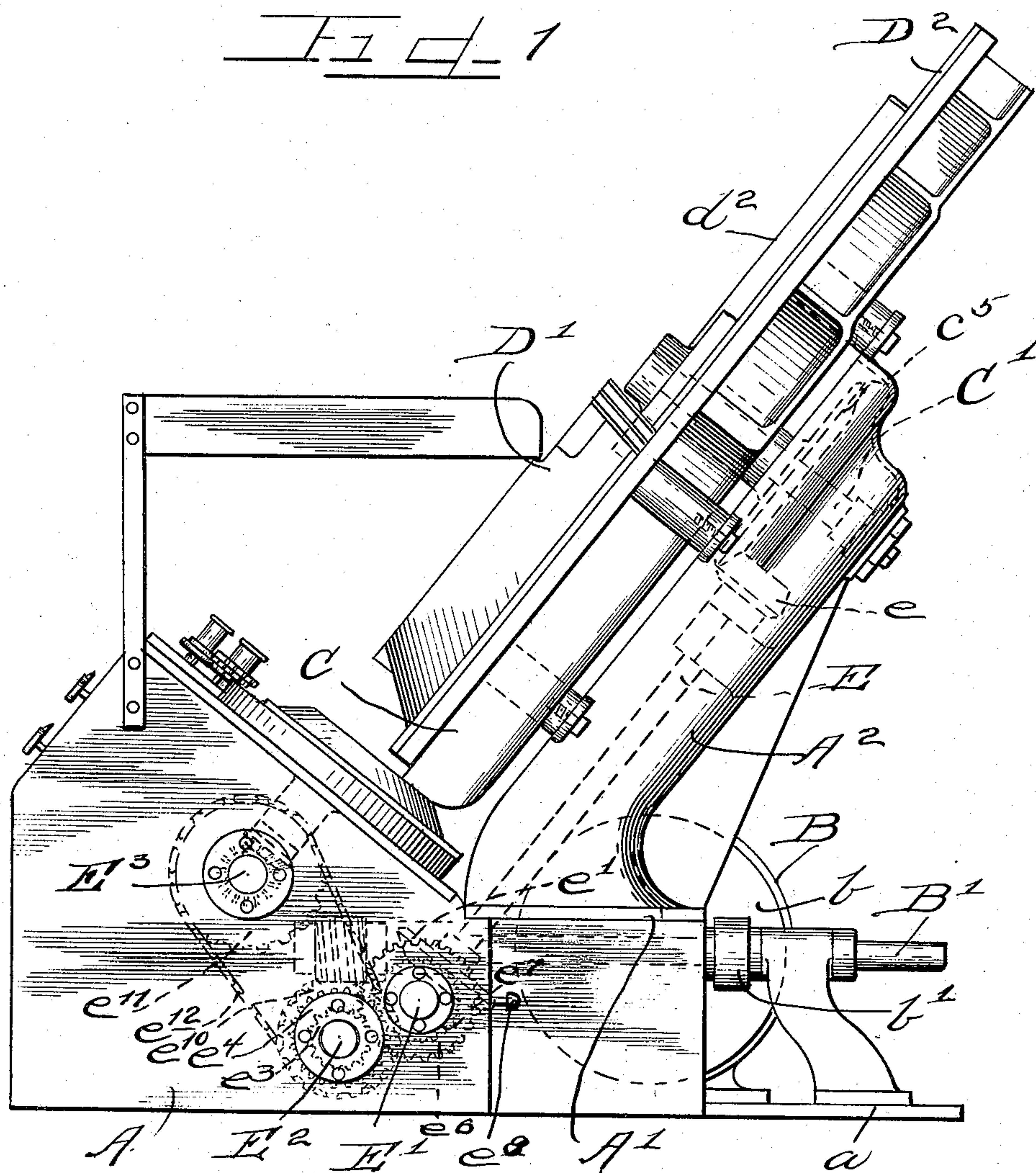


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 COIN SEPARATOR AND COUNTER.
 APPLICATION FILED JULY 15, 1907.

915,965.

Patented Mar. 23, 1909.

7 SHEETS—SHEET 1.



WITNESSES
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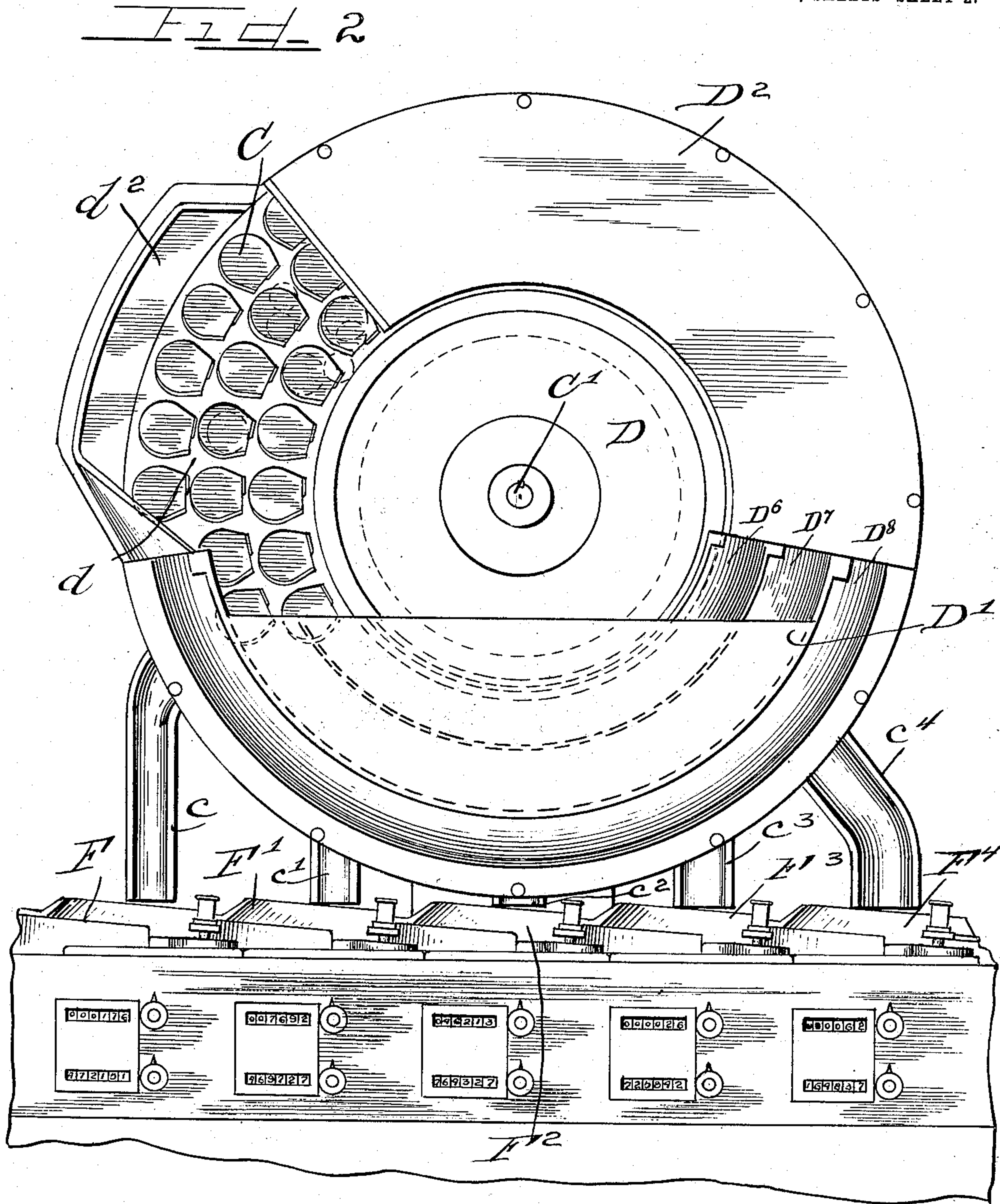
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7 SHEETS—SHEET 2.



