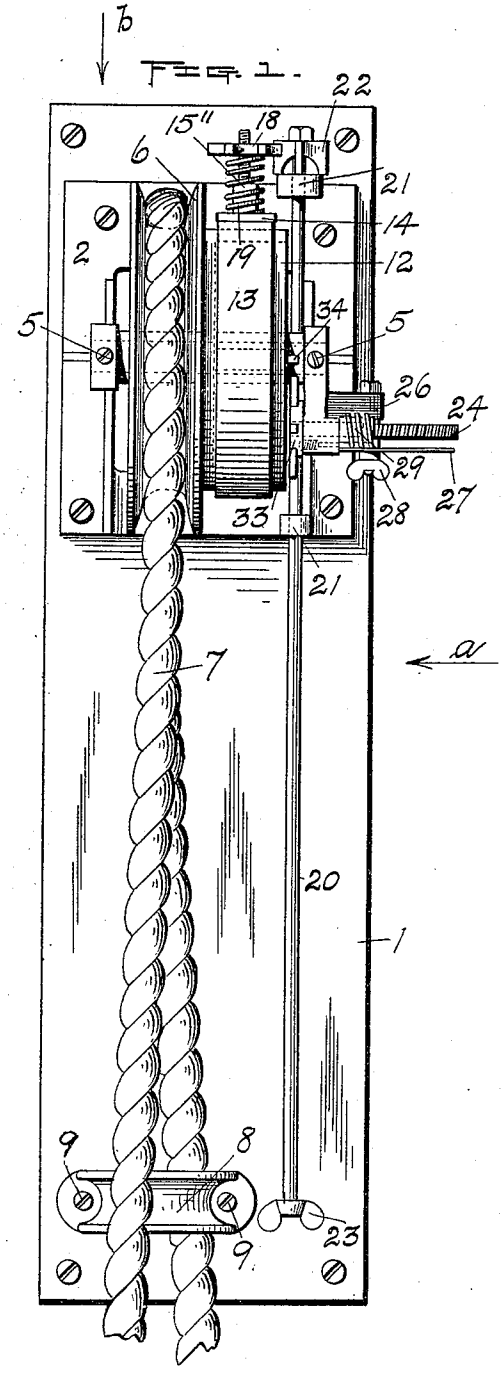
No. 641,519. Patented Jan. 16, 1900.

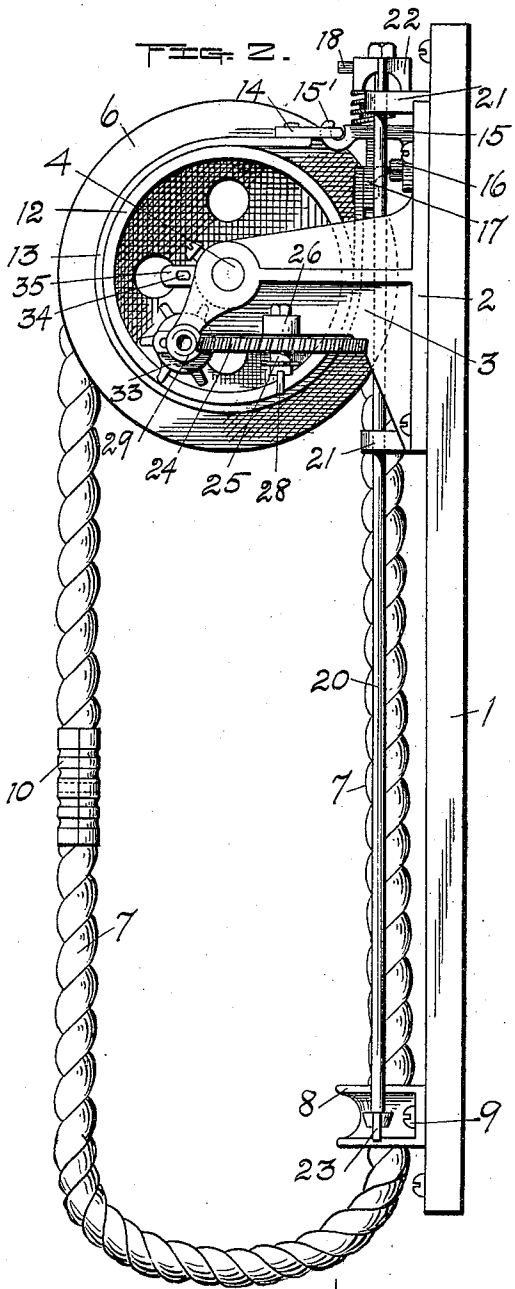
E. J. KERNS.

