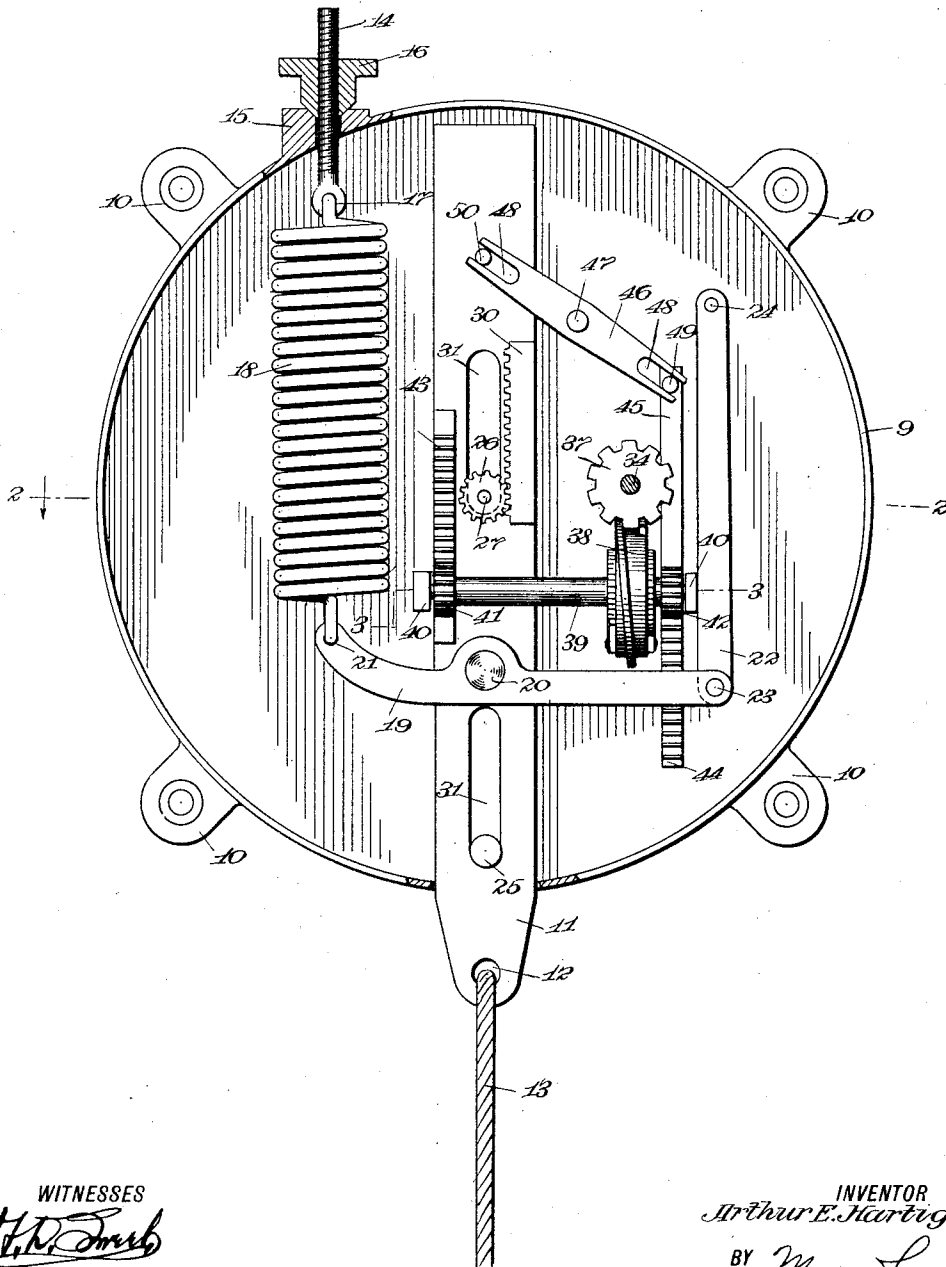


1,040,672.

2 SHEETS--SHEET 1.

Fig. 1



WITNESSES

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 REGISTERING PHYSICAL EXERCISING MACHINE.
 APPLICATION FILED MAR. 4, 1911.

1,040,672.

Patented Oct. 8, 1912.

