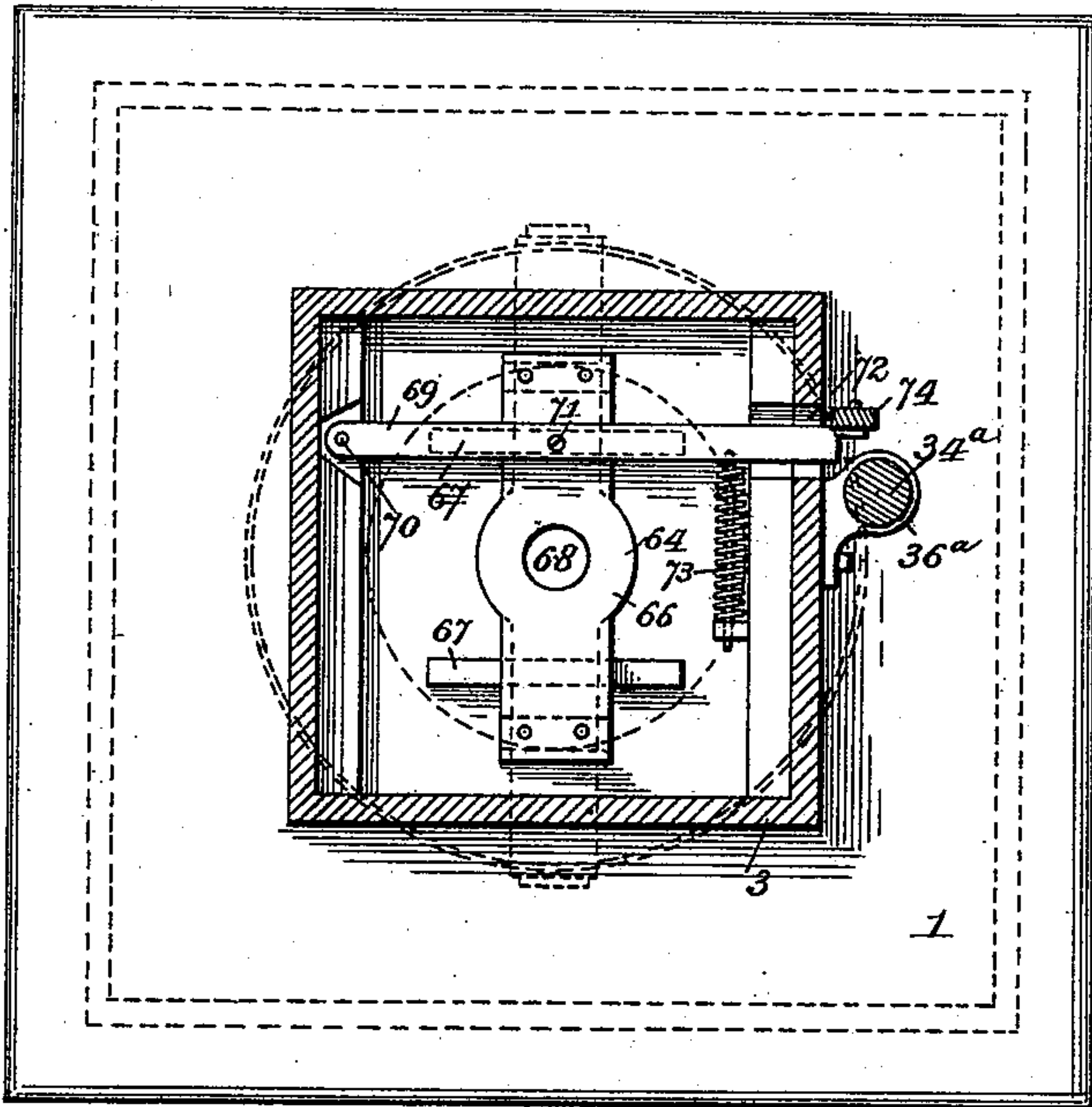


Fig. 4.

