

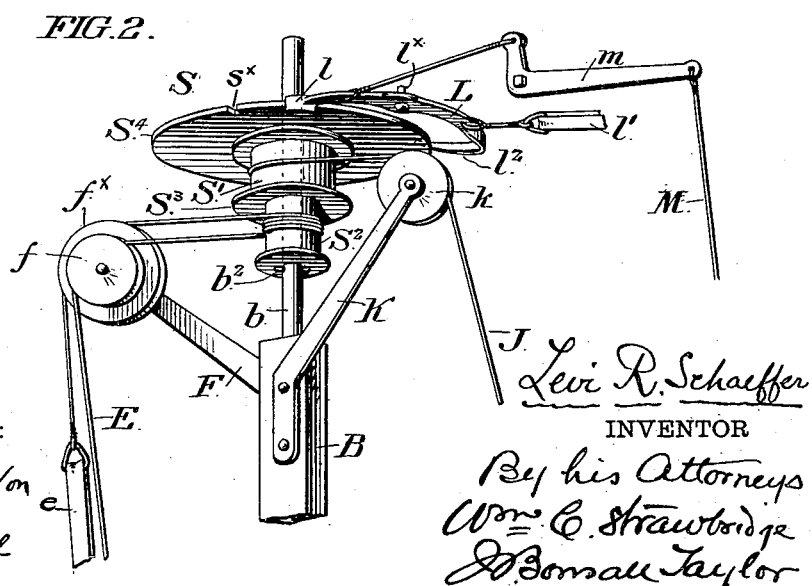
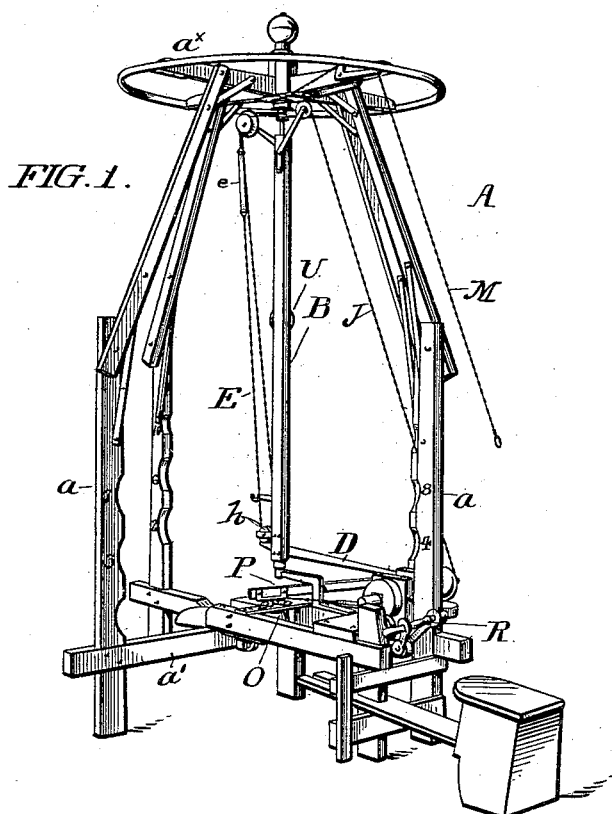
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L. R. SCHAEFFER.
EXERCISING AND STRENGTH TESTING MACHINE.

No. 493,561.

Patented Mar. 14, 1893.



