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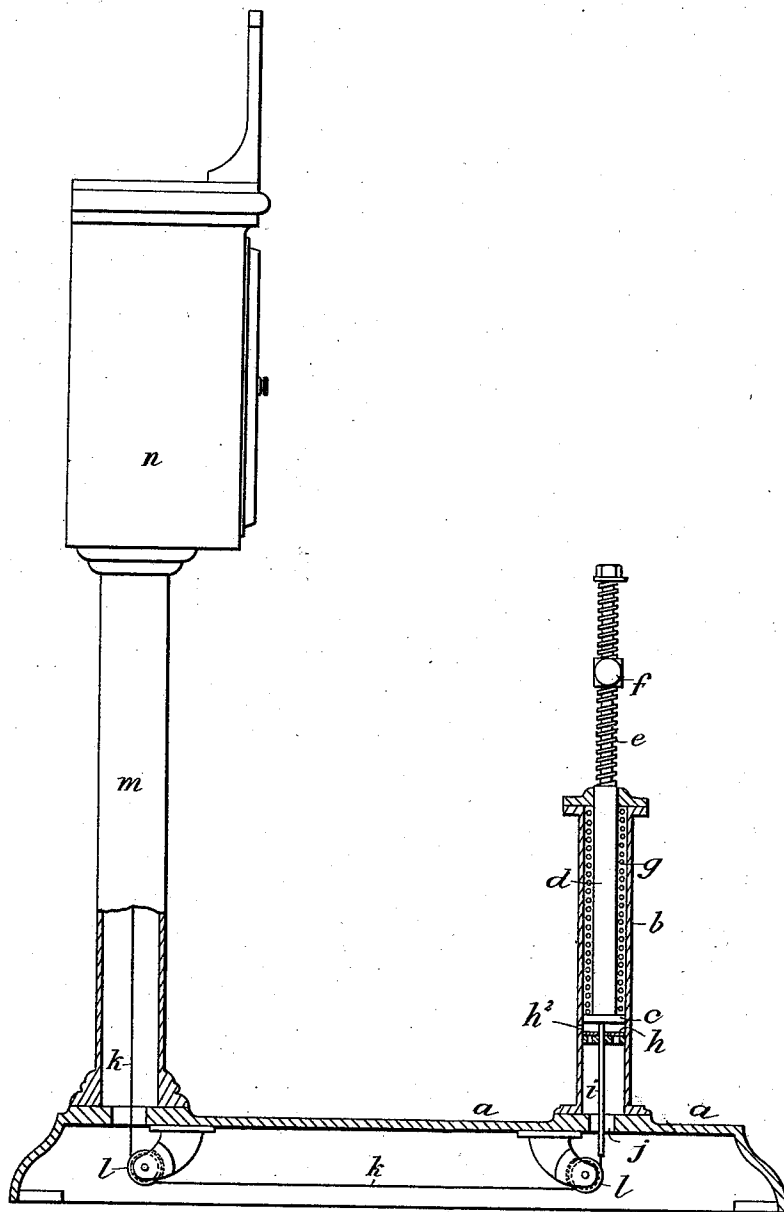
R. W. PAGE.

COIN OPERATED STRENGTH TESTING MACHINE.

No. 373,942.

Patented Nov. 29, 1887.

Fig. 1.



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(No Model.)

