No. 667,090. Patented Jan. 29, 1901.

C. E. HOLMES.

COIN CONTROLLED MECHANISM.

(Application filed Jan. 18, 1900.)

(No Model.) 4 Sheets—Sheet 1.

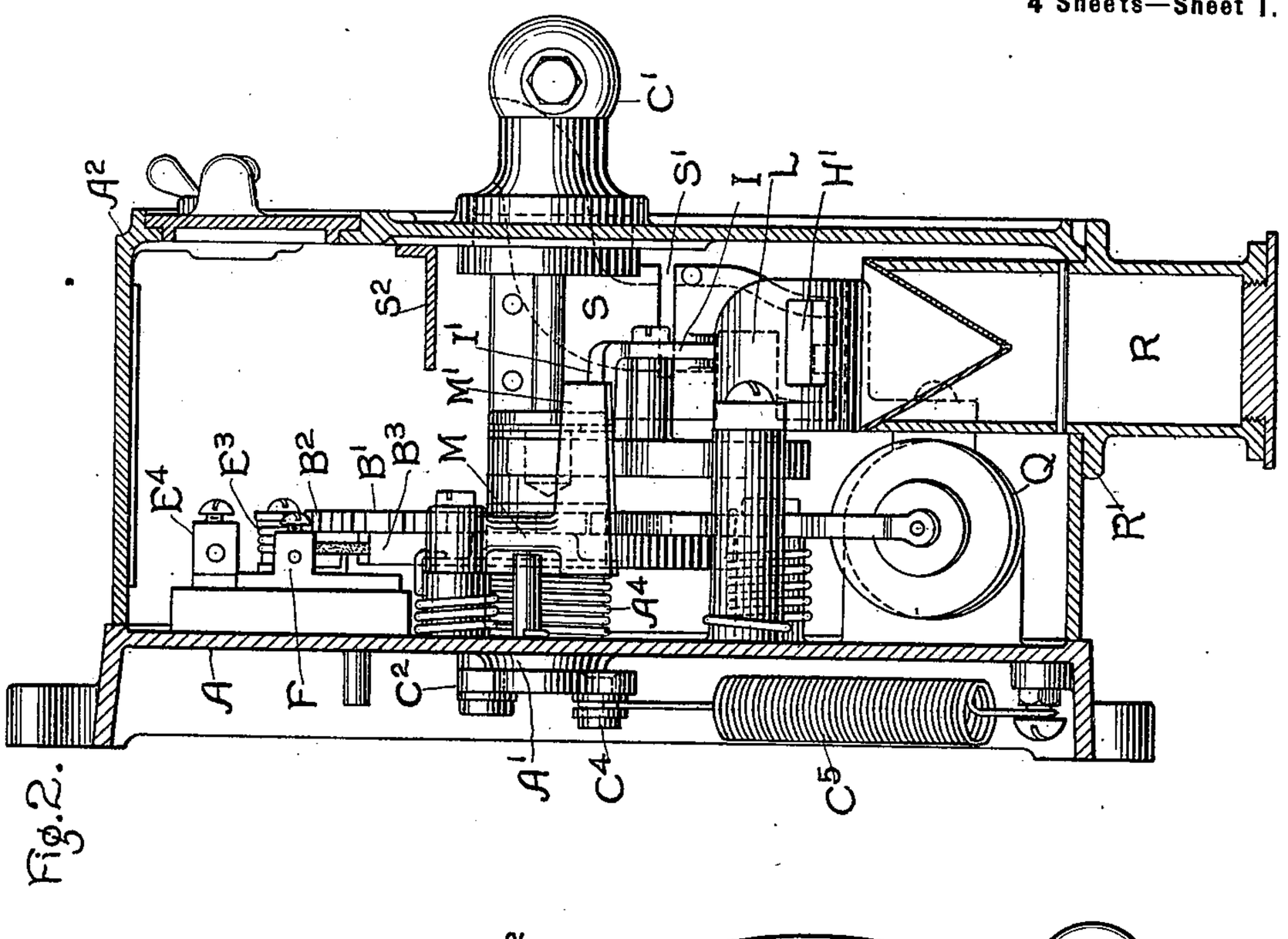

Fig. 2.

