

Aug. 20, 1935.

C. FLEISCHER

2,011,574

SEMIAUTOMATIC VENDING MACHINE

Filed July 20, 1933

4 Sheets-Sheet 1

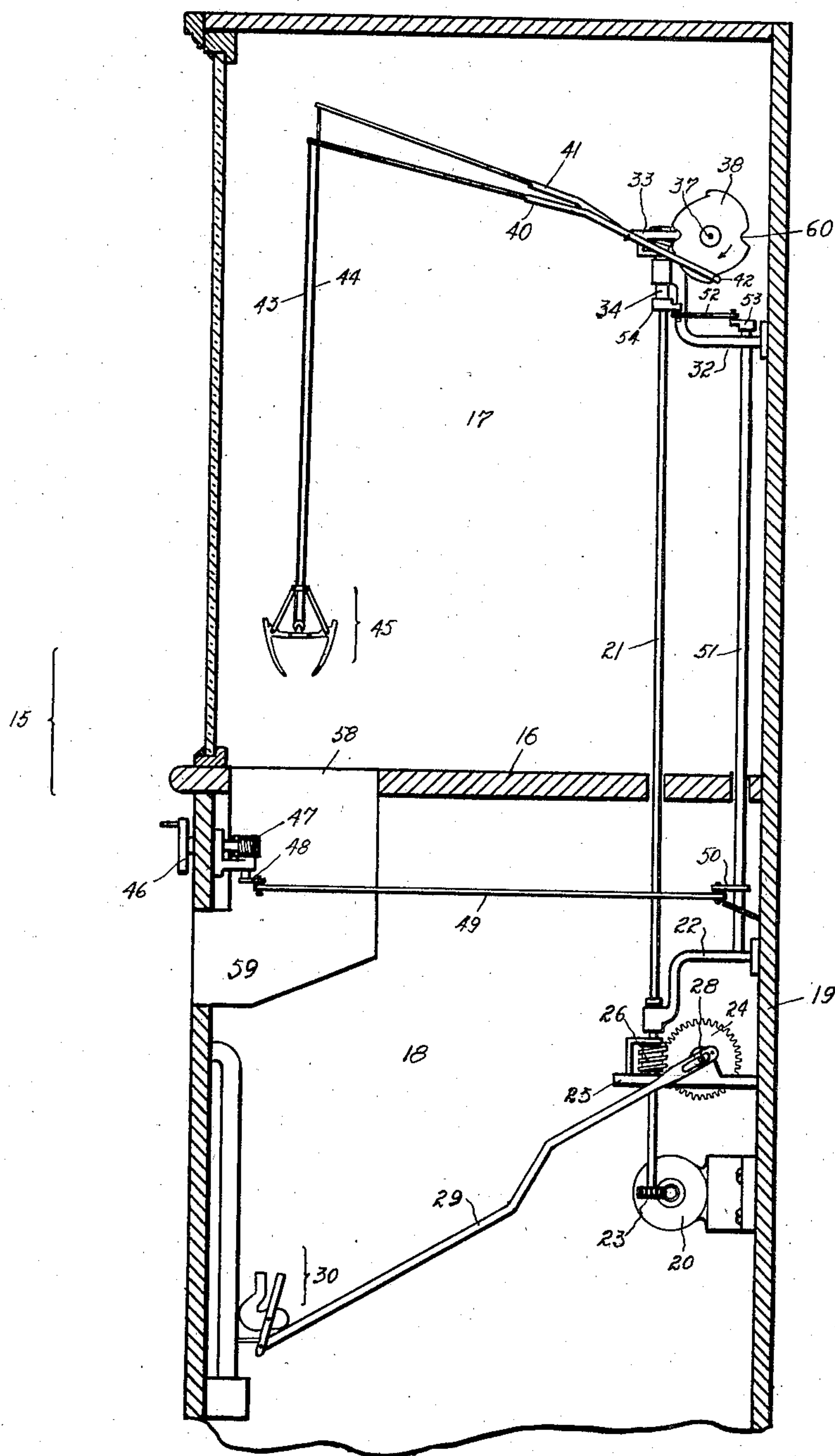


Fig-1-

