(No Model.) 5 Sheets—Sheet 1.

J. F. BOWER.

COIN CONTROLLED TESTING AND DISPLAY APPARATUS.

No. 438,520. Patented Oct. 14, 1890.

Fig. 1.

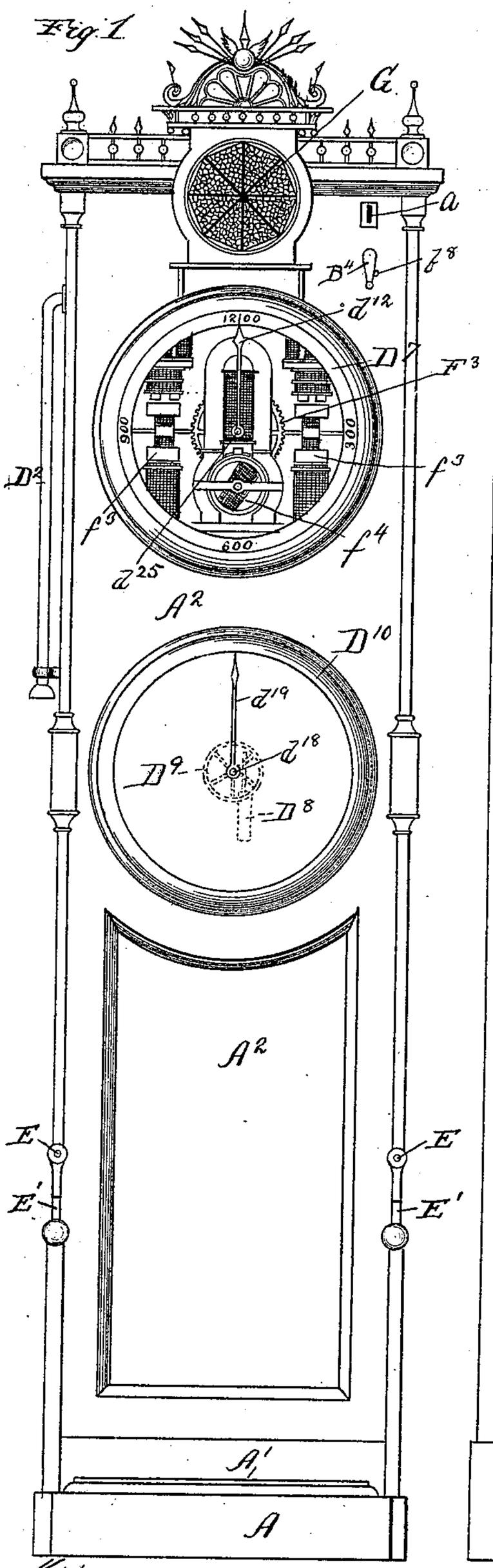
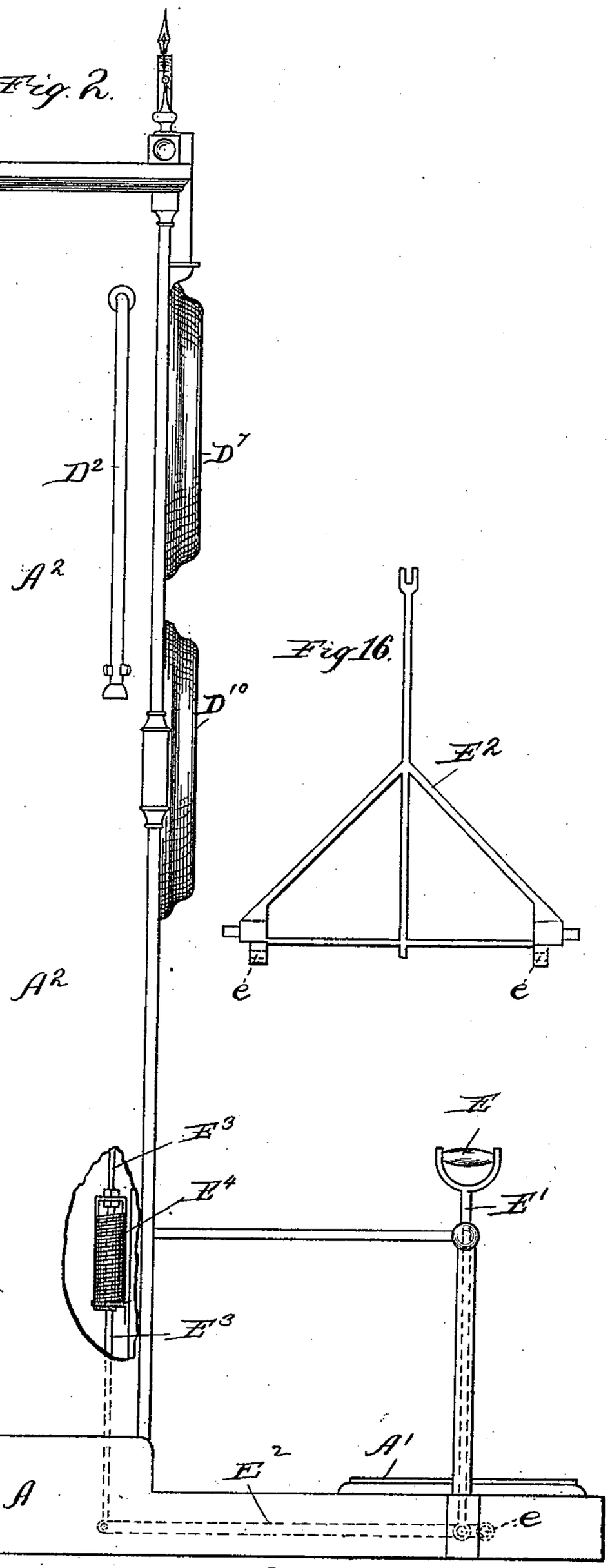


Fig. 2.



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(No Model.) 5 Sheets—Sheet 2.

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COIN CONTROLLED TESTING AND DISPLAY APPARATUS.