WITNESSES
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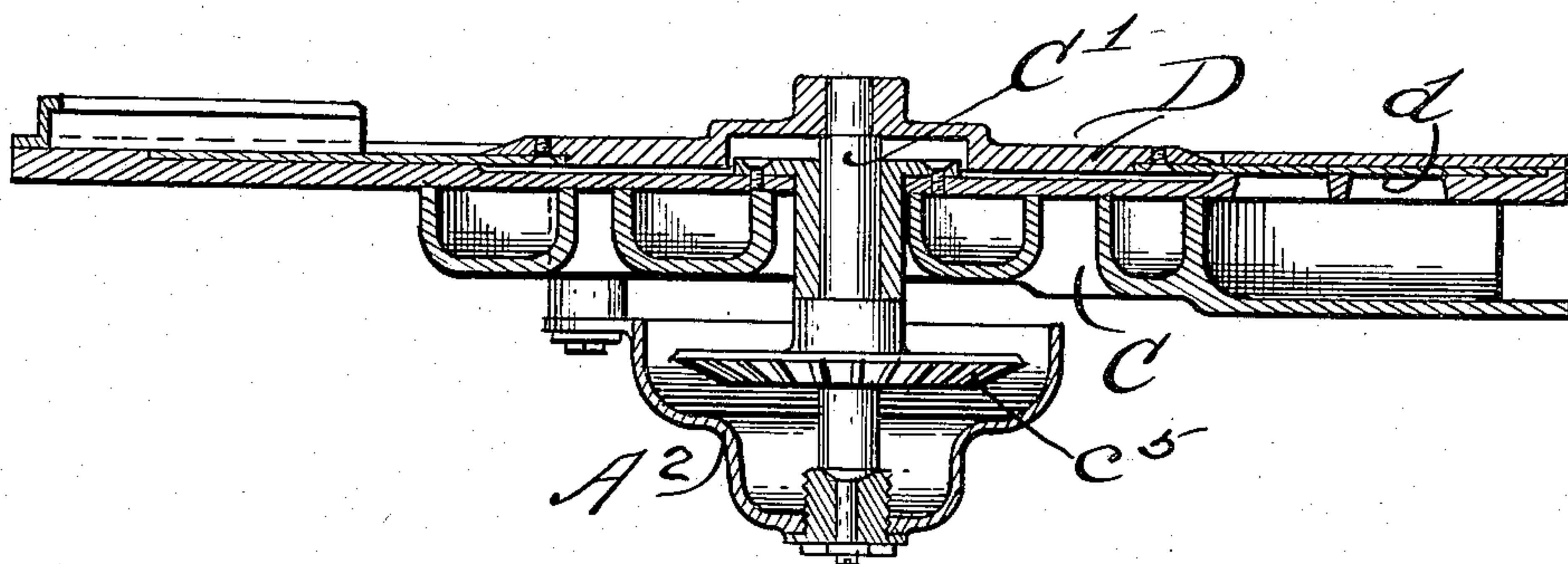
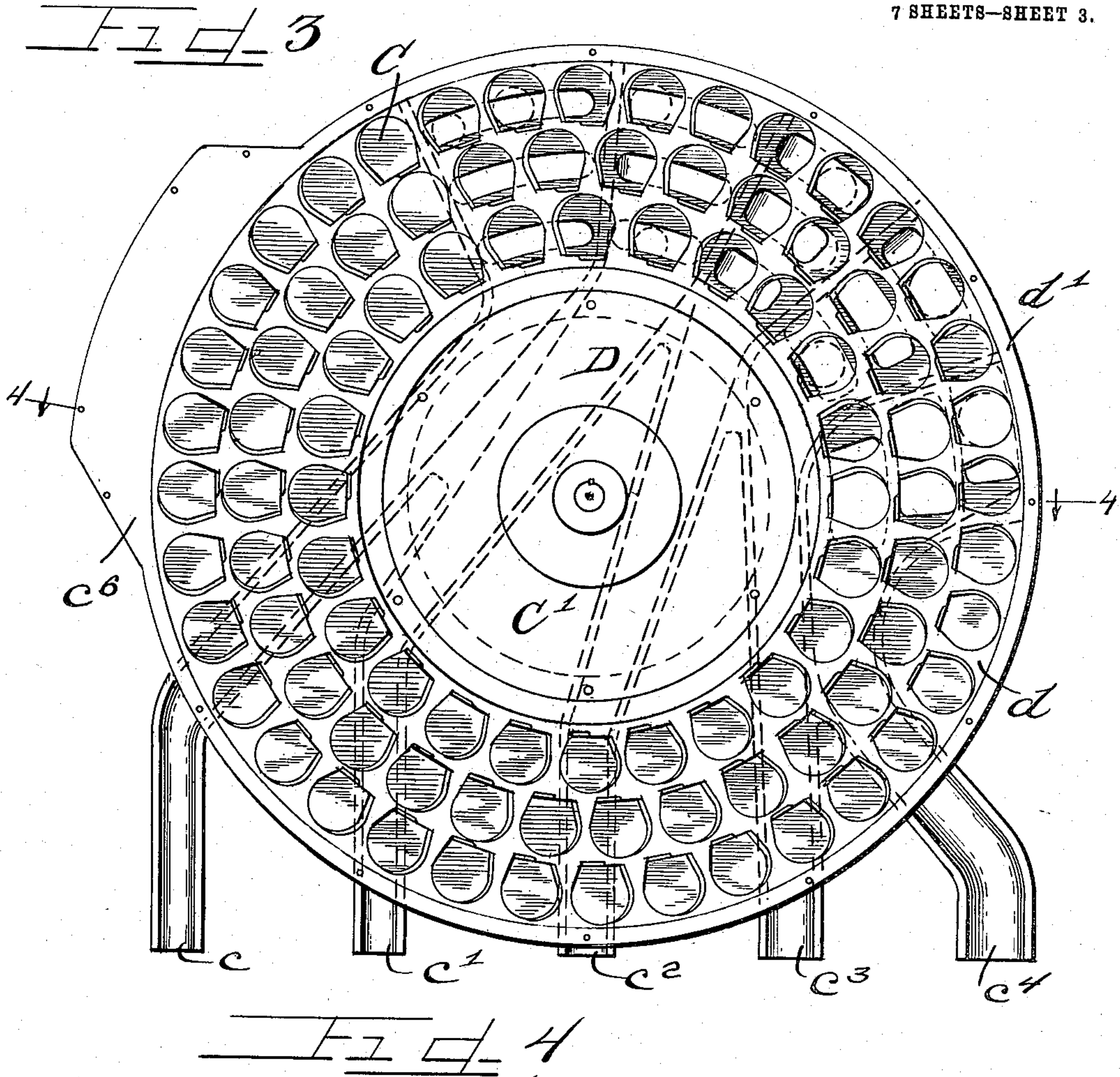
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915,965.

Patented Mar. 23, 1909.

7 SHEETS—SHEET 3.



WITNESSES
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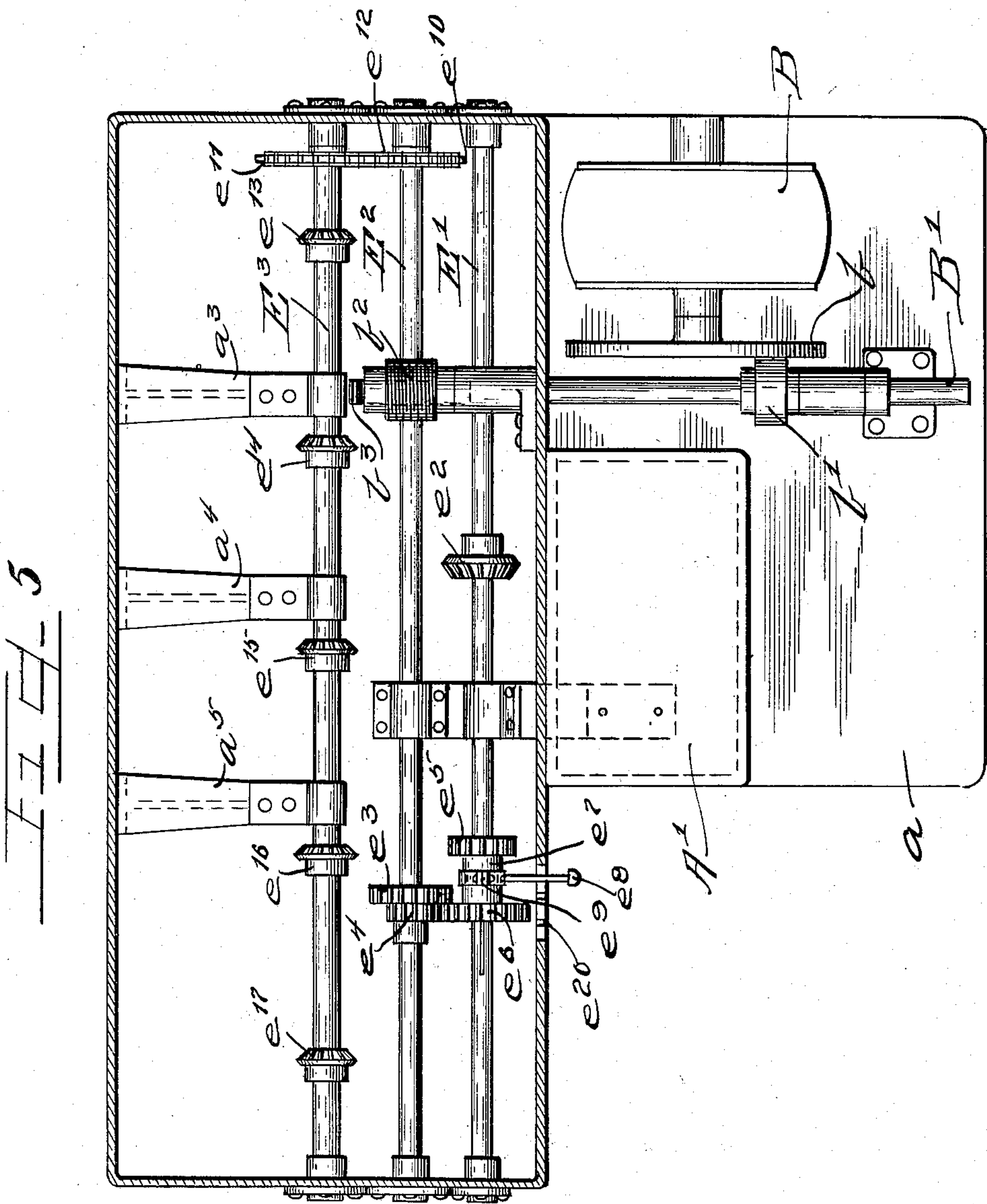
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7 SHEETS—SHEET 4.