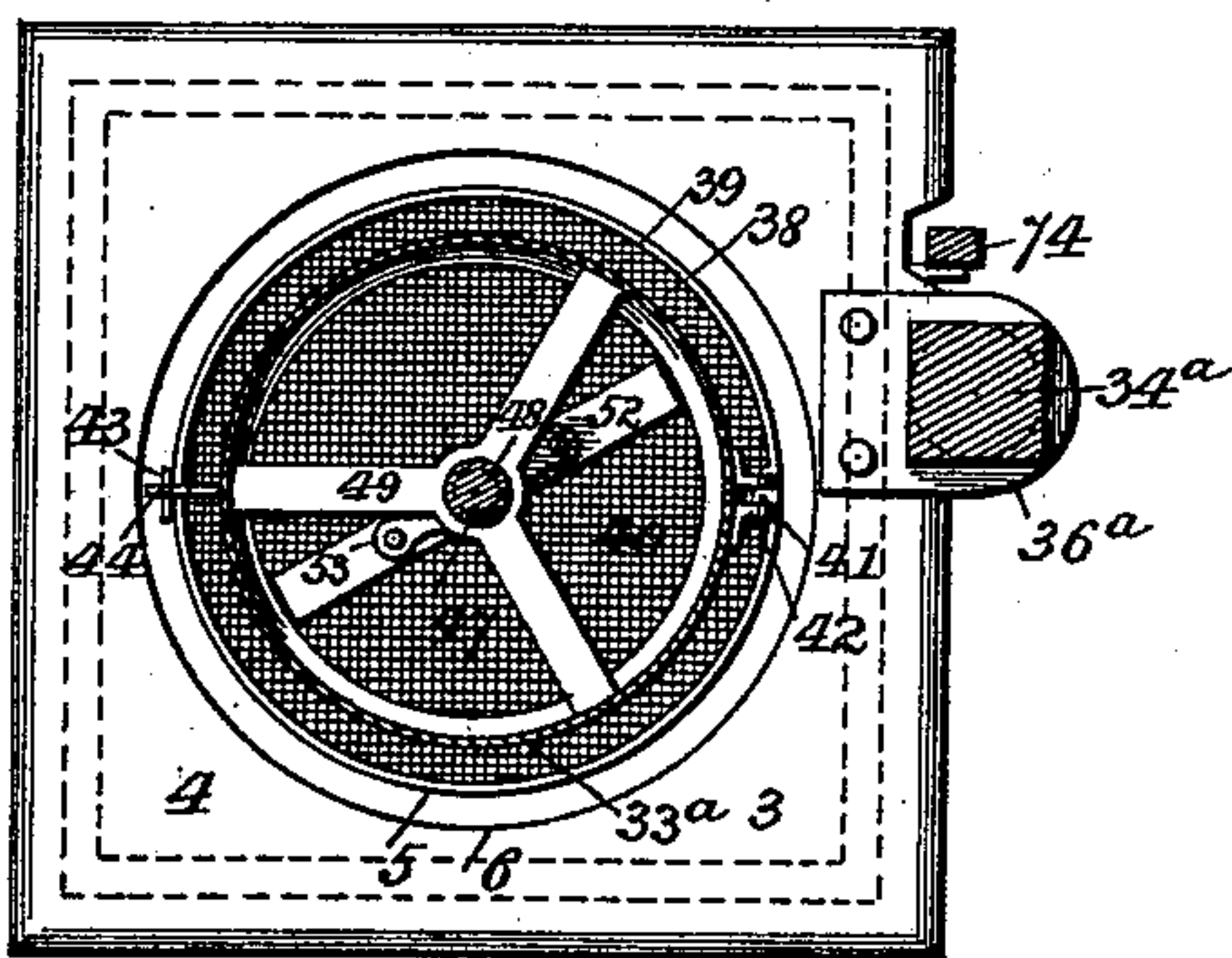