7 Sheets—Sheet 2

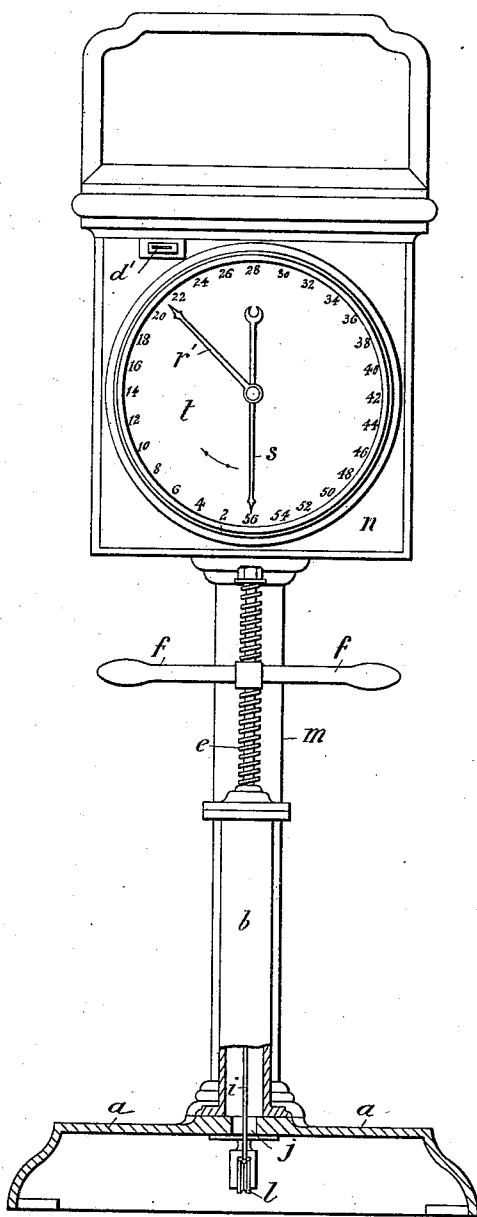
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COIN OPERATED STRENGTH TESTING MACHINE.

No. 373,942.

Patented Nov. 29, 1887.

Fig. 2.



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7 Sheets—Sheet 3.

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COIN OPERATED STRENGTH TESTING MACHINE.

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Fig. 3.

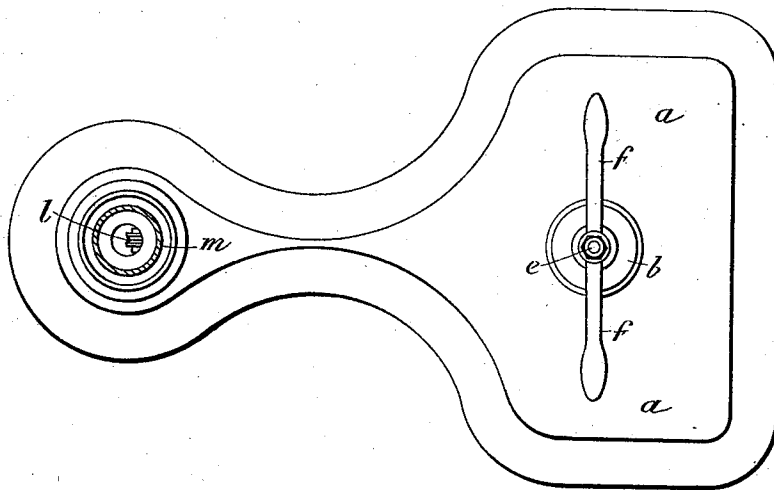
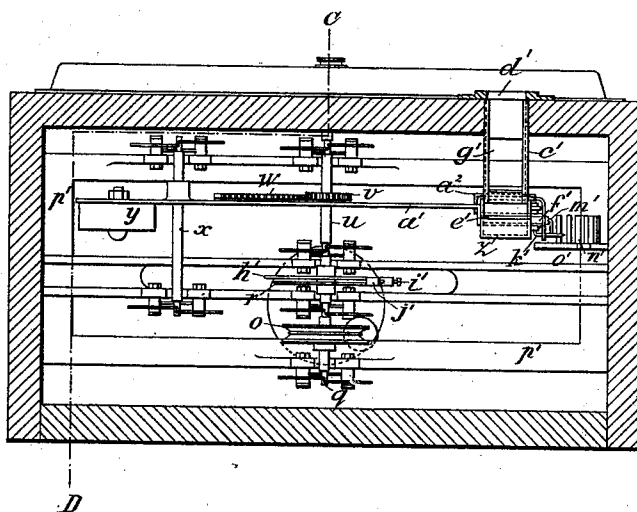


Fig. 5.