WITNESSES:
F. Norman Dixon
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J. Levi R. Schaeffer
INVENTOR
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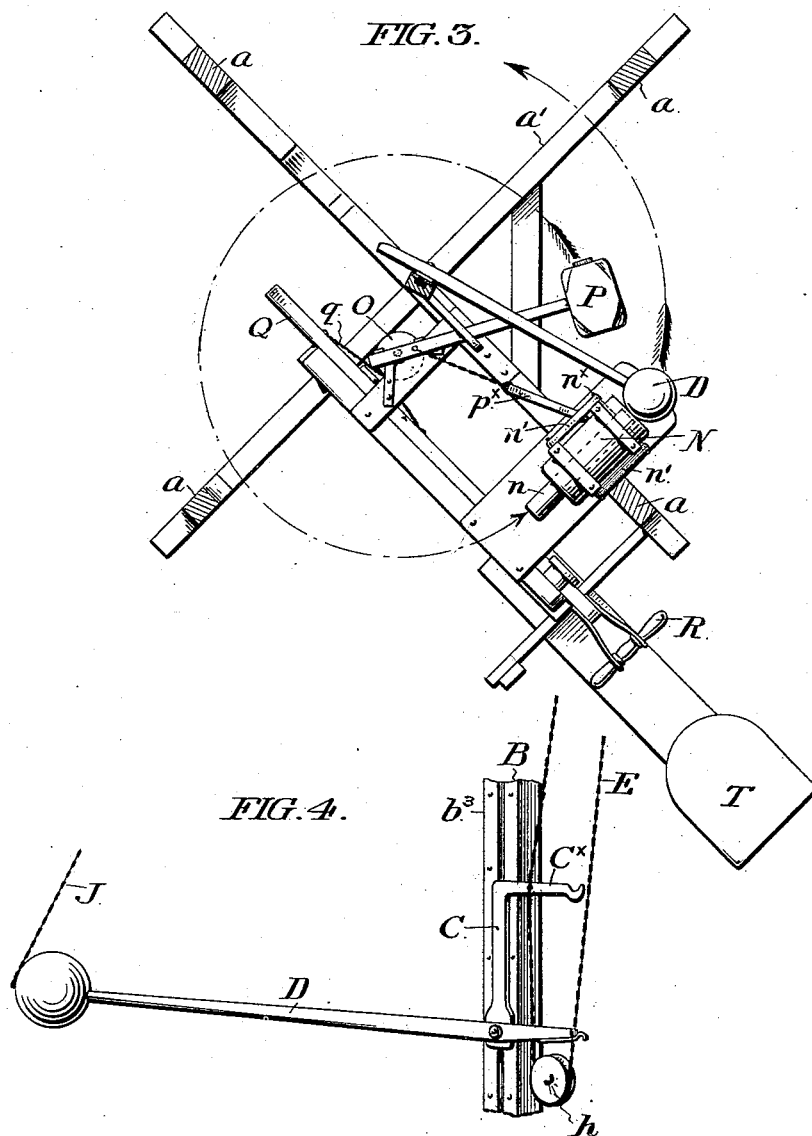
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UNITED STATES PATENT OFFICE.

LEVI R. SCHAEFFER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
FRANCES M. WETTER, OF SAME PLACE.

EXERCISING AND STRENGTH-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,561, dated March 14, 1893.

Application filed May 28, 1892. Serial No. 434,746. (No model.)

To all whom it may concern:

Be it known that I, LEVI R. SCHAEFFER, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Exercising or Strength-Testing Machines, of which the following is a specification.

My invention relates to a class of exercising machines adapted, when actuated, to register or indicate the degree of force exerted in such actuation.

In the accompanying drawings I illustrate and herein I describe my invention as embodied in an apparatus adapted to be operated by a direct pull upon a manually grasped handle, and said machine is therefore adapted to indicate the pulling or tractive strength of the operator. It is, however, to be understood that the apparatus may be constructed and arranged to operate in a manner other than that mentioned.

In the accompanying drawings, Figure 1 is a view in perspective of an apparatus embodying a good form of my invention. Fig. 2 is a view in perspective of the upper portion of the pole, together with the spool, and the ratchet. Fig. 3 is a plan view of the lower portion of the apparatus. Fig. 4 is a view in perspective of the weight arm and slide plate.

Similar letters of reference indicate corresponding parts.

In the drawings, A is a framework consisting of a series of upright members, *a*, grouped around a common center, conveniently somewhat inarched at their upper portions,—of transverse members *a*^x supported upon the upper portions of said upright members,—and of transverse members *a*^l supported upon the lower portions of said uprights.