WITNESSES

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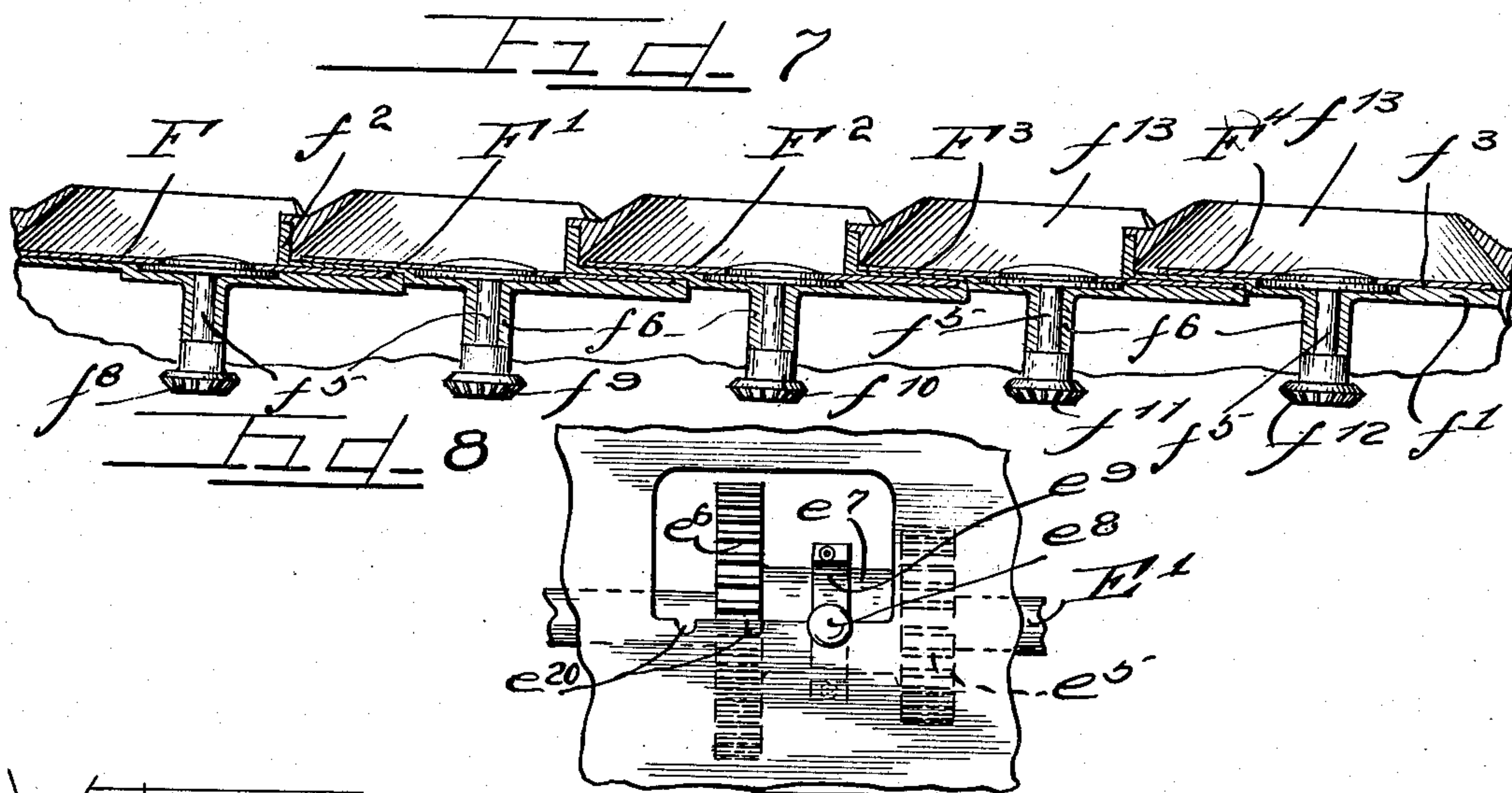
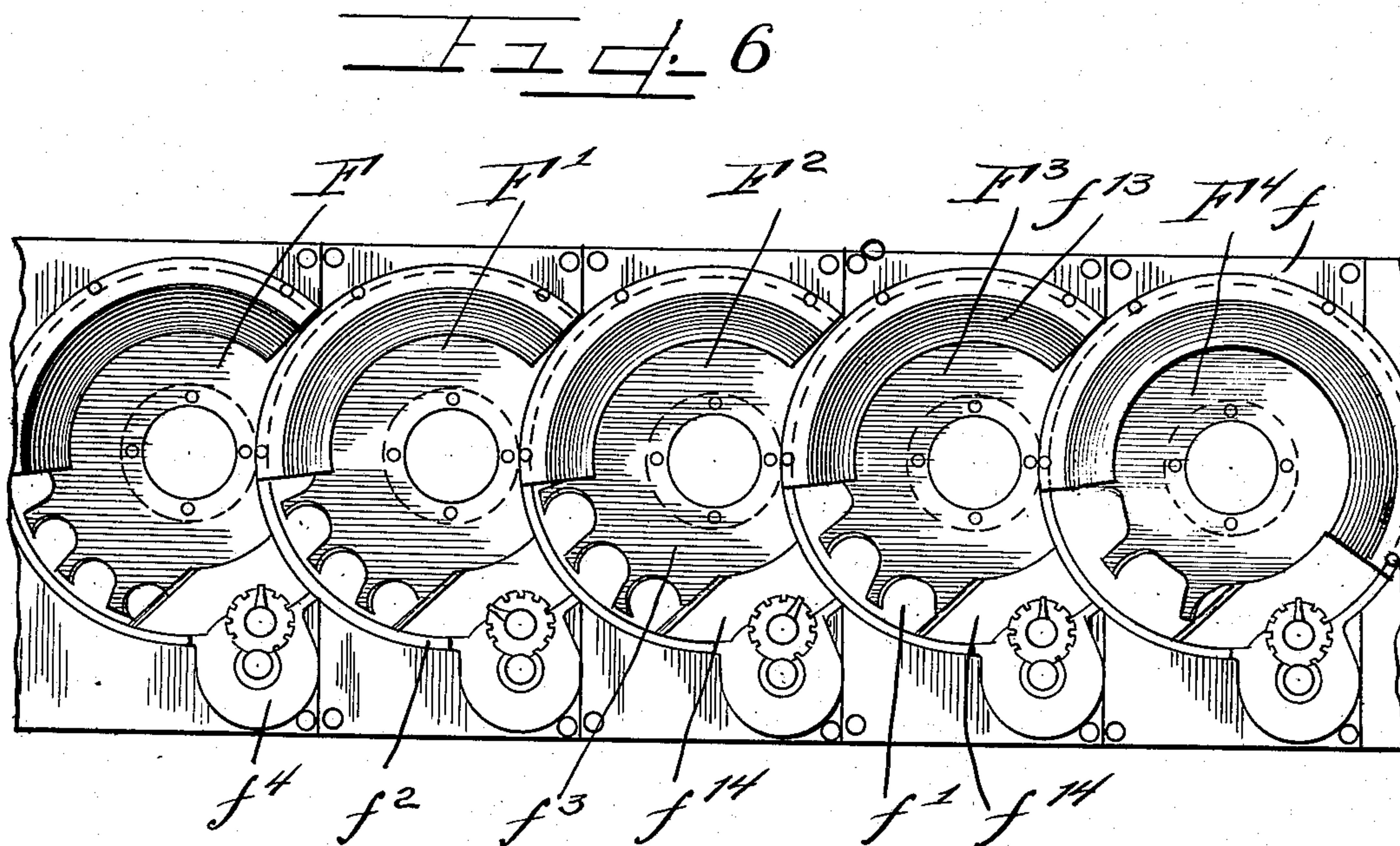
ATTY.

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 APPLICATION FILED JULY 15, 1907.

915,965.

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7 SHEETS—SHEET 5.



WITNESSES

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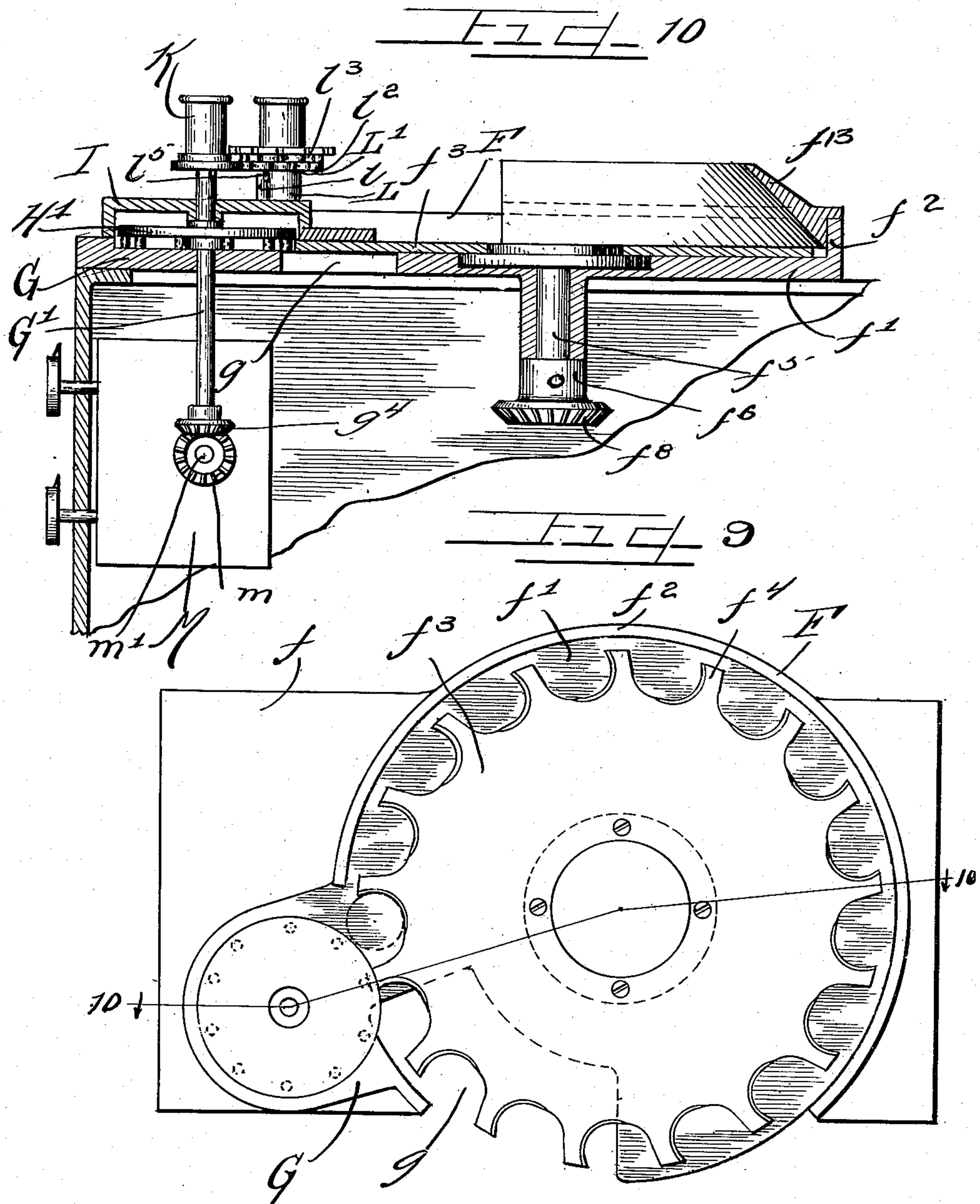
Att'y.

