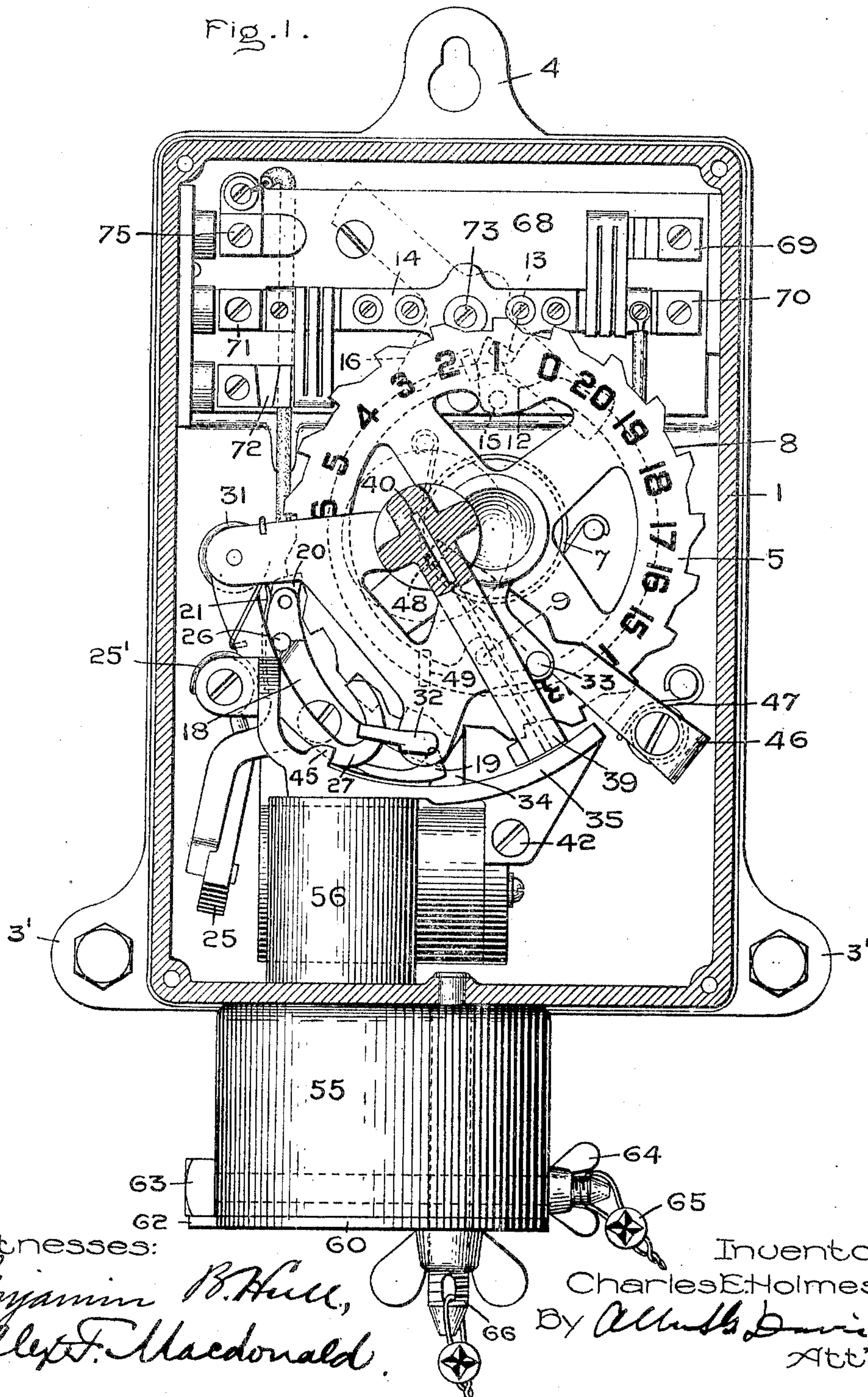


G. E. HOLMES.
COIN CONTROLLED MECHANISM.

APPLICATION FILED AUG. 12, 1901.

6 SHEETS—SHEET 1.



No. 797,808.

PATENTED AUG. 22, 1905.

C. E. HOLMES.
COIN CONTROLLED MECHANISM.

APPLICATION FILED AUG. 12, 1901.

6 SHEETS—SHEET 2.

Fig. 2.

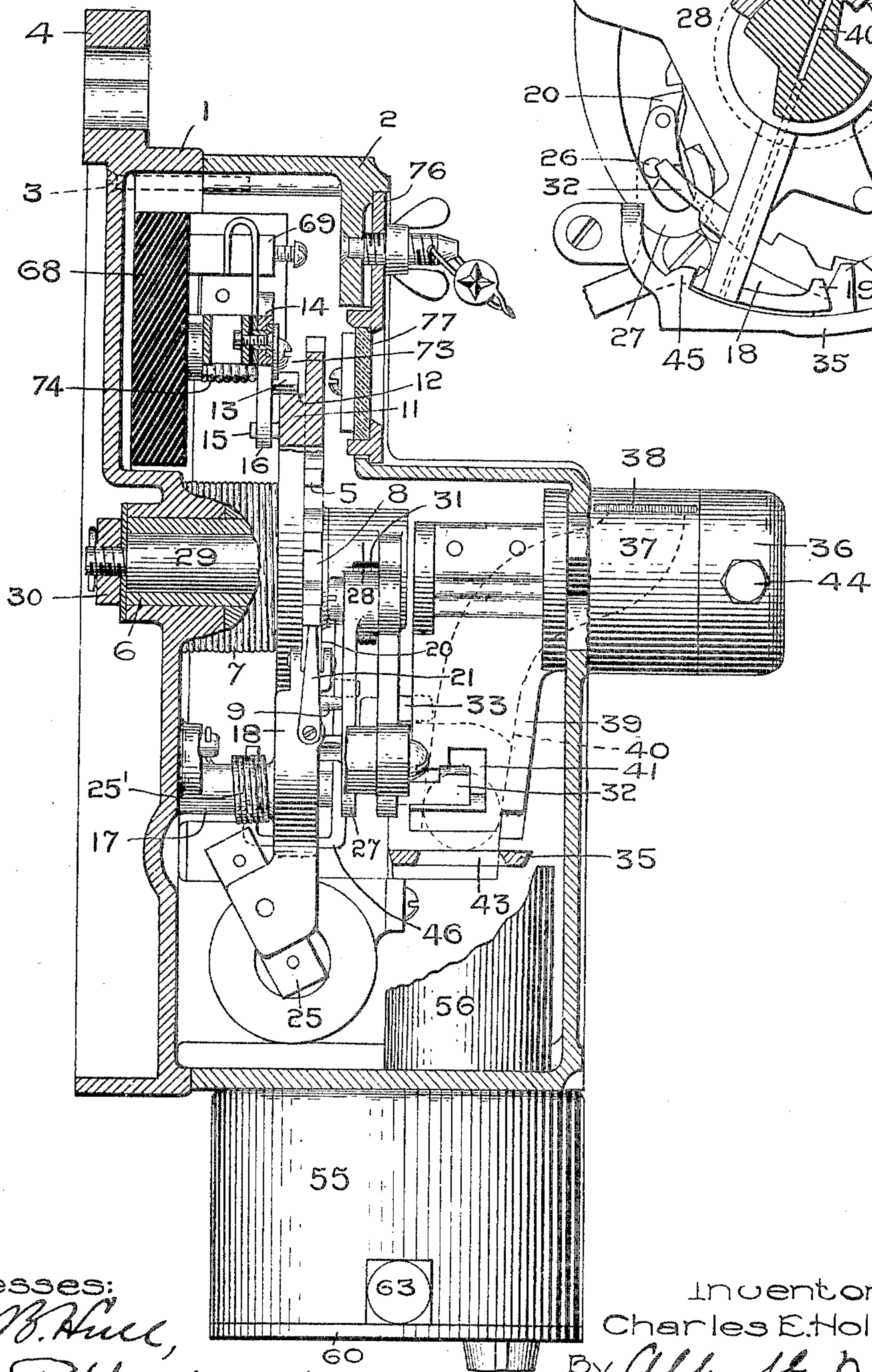
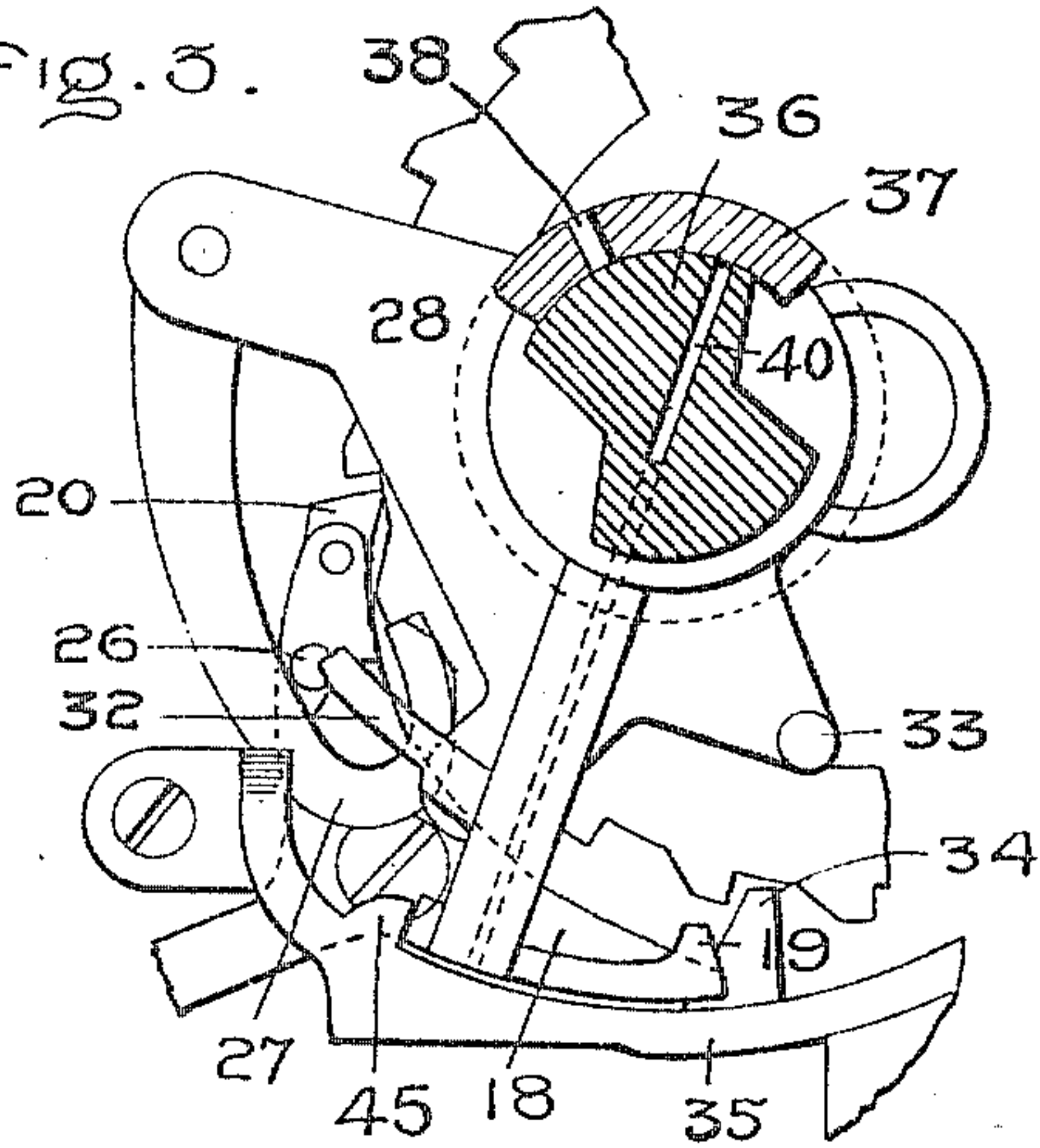


