

(No Model.)

2 Sheets—Sheet 1.

H. W. WILSON.
MUSCLE TESTER.

No. 536,771.

Patented Apr. 2, 1895.

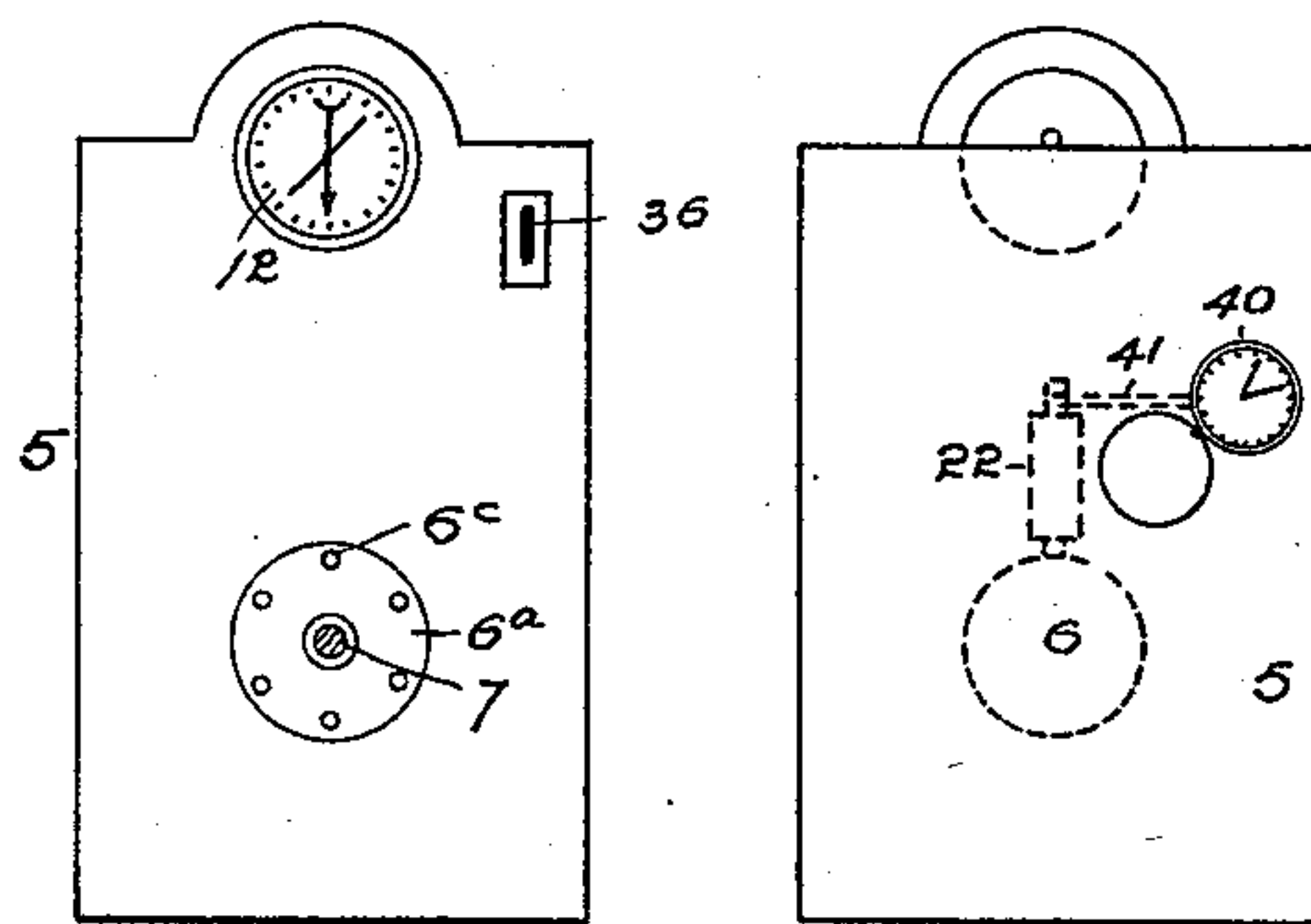
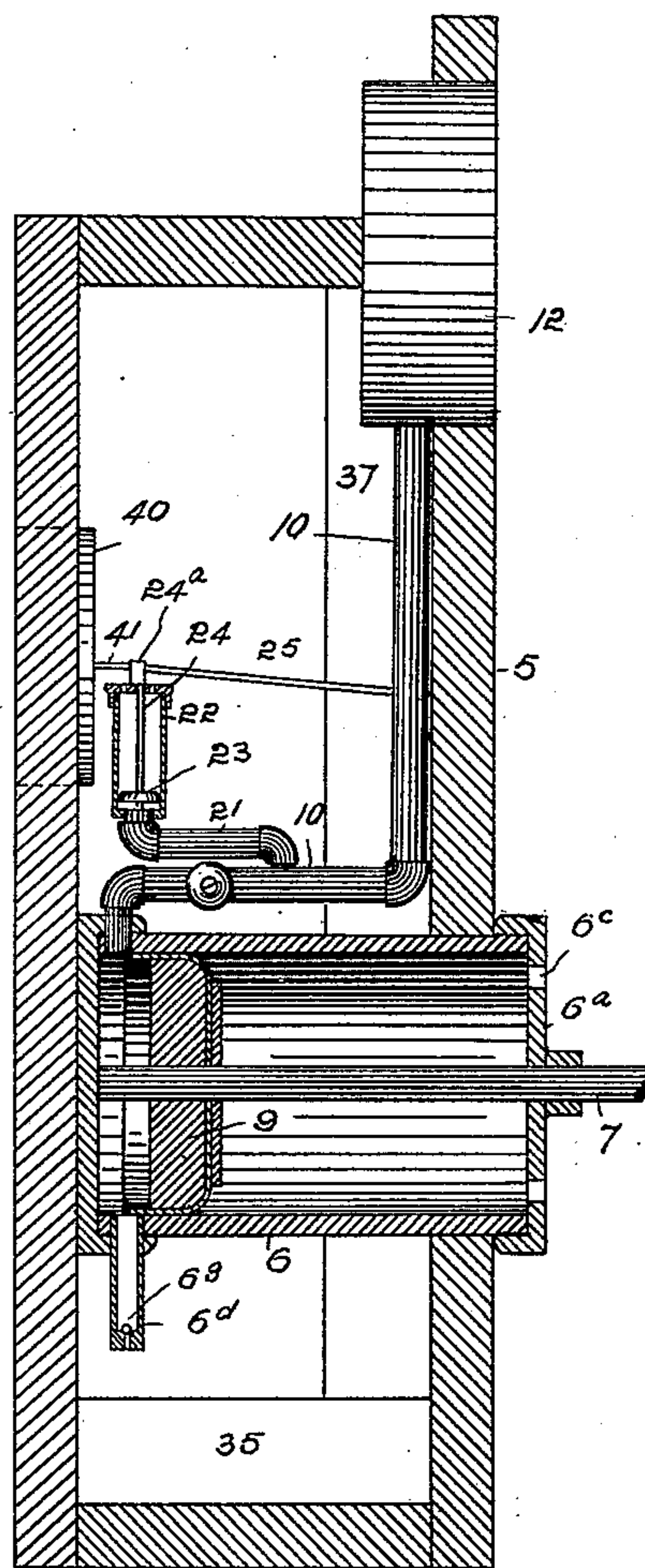
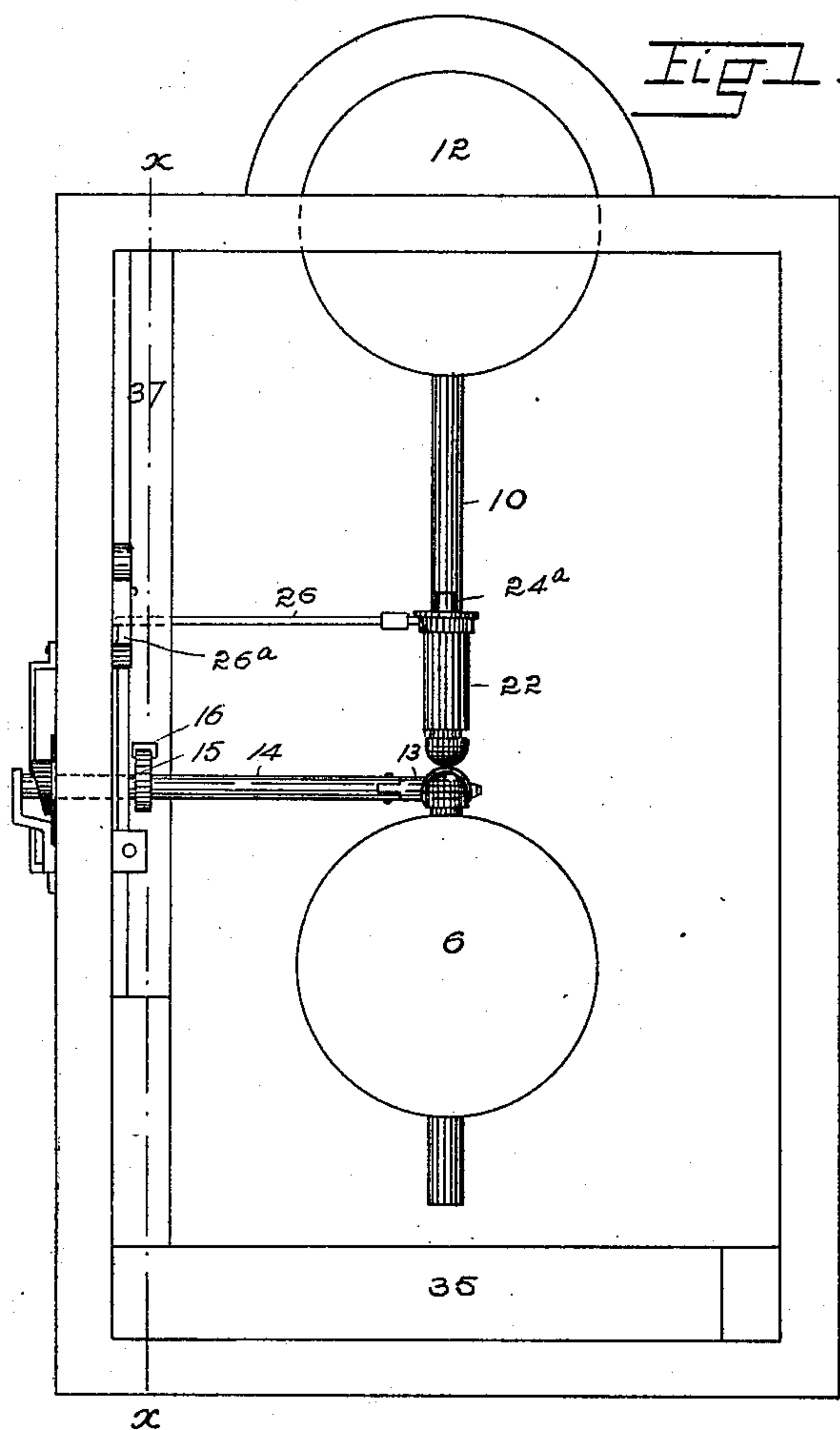