J. M. JOHNSON.
 COIN SEPARATOR AND COUNTER.
 APPLICATION FILED JULY 16, 1907.

915,965.

Patented Mar. 23, 1909.

7 SHEETS—SHEET 6.



WITNESSES

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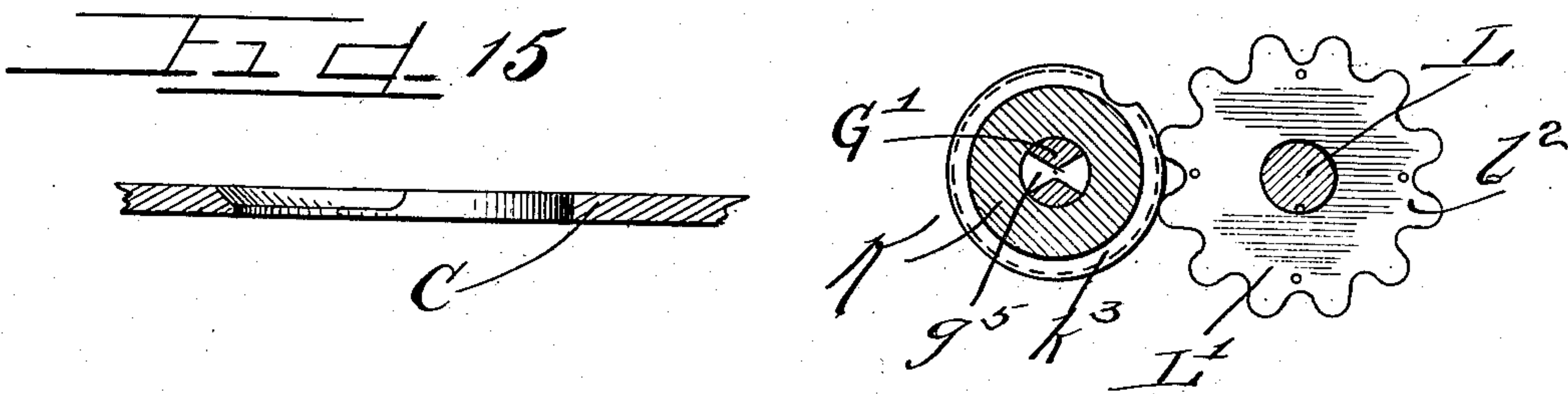
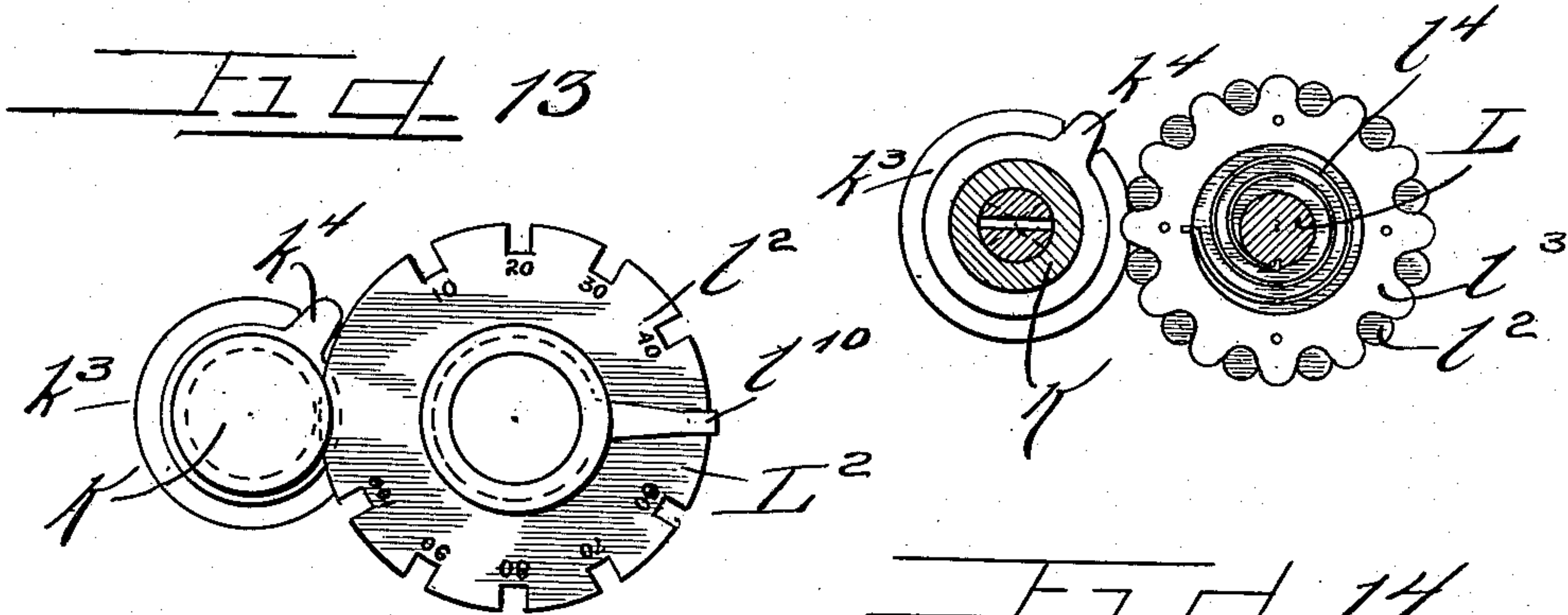
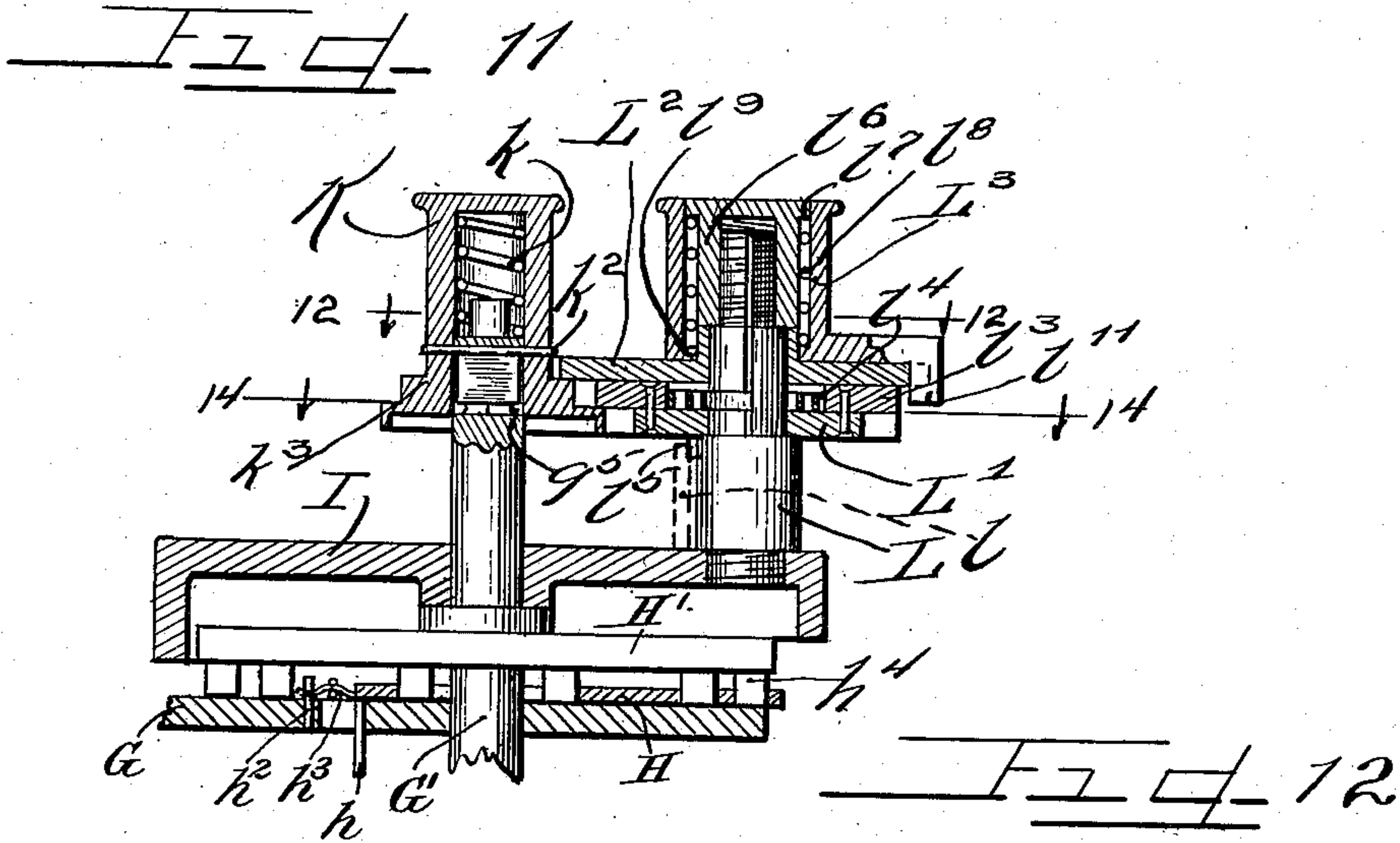
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 Charles A. Rice

ATTY

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 APPLICATION FILED JULY 15, 1907.