Fig. 3.



Witnesses:

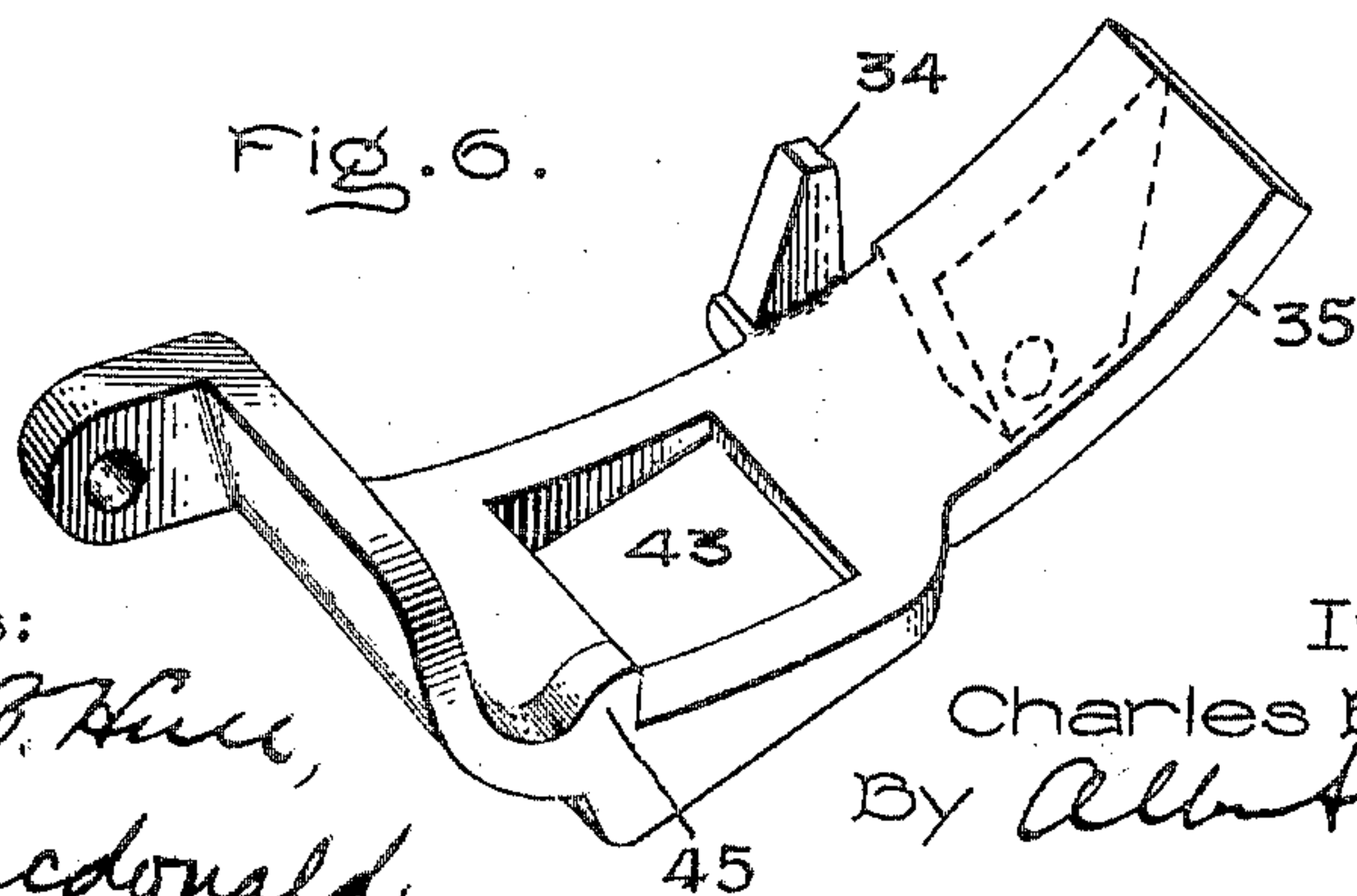
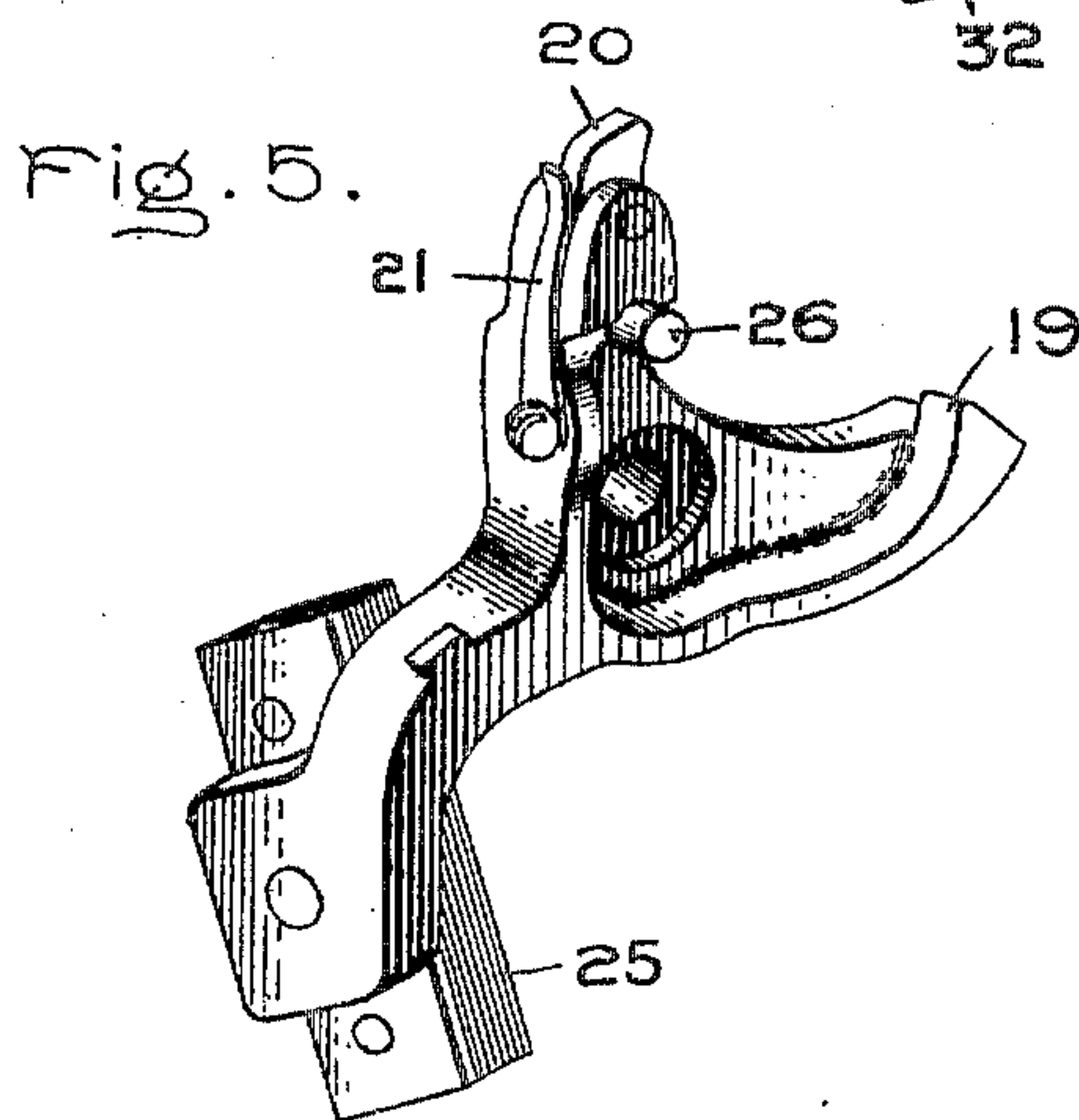
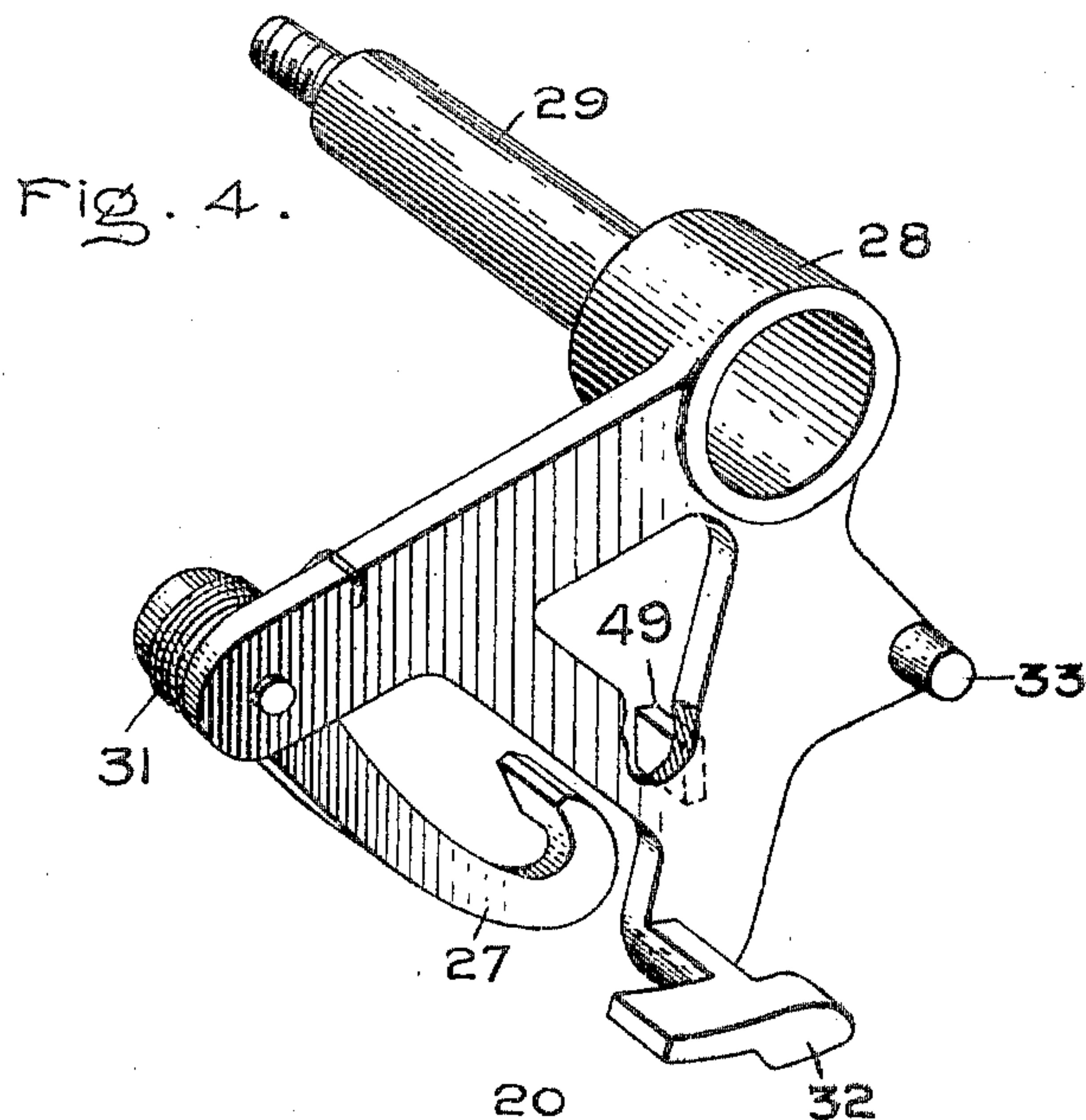
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APPLICATION FILED AUG. 12, 1901.