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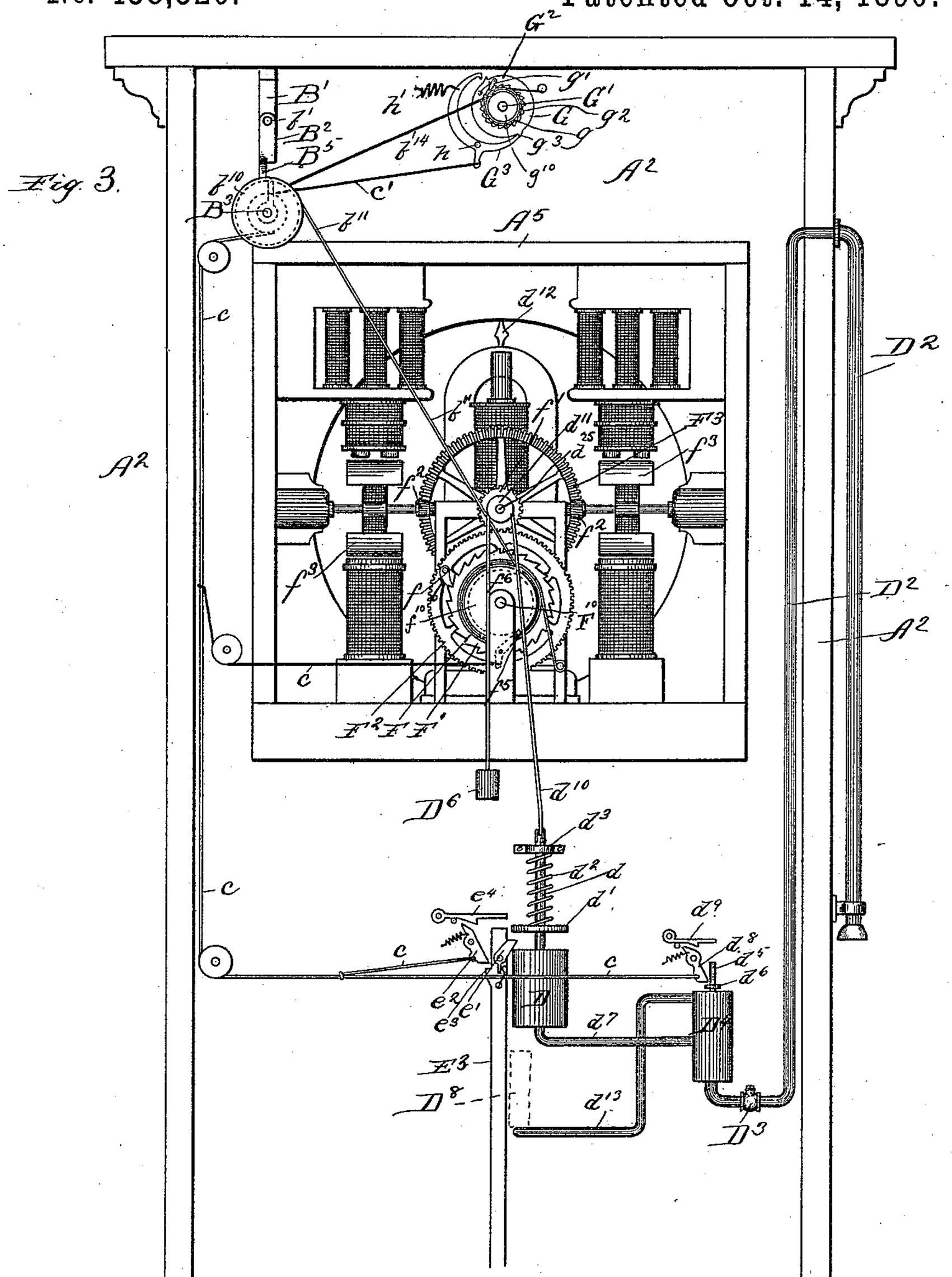
Fig. 3.



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COIN CONTROLLED TESTING AND DISPLAY APPARATUS.

No. 438,520. Patented Oct. 14, 1890.

Fig. 6.

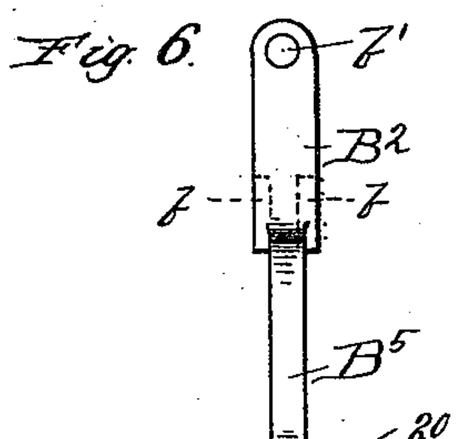

Fig. 8.

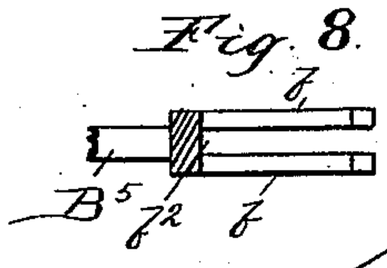

Fig. 5.