915,965.

Patented Mar. 23, 1909.
 7 SHEETS—SHEET 7.



WITNESSES
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UNITED STATES PATENT OFFICE,

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COIN SEPARATOR AND COUNTER.

No. 915,965.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed July 15, 1907. Serial No. 383,933.

To all whom it may concern:

Be it known that I, JAY M. JOHNSON, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, and whose post-office address is 251 South Jefferson street, Chicago, Illinois, have invented certain new and useful Improvements in Coin Separators and Counters; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in coin handling machinery of that class set forth in the prior patent issued to me for coin counter on the second day of May, 1905, and numbered 788,585. Machines embodying the invention stated in said prior patent are capable of counting coin of but one denomination for each machine. In consequence it was necessary if all denominations of coins were to be counted to provide a counting head for each denomination thus necessitating a considerable expenditure of money and the number of separate and distinct machines occupied considerable space. The coins had first to be sorted into their various denominations inasmuch as coins of different sizes would clog the machine resulting unavoidably in delaying and might cause error in the count.

The object of this invention is to provide a machine to which the coin may be delivered indiscriminately mixed and in any desired quantity and whereby the coin are separated to their various denominations and delivered into separate compartments from whence the same are passed automatically to the counting mechanisms and each denomination counted separately though simultaneously.

The invention embraces also a recording mechanism whereby the count of the various coins of various denominations is separately recorded, and whereby the number of coins of any particular denominations passed through the machine may be instantly read by inspection.

It is also an object of the invention to provide mechanism whereby the various counters may each or all be set to count serially a desired number for the purpose of enabling the coin to be delivered for packages.

It is finally an important object of the invention to provide in compact form a combined separating, counting and recording machine whereby the counting of coin may be reduced to the least possible expenditure of time and energy and whereby a mistake in the count is a mechanical impossibility.

The invention embraces many novel features and consists in the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a front elevation thereof partly broken. Fig. 3 is a similar view of the assorting and separating mechanism showing the same detached from the counter and base. Fig. 4 is a section on line 4—4 of Fig. 3. Fig. 5 is a horizontal section through the base of the frame to illustrate the driving mechanism of the assorting and counting mechanisms. Fig. 6 is a top plan view of the counting mechanisms. Fig. 7 is a longitudinal section taken through the counting mechanism showing the same separated from the driving shaft. Fig. 8 is an enlarged detail view of a part of the shifting mechanism for varying the speed of the separator. Fig. 9 is an enlarged detail view of one of the counting heads showing the same in plan view. Fig. 10 is a section taken on line 10—10 of Fig. 9. Fig. 11 is an enlarged detail section taken through the set back and stop mechanisms. Fig. 12 is a section taken on line 12—12 of Fig. 11. Fig. 13 is a top plan view of the same. Fig. 14 is a section taken on line 14—14 of Fig. 11. Fig. 15 is a fragmentary view of the separating plate.

As shown in the drawings: A indicates the base, which may be constructed in any desired form, manner or size to contain the actuating mechanism. As shown in Figs. 1 and 5 said base is constructed to afford a strong frame, for the support of the various actuating mechanisms, and which at its rear side is provided with a rearwardly directed flat bed *a* upon which is secured the driving motor B, shown as an electrical motor.

Near the middle of the frame as shown in Fig. 5 is provided a flat raised pedestal or base A', to which is rigidly bolted or otherwise secured an upwardly and rearwardly directed and inclined standard A² shown in Fig. 1. At the top of said standard is rig-

idly secured an inclined plate C, which is cored on the rear side to provide a plurality of channels equal in number to the number of denominations of coins it is desired to count by said machine. Said channels diverge from near the top of said plate and extend downwardly to afford tubes c — c' — c^2 — c^3 — c^4 each adapted to receive and to deliver therefrom but one denomination of coin respectively. Said plate as shown is slotted in its face equal distances from the center to provide a plurality of slots opening into the enlarged upper end of each tube. Said slots successively increase in width vertically for the different tubes the first or those opening into the tube c being of a width to permit a dime or the denomination of coin of the smallest size to fall therethrough into said tube. Those opening into the tube c' next beyond the tube c in the direction of travel of the coin of a size for the next larger coin, and those opening into the tubes c^2 — c^3 — c^4 are successively of greater width permitting each the passage of but a single denomination of coin therethrough into its respective tube. Journaled in said bracket or standard A^2 and in a suitable bearing in the plate C is a shaft C' provided at one end within said standard with a beveled gear c^5 , for driving the same. Secured on the outer end of the shaft and resting flat against the plate C, is a separating wheel having a diameter approximately coincident with the diameter of the plate C and comprising a central hub and plate D integral therewith around the periphery of which is rigidly secured by means of screws or otherwise, a thin plate d , which is provided with apertures closely arranged in lines concentric with the shaft as shown in Fig. 3, and registering with the slots in the plate C and as shown in Fig. 3 of sufficient size to receive therein the largest denomination of coin to be counted. Said apertures as shown are rounded or semi circular on the side adjacent the periphery of the wheel and on the inner side or that adjacent the center of the disk wheel are shaped to afford an approximately straight line. At the rear edge of each aperture and from the forward edge along the bottom of each aperture or the edge adjacent the center, the plate or wheel is reduced in thickness to approximately the thickness of the thinnest coin to be counted. As the plate or wheel is revolved by said shaft the coins are carried upwardly thereby inclining against the plate C and the coins fall successively through the slots in the plate C in the order of their size and into the appropriate coin tubes.

Removably secured on a raised peripheral flange d' on the face of the plate C and enclosing the bottom of said revolving separating plate d is a hopper D' adapted to receive the coins therein in bulk or troughs D^6 , D^7 and D^8 may be provided. Said hop-

per extends upwardly to near the middle of the separating plate or wheel and partly around the side thereof along which the coins are swept upwardly before separating. A lateral extension d^2 of the hopper is rigidly though removably secured to an extension c^6 , on that side of the slotted plate C. From the upper edge of said lateral hopper d^2 and covering the plates C and d to the opposite side of the hopper D' is a close fitting plate D^2 . The coins when dumped into said hopper D' fall into the apertures in the plate or wheel which serve as pockets and resting flat against the back plate C which serves as the bottom of said pockets are carried upwardly by the rotation of said plate d to successively drop in the order of their size through the slots in said back plate C. The coin are thus separated and delivered into the respective coin tubes c to c^4 inclusive, each of which is appropriated to a particular denomination of coin and from said tubes said coins are delivered to the counting mechanism to be counted and registered. As shown the shaft C' of said separating wheel d is driven by means of beveled pinion e secured upon a shaft E journaled in and longitudinally of the standard A^2 as shown in dotted lines in Fig. 1. Said beveled pinion e intermeshes the gear c^5 and on the lower end of said shaft E is secured a beveled gear e' which meshes with a beveled pinion e^2 , rigidly secured on a shaft E' , journaled horizontally and longitudinally of the base frame, as shown in Fig. 5 and in dotted lines in Fig. 1. Said shaft E' as shown is driven from the motor B. For this purpose a friction disk b is secured on the shaft of the motor and engages a complementary friction member b' on a transverse shaft B' . This shaft B' extends within and is journaled in the base frame and is provided at its inner end with a worm b^2 which meshes with a worm gear b^3 on a shaft E^2 journaled at the end of the frame and parallel the shaft E' , and also parallel a corresponding shaft E^3 , from which are driven the counters. Rigidly secured on the shaft E^2 are a large and a small gear e^3 and e^4 and slidably secured on the shaft E' are complementary gears e^5 and e^6 , which are rigidly connected together and adapted to engage respectively and intermesh with the gears e^3 and e^4 on the shaft E^2 thereby enabling the separator shaft E to be driven at a relatively high or a relatively low rate of speed as desired dependent upon the pair of said gears that are in mesh. As shown said gears e^5 and e^6 are connected by a sleeve e^7 splined on the shaft E' and a lever e^8 is secured thereon by means of a collar e^9 in which the sleeve rotates. Said lever extends outwardly through the side of the base frame and is adapted for manual engagement to permit the gears to be shifted longitudinally

of the shaft E' . As shown notches c^{20} are provided in said frame to receive said lever at the respective stations for engaging either or neither of said pairs of gears in mesh as shown in Fig. 5. The driving shaft E^3 , for the counters is also actuated from the shaft E^2 . For this purpose sprocket wheels e^{10} and e^{11} are engaged on the shafts E^2 and E^3 , and connected by a sprocket chain e^{12} . Secured on said shaft E^3 at equal distances apart are beveled pinions e^{13} to e^{17} inclusive. As shown the driving shaft E^3 for the counters is also journaled at intervals in its length between said pinions in suitable brackets a^3 — a^4 — a^5 which hold said shaft at all times in alinement and prevent springing thereby preventing the beveled pinion from being thrown out of mesh with the coacting gears driven thereby.