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APPLICATION FILED AUG. 12, 1901.

6 SHEETS—SHEET 4.

Fig. 7.

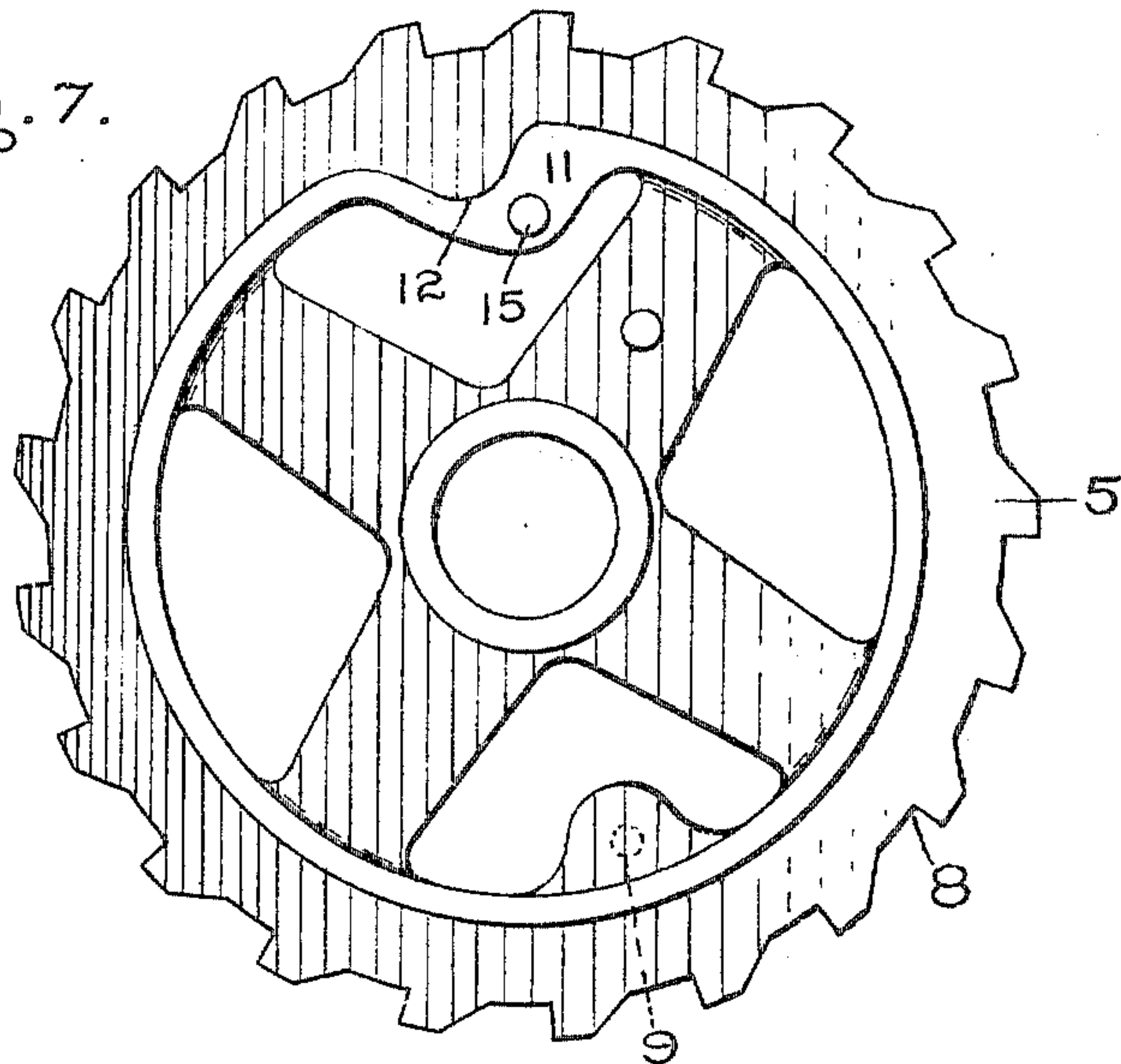


Fig. 8.