2 SHEETS—SHEET 2.

Fig. 2

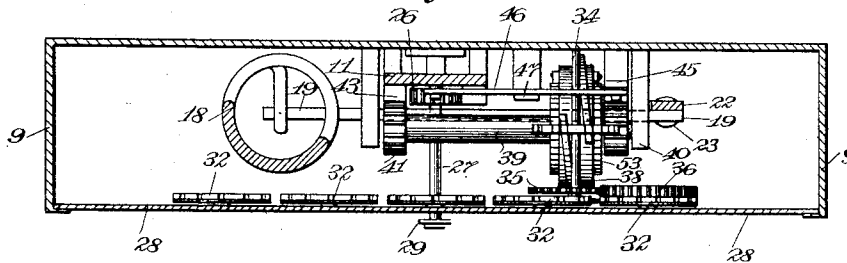


Fig. 3

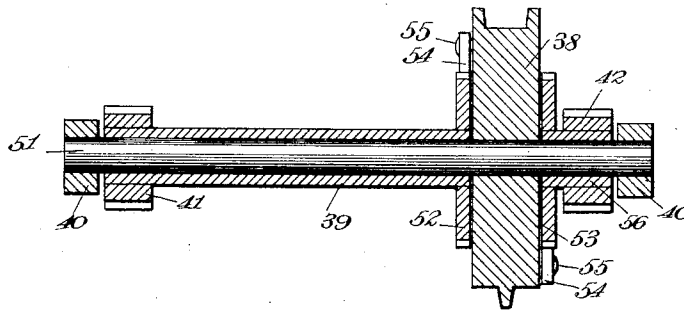
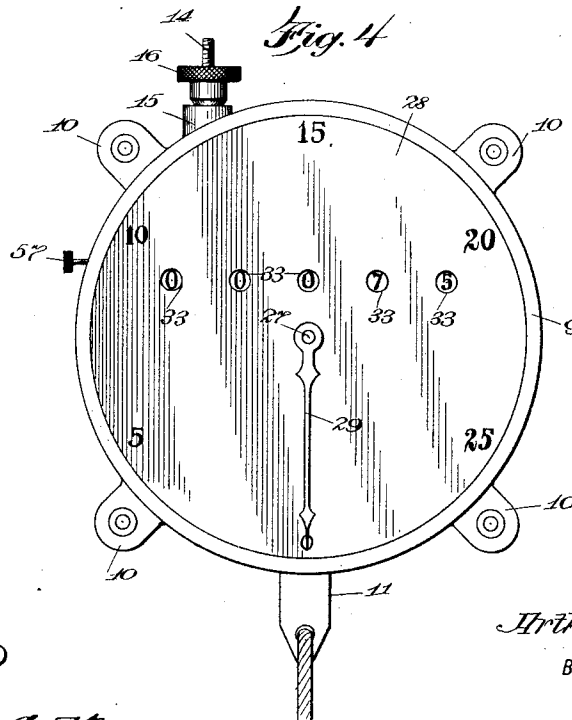


Fig. 4



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ARTHUR E. HARTIG, OF CHICAGO, ILLINOIS.

REGISTERING PHYSICAL-EXERCISING MACHINE.

1,040,672.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed March 4, 1911. Serial No. 612,221.

To all whom it may concern:

Be it known that I, ARTHUR E. HARTIG, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Registering Physical-Exercising Machine, of which the following is a full, clear, and exact description.

An object which the present invention has in view is to provide an exercising machine of the character shown and described, with a registering mechanism to show the total number of pounds of force exercised in the employment of the said machine.

With this object in view the invention consists in connecting to the spring pulling mechanism a comptometer and transmission mechanism disposed in operative relation between the said exercising mechanism and said comptometer.

It further consists in the construction and arrangement of the transmission mechanism to simplify and increase the efficiency of the said transmission mechanism.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a side view of an exercising machine and containing case therefor, said case being partly in section and the cover thereof being removed to disclose the operating mechanism of the exercising machine; Fig. 2 is a section taken on the line 2—2 in Fig. 1; Fig. 3 is a detail view, on an enlarged scale and in section, taken on the line 3—3 in Fig. 1, showing the reversing shaft and worm wheel mounted thereon for intermittently operating the comptometer mechanism; and Fig. 4 is a side view of the comptometer and the pound registering mechanism connected therewith, constructed and arranged in accordance with the present invention.