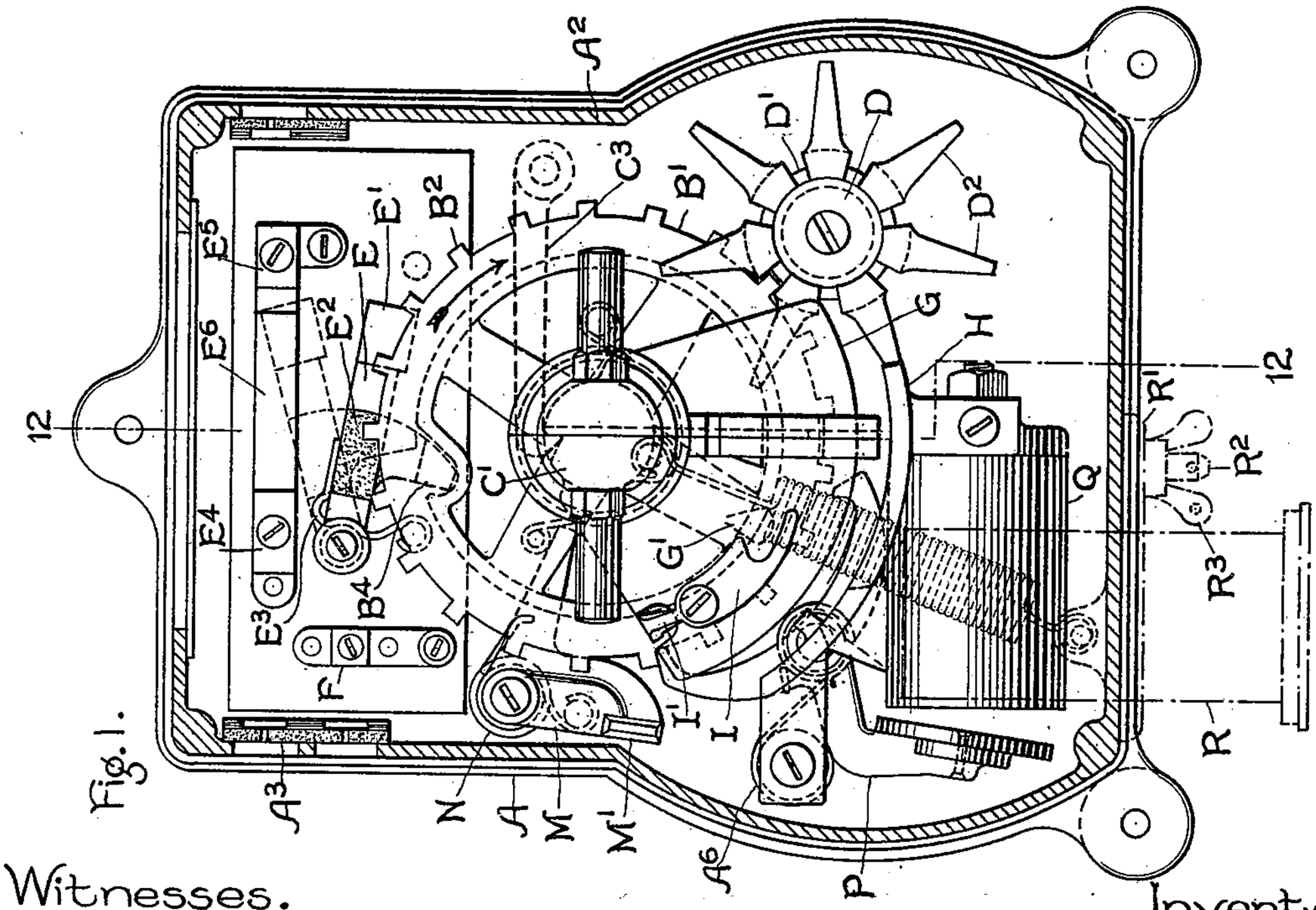

Fig. 1.

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Fig. 3.

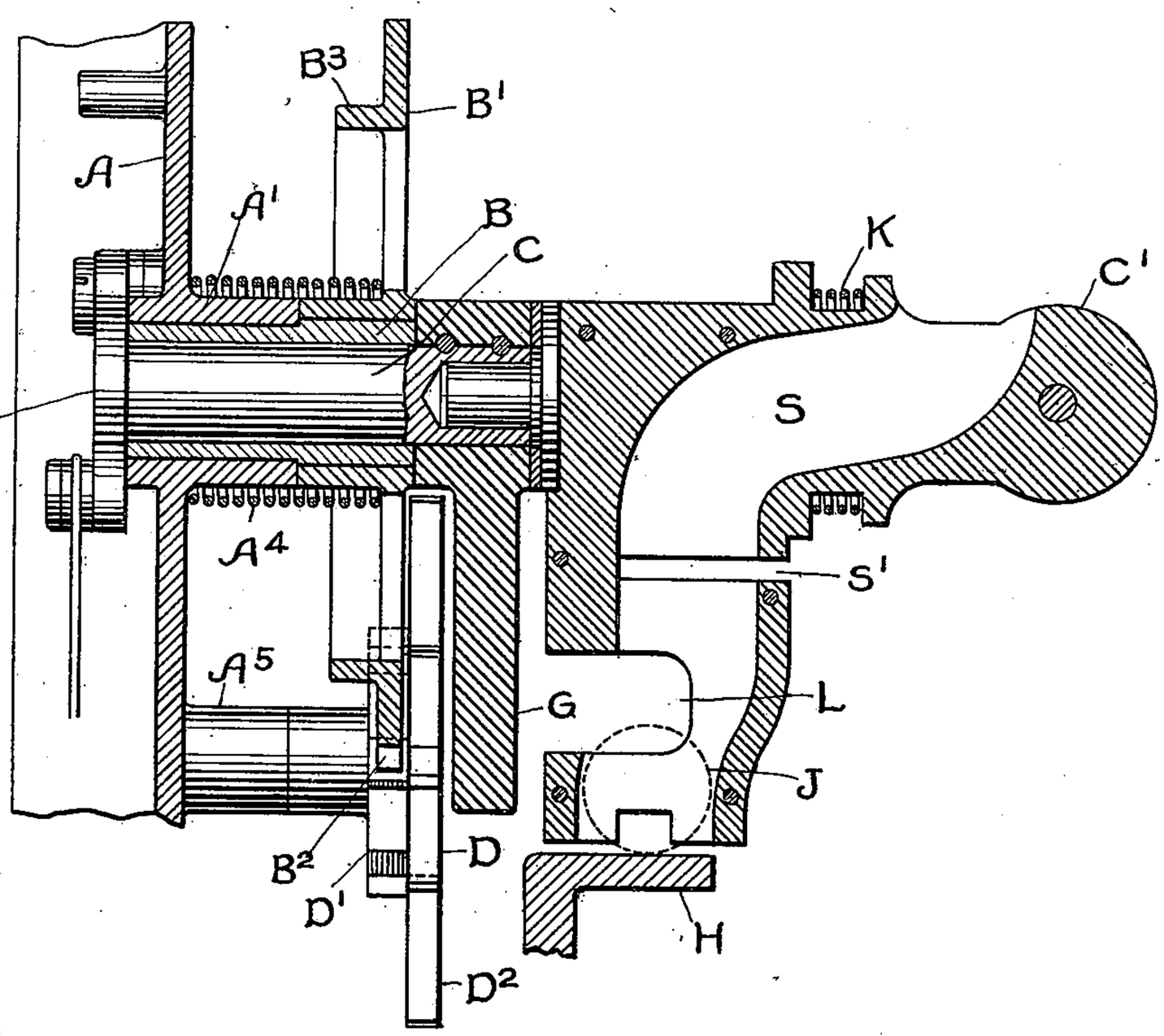


Fig. 4.