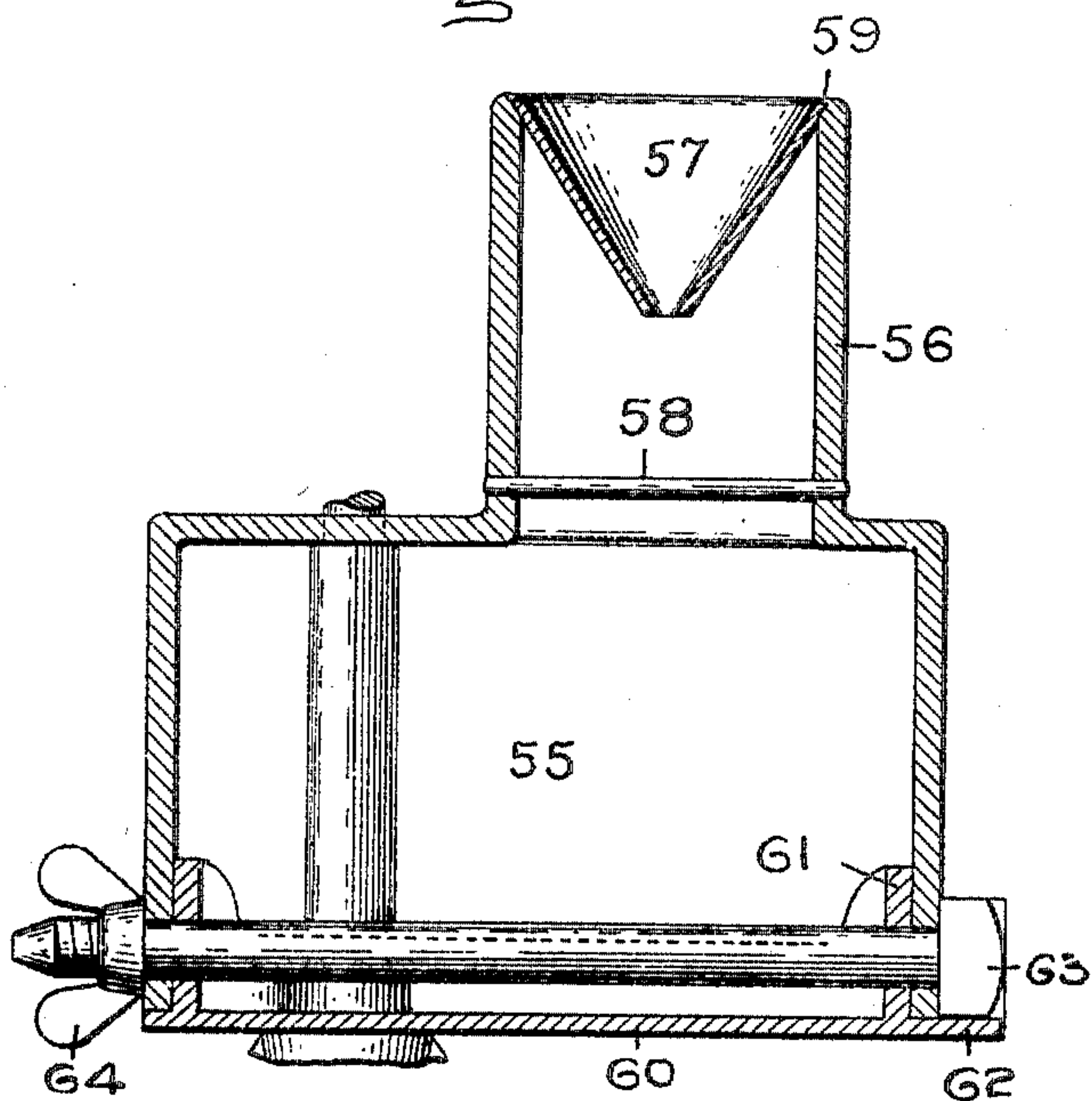
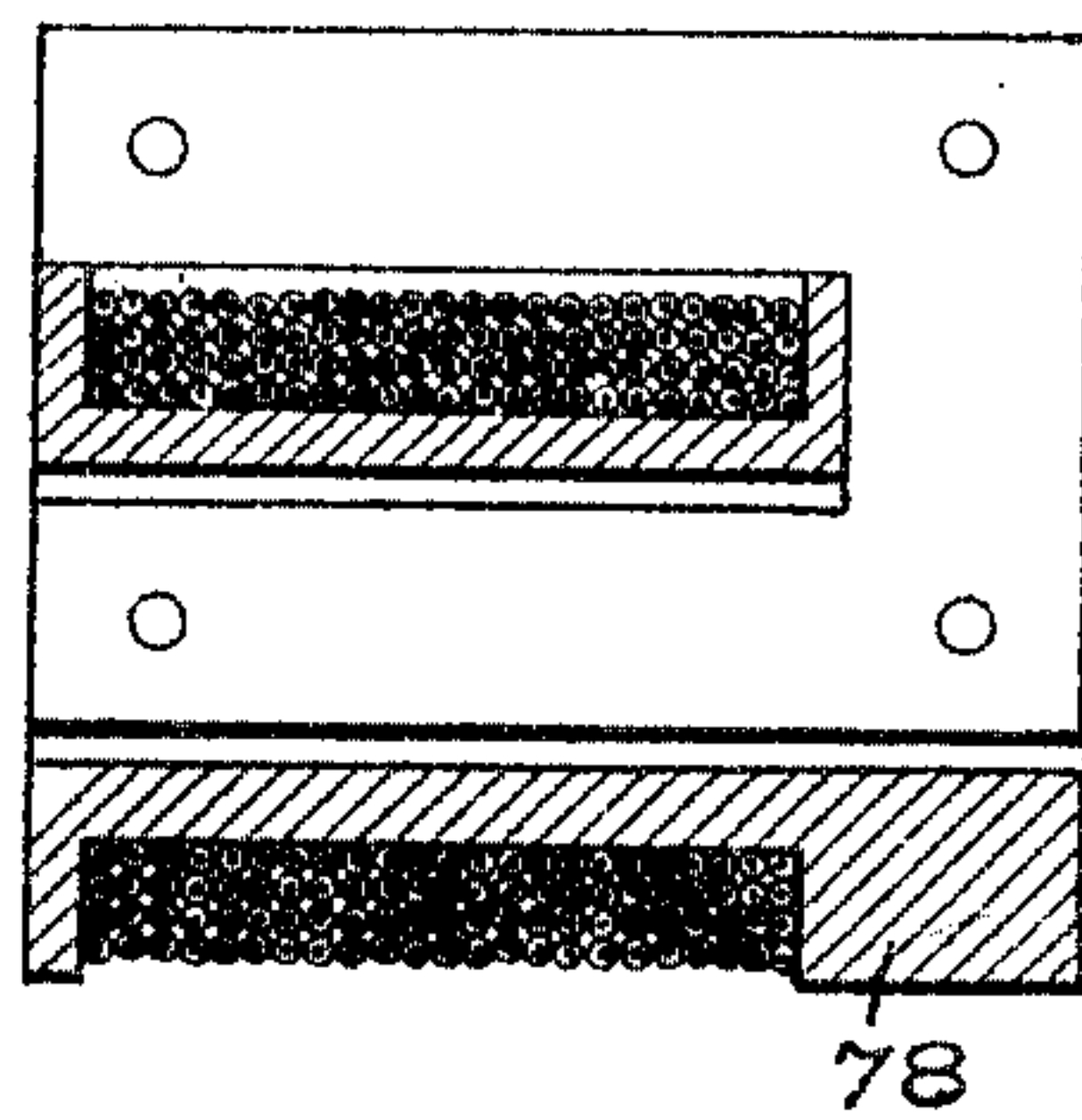


Fig. 9.



