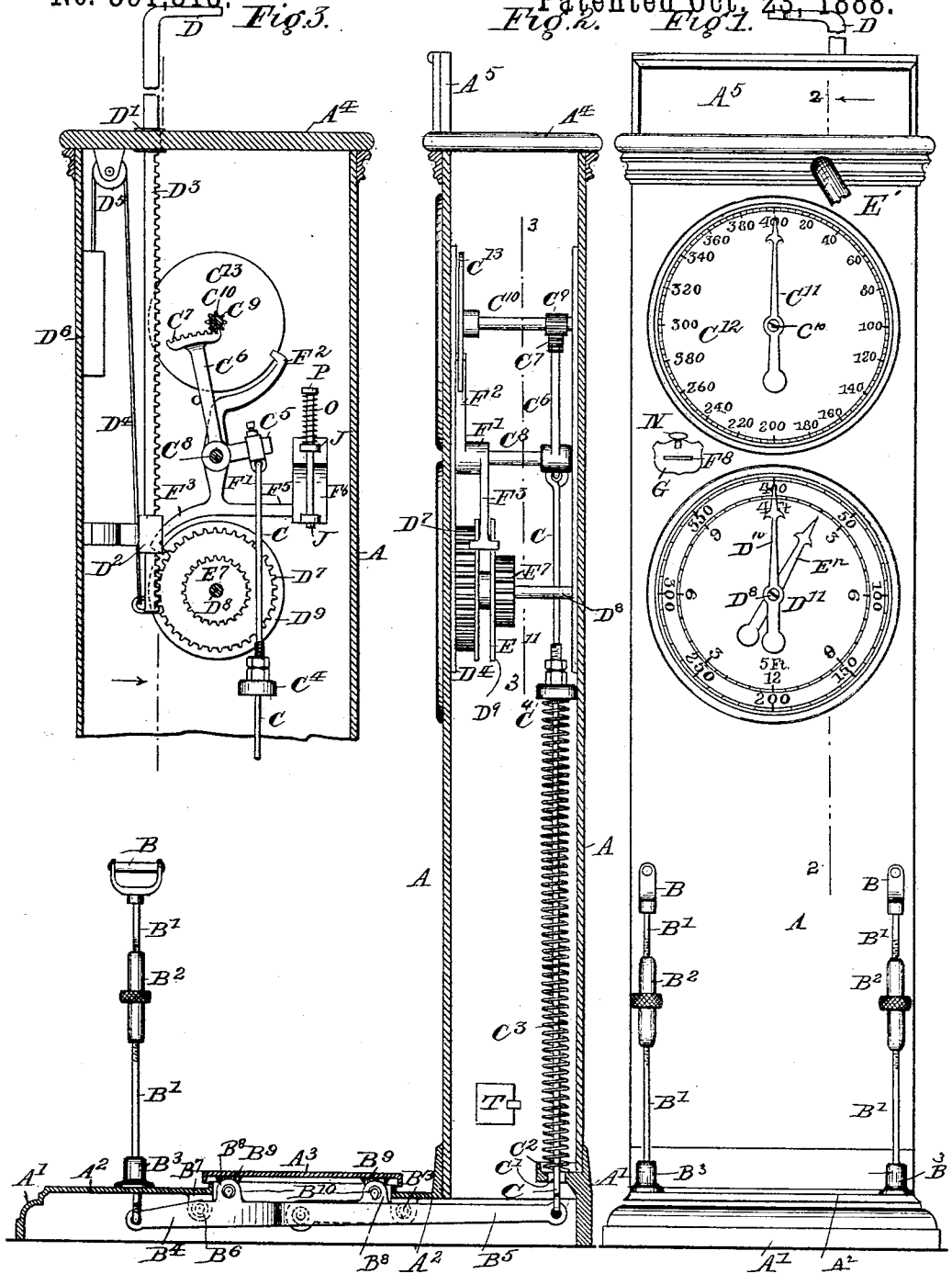
(No Model.) 3 Sheets—Sheet 1.

E. J. COLBY.

COIN CONTROLLED MACHINE FOR WEIGHING, LIFTING, LUNG TESTING, AND HEIGHT MEASURING.

No. 391,513. Patented Oct. 23, 1888.



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(No Model.) 3 Sheets—Sheet 2.

E. J. COLBY.

COIN CONTROLLED MACHINE FOR WEIGHING, LIFTING, LUNG TESTING, AND HEIGHT MEASURING.