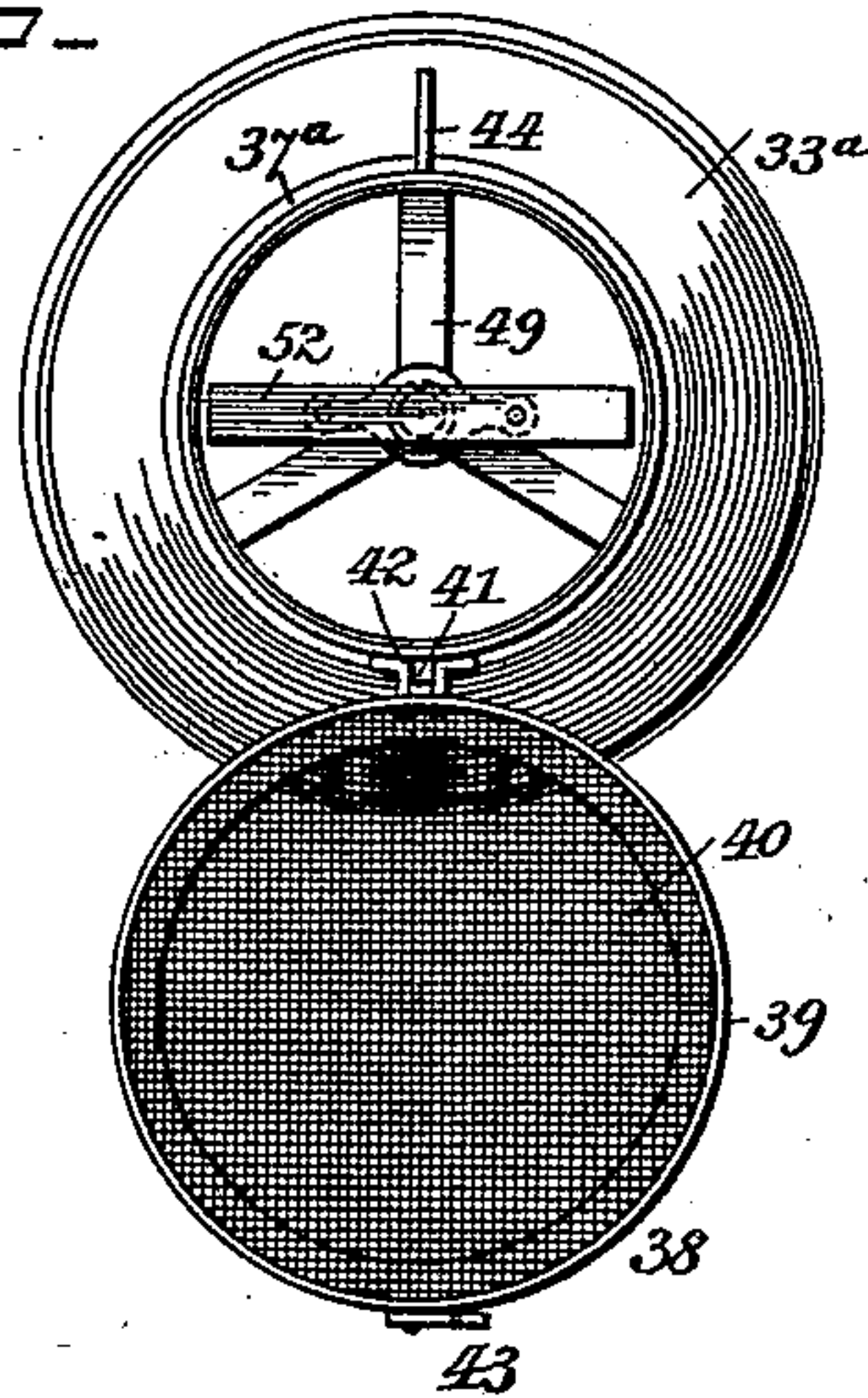