Fig. 2.

Fig. 3.

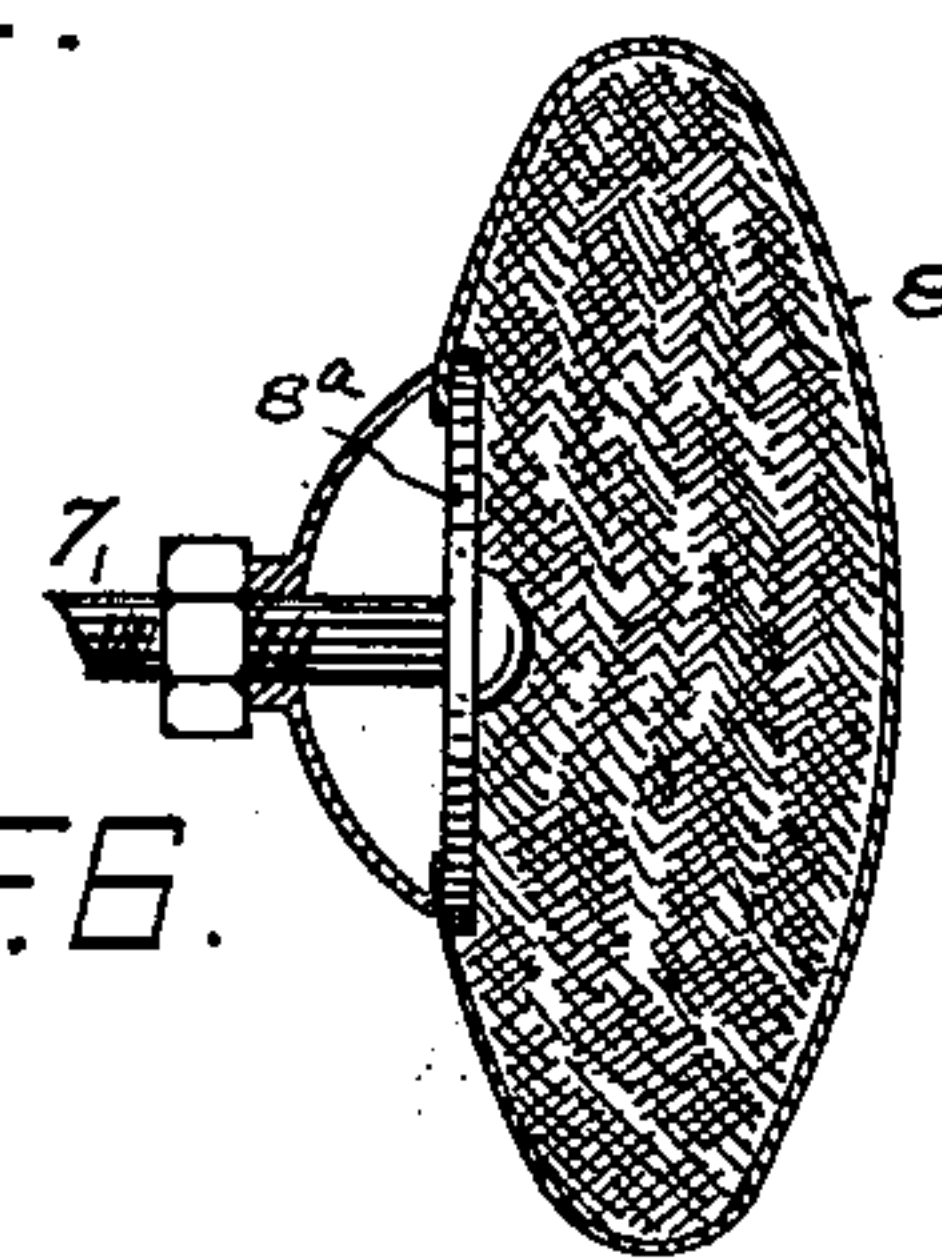


Fig. 5.