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(No Model.)

7 Sheets—Sheet 5

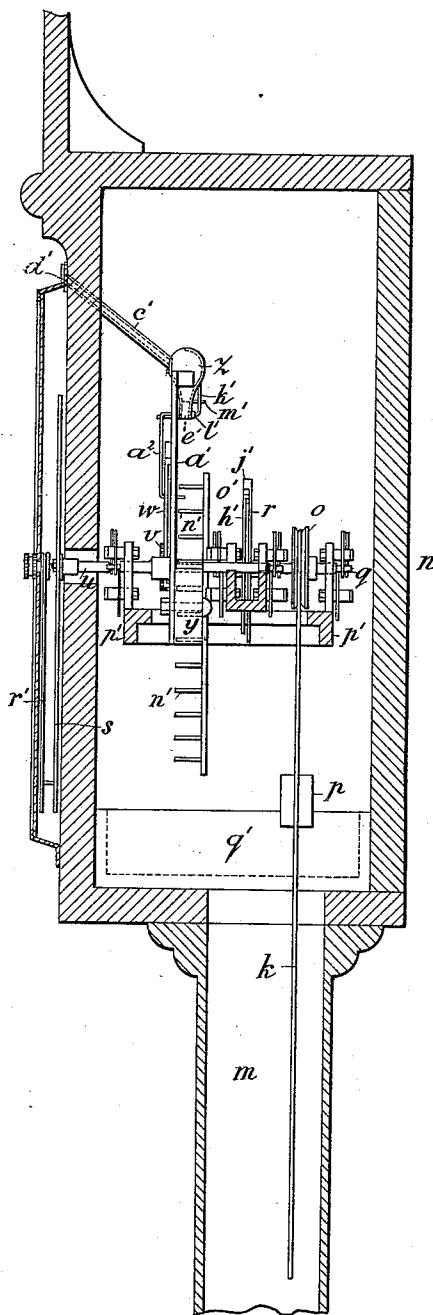
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COIN OPERATED STRENGTH TESTING MACHINE.

No. 373,942.

Patented Nov. 29, 1887.

Fig 6



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7 Sheets—Sheet 6.