As shown in the drawings, the comptometer and exercising mechanism are mounted in a box-like case 9. The case 9 is provided with a series of tabs 10 whereby the same is secured in convenient arrangement, usually as attached to a wall. Extended through the side wall of the case 9 is a slide plate 11 provided in the upper end with an eyelet 12 through which is threaded the end of a pulling cable 13. Extended through the

wall of the case 9 is also a screw 14, a perforated boss 15 being provided to pass the said screw freely as the nut 16 is manipulated to draw outward the said screw or to prevent the same passing within the case 9. The screw 14 is provided with an eyeleted end 17 to which is hooked a spiral spring 18. The spring 18 is the power spring of the exercising machine, and is connected to the slide plate 11 by means of a lever 19, which lever is pivotally connected by means of a screw pin 20 to the plate 11 and connected to the spring 18 by the end of the said spring passing through an eyelet 21. To permit the necessary swing of the lever 19 it is fulcrumed upon a swinging arm 22 to which it is pivotally connected at 23. The arm 22 is pivotally mounted upon a pin 24 secured in the bottom of the case 9.

The plate 11 is guided in its reciprocations by guide pins 25 and the hub of the pinion 26. The shaft 27 to which the pinion 26 is fixedly secured is extended through the face plate 28 of the case 9, and has there fixedly mounted a pointer 29. The face plate 28 is provided with a series of numbers over which the end of the pointer 29 wipes, which numbers indicate the force measured in pounds of the pull exerted upon the plate 11.

It will be understood that the tension of the spring 18 may be varied by the manipulation of the nut 16 to set the machine and the said spring so that the force exerted to extend the plate 11 from the case 9 a certain distance will correspond to five pounds, ten pounds, fifteen pounds, and so on, each of the said devices being marked on the face plate 28, as shown best in Fig. 4 of the drawings. The rotation of the pointer 29 is caused by the engagement of the rack 30 with the pinion 26, as shown best in Fig. 1 of the drawings.

The slots 31 formed in the plate 11 are of equal length. The slots are cut to a length which will permit the rotation of the pinion 26 one complete revolution and the pointer 29 to move from zero to zero, as shown in Fig. 4 of the drawings.

It is to register the total number of pounds pull when using the exercising machine that I have provided the comptometer intermeshed disks 32, which disks are pivotally mounted on the face plate 28 in such manner that the numerals provided on the face will show through the orifices 33

formed in the said plate. The multiplying mechanism of the disk is of usual construction, and not herein shown or described. For the purpose of the present invention it is sufficient to state that the shaft 34 is provided adjacent the plate 28 with a gear wheel 35. The teeth of the gear wheel 35 are meshed with the teeth of the gear wheel 36. Said gear wheels are equal in diameter, whereby there is secured a complete rotation of the wheel 36 and the first or unit disk of the disks 32 for each complete rotation of the shaft 34. To rotate the shaft 34 in harmony with the movement of the plate 11 said shaft is provided with a worm wheel 37 fixedly mounted on the said shaft, the teeth whereof are engaged with a worm 38 loosely mounted on the shaft 51. The shaft 51 is supported in bearings formed in standards 40 and supports loosely the pinions 41 and 42. The pinion 41 is tooth engaged with a rack 43 provided on the face of the plate 11. The pinion 42 is tooth engaged with a rack 44 formed in the end of a slide bar 45. The slide bar 45 is suitably guided within the case 9, and is connected to move synchronously with the plate 11, but in opposite direction, by means of a rocking arm 46. The arm 46 is pivoted at 47 and is provided in the ends thereof with riding slots 48. The slots 48 are provided to receive coupling pins 49 and 50, the former being set out from the side of the bar 45 and the latter from the side of the plate 11. The pinion 41 is fixedly mounted on a sleeve 39. The sleeve 39 is slipped over the shaft 51 and is also provided with a ratchet wheel 52. The ratchet wheel 52 and the ratchet wheel 53 form guides for the operation of the worm 38. The teeth of the two ratchet wheels are oppositely set, and are engaged by pawls 54, which pawls are pivotally mounted on pins 55 set in opposite sides of the worm 38. The wheel 53 is fixedly mounted on a sleeve 56 upon which is also fixedly mounted the pinion 42. By means of the connection through the rocking arm 46, the slide bar 45 is reciprocated in a direction opposite the direction followed by the plate 11. The two pawls 54 are disposed to engage the ratchet wheels 52 and 53 alternately and as the same are moved in relatively opposite directions. The rotation of the ratchet wheel 52, which engages the pawl 54, is produced by the outward movement of the plate 11, the rack 43 rotating the sleeve 39 through its engagement with the pinion 41. The outward movement of the plate 11 causes, through the rocking arm 46, a movement in the opposite direction of the bar 45. This movement of the bar 45 rotates the pinion 42 in the direction where the ratchet wheel 53 avoids the pawl 54 with which it is in contact. When, now, the plate 11 is drawn back by the spring