WITNESSES: *Fig. 7.*
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Fig. 10.

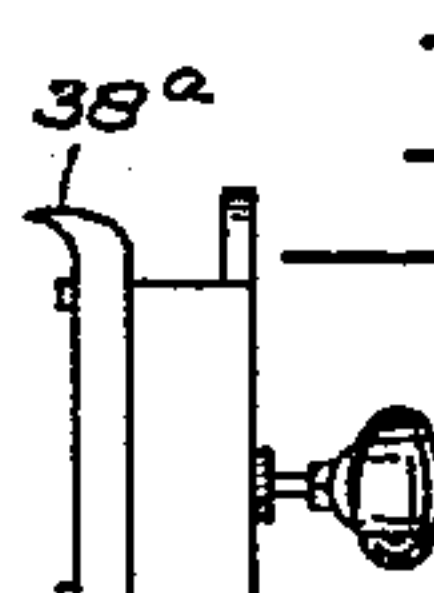
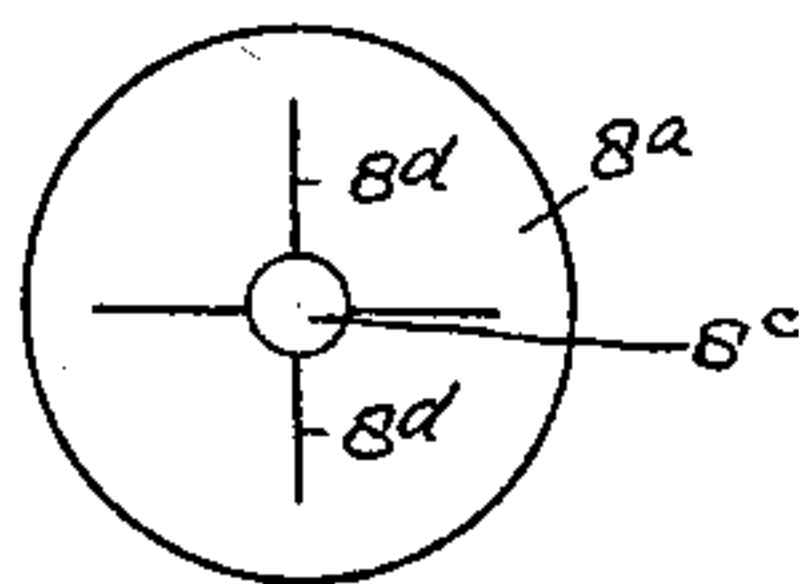


Fig. 9.

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(No Model.)

2 Sheets—Sheet 2.

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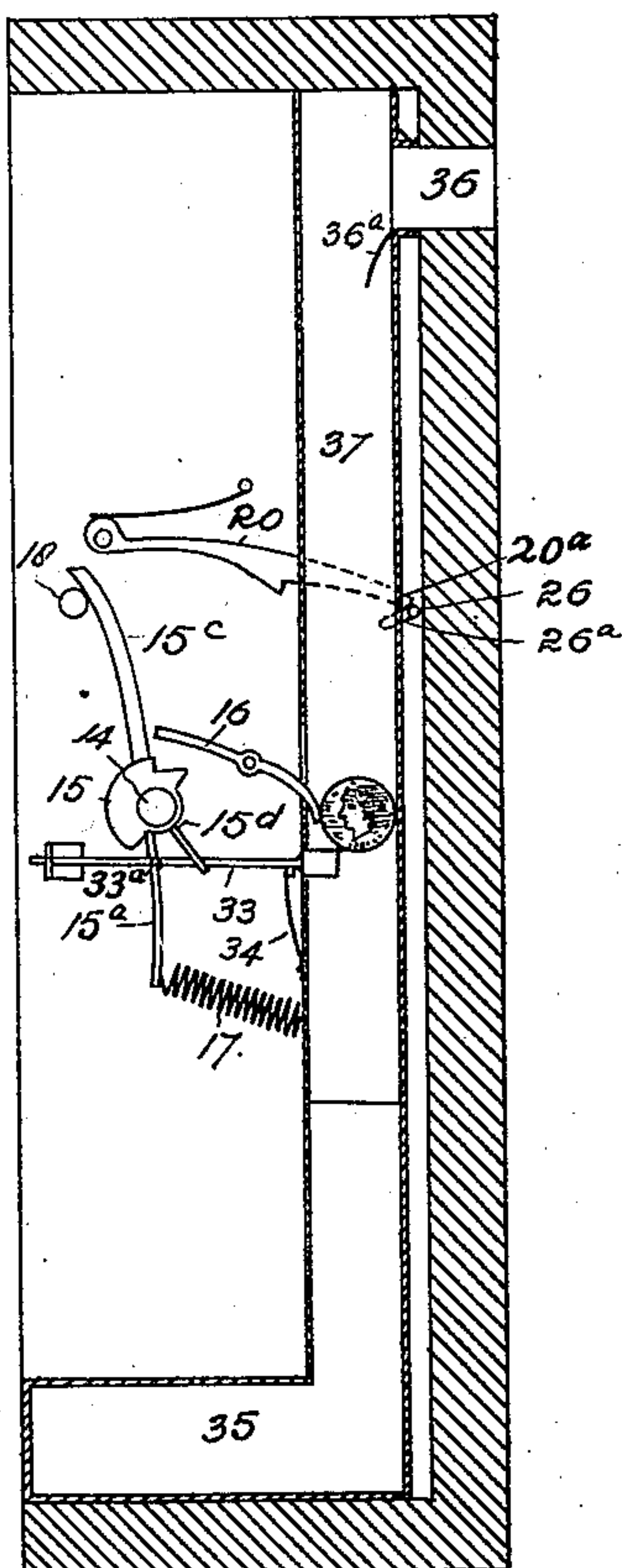


Fig. 3.