The top of the base beneath the separating mechanism is inclined at an angle from the horizontal sufficient to bring the same approximately at a right angle with the plane of said separator plate or wheel and supported on the inclined top of said frame as shown are counting heads F , F' , F^2 , F^3 and F^4 corresponding in number with the number of coin tubes and each adapted to receive and count the coins delivered thereto from its tube. Each of said counting heads as shown is secured on a base plate f adapted to be rigidly bolted on the top of said base frame as shown in Fig. 6, affording a cover therefor. Said counting heads as shown are slightly inclined toward the right of the machine so that one edge of the successive circular heads or tables f' overlap the adjacent edge of the other for the purpose of economizing space. Partly surrounding each of said flat circular bed plates or tables f' is a peripheral rim f^2 and secured thereon at the lower side of the bed is an inwardly directed upwardly inclined plate which affords a hopper f^{13} to receive the coin from the coin tube. Rotatively secured on said flat bed plate or table f' concentric therewith is a coin carrying wheel f^3 . This as shown is provided on its periphery with radial teeth f^4 which are hooked slightly forwardly as shown in Fig. 9 and the throats of which are wide and of a depth that a coin of the denomination delivered thereto will project beyond the tooth. The front or engaging edge of each tooth as shown is reduced in thickness to approximately that of the thinnest coin to be carried thereby. Said teeth may be of any desired number and extend somewhat closely to the raised flange f^2 the distance of course varying somewhat for the different heads dependent on the size of the coin to be carried thereby. Each of said coin carrying wheels is rigidly secured upon a shaft f^5 journaled in a downwardly directed bearing sleeve f^6 integral as shown with the base or bed plate f' and at its lower end each is provided with a beveled pinion f^8 to f^{12} in-

clusive which mesh with the beveled pinion e^{13} to e^{17} inclusive on the driving shaft E^3 for the counting heads.

From the construction described it is evident that the coin carrying wheels act continuously as does also the separator, both being driven from the same source of power.

As shown the bed plate which serves as a coin tray, overlaps and rests flat on the carrying wheel next adjacent thereto and a separating blade f^{14} rests flat on said carrying wheel at the top of the tray and is provided with a sharp obliquely directed edge against which the carrying wheel rotates and which acts to prevent more than one coin being carried beneath the same by any tooth.

Integrally connected with the coin tray bed or table f' near the discharge aperture g and affording an extension in the same plane therewith is a plate or table G which is shown circular in shape, and affords a support for a part of the actuating and registering means for the registering and counting mechanism. Extending through said plate G as shown beyond the periphery of the coin tray parallel the shaft f^5 is a rotatable counting shaft G' . Slidably secured on said plate G is an escapement or detent H which is longitudinally slotted to receive the shaft G' and a pin h is set in said plate. Said detent is at a level with the coin carrying wheel and projects toward and sufficiently near the same for its end to be positively engaged and forced rearwardly by each passing coin carried by said wheel. A pin h^2 is secured in the base G and a pushing spring h^3 is secured on said plate and bears against the end of said detent and against said pin h^2 and acts to hold the same normally in its forward position to be engaged by the coin.

Rigidly secured on the register shaft G' above the detent H is an escapement wheel H' provided with downwardly projecting teeth h^4 ten in number arranged equal distances apart near its periphery and between which the escapement detent H projects normally to lock said registering shaft from movement. A register M of any suitable kind as shown such as set forth in my prior application for patent filed August 13, 1906, Serial No. 330,277, arranged to indicate by tens to any desired number is secured in the base frame below each register shaft G' and the beveled pinion m thereon is driven from a beveled gear g^4 of equal size thereby actuating the shaft m' of the register.

The escapement wheel is inclosed in a housing I through which extends the shaft G' the end of which is slotted longitudinally and provided at the bottom of the slot with a groove g^5 extending transversely thereof. Yieldingly supported upon the upper end of said shaft by means of a spring k which bears on the end of said shaft and in the top thereof is a cap K' provided with a pin k^2 extend-

ing therethrough and through the slot. The lower end of said cap is enlarged to provide an integral friction wheel or pulley k^3 , having a downturned peripheral flange and above the friction wheel is provided a finger k^4 which projects beyond the periphery thereof. Beneath said finger said flange is omitted.

A stud shaft L parallel the shaft G' is secured on the casing and provided on one side thereof is a stop l secured on said casing I parallel the shaft G'. A rotative element comprising a wheel L' provided with twelve equally spaced peripheral teeth l^2 having round points and affording rounded notches between the same is secured on said shaft L and is of a diameter to bring two of said teeth normally in bearing contact with the flanged periphery of the friction pulley k^3 on the register shaft. A corresponding wheel l^3 having the same number of teeth is rigidly secured thereon so that the teeth of one registers with the notches in the other. A concentric channel is provided around the shaft within said wheel l^3 in which is secured a strong spring l^4 one end of which is engaged in a suitable groove in the side of the stud shaft L and the other end of which is engaged in a notch in the inner periphery of said wheel as shown in Fig. 12. Said spring acts normally when rotated to return the wheels to the starting position which is determined by a pin l^5 set in the wheel L' to engage the stop l on the stud shaft.

Rigidly secured on the two wheels, just described, is a wheel or dial L² provided about its periphery as shown with notches corresponding with the teeth on said wheel L' and which are marked respectively from 10 to 100 by tens having a space of twice the usual distance between two notches between the ten and the hundred notch. The upper end of the shaft L is reduced in diameter and threaded to receive a nut l^6 on which as shown is a peripheral flange l^7 at its upper end to afford a stop for a spiral spring l^8 which engages around said nut and at its lower end bears against an inwardly turned flange l^9 of a sleeve L³ which fits around the nut l^6 and bears on the dial L². Said sleeve is provided on one side at its bottom with an arm l^{10} having a downturned end l^{11} which is capable of engagement in any of the notches of the dial plate L², and serves also as a stop therefor by engaging against the cap K at the completion of the count indicated by the notch on the dial in which the said arm is engaged.

The operation is as follows: The coins are delivered into the respective counter trays from the appropriate tube and fall or slide to the lower side of the tray where they are engaged and swept singly by the teeth on the carrying wheel around the periphery of said tray and are brought successively into con-

tact with the sliding detent H' which normally holds the escapement wheel from movement. This is pushed back by the coin which next engages the adjacent tooth h^4 on said wheel, rotating said wheel and all parts driven thereby one space or one-tenth of a revolution. As the coin slips past the escapement detent to the discharge aperture g the detent slides forwardly and engages the next succeeding tooth h^4 on said escapement wheel affording an effective lock to prevent a greater movement of said wheel and register shaft than one-tenth of a revolution. For the purpose of facilitating the return movement of said detent when the coin has passed, the rear corner of the same is cut away to afford an incline which permits the detent to slide down into locking position immediately after the coin has passed. In counting the various coins in bulk or in large quantities the head K is pressed down engaging the pin k^2 therein in the groove of the bottom of the slot, in the shaft G'. This brings the finger k^4 out of engagement with the toothed wheels L' and l^3 and enables the shaft G' to rotate continuously and without affecting the stop mechanism. When it is desired to count serially the head is elevated bringing the finger k^4 into position to engage the wheel l^3 which normally under the action of its spring, stands with the stop l^5 engaged with the stop l and with the one hundred and the ten notches on the dial wheel L² are on opposite sides of the line drawn between the shafts G' and L. Having adjusted the arm l^{10} so that its detent l^{11} engages in the notch in the dial indicating the number of coin it is desired to count serially, as for instance 50 as shown in Fig. 13, the rotation of the coin carrying wheel brings the coin against the escapement detent retracting the same and rotating the escapement wheel and the head K and as said head completes one revolution, the finger k^4 thereon engages a tooth of the wheel l^3 rotating the same one tooth or one tenth of a rotation. This is possible for the reason that the flange is omitted beneath the finger k^4 permitting the tooth l^2 of the brake wheel L' to enter the notch in the flange as the finger engages a tooth of the wheel l^3 to rotate the dial a part of a revolution. This is repeated until the shaft G' has revolved five (5) times, bringing the end of the arm l^{10} in contact with the end of the head K and rigidly locking the mechanism from action. The head may now be pressed downwardly to release the finger k^4 whereupon the spring l^4 acts instantly to return the dial to its starting position as shown in Fig. 12. In the same manner should the detent l^{10} be adjusted in any of the other notches, the count will be completed to the exact number indicated in the notch in the dial, and the machine will then lock but will automatically

set back the dial by merely pressing down the head K preliminary to another count. In setting back the register the detent is retracted out of engagement with the teeth h^4 on the escapement wheel H' by means of the pin which projects through the plate G and the head K is pushed down to release the finger h^4 from the toothed wheel L'. The counting shaft G' can now be rapidly rotated with the fingers to set back the register. In separating the coin mechanically and actuating the various counters heads the single motor drives all the heads but of course except when coins are in the counting tray the carrying wheel of any head revolves only, and the counters do not work. The counted coin may be delivered into separate bags or may be collected and put up in packages as serially counted and this may be done either mechanically or manually. For counting previously assorted coins the lever e^8 may be shifted to throw the gears on the shafts E'—E² out of mesh and the coin may be then delivered into the desired coin tray manually. While I have described my invention as adapted for the separating and the counting of coin it of course may be used to separate and to count other articles and various details of construction and operation may be modified without departing from the principles of this invention.

I claim as my invention:—

1. In a machine of the class described, the combination with a rotary carrying element having concentric lines of pockets therein, each to receive a single coin indiscriminately from a mass, of coin tubes, one for each denomination, and each provided in the top thereof with a plurality of radially disposed slots one beneath each line of pockets and the slots of successive tubes increasing in width to receive the coins selectively as to size thereby separating the coins.

2. In a separating machine the combination with a backing plate of a movable element slidable thereon and having apertures therein, each adapted to contain but one of the articles to be separated from a mass, radially alined groups of slots in the backing plate registering with the apertures in the movable element and each group adapted to receive but one size of the articles to be separated therethrough, the slots of each group being of greater width than the slots of the preceding group and a tube for each group adapted to receive therefrom but a single size of coin.