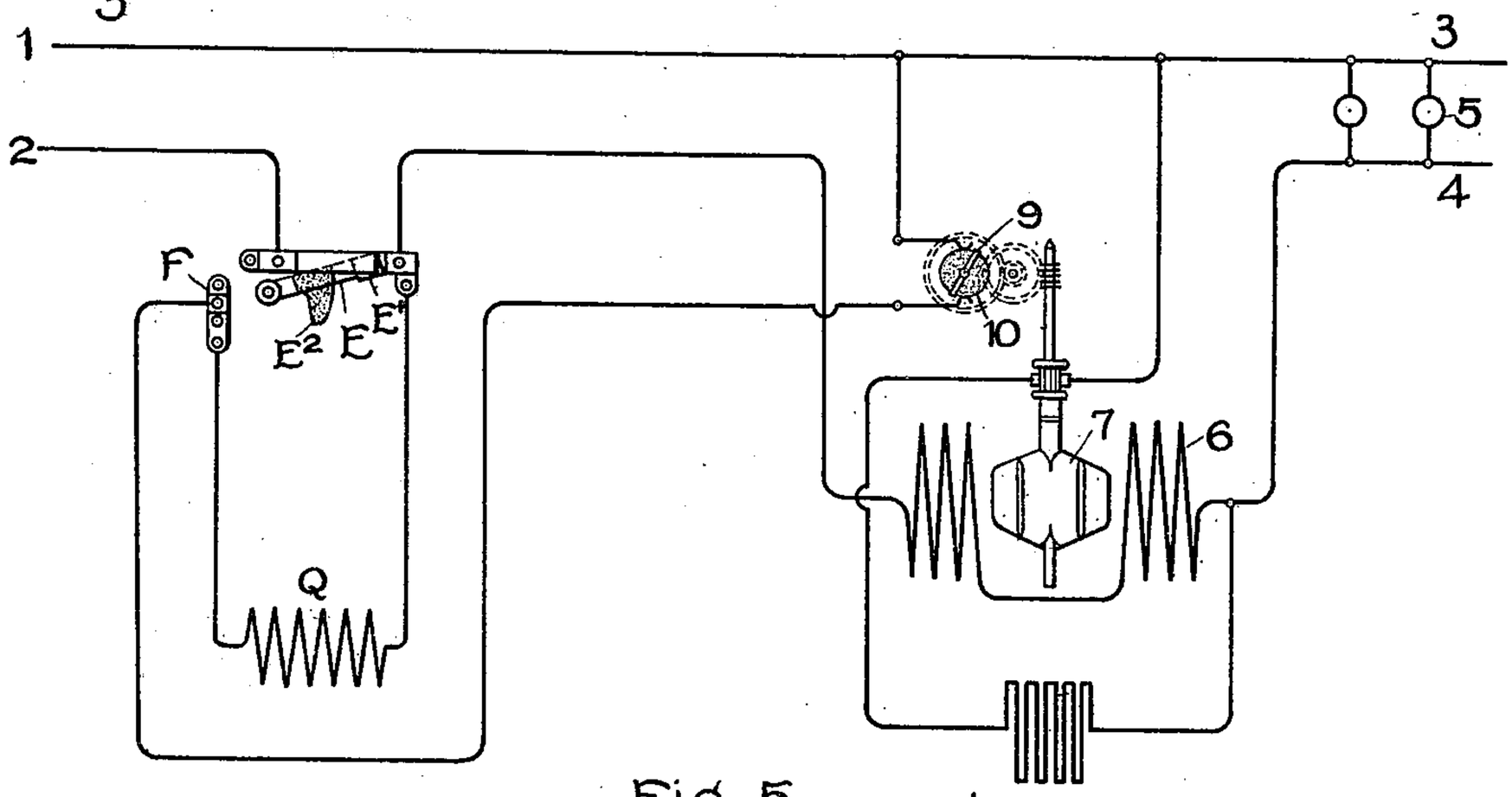
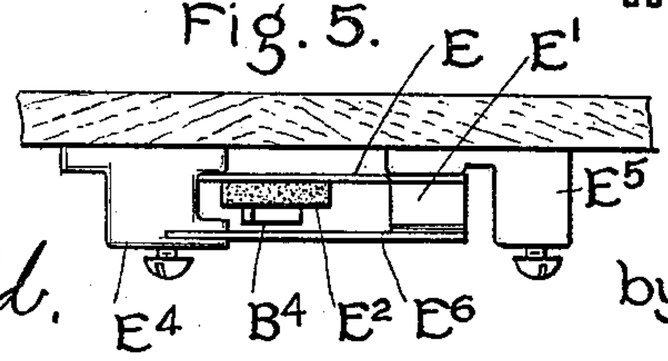


Fig. 5.



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(No Model.) 4 Sheets—Sheet 3.

Fig. 8.

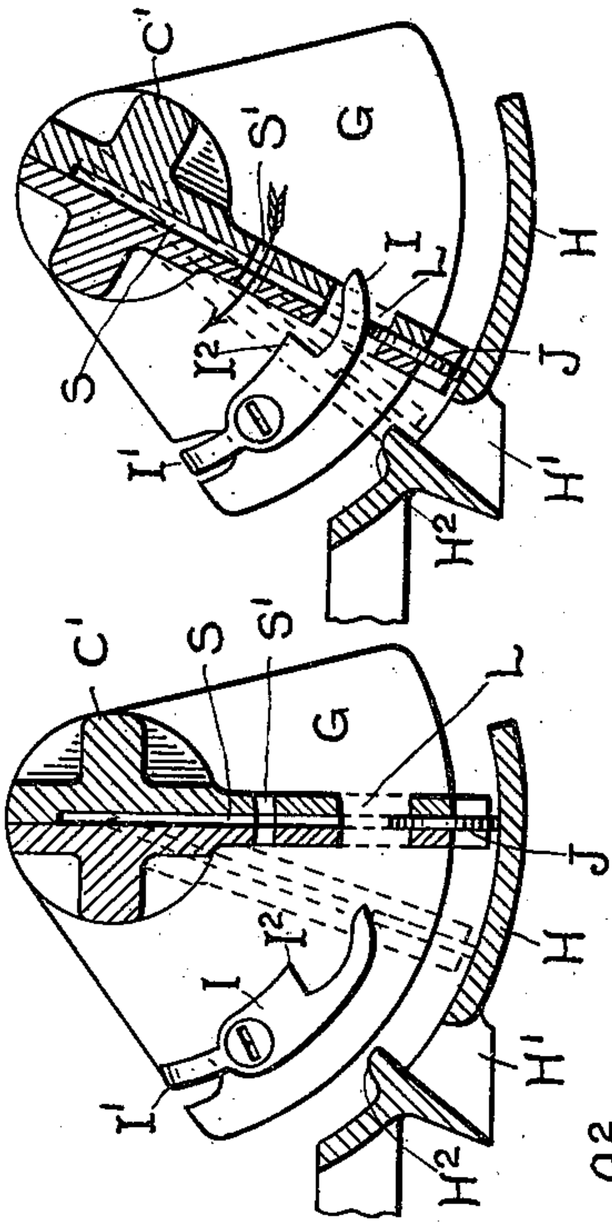


Fig. 10.