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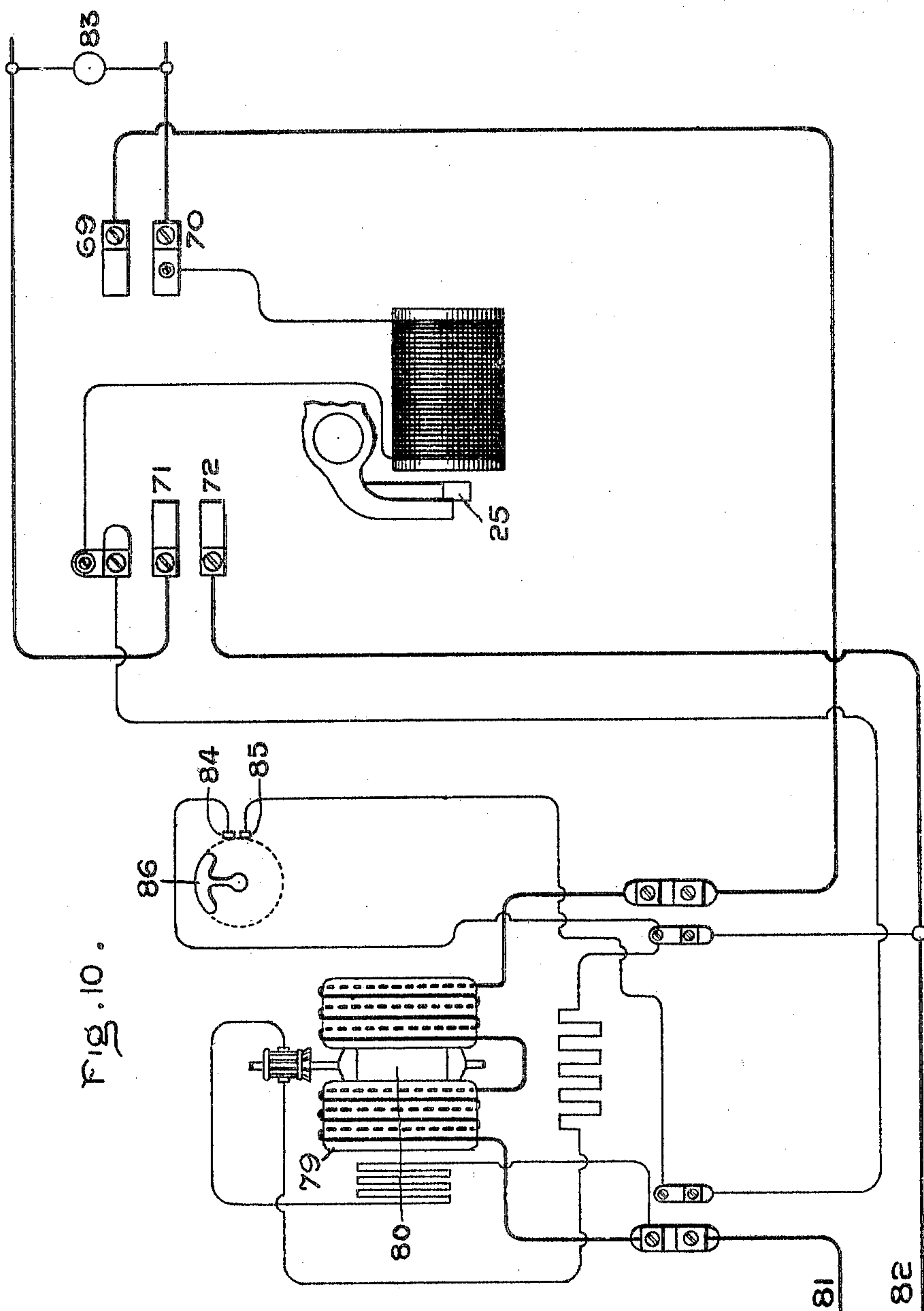
No. 797,808.

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C. E. HOLMES.
COIN CONTROLLED MECHANISM.

APPLICATION FILED AUG. 12, 1901.

6 SHEETS—SHEET 5.



Witnesses:

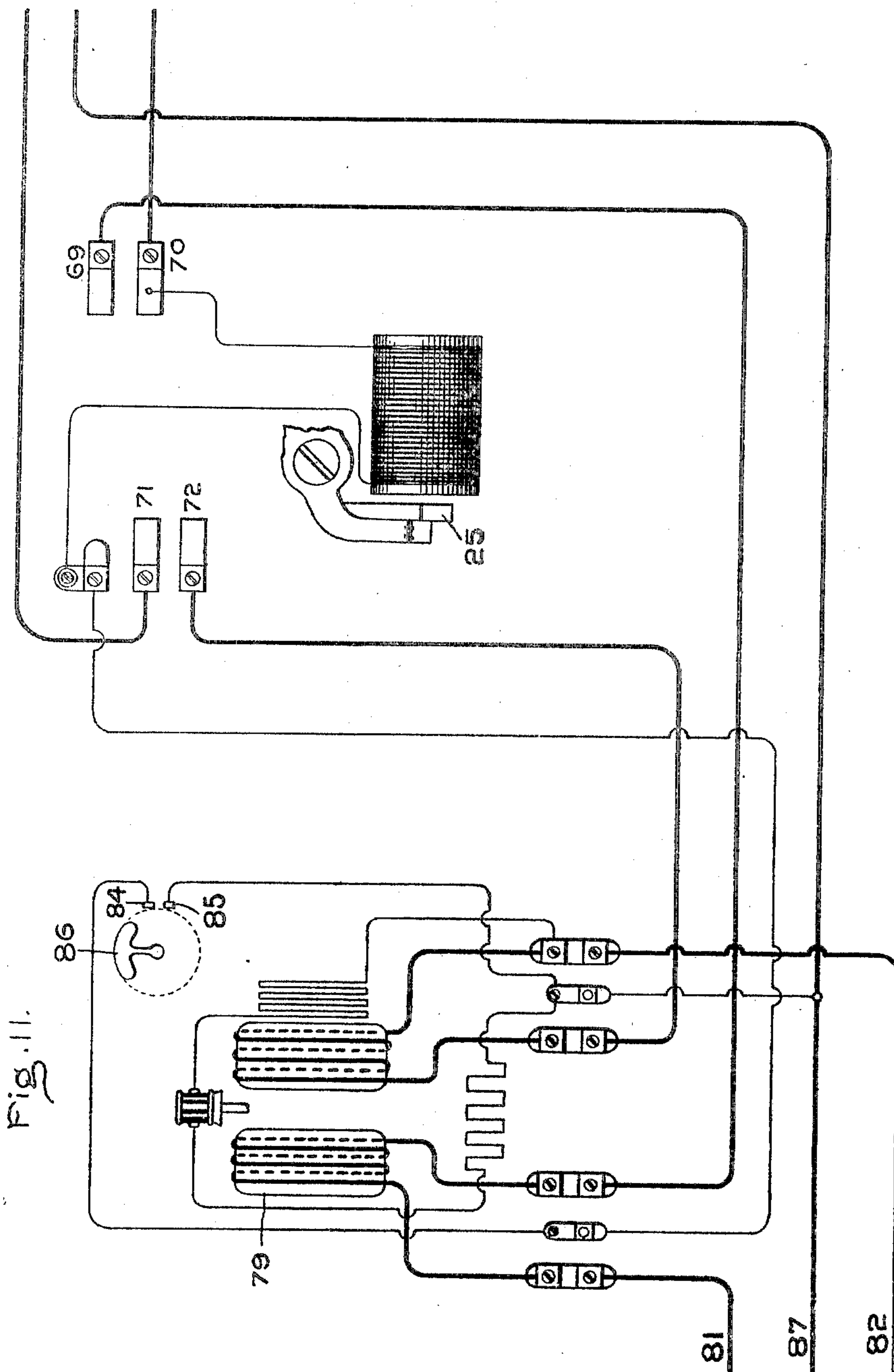
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APPLICATION FILED AUG. 12, 1901.

6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

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COIN-CONTROLLED MECHANISM.

No. 797,808.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed August 12, 1901. Serial No. 71,696.

To all whom it may concern:

Be it known that I, CHARLES E. HOLMES, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Coin-Controlled Mechanism, of which the following is a specification.

The present invention relates to coin-controlled apparatus, and more particularly to that employed for recording the consumption of electric energy.

The object of my invention is to provide a coin-controlled mechanism which will insure the customer under all conditions a predetermined amount of energy for the value of the coin or coins deposited and at the same time protect the rights of the station operators.

The scope of my invention will be pointed out in the claims appended hereto.

In the accompanying drawings, which illustrate an embodiment of my invention, Figure 1 is a front elevation, partially in section, of a coin-controlled mechanism. Fig. 2 is a vertical section thereof, showing certain of the operating parts in elevation. Fig. 3 is a detail view in elevation of the operating mechanism. Fig. 4 is a perspective view of the actuating arm or lever; Fig. 5, a perspective view of the armature and escapement for canceling the value of a coin when the prepaid amount of energy has been consumed. Fig. 6 is a perspective view of the stationary part of the coin-actuating mechanism. Fig. 7 is a rear elevation of the dial. Fig. 8 is a vertical section of the cash-box. Fig. 9 is a section of the releasing-magnet. Fig. 10 is a diagram illustrating the circuit connections of the apparatus when used in connection with a two-wire meter, and Fig. 11 is a diagram of the circuit connections when used in connection with a three-wire meter.

My invention is illustrated in connection with a coin-controlled meter system wherein the meter may be located at one point and the prepayment device at another, suitable circuit-wires connecting the two. The prepayment mechanism is provided with a switch for closing the circuit of the consumer, and this switch is under the control of a coin-actuated means composed of a primary and a secondary actuator, the two actuators being eccentrically disposed with respect to each other and arranged to be connected by a deposited coin.