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY H. SCHUMAN, OF TRINIDAD, COLORADO.

DRY GOLD SEPARATOR AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 539,549, dated May 21, 1895.

Application filed March 29, 1894. Serial No. 505,616. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. SCHUMAN, a citizen of the United States, residing at Trinidad, in the county of Las Animas and State of Colorado, have invented a new and useful Dry Gold Separator and Amalgamator, of which the following is a specification.

This invention relates to dry gold separators and amalgamators; and it has for its object to provide an improved machine of this character which shall provide simple and efficient means for separating and collecting gold by the dry process.

To this end the main and primary object of the present invention is to construct a machine for the separation and amalgamation of gold out of the sand, gravel or "pay dirt," without the use of water in working placer mines, thereby effecting a great saving in the gold collected, as well as in the expense of working the mines, especially where water is not obtainable.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a separator and amalgamator machine constructed in accordance with this invention. Fig. 2 is a central vertical longitudinal sectional view thereof. Fig. 3 is a horizontal sectional view on the line *xx* of Fig. 1. Fig. 4 is a similar view on the line *yy* of Fig. 2. Fig. 5 is a bottom plan view of the hopper-bucket, showing the hinged sieve-bottom swung open.

Referring to the accompanying drawings, 1 designates a table stand constructed of material of suitable strength and inclosed at the sides by the casing sides 2, which form a lower casing, and which may be provided with suitable doors or openings for gaining ready access to the interior of the lower casing for the purpose of removing and replacing the parts of the machine located therein, and the lower casing table stand 1, supports in position thereon the smaller box casing 3, which may be of a cylindrical or other suitable shape and rises a suitable height above the table or top of the stand 1, and said box casing 3, is con-

structed in any suitable manner to form an inclosing support for certain parts of the machine and is provided with an inclosing top board 4, having a central opening 5, therein, surrounded by a shouldered edge 6, that forms a support and seat for the upper flanged end 7, of the cylindrical separator box 8, arranged inside of the casing 3.

The separator box 8, is removably supported in position within the upper casing 3, by its flange 7, which rests in the shouldered seat 6, surrounding the edge of the opening 5, and said box is made of copper metal, preferably, and while illustrated and described as cylindrical in form, may be of other convenient shapes adapted for the purpose.

The separator box 8, is contracted at its lower end into a conical or funnel-shaped separating pan 9, that is extended at its apex into the discharge neck 10, which fits in a discharge opening 11 in the top or table of the stand 1, so as to communicate with the interior of the lower casing at the top thereof.

The conical or funnel shaped separator pan 9, of the separator box 8, is provided with a concentric series of interior circular collecting ribs or flanges 12, that are arranged concentric with the neck 11 and are disposed vertically so as to form at different or regularly spaced points on the inner sloping sides of the pan 9, a concentric series of mercury holding gold pockets 13, into which the gold settles and is collected as it is fed together with the sand or gravel through the box 8 and out of the neck 11, and said neck 11, is adapted to removably receive therein a slightly tapered discharge tube 14, which is removably wedged therein from the inside of the box and projects upwardly thereinto to form at the apex of the pan 9, an interior gold pocket 13^a, which corresponds with the other pocket 13, and is somewhat larger than the same to insure a collection of the gold which has passed below the upper pockets.

Removably supported within the upper open end of the separator box 8, is the primary conical or funnel-shaped separating pan 15, that is similar in shape and construction to the pan 9, located at the lower end of the box 8, and the upper or primary pan 15, is provided at its upper flared ends with the off-standing supporting flange 16 that rests on the flange 7 at the upper end of the box 8 and serves

to removably support the pan 15 in position. The upper conical or funnel shaped separator pan 15, is provided at its apex with the tubular discharge neck 17, into which is removably fitted, from the inside, the inwardly projecting slightly tapered discharge tube 18, that forms within the pan 15 at the apex thereof an interior bottom collecting pocket 19 corresponding to the pocket 13^a, of the pan 9, and holding mercury so as to serve to collect and hold any gold that may be separated from the sand or gravel at this point.