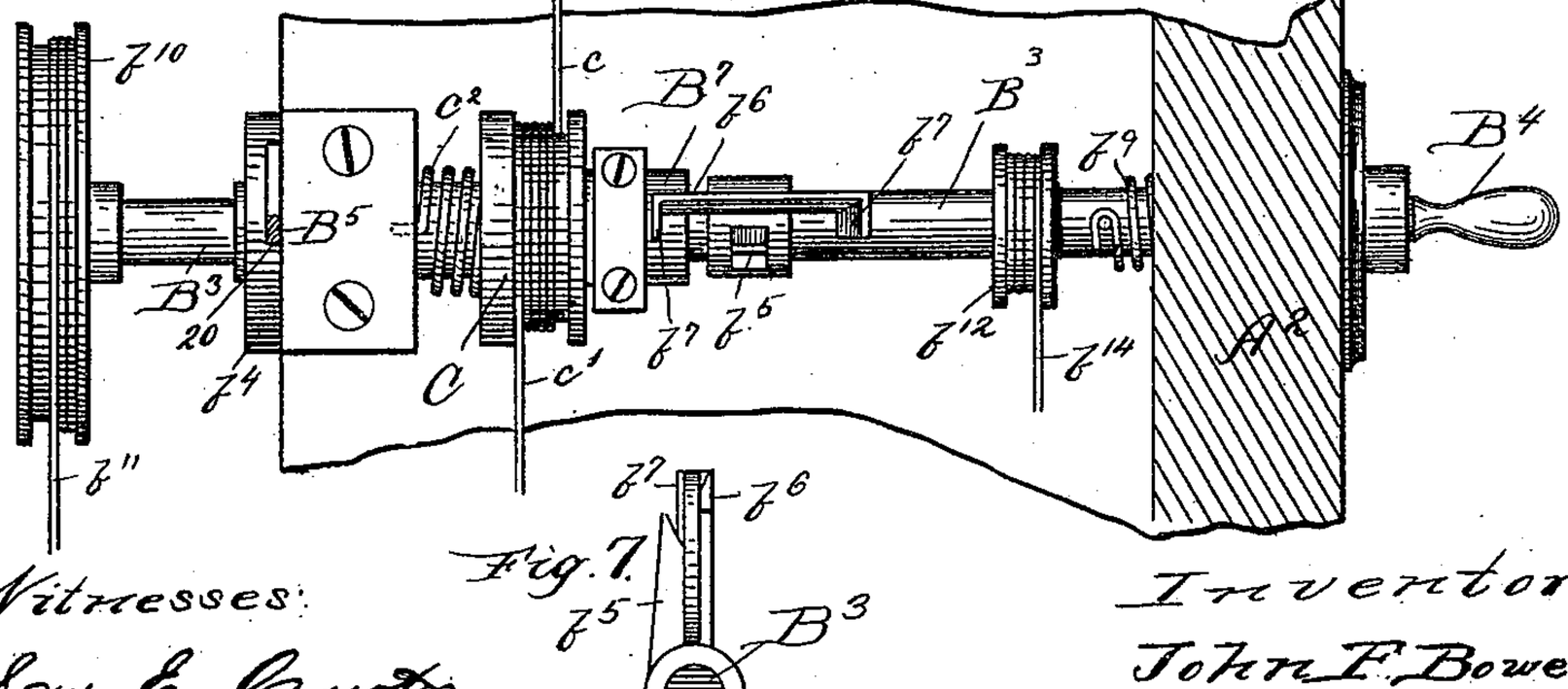

Fig. 7.

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COIN CONTROLLED TESTING AND DISPLAY APPARATUS.

No. 438,520. Patented Oct. 14, 1890.

Fig. 9.

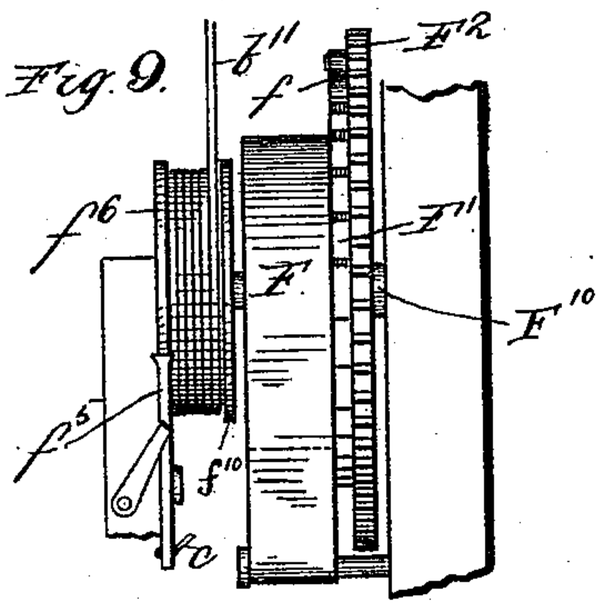


Fig. 12.

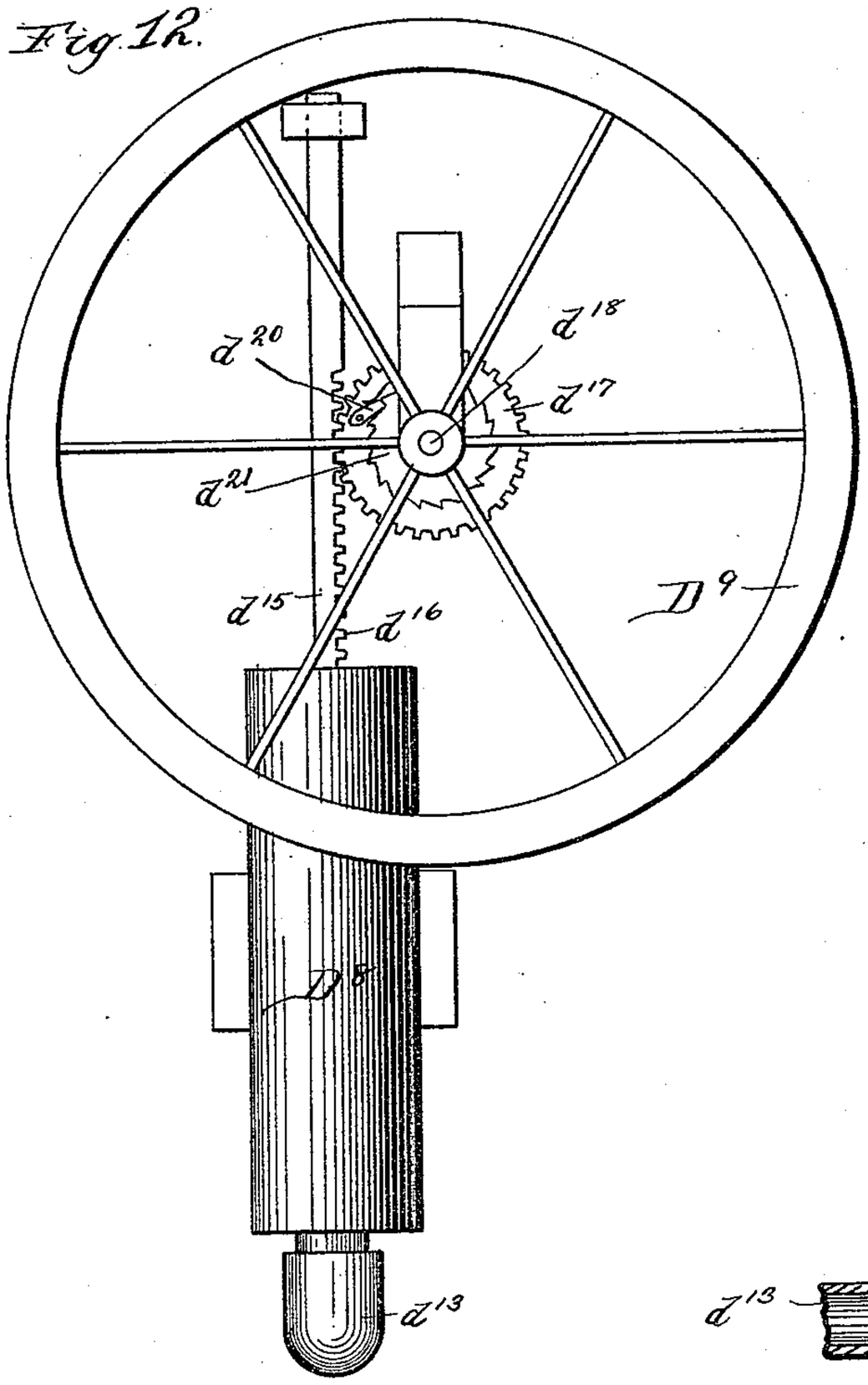
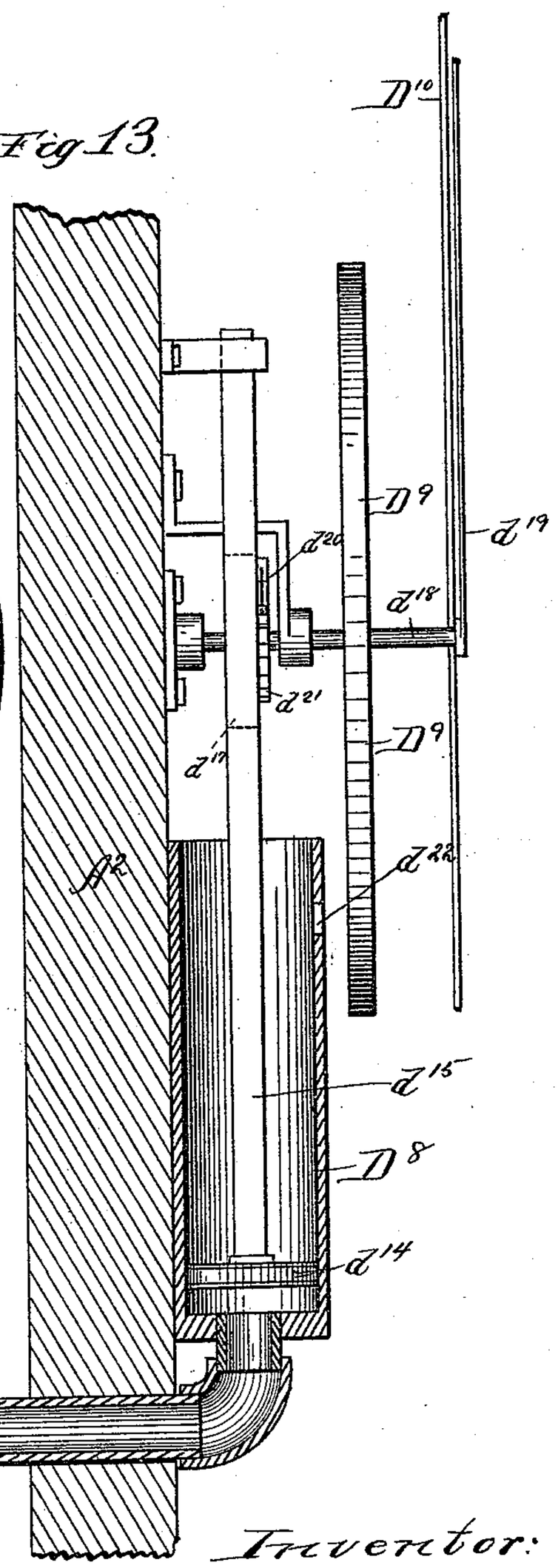