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4 Sheets-Sheet 2

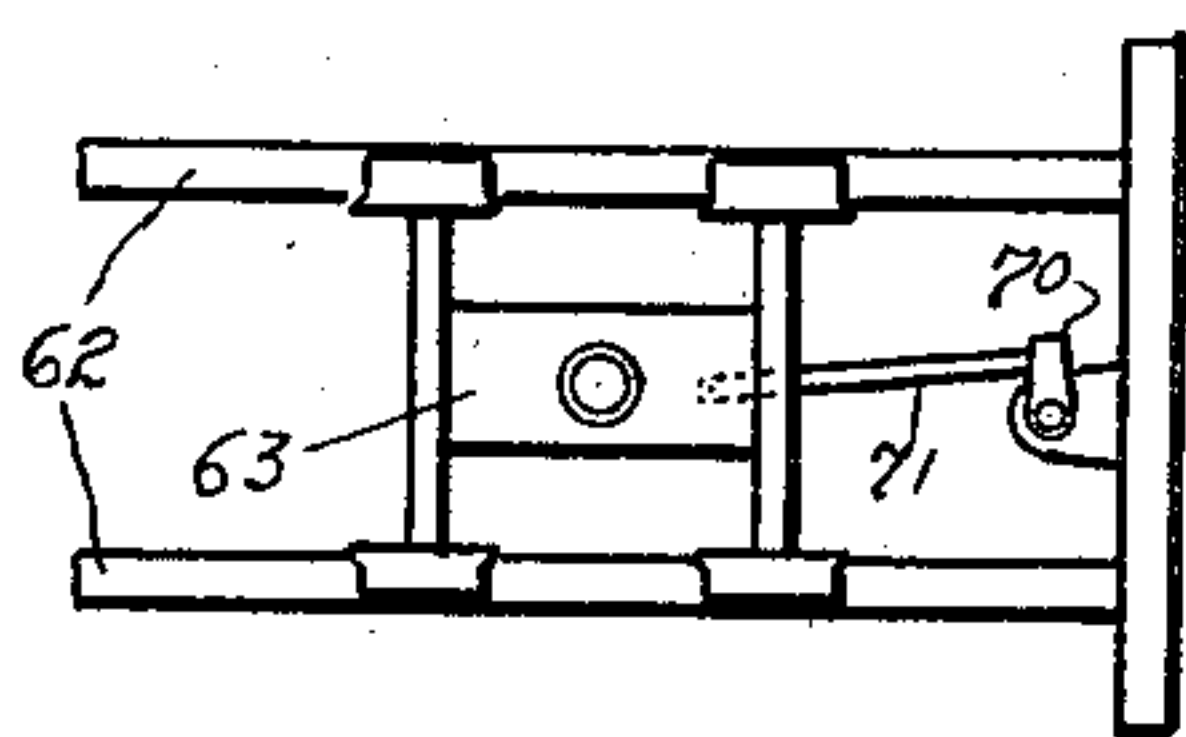


Fig. 2a-

Fig. 2-

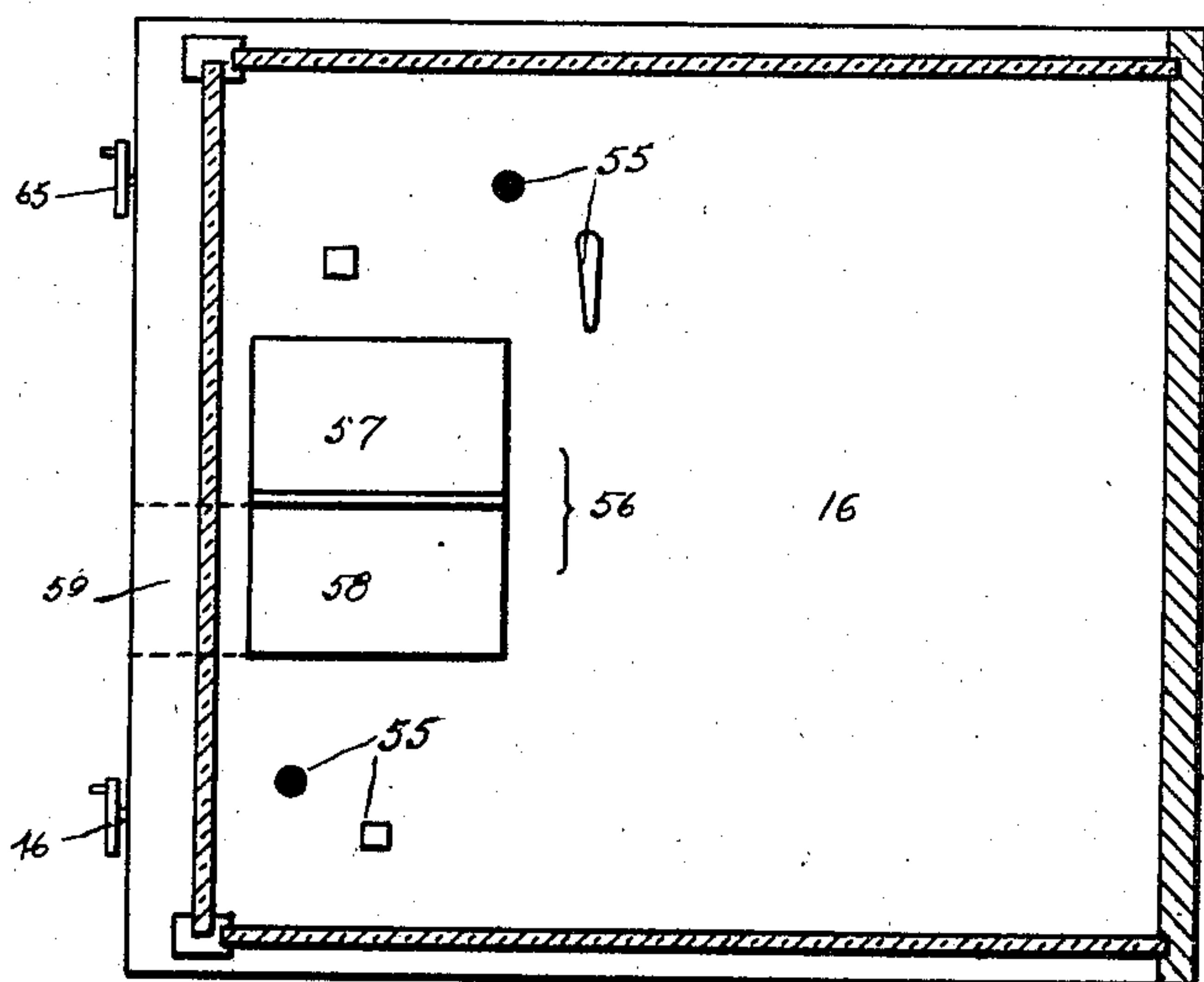
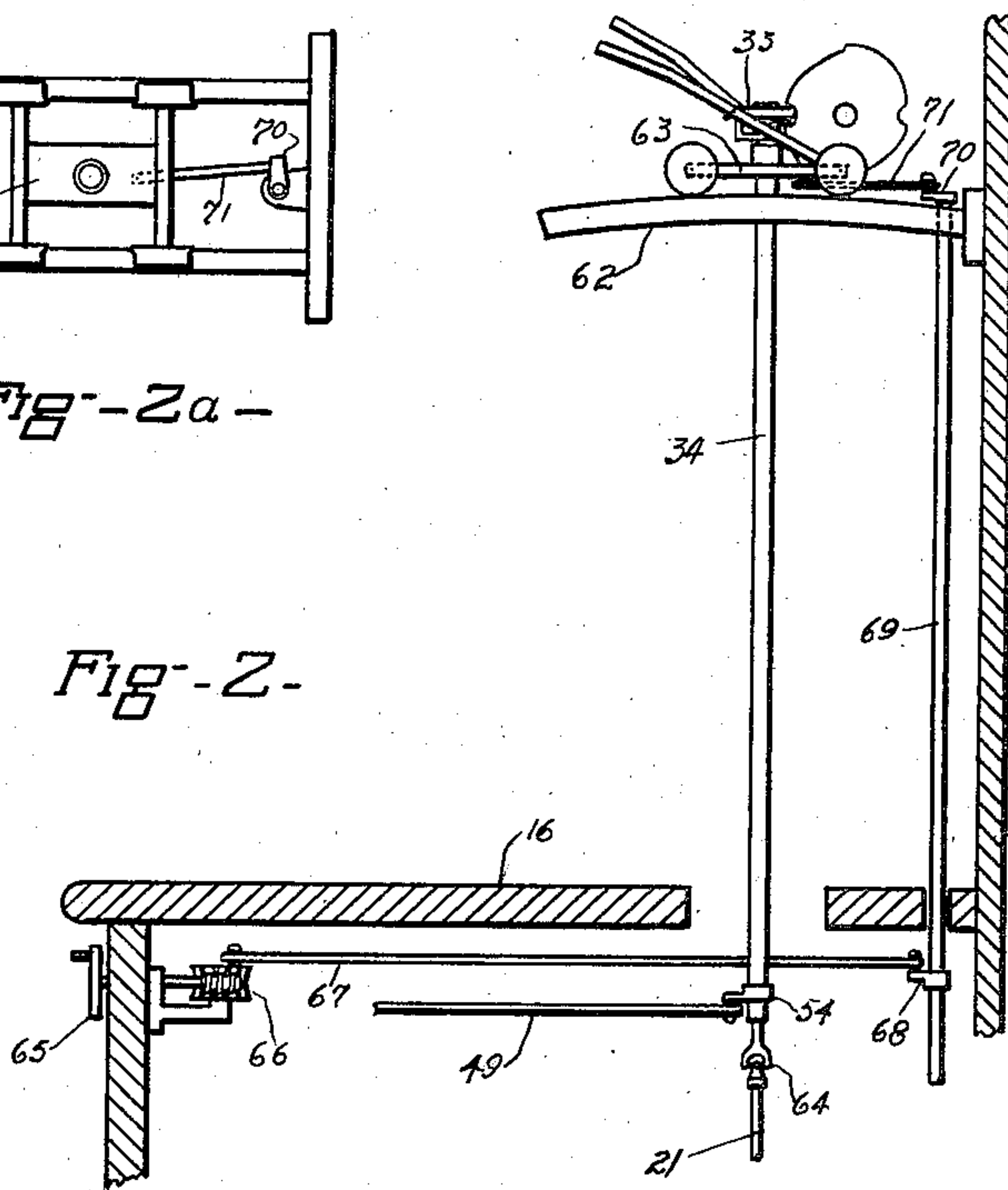