EXERCISING MACHINE.

(Application filed Mar. 8, 1899.)

(No Model.) 2 Sheets—Sheet 1.





Witnesses,
L. Forrest Wesson.
A. J. Galvin.

Inventor,
E. J. Kerns.
By J. C. Dewey Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

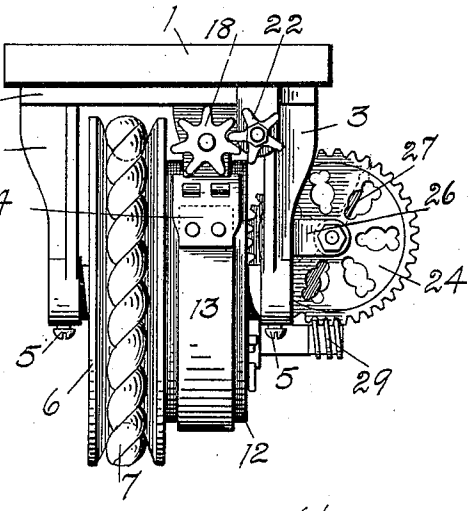
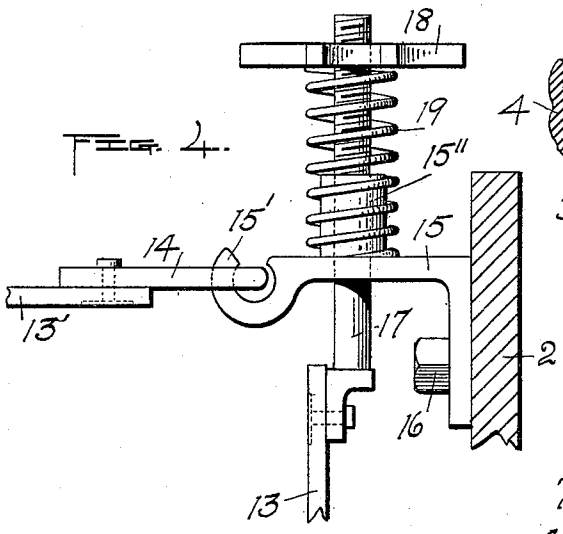


Fig. 4.



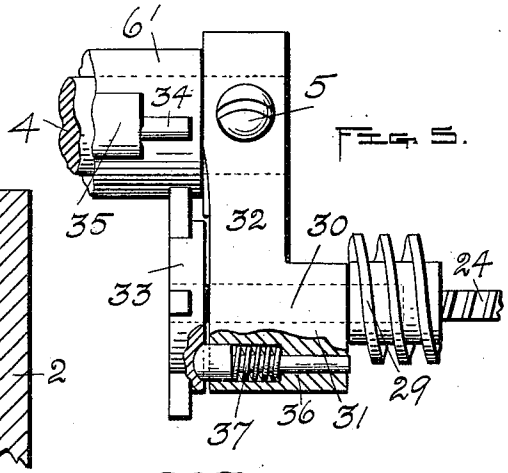


Fig. 5.

Fig. 6.

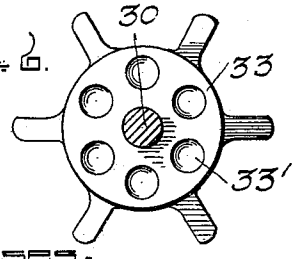


Fig. 7.

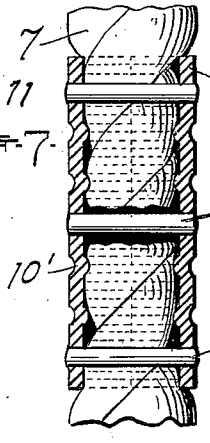
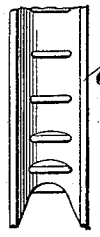


Fig. 8.



Witnesses;
C. Forrest Wesson.
M. J. Galvin.

Inventor,
E. J. Kerns.
By J. C. Dewey Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD J. KERNS, OF WORCESTER, MASSACHUSETTS.

EXERCISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 641,519, dated January 16, 1900.

Application filed March 8, 1899. Serial No. 708,181. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. KERNS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Exercising-Machines, of which the following is a specification.