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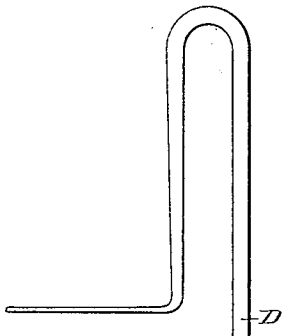


Fig. 5.

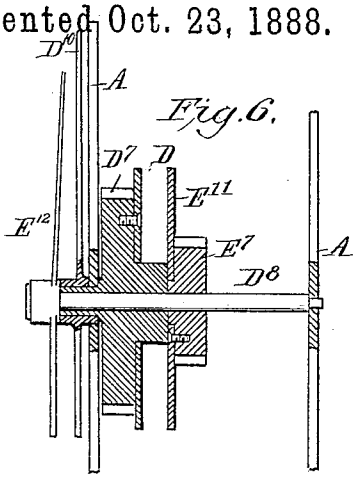
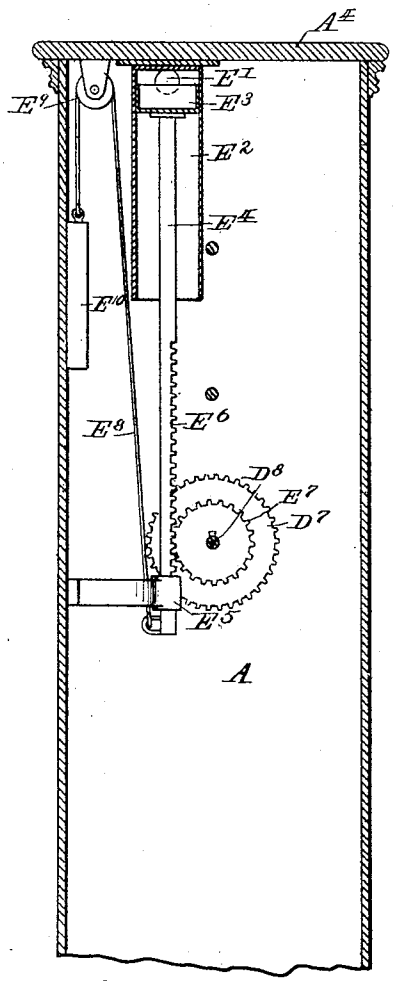


Fig. 6.



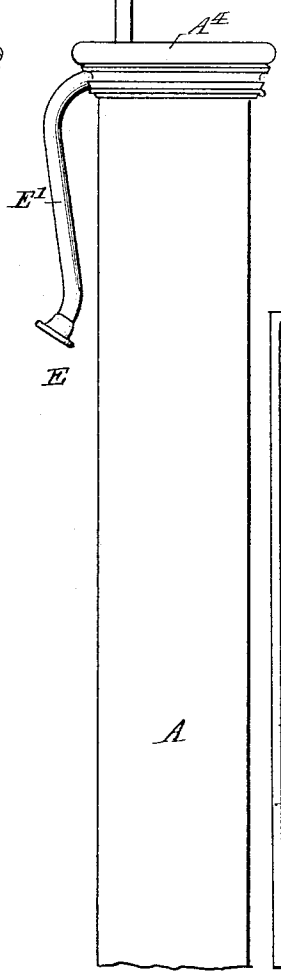
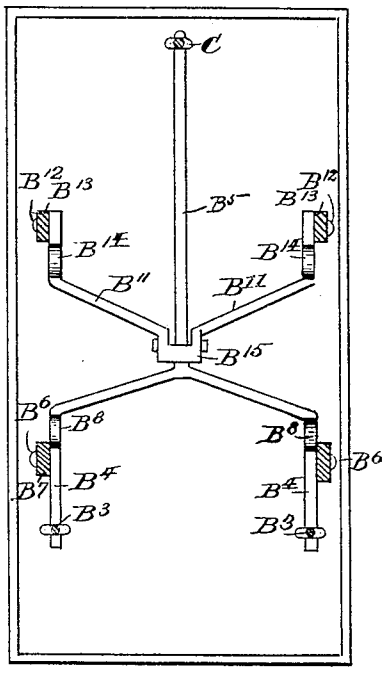


Fig. 4.

Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

E. J. COLBY.

COIN CONTROLLED MACHINE FOR WEIGHING, LIFTING, LUNG TESTING, AND HEIGHT MEASURING.

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Fig. 8.