Fig. 3-

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4 Sheets-Sheet 3

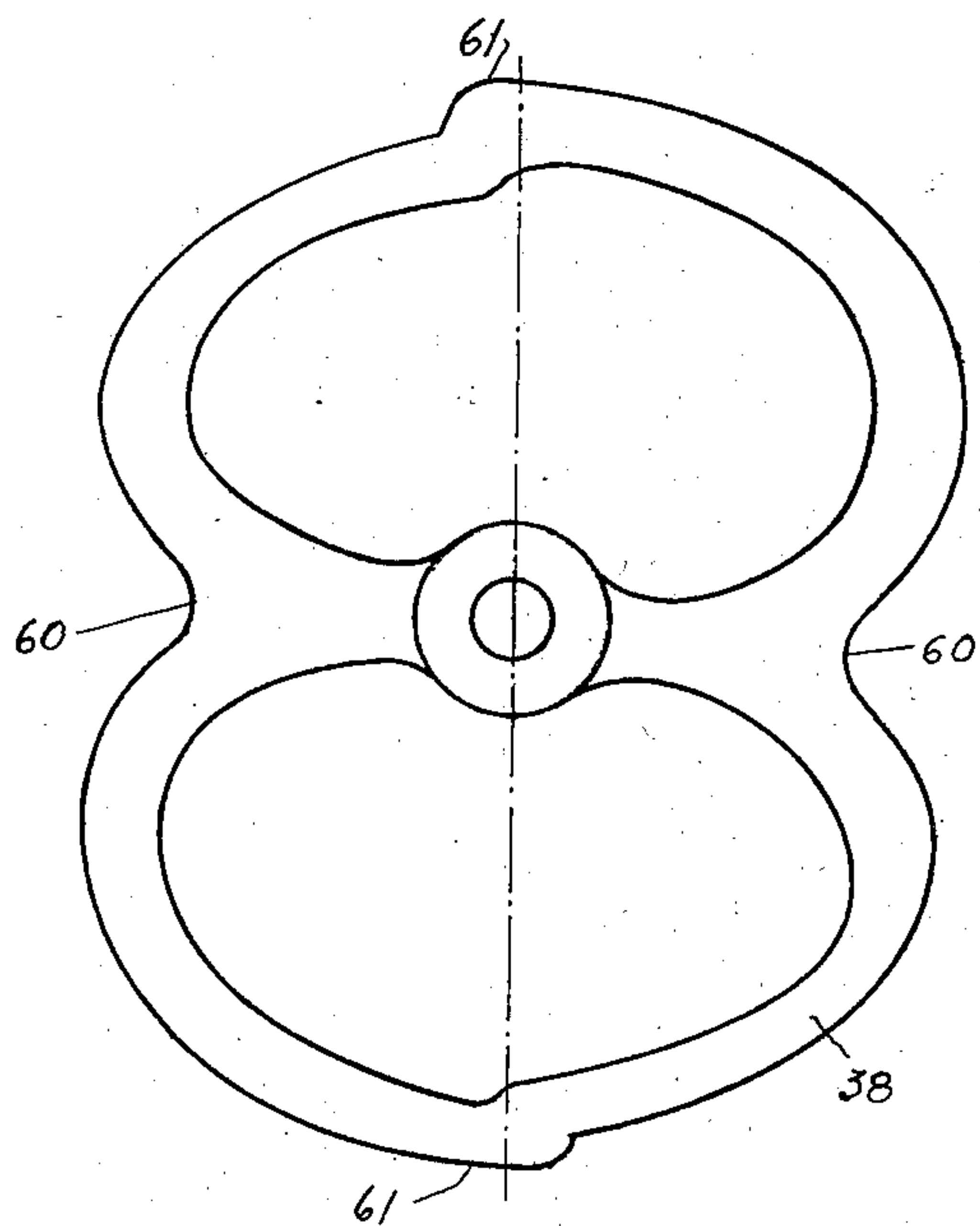


Fig-4-