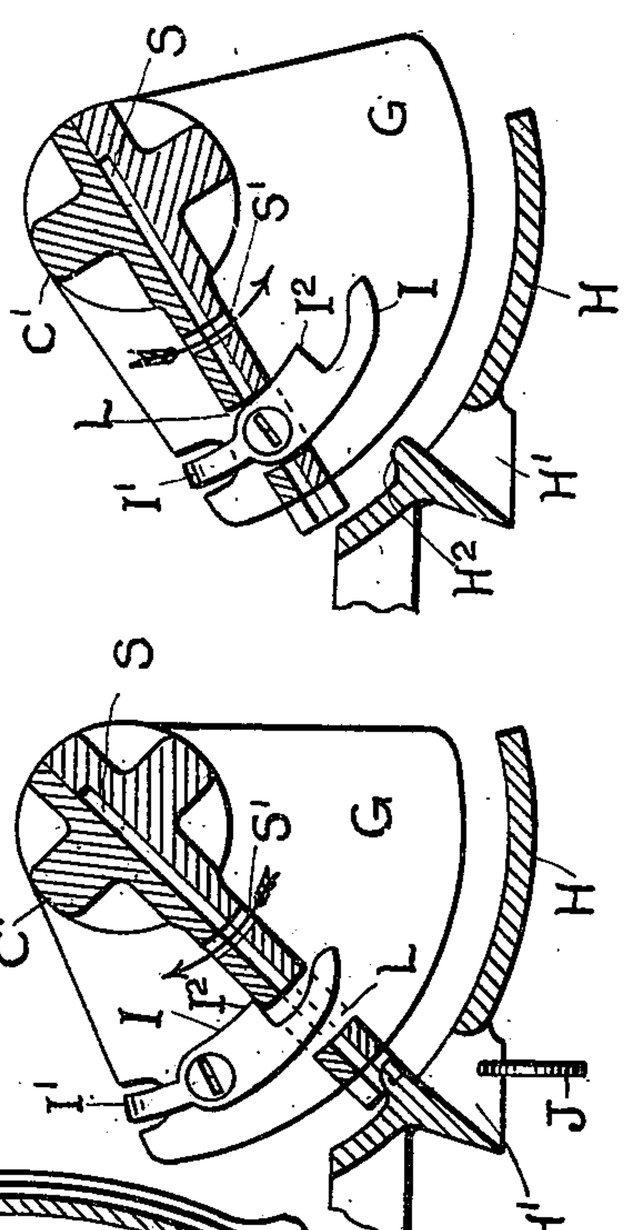
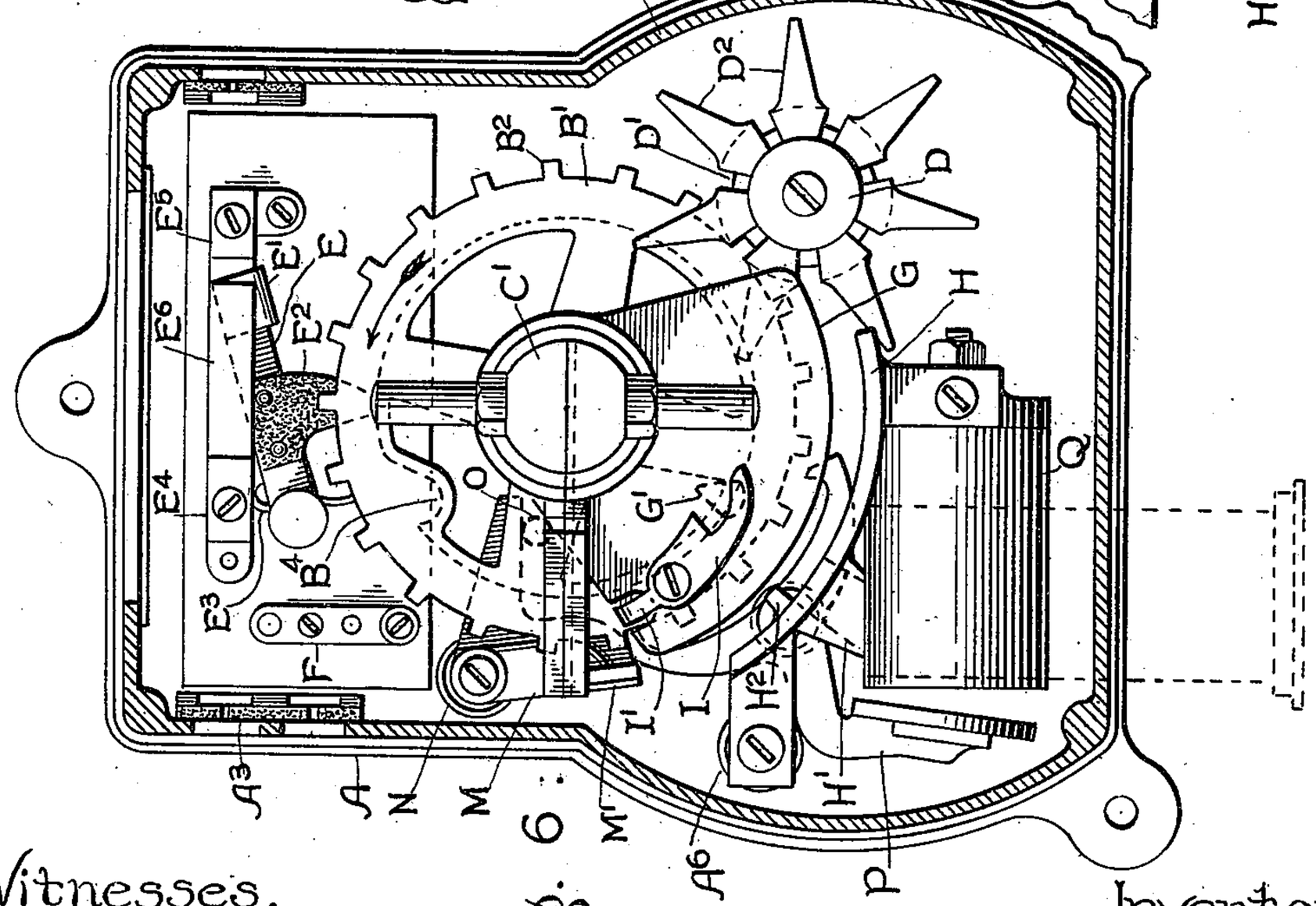


Fig. 7.

Fig. 9.

Fig. 6.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 12.