In order to cancel the value of the coins, an escapement is provided which acts on the switch-closing device, the escapement itself being under the control of a magnet the circuit of which is made and broken by a contact driven by the meter mechanism. To insure the proper cancellation, even though a consumer be in the act of depositing a coin, means are provided between the switch, its actuating means, and the value-canceling mechanism whereby the said actuating means are momentarily rendered inoperative.

My invention is illustrated in connection with apparatus designed for use with prepayment-meters; but many of the novel features are applicable to other kinds of mechanism, and I aim to embrace such a use in the claims.

In the drawings, 1 represents the base or support, and 2 a removable cover for inclosing the operating parts of the mechanism. This cover is secured to the base by screws 3, which extend through from the back, so that they are covered up when the meter is mounted on its support. To prevent tampering with these screws, the prepayment attachment as a whole may be provided with some sort of a seal. In the present instance the base is provided with two projections 3' on the lower end, which are bolted to the support, and a slotted projection 4 on the upper end, which is designed to be sealed in place.

The operating mechanism consists, primarily, of two oscillating members or actuators, which are mounted for movement on non-concentric shafts. One of these actuators is manually operated, while the other is operated through the medium of a coin and constitutes a secondary actuator. The object of this non-concentric mounting of the operating parts is to insure the discharge of the coin before the apparatus is set in operative relation, as will be described more fully hereinafter. The second of these actuators consists in part of a disk 5, which is loosely mounted on the stationary sleeve 6, Fig. 2. Between the disk and a stationary abutment on the frame is a coiled spring 7, which tends at all times to rotate the disk in an anticlockwise direction. In other words, the spring tends at all times to move the disk to a point where it will permit the circuits to open. The periphery of the disk is provided with a number of notches 8. In the present instance twenty-

one of these notches are provided, it being intended that the apparatus shall be capable of receiving twenty coins. If it is desired to use a greater or less number of coins, the number of notches is correspondingly varied. On the front of the disk is a pin 9. (Shown in dotted lines in Figs. 1 and 7 and in full lines in Fig. 2.) This pin is designed to actuate the mechanism that prevents the insertion of more than a specified number of coins, which mechanism will be described hereinafter. On the back of the disk, as shown in dotted lines, Fig. 1, and in full lines, Figs. 2 and 7, is a cam 11, having a depression 12. The cam is arranged to engage with the lug 13, Fig. 2, on the main switch 14 and closes the switch. When the lug is opposite the depression 12, the switch will open under the action of a spring, as will be described hereinafter.

Situated on the back of the dial and adjacent to the depression 12 is a pin 15, which engages with the projection 16 on the switch 14. (Shown in dotted lines, Fig. 1, and in full lines, Fig. 2.) When the pin strikes the projection, it will positively open the switch in case the switch fails to open under the action of its spring.

Situated in the lower left-hand corner of the casing and pivotally mounted on a short stud 17, formed on the base, is an escapement-pawl 18. (Best illustrated in Fig. 5.) The right-hand end of the pawl is provided with a fixed projection 19, while the left-hand end is provided with a dog 20, that is normally held in the position shown by the flat spring 21. The projection 19 and the dog 20 are arranged to engage with the notches or teeth on the disk and regulate the backward or value-canceling movement of the disk. The object in providing the dog is to permit the clockwise rotation of the dial under the action of the coin-controlled mechanism. Without this the disk would rotate backward under the action of the spring when the coin-controlled mechanism was in the act of moving it because the pin 26 would strike the hooked arm 27 and disengage it from the disk, as will appear hereinafter. The projection 19 and the dog 20 are so related to the notches on the disk that when the armature 25 is attracted the disk will rotate anticlockwise a distance equal to one-half of a notch and when the magnet is deenergized will move the remainder of the distance between the notches. The armature consists of a rectangular body of iron, which is preferably laminated, which armature is adapted to bridge the fixed core of the releasing-magnet. (Illustrated in section in Fig. 9.) The escapement is moved in one direction by the magnet and in the reverse by the coiled spring 25'.

Mounted on the front of the escapement-pawl is a pin or projection 26, which pin is arranged to engage with the actuator-arm 27 and throw it out of engagement with the disk

each time the escapement is actuated. The mechanism is so arranged that no matter if a coin is being inserted at the time the releasing-magnet is energized the equivalent of one coin only will be canceled, for the escapement-pawl will engage the teeth on the disk and prevent backward rotation. At such times as the coin-actuating mechanism is idle the movement of the pin will have no effect, the arm merely moving away from the disk and back again. The pin or projection 26 also prevents the fraudulent use of the apparatus by tying the operating-handle and coin in an intermediate position, thus holding the disk 5 and maintaining the switch closed.

Assume, for example, that the secondary actuator 28 is in the act of moving the disk and is in the position shown in Fig. 3. The dog 20 on the escapement will permit the teeth on the disk to pass by, the escapement as a whole remaining stationary, and consequently not affecting the hooked arm 27. On the other hand, if the dog 20 were made a fixture with the escapement when the teeth passed over it the escapement as a whole would vibrate after the manner of those of ordinary construction, and the pin 26 would throw the hooked arm out of engagement with the disk, permitting the coiled spring 7 to rotate it anticlockwise.

The disk is retained against outward movement away from the back or base by the secondary actuator 28, Fig. 4, which is provided with a rearwardly-extending shaft 29, that passes through the stationary sleeve 6 and is provided with a retaining-nut 30. On the front end of the shaft is a triangular frame, and on the left-hand leg thereof is pivoted a hooked actuated arm 27. The hook on this arm is arranged to engage with the notches on the disk and move the same in a clockwise direction when a coin is deposited in the apparatus. This hooked arm is normally pressed into engagement with teeth or projections of the disk and with the pin or projection 26 on the escapement-pawl by the coiled spring 31. The spring is attached to the arm at one point and to the frame at the other and tends at all times to move the hooked arm inward toward the center of rotation of the disk. On the lower end of the right-hand leg of the triangular frame is a projection 32, which is arranged to engage with the coin after it is dropped through the coin-slot in the operating-handle. To the right of the projection 32 and mounted on the same leg therewith is a stop or pin 33. This pin engages with the manual actuator when it is moved in an anticlockwise direction and sets the apparatus into an operative position, Fig. 1. The backward rotation of the actuator is controlled by a stop 34, Fig. 6, on the curved plate 35, which forms a support for the lower edge of the coin when it is first deposited.

Mounted on the cover of the apparatus is a

manual or primary actuator, consisting of a cylindrical head 36, Fig. 3, which is fitted into the hub 37, the latter preferably being formed integral with the cover. The hub is slotted at 38 to permit the insertion of a coin or other token of predetermined character. Extending rearwardly from the head 36 is an arm 39, containing a slot 40 of the formation illustrated in dotted lines, Fig. 2. The center of rotation of this arm is offset to the left with respect to that of the disk. The lower end of the arm is provided with a transverse L-shaped slot 41, through which the projection 32 is arranged to pass when the arm is rotated either before or after the insertion of a coin. Situated below the moving arm 39 and secured to the back of the casing by screws 42 is a curved plate 35. (Best illustrated in Fig. 6.) This plate forms a part of the coin receiving or holding device, the lower edge of the coin resting on the upper face of the plate. The left-hand end of the plate is provided with an opening 43, through which the coin drops after the apparatus has been started into operation. When the coin is first deposited, its lower edge rests on the curved plate 35, and when moved to the left the projection 32 strikes it in about the center, and as the handle 44 and arm 39 are rotated in a clockwise direction the eccentric relation of the parts causes the projection 32 to be dragged across the face of the coin until finally it passes off of the edge and the coin drops through the opening 43 into the coin-box. This releasing of the coin takes place before the disk has been moved the distance of one notch. The object in discharging the coin prior to the actuation of the disk is to prevent fraudulent operation of the apparatus, which might take place if the parts could be held in contact long enough to swing the coin to the right, where it would again rest on the curved plate—in other words, assume an initial position. The clockwise rotation of the manually-actuated handle is arrested by a stop 45 on the curved plate.

It is desirable to have a certain amount of lost motion between the primary and secondary actuator to decrease the liability of fraudulent operation due to wires or coins with strings tied thereto. The actuator makes such a close fit with the hub 37 that a string attached to the deposited coin will be severed before the parts are in coöperative relation. During the interval of time that the manual actuator is moving from the position shown in Fig. 1 to the point where the coin will strike projection 32 it has no effect on the mechanism; but as soon as it strikes the coin it picks up the secondary actuator. Then any movement imparted to the primary actuator is transferred to the disk.

In order to limit the number of coins which can be inserted in the apparatus, it is necessary to provide means for preventing the ro-

tation of the disk and also to provide means for closing the opening of the coin-slot 39. This is accomplished by means of a pivoted arm 46. (Best shown in Figs. 1 and 2.) This arm is pivoted on a support carried by the base and is normally pressed upward into the position shown by the coiled spring 47. The outer end of the arm is provided with a projection 48. (Shown in dotted lines, Fig. 1.) This hook is arranged to engage with a rearwardly-extending pin or projection 49 on the actuator 28 and prevent the same from being rotated. This stop is so positioned that the actuator is held at an intermediate position, and it is impossible to move the handle 44 back to a position where the coin-slot 39 will coincide with the coin-opening 38 in the hub 37. In other words, the pin 33 has been advanced far enough to the left to prevent the complete backward movement of the arm 39, and it is only when a certain amount of energy has been consumed and the disk permitted to rotate backward or in a clockwise direction an amount equivalent to one tooth that the handle may be returned to its normal position—in other words, returned to a position where the coin-slot and coin-opening coincide. The coin-limiting arm 46 is actuated by a pin 9, carried on the front of the disk, and when this pin strikes the upper edge of the arm it depresses it until the free end thereof is in the path of the projection 49.