3. In a machine of the class described the combination with an inclined rotative carrying element having concentric rows of apertures therein adapted to receive a coin in each aperture, of a stationary member provided with radially alined slots adapted to receive the coins selectively as to denomi-

nations from the carrying element, and spouts connected therewith one for each size of coin and into which the separated coins are selectively delivered.

4. In a coin separating machine the combination with a hopper adapted to contain the mixed coin, of a carrying element having apertures in rows therein each adapted to contain but a single coin, coin tubes one for each denomination of coins and having slots therein for each row of apertures and differing in size in different tubes and over which the coins are moved by the carrying element permitting those of the same size to fall into the same tube.

5. In a coin separating machine the combination with a rotative wheel having concentric lines of apertures arranged therein each adapted to receive a coin to be separated from the mass, a fixed backing plate behind the carrying wheel and provided with a plurality of radially alined groups of slots, the slots of each group being of greater width than those of the preceding group and a coin tube for each group to receive selectively therefrom coins of a given denomination only.

6. A machine adapted to separate mixed coins comprising an apertured rotating carrying wheel upon which the mixed coins are dumped in quantities, each aperture adapted to receive a single coin, troughs adapted to direct the coin to said apertures and means adapted to receive said coin from said apertures selectively as to size.

7. In a machine adapted to separate mixed coins comprising a carrying wheel provided with a plurality of concentrically arranged apertures each adapted to receive a single coin from a mass, a stationary plate behind said wheel, radially alined groups of slots therein, each group adapted to receive coins of a single denomination, a coin tube for each group and a plurality of troughs each adapted to deliver the coin to the carrying wheel.

8. The combination with a rotating carrying wheel, inclined from the perpendicular and having apertures therein arranged in concentric rows and each adapted to receive but one of any of the coins to be separated, a hopper acting to deliver the mixed coins to said wheel, means adapted to direct the coins to each row of apertures, a backing plate behind said carrying wheel and having apertures therein registering with the apertures in the carrying wheel as the same revolves and each adapted to permit only one size of coin to pass therethrough and coin tubes, one for each size of coins, communicating with respective apertures in the backing plate.

9. In a machine of the class described the combination with a rotative element with apertures therein to receive coins, of a back-

ing plate having slots therein through each of which one size of coin only can pass, and through which the coin falls from the carrying wheel by gravity, and coin tubes one for each size of coin, and into which all slots for coin of like size open.

10. A combination with a support of a fixed backing plate thereon arranged at an angle from the perpendicular, a rotative carrying wheel having a thickness approximately equal to the thickest coin to be separated and having apertures therein adapted each to contain one coin only, a hopper acting to deliver the mixed coin to the carrying wheel in quantity, graduated slots between the center and top of the said backing plate registering approximately with the aperture through the carrying plate and having the lower edge projecting above the bottoms of corresponding apertures and the upper edge of the slot a distance from the bottom of corresponding aperture in the carrying wheel when in register equal to the diameter of a coin, thereby permitting coin of that size to fall therethrough selectively, and coin collecting tubes each adapted to receive the coins from all the slots of like size.

11. In a coin separating machine the combination with a back plate, of a rotating carrying wheel, an apertured disk thereon of a size to permit one coin only to engage therein said apertures being arranged on the carrying wheel in concentric lines and the metal adjacent the rear of the apertures having a thickness approximately equal to the thinnest coin to be separated, slots in the back plate arranged radially in groups for like coin, and circumferentially for different coins in the order of their size, the lower edges of all slots projecting above the bottom of each aperture in the carrying wheel when in register and the top of each slot being distanced from the bottom of said apertures equal to the diameter of the coin to be delivered therethrough, and a stripper plate in close relation with the carrying wheel and permitting but one coin only to be contained in each aperture of the carrying wheel, a tube for each size of coin and communicating each with slots for one size of coin, and a hopper delivering the mixed coin to the carrying wheel.

12. In a device of the class described a thin carrying wheel having apertures arranged therein in a plurality of concentric lines and having the rear edges beveled to approximately the thickness of the thinnest worn coin, a stripper acting to permit one coin only to be carried in each aperture in the plate, a plurality of coin troughs one for each line of apertures into the innermost of which the coin is delivered, and from which the same work outwardly to the outer troughs as the carrying wheel is rotated, a slotted backing plate through which the

coins fall selectively by gravity and receiving tubes one for each size of coin.

13. In a coin separating machine a hopper in which the mixed coin is received, a rotative apertured carrying wheel, a plurality of concentric troughs adapted to deliver coins thereto, a slotted backing plate for said carrying wheel through which the coins separated are delivered selectively, and means rotating the carrying wheel.

14. In a machine of the class described an inclined carrying wheel having closely arranged apertures therein extending around the same in a plurality of concentric lines, and each apertured at the rear edge corresponding in thickness with the thinnest coin, said apertures having approximately straight sides adjacent the center of the wheel, means provided with apertures through which the coins selectively fall by gravity and tubes each adapted to receive but one size of coins.

15. In a machine of the class described an inclined slotted backing plate, a carrying wheel parallel therewith and rotative thereagainst and comprising a thin plate having apertures therethrough closely arranged in concentric lines each aperture being of a size to receive a single coin and having the rear and bottom edge reduced in thickness, said slots in said backing plate and the apertures in the carrying wheel being so related and registering as to permit the coin to be selectively delivered through successive slots in the order of their size beginning with the smallest.

16. In a machine of the class described the combination with a backing plate provided on its upper portion with radially aligned groups of slots, a coin tube leading from each group, a rotative carrying wheel on said plate and provided with concentric lines of apertures therethrough, each adapted to register with one slot of each group, a shaft journaled in the backing plate and rigidly engaged on said wheel, means for driving said shaft, a trough for each line of apertures in said wheel and a stripping plate fitting closely to the face of said wheel above said troughs.

17. In a machine of the class described the combination with a rotative carrying plate having concentric lines of apertures therethrough, a slotted backing plate having an upwardly directed flange thereon, a stripper plate rigidly engaged on said flange and provided with a thin edge adapted to permit but one coin to be carried in a single aperture in said wheel, a trough for each line of apertures in said wheel and tubes beneath said backing plate adapted to receive coins of a single denomination.

18. In a device of the class described the combination with a rotative carrying wheel having concentric lines of apertures there-through each of a size to receive one coin

only, a stationary backing plate provided with concentric lines of slots registering with the lines of apertures in said wheel, a plurality of coin tubes each having opening therein to the appropriate line of slots, a mouth piece on the end of each tube and means for rotating said carrying wheel.

19. In a machine of the class described mechanism adapted to assort the articles to be counted embracing a receptacle provided with apertures in its bottom, a rotatable plate having concentric rows of apertures therein to receive a single coin, means for rotating the plate to move the coins singly over the apertures and a plurality of counting mechanisms adapted each to receive coins of one size from the separating mechanism.

20. In a machine of the class described a separating mechanism consisting of a receptacle, passages opening from the bottom thereof, means for moving indiscriminately mixed coins over the mouth of the passages, means for removing a superposed coin from any coin conveyed by said moving means prior to reaching the passages, a plurality of independently operative counting mechanisms positioned each to receive but one kind of coin and registering mechanism operated by the coins.

21. In a device of the class described a hopper adapted to receive coins of different sizes, means provided with slots of different widths for separating the coins, a plate having concentric apertures therein and each aperture adapted to receive one coin and one edge of each aperture reduced in thickness to the thickness of the thinnest coin, means for forcing all coins over one from each aperture and into a subsequent aperture, mechanism for receiving and counting each set of coins and mechanism for registering a coin of each set.

22. In a machine of the class described the combination with a coin separator comprising an apertured carrying plate adapted to elevate the coin, means provided with sets of slots therein and each set of slots successively increasing in size and adapted to receive coin of only one denomination, tubes to receive the coin of each denomination, a plurality of counting mechanisms positioned each to receive the coin from a single tube, and registering mechanism operated by the meshing of the coin during the counting with elements normally unconnected with the counting mechanisms.

23. In a device of the class described the combination with a rotative coin separator adapted to receive mixed coins, of a rigid element adapting the coins to selectively fall therethrough to assort the same, rotatable mechanism for moving indiscriminately mixed coins over the rigid element, a plurality of counting mechanisms each adapted

to receive but one denomination of coin from the separator in bulk and the counters overlapping each other, rotative mechanisms acting to deliver the coins to the counting mechanisms and means adapted to permit the coins in any of the counters to be counted continuously or serially into groups containing a predetermined number.

24. In a device of the class described the combination with a hopper adapted to receive mixed coins of a rotative separating wheel provided with recesses each adapted to receive but one coin, means beneath the plate apertured to successively receive coins of larger sizes, tubes, one adapted to receive the coins of only one size, a plurality of counting mechanisms each adapted to receive but the denomination from a single tube, rotative mechanisms therein acting to deliver the coin to the counting mechanism, a registering mechanism for each counter operated only by the passing coin and a stop mechanism therefor whereby the count may be continuous or in groups of a predetermined number.

25. In a device of the class described the combination with a fixed separator provided with sets of apertures, each set adapted to receive coins of but one size, means adapted to move indiscriminately mixed coins over the apertures, means for removing a coin resting on another before passing the under coin over the apertures, a plurality of counting mechanisms each adapted to receive but one denomination from the separator, a constantly driven rotative mechanism in each, a registering mechanism to receive the coins therefrom and acting only when receiving coins therethrough and stop mechanism connected with the register adapted to be set to collect the coins into uniform groups.