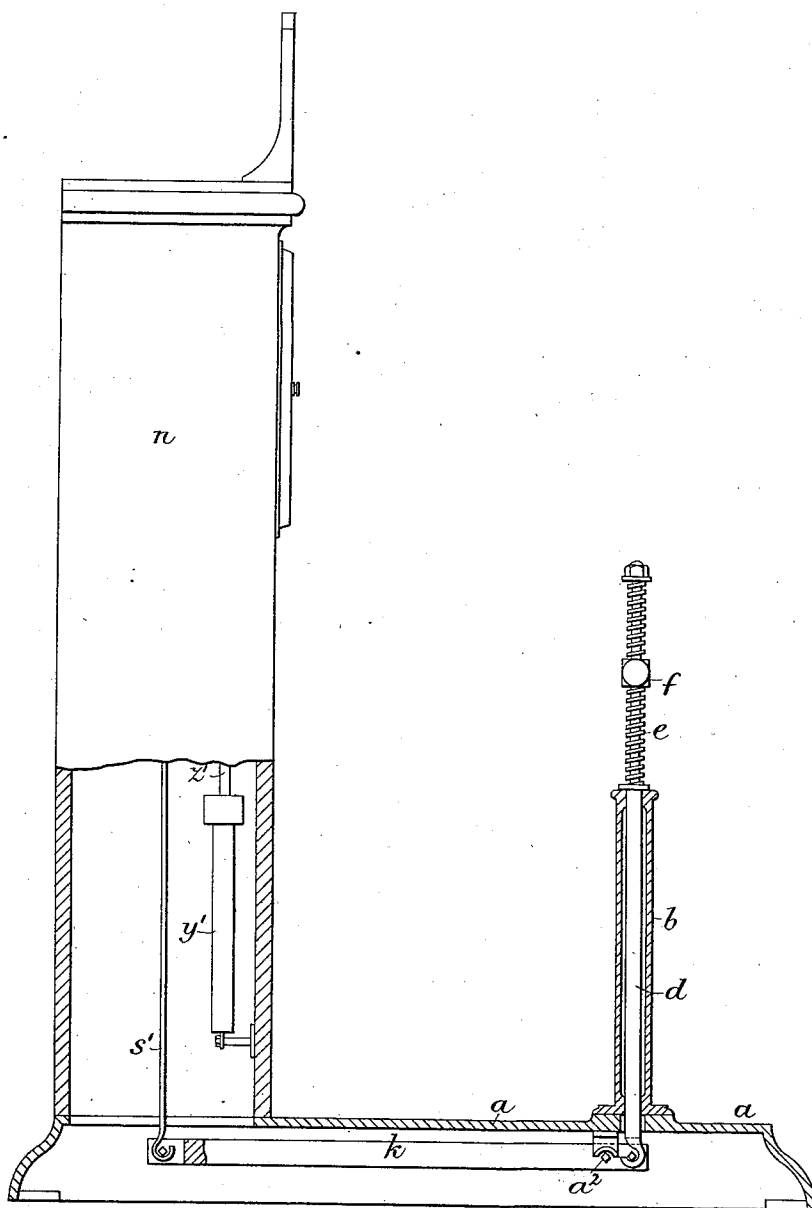
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COIN OPERATED STRENGTH TESTING MACHINE.

No. 373,942.

Patented Nov. 29, 1887.

Fig. 7.



Witnesses:

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(No Model.)

7 Sheets—Sheet 7.

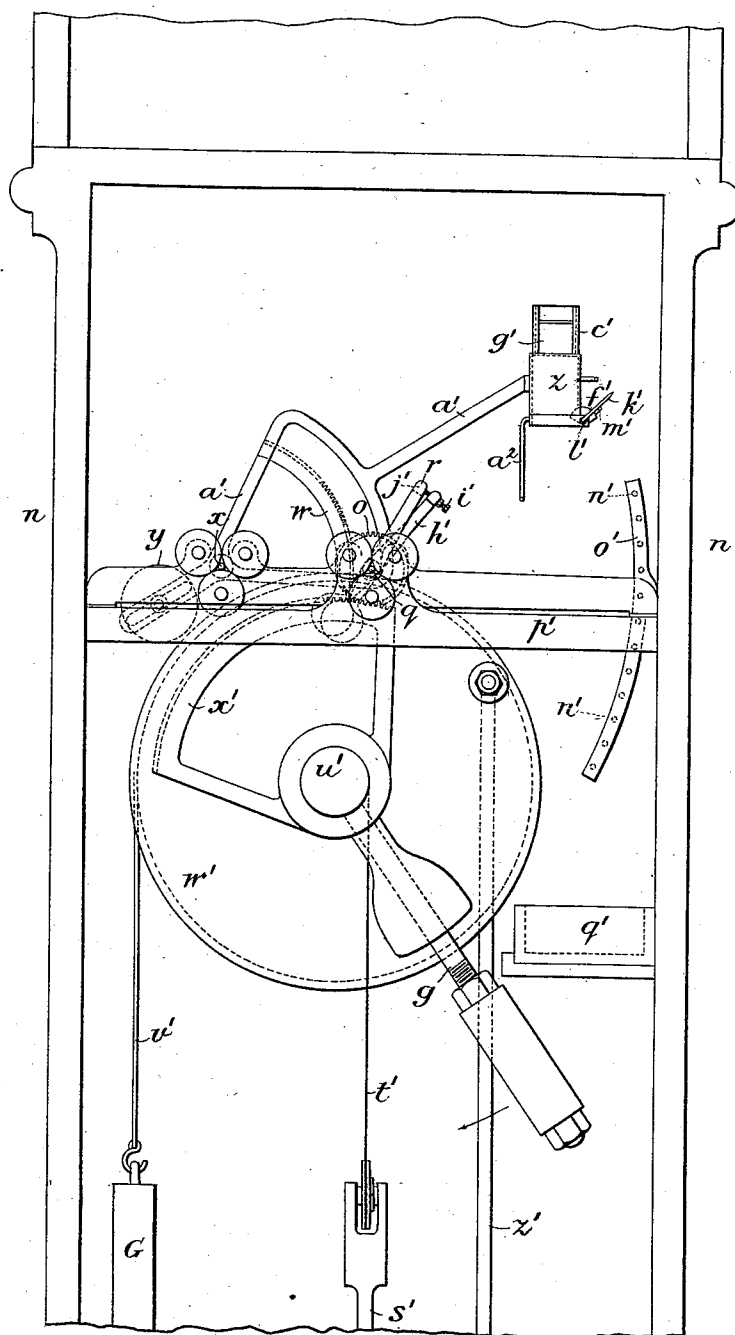
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COIN OPERATED STRENGTH TESTING MACHINE.