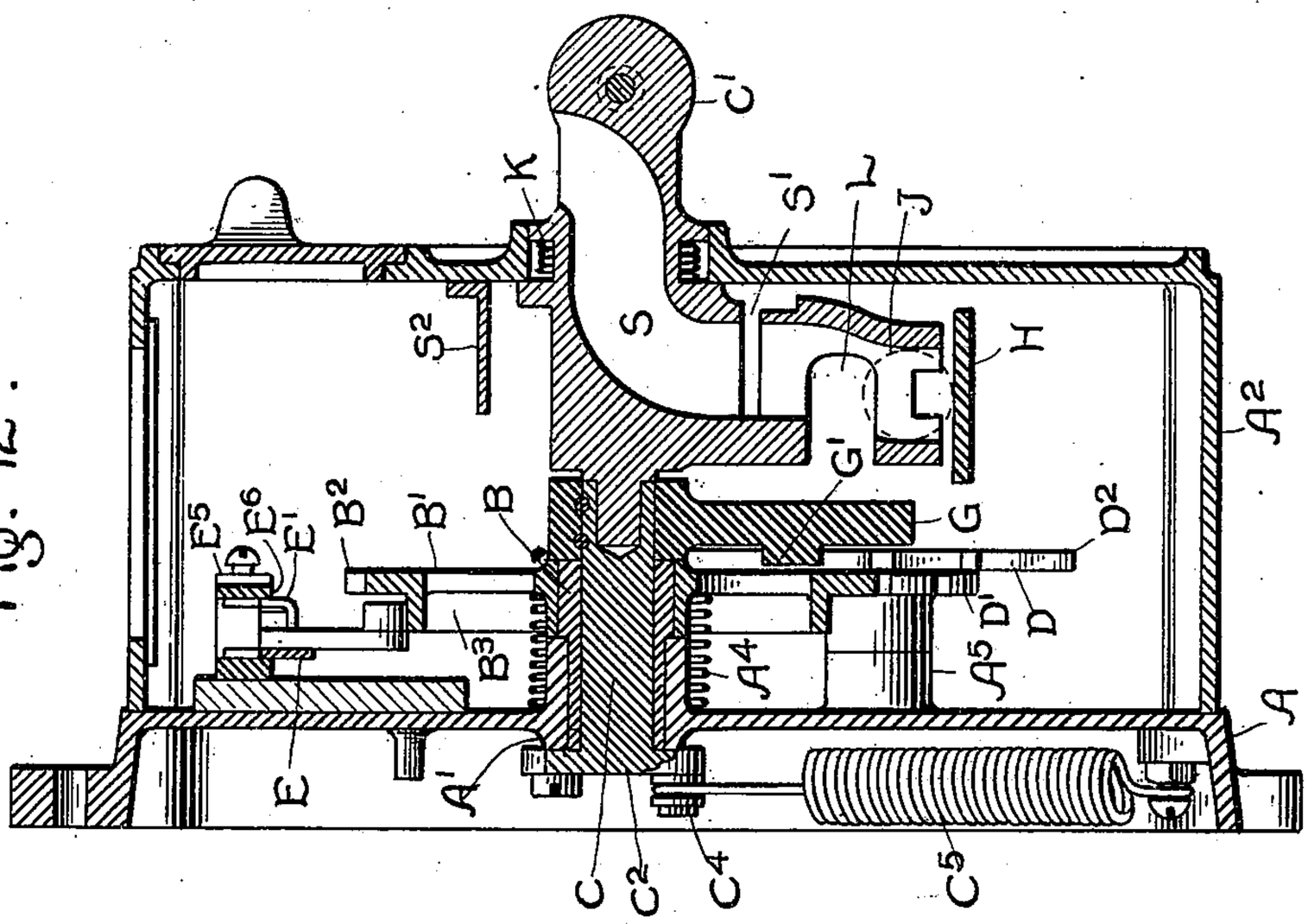
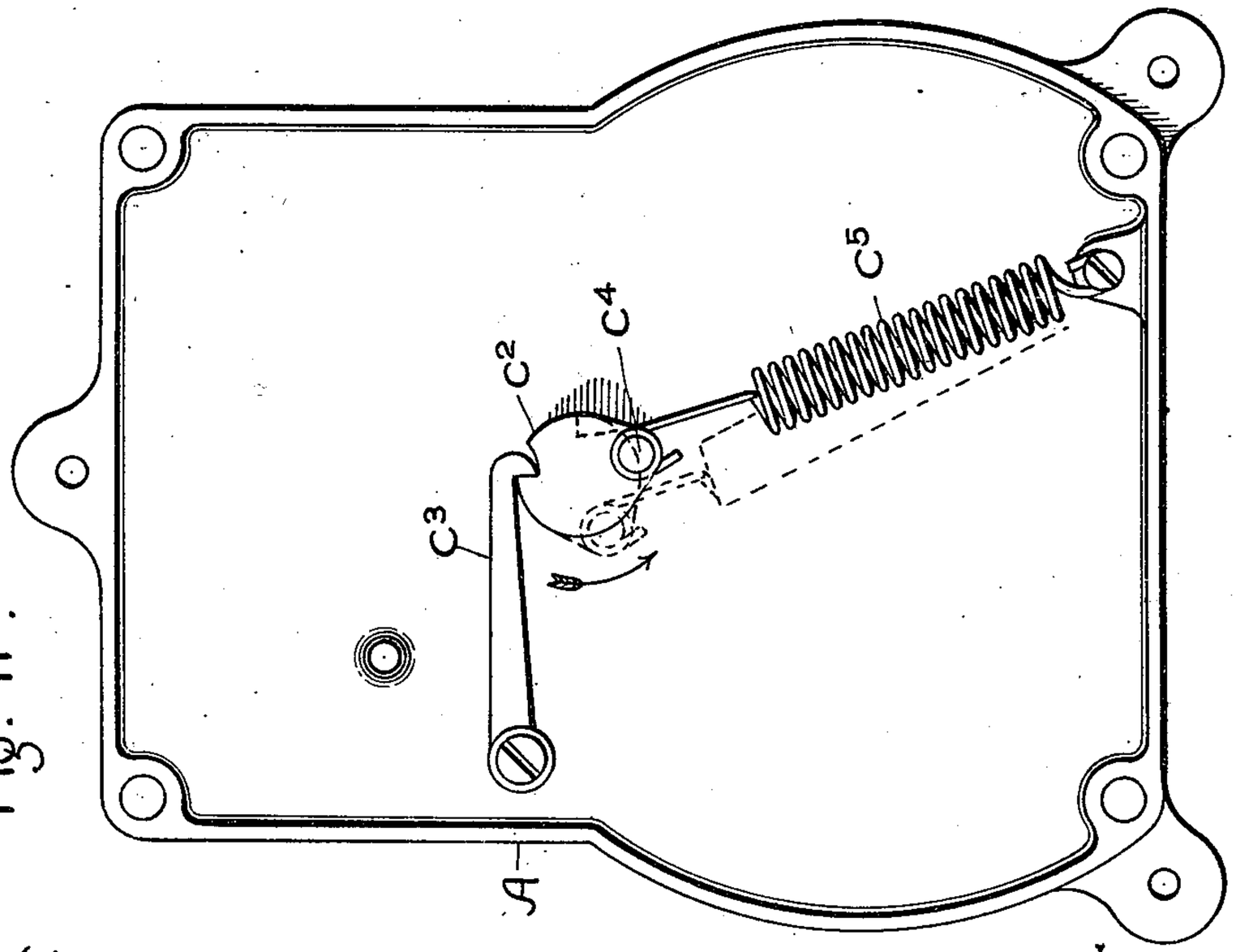


Fig. 11.



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by Albert G. Davis
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UNITED STATES PATENT OFFICE.

CHARLES E. HOLMES, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF NEW YORK.

COIN-CONTROLLED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 667,090, dated January 29, 1901.

Application filed January 18, 1900. Serial No. 1,829. (No model.)