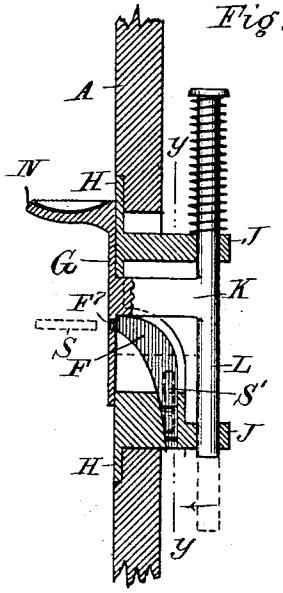
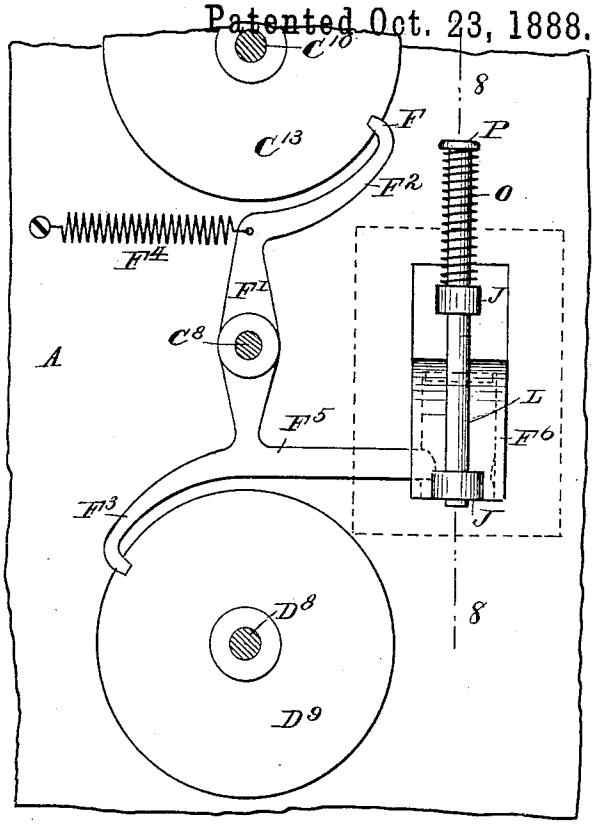


Fig. 9.



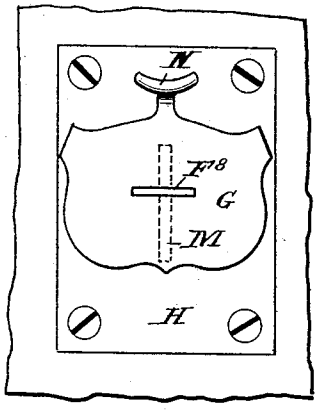
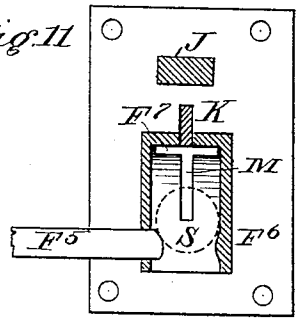


Fig. 10.

Fig. 11



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UNITED STATES PATENT OFFICE

EDWARD J. COLBY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE COLBY TESTING MACHINE COMPANY.

COIN-CONTROLLED MACHINE FOR WEIGHING, LIFTING, LUNG-TESTING, AND HEIGHT-MEASURING.

SPECIFICATION forming part of Letters Patent No. 391,513, dated October 23, 1888.

Application filed November 25, 1887. Serial No. 256,044. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. COLBY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Coin-Controlled Machines for Weighing, Lifting, Lung-Testing, and Height-Measuring, of which the following is a specification.

My invention relates to improvements in automatic appliances for weighing or lifting or lung-testing or the like, and its object is to provide a machine having any or all such appliances, together with means whereby the introduction of a coin may throw the parts which are normally out of operation into operation. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a front view of an illustration of my invention, containing a scale, lifting-device, lung-tester, and measuring-rod. Fig. 2 is a vertical section of the same on the line 2 2. Fig. 3 is a vertical section of a portion of the device on the line 3 3. Fig. 4 is a side view of the same showing the measuring-rod and lung-tester tube. Fig. 5 is a vertical section showing the structure of the lung-tester. Fig. 6 is a detail of the mechanism for indicating the height and lung capacity. Fig. 7 is a detail of the levers of the weighing and lifting devices. Figs. 8, 9, 10, and 11 are details of the mechanism whereby the introduction of a coin is made to throw the parts into position for operation, Fig. 8 being taken on line 8 8 of Fig. 9.