No. 373,942.

Patented Nov. 29, 1887.

Fig. 8.



Witnesses:

Wm. J. Norton
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UNITED STATES PATENT OFFICE.

ROBERT W. PAGE, OF LONDON, ENGLAND.

COIN-OPERATED STRENGTH-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,942, dated November 29, 1887.

Original application filed October 19, 1886, Serial No. 216,665. Divided and this application filed July 5, 1887. Serial No. 243,462. (No model.) Patented in England October 20, 1885, No. 12,576; in France September 6, 1886, No. 178,363; in Belgium September 22, 1886, No. 74,614; in Victoria October 11, 1886, No. 4,758; in Spain November 5, 1886, No. 9,849; in India November 25, 1886, No. 460; in Tasmania November 27, 1886, No. 437/9; in South Australia November 27, 1886, No. 739; in New Zealand December 6, 1886, No. 2,148; in Cape of Good Hope December 28, 1886, No. 6/109; in Italy December 31, 1886, XX, 20,601, XLI, 182; in Natal January 5, 1887; in Austria-Hungary March 3, 1887, No. 36,094 and No. 5,352; in Mauritius March 5, 1887; in New South Wales May 28, 1887, No. 5,457/2,084, and in Ceylon July 8, 1887.

To all whom it may concern:

Be it known that I, ROBERT WILLIAM PAGE, a subject of the Queen of Great Britain, residing at London, England, have invented certain new and useful Improvements in Muscular Power or Strength-Testing Machines, (for which I have obtained patents in the following countries, namely: Great Britain, dated October 20, 1885, No. 12,576; France, No. 178,363, dated September 6, 1886; Belgium, No. 74,614, dated September 22, 1886; Spain, Fol. 4-5^o, No. 9,849, dated November 5, 1886; India, No. 460, Register No. 192 of 1886, dated November 25, 1886; Tasmania, No. 437/9, dated November 27, 1886; South Australia, No. 739, dated November 27, 1886; Italy, XX, No. 20,601, XLI, No. 182, dated December 31, 1886; Austria and Hungary, No. 36,094 and No. 5,352, dated March 3, 1887; Mauritius, dated March 5, 1887; Victoria, No. 4,758, dated October 11, 1886; New Zealand, No. 2,148, dated December 6, 1886; Cape of Good Hope, Register Folio No. 377, No. 6/109, dated December 28, 1886; Natal, dated January 5, 1887; New South Wales, by Letters of Registration No. 5,457 and No. 2,048, dated May 28, 1887, and Ceylon, dated July 8, 1887,) of which the following is a specification.