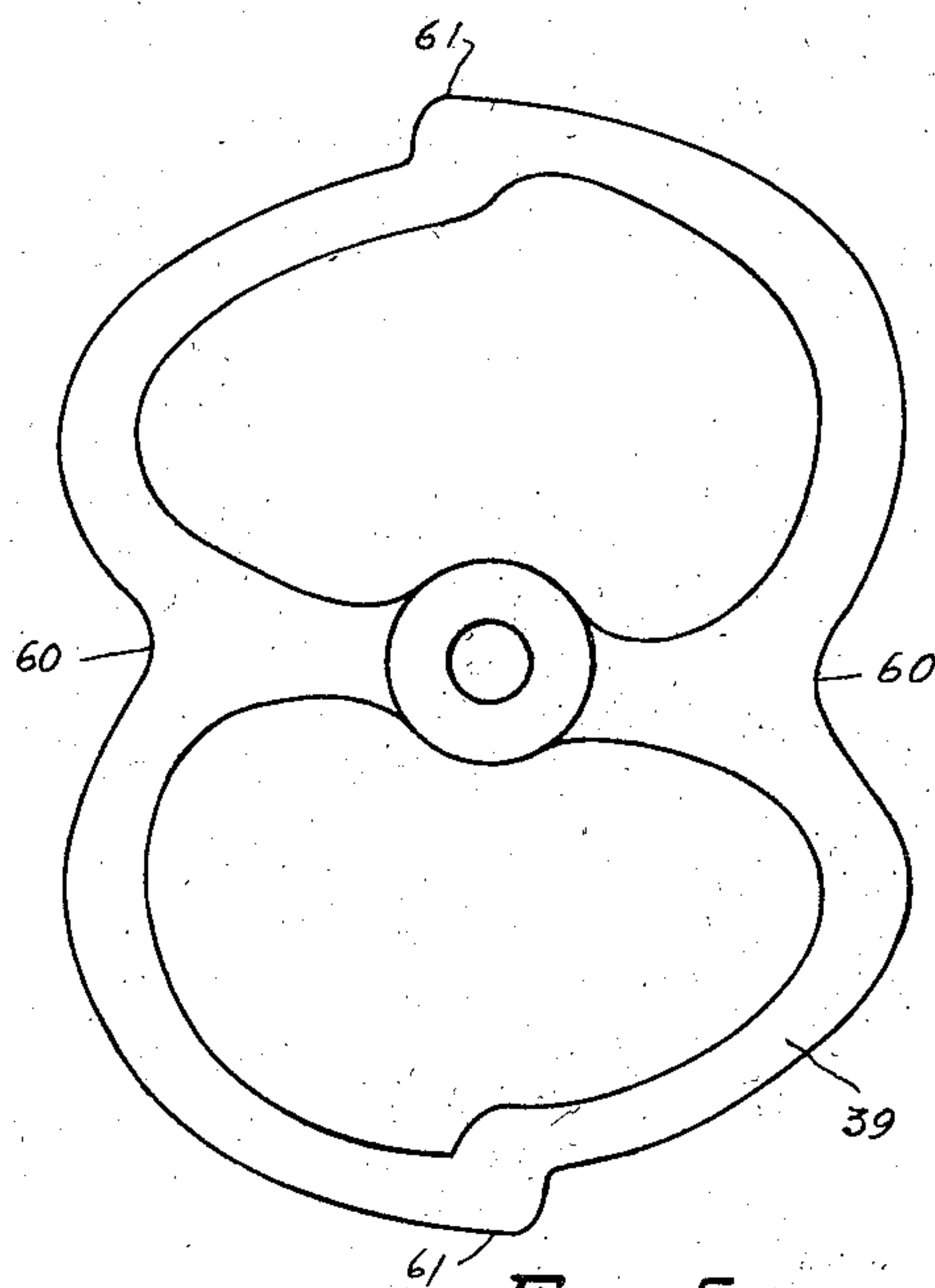


Fig-5-

Fig-6-

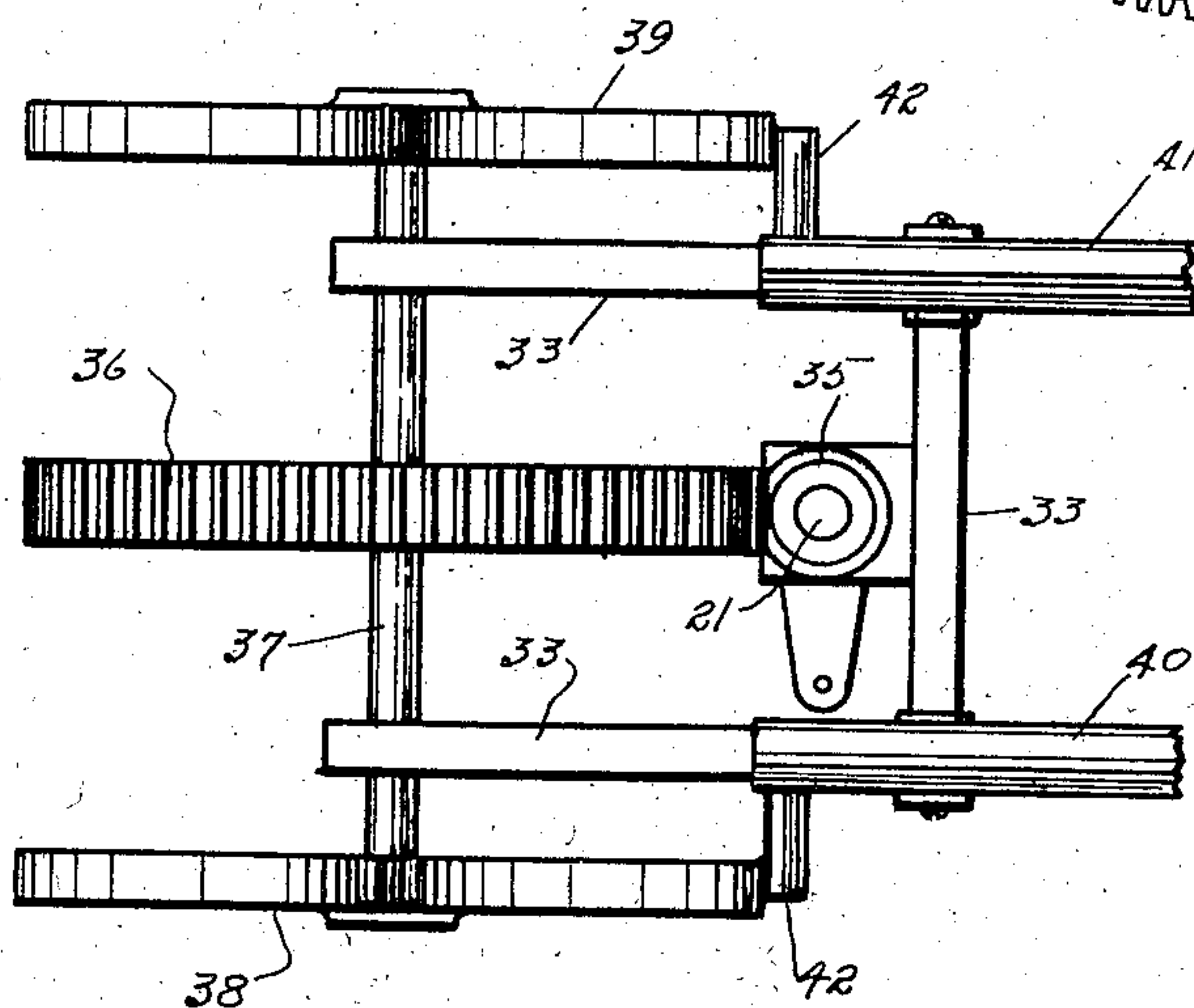
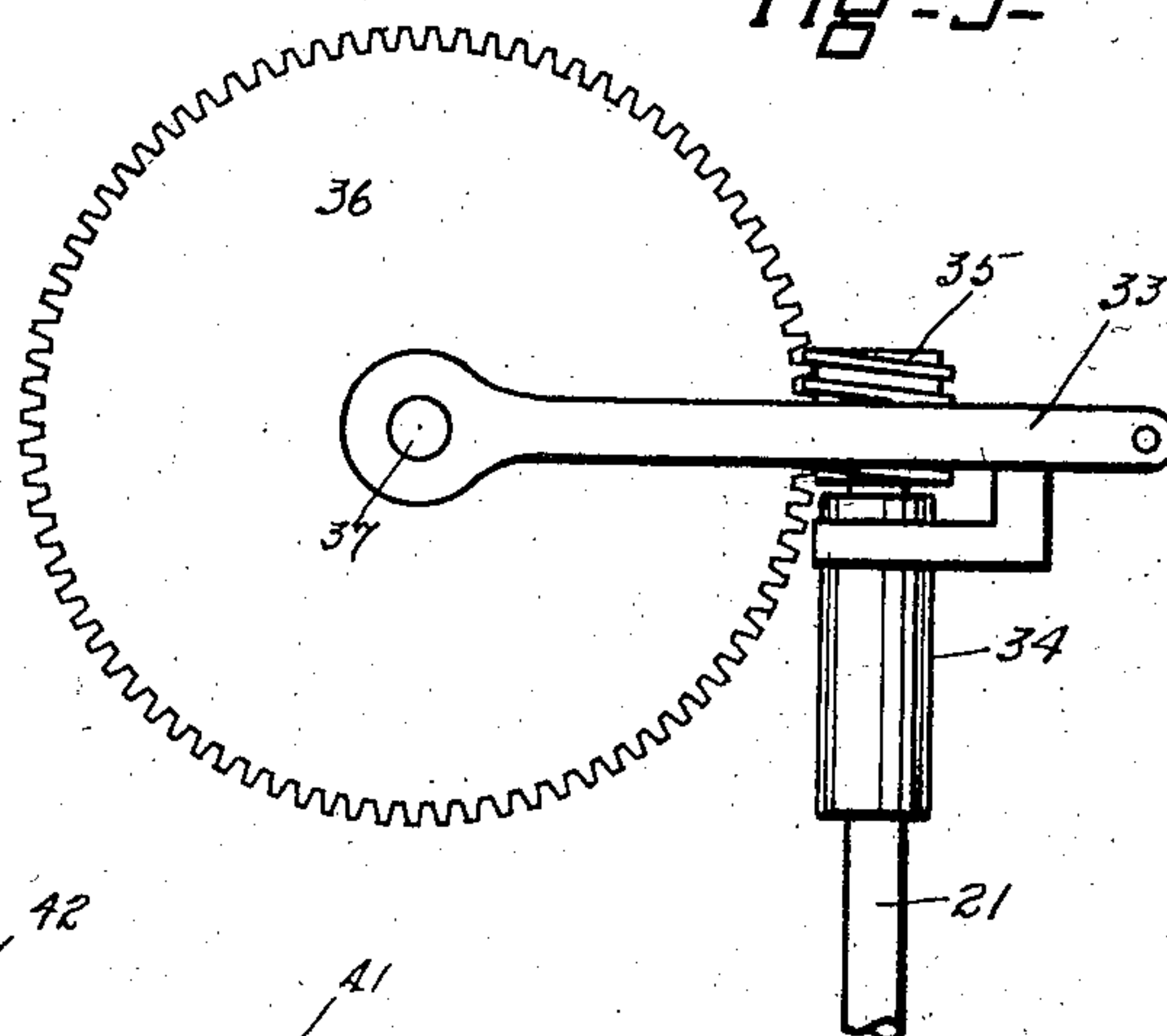