Situated below the opening 43 in the curved plate 35 is a coin-box 55. This box is best illustrated in Fig. 8. The main body of the box is preferably made of a casting and of some light material—such as aluminium, for example. Extending upward above the main body of the box is a neck 56, which contains a slotted thimble 57 to receive the coins as they drop through the opening 43 in the curved plate. This thimble is preferably made out of a single piece of metal and is retained in place by spinning the upper end of the neck over it, as indicated at 59. In order to prevent coins from being extracted from the box, it is necessary to provide a protective device, and such a device is found in the pin 58, which is located a short distance below the slot and extends transversely thereto. As the coins are dropped through the slot they strike the pin and are deflected, and the coins cannot be withdrawn by fishing with a wire or similar device. The box is provided with a detachable bottom 60, having a rim 61 and a projection 62, that engages with the head of the retaining-bolt 63 and holds the same in place. The outer end of the bolt is provided with a winged nut 64 and is retained in place by a seal 65, Fig. 1. The neck of the box passes upward through the under side of the cover, and the box as a whole is retained in place by the vertically-extending bolt 66, which bolt is also provided with a winged nut and seal. By reason of this arrangement the

box may be removed from the apparatus by a collector duly appointed, who will replace the box containing the coins with an empty one, after which the box is sealed in place. The box containing the money can then be returned to the office of the company and there opened by removing the seal 65. In this manner a check is had on the collector of the box.

Mounted in the upper part of the inclosing case is a piece of insulation 68, upon which are mounted the switch-contacts, the contacts 69 and 70 being arranged to form one pair and the contacts 71 and 72 to form a second pair. The switch is pivotally supported at 73 and consists of a plate having a lug 13 and a projection 16. The lug 13 is arranged to engage with the cam-surfaces on the back of the disk and close the switch against the action of the coiled spring 74, which tends at all times to open the switch, as shown in dotted lines, Fig. 1. In case the switch fails to operate for any reason the projections 16 will strike against the pin 15 on the disk, and the switch will be forced open by it and by the coiled spring 7. The moving switch-contacts, which engage the stationary contacts 69 to 72, inclusive, are insulated from the plate, so that there is no danger of a short circuit. Opposite each of the stationary contacts is an opening through which the circuit-wires extend and are retained in place by screws 75. It is desirable to provide a plurality of contacts where the circuit is made and broken, so as to prevent destructive sparking. The number of breaks in series can be changed with the voltage of the system.

In order to get at the switch-contacts and also to read the figures on the dial, a removable plate 76 is provided, having a window 77, the latter being situated directly in front of the numbers of the dial, so that the consumer can tell at a glance how much energy remains to his or her credit. The plate is retained in place by a bolt and wing-nut, which nut is sealed in place.

Fig. 9 illustrates a longitudinal section of the releasing-magnet. The wire is wound on a spool 78, of insulating material, and the spool is slotted to receive the U-shaped laminated core. The ends of the core are flush with the left-hand end of the magnet, and the armature 25 is so arranged that it completes the magnetic circuit. The armature is at all times in close proximity to the pole-pieces, so that the action of the magnetic release is very positive and at the same time requires only a very small amount of energy.

In Fig. 10 I have shown my improved prepayment mechanism in connection with a meter. In the present instance a motor-meter is shown, wherein a stationary field-magnet 79 and a rotating armature 80 are provided; but the type of meter can be varied without departing from the spirit of my invention. 81 and 82

represent the circuit wires or mains. The main 81 is connected to the field-coils 79 and thence passes to the switch-terminal 69. Connection between the terminals 69 and 70 and 71 and 72 is attained by the switch in the upper part of the prepayment attachment. The main 82 passes directly to contact 72 of the prepayment device and is connected to the terminal 71 by means of the switch. From terminals 70 and 71 current flows to the lamps 83 or other translating device. The armature of the meter is connected between the main 81 and the main 82, a suitable resistance being included in series to cut down the current. In circuit with the main 82 is a contact 84 and in circuit with the main 81 and the releasing-magnet is a contact 85. These two contacts are so arranged that they are momentarily closed by the bridge-contact 86. The latter is driven by the meter mechanism, and after the armature thereof has made a certain number of revolutions or movements the contact 86 will momentarily bridge the contacts 84 and 85 and energize the releasing-magnet. At the instant the magnet is energized the armature will be attracted and the escapement-pawl 18 will permit the disk to move backward a distance equal to one-half the pitch distance of the teeth. As the contact 86 passes off of the contacts 84 and 85 the circuit is interrupted and the disk is permitted to rotate the balance of the pitch distance. This action is repeated each time the meter makes a certain predetermined number of movements or revolutions. If there are a number of coins on deposit in the prepayment apparatus, the disk will move backward one notch and the circuit will remain closed; but if it so happens that only one coin or its equivalent is on deposit when the contacts 84 and 85 are bridged, as aforesaid, the switch 14 will open and interrupt the circuit, not only of the consumer, but also of the releasing-magnet.

Referring to Fig. 11, I have shown the prepayment attachment as used in connection with a meter intended for three-wire service. Mains 81 and 82 each include one of the field-coils of the meter, while the main 87 passes uninterrupted to the consumer's circuit. The armature for the meter is connected between mains 82 and 87. The contact 85 is connected to the main 87 and the contact 84 is connected, through the prepayment mechanism, with the main 81. It will thus be seen that the armature is placed on one side of the three-wire system and the contacts and releasing-magnet on the other side of the three-wire system. I prefer to connect the parts in this manner so as to balance up the small losses incident to the operation of the devices. In the present instance the parts are of such high resistance and the power required to operate the various parts of the mechanism is so slight that the losses are negligible; but in event of device or devices requiring considerable

amount of energy to operate them it will be found desirable to connect them in a manner described. The operation of the attachment in this instance is the same as that previously described.

Assuming that the main switch is open and a consumer desires energy, a coin is dropped in the slot 38 and is arrested by the curved plate 35. The coin is then moved clockwise on the plate until finally it strikes the projection 32 on the secondary actuator. Continued movement in the same direction causes the hooked arm 27 to engage with and advance the disk. Shortly before the disk is advanced one step or notch the projection 32 slips off of the coin, due to the eccentric relation of the actuators; and the coin drops into the box. The motion of the actuator is continued after the coin drops by reason of the projection 32 having assumed a position where it can engage with the manual actuator. This moves the disk around to a point where the switch will be closed, and the consumer is at liberty to use the prepaid amount of energy.

In order to prevent the depositor from losing the value of a coin in case it is a little sticky or lags for any reason in the coin-chute, the projection 32 on the secondary actuator is extended to form a shelf. Under initial or normal conditions this shelf covers the coin-opening 43 in the curved plate, as illustrated in Fig. 1. Assuming that a coin is deposited in the chute and that before it strikes the curved plate the manual actuator is moved, the coin will then fall and strike the shelf formed on the projection 32 and be prevented from falling through the coin-opening. If now the manual actuator is returned to its initial position, the coin will drop on the curved plate, and when the handle is again moved the coin will engage with the projection 32 in the ordinary manner. Without the shelf a coin which was retarded in the coin-chute could be discharged directly into the coin-box without operating the mechanism.

It is to be understood that the word "coin" as used in the description and claims includes such equivalents as tokens and checks of various shapes and sizes.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a prepayment mechanism, the combination of a coin-controlled means for setting the mechanism into operation, a value-canceling device, acting independently of the coin-controlled means and means for rendering the coin-controlled means inoperative when the value-canceling device is operating.

2. In a prepayment mechanism, the combination of a coin-controlled means for setting the mechanism into operative relation with means acting independently of the coin-controlled means for rendering the coin-controlled means inoperative when the value of a coin is being canceled.

3. In a coin-controlled mechanism, the combination of a rotary element, a coin-controlled means for actuating the element, a let-off device for said element, and a device for rendering said means inoperative when said let-off is operated.

4. In a prepayment mechanism, the combination of a manually-actuated element, a second element which is connected to the first through the medium of a coin, a releasing mechanism, and means actuated by the releasing mechanism for rendering the connection between the elements inoperative.

5. In a prepayment mechanism, the combination of an element which is moved in one direction through the medium of a coin, a spring for moving it in the opposite direction, a pair of members which are movable with respect to each other, and are united for action by a coin; means carried by one of the members for actuating the element, a releasing mechanism which permits the element to rotate under the action of the spring, and means controlled by the releasing mechanism for rendering the actuating means carried by one of the members inoperative.