The object of my invention is to construct an apparatus whereby the muscular power of a person as exerted in the act of lifting, or other acts involving the employment of muscular power, can be indicated or disclosed, but which can only be done when a coin—such as a penny, or a token, or the like—is placed in a receptacle provided in the machine.

In order to enable my invention to be fully understood I will describe the same by reference to the accompanying drawings, in which—

Figure 1 is a side elevation partly in section; Fig. 2, a front elevation partly in section; and Fig. 3, a sectional plan illustrating a suitable arrangement of machine adapted for indicating the muscular power exerted in the act of lifting according to my invention, a spring being employed for counterbalancing

the lifting force. Fig. 4 is a rear elevation of part of the apparatus, the back of the casing being removed in order to show the indicating mechanism. Fig. 5 is a horizontal section on line 5 5 of Fig. 4, and Fig. 6 is a vertical section on the crooked line 6 6 of Fig. 5. Fig. 7 is a sectional side elevation, and Fig. 8 a rear view, with the back of the case removed, illustrating a machine constructed according to my invention in which a counterpoise for counterbalancing the muscular force exerted is employed. Figs. 1 to 3 and Fig. 7 are drawn to a scale of about one-eighth full size, and Figs. 4, 5, 6, and 8 about one-fourth full size.

Similar letters in all the figures represent similar or corresponding parts.

I will first describe my invention by reference to Figs. 1 to 6.

a represents a platform on which the person testing his lifting-power stands.

b is a cylinder or tube fixed to the platform *a*, in which cylinder or tube works a piston, *c*, on a rod, *d*, the upper part, *e*, of which is screw-threaded, as usual, for carrying the handles *f*, which by this means can be adjusted in the usual manner to suit the height of the said person who grasps the handles in order to test his lifting-power.

g is a spring on the rod *d*, which spring serves to counterbalance the force applied to the handles *f*.

h is a valve in the cylinder or tube *b*, which acts so as to provide a temporary cushion of air in order to prevent a too abrupt return of the piston and rod when the handles *f* are released, the air escaping gradually through a small hole, *h'*, in the cylinder *b*; or, instead of a valve, a perforated partition can be employed. A spindle or rod, *i*, extends downward from the piston *c* and passes through a hole, *j*, in the platform *a*. To the lower end of the spindle or rod *i* is attached a cord, *k*, passing over pulleys *l l*, under the platform, and up through the pillar or standard *m* into the casing *n*, containing the indicating mechanism shown in Figs. 4, 5, and 6. The cord

k there passes around and is attached to a grooved wheel, o , and has a weight, p , suspended to its end; or, in place of a weight, a spring may be employed. The grooved wheel o is fixed upon an arbor, q , carrying at one end a finger or bar, r . This bar is operated through the grooved wheel o and cord k by the force or power applied by the person to the handles f , and regulates the extent of movement of the index s over a dial, t , placed outside the casing n of the apparatus, and serving to indicate the said lifting power.

On the arbor u , Figs. 5 and 6, of the index s is fitted a pinion, v , which gears with a quadrant, w , on an arm, a' , pivoting at x , and provided with a counter-weight, y . The arm a' carries the receptacle or bucket z for the coin b' , Fig. 4, the weight of which coin is sufficient to overbalance the counter-weight y . The bucket z has an open top, and is normally situated immediately below a chute, c' , extending from a slit, d' , in the casing n of the apparatus, as shown in Figs. 4, 5, and 6. The bottom of the bucket z is provided with an opening, e' , which is partly closed by a pivoted block, f' , carrying an arm or counter-weight, a'' . The opening e' is just of sufficient length to allow the coin b' to pass through when the block f' is rotated clear thereof, as hereinafter described. The chute c' is formed with an opening, g' , in its bottom of such a size that any coin smaller than the size of the predetermined coin will pass through the said opening into the apparatus without operating the parts.