My invention relates to exercising-machines; and the object of my invention is to provide an improved exercising-machine in which an endless rope or band passing at one end loosely around a pulley or wheel with the other end free and loose to be grasped by the hands of the operator is employed, combined with means for regulating and adjusting the friction on the pulley to vary the strength required to pull the rope.

A measuring mechanism may be combined with my exercising-machine to indicate the number of feet of rope pulled by the operator.

My invention consists in certain novel features of construction of my exercising-machine and the parts connected therewith, as will be hereinafter fully described.

My exercising-machine is adapted to be secured in an upright position on a vertical wall or support.

Referring to the drawings, Figure 1 is a front view of my exercising-machine. The endless rope, which is of desired length, is shown broken off at its lower part. Fig. 2 is a side view looking in the direction of arrow *a*, Fig. 1. The lower loose end of the rope is shown in this figure. Fig. 3 is a plan view looking in the direction of arrow *b*, Fig. 1. Fig. 4 is a detail of the friction-regulating mechanism of the pulley. Fig. 5 is a detail of the measuring mechanism shown at the right in Fig. 1. Fig. 6 shows the sprocket-wheel of the measuring mechanism detached, and Fig. 7 is a sectional detail of the coupling which connects the ends of the rope. Fig. 8 is an edge view of a portion of the pulley around which the endless rope passes, showing the corrugations or ridges in the peripheral groove. Figs. 4 to 8, inclusive, are shown on an enlarged scale.

In the accompanying drawings, 1 is a board or stand to which in this instance my exercising-machine is secured by screws or otherwise. The board or stand 1 is secured by screws or otherwise in a vertical position to the upper part of the side wall of the room in which the exercising-machine is to be used.

The machine proper consists of a flat base 2, having stands or brackets 3 extending out therefrom and in this instance made integral therewith. In the outer ends of the brackets 3 are bearings for a shaft 4, which is secured in said bearings and prevented from turning in this instance by screws 5.

On the shaft 4 is loosely mounted a peripheral grooved pulley or wheel 6 to loosely receive one end of the endless band or rope 7, which is preferably (when doubled) about seven feet in length. The other or lower end of the rope 7 hangs loose and free at about the height of a man's body and in position to be readily grasped by the outstretched arms. The pulley 6 is corrugated or ridged in its grooved portion to prevent the rope 7 from slipping around thereon, as shown in Fig. 8. The rear portion of the rope 7 is guided and held in position on the board 1 by means of a loop 8, rounded on its inner surface and secured to the lower part of the board 1 in this instance by screws 9. The ends of the rope 7 are preferably secured together by means of the coupling 10, (shown in the drawings,) which is made of metal and in two parts secured together by pins or rivets 11. The external diameter of the coupling 10 corresponds to the external diameter of the rope, and the coupling may have annular grooves 10′ therein to prevent its slipping on the wheel 6.

In securing the ends of the rope 7 together by the coupling 10 the two halves of the coupling are fitted onto the two ends of the rope, as shown in Fig. 7, and compressed thereon and the pins or rivets 11 driven transversely through the ends of the rope in the coupling and extend through holes therein and are headed at their ends to hold the halves of the coupling together and in place on the rope and secure the ends of the rope within the same. The ends of the rope may be wound with twine, as indicated by broken lines, Fig. 7.

I will now describe the friction mechanism used in connection with the pulley 6 to regulate the friction on said pulley.

Extending out from one side of the pulley, and preferably made integral therewith, is an

annular rim or flange 12, preferably about the same width as the width of the pulley. Around said flange extends a band or belt 13, preferably of leather. One end of said band is provided with an attaching-piece 14, secured thereto, which has openings therein to engage the hooked ends 15′ on a stand 15, which is rigidly secured to the base 2 of the machine by a bolt or bolts 16. The hooks on the stand 15 secure one end of the belt in a fixed position. To the opposite end of the belt or band 13 is secured a stud or pin 17, which extends loosely through a hole in the stand 15 and a circular extension or hub 15″ thereon, which acts as a bearing and guide for the pin 17. The upper end of the pin 17 is made screw-threaded, and a nut or sprocket-wheel 18 turns on said screw-thread. Intermediate the nut 18 and the upper side of the bracket 15 is a compressible spiral spring 19.