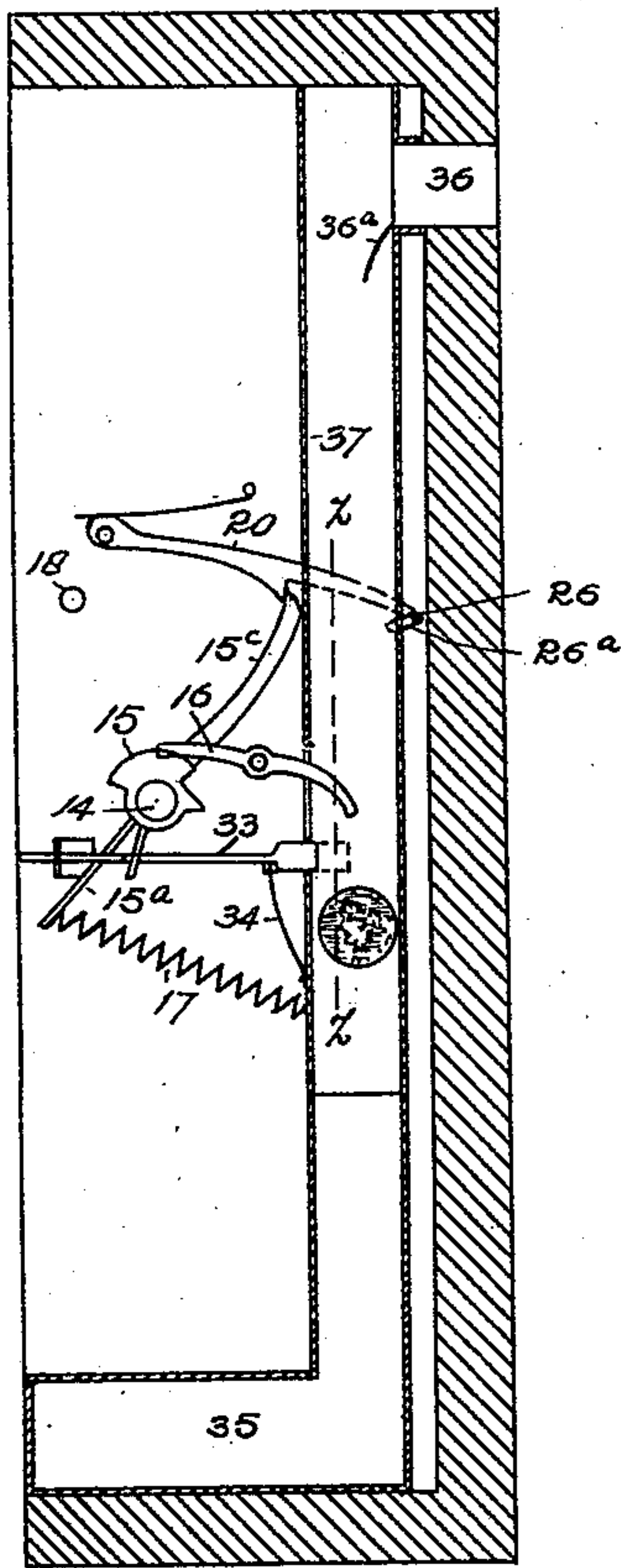


Fig. 4.

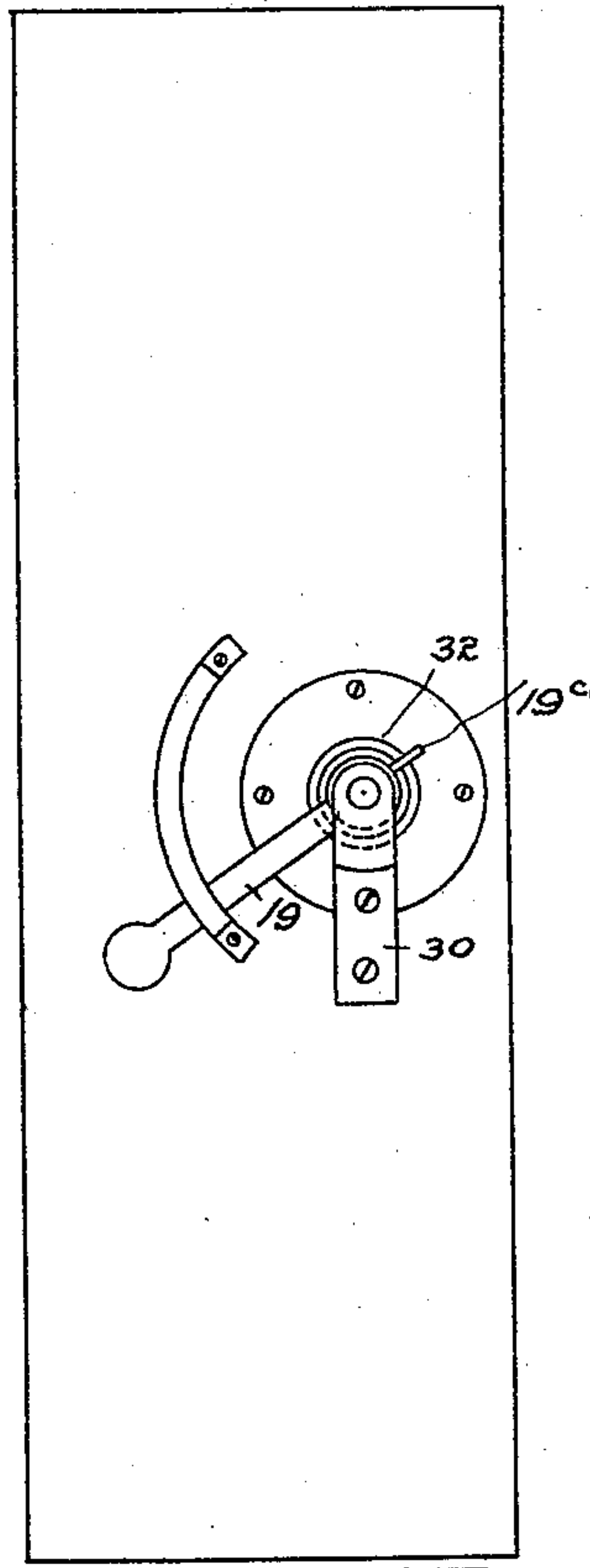


Fig. 5.