Fig. 13.



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COIN CONTROLLED TESTING AND DISPLAY APPARATUS.

No. 438,520. Patented Oct. 14, 1890.

Fig. 10

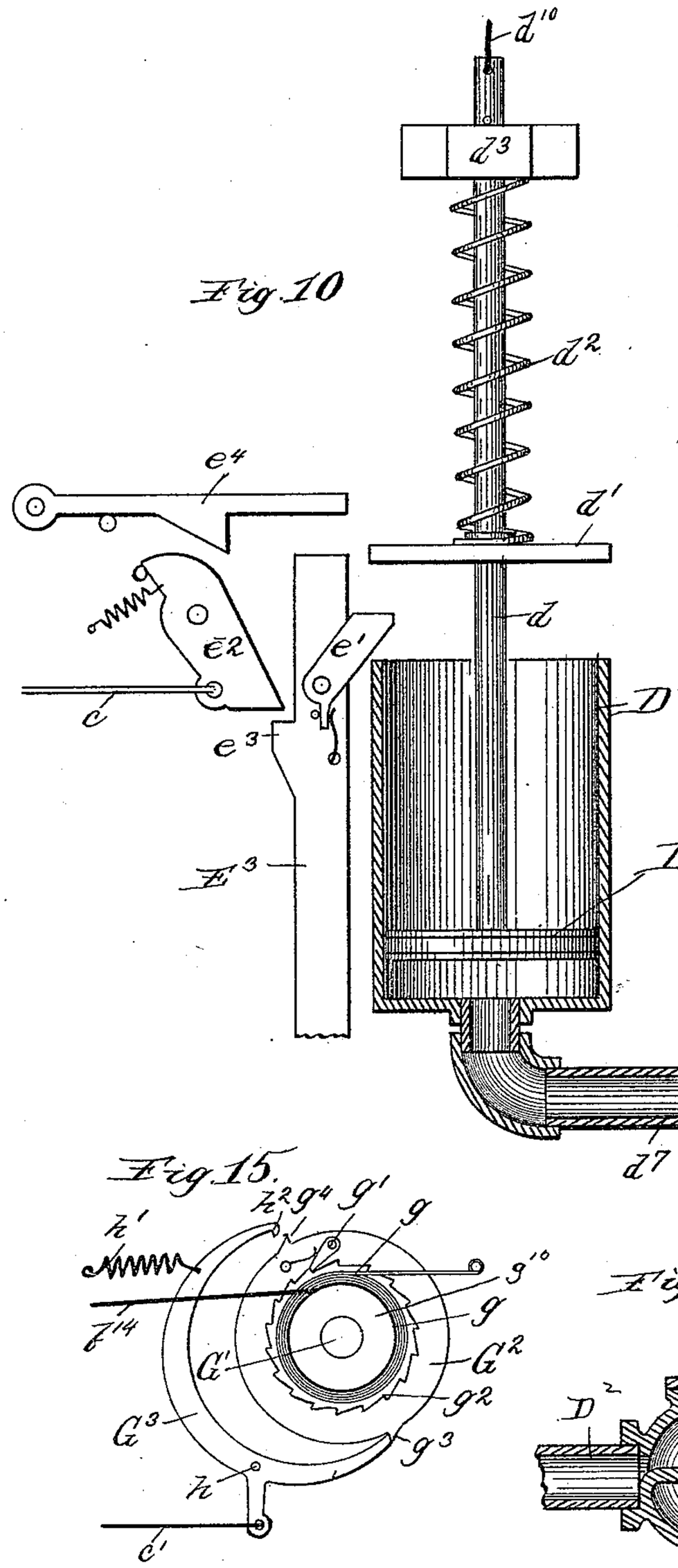
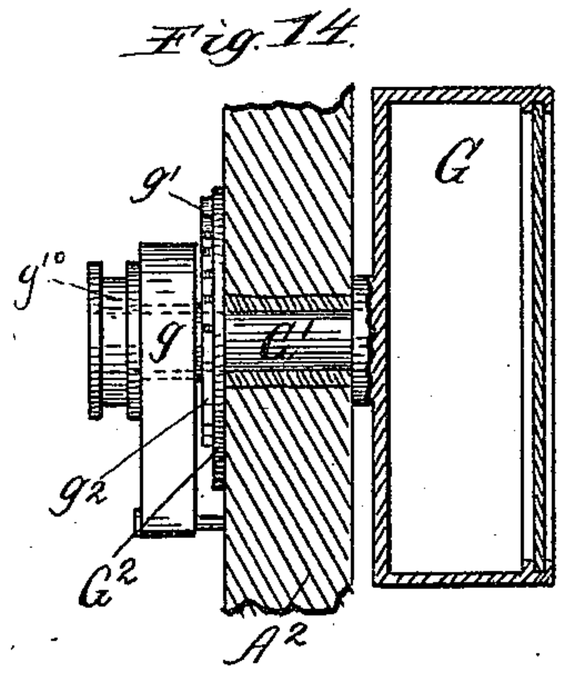


Fig. 14.