B is a vertical pole, the upper and lower extremities of which are, to render the pole rotatable, provided with suitable axles or gudgeons, entered in bearings formed in the transverse members *a*^x *a*^l respectively. The upper portion of the pole has a rounded shank *b*, seated upon which and resting upon a stud or projection *b*² thereof is a spool, S, as I term it, the body portion of which is shaped to form two winding drums S' S² respectively, of different diameters, S' being the larger, between

which drums is a circumferential wall S³. The upper portion of the spool constitutes a ratchet plate S⁴, whereof hereinafter.

One side of the pole B embodies a longitudinal recess which is, to constitute a dove-tailed groove, covered by a plate *b*³ embodying a central slot. Within this groove is mounted a sliding plate C which is free for vertical movement with reference to the pole, and rotatable with said pole. The slide plate is of such length as will preclude binding in its vertical movement, and is provided with a stud or projection C^x.

D is a weight arm, pivotally connected, at a point at or near its inner end, to the slide plate, and extending radially away from the pole, said arm being equipped with a weight, which is preferably situated at its outer end.

E is a cord secured to the stud C^x, and extending upward along the pole to and over a sheave *f* journaled free for idle rotation upon an arm F rigidly secured to and projecting from the pole,—to and around the winding drum S² of the spool S,—to and over a sheave *f*^x journaled free for idle rotation upon the arm F,—downward along the pole to and around a sheave *h* journaled free for idle rotation at a point near the lower end thereof, and back into fixed attachment with the stud C^x. A rubber band *e* forms part of the length of said cord, and serves to maintain the remainder of the cord taut.

J is a cord one end of which is secured to the outer extremity of the weight arm, and which extends upwardly to and over an idle sheave *k* mounted upon an arm K rigidly secured to and projecting from the pole, and then to and into fixed attachment with the drum S' of the spool.

The ratchet plate referred to embodies a notch S^x with which the tooth *l* of a ratchet bar L mounted upon a suitable pivot *l*^x, is held in engagement by a spring *l*^l suitably disposed for such purpose with reference to said ratchet bar. The spring *l*^l is illustrated as consisting of a rubber band, one end of which is secured to the body of the ratchet bar and the other to any suitable point of support. The rear end of the ratchet bar is provided with a friction brake shoe *l*².

M is an operating cord secured to the

ratchet bar and depending to a position where it may be grasped by the operator, intermediate of the length of which cord and forming in effect a part of it is a bell crank lever *m*.

5 The action of the structure so far described is as follows: To work or operate the apparatus the weight arm is thrown to the right, whereby it and the pole are caused to revolve together, and the number of revolutions so
10 made will be in proportion to the amount of force exerted in the impulse given to it. Inasmuch as the weight arm and the pole revolve, while the spool *S* is stationary, the cord *E* is taken up on one side of the drum
15 *S*² and paid out from its other side, and, the branch or division which is taken up by or wound upon the drum in the revolution of the pole being directly attached to the sliding plate, said plate and the connected weight
20 arm are drawn upward by it: at the same time, the cord *J* is by said revolution continuously wound upon the drum *S'* of the stationary spool and being thereby in effect shortened co-operates with the cord *E* in
25 drawing the weight arm upward, and, said drum *S'* being of greater diameter than the drum *S*² the cord *J* will be taken up at a greater speed than the cord *E*, whereby the
30 outer end of the weight arm will be caused to ascend more rapidly than the inner end and the weight arm assume a tilted position in its ascent. After the force of the impulse
35 given to the weight arm has spent itself, the weight of said arm is such that it will descend by gravity, in such descent revolving with the pole in the direction opposite to that
40 in which it revolved in its ascent, and this for the reason that the spool, being secured against rotation by the locking engagement
of the ratchet bar *L* with the ratchet plate which forms a part of said spool, the necessary release of the cords to permit of the descent of the weight arm can only be effected
45 by the unwinding of said cords from said spool by the revolution of the pole. The weight of the weight arm therefore, as will be understood, exerts such a pull upon the cords
50 *E* and *J*, which are wound upon said spool and pass over the guide sheaves of the rotatable pole, as will, acting against the sheave-equipped arms of the rotatable pole, carry the
latter (and with it the weight arm) around, the cords being unwound from the spool, and
55 the weight arm descending, as said pole and arm revolve, until the weight arm comes to its rest at the base of the apparatus.