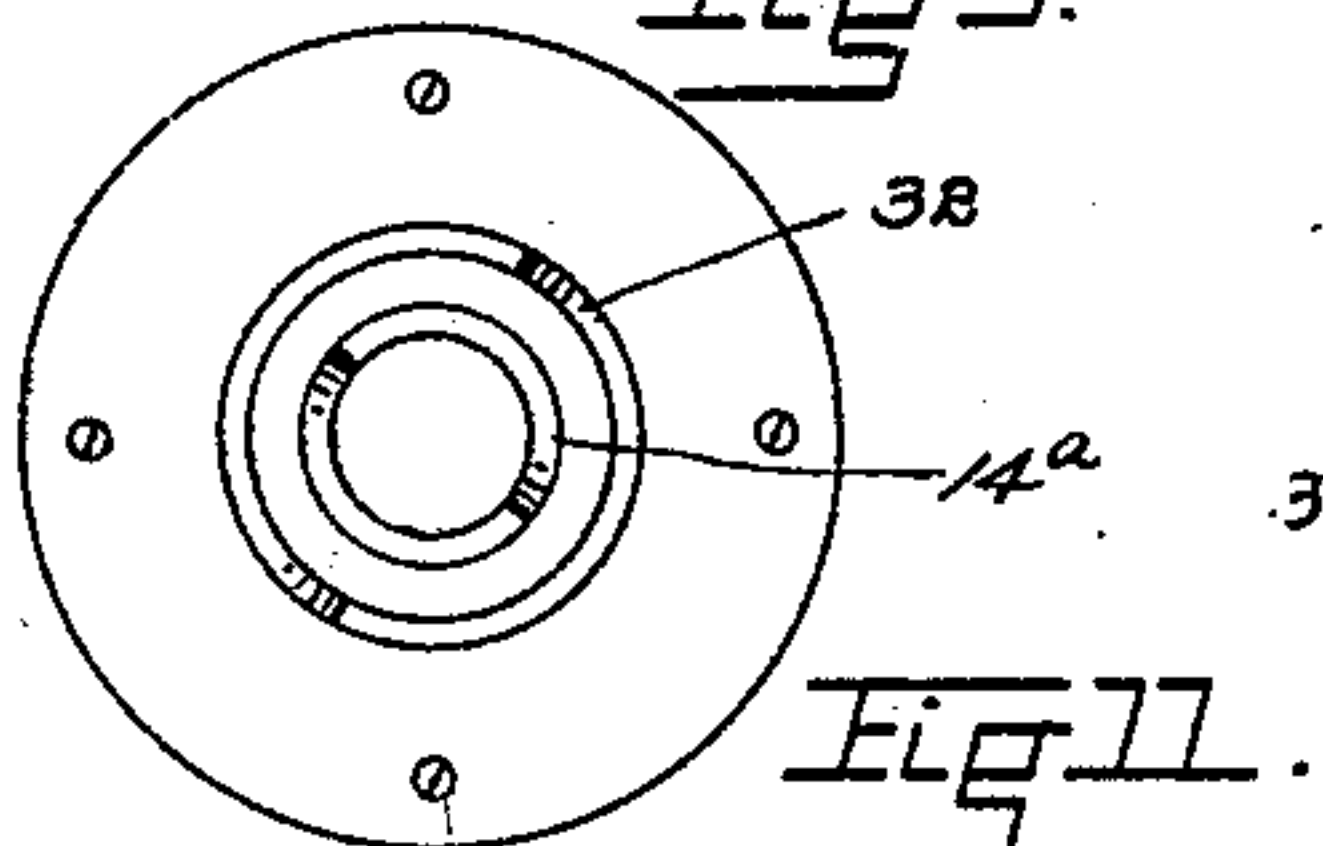


Fig. 11.

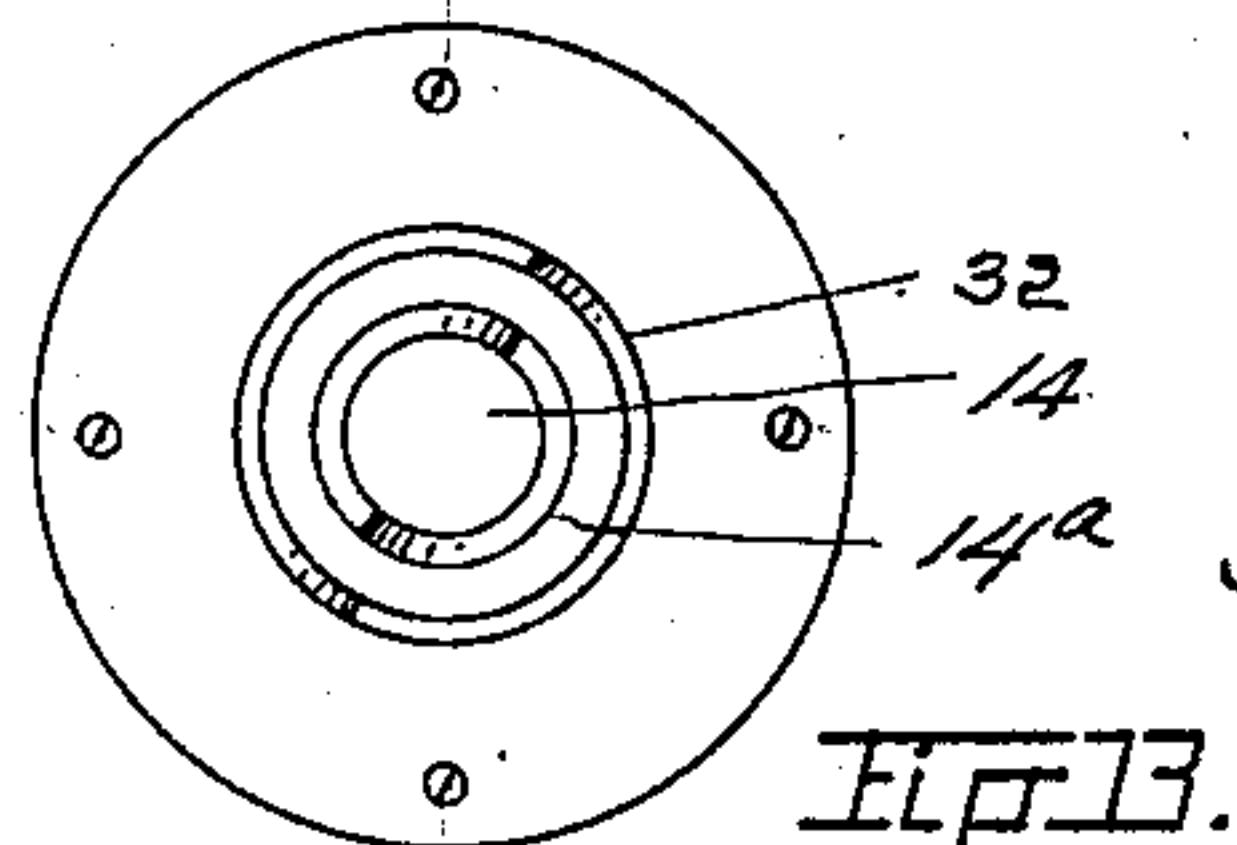


Fig. 13.