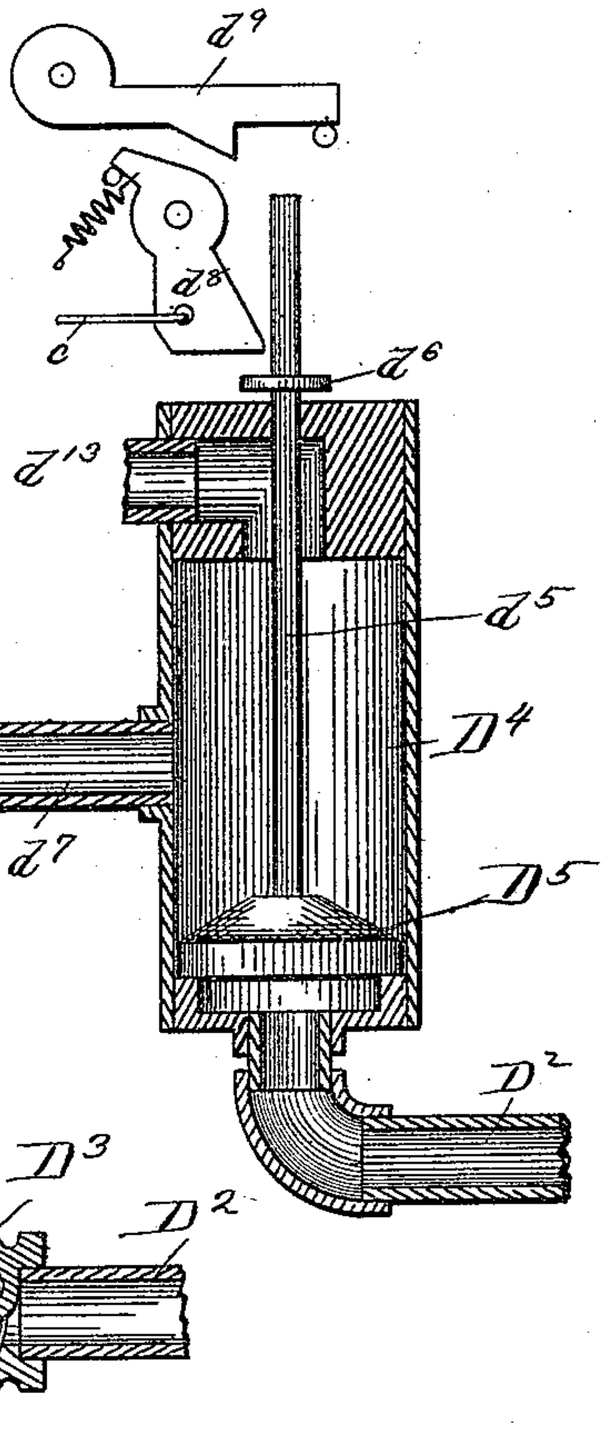
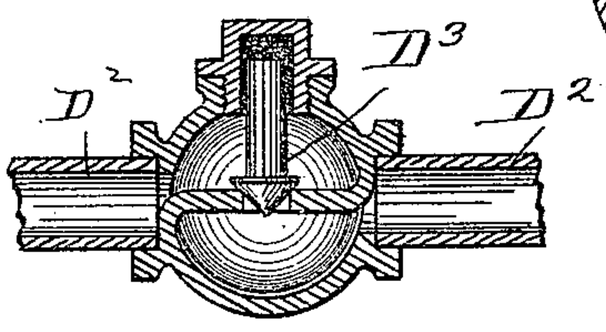


Fig. 15.

Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHN F. BOWER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE BOWER'S AUTOMATIC MACHINE COMPANY, OF SAME PLACE.

COIN-CONTROLLED TESTING AND DISPLAY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 438,520, dated October 14, 1890.

Application filed October 30, 1889. Serial No. 328,615. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BOWER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Coin-Controlled Testing and Display Apparatus, of which the following is a specification.

I have combined in this machine a lung-testing apparatus and a health-lift apparatus, also a kaleidoscope and a display mechanism, which are set in operation when the machine is used, and the latter of which is designed to render it attractive in appearance and interesting in operation.

An important feature of my invention is the combination, with a spring or equivalently-actuated display mechanism or device, of connections between the same and the handle which operates the coin mechanism, whereby the user of the machine necessarily winds up or prepares for operation the display apparatus. The coin-controlling apparatus possesses several novel features, and is applicable to any coin-controlled machine.

The novel features of my invention will be understood from the subjoined description and the accompanying drawings.

The drawings show at Figures 1 and 2, respectively, a front and side elevation of a machine embodying my present improvements, the latter partly broken away. Fig. 3 is a vertical elevation of a portion of the machine with the back of the case removed. Fig. 4 is a vertical section of the coin-receiving devices. Fig. 5 is a section upon the line 5 5 of Fig. 4. Figs. 6, 7, and 8 are sections upon the lines 6 6, 7 7, and 8 8, respectively, of Fig. 4. Fig. 9 is a detail of the motor apparatus for driving the display mechanism. Fig. 10 is a vertical section of the lung-testing device, showing the parts thereof which receive the air-pressure. Fig. 11 is a detail section of the check-valve employed in the lung-testing apparatus. Fig. 12 is a front elevation, and Fig. 13 is a sectional view, of the apparatus for actuating the indicator-hand of the lower dial. Figs. 14 and 15 are detail views of the kaleidoscope and its actuating devices. Fig. 16 is a detail of the health-lift.