The same or like parts are indicated by the same letter in all the drawings.

A is a casing provided with a lower stand, A′ A′, on which is a platform, A^2, upon which the person lifting stands, and the scale-platform A^3.

B B are the handles of the lifting-machine attached to the rods B′ B′, said rods being joined by the unions B^2 B^2 and passing through the guide-pieces B^3 B^3. Each of these rods is secured below to the arms B^4 B^4 of the lever B^5. These arms are pivoted at B^6 to the lugs B^7, which depend from the platform A^2. Each arm carries the perforated lug B^8.

B^9 B^9 are lugs on the platform A^3, and each is provided with an arm, B^{10}, having a knife-edge which rests in the perforation of the lug B^8.

B^{11} B^{11} are arms pivoted at B^{12} B^{12} to lugs B^{13} B^{13}, each of which lugs depends from the platform A^2, and each of such arms carries a perforated lug, B^{14}, each of which latter lugs receives one of the knife-edged lugs B^{10}, above described. The two arms B^{11} B^{11} are joined by the yoke B^{15}, which rests upon the lever B^5. From the other end of the lever B^5 proceeds a rod, C, which passes through a guide, C′, on the lug C^2, and is encompassed by the spiral spring C^3, which bears against said lug and carries the stop-nut C^4, against which the other end of the spring rests. The rod C is secured to the arm C^5 of the elbow-lever, whose other arm, C^6, carries the gear-plate C^7. The lever is pivoted at C^8. The gear-plate engages the pinion C^9 on the shaft C^{10}, which shaft carries the indicator-hand C^{11}, moving on the dial C^{12}. On the shaft C^{10} there is a notched disk, C^{13}.

D is a measuring-rod, shaped as shown—that is to say, with a downwardly-turned portion and horizontal end—and passing through the guideways D′ and D^2. On its inner portion it has a ratchet-face, D^3, and to its lower end is secured the rope D^4, which passes over the pulley D^5 and carries the weight D^6. This ratchet-bar engages the cogs of the pinion D^7, which rotates freely upon the shaft D^8. Secured to the pinion D^7 is a notched disk, D^9. The pinion D^7 rotates on the shaft D^8 and carries at its outer end the indicating-hand D^{10}, which moves over the dial D^{11}.

E is the mouth-piece of the lung-tester E′, with a flexible tube leading therefrom into the cylinder E^2, which is secured within the casing A. In this cylinder moves the piston E^3 on the rod E^4, which rod passes through the guide-way E^5 and has a ratchet-face, E^6, which engages the pinion E^7 on the shaft D^8. To the lower end of the rod E^6 is secured the rope E^8, which passes over the pulley E^9 and supports the weight E^{10}. The pinion E^7 is keyed to the shaft D^8, and to it is secured the notched disk E^{11}, similar to the notched disk D^9. On the outer extremity of the shaft D^8 is secured the indicating-hand E^{12}, which moves over the dial D^{11}.

On the shaft C^8 is pivoted the double-locking clutch F′, having the arms F^2 and F^3, adapt-

ed, respectively, to engage the notched disk C^{13} and the notched disks D^9 and E^{11}. To the arm F^2 is secured the spiral retracting-spring F^4, (see Fig. 9,) which is fastened to the casing A. This spring holds the locking-arms F^2 and F^3 in the notches of the disks C^{13} and D^9, and thus prevents rotation of the shafts C^{10} and D^8. Secured to the clutch F' is the arm F^5, which projects through an aperture in the side of the guideway F^6. The coin-guideway F^6 has an aperture, F^7, which opens into a slot, F^8, in the face of the escutcheon G. This escutcheon is placed upon and over the plate H, which is a face or protecting plate at and about the coin-aperture, and from which project the guide-lugs J J, as seen in Fig. 8. Inwardly projecting from the escutcheon and rigid therewith is the arm K, having at its outer extremity the rod L, which passes through guide-lugs J J.

M is a vertical slot in the guideway F, through which the arm K descends.

N is a thumb-piece on the escutcheon.

The rod L is encompassed by the spring O, which bears against a cap P and also against one of the lugs J and thus keeps the rod normally elevated.

S in Fig. 8 indicates a coin in position to be inserted in the machine, and S′ the same coin at the point where it is in position to be operated upon by the arm K to move the rod or arm F^5.