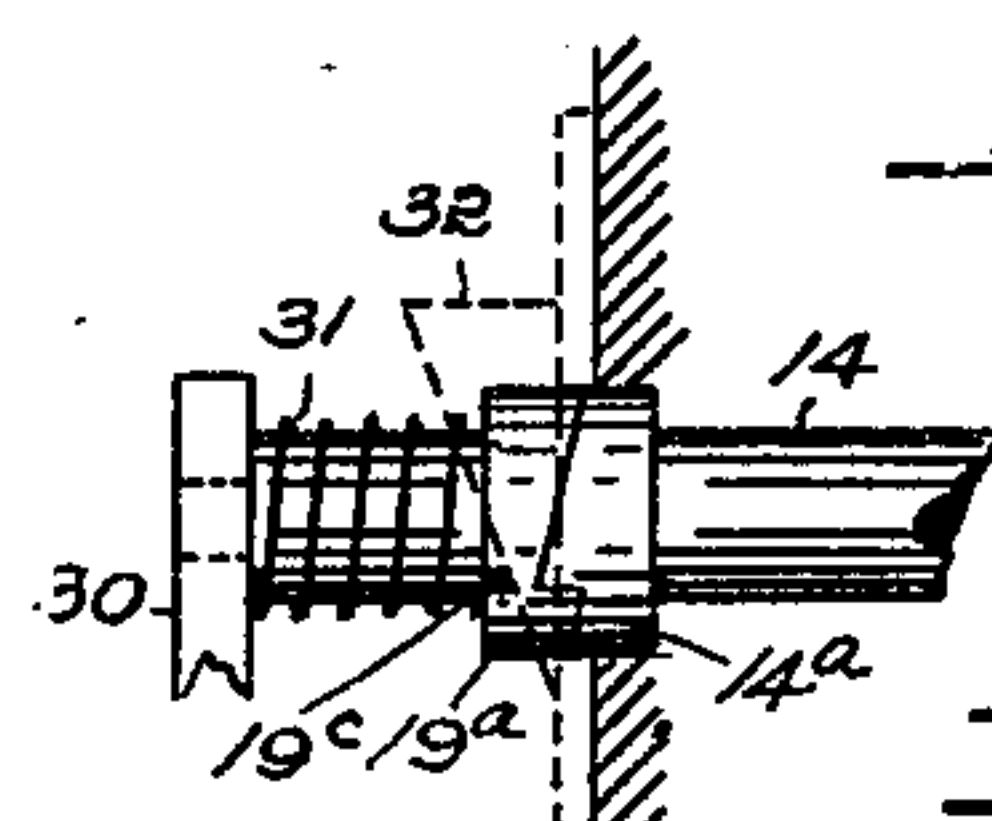


Fig. 12.

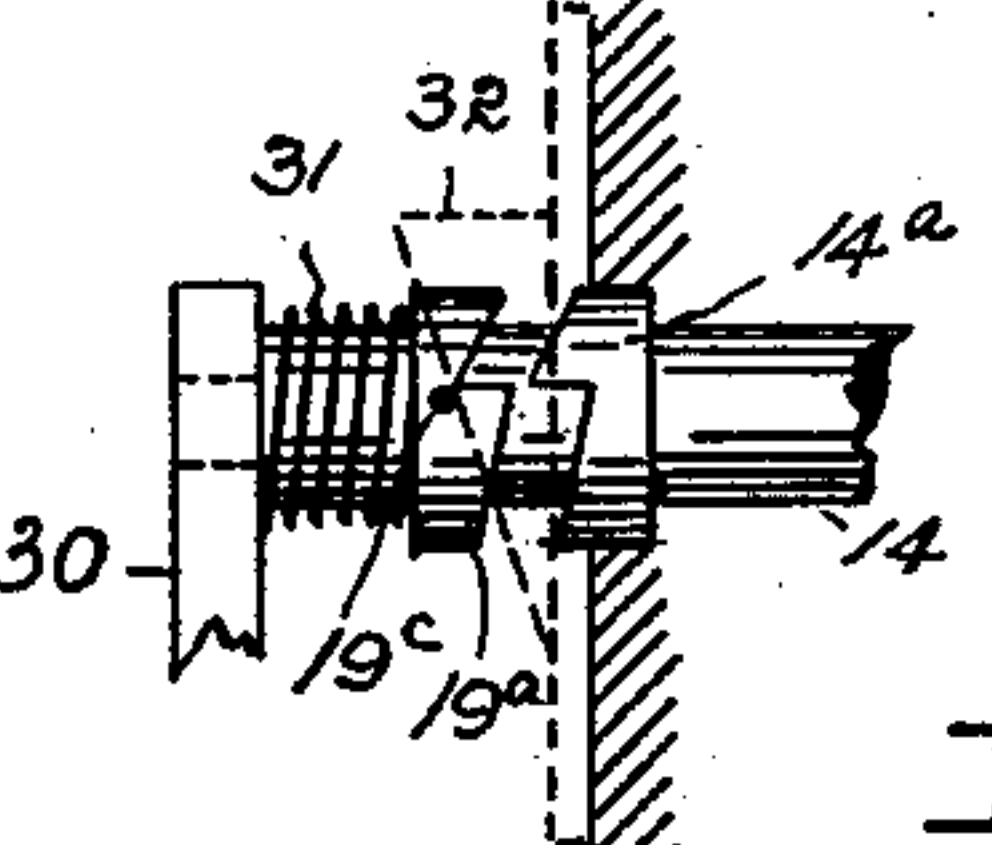


Fig. 14.

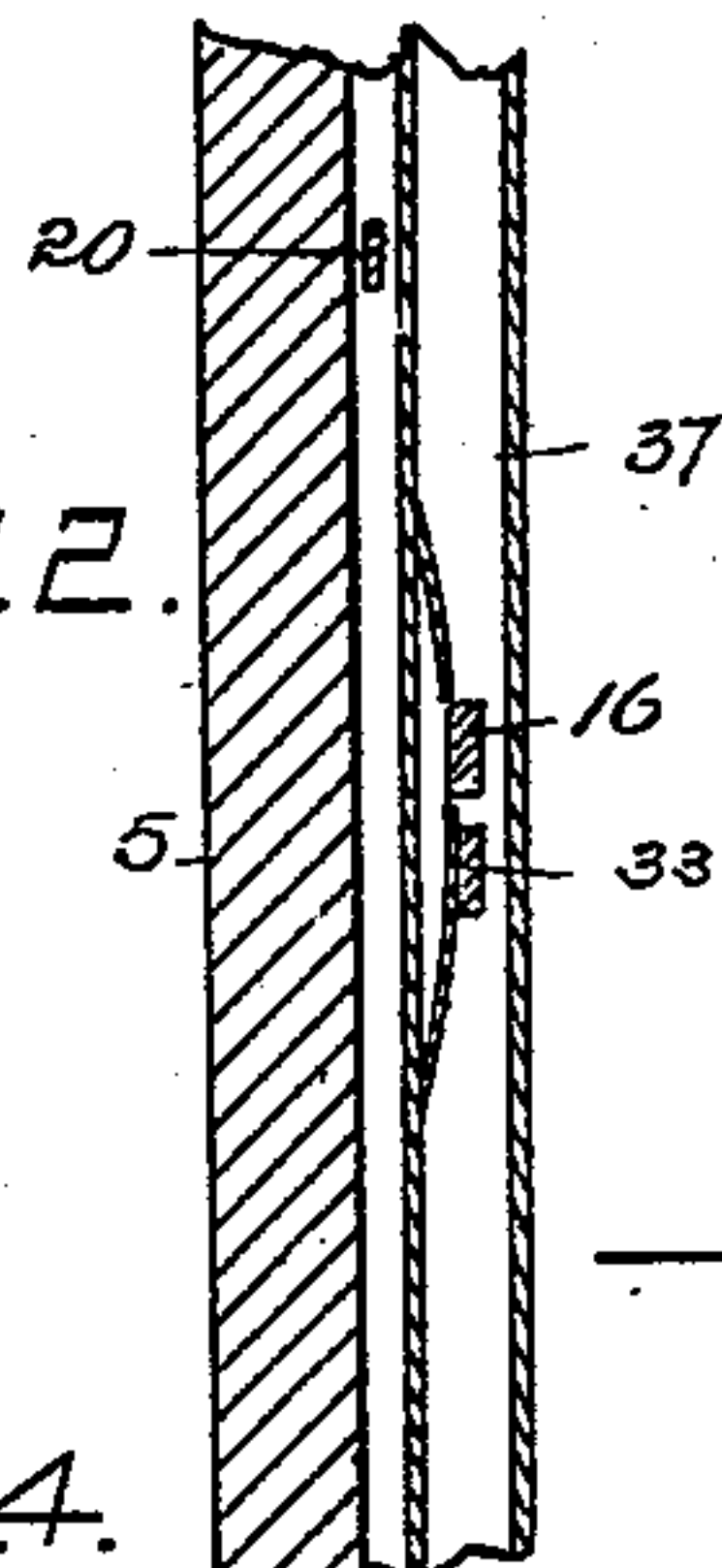


Fig. 15.