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 and State of Massachusetts, have invented certain new and useful Improvements in Coin or Token Controlled Mechanisms, (Case No. 1,140,) of which the following is a specification.

The present invention relates to mechanism which is controlled or placed in operative condition by the insertion of a proper coin or token. Prepayment mechanisms have been devised in which the coin-controlled mechanism is designed to be located at one point and the apparatus which is controlled by the said mechanism located at a distant point. The invention is more particularly directed to this last-mentioned class; and it has for its object to provide a coin-controlled mechanism which shall be simple in construction, reliable in its operation, and proof against fraudulent manipulation.

Referring to the drawings, which represent an embodiment of my invention, Figure 1 is a front elevation of a coin-controlled mechanism with the cover in section. Fig. 2 is a side view of the same with certain minor parts in section. Fig. 3 is an enlarged detail of the coin receiving and actuating mechanism. Fig. 4 is a diagram of circuits. Fig. 5 is a detail plan view of a switch. Fig. 6 represents the positions of the various parts of the apparatus when the maximum number of coins has been deposited. Figs. 7 to 10, inclusive, represent various positions which are assumed by parts of the apparatus during the operation. Fig. 11 is a back view of the apparatus, and Fig. 12 is a sectional view taken on the line 12 12 of Fig. 1.

In general, the prepayment mechanism consists of a toothed disk which is mounted for rotary step-by-step movement both forward and backward through a greater or less angular space. The coin-controlled device is arranged to advance the disk against a spring by means of an armed wheel, and at the time the first coin is introduced a switch is closed, which remains in that position so long as a coin is on deposit. An electrically-controlled escapement is employed to release the disk and permit it to move under the action of the spring. This escapement is regulated by contacts mounted on the meter or other mechanism controlled by the coin-controlled mechanism.

Referring specifically to the drawings, A represents the base or back, which is designed to be secured to a support by convenient means. The base is provided with a hub A′, and mounted for movement within the hub is a sleeve B, to which is secured the disk B′, and a shaft C, to which is secured the operating-handle C′. On the back end of the shaft is mounted a disk C^2, having a notch in the periphery for receiving the hooked pawl C^3, and a screw or pin C^4, to which the extension-spring C^5 is secured. The spring which is secured at its lower end to the base is employed to prevent the operator from manipulating the apparatus in a manner other than is intended. When the actuator is turned, the spring is extended until the pin C^4 reaches a point where a line drawn from its center to the lower end of the spring is beyond the center of movement, as considered by the direction in which the actuator is traveling. The spring will then complete the balance of the movement, thereby taking it out of the control of the depositor. At the same time the pawl C^3 drops into place and prevents the depositor from moving the actuator backward. The disk B′ is provided with teeth B^2 on the periphery, and these teeth are arranged to engage with teeth D′ on the rotary armed wheel D. On the back of the disk is a flange B^3, which constitutes a cam. This flange is cylindrical with the exception of a small groove or depression B^4, as shown in dotted lines in Figs. 1 and 6. This cam is designed to close the switch after a coin has been properly deposited and to hold the switch closed until the value of the coin or coins has been canceled.

Surrounding the hub A′ is a coiled spring A^4, which is secured at one end to the base and at the other end to the disk. This spring tends at all times to move the disk in an anticlockwise direction in opposition to the action of the driving-wheel D.

The switch consists of a pivoted blade E, having a spring contact-piece E′ at its outer end and a finger-like projection E^2, prefer-

ably made of insulating material, which engages with the cam-surface B^3 on the disk. When the disk is in other than its initial position, the switch is closed, but when the disk is at that position the spiral spring E^3, which surrounds the switch-pivot, causes the switch to open. The fixed switch-terminals consist of two metal blocks E^4 and E^5, Figs. 5, 6, and 12, and extending from block E^4 toward the other is a spring-plate E^6, and it is between this long plate and the block E^5 that the end of the switch-blade is forced by the cam. The switch is mounted on a piece of insulating material, as is also the binding-post F. Surrounding the mechanism is a casing A^2, and in the left-hand side are openings A^3 to permit the circuit-wires to enter. These openings are covered by pieces of rubber, which when the wires are in place closely surround them and prevent the entrance of insects and dirt.

The driving-wheel D is mounted for rotary movement on the frame-boss A^5 and is provided with a number of arms D^2, seven being the number in the present instance. These arms radiate from a central hub and are unconnected at their outer ends. The arms so stand with respect to the remainder of the apparatus that each time a coin is deposited and the actuator C′ given its regulation movement the wheel will be advanced one tooth, and consequently the disk which is in mesh therewith will advance one tooth or notch.

In order to guard against fraud, the coin-controlled mechanism is so arranged that the coin or token must actually be received and discharged before any material part of the act of setting the apparatus in operative condition shall take place. In addition to this a string or wire cutter is provided, so that the coin or other token cannot be withdrawn by a string or wire after it has been deposited and performed any useful work.

The coin chute S is formed in the manual or main actuator C′, Figs. 3 and 6 to 10, inclusive. In the present instance the actuator is composed of two pieces of metal, one of which is chamfered out to form a groove, and the two pieces are united by rivets. The main actuator is mounted for oscillatory movement and is supported at the front by a bearing formed in the casing A^2, while the rear end is provided with a cylindrical extension which fits into a bearing formed in the shaft C, Figs. 3 and 12. A coiled spring K surrounds the shank of the actuator and is located in a groove formed thereon. This spring and groove are surrounded and protected by the casing A^2.

In order to cut a string, wire, or similar device attached to a coin for the purpose of withdrawing it after operating the mechanism, a slot S′ is made in the actuator, which extends transversely to the plane of the coin-groove. Rigidly secured to the casing in a position to enter the slot as the actuator is turned is a curved plate S^2. (Shown in section in Fig. 2.) This plate substantially fills the slot, so that any string or wire which might be secured to the coin will be severed as the actuator is rotated. This forms a desirable construction for the reason that all of the rotating parts have the same center of motion and that the apparatus is simple in construction.

Rigidly secured to the shaft C is a sector G, having considerable weight, which weight is utilized in actuating the apparatus. The sector forms the secondary actuator and is provided with a projection G′ on the back side, Figs. 1, 6, and 12, which strikes one of the arms D^2 on the driving-wheel D each time it is revolved and advances the latter one step and also the disk B′.

Located under the coin-receiver is a curved metal plate H, which is rigidly secured to a boss A^6 on the base. This plate forms the bottom portion of the coin-receiver, and as the manual actuator is moved in a clockwise direction the coin is moved edgewise thereon.