In said drawings, A represents the bed of the machine, and A^2 a vertical casing applied thereto. Upon the bed A is a platform A′, whereon the person intending to use the machine stands. The coin is inserted at the slot *a*, which delivers it upon a tilting platform B, intended to tilt when the coin reaches its lower edge, but having gravity sufficient to resist unless the coin is of the proper weight, a coin of less weight being insufficient to actuate the platform. Over this platform is a slotted guideway B′. When the coin has traversed the guideway B′ and platform B, it is received between forked arms *b*, attached to a laterally-swinging lever B^2, pivoted at *b*′. As already stated, a coin of insufficient weight will be unable to tip the platform B, so that any such coin, even if it be of the proper diameter, will be detained between the point b^2 at the crotch of the arms *b* and the lowermost point b^3 of the platform B, so that it cannot fall into position to be used in releasing the various mechanisms of the machine. Such a coin will also remain in the fork formed by the arms *b* until the lever B^2 is swung upon its pivot *b*′, so as to carry the coin to the side of the platform B and allow the coin to drop out of the way. This swinging of lever B^2 is brought about as follows: B^3 is a shaft extending to the front of the case A^2 and provided with a handle B^4. This shaft carries a cam b^4, having a shoulder 20, as shown at Fig. 6, such shoulder engaging the point of an extension B^5, attached to the lever B^2. If now the shaft B^3 be rotated by moving the handle B^4 to the right, the extension B^5 and lever B^2 will be swung away from their normal position, and any inferior coin which may then be resting in the fork of arms *b* against the edge of the platform B will be delivered at one side of but not into position to operate the devices which are intended to give control of the machine. If the coin be of the proper weight and size, it will tilt the platform B when it reaches the point at which the inferior coin was detained and fall from that point into the space formed between an arm b^5, fast upon the shaft B^3, and an opposing arm b^6, supported from a sleeve B^7, loose upon the shaft B^3. The arm b^6 is shaped very much

like the letter **F**, so that when no coin is interposed between it and the arm b^5 the latter may pass freely under the horizontal part of the arm b^6. Said arm b^6 is also provided with flanges b^7, which serve to confine the coin at its edges. The coin when it has reached the point last described is in condition to effect the release of the various mechanisms embodied in the machine, and it is caused to do this by the rotation of the shaft B^3 by means of the handle B^4, such rotation extending through the major part of a rotation and stopping when the crank has reached the stop b^8. In this rotation of the shaft B^3 the coin is carried with the arms b^5 b^6, and it may continue in their embrace until the return movement commences. In this return movement the shaft B^3 moves first, in point of time, under the power of the retracting-spring b^9, so that said coin-carrying arms are separated. This allows the coin to drop to any proper receptacle—such, for instance, as the space inclosed between the front of the case, the upright b^{13}, and the floor A^5. The difference in point of time between the retractile movements of the shaft B^3 and sleeve B^7 is obtained by detaining the sleeve momentarily by a device which I will now describe.

C′ is a pivoted lever, the free end of which is depressed by the projection b^{15} upon the cam b^4. As soon, however, as the cam moves sufficiently to carry the part b^{15} beyond said lever the latter rises under the power of the spring b^{16} and into position to engage a projection b^{17} on the rim of a pulley C, secured on sleeve B^7, and thereby to stop said pulley and the sleeve from returning to their normal position until the cam returns and again depresses the lever C′, thus releasing the sleeve from the detaining-power of said lever and allowing it to turn back in obedience to spring c^2, by which the sleeve is connected with one of the shaft-bearings, or other relatively-fixed part. In this manner I obtain the release of the coin from the grasp of the arms b^5 b^6 and liberty for it to fall into the coin-receptacle.

The shaft B^3 carries a pulley b^{10}, upon which a cord b^{11} is wound. This cord winds up a spring F, through which the display mechanism is actuated, as hereinafter stated. The shaft B^3 also carries a pulley b^{12}, actuating the spring F, whereby the kaleidoscope G, constituting a secondary display device, is operated through the medium of a cord b^{14}. (See Figs. 3 and 5.) These cords are caused to wind up the springs whenever the shaft B^3 is turned by the crank B^4, except, however, that when once wound up said springs remain under tension until they have done their work of actuating the display apparatus, and any subsequent rotation of the shaft B^3 will have no effect upon the springs prior to their performing their said function. Any such rotations of the shaft would only result in winding up the cords and unwinding them again when the shaft is retracted by its spring b^9.

The sleeve B^7 moves with the shaft B^3 only when a coin is in position between the arms b^5 and b^6, the coin at such times receiving the power from arm b^5 and transmitting it to the sleeve through the arm b^6. This movement of the sleeve winds up the cords c and c' on the pulley C, which is fastened to the sleeve B^7, and as said cords are connected to locking-pawls or equivalent devices for normally locking the various testing and display apparatus embodied in the machine, when so wound up they effect the release of such locking-pawls by drawing them away from their normal locking positions. Having performed this function, the cords are unwound from the pulley C when the sleeve is retracted by its spring c^2, and the several pawls, being impelled by springs or gravity, will be free to resume their normal positions as soon as the various testing devices are used.

The lung-testing part of my machine consists of a cylinder D, open at one end and provided with a spring-depressed piston or head D′, which is made by a suitable packing practically air-tight. The stem d of this piston carries a collar d', and the spring d^2 is confined between this collar d' and the bearing or guide d^3. The stem d of the piston D′ is connected by a cord d^{10} to a weight D^6, such cord passing over a pulley d^{11} (see Fig. 3) upon the shaft d^{25}, carrying the indicator-hand d^{12}, located at the center of a dial D^7, so that when the piston-head D′ and stem d are raised the cord d^{10} is yielded toward the weight D^6, which then causes the pulley d^{11} and indicator-hand to rotate, thus indicating by means of dial D^7 and hand d^{12} the test made. The air is blown into cylinder D and under the piston-head D′ through the air-tube D^2; but it is compelled before reaching said cylinder to pass first through a check-valve D^3 and thence through a controlling-cylinder D^4. This latter cylinder has a piston-head D^5, mounted upon a stem d^5, carrying a collar d^6. Said cylinder D^4 is connected to the main cylinder D by a pipe d^7. The air entering the apparatus is prevented from returning by the check-valve D^3, or under some circumstances by the piston-head D^5 in the controlling-cylinder D^4. The air cannot reach the cylinder D without raising the piston-head D^5 sufficiently to uncover the mouth of the pipe d^7. The piston-head D^5 when once raised, however, will remain above the pipe d^7 until the user stops blowing, and the air is thus caused to actuate the piston D′.