To occasion, when desired, a more expeditious descent of the weight arm, I pull upon the cord *M* to withdraw the tooth of the ratchet
60 from its notch in the ratchet plate, thus releasing the spool for revolution upon the spindle *b*, whereupon the weight arm immediately drops to its normal position, unwinding the cords *E* and *J* from the spool *S* which is thereby
65 caused to revolve, while the pole remains stationary. In withdrawing the ratchet tooth

from its notch the ratchet bar is swung on its pivot and the brake *Z* at its rear end carried into contact with the margin of the ratchet plate, by which brake, through the cord *M*, the
70 rapidity of the rotation of the spool, and consequently the rapidity of the descent of the weight arm, is under control.

I prefer to form in the inner edge of each of the vertical members *a* a series of recesses, 75 which recesses are disposed in the respective members in lateral succession in a spiral arrangement,—and to paint a series of consecutive numbers or letters one upon or in the vicinity of each of the successive recesses. 80

The weight arm in its movement of revolution and ascent passes in front of or through one after one another of these recesses, beginning with the lowest, and the number of recesses passed by it will be in proportion to 85 the force with which it has been given its initial movement.

In the embodiment of the apparatus illustrated, the manual act by which the apparatus is operated is a pull upon a conveniently 90 arranged handle, the result of which pull is to swing a mallet the movement of which through the intervention of a follower is imparted to the weight arm. The weight arm when in its normal or lowest position rests 95 against the front face of a follower casing *N*, within which is mounted a follower *n*, being conveniently a wooden bar, somewhat longer than the casing, and controlled by any suitable spring to normally occupy a position 100 in which its end projects from the rear end of the follower casing; conveniently the follower is provided with a cross bar, *n*^x, shown in Fig. 3, the extremities of which project through slots in the wall of the follower casing, and with which extremities are engaged 105 rubber bands *n'* which are secured to permanent studs on the outside of said casing.

Supported upon the transverse members *a'* is a sheave block *O*, mounted for rotation upon 110 a stud or gudgeon, and to said sheave block is rigidly secured a mallet *P*, the handle of which mallet extends outwardly to a point which brings the mallet head in line with the follower *n*. 115

Q is a rigid bar, mounted for longitudinal reciprocation in suitable bearings, extending past the sheave block *O*, and provided at its outer end with a handle *R*. A band or strap 120 *q* passes around the sheave block and is as to its respective extremities secured to the bar *Q* at different points of the length of the latter. To prevent the slipping of the strap upon the sheave block it may be secured thereto by nails or otherwise. The mallet when at 125 rest lies in the position shown in Fig. 3, and below the weight arm.

p^x is a rubber or other spring one end of which is attached to the handle of the mallet *P* and the other to a permanent part of the 130 framework. Inasmuch as it is necessary for the mallet to rise slightly when it moves for-

ward to encounter the follower, in order to bring it up to the level of said follower, the stud upon which the sheave block O is mounted is slightly inclined from the vertical so that said mallet swings in a plane somewhat inclined from the horizontal, the highest point of which plane is in the vicinity of the follower casing.

T is an adjustable bench or chair.

The user of the apparatus being seated upon the bench pulls the handle R and this of course through the bar Q and strap q occasions the rotation of the sheave block and the swinging of the mallet, which latter encounters the follower n in contact with the weight arm, and the force of the blow of the mallet therefore acts against said weight arm and occasions its revolution and upward movement as hereinbefore described. The onward movement of the mallet is stopped by the encounter of the latter with the follower casing.