Fig-7-

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4 Sheets-Sheet 4

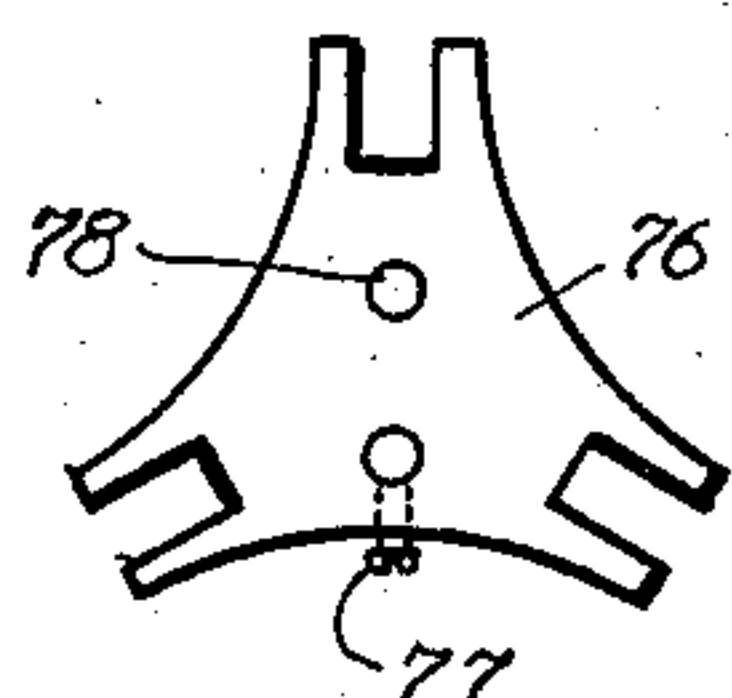


Fig. 10-

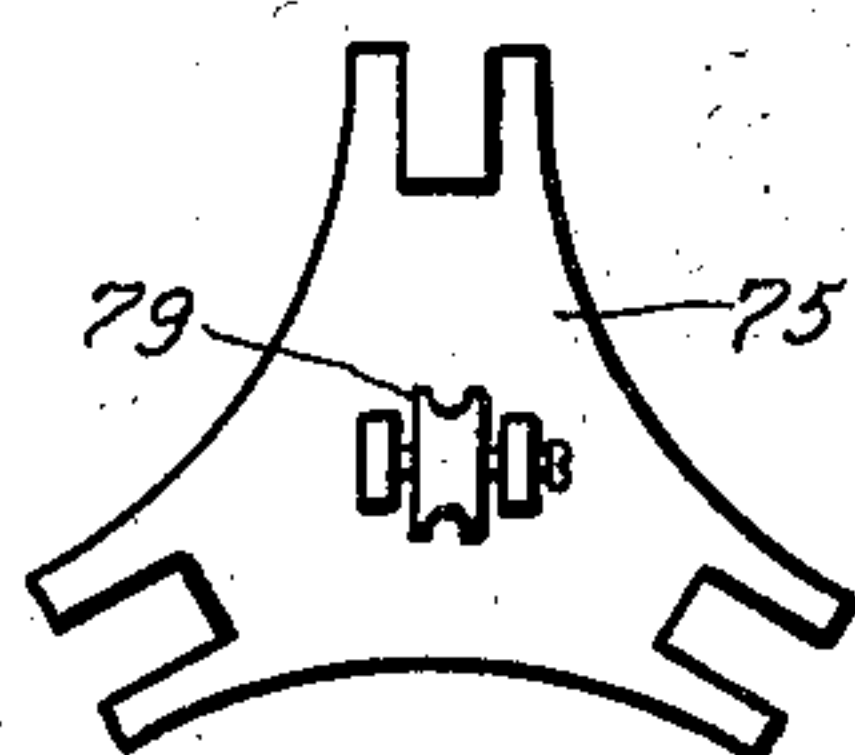


Fig. 9-

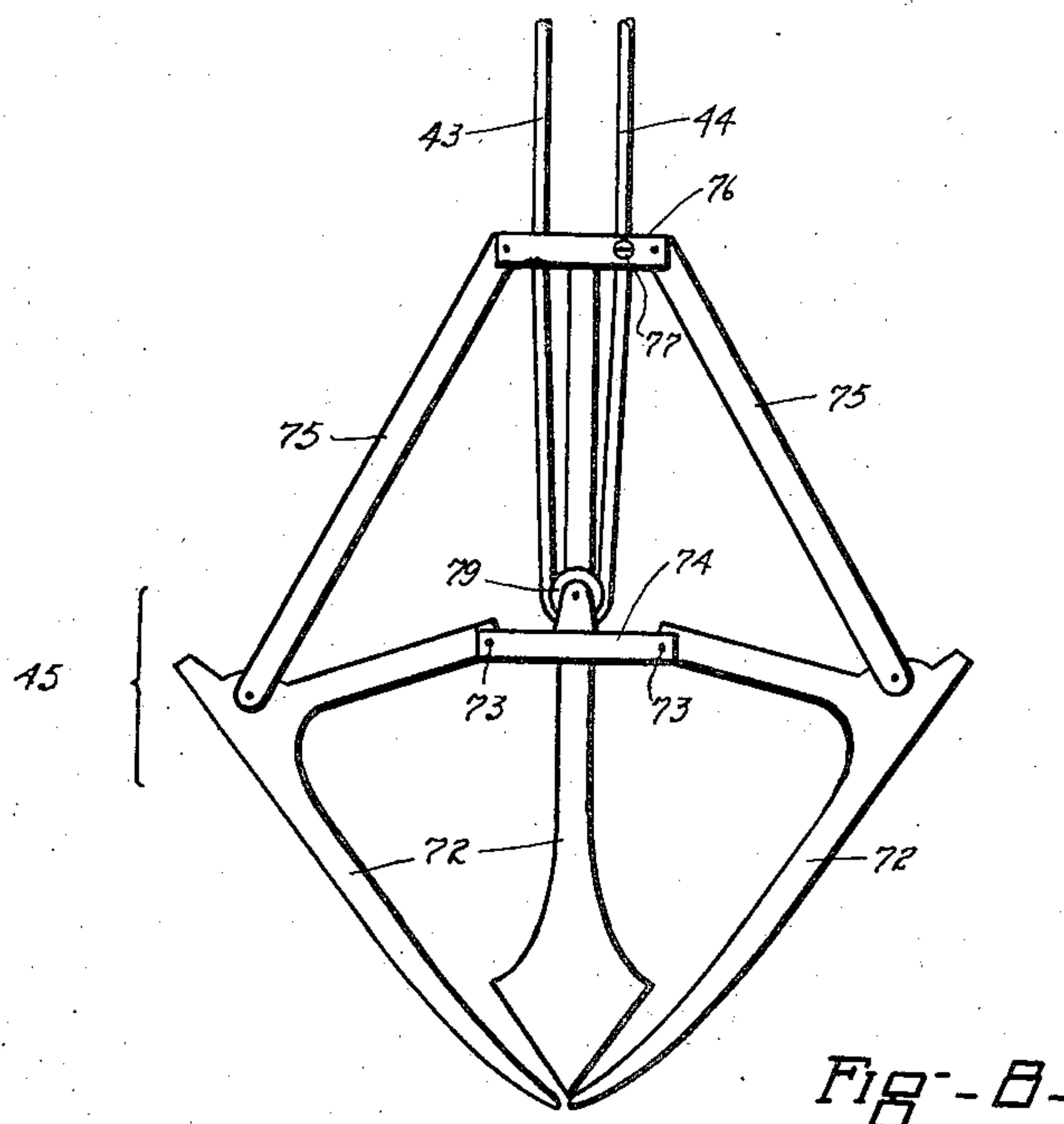


Fig. 8-

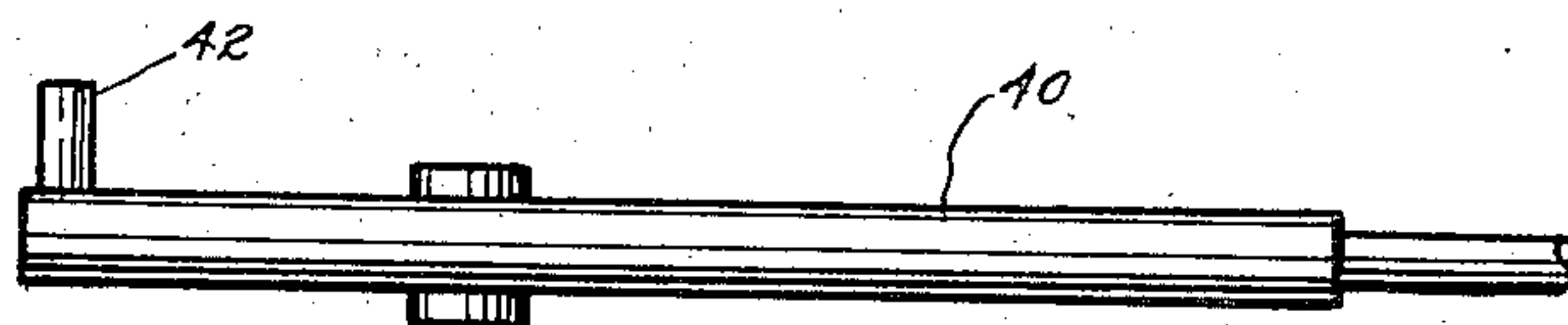


Fig. 11-

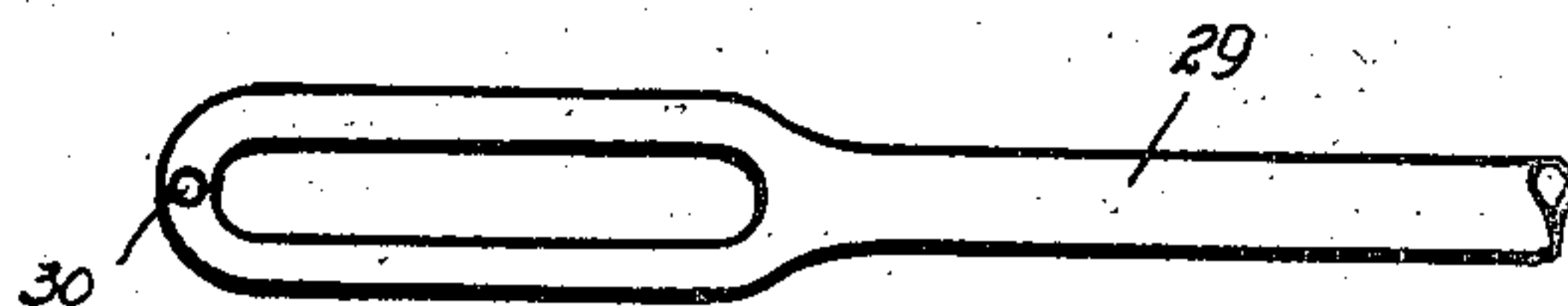


Fig. 12-

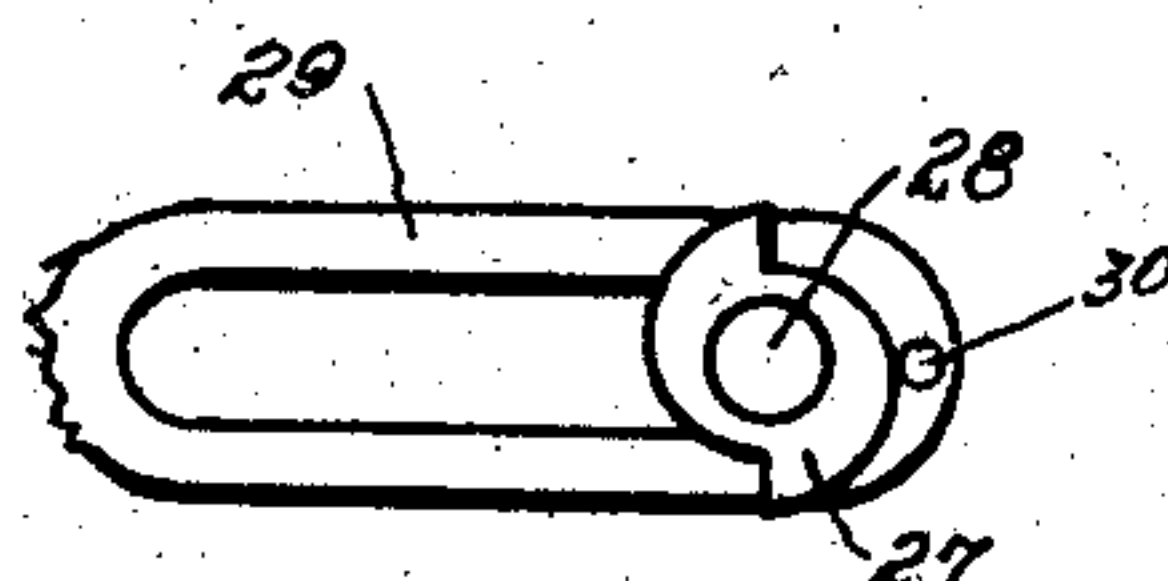


Fig. 13-

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UNITED STATES PATENT OFFICE

2,011,574

SEMI-AUTOMATIC VENDING MACHINE

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Application July 20, 1933, Serial No. 681,243

14 Claims. (Cl. 221-146)

This invention relates to vending machines, and more particularly, to vending machines or delivery cabinets of the semi-automatic type, in which part of the operating cycle is automatically performed, and another part performed by the vendee.

The general object of the invention is to provide a vending machine which will perform such a particularly attractive operating cycle as to induce possible purchasers to buy from a natural curiosity to see the machine function.

Another object of the invention is to provide a vending cabinet of the semi-automatic type in which the skill of the vendee in performing the manual part of the operating cycle is made a condition precedent to the delivery of the merchandise to him.

A further object of the invention is to provide a semi-automatic vending machine in which the time of the mechanically operated portion of the cycle varies automatically.

Still another object of the invention is to provide a vending machine which will perform an apparently complex cycle, but whose mechanism in fact is relatively simple, inexpensive and troubleproof.

A feature of the invention resides in the provision of a vending cabinet having two delivery chutes, one of which delivers merchandise to the vendee and the other of which, under certain conditions, returns the merchandise to the cabinet.