h' is a finger or stop for regulating the movement of the index s by coming in contact with the bar r . The finger or stop h' is fixed on the inner end of the arbor u of the index s , and when the pinion v is rotated by a coin dropped into the bucket z , overbalancing the arm a' and operating the quadrant w , the finger or stop h' will rotate until a stud, i' , thereon comes against a projection, j' , on the bar r , when it will be stopped thereby at the proper position to indicate by means of the index s the force or power applied to the handles f . When the said force ceases and the piston c reassumes its normal position, the projection j' on the bar r will as the bar rotates bear against the stud i' on the finger or stop h' , so as to raise the bucket z .

k' is a finger or catch working loosely within the pivot l' of the block f' (see Figs. 4, 6, 8) and resting upon a bar or projection, m' , located on this block f' in such a manner that when the bucket z is lowered by the weight of the coin b' , placed therein, the finger or catch k' will, by coming in contact with a series of pins or catches, n' , on a curved bar, o' , fixed to the frame p' of the mechanism, be raised and pass by the pins n' . When, however, the bucket z is raised by the release of the handles f , the finger or catch k' will be brought into contact with the under side of the pins n' , and being thereby pressed down will press down the bar or projection m' and rotate the block f' out of

the opening e' into the position shown in dotted lines in Fig. 4. The coin will then be free to pass out of the bucket z into a drawer, q' , or other suitable receptacle.

r' is a loose marking-hand or pointer, which is carried along by the index s and remains at the point to which it has been so moved until replaced at zero by a person using the machine, or otherwise. By this means the muscular power exerted by the person using the machine remains indicated upon the dial t after the index s has returned to zero, which it does directly after the handles f are released.

By this construction of machine, if a person desire to test his lifting-power, a coin or token of predetermined value or size must be passed through the slit d' and will fall into the bucket z , where it will remain until the handles f be lifted by the said person, this being done in the manner usual when using an ordinary lifting-machine for testing strength. The spring g will by this means be compressed to a certain extent, according to the force or power exerted, and the piston c will be raised to a corresponding degree. This extent of movement will be communicated by the cord k and grooved wheel o to the bar r on arbor q . The bucket z , by the weight of the coin b' therein, will at the same time descend, and the finger or catch h' on arbor u will be rotated by the quadrant w and pinion v , its extent of rotation being limited by the bar r , and the power exerted by the person using the machine will be thereby indicated by the index s and loose marking-hand or pointer r' on the dial t . Upon the person releasing the handles f the piston will resume its normal position and the bar r , as it is carried back by the cord k and grooved wheel o , will carry with it the finger or catch h' and index s , and the bucket z will be thereby raised, the bottom of the bucket will be fully opened by the finger or catch k' coming against the pins n' , as hereinbefore described, and the coin b' will be discharged into the drawer q' . If a smaller coin or token than that predetermined should be dropped through the slit d' , it would simply pass through the opening g' in the chute c' into the drawer q' without operating the mechanism, and the slit d' is of course of such a size as will not admit of the introduction of a larger coin than that required.

In the arrangement of machine illustrated in Figs. 7 and 8, g^3 and G represent the counterpoise which I sometimes employ in place of the spring g (shown in Figs. 1 and 2) for counterbalancing the force applied to the handles f . The weighted arm g^3 is connected with the handles f by means of a lever, k^3 , having its fulcrum at a^3 , and connected at one end to the lower part of the rod d , and at its other end to a rod, s^3 , to which is attached a steel ribbon, t' , fixed to and wound upon a spindle, u' , carrying the weighted arm g^3 . The weight G is suspended by a cord, v' , which passes round a pulley, w' , fixed on the spindle u' . When the

handles *f* are lifted, the ribbon *t'* will partly rotate the spindle *u'* and pulley *w'* and the weight *G* will be raised, and the weighted arm *g'* will partly rotate in the direction shown by the arrow until the weights *g'* and *G* counter-

balance the force applied to the handles *f*.
x' is a toothed quadrant fixed on the spindle *u'*, and serving to operate when the spindle is rotated, a pinion, *o*, fixed on the arbor *g*, carrying the bar *r*.