The gravel or sand that is fed into the upper separating pan 15 is thoroughly ground up, agitated and sieved by the devices to be hereinafter described, so that the same will pass into the pan 15, in a finely divided state and throughout the entire area thereof, and this pan being made of sheet copper will allow a certain portion of the ore or gold carried by the sand or gravel to run into the pocket 19, while other portions of the gold, together with the finely divided sand or gravel will pass out through the tube 18 into the interior of the box 8, and as the material discharges from the tube 18, the same strikes the apex of the spreading cone 20. The spreading cone 20, is made of smooth sheet metal, preferably copper like the other parts of the machine, and has the point or apex thereof disposed upwardly directly under the discharging point of the upper pan 15, and the lower edge of said spreading cone has projected therefrom a series of spaced supporting feet 21, that rest within the upper flared end of the lower pan portion 9, of the box 8, and serve to removably support the cone in position to deflect or spread the material out to the upper flared end of the pan 9, and as the sand or gravel runs through this pan 9 and out of the discharge tube 14, other portions of the gold are arrested by the ribs or flanges 12, and the tube 14, and are collected in the pockets 13 and 13^a, and the discharge from the pan 9, through the tube 14, strikes the point or apex of the lower sheet metal spreading cone 22, provided at its lower edge with a series of supporting legs 23, that serve to removably support the cone in position within the upper flared ends of the lower conical or funnel shaped separating pan 24.

The lower conical or funnel shaped separating pan 22, is supported within the lower casing or table stand by the pan supporting shelf 25 arranged to slide on the supporting cleats 26 at the inner opposite sides of said stand, and at the apex of the pan the same is provided with the discharge neck 27, that is fitted into the brace block 28, arranged to engage between the cleats 29 at opposite sides of the same, to hold the neck 27 positioned over the bottom discharge opening 30 through which the waste sand or gravel or tailings discharge into the tailings pan 31, arranged within the bottom of the lower casing or table stand under the bottom board 32, in which the bottom discharge opening 30, is formed.

The lower separating pan 24, is also provided with a concentric series of interior collecting ribs or flanges 33, that are disposed vertically to form a concentric series of pockets 34, in which quicksilver or mercury is placed to insure the collection of all gold that has escaped separation in the upper pans, and the neck 27, is adapted to removably receive the slightly tapered discharge tube 36, that projects inwardly within the pan to form at the apex of the same the interior collecting pocket 37, below the plane of and concentric with the pockets 34 in order to secure the complete separation and amalgamation of all gold, while the uncollected sand and gravel passes out through the discharge tube 36, into the pan 31, as tailings, it being seen that the spreading cone 22 serves to evenly distribute or feed the material into the upper end of the said lower separating pan.

Arranged to swing over the upper end of the separator box 8, and the upper pan 15, therein, is the hopper bucket 33^a, which is also of a slightly tapered or conical shape and is designed to receive the gold bearing sand or gravel as it is mined, and said bucket 33^a, is adapted to be securely attached to the turning standard 34^a, by means of one or more brace arms 35^a bolted to said standard and suitably secured to the bucket, and said standard is supported for its turning movement in the upper and lower combined supporting and bearing collars 36^a, secured to and extended from one side of the upper casing 3.

The swinging hopper bucket 33^a is encircled at its lower end by the band or ring 37^a which forms a support and connection for the hinged sieve bottom 38. The sieve bottom 38, consists of a bottom ring or frame 39 in which is fitted a suitable mesh sieve or screen 40, that may be renewed at any time, and said hinged bottom is provided at one side with the hinge or pivot lug 41, that is suitably hinged or pivoted, as at 42, to the band or ring 37^a, and an opposite side is provided with a shouldered pivoted latch 43, that is designed to engage the latch pin 44, projected from one side of the band or ring 37^a, and completing means for removably securing the sieve or screen bottom over the lower open end of the hopper bucket.