Another feature of the invention resides in the use of two double cams mounted on a single shaft to operate a grasping device by virtue of one-half revolution of the shaft.

Another feature of the invention resides in the provision of a two-dimensional hand control in combination with a single dimensional automatic control.

Another feature of the invention resides in the designing of the machine in such a manner as to make several parts completely interchangeable, thus reducing manufacturing costs.

Other objects and features of the invention will be more apparent from the following description to be read in connection with the accompanying drawings in which:

Fig. 1 is a side elevational view of a vending cabinet, in section, showing the operating mechanism,

Fig. 2 is a fragmentary, elevational view of the cabinet, showing the hand operated elements of the device,

Fig. 2a is a plan view of the tracks and carriage of Fig. 2,

Fig. 3 is a plan view of the display platform and delivery area of the vending cabinet,

Figs. 4 and 5 are plan views of the scoop operating cams,

Fig. 6 is an elevational view of a portion of the cam driving mechanism,

Fig. 7 is a plan view of the mechanism of Fig. 6,

Fig. 8 is an elevational view of the merchandise grasping device or scoop,

Fig. 9 is a plan view of the lower spacing member of the grasping device of Fig. 8,

Fig. 10 is a plan view of the upper spacing member of the grasping device of Fig. 8,

Fig. 11 is a plan view of one of the levers adapted to coact with the cams of Figs. 4 and 5 in operating the scoop or grasping device of Fig. 8,

Fig. 12 is a plan view of the coin controlled switch operating lever, and

Fig. 13 is a plan view of the cam adapted to coact with the lever of Fig. 12 to open the switch at a predetermined time.