Figs. 6 to 10, inclusive, are particularly directed to this feature of my invention, and the various positions of the parts are clearly shown. Mounted on a boss on the front of the sector or secondary actuator G is a small finger I, which when a coin of approximately the proper size is deposited moves into the path of the manual actuator, and the parts of the apparatus are then set in operative relation. An arm I′, which fits into a slot on the sector for limiting the movements of the finger, extends rearwardly. Between the finger I and the boss on the sector is preferably located a spring friction-washer, or the retaining-screw may be set down hard enough to hold the finger in whatever position it is set. Fig. 7 represents the first position, with the deposited coin resting on the curved plate H, and the dotted lines, same figure, show the parts after the coin J has advanced to a point where it just touches the finger. Further movement in the same direction will raise the finger to the position shown in Fig. 8, and the finger H has entered the horizontally-extending U-shaped slot L in the manual actuator, (which is best shown in Figs. 3 and 12,) and the coin by striking the curved under side has raised it until the shoulder I^2 is in a position to be engaged by the actuator C′. The next position is shown in Fig. 9, and the coin has been discharged through the opening H′ in the curved plate. The left-hand side of the slot is formed with a projection H^2, which acts as a stop. If the depositor applies considerable pressure to the manual actuator or gives it a quick turn, the coin will be held against the stop, and until the pressure is practically removed the coin will not drop, nor will it be possible to advance the switch-controlling coin and disk. On the other hand, if the manual actuator moves slowly the coin will fall through the opening practically as soon as it is reached, and the movement of the actuator can be continued. In either

event it will be seen that the coin has to be discharged before the secondary actuator G can be moved or before any material part of the operation of setting takes place. Assuming now that the depositor has moved the actuator to the position shown in Fig. 9 and that instead of continuing the action he removes in whole or in part the pressure from the actuating-handle and the coiled spring K returns or partially returns the parts to the position shown in Fig. 1, this will not affect the position of the finger I, as a spring-washer or other friction device holds it in position, and although the coin has dropped into the receiver it remains for the depositor to receive credit for the coin by resuming the previously-started motion. After the coin has been discharged the clockwise movement of the actuator may be continued, and by reason of the finger I engaging therewith the sector G will be rotated under the control of the depositor. The disk C^2 and the shaft C rotate with the sector G, they being rigidly connected, so that as soon as the rotation due to the depositor has moved the pin C^4 to a point where it passes over the dead-center further actuation of the parts is due to the spring C^5 and the weight of the sector G. At or about the instant the parts move out of the control of the depositor the manual actuator strikes a stop (not shown) on the casing. Further movement in this direction being prevented, the coiled spring K returns the actuator to its normal position as soon as the external pressure is removed. As soon as the sector completes its movement under the action of the spring it assumes the position shown in Fig. 1. There is still one more important action to complete the cycle of operation, and that is to set the finger I in such position that the apparatus cannot be actuated without depositing another coin. This action is accomplished by the return of the manual actuator under the action of the coiled spring K. Fig. 10 represents the actuator in the act of returning, as is indicated by the arrow. It will be seen that the metal on the upper side of the slot is sliding along the top of the finger instead of striking the shoulder thereon, and this depresses the finger until it assumes the position shown in Fig. 7.

In an apparatus of this character it is desirable to have some means for limiting the number of coins which can be inserted at any one time to the capacity of the apparatus for returning or giving value therefor. This particular device is designed to receive twenty coins or tokens, and when that number is on deposit at any one time the apparatus assumes the position shown in Fig. 6.

Pivotally mounted on the base of the apparatus and at one side of the disk is a pivoted bell-crank lever M, having a projection M′ on one of its arms, while the other arm projects toward the center of the disk and is in the path of movement of a pin O, carried by it. A coiled spring N under ordinary conditions holds the lever in the position shown in Fig. 1. On the back of one of the arms of the disk-wheel B′ is a pin O. (Shown in dotted lines, Fig. 6.) This pin is so adjusted with respect to the other parts of the mechanism that after the twentieth coin has been deposited and the manual actuator moved to its operative position the sector G will advance the disk to a point where the pin will strike one arm of the lever M and move the other arm and the projection M′ inward, so as to be in the path of the manual actuator on its return. In other words, the coin-groove has been moved to a position where a coin cannot be operatively deposited therein, and it cannot be moved toward its normal position until the value of a coin has been canceled. This relation of parts is shown in Fig. 6. As soon as the value of the last coin has been canceled the disk rotating backward withdraws the pin O and the coiled spring N returns the lever or limiting device to its inoperative position.

It is necessary to provide means for canceling the value of a deposited coin or token after the value has been received by the consumer. This is accomplished by means of an escapement comprising a pivoted lever P, having two arms arranged to alternately engage with the teeth on the disk B′ and a third arm, to which is secured an armature. Mounted on a lug formed on the base A and directly in front of the armature is an electromagnet Q. The magnet moves the lever P in one direction and a coil-spring, which is wound around the lever-support, in the other direction. The circuit of the magnet is controlled by some suitable make-and-break device. When the circuit is closed and a suitable source of power included therein, the armature is attracted and the disk moves backward one-half the angular distance between two of its teeth under the action of the coiled spring, and on interrupting the circuit the armature is released and the disk moves the second half of the angular distance between teeth.

Located below the opening H′ in the curved plate is a removable cash-box R. This box is provided with an enlarged ring or shoulder R′ about midway of its length. This plate is provided with an opening for receiving the bolt R^2, and a wing-nut R^3 is mounted on the bolt and is preferably sealed to prevent tampering.

The circuit connections are shown in Fig. 4. 1 and 2 represent the supply-mains, and 3 and 4 the consumption-mains, supplying current to the translating devices 5. E represents the switch-blade, and Q the magnet for controlling the escapement. Mounted for rotary movement between the series field-coils 6 is an armature 7, and this armature is connected by suitable gearing with the circuit-closing device. The circuit-closer consists of two contact-brushes which are arranged to be bridged at certain intervals by

a strip of metal 9, that is mounted on an insulating-disk 10.

The operation of the invention is as follows: The coin J is dropped into the coin-chute and rests on the curved plate H. Pressure is then applied to the manual actuator C′ and the coin J raises the outer end of the finger I until the shoulder thereon engages with the actuator. The movement of the actuator is continued in a clockwise direction until it strikes the stop on the casing. At or about that instant the extension-spring C^5 on the back of the case will pass the dead-center and complete the movement of the sector G. As the sector descends the lug G′ on the back thereof strikes one of the arms of the wheel D and advances it one step or tooth, which in turn moves the disk B′ against the action of the spring, and the escapement engaging with one of the teeth holds the disk against the action of the spring and also against any backward movement of the sector G for any cause. As the disk moves the switch-blade is moved into its closed position, and current will be supplied to the translating devices 5. On depositing other coins in succession the disk is advanced one step for each coin introduced. Assuming that the translating devices 5 are in circuit, the armature 7 will begin to revolve, and after it has made a certain number of revolutions the piece 9 will bridge the contact-brushes and the circuit will be complete through the magnet Q. The magnet on being energized attracts its armature, which permits the disk to advance an angular distance equal to one-half the pitch between teeth. The armature continues to revolve, and when the contact-piece 9 passes out from under the brushes the circuit of the magnet is interrupted, the armature moves backward under the action of the spring, and the disk moves the remaining half of the distance backward. If it so happens that the value of the last coin is being canceled, the slot in the cam B^3 will be under the piece E^2 of the switch-blade and the latter will open under the action of the spring.