A transverse bearing bar 45 is secured across the upper open end of the hopper bucket and is provided with a central bearing 46 to receive the stirring shaft 47, the lower end of which turns in the central bearing 48, of the spider bearing frame 49, fitted within the lower reduced end of the hopper bucket. The stirring shaft 47, has fitted thereto within the bucket at regularly spaced points a series of double stirring blades or knives 50, that extend to both sides of the shaft and are adapted to be carried through the gold bearing sand or gravel to thoroughly stir up and partially grind or pulverize the same in order that it may be put in the best

possible condition for screening through the sieve or screen 40, which serves to separate the larger gravel or stones from the sand and finer particles of gravel, which pass through the several separating devices described, and these stirring blades or knives are held in their separated positions by means of the spacing sleeves 51, interposed between the same.

10 The extreme lower end of the shaft 47, below the bearing frame 39, is adapted to loosely carry thereon the brush bar 52, that works flat on the inner side of the sieve or screen 40. The brush bar 52, has attached to its upper 15 side the perforated bracket plate 53, through which projects the lower extremity of the shaft 41 and which receives the securing pin 54, for properly connecting the brush bar with the shaft, while at the same time making a loose connection so that the brush can work 20 loosely or yieldingly over the sieve or screen in order to brush the dirt or sand into the upper pan 15.

The stirring shaft 47 extends above the 25 bucket 33^a and turns in the bearing 55 at the outer extremity of the standard arm 56 extended from the upper end of the standard 34^a, and on this arm 56 is journaled a horizontal crank shaft 57 carrying at its outer end a 30 crank handle 58 for turning the same and at its inner end a vertical beveled gear pinion 59, that meshes with a beveled gear wheel 60 keyed on the shaft 47, thereby completing a connection which allows the bucket and the 35 gearing therefor to be swung around with the standard 34 as the hopper bucket is moved over and away from the separating devices of the machine.

In order to effect a proper separation of the 40 gold from the sand, it is necessary to provide means for shaking or vibrating the separating pans, and to effect this I employ a shaking frame 61. The shaking frame 61, is provided with the opposite depending arms 62, that 45 embrace upper opposite sides of the lower separating pan 24, and is centrally perforated as at 63, to permit the discharge from the pan 9, to freely pass to the pan 24. The shaking frame 61 is further provided with an up- 50 wardly extended frame portion 64, that works in the slots or openings 65 in the top of the table and has a horizontal portion 66, supported on the strips or cleats 67, which, in fact, support the entire shaking frame, and 55 said horizontal portion 66, is provided with a central opening 68, that embraces the lower contracted portion or neck of the separating pan 9. A shaking lever 69, is pivoted at one end as at 70 to the top of the stand 1, and is 60 also pivoted at an intermediate point as at 71 to the top of the frame 61. The lever 69, has the free end thereof extended through the slot or opening 72, in one lower side of the casing 3, and has connected thereto one end of the 65 retracting spring 73, the other end of which is suitably connected to a stationary point of attachment within the casing 3.

The outer free end of the shaker lever 69, is adapted to be engaged by the lower end of the shaker rod or bar 74, pivotally mounted at an 70 intermediate point in the pivot bracket 75, secured to one side of the standard 34, and the upper end of said rod or bar has pivotally connected thereto the pawl arm 76. The pawl arm 76, is provided with a U-shaped portion 75 77, pivoted on the pin 78, to the rod or bar 74, and adapted to rest on the stop or rest cleat 79, attached to one side of the rod or bar below the pawl arm to prevent it dropping out of position. One end of the pawl arm 76, is 80 adapted to be engaged by the ratchet or cam wheel 80, secured on one end of the shaft 57, and adapted to bear against the pawl arm in a downward direction, a reverse movement of the ratchet or cam wheel simply lifting the 85 pawl arm without operating the rod or bar 74. It will be seen that when the machine is in operation and the ratchet or cam wheel properly working against the pawl arm 76, the lever 69, will be moved in one direction by the 90 rod or bar 74, and as the teeth or projections of the wheel 80 pass the pawl arm, the spring 73, will quickly retract the lever 69, so as to shake or vibrate the frame 61, and thereby cause a shaking or vibrating movement to be 95 given to the separating pans with which the shaking frame is connected and thereby greatly increasing the efficiency of the machine.