6. In a coin-controlled mechanism, an element movable in one direction through the medium of a coin, means for moving it in said direction comprising a pair of members arranged to be operatively connected by a deposited coin, and a pivoted arm carried by one of said members for engaging said element, means for moving the element in a different direction, and means for preventing an operative engagement between said pivoted arm and said element when the element is being moved in said different direction.

7. In a prepayment mechanism, the combination of a pair of pivotally-supported elements movable with respect to each other, and arranged to be connected by a deposited coin, pivots for the elements that are so set with respect to each other that one of the elements is dragged across the face of the deposited coin, a device for controlling the delivery of that for which the payment is made, mechanism for canceling the value of the deposited coins, and means for rendering the connection between the elements inoperative during the period of cancellation.

8. In a prepayment mechanism, the combination of a pair of moving elements eccentrically mounted with respect to each other, a means controlling the delivery of that for which the deposit is made, a connection between one of the elements and the means, a value-canceling mechanism, and a device for rendering the connection inoperative during the period of cancellation.

9. In a coin-controlled apparatus, a movable member, an element mounted concentrically therewith for actuating it, a second element mounted eccentrically with respect to the first but adapted to be connected thereto by a coin,

said second element being provided with a coin-receiving pocket, and a curved plate arranged to engage the coin in said pocket, and prevent its escape from the position in which it couples said element together prior to the termination of predetermined angular movements of said elements.

10. In a coin-controlled apparatus, the combination of a pair of elements eccentrically mounted with respect to each other, and provided each with a coin-engaging portion, a plate curved concentrically with respect to the axis of one of said elements placed to prevent the escape of a coin from the position in which it is engaged by the coin-engaging portions of said elements during limited angular movements of said elements.

11. In a coin-controlled apparatus, the combination of a pair of elements eccentrically mounted with respect to each other, and adapted to be coupled together by a coin, with a curved plate forming a part of a coin-receiver located below the elements and concentrically arranged with respect to one of them, said plate serving to hold the coin in position to couple said elements together.

12. In combination, a disk, a movable element, a second element united to the first through a deposited coin, a device carried by one of the elements for moving the disk, an escapement, and means actuated by the escapement for rendering said device inoperative.

13. In combination, a notched disk, a movable element, a second element united to the first through a deposited coin, a pivoted arm carried by the first element for engaging with the notches on the disk, an escapement for canceling the value of a deposited coin, and means for holding the arm out of engagement with the disk when the escapement is being actuated.

14. In combination, a notched disk, an escapement coacting therewith to cancel the value of a deposited coin, a hooked arm for moving the disk, coin-controlled means for operating said arm, and means actuated by the escapement for moving the arm out of engagement with the disk.

15. In a coin-controlled mechanism, the combination of a disk, a pivoted switch movable with respect thereto, a coin-controlled means for rotating the disk in one direction, a spring for rotating the disk in an opposite direction, means carried by the disk for closing the switch, and means carried by the disk for positively opening the switch when the value of the last coin on deposit has been canceled.

16. In a coin-controlled mechanism, the combination of a pivoted switch, a coin-actuated disk, a cam on the disk for closing the switch, a spring for opening the switch under normal conditions when the value of the last coin has been canceled, and an auxiliary means

actuated by the disk for insuring the opening of the switch in case the spring fails to act.

17. In a coin-controlled mechanism, the combination of means for insuring the delivery of that for which the payment is made, an element mounted concentrically with said means, a second element mounted eccentrically with respect to the first and containing an open-ended coin-slot, a plate containing a coin-opening, which plate is located below the second element, means on the first element for engaging with the coin, and a connection between the first element and said means, the parts being so arranged that the coin is discharged through the opening of the plate before said means is actuated.

18. In a coin-controlled mechanism, the combination of a notched disk, means for actuating the disk, and an escapement for regulating the let-off movement of the disk comprising a pivoted arm having projections arranged to engage in the notches on the disk, one of said projections being movable whereby the disk may be actuated by said means without actuating the escapement.

19. In a coin-controlled mechanism, the combination of a notched disk, means for moving the disk, an escapement for regulating the movements of said disk comprising a pivoted arm having a fixed projection and a spring-pressed dog for engaging with the notches on the disk, and a magnet for actuating the escapement.

20. In a prepayment mechanism, the combination of a manual actuator provided with a coin-carrier, a secondary actuator mounted eccentrically with respect to the first, and a projection carried by the secondary actuator and arranged to be dragged across the face of a coin in said carrier to engage said manual actuator by reason of the eccentric relation of the parts when the manual actuator is moved.

21. In a coin-controlled mechanism, the combination of a manual actuator, a secondary actuator eccentrically mounted with respect to the first, a rotary notched disk, means carried by the secondary actuator for moving the disk in one direction, an escapement controlling the movements of the disk in the opposite direction, and a projection carried by the escapement and engaging with said means whereby the latter is thrown out of operation at the time the escapement is being actuated.

22. In a coin-controlled mechanism, the combination of a base or support, a detachable cover, a manual actuator mounted on and secured to the cover, a secondary actuator mounted on the base and adapted to be connected to the manual actuator through a deposit of a coin, the manual and secondary actuators being eccentrically mounted with respect to each other.

23. In a coin-controlled mechanism, the combination of a detachable cover, a base, a circuit-controller mounted thereon, a rotary

element for actuating said circuit-controller and movable with respect thereto, a secondary actuator concentrically mounted with respect to the rotary element, a manual actuator eccentrically mounted with respect to the secondary actuator and rotary element, and a bearing for the manual actuator which is carried by the cover.

24. In a coin-controlled mechanism, the combination of an element advanced in a step-by-step manner under the action of the deposited coins, a manual actuator, means operated thereby for preventing the deposit of a coin whenever the actuator is out of its initial position, and means for limiting the number of coins which can be deposited at a given time, comprising a pivoted arm that is actuated by the element and moved thereby into the path of the manual actuator to prevent it from being returned to its initial position.

25. In a prepayment metering system for three-wire circuits, the combination of field-coils, an armature connected between the neutral and one of the outside mains, a coin-controlled switch for completing the circuits of the mains, a releasing-magnet, and means for connecting the releasing-magnet between the neutral and the other outside main.

26. In a three-wire system of distribution, the combination of a coin-controlled switch, means connected between the neutral and one of the mains for controlling the delivery of that for which the payment is made, and means connected between the neutral and the other main for regulating the opening of the switch.

27. In a coin-controlled mechanism, the combination of a movable member, a step-by-step let-off device, means for advancing the member, mechanism between the let-off device and the means whereby the two are mutually dependent, and means for allowing said member to be advanced without operating said let-off device.

28. In a coin-controlled apparatus, the combination of a primary actuator, a secondary actuator, and a coin-support located below the actuator having integrally formed thereon two stops, one for the primary, and the other for the secondary actuator.

29. In a coin-controlled apparatus, the combination of a primary actuator, a secondary actuator, a coin-support located below the actuators, and a pair of stops mounted thereon, one stop being arranged to arrest the forward movement of one actuator, the other stop being arranged to arrest the backward movement of the other actuator.

30. In combination, a movable member, means for advancing it, a step-by-step let-off device for allowing it to recede, said let-off device being provided with means for rendering said advancing means inoperative at the instant when said let-off device is being operated.

31. In combination, a movable member, means for advancing it, a step-by-step let-off device for allowing it to recede, said let-off device being provided with means for rendering said advancing means inoperative at the instant when said let-off device is being operated, said let-off device also being provided with means whereby the advancement of said member does not operate said let-off device.

32. In a prepayment device, a manual actuator and a secondary actuator, said actuators being eccentrically mounted with respect to one another and provided with engaging surfaces so placed as to be normally out of position to engage with one another, and coin-coupling means carried by said actuators so arranged that on the insertion of the proper coin and the operation of the manual actuator the engaging surfaces are moved into contact with one another.

33. In a coin-controlled mechanism, the combination of a switch, coin-controlled means for closing the switch and locking it closed, said means including a rotary element, means controlled by said rotary element for releasing said switch, and other means also controlled by said rotary element for positively opening said switch.

34. In a prepayment device, a manual actuator, a secondary actuator, said actuators being eccentrically mounted with respect to one another and so arranged as to be normally out of position to engage with one another, and coin-coupling means carried by said actuators whereby on the insertion of the proper coin and a preliminary operation of the manual actuator the secondary actuator is moved into engagement with the primary actuator so that a further operation of the manual actuator will move the secondary actuator by reason of said engagement.

35. In a prepayment device, a primary pivoted actuator, a secondary pivoted actuator, both of said actuators having coin-engaging portions and being mounted eccentrically with respect to one another, the eccentricity being less than the distance between the pivot center and the coin-engaging portion of each actuator.

36. In combination, an electric circuit, a meter in said circuit, an element controlling said circuit coin-controlled means for moving said element in one direction, value-canceling means intermittently actuated by the meter for moving the element in the opposite direction and means for rendering the coin-controlled means inoperative whenever the value-canceling means operates.

In witness whereof I have hereunto set my hand this 8th day of August, 1901.

CHARLES E. HOLMES.

Witnesses:

DUGALD McK. McKILLOP,
ALEX. F. MACDONALD.