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

1. In a coin-controlled mechanism, the combination of a primary actuator, a secondary actuator, a device actuated by the deposited coin for placing the actuators in operative relation, and means for discharging the coin before one of the actuators is started into operation.

2. In a coin-controlled mechanism, the combination of a primary actuator, a secondary actuator normally independent of the first, a device actuated by the deposited coin for placing the two actuators in operative relation, and means controlled by one of the actuators for rendering said device inoperative.

3. In a coin-controlled mechanism, the combination of two actuators normally independent of each other, means for imparting a limited angular movement to one of the actuators, means for imparting a rotary movement to the other actuator, and means set in an operative position by the deposited coin for connecting the actuators.

4. In a coin-controlled mechanism, the combination of two actuators normally independent of each other, means for imparting a limited angular movement to one of the actuators, means for imparting a rotary movement to the other actuator, and means set in an operative position by the deposited coin for connecting the actuators, and means for rendering the connecting means inoperative.

5. In a coin-controlled mechanism, the combination of a main actuator, a secondary actuator, means carried by the secondary actuator for connecting it with the main actuator under certain conditions, and a device actuated by the main actuator on its return stroke for rendering the said means inoperative.

6. In a coin-controlled mechanism, the combination of a slotted actuator, a secondary actuator, a pivoted finger carried thereby, which is located in the path of the slot in the actuator, means assisted by the deposited coin for moving the finger into operative position, and means controlled by the slotted actuator for moving the finger into an inoperative position.

7. In a prepayment mechanism, the combination of a rotary actuator, a pivoted finger carried thereby, a rearwardly-extending arm which is secured to the finger and engages with stops on the actuator for limiting its movements, means engaging with the finger for imparting an initial movement to the actuator, and a rotary wheel driven in a step-by-step manner one step at a time for each complete, or substantially complete, rotation of the actuator.

8. In a prepayment mechanism, the combination of a coin-chute which is open at both ends, a stationary curved plate located below the chute which stops the coin in its descent and holds it during a certain movement of the coin-chute, and means for discharging the coin.

9. In a prepayment mechanism, the combination of a main or primary actuator which is mounted for oscillatory movement and forms a part of the coin-chute, a casing for the actuator, a boss formed on said casing, and a stationary curved plate located below the actuator which is secured to the boss which stops the descent of the coins and forms the remaining part of the coin-chute.

10. In a coin-controlled mechanism, the combination of a slotted actuator made of two pieces of metal and riveted together, one of said pieces being cut out to form a coin-chute; a pivoted finger which enters one of the slots and engages with the deposited coin, and a plate which enters a second slot in the actuator and acts to cut any string or wire which may be attached to the deposited coin.

11. In a coin-controlled mechanism, the combination of a toothed disk mounted for ro-

tary movement, an armed driving-wheel meshing therewith, and means set into operative relation by a deposited coin for striking the arms of the wheel for the purpose of advancing the disk and wheel.

12. In a coin-controlled mechanism, the combination of a rotary toothed wheel, a driving-wheel with teeth meshing with those of the first-mentioned wheel, arms on the driving-wheel, and means set into operative relation by a deposited coin for striking these arms and advancing the driving-wheel in a step-by-step manner.

13. In a coin-controlled mechanism, the combination of a rotary wheel having peripheral teeth, a second wheel meshing with the first, arms on the second wheel extending in front of both sets of teeth, a rotary actuator, and means on the back of the actuator for striking the arms one at a time and advancing the toothed wheels.

14. In a coin-controlled mechanism arranged to receive a limited number of coins, means for receiving the coins and setting the parts in accordance with the number of coins received, and a device which moves into operative position only when the maximum number of coins has been deposited and thereby prevents the return of the said means to its normal position so long as the maximum number of coins remains to the credit of the depositor.

15. In a coin-controlled mechanism arranged to receive a definite number of coins, the combination of an actuator arranged to travel in the path of a circle, with a locking device normally inactive but which is arranged to move into the path of the actuator after it has moved into a position to give credit for the maximum number of coins deposited and prevent the return of the actuator to a coin-receiving or starting position.

16. In a coin-controlled mechanism, the combination of a coin-limiting device comprising a pivoted bell-crank lever, a rotary wheel having a projection arranged to engage with one arm of the lever and move the other arm inward, and a coin-controlled actuator which is arranged to rest in an inoperative position on one arm of the lever when the maximum number of coins is deposited in the apparatus.

17. In a prepayment mechanism, the combination of a rotary wheel, a secondary actuator arranged to move the wheel, a manual actuator for moving the secondary actuator through a certain portion of its movement, and a spring for completing the balance of the movement of the secondary actuator.

18. In a coin-controlled mechanism, the combination of a rotary shaft, means for moving the shaft through a portion of its total movement by the medium of a deposited coin, a spring working over a dead-center for carrying the shaft through the remainder of its movement, and a wheel actuated by the shaft for controlling the movements of a switch.

19. In a coin-controlled mechanism, the combination of a manual actuator, having two shoulders with a circular groove formed between them, a casing for the actuator which surrounds the grooved portion, and a spring located in the groove for returning the actuator to its normal position.

20. In a coin-controlled mechanism arranged to receive a limited number of coins, the combination of a movable coin-chute, with means normally inactive for holding said chute in a position other than normal after the last coin has performed its work for preventing the actuation of the mechanism when the maximum number of coins has been deposited, and remain to the credit of the depositor.

21. In a mechanism controlled by an inserted coin or token and arranged to receive a limited number of coins, the combination of a movable coin-chute, a device for limiting the number of coins or tokens which can be on deposit at any one time, and means normally inactive for holding the chute in an inoperative position when the maximum number of coins are on deposit, and remain to the credit of the depositor.

22. In a coin-controlled mechanism, the combination of a manual actuator, a switch, means for closing the switch, the actuator and means being placed in operative relation by a coin or token, and means for discharging the coin or token before the said switch-closing means starts into operation.

In witness whereof I have hereunto set my hand this 16th day of January, 1900.

CHARLES E. HOLMES.

Witnesses:
DUGALD MCKILLOP,
HENRY O. WESTENDARP.