To prevent the operation of the lung-testing device without the prior insertion of the requisite coin in the machine, the piston D^5 is kept normally locked by a spring-pawl d^8, engaging the collar d^6, and such pawl is controlled by the cord c, before referred to, such cord acting when the coin mechanism is properly operated to draw the pawl out of the path of the collar d^6 and to cause its upper end to lift and engage with a pivoted and gravitating stop d^9. In this latter condi-

tion of the apparatus the user is free to blow into the air-tube D^2, and when he does so he forces the stem d^5 upward and causes it to lift the stop d^9, thereby allowing the pawl to return to its locking position as soon as the piston-head D^5 falls to its normal position. The pawl d^8 of course remains in the unlocking position until the lung-testing device is used. When the user ceases blowing, the piston-head D^5 immediately drops to its normal position, shutting off exit by the air-tube D^2; but the air which has been blown into the cylinder D is allowed to escape through the cylinder D^4 and through a passage formed by the pipe d^{13} into a third cylinder D^8, (see Figs. 10, 12, and 13,) provided with a piston-head d^{14}, the stem d^{15} whereof carries a rack d^{16}, which actuates a pinion d^{17} upon the shaft d^{18}, carrying at its outer end an indicator-hand d^{19}, traversing a dial D^{10}. A number of turns will thus be given to this indicator-hand d^{19} around the dial, and the user is thereby made aware of the expansive power of the air he has forced into the apparatus. A pawl d^{20} and ratchet d^{21} are employed to prevent any backward movement of the indicator-hand d^{19}, and a fly-wheel D^9 may be applied to the shaft d^{18} of the indicator to prevent too quick rotation when the pressure of the air first comes upon the piston d^{14}. The air finally escapes at the port d^{22} in the cylinder D^8.

The health-lifting apparatus consists of the handles E, mounted upon the ends of vertical rods E′, located at each side of the platform A′ and connected with a horizontal lever E^2, a plan view whereof is given at Fig. 16. This horizontal lever is pivoted in front at e, and at its rear end it is connected to a vertical rod E^3, which passes through and is connected to the upper end of a spring E^4. It will now be seen that if the handles are lifted upon the horizontal lever will be raised at its inner end, so as to lift the rod E^3 and distend the spring. The extent of the movement thus communicated to the vertical rod E^3, I cause to be indicated by the hand d^{12} by providing said vertical rod E^3 with a spring-pawl e', (see Fig. 10,) which will engage the collar d' on the piston-rod d and raise said piston-rod, thus allowing the weight D^6 to descend and actuate the indicator-hand d^{12}, through the shaft d^{25}, to a corresponding extent. The same hand d^{12} is thus employed to indicate both the amount of air blown into the spirometer or lung-tester and the weight lifted, the lower hand d^{19} merely showing the force with which the compressed air returns from the spirometer. The dial D^7 may be provided with one or more rows of numerals to indicate the number of pounds lifted, as well as the pressure exerted in the lung-testing apparatus. This vertical rod E^3 is normally locked by a pawl e^2, engaging with the projection e^3 upon the rod, and the pawl is actuated by a spring and is withdrawn from the locking position by the cord c in the same manner as pawl d^8. It is also provided with a pivoted gravitating-stop e^4, similar to the stop d^9, whereby when it has been released by the coin-controlling mechanism it will be held in the unlocked position until after the health-lift has been used, such stop being lifted to release the pawl by the upward movement of the rod E^3.

As already stated, the turning of the crank B^4 winds up the cord b^{11} upon pulley b^{10}, and through said cord and pulley f^{10} on shaft F^{10} winds up the spring F or equivalent actuating means, which actuates the display mechanism. The latter may be a mechanically-operating imitation of an electro-motor, as shown. This spring gives movement to the ratchet F′, and upon the same shaft with the ratchet is a gear F^2, actuated in one direction by the ratchet through the spring-pawl f. (See Figs. 3 and 9.) Through this gear F^2 and the pinion f' movement is imparted to a number of parts constituting the display mechanism—such, for instance, as the bevel-gear F^3, the pinion-gears f^2 meshing therewith, the armatures f^3 on the shafts of pinions f^2, and the armature f^4, driven from gear F^3. (See Figs. 1 and 3.) These parts will continue the movement until the power stored in the spring F is exhausted; but the spring is held under tension by the pawl f^5, meshing with a second ratchet f^6, until said pawl f^5 is drawn out of engagement with said ratchet by the cord c when the coin is inserted in the machine, as already explained. The pinion f' is connected to the gear F^3 by a sleeve (not shown) loosely encircling the shaft d^{25} of indicator-head d^{12}.

The display mechanism may consist of any number and such variety of parts as may be deemed desirable.

The kaleidoscope G is mounted upon a journal G′, passing through the front of the vertical case. Said journal carries a spring g, which is connected by a pulley g^{10} and cord b^{14} to pulley b^{12}, as already stated, and is wound up by said cord when the user turns the crank B^4. The tension thus secured in the spring is held by the spring-pawl g' upon a disk G^2, engaging the ratchet g^2 upon the shaft G′. A kaleidoscope preferably requires an intermittent movement to allow the particles or pieces of colored glass to come to a position of rest and retain such positions long enough for the eye to grasp them, and hence I provide my kaleidoscope with a disk G^2, having one or more teeth or projections g^3 and g^4, and in conjunction therewith a double pawl G^3, pivoted at h and operated in one direction by the cord c' when wound upon the pulley C, and in the other direction by the spring h'. One end of said pawl is hooked, as shown at h^2. With this construction the operation is substantially as follows: Supposing the spring F to have been wound up, drawing upon the cord c' will withdraw the end of the pawl G^3 (shown to be in engagement with the projection g^3 of the disk G^2 in Figs. 3 and 15) away from such engagement,

thereby allowing the spring to carry the disk around until the stop g^3 reaches the hooked end of the pawl and engages therewith. The kaleidoscope will now be held until the cord c' is slackened. This allows the spring h' to draw the hooked end of the pawl away from the disk, and another half-rotation is imparted to the kaledioscope, stopping when the tooth g^3 again reaches the position shown in Fig. 15.

The check-valve D^3 is not a necessity in the apparatus, and may be omitted therefrom.

I claim—

1. In a coin-controlled machine, the combination of a horizontal shaft rotatable by the user and provided with an arm b^5, a sleeve loose upon said shaft and carrying an arm opposing said arm b^5, a pulley rigid with said sleeve, devices which normally prevent the use of the machine connected with said sleeve, and a coin-chute delivering the coin between said arms, substantially as set forth.

2. In a coin-controlled machine, the combination of the horizontal shaft B^3, having an operating-handle and rotatable by the user and provided with an arm b^5, a sleeve loose upon said shaft and carrying an arm b^6, the latter arm being fashioned like the letter **F**, flanges b^7 upon one of said arms, and a chute delivering the coin between said arms, substantially as set forth.