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UNITED STATES PATENT OFFICE.

HENRY W. WILSON, OF DENVER, COLORADO.

MUSCLE-TESTER.

SPECIFICATION forming part of Letters Patent No. 536,771, dated April 2, 1895.

Application filed July 13, 1894. Serial No. 517,414. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. WILSON, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Muscle-Testers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in muscle testers, or machines designed to accurately measure the force of a blow, being specially designed to measure the force, power, or striking capacity of a person when using the clinched hand or fist.

The device consists in part, of coin-controlled mechanism, whereby the machine can only be operated by dropping a coin thereinto every time it is used.

The invention consists further of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a rear view of the machine detached from its supporting standard, the rear part of the casing being removed. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a section taken through the casing on the line $x-x$, Fig. 1, the coin controlled mechanism being shown in elevation. Fig. 4 is a similar view of the said mechanism shown in another position. Fig. 5 is a side elevation of the casing looking toward the right in Fig. 1. Fig. 6 is a sectional view in detail of the cushion which receives the blow, the piston stem to which it is attached being partly broken away. Fig. 7 is a front elevation of the device shown on a smaller scale. Fig. 8 is a rear elevation of the same. Fig. 9 is a side elevation of the device attached to its supporting standard, and shown on a very small scale. Figs. 10, 11, 12, 13, and 14 illustrate details of construction. Fig. 15 is a section taken on the line $z-z$, Fig. 4.

Similar reference characters indicating cor-

responding parts or elements in these views, let the numeral 5 designate the casing inclosing the operating parts of the machine. This casing is preferably composed of wood, and the front part is provided with an opening for the reception of the cylindrical chamber 6. The outer extremity of this chamber protrudes slightly from the casing and is provided with a head or cap 6^a centrally apertured to receive the piston stem 7. To the outer extremity of this stem is attached the cushion 8, while to the opposite extremity is attached the piston 9. The head plate is provided with small apertures or vents 6^c to allow the air to escape from the chamber as the piston is drawn outward. To the rear extremity of the chamber is attached an inlet tube 6^d provided with a check valve 6^e which allows the air to enter the chamber to the rear of the piston as the latter is drawn outward, but which prevents the escape of air from the chamber through the tube. Hence, the piston being drawn out to its limit of movement, and a blow delivered on the cushion extremity of the piston stem, the piston will be driven inward and the air in the chamber compressed according to the force of the delivered blow. An open ended pipe 10 is connected with the rear extremity of the chamber and leads to a suitable registering device 12, which may be of any ordinary construction. This device registers the force of the blow, or the degree to which the air is compressed in the chamber to the rear of the piston.

In the pipe 10 leading from the chamber is located a valve which is normally closed, and provided with a stem 13 which is connected with a rod 14 in such a manner that the turning of the rod turns the stem and opens or closes the valve as the case may be. The rod 14 carries a notched segment 15, which, when the valve is closed, is locked by a gravity pawl 16 pivoted on the casing and forming a part of the coin controlled mechanism. The rod 14 is held in such a position as to close the valve in the pipe 10, through the action of a coil-spring 17 which is secured to the casing at one extremity, and to an arm 15^a at the opposite extremity. This arm is made fast to the segment 15, which is provided with another arm 15^c, which, when the valve is closed, engages a stop 18.

Referring to Fig. 3, the position of the coin controlled mechanism indicates that the valve is closed, the rod 14 being unlocked by the engagement of a coin with the tail of the dog. 5 The gravity of the coin raises the dog from engagement with the segment 15. The rod may now be turned and the valve opened. This is accomplished by moving an arm 19, located outside of the casing and connected 10 as hereinafter described, with the protruding extremity of the rod 14. When the arm 19 is moved sufficiently to open the valve, the arm 15^c of the segment engages a pawl 20 which locks the valve in the open position 15 through the medium of the segment 15 and the rod 14. The machine is now ready for use, and a blow being delivered upon the cushion extremity of the piston-stem 7, the piston is driven inward, and the degree of 20 compression of the air in the chamber indicated by the registering device 12.

From the pipe 10 leads a branch pipe 21 to a small chamber 22, in which is located a piston 23 provided with a stem 24 which protrudes from the chamber and terminates in a stirrup-shaped part 24^a into which projects one extremity of an arm 25, the opposite extremity of said arm being made fast to a rod 26 rotatably attached to the casing and extending at right angles to the arm 25. 30 The rod 26 terminates at its free extremity in a short crank 26^a which engages the tail 20^a of the pawl 20. The compression of the air in chamber 6 acts on the piston 23 and raises the stem 24 sufficiently to turn the rod 26 through the medium of the arm 25, and raise the pawl 20 sufficiently to disengage the arm 15^c of the segment 15, when the recoil of spring 17 returns the segment and its rod 14 to the position shown in Fig. 3 and closes the valve in the pipe. The dog 16 then drops to engagement with the notch of the segment 15 and locks the rod and its controlled valve in the closed position. The connection of the arm 45 19 must be such that while the rod, when unlocked, may be turned by the arm sufficiently to open the valve in the pipe 10, it will still be impossible by holding the arm, to prevent the reverse action of the rod, and the closing 50 of the valve when the arm 15^c is released from the locking pawl 20 as hereinbefore described. In other words, it is intended that no action from outside the casing shall replace the muscle testing mechanism in working order, 55 after it has once been used, except by the introduction of a coin. To this end, the arm 19 is movable on the rod 14, and is provided with a clutch collar 19^a adapted to engage a counterpart collar 14^a made fast on the protruding extremity of the rod. Between the stationary arm 30 and the clutch collar 19^a is located a coil-spring 31 whose function is to maintain the clutch collar in the locked position when the valve in pipe 10 is closed and the arm 19 properly adjusted. To the outside of the casing is 65 attached a cam 32 adapted to engage a pin 19^c attached to the collar 14^a. The arrangement

of the parts is such that when the valve in the pipe 10 is closed, the clutch collars 19^a and 14^a are in the locked position as shown 70 in Fig. 12. Now as the arm 19 is moved in the direction to turn the rod 14 and open the valve, the clutch collars begin to separate by virtue of the engagement of the pin 19^c with the inclined face of the cam 32, and when the 75 rod 14 has been turned sufficiently to open the valve, the clutch collars are disengaged as shown in Fig. 14, the rod being locked in the adjusted position by the engagement of the arm 15^c with the spring locking pawl 20. 80 Now, as soon as the rod 14 is unlocked by the disengagement of the arm 15^c from its locking pawl, the rod is reversed by the action of the spring 17 and without moving the arm 19. When, however, it is desired to open the 85 valve again, or as soon as the rod is released from the locking pawl 16, the arm 19 is turned backward until its clutch collar is thrown by the spring 31 to engagement with the counterpart collar on the rod. (See Fig. 12.) 90

After the introduction of a coin, and the unlocking of the pawl 16 by the gravity of the coin, the pawl is held in the unlocked position through the agency of a movable rod 33 slidably attached to the casing and normally held by a coil spring 34 in such a position that it supports the coin in engagement with the tail of the dog 16. (See Fig. 3.) 95

The segment 15 is provided with a short arm 15^d adapted to engage a stop 33^a on the rod 33, and as the rod 14 is turned in the direction to open the valve in the pipe 10, the arm 15^d engages the stop 33^a and moves the rod 33 sufficiently to release the coin, which drops into a receptacle 35 below and releases 105 the dog 16, whereby the latter is left in a position to engage the segment and lock the rod as soon as the segment is in the proper position, as heretofore explained.