The operation of the separating devices has 100 already been detailed, and in reference to the hopper bucket it will be obvious that when the proper time arrives it is simply necessary to swing the same from over the upper pan 15, and to unlock the hinged sieve bottom in order to clean the bucket of large gravel, stones 105 or other matter that will not pass through the sieve or screen.

Changes in the form, proportion and the minor details of construction may be resorted 110 to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is— 115

1. In a machine of the class described, a conical or funnel shaped separating pan having a concentric series of interior collecting ribs or flanges forming a series of concentric collecting 120 pockets, a discharging neck at its apex, and a discharge tube removably fitted in said neck and projecting into the pan to form an interior collecting pocket at the inner end of the neck, substantially as set forth. 125

2. In a machine of the class described, a conical or funnel shaped separating pan having a discharge neck at its apex, a concentric series of interior circular ribs or flanges forming collecting pockets, a discharge tube adapted to 130 be removably fitted within the inner end of the discharge neck and projecting into the pan to form a surrounding gold collecting pocket, a spreading cone removably supported within

the flared end of said pan, and a vibrating frame rigidly attached to said pan substantially as set forth.

3. In a machine of the class described, a vertically aligned series of conical or funnel-shaped separating pans having depending discharge necks at their apices, and inwardly projecting discharge tubes removably fitted within said discharge necks, substantially as set forth.

4. In a machine of the class described, the combination with a suitable casing; of a separator box removably supported within the upper portion of said casing and provided with a conical separating pan at its lower end having a bottom discharge and a concentric series of circular gold collecting pockets, an upper conical or funnel shaped separating pan removably supported within the upper end of said separator box and having a discharge opening at its apex, a spreading cone removably supported within the separator box below the upper pan, a lower conical or funnel shaped separating pan removably supported within the lower portion of the casing and provided with a concentric series of collecting pockets and a discharge opening at its apex, a spreading cone removably supported within the upper flared end of the lower pan, and a swinging hopper bucket arranged over said upper pan substantially as set forth.

5. In a machine of the class described, the combination with a vertically aligned series of bottom discharging separating pans; of a swinging hopper bucket arranged to swing over the upper one of said pans and provided with a sieve or screen bottom, substantially as set forth.

6. In a machine of the class described, the combination with the casing, the upper portion of which is provided with off-standing vertically aligned bearing collars; the separating devices arranged within the casing, a revoluble standard mounted to turn in said collars, and a hopper bucket secured to said standard and provided with a sieve or screen

bottom adapted to be swung over and away from the upper end of said separating devices, substantially as set forth.

7. In a machine of the class described, the combination with the casing and the separating devices therein; of a hopper bucket supported for a swinging movement over the upper end of said separating devices and the casing inclosing the same, stirring devices arranged within the bucket, and a sieve or screen bottom hinged to the lower end of the bucket, and a securing latch for said hinged bottom, substantially as set forth.

8. In a machine of the class described, the combination with the casing and the separating devices therein; of a hopper bucket supported for swinging movement and having a sieve or screen bottom, a stirring shaft journaled vertically within said bucket, a series of parallel double stirring blades or knives secured on said shaft, and a brush bar loosely connected to the lower extremity of said shaft and working over said sieve or screen bottom, substantially as set forth.

9. In a machine of the class described, the combination with the adjacent conical separating pans; of a shaking or vibrating frame rigidly connected with the adjacent ends of said pans, a spring-retracted shaker lever pivotally connected at one end to a fixed point of attachment and at an intermediate point to said shaking or vibrating frame, a shaker rod or bar arranged to have one end play against one end of said shaker lever, a pawl arm pivotally connected to the upper end of said rod or bar, and a suitably operated ratchet or cam wheel arranged to play against one end of said pawl arm, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HENRY H. SCHUMAN.

Witnesses:

J. O. PACKER,

EDWIN B. FRANKS.