F^8 is a slot in the escutcheon to register with the slot F^7.

T is a door securely locked and giving admission to the interior of the case.

The use and operation of my invention are as follows: A machine constructed substantially as shown in Fig. 1 is placed in any convenient position where it is likely to be used, and is provided with any convenient door, which is locked so as to prevent access to the interior of the case. It is the intention that by the introduction of a coin—as, for instance, a nickel—the machine may be set in operation, so that the user may be weighed, may test his lifting capacity, take his measurement, and also test his lungs. I will describe the operation of these several parts in order.

1. *The weighing device.*—The stand A rests by the knife-edges B^{10} B^{10} on the arms B^{11} B^{11} and B^4 B^4, both of which arms operate upon the lever B^5. The lever B^5 is pivoted at the points B^6 B^6, so that when weight is applied to the platform A^3 the same has a tendency to be carried downward, and with it to carry the lever B^5, thus drawing down the rod C, compressing the spring C^3 and applying power to the arm C^5 of the elbow-lever, which is pivoted at C^8. This also tends to cause the arm C to move, carrying with it the ratchet edge or plate C^7, which engages the pinion C^9 and rotates the shaft C^{10}, on which the pinion is secured. On this shaft is secured the indicating-hand C^{11}, which passing around the dial will register the amount of weight applied to the platform A^3. Of course the proportions of the levers, strength of the spring, &c., must be adjusted so as to correspond with the scale. This operation, however, will not take place so long as the lock-arm F^2 engages the notch in the notched disk C^{13}. It is therefore necessary in the first instance to release the notched disk C^{13} from the arm F^2, so that the weight can cause the indicating-hand to move, and this is accomplished, as will be seen by reference to the mechanism hereinafter described; but supposing the arm F^2 to be free from the notch, then the operation is as above set forth.

2. *The lifting device.*—The lifting-handles, it will be seen, are secured on opposite sides of the outer extremity of the platform A^2 and each terminates below the platform and engages the outer ends of the arms B^4 B^4, thus being on opposite sides of the pivotal points B^6 B^6. If now the power be applied to these handles, the lever B^5 will be depressed and the lifting force, instead of the weight of the user, will be applied to the rod C and thus to the indicating-hand C^{11}. The length of these levers and arms of course will have to be proportioned so as to correspond with the scale. The same result could of course be accomplished by having a separate scale for both the weighing and the lifting devices.

3. *The measuring device.*—Supposing the disk D^9 to be freed from the arm F^3, so as to permit the same to rotate freely, the user standing on the platform A^3 now draws down the measuring-bar D until its outer extremity rests upon the top of his head. By so doing the ratchet-bar D^3 is caused to operate the pinion D^7, at the same time drawing up the weight D^6, which serves to restore the parts to their normal positions after use. Now the pinion D^7, as shown in Fig. 6, has secured to it a notched disk, D^9, which is above referred to as having been released from the arm F^3. This pinion rotates freely on the shaft D^8, carries at its outer extremity the collar on which is secured the index-hand D^{10}, which registers upon the dial D^{11} the height of the person using the machine.

4. *The lung-tester.*—When the arm F^3 releases the notched disk D^9, it also releases the similar notched disk E^{11}. This notched disk is secured to the pinion E^7, which pinion is keyed to the shaft D^8, the shaft D^8 carrying at its outer extremity the indicating-hand E^{12}, which rotates about the dial D^{11}. Now the user, still standing on the platform A^3, tests his lungs in the usual manner by blowing into the mouth-piece E and tube E′, and thence into the cylinder E^2 above the piston E^3. The pressure of the atmosphere will cause the piston E^3 to descend, thus carrying with it the rod E^4, which is guided by the guideway E^5 and carries the ratchet E^6. This ratchet E^6 engages the pinion E^7 and rotates it, together with the shaft D^8, thus causing the indicating-hand E^{12} to rotate about the dial D^{11}. The cord E^8 and weight E^{10} are applied to the lower end of the ratchet-bar E^6, so as to restore the parts to their position after use.