26. In a device of the class described the combination with an inclined hopper adapted to receive mixed coins therein, channels extending underneath the hopper and opening into the hopper at the highest side thereof, a rotary element for moving the coins to fall into the appropriate passage, a plurality of receiving hoppers overlapping each other and all rigidly secured to a common base, adapted to receive each one denomination from the separator, a toothed rotative wheel therein acting to deliver the coins selectively therefrom, a register through which the coins are carried singly by said wheel, said coin in its passage intermeshing both, and a stop mechanism adapted to be set for continuous counting or for serially counting into predetermined groups of a desired number.

27. In a device of the class described the combination with an inclined hopper adapted to receive mixed coins, inclined channels extending beneath the hopper and opening upwardly into the hopper, means for elevating the coins adapting the same to fall into

the appropriate channel, an inclined counting mechanism for each denomination of coins, rotative means therein for delivering the coins therethrough selectively, registering means operated only by and intermeshing with successive coins to register the same, means for locking each registering means from operation after each coin is registered and adjusted out of locking position by each succeeding coin and means for locking the register when a predetermined number of coins have been counted.

28. In a device of the class described the combination with an inclined rotative separator adapted to assort mixed coins into their denominations, embracing coacting apertured elements, one rigidly supported adapting the coins to selectively fall through the apertures, therein the other rotatable to move the coins over the aperture in the rigid member, an inclined counting mechanism for each denomination of coin, a tube delivering the coin to each, registering means operated only by and intermeshing with successive coins to register each and an adjustable stop for locking the registers to count a predetermined number of coins only.

29. In a device of the class described the combination with an inclined rotative apertured element adapted to elevate mixed coins, a rigid member having channels of different sizes therein to receive and separate the coins, a tube for each denomination communicating with the appropriate channel, inclined overlapping counting mechanisms positioned to receive each the coin from one tube, continuously operating means to deliver the coin therefrom, registering means operated by the intermeshing with the successive coins to register each and an adjustable stop adapted for adjustment to lock the counters and registers for any of a predetermined number of coins or to be adjusted for continuous counting.

30. In a device of the class described the combination with inclined mechanisms, one mechanism adapted to assort mixed coins into their various denominations, and the other mechanism adapted to singly elevate the coins to the assorting mechanism, an inclined counting mechanism for each denomination of coin, means operated by the coin meshing therewith while being counted for registering each coin, a motor adapted to simultaneously operate the separator and counting mechanism and a transmission device adapted to cut the separator out of operation.

31. In a device of the class described the combination with an inclined separator of a hopper at the bottom thereof tubes at the back of the separator to receive the separated coins there into, a rotative element carrying the coins or articles to be counted around the separator and delivering the same there-

through into the respective tubes, a counting mechanism for each denomination and positioned to each receive the coins from a single tube and each embracing a register, actuating means therefor and a rotative carrying wheel adapted to deliver the coins counted past the actuating means for the register and to actuate the same by intermeshing the coin therewith, means for driving said separator and counters and a transmission element for varying the speed of drive of both separator and the counters and for driving the counters only.

32. In a device of the class described the combination with an inclined separator for mixed coins, cored on its under side to provide a plurality of channels appropriated to coins of different sizes, of a hopper at the bottom thereof, a rotative element carrying the coins to be counted around the separator and delivering the same therethrough, tubes into which the separated coins are delivered from the separator, a plurality of counting mechanisms each embracing a register and actuating means therefor and a rotative carrying wheel adapted to deliver the coins to be counted to the actuating means for the register.

33. In a device of the class described the combination with an inclined separator, provided with channels opening upwardly through the bottom and each channel appropriated to but one size of coin, of coin tubes one for each denomination of coin, and connected with the respective channel, a hopper to receive the mixed coins, a rotative element carrying the coins from the hopper and delivering the same selectively therethrough into the respective channel, a plurality of counting mechanisms each embracing a register and actuating means therefor and a rotative carrying wheel each adapted to receive but one denomination of coin from a coin tube and to carry the coins singly through and intermeshing the coin with the actuating means for the register.

34. In a device of the class described the combination with an inclined separator comprising coacting rigid and rotatable elements, one adapted to indiscriminately advance coins in a single layer, the other provided with apertures to assort the coins according to size or denomination, a plurality of coin tubes positioned for each to receive but one denomination of coin from the separator, a hopper at the bottom of the separator, a rotative element acting to deliver the coin selectively to the coin tubes, counting mechanisms each adapted to receive coin from a single coin tube and embracing a register, actuating means therefor, an inclined rotative carrying wheel adapted to deliver the coins selectively past and intermeshing with the actuating means for the register and means driving the separators and counters simultaneously or the counters only.

35. In a machine of the class described an inclined rotative coin carrying wheel, means adapted to selectively separate indiscriminately mixed coins carried by said wheel into their various denominations, inclined counters arranged to receive each but one denomination of the coin, a hopper on each counter to receive the coin, a register, a toothed actuating wheel therefor, a toothed carrying wheel for each counter, said actuating wheel for the registers and said toothed carrying wheel being adapted to intermesh through the medium of the coins as counted.

36. In a machine of the class described an inclined rotative carrying wheel provided with apertures each having one beveled side, means adapted to selectively separate mixed coins elevated by said wheel into their denominations, means adapted to force a coin up the beveled side of any aperture into another aperture when more than one coin is carried in any aperture of said wheel, inclined counters arranged to receive each but one denomination of the separated coin therefrom, a register, a toothed actuating wheel therefor, an inclined toothed carrying wheel for each counter, a hopper into which the periphery thereof extends and into which the separated coins are received and driving means for the separator and carrying wheel the latter being adapted to intermesh through the medium of each coin while being counted.

37. In a device of the class described a rotatively operated separator for indiscriminately mixed coins or the like, passages opening from the bottom of the separator successively increasing in size in the direction of rotation, coin tubes adapted to receive the coins from the passages, a plurality of inclined counting mechanisms arranged below the separator and successively overlapping each the other and each adapted to receive the coins from a single coin tube.

38. In a device of the class described a rotatively operated wheel adapted to elevate indiscriminately mixed coins or the like, a plate provided with apertures increasing in size in the direction of rotation of the wheel, and into each of which coins of but one denomination pass, coin tubes each adapted to receive from and through the separator but a single denomination of coin, a plurality of inclined counting mechanisms arranged below the separator and successively overlapping each other and each adapted to receive coins from but one coin tube.

39. In a device of the class described an inclined hopper, coacting apertured rigid and apertured rotatable mechanisms for separating indiscriminately mixed coins in the hopper, coin tubes at the rear thereof each adapted to receive from and through the separator but a single denomination of coin, a plurality of inclined counting mechanisms arranged below the separator and successively overlapping

each the other and each adapted to receive coins from but one tube therein.

40. In a device of the class described an inclined rotatively operated separator for mixed coins, channels forming an integral part of the separator and positioned beneath the same for receiving coins of the same sizes, coin tubes communicating with the channels and each adapted to receive from and through the respective channel but a single denomination of coin, a plurality of inclined counting mechanisms arranged below the separator and successively overlapping each the other and each adapted to receive coins from but one tube therein and a normally locked register operated by the coins in counting.

41. In a device for the purposes specified mechanism for automatically separating mixed coins into coins of the same denominations, comprising a rotatable carrying wheel having rows of concentric apertures each adapted to receive one coin, a plate beneath the carrying wheel having apertures therein increasing in size in the direction of rotation of the carrying wheel, mechanisms, each adapted to receive all coins of the same denomination and means for delivering the coins of each denomination by gravity to the proper mechanism.

42. In a device of the class described the combination with means for receiving mixed coins, rotatable means for elevating one layer of coins at a time, a plate provided with apertures through each of which only the coins of one denomination is admitted, independent means adapted each to receive the coins of one denomination only and independent mechanisms, one appropriated to each denomination of coin and adapted to count the same either serially or continuously.

43. In a device of the class described the combination with a hopper adapted to receive mixed articles, means provided with slots therein successively increasing in size means adapted to move the articles over the slots permitting all articles of the same sizes to fall through the same sized slots, a plurality of hoppers each appropriated to one size of articles and adapted to receive all the articles of approximately the same size, rotative means for each hopper selectively removing the articles and means for counting the articles.

44. In a device of the class described a hopper for receiving mixed articles, means provided with concentric sets of slots, each set of which successively increases in size, rotative means provided with concentric rows of apertures corresponding in number with the slots of each set and adapted to receive the articles, means for preventing more than one article from passing over any slot at the same time, counting mechanisms adapted to independently receive all articles from the slots of the same sets and means

delivering the articles by gravity to the appropriate counting mechanism.

45. In a device of the class described means for receiving and holding coins, means for indiscriminately moving the coins therefrom, means for preventing more than one layer of coins passing thereby at one time, means having sets of apertures over which the layer of coins is passed and the apertures of each set increasing in size adapting coins of the smallest size only to pass through the first apertures and coins of increasing sizes to pass through the appropriate succeeding apertures, hoppers, each adapted to receive a different denomination of coin and each receiving from the layers, coins of the same denomination and mechanism counting the coin delivered to the hoppers.

46. In a device of the class described the combination with a hopper to receive mixed coins of means provided with sets of slots each set successively increasing in size, a carrying wheel provided with apertures to receive the coins and each having the metal

on one side reduced in thickness providing an inclined face, means adapted to prevent more than one coin in each aperture passing over the slots, said means adapted to force any coin or coins in the aperture more than one over the inclined face and into a subsequent aperture.

47. In a machine of the class described the combination with a hopper adapted to contain mixed articles, means above the hopper having slots therein each adapted to admit articles of one size therethrough, means for elevating the articles to be assorted to fall through the appropriate slot or slots, means delivering the assorted articles by gravity to the desired place.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JAY M. JOHNSON.

Witnesses:

S. E. HANNAH,
J. W. ANGELL.