3. In a coin-controlled machine, a horizontal shaft having an external operating-handle and rotatable by the user, and a sleeve loose upon said shaft, both shaft and sleeve carrying arms adapted to seize the coin between them in a position parallel with the arms and shaft and forming a receptacle above and in line with the shaft, in combination with a locking device for normally locking the apparatus contained in the machine, and a mechanical connection between the sleeve and locking device, whereby the sleeve may release the apparatus, substantially as set forth.

4. In a coin-controlled machine, a shaft having a handle and rotatable by the user, a sleeve loose upon said shaft, means upon said shaft and sleeve for seizing the coin and causing the sleeve to move with the shaft, and separate springs for retracting both said shaft and sleeve, substantially as set forth.

5. In a coin-controlled machine, the combination of a lung-tester, an indicator for the same, display apparatus having an actuating-spring and winding mechanism therefor, means for controlling said lung-tester and display apparatus to normally prevent their use, coin-controlled mechanism for releasing said lung-tester and display apparatus, and connections from the winding mechanism of said spring to said coin-controlled mechanism, whereby said spring may be wound up, substantially as set forth.

6. In a coin-controlled machine, the combination of a testing apparatus, indicator for the same, display apparatus having an actuating-spring, means, such as pawls, for controlling said testing and display apparatus to normally prevent their use, coin-controlled mechanism having an external handle and connected with and adapted to release said testing and display apparatus, means, such as a pulley and cord, for winding up the spring of said display apparatus by the operation of the handle of the coin-controlled mechanism, and means, such as a pawl, for retaining the tension on said spring until released by the coin-controlled mechanism, substantially as set forth.

7. The coin-controlled machine consisting of health-lift device, lung-testing device, indicators for the same, display apparatus having an actuating-spring and winding mechanism therefor, means, such as pawls, for controlling said health-lift, lung-tester, and display apparatus to normally prevent their use, coin-controlled mechanism having an external handle and connected with the winding mechanism and with said controlling means, whereby said actuating-spring is wound up and the various devices are released, substantially as set forth.

8. The coin-controlled machine consisting of health-lift devices, lung-testing devices, indicators for the same, display mechanism having an actuating-spring and winding mechanism therefor, a second display device, such as a kaleidoscope, means, such as pawls, for controlling said health-lift, lung-tester, and display apparatus to normally prevent their use, and coin-controlled mechanism having an external handle and connected with said winding mechanism and with said second display device and adapted for releasing said devices and winding up said spring, substantially as set forth.

9. The combination, with the gravity-platform B and swinging forked lever B^2, of the cam b^4, and the shaft of the controlling mechanism, whereby said lever is swung, substantially as set forth.

10. In the controlling mechanism of a coin-controlled machine, a shaft rotatable by the user, and a sleeve mounted on said shaft, both shaft and sleeve having arms for seizing the coin, and springs for retracting both the shaft and sleeve, in combination with devices for holding the sleeve momentarily against retraction, substantially as set forth.

11. In the controlling mechanism of a coin-controlled machine, a shaft rotatable by the user, and a sleeve mounted on said shaft, both shaft and sleeve having arms for seizing the coin, and springs for retracting both the shaft and sleeve, in combination with lever C′ and projection b^{17} on pulley C, substantially as set forth.

12. In the controlling mechanism of a coin-controlled machine, a shaft rotatable by the user, and a sleeve mounted on said shaft, both shaft and sleeve having arms for seizing the coin, and springs for retracting both the shaft and sleeve, in combination with lever

C′, projection b^{17} on pulley C, and cam b^4, having projection b^{15}, substantially as set forth.

13. The shaft B^3, having an external handle rotatable by the user of the machine and carrying a pulley connected to and winding up the spring of a display apparatus, said apparatus and spring, a locking device therefor, a sleeve loose upon said shaft, carrying a device, such as a pulley, connected to said device, which normally locks said apparatus, and means upon said shaft and sleeve for receiving the coin and transmitting power from one to the other thereby, in combination with said apparatus, substantially as set forth.

14. The shaft B^3, having an external handle rotatable from the outside of the machine and carrying a pulley connected to and winding up the actuating-spring of a display apparatus, said apparatus and actuating-spring, means for retaining the tension thus put upon the spring, and a spring for retracting said shaft, in combination with said apparatus and its actuating-spring, substantially as set forth.

15. In a coin-controlled machine, the combination of health-lift devices, an indicator for the same, means, such as pawls, for controlling said devices, a display mechanism having an actuating-spring, a shaft carrying an external handle and an arm b^5 and connected to and winding up the spring of said display mechanism, a sleeve mounted upon said shaft, having an arm opposing said arm b^5 in seizing the coin and connected with and adapted to release both said controlling means and the spring of said display mechanism, a coin-chute adapted to deliver the coin to said arms, a receptacle to receive the coin, and means for retracting the shaft and the sleeve, substantially as set forth.

16. In a coin-controlled mechanism, the combination of a normally-locked lung-testing apparatus having a piston-stem, an indicator for the same, a dial-hand, means for carrying motion from said piston to said dial-hand, a normally-locked health-lift apparatus connected to the same indicator, a shaft rotatable by the user, a sleeve mounted on said shaft, arms on said shaft and sleeve for seizing the coin between them, and springs for retracting both said shaft and sleeve, both apparatus being released by connections with said sleeve, substantially as set forth.

17. In a coin-controlled machine, the combination, with a lung-testing apparatus and mouth-tube, of apparatus for indicating the expansive power of the air from said lung-testing apparatus, a valve between said mouth-tube and lung-testing apparatus and having locking devices, the coin-controlled mechanism having an external handle and shaft rotatable by the user, an air-pipe leading from the casing of and adapted to be closed by said valve and connected with the expansion-indicator, a sleeve mounted on said shaft, arms on said shaft and sleeve, adapted to receive the coin between them, and springs for retracting both said shaft and sleeve, substantially as set forth.

18. In a coin-controlled machine, the combination, with a display apparatus and actuating means therefor, of a coin-controlled mechanism, an operating-handle for the latter, and connections between said handle and said actuating means of the display apparatus, whereby the actuating means is wound up or prepared to actuate the said display apparatus by the act of operating said coin-controlled mechanism, substantially as set forth.

19. In a coin-controlled machine, the combination, with a display apparatus having an actuating means and a controlling means, of a coin-controlled mechanism having an operating-handle and comprising two movable parts between which the coin is adapted to be received, the one part being connected with the said controlling means of the display apparatus and the other part being connected with the operating-handle and adapted to move the first-mentioned part through the medium of the coin, and connections between said handle and the actuating means of the display apparatus, whereby the actuating means is wound up or prepared to actuate the said display apparatus by the act of operating said coin-controlled mechanism, substantially as set forth.

JOHN F. BOWER.

Witnesses:
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EMMA HACK.