The coin required to operate the mechanism is introduced through a slot 36 formed in the front of the casing, and is guided to engagement with the tail of the dog 16 by a closed tube or chute 37 formed within the casing. 115

The casing 5 may be suitably attached to a standard 38. (See Fig. 9.) This standard is provided with a hook 38^a at its upper extremity, whereby when it is leaned against any stationary support it will project thereinto 120 and tend to support the mechanism in a stable condition. The lower extremity of the standard is provided with a cross-bar 38^c which is intended to rest upon the ground, or other surface available for the purpose. 125

The machine is provided with another register 40 attached to the rear part of the casing. The arm 41 connected with the operating mechanism of this register projects into the stirrup-shaped upper extremity 24^a of the piston-stem 24. Hence, every time this piston is raised, the said arm is actuated. The function of this register is to indicate the number of coins dropped into the machine. 130

From the foregoing description, the operation of the machine will be readily understood.

Assuming that the valve in pipe 10 is closed, a suitable coin, as a nickel, is dropped into the machine through the slot 36 and falls through the chute 37 to engagement with the tail of the pawl 16. The gravity of the coin raises the opposite end of the lever from engagement with the segment 15, while the rod 33 maintains the coin in this position. By the use of the arm 19, the rod 14 is now turned sufficiently to open the valve in the pipe 10, and is locked in this position by the engagement of the arm 15^c with the pawl 20. The piston 9 having been drawn to the front end of the chamber 6, a blow is delivered on the cushion 8 and the piston forced inward according to the power of the blow, which is indicated by the register 12, the air at the same time acting on the piston 23 and raising the stem 24 sufficiently to raise the pawl 20 through the medium of the parts 25, 26, 26^a, whereby the arm 15^c is released, the movement of the rod 14 reversed through the medium of the spring 17, and the valve in the pipe 10 closed. The pawl 16 now drops to engagement with the notch of the segment 15 and locks the valve in the closed position until another coin is introduced.

Fig. 10 is intended to illustrate a sole-leather disk 8^a forming the base of the cushion 8. This disk is provided with an aperture 8^c, from which lead slots 8^d. The enlarged extremity of the piston stem is passed through this aperture which opens sufficiently for the purpose by reason of the slots.

At the inner extremity of the coin slot 36, the coin chute is provided with a depending plate 36^a, the function of which is to prevent the fraudulent removal of a coin which has been inserted with a string tied to it. If the coin is dropped below this plate, or far enough to act on the pawl 16, it cannot be withdrawn by a string attachment for the reason that it will catch upon the plate 36^a.

The coin chute is so constructed where the dog 16 projects thereinto, that a coin of a certain thickness, as a nickel, will engage the dog, while if a penny or a thinner coin is used, it will pass down the chute to one side of the dog. This feature is illustrated in Fig. 15. It will also be observed from the last named figure, that the coin chute is sufficiently removed from the casing to allow the pawl 20 an intermediate entrance.

Having thus described my invention, what I claim is—

1. In a muscle tester, the combination with a suitable registering mechanism, of an air chamber connected with the registering mechanism, a piston located in the air chamber and provided with a stem having its protruding extremity suitably cushioned, a cut-off valve located in the passage way between the air chamber and the registering mechanism, a spring-actuated rod for controlling the valve

and normally maintaining the same in the closed position, a dog for locking the valve rod in the normal position and provided with a tail piece projecting into a coin chute, whereby a coin dropped into the chute engages the tail piece and unlocks the rod, substantially as described.

2. In a muscle tester, the combination with a suitable registering mechanism and a suitable casing, of an air chamber connected with said mechanism by means of a suitable passage way, a cut-off valve located in said passage way, a piston in the air chamber, a stem connected with the piston and having a protruding extremity adapted to receive a blow, whereby the air is compressed in the chamber, a spring-actuated rod connected with the valve and normally maintaining the same in the closed position, said rod having an extremity protruding outside the casing, an arm attached to the protruding extremity of the rod and movable thereon, said arm being provided with a clutch collar adapted to engage a counterpart collar fast on the rod, a spring normally holding the clutch collars in engagement, and a cam made fast to the casing and adapted to engage a projection on one of the collars, whereby as the rod is turned to open the valve, the clutch collars are disengaged, whereby the rod may make the reverse movement and open the valve without engaging the clutch collar of the arm, substantially as described.

3. In a muscle tester, the combination with a casing, of a registering device, a piston having a protruding stem, an air chamber, a conduit connecting the chamber and said registering device, a valve located in the conduit, a spring-actuated rod connected with the valve and normally maintaining the same in the closed position, an arm connected with the rod outside the casing, whereby the same may be turned and the valve opened, a pawl pivoted on the casing and adapted to engage an arm on the rod and lock the valve in the open position, an auxiliary chamber carrying a piston and protruding stem, a branch conduit leading to the chamber, and means connecting the extremity of the last named piston-stem with the tail piece of the said locking pawl, whereby when the air is compressed in the air chamber, it raises the piston in the auxiliary chamber and disengages the locking pawl, permitting the rod to return to its normal position, substantially as described.

4. In a muscle tester, the combination with a suitable casing, an air chamber, a piston and protruding stem, a registering device connected with the air chamber by a suitable conduit, a valve located in said conduit, means connected with the valve whereby the latter may be opened from the outside of the casing, means for locking the valve in the open position, and means connected with the air chamber for releasing said locking mechanism when the air is compressed in the chamber, substantially as described.

5. In a muscle tester, the combination with
suitable registering mechanism and a casing,
of an air chamber, a piston and protruding
stem, the air chamber being connected with
5 the registering device by a suitable conduit, a
valve located in the said conduit, a spring-
actuated rod normally holding the valve in
the closed position, a coin controlled locking
pawl engaging the rod, means for supporting
10 the coin whereby it holds the pawl in the un-
locked position, and means connected with
the rod for actuating said supporting mechan-
ism and releasing the coin as the rod is turned
to open the valve, substantially as described.
In testimony whereof I affix my signature 15
in the presence of two witnesses.
HENRY W. WILSON.

Witnesses:

G. J. ROLLANDLT,
CHAS. E. DAWSON.