In a preferred embodiment the invention comprises a vending cabinet divided into an upper and a lower portion. The lower portion contains a motor, gearing and other unsightly parts, while the upper portion, encased in glass or other transparent material, contains the merchandise, a grasping device, and attractive mechanism for operating the grasping device. In operation, the grasping device is first moved by hand, from without the machine, to a position directly above the desired article of merchandise. A coin of specified denomination is then inserted into the machine to close the coin controlled switch. Immediately, the grasping device is lowered, closes over the article, and is then lifted. Simultaneously, the would-be purchaser manipulates the hand mechanism to bring the grasping device over the delivery area. If the purchaser is sufficiently dexterous, the grasping device opens at this point and the article is delivered to him. Otherwise, the article is returned to the machine.

With reference to the drawings, similar designations referring to similar parts, and particularly Fig. 1, numeral 15 designates generally a vending cabinet divided by a horizontal partition or table 16 into an upper portion 17 and a lower portion 18. The lower portion is completely enclosed by wood or other non-transparent material, while the upper portion (see Fig. 3) is encased on three sides by glass or other transparent material. A heavy non-transparent back 19 extends the full length of the cabinet.

Considering the lower portion 18, a motor 20 is mounted on back 19. A vertical shaft 21, sup-

ported in lower bearing piece 22, is adapted to be driven by motor 20 through gearing 23. Worm wheel 24, mounted in a suitable bracket 25, meshes with and is rotated by worm gear 26 on the shaft 21. A double cam 27 (see Fig. 13) is mounted on shaft 28 carrying worm wheel 24. A slotted lever 29 fits over the end of the shaft 28 in such a manner that a pin 30 near one end of the lever 29 is in constant engagement with the face of cam 27. The other end of the lever 29 is adapted to operate movable member of the coin control switch 30 (Fig. 1). In operation, a coin inserted in tube 31 trips the movable member of the coin control switch 30, thereby closing an electrical circuit, including the motor 20. Worm gear 26, on shaft 21, rotates worm wheel 24 and thus rotates cam 27. The cam, in engagement with pin 30 (see Fig. 13) causes lever 29 to move to the right. When the pin passes the highest point of the cam 27, the lever 29 operates switch 30 to break the electrical connection and returns the switch to its original position.

In the upper portion 17 of the cabinet 15, mounted on the back 19, is an upper bearing piece 32, adapted to support a grasping device operating mechanism. This mechanism comprises a frame 33 mounted for rotation about the end of the bearing piece 32. The shaft 21 passes through the center of the hub 34 of the frame 33 and terminates in a worm gear 35 (see Figs. 6 and 7). A worm wheel 36, suitably fastened to a shaft 37, journaled in bearings on frame 33, meshes with worm gear 35 and is adapted to be rotated thereby. A double cam 38 (see Fig. 4) is mounted on one end of the shaft 37 and a comparable double cam 39 (see Fig. 5) is mounted on the other end thereof. Levers 40 and 41 (see Figs. 1 and 11), mounted on opposite sides of frame 33 and fulcrumed on the ends of the frame, have their pins 42 and 42a in engagement with the face of the respective cams 38 and 39. The other ends of the levers 40 and 41 carry cables 43 and 44, which cables operate the scoop generally designated 45, in a manner which will hereinafter be made clear. Generally, the scoop is of the type in which independent movement of one cable 43 is adapted to open and close the scoop, while simultaneous movement of both cables 43 and 44 will lift and lower it.

For the purpose of rotating the frame 33 and thereby, as can be understood, positioning the scoop, a hand wheel 46, through gearing 47, crank arm 48, connecting link 49 and crank arm 50, is adapted to rotate vertical shaft 51. Shaft 51 is journaled at its lower end in the lower bearing piece 22 and at its upper end in the upper bearing piece 32. A linkage 52 connects a crank arm 53 on the upper end of the shaft 51 with a crank arm 54 on the lower end of the hub 34. With reference to Fig. 3, it can be seen that the table 16 provides a space on which articles of merchandise 55 can be conveniently positioned. In the front and near the center of the table 16 is provided a delivery area generally designated 56. The delivery area is divided into two portions 57 and 58. One portion (57) leads back to the machine, and the other (58) leads to a vendee's receptacle 59 in the front wall of the cabinet 15.

In operation, the would-be purchaser first rotates hand wheel 46 to bring scoop 45 above the desired article 55. The purchaser then inserts a coin in the tube 31, which, as was described, closes switch 30 to place motor 20 in operation, thus rotating shaft 21 and its associated parts. As a result, worm gear 35, in mesh with worm wheel

36, causes the cams 38 and 39 to rotate in the direction indicated in Fig. 1. The pins 42 and 42a on the ends of levers 40 and 41 follow the curvature of the cams 38 and 39. Thus, as the cams rotate, levers 40 and 41 are simultaneously lowered, thereby lowering cables 43 and 44, hence scoop 45. As the pins drop into the depression 60, the scoop drops very suddenly to get a digging effect. An examination of Figs. 4 and 5 indicates that continued rotation of cams 38 and 39, past point 60, will cause a relative movement of levers 40 and 41. Thus, lever 40 is lifted more rapidly than lever 41, and as a result, the scoop closes. Thereafter, the two levers move simultaneously and hence, lift the scoop with its article from the table. When the two pins approach the uppermost part of the cam, the scoop is in its uppermost position, and as can be seen from Figs. 4 and 5, as they pass over the hump 61, there will be another relative movement of the levers. As a result, lever 41 will drop to a greater extent than lever 40 and the scoop will open, releasing its article. Simultaneously, with this mechanical movement, the purchaser has rotated hand wheel 46 to bring the scoop over the delivery area. If properly timed, the scoop will open at just the right point and the article will drop into 58, and hence, into receptacle 59, from which the purchaser may remove it. However, if the purchaser is slow, or if in his haste, he has caused the cable to swish past the delivery area, the article is dropped either back to table 16 or into the return portion 57 of the delivery area. As can be seen, this adds a speculative element to the selling device which is usually very attractive.

With the opening of the scoop, the operating cycle is complete. Therefore, at this point, motor 20 should be stopped. To this end, as has been previously described, cam 27 operates lever 29 to open the switch and to reset it in its original position.

It is of particular importance to note that by applicant's unique design, worm gears 26 and 35 may be made identical, and similarly, their respective worm wheels 24 and 36 are identical. Thus, one half revolution of wheel 36 completes the lowering, grasping, lifting and opening of the scoop, while one-half revolution of worm wheel 24 opens and resets the switch.