If desired, a bell U or other device adapted to be tripped may be mounted upon the upper portion of the pole in position to be encountered by the sliding plate when the latter is carried upward to the point where the bell is situated.

Having thus described my invention, I claim—

1. In an exercising or strength testing apparatus, in combination: a framing, a pole, a weight arm mounted upon said pole, revoluble, free for vertical movement with respect to said pole, and adapted when revolved, to ascend said pole, substantially as set forth.

2. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, an arm mounted upon said pole, revoluble with it, and free for vertical movement with respect to it, a supporting cord connected with said arm and adapted to be taken up and paid out in the vertical movement of said arm, substantially as set forth.

3. In an exercising or strength testing apparatus, in combination: a framing, a pole, a weight arm mounted upon said pole, revoluble, and free for vertical movement with respect to said pole, and adapted, when revolved, to ascend said pole, and means for occasioning the revolution of said arm, substantially as set forth.

4. In an exercising or strength testing apparatus, in combination: a framing, provided with a spiral series of numbers or symbols, a pole, a weight arm mounted upon said pole, revoluble, and free for vertical movement with respect to said pole, and adapted when revolved to ascend said pole, substantially as set forth.

5. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, a weight arm mounted on and free for vertical movement with respect to said pole, a rotatable spool, means for normally holding said spool against rotation, and a cord

connected with said weight arm and engaged with the spool, substantially as set forth.

6. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, an arm mounted upon said pole and revoluble with it, a revoluble spool, means for at will locking said spool against and releasing it for rotation, a supporting cord connected with the arm and with the spool, substantially as set forth.

7. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, an arm mounted upon said pole and revoluble with it, and vertically movable with respect to it, a cord connected with said arm and wound upon a stationary body,—a second cord connected with said arm or its sliding plate, led to the upper end of the pole, around a stationary body, led then to the lower part of the pole, and back to the starting point, and guide sheaves for said cord, substantially as set forth.

8. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, an arm mounted upon said pole and revoluble with it, a spool provided with a notched disk, a ratchet arm having a tooth, a spring tending to press said tooth against said disk, a cord connected with the arm and wound upon said spool, a second cord connected with said arm led to the upper end of the pole, around said spool, led then to the lower part of the pole and back to the starting point, and guide sheaves for said cord, substantially as set forth.

9. In an exercising or strength testing apparatus, in combination: a framing, a revoluble pole, an arm mounted upon said pole and revoluble with it, a spool provided with a notched disk, a ratchet arm having a tooth and a brake, a spring tending to press said tooth against said disk, a cord connected with the arm and wound upon said spool, a second cord connected with said arm led to the upper end of the pole, around said spool, led then to the lower part of the pole and back to the starting point, and guide sheaves for said cord, substantially as set forth.

10. In combination, the revoluble pole, embodying a longitudinal groove or slot, the slide plate mounted in said groove or slot, the weight arm secured to said plate, a cord secured to said arm and engaged with a winding drum, a mallet, means for operating the mallet,—a follower, and the follower casing, substantially as set forth.

11. In combination, the revoluble pole, embodying a longitudinal groove or slot, the slide plate mounted in said groove or slot, the weight arm secured to said plate, a cord secured to said arm and engaged with a winding drum, a mallet, the follower, the follower casing, the sheave block, and the reciprocating bar engaged with said sheave block, substantially as set forth.

12. In combination, the pole, the weight arm, the slide plate, the spool, the cord, and the ratchet bar having the tooth and the brake shoe, substantially as set forth.

5 13. In combination, the pole, the weight arm, the slide plate, the spool, the cords, the mallet, the follower, the follower casing, and means for operating the mallet, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 16th day of May, A. D. 1892.

LEVI R. SCHAEFFER.

In presence of—

F. NORMAN DIXON,
R. M. RUSSELL.