18, the bar 45 is moved in the direction opposite to that just described, and the teeth of the wheel 53 engage the pawl 54 to rotate the worm 38 in the same direction as imparted thereby by the wheel 52.

By means of this arrangement it will be observed that the worm 38 is continuously rotated in the same direction, and that the first half of the complete rotation is imparted by the rack 43 when the plate 11 is drawn out of the case 9, and the remainder of the rotation is imparted by the rack 44 when the said plate 11 is returned by the spring 18 within the case.

In the operation of a machine thus constructed and arranged it will be seen that when the person exercising draws on the cable 13 against the spring 18, the force exerted in pounds measure is disclosed by the rotation of the pointer 29. It will also be observed that the total number of pounds lifted or pulled by the exerciser during the period of his exercise will be recorded on the comptometer and shown by the numbers exposed through the orifices 33 after the retraction of the plate 11. It will be understood that the comptometer in the first part of the movement, or the outward pull of the plate 11, is moved by the worm 38 to register one half of the total measure of the pull, the remaining half of the registration being effected by the retraction of the plate 11 and through the intermediary of the slide bar 45 and rack 44. Thus it will be observed that the pointer 29 indicates the total pounds pull on the plate 11 at the end of the complete extension thereof, while the comptometer registers the same total pounds pull at the end of the retraction of the plate 11. Thus, if the exerciser pulls 30 pounds at one exertion, and the comptometer has been previously set at zero, there will appear the numeral 1 in the first orifice to the right of the face plate 28, as shown in Fig. 4 of the drawings. If, however, the strength of the pull is only 10 pounds it will require three such exertions to rotate the shaft 34 and the unit disk 32 connected therewith sufficiently to expose the numeral 1. Thereafter each of the operations of the machine will show the total number of complete operations or the operations represented by 30 pounds as a unit. According to the illustration as seen in Fig. 4 of the drawings, the machine has been exercised to the extent of lifting 75 times 30 pounds, or 2250 pounds total.

It will be understood that if it is desired the unit of the comptometer disks may be one pound, and the first disk of the series may be divided and moved to operate in accordance. Should this arrangement be adopted then the numeral 75 shown in Fig. 4 of the drawings would represent 75 pounds.

At the end of the exercise by manipulat-

ing the milled nut 57 in the manner usual with comptometer mechanisms the disks 32 may be set to register zero.

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

1. A registering physical exercising machine, having a comptometer and means for operating the same; comprising a worm and gear wheel; a double rack and pinion driving mechanism for said worm arranged to rotate the same in one direction only; and manually operated reciprocating means for operating said driving mechanism.

2. A registering physical exercising machine, having a reciprocating member; flexible means connected with said member for moving the same manually in one direction; a resilient member operatively connected with said reciprocating member for returning said reciprocating member to its normal position; a comptometer for registering the extent of the double movement of said reciprocating member; and a transmission mechanism operatively connecting said reciprocating mechanism and said comp-

tometer, said mechanism embodying a worm wheel, a plurality of ratchet wheels disposed adjacent said worm wheel, a plurality of pawls mounted on said worm wheel to engage said ratchet wheels in opposite directions, a plurality of pinions driving said ratchet wheels, a plurality of racks each operatively engaging one of said pinions one of said racks being rigidly mounted on said reciprocating member, and a rocking lever connecting said reciprocating member and the other of said racks to move the said other rack in a direction opposite that traveled by said reciprocating member, whereby the worm wheel is moved the same direction by each of said racks and in equal proportion for the outward and inward movement of said reciprocating member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR E. HARTIG.

Witnesses:

PETER SCHMITZ,
MATHIAS HUBERTY.