y', Fig. 7, is a cylinder in which fits loosely a piston connected by a rod, *z'*, to the pulley *w'*. The said cylinder contains water or other suitable fluid, which serves as a cushion, in order to lessen the shock on the weights *g'* and *G*, reassuming their normal position when the force is removed from the handles *f*. The indicating mechanism is the same as that hereinbefore described, and shown in Figs. 4 to 6, and the apparatus will be thereby easily understood without further description.

It will be obvious that the loose marking-hand hereinbefore described may be dispensed with, if desired, and it will be also obvious that my improvements are applicable to other descriptions of machines for indicating the muscular power of persons than those described—such, for example, as to dynamometers for testing the strength of the hand, and others.

Sometimes it may be advantageous—as, for example, in the case of small coins, where the weight of the coin might not be sufficient to effectually actuate the indicating mechanism—to so arrange the indicating mechanism that as the coin falls from the chute it will act as a key and lock the indicating mechanism to the strength-testing mechanism, and on the release of the handles the coin will fall, as hereinbefore described.

I have described my invention constructed to be used with a coin or token; but it will be obvious that it can be constructed to be operated by any article of a given weight or size, such as a marble, or otherwise.

In the preceding description I have described and illustrated the use of a dial and a hand or finger; but it will be obvious that other suitable means of indication may be used, such as a rotating dial disclosing the indicating numeral or sign through an opening, or a rotating opening and a fixed dial; or the indicating numerals or signs may be similar to those of an ordinary engine-counter.

It will be obvious that in place of the coin, token, or the like directly actuating the indicating mechanism, the coin or the like may be made to unlock a drawer, shutter, slide, or the like, which can then be opened so as to disclose the index. It will also be obvious that in place of the indications being made or disclosed on a dial or other index, as hereinbefore described, the muscular power or

strength-testing mechanism can be caused to operate an adjustable arrangement of printing-type inside the apparatus so as to print or impress the said indications on cards or tickets which can be obtained by pulling out a slide or drawer when the coin, token, or the like has been placed in the apparatus.

The arrangement of printing-type may consist of disks having the type on their peripheries, or any other arrangement of adjustable type may be used. I place the cards or tickets adjacent to the printing-type. The card nearest to the type is delivered to the outside of the machine by means of the said slide or drawer actuated by hand from the outside, the said slide or drawer having a projection or other device for withdrawing the card. The slide or drawer communicates by means of suitable mechanism with the printing device, by which means on the outward motion of the slide or drawer before the projection on the same pushes out the card the type is caused to come into contact with the adjacent card and imprint or impress the said card with the numerals or signs indicating the muscular force exerted by the person using the machine, the adjustment of the type for this purpose having been effected by the movement of the cord *k*, or of the weighted arm *g'*, or other suitable counterpoise. As the slide or drawer is continued to be pulled out the card recedes from the type and the projection on the slide or drawer comes in contact with the printed card, which is thereby delivered outside the apparatus.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I would say that this application being a division of my pending application, Serial No. 216,665, filed October 19, 1886, I do not herein claim the subject-matter of the claims in that application; but

What I do claim is—

An apparatus for testing muscular power or strength, the said apparatus being provided with a suitable indicating-gage and with a coin or token receiving device in communication with the said gage, the said gage and receiving device being combined with an arbor having mounted thereon a grooved wheel, handles, or like devices to be grasped by the operator, and connections between said handles and arbor, whereby the force or power exerted will be registered upon the gage, and the result—to wit, the power or strength exerted—will be caused to be displayed by the co-operation of the coin-receiving receptacle with said gage.

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T. W. PRICE.