During all these operations it has been observed that it is necessary for one or all of the disks, C^{13}, D^9, and E^{11}, to be freed from, respectively, the arms F^2 and F^3, and by inspection of Fig. 9 it will be seen that when any one of these disks is freed from such connection all are, so that to operate the machine it is only necessary to throw the arms out of connection with the disks, after which they will remain free so long as the operation continues; but when the operations are completed the reaction of the springs and weights will restore the parts to their normal positions, and thus permit the arms F^2 and F^3 to lock their respective disks. I proceed, therefore, to describe the manner in which these disks are released. A coin of suitable size, according to the construction of the machine—as, for instance, the nickel S—is inserted through the slot F^8 and slot F^7 into the downwardly-curved coin-guideway F^6, where it comes in contact with the end of the rod or arm F^5, which projects through the side of the guideway F^6, and is connected at its other end to the arm F^3 and the part F'. If now the person who is standing on the platform A^3 presses downward upon the thumb-piece N, the rod or arm K will descend through the slot M and engage the top of the nickel in the position shown in dotted lines in Fig. 8. If more pressure be applied, the nickel will be forced through, where it will descend to the bottom of the case and may be taken out through the door T; but in descending and passing out through the guideway F^6 it necessarily forces the rod F^5 outward, thus moving the part F' on the shaft C^8 and throwing both the arms F^2 F^3 out of connection with their respective disks. Immediately the weight of the operator upon the platform A^3 causes the shaft C^{10}, with its disks C^{13}, to move, thus preventing the parts from returning to their positions. When the weight has been taken, the operator will pull slightly on the lifting-handles, so as to keep the shaft C^{10} partially turned, and thus prevent the parts from being locked, and he will then step on the platform A^2, where he can test his lifting-power, as above set out, the same being registered on the dial C^{12}. He now, without entirely releasing his grip, steps upon the platform A^3, thus holding the several disks out of position to be locked, and proceeds with the other operations of testing his lungs and his height, if desired. He now steps from the platform of the machine, and immediately the reaction of the spring and weights causes the parts to return to their normal positions, so as to be locked, thus preventing the use of any or all of them until a second nickel has been introduced into the slot and forced down into the guideway, as above described.

Of course it is easy to see that the dials could be differently arranged and that one or more of these features could be dispensed with in the same machine. I have shown simply an illustration of my ideas.

The coin unlocks or releases the mechanism, or is made to unlock or release the mechanism by its action against the lever F^5—that is to say, there is no movable part about the machine which can be forced against this lever—and it is only when a coin—as, for instance, a nickel—is introduced into the coin-guide by operating the sliding escutcheon or push and its parts attached thereto that the coin can be made to move the lever F^5. The motion of this lever or arm releases all of the parts, as heretofore described, and indicated in Fig. 9. This coin releases or is made to release and unlock the mechanism.

Having described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a testing-machine, the combination of a lung-testing apparatus and indicator with locking apparatus which normally prevents the indicator from moving, a coin-guideway, a push to force said coin through the guideway, and a projection from said locking apparatus in the path of such coin, so that as the coin is forced through its guideway pressure is applied to said projection by the coin, and thus the locking apparatus released to permit the indicator to move.

2. In a testing-machine, the combination of a series of testing apparatuses and indicators, a series of disks connected with such indicators, suitable connections between such disks and testing apparatuses, a rock-shaft and arms thereon, said arms normally locking such disks, a coin-guideway and push, and an arm from such rock-shaft in the path of said coin, so that when the coin is pushed through its guideway the arm is moved, the rock-shaft rotated, and the disks released, so that the indicators can operate.

3. In a testing-machine, the combination of a stand, lifting-handles suspended above the same, a weighing-platform fixed thereon with a vertical case having suitable indicators and levers, and rods whereby pressure applied to said lifting-handles or to said platform is registered by the indicators on said case.

4. In a testing-machine, the combination of a lifting-machine and a weighing-machine with indicating-disks attached thereto, locking devices which prevent said disks and indicators from moving, an arm on such locking devices, a coin-guideway into which said arm projects, and a push which forces said coin against the arm, operates the locking mechanism, releases the disks, and permits the indicators to register.

5. In a testing-machine, the combination of a lifting-machine, a weighing-machine, and a height-testing machine with indicating-disks attached thereto, locking devices which prevent said disks and indicators from moving, an arm on such locking devices, a coin-guideway into which said arm projects, and a push which forces said coin against the arm, operates the locking mechanism, releases the disks, and permits the indicators to register.

6. In a testing-machine, the combination of

a lifting-machine, a weighing-machine, a height-testing machine, and a lung-testing machine with indicating-disks attached thereto, locking devices which prevent said disks and indicators from moving, an arm on such locking devices, a coin-guideway into which said arm projects, and a push which forces said coin against the arm, operates the locking mechanism, releases the disk, and permits the indicators to register.

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