Fig. 2 shows a variation of the device of Fig. 1. In Fig. 1, it will be noted that the operation of the scoop is in two directions, to wit, a mechanical lifting and lowering, and a manual radial movement. In Fig. 2, applicant provides manually operated lateral, as well as radial movement, plus the same mechanically operated lifting and lowering action. To this end, the upper bearing piece 32, of Fig. 1, is replaced with a bracket comprising a pair of tracks 62 and a wheel carriage 63 adapted to ride on tracks 62. The rotatable frame 33 is suitably journaled on the carriage 63. The hub 34 of frame 33 is extended downwardly to a point below table 16 and at a point below the end of the hub a universal joint 64 is inserted in the vertical shaft 21. By extending the hub 34, applicant is enabled to join connecting link 49 directly to the crank arm 54 without utilizing an intermediary shaft such as 51 of Fig. 1. Thus, the rotation of hand wheel 46 causes a radial movement of the frame 33, and through its associated parts, the scoop 45. A second hand wheel 65, through gearing 66, connecting link 67 and crank arm 68 is adapted to rotate shaft 69. The shaft 69 is comparable and similar in all respects to shaft 51 of Fig. 1. A crank arm 70

on its upper end, through link 71, is adapted to cause a lateral movement of carriage 63, frame 33, and hence, the scoop 45. Thus, in operation, the scoop may be moved laterally (forwardly and rearwardly) of the cabinet by means of hand wheel 65 and radially by means of hand wheel 46. The mechanical portion of the cycle is identical with that described in connection with Fig. 1. The design of cams 38 and 39 is of particular importance. As has been stated hereinbefore, one-half revolution of the cams accomplishes a complete operating cycle. Obviously, then, a complete revolution accomplishes two cycles. Therefore, in order that the device may function properly, the critical points 60 of both halves of a cam (38, for example) are comparably placed, that is, if cam 38 were divided along the dotted line of Fig. 4, and the two halves compared, the critical points 60 would coincide, but it would be immediately apparent that the points 61 do not quite coincide. In other words, the face of one half cam is slightly longer than the face of the other half. The same thing is true of the cam 39. Therefore, in operation, the time required to complete an operating cycle on one half the cam is greater than the time required to complete an operating cycle on the other half. Thus, with each successive cycle, the time of operation changes. Thus, in order that the article may be delivered to him, the vendee must be skillful in operating the hand movements to coincide with the varying mechanical movements of the machine.

With reference to the scoop, any form of the particular type hereinbefore described may be utilized. In Fig. 8, applicant illustrates one particular form comprising three jaws 72 pivotally connected at 73 to a lower spacing member 74. Links 75 pivotally connect the jaws to an upper spacing member 76. The lifting cable 44 is firmly attached to the spacing member 76 by means of set screw 77, while the closing cable 43 passes through hole 78 in the upper spacing member 76, over the pulley on the lower spacing member and is firmly attached to the upper spacing member by means of set screw 77. While 43 and 44 are, in effect, two separate cables, in actuality, it is one continuous cable. In operation, a lifting or lowering of 44 causes a lifting or lowering of the complete scoop 45. An independent movement of the cable 43, however, either lifts or lowers the spacing member 74, and as a result opens or closes the jaws 72. As can be understood, a relative movement of the cables 43 and 44 will cause an opening or closing, while a simultaneous movement of both cables will cause a lifting or lowering in either open or closed position.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a vending machine, a merchandise platform, a passage for delivering merchandise from said platform to a vendee, a passage for returning merchandise from said platform to the machine, said passages being positioned side by side so that they are indistinguishable as viewed from the upper side of said merchandise platform, a grasping device, means for radially positioning

said grasping device, means for automatically lowering, lifting and opening said grasping device, and means for automatically stopping said lowering, lifting and opening device at a predetermined time.

2. In a vending machine, a table for supporting articles of merchandise, a passage for delivering articles of merchandise to a vendee, a grasping device, means for operating said grasping device including a plurality of double cams, said cams being arranged to cause a lowering, closing, lifting and opening of said grasping device during one half revolution thereof, and independently operable means for positioning said grasping device at a desired point above the articles on said merchandise platform, and for moving said grasping device towards said passageway during the operation of said first mentioned means.

3. In a vending machine, an automatic delivery mechanism including a grasping device, a plurality of cables for operating said grasping device, a plurality of levers for operating said cables, and a plurality of double cams for operating said levers, the halves of said double cams being of different lengths.

4. In a vending machine, an automatic delivery mechanism including a grasping device, a plurality of cables for operating said grasping device, a plurality of levers for operating said cables, a plurality of double cams for operating said levers, the halves of said double cams being of different lengths, a motor for driving said cams, and a double cam operating in timed relation to said first mentioned double cams for stopping said motor.

5. In a vending machine, a platform for supporting articles of merchandise, a delivery chute, a grasping device, means for automatically operating said grasping device, and means for positioning said grasping device over a desired article before the operation of said automatic means, and manually operated means for moving said grasping device toward said delivery chute during the operation of said automatic means.

6. In a vending machine, a platform for supporting articles of merchandise, a delivery area including a chute for delivering articles of merchandise to a vendee and a chute for returning articles to the vending machine, a grasping device, automatically operated means for opening, lowering, lifting and closing said grasping device, a first manually operated means for moving said device radially about said platform and a second manually operated means for moving said grasping device laterally of said platform whereby the grasping device may be positioned above a desired article on the platform prior to the operation of said automatic means and may be moved towards said delivery area during the operation thereof.

7. In a vending machine, an automatic delivery mechanism including a grasping device, a plurality of cables for operating said grasping device, a plurality of levers for operating said cables, and a plurality of simultaneously operated double cams for moving said levers, said cams being adapted to vary the time of operation of said grasping device.

8. In a vending machine, an automatic delivery mechanism including a cable operated grasping device, a pair of levers for operating said grasping device, a pair of double cams for operating said levers, the halves of the individual cams being of different lengths.

9. In a vending machine, a cabinet, a table

within said cabinet for supporting articles of merchandise, a passageway for discharging merchandise from the inside to the outside of said cabinet, a grasping device, motor operated means for lowering, closing, lifting and opening said grasping device, and manually operable means for positioning the grasping device over a desired article prior to the operation of said first mentioned means and for moving said grasping device over said passageway during the operation of said first mentioned means.

10. In a vending machine, a cabinet, a table within the cabinet for supporting articles of merchandise, a passageway for discharging merchandise from the inside to the outside of said cabinet, a grasping device, motor operated means for lowering, closing, lifting, and opening said grasping device, and manually operable means for positioning the grasping device over a desired article prior to the operation of said first mentioned means and for moving said device over said passageway during the operation thereof, said grasping device being movable both radially and laterally by the operation of said second mentioned means.

11. In a vending machine, a cabinet, a merchandise platform within said cabinet, a delivery area in said platform, said delivery area being relatively small with respect to the remaining part of said platform, a first passageway leading from said delivery area to the outside of said cabinet, a second passageway leading from said delivery area to the inside of said cabinet, said passageways being positioned side by side so as to be indistinguishable as viewed from above said merchandise platform, a grasping device, means for automatically lowering, closing, lifting and opening said grasping device, and manually operable means for positioning said grasping device above

a desired article on said platform prior to the operation of said first mentioned means and for moving said grasping device over said delivery area during the operation thereof.

12. In a vending machine, a table for supporting articles of merchandise, a delivery area formed in said table, a grasping device, means including a double cam for automatically lowering, closing, lifting and opening said grasping device, manually operable means for positioning the grasping device above a desired article on the table prior to the operation of said first mentioned means and for moving said grasping device towards said delivery area during the operation thereof, the halves of said double cam being of different lengths.

13. In a vending machine, a table for supporting articles of merchandise, a delivery area formed in said table, a grasping device, means including a plurality of double cams for automatically lowering, closing, lifting and opening said grasping device, manually operable means for positioning said grasping device above a desired article on said table prior to the operation of said first mentioned means and for moving said grasping device towards said delivery area during the operation thereof.

14. In a vending machine, a table for supporting articles of merchandise, a passage for delivering articles of merchandise to a vendee, a grasping device, means for automatically operating said grasping device including a plurality of double cams, the halves of said double cams being of different lengths, and independently operable means for positioning said grasping device above a desired article prior to the operation of said automatic means and for moving said device towards said passage during the operation thereof.

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