To regulate the friction of the belt 13 on the flange 12 of the pulley 6, the nut 18 is screwed on or off the pin 17. By screwing the nut 18 onto the pin 17 the pin is drawn up and the belt 14 tightened on the flange 12 on the pulley 6. When the nut 18 is turned in the opposite direction, the belt 14 is slackened. The spring 19 acts to form a yielding attachment for the end of the belt, so as to allow the flange 12 on the pulley 6 to turn within the belt and also take up any stretch in the belt, so as to give a steady friction. It will be understood that the flange 12 on on the pulley 6 turns within the belt 13 and that the pulley 6, carrying the flange 12, is only intended to be turned in one direction and in the direction caused by the downward pull of the front strand of the endless rope 7.

In case the pulley and mechanism connected therewith are located at some height, so that the friction-regulating nut 18 is not easily reached, I provide a rod 20, turning in bearings 21 on the base 2 and having on its upper end a sprocket-wheel 22, adapted to engage with the sprockets of the friction-regulating nut or sprocket-wheel 18, as shown in the drawings. The lower end of the rod 20 is provided with a thumb-nut 23. By turning the thumb-nut 23 in either direction through rod 20 and the sprocket-wheel 22 on the upper end thereof the friction-regulating nut or sprocket 18 is turned in either direction, as desired.

In connection with my exercising-machine I may use a measuring device for measuring the number of feet the rope 7 is pulled in using the machine. In this instance my measuring mechanism consists of a dial mounted to turn on a stud 25, fast in an arm 26 on one of the brackets 3, as shown in Fig. 3. The face of the dial may be graded and a stationary pointer 27, secured on the stud 25 of the dial 24 by a thumb-nut 28 or otherwise, be used in connection with the dial.

Motion is communicated to the dial 24 by a worm 29, engaging with teeth on the periphery of the dial 24. The shaft or spindle 30 of the worm 29 is mounted to turn in a bearing 31 on the end of an arm 32, extending out from one of the bearings of the shaft 4, as shown. On the opposite end of the shaft 30 from the worm 29 is fast a sprocket-wheel 33, which is engaged by a pin 34 on a block 35 on the hub 6′ of the pulley 6.

In connection with the sprocket 33 to hold said sprocket after each movement I use a spring-actuated pin 36, which extends in a hole in the arm 32, as shown in Fig. 5. A spring 37, encircling said pin, acts to hold it in its outward position, with its end extending into a recess or depression 33′ in the sprocket 33.

It will be seen that at each revolution of the pulley 6 the pin 34 will engage the sprocket-wheel 33 and give it in this instance a one-sixth turn. The revolution of the sprocket 33 through the worm 29 will turn the dial 24, and the stationary pointer 27 will indicate the movement of the dial, and the divisions or gradations on the dial will give the number of feet of rope pulled by the operator.

The operation of my exercising-machine will be readily understood by those skilled in the art from the above description in connection with the drawings. The operator grasps the front portion of the rope 6 with one or both hands and draws down on the rope, which causes the pulley 6 to revolve. By adjusting the friction-belt 13 by the friction-regulating device 18 the pulley 6 may be made to revolve easily or not, as desired, according to the amount of exercise desired to be obtained in pulling the rope.

It will be understood that the details of construction of my exercising-machine may be varied somewhat from what is shown and described, if desired.

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

1. In an exercising-machine, in combination, a stand or base, brackets extending out therefrom, a shaft in bearings on said brackets, a peripheral grooved wheel or pulley on said shaft having ridges or corrugations in the groove, an endless rope extending at one end loosely around said wheel in the groove, with its other or lower end free and loose to be grasped by the operator, a friction mechanism for regulating the strength required to turn said wheel, consisting of a belt passing around a pulley or annular flange connected with said wheel, and secured at one end in a fixed position, and its other end adjustably attached to vary the friction of the belt on the pulley, and a spring forming a yielding attachment for one end of the belt, substantially as shown and described.

2. In an exercising-machine, the combination with a peripheral grooved wheel having corrugations or ridges in the groove, and an endless rope extending around said wheel in the groove, of friction mechanism for regulating the strength required to turn said wheel,

comprising a belt passing around a pulley or annular flange connected with said wheel, said belt secured in a fixed position at one end, and the other end adapted to be adjusted, to vary the friction of the belt on said pulley or flange, and a spring forming a yielding attachment for the adjustable end of the belt, and a rod having a sprocket-wheel thereon to engage and turn a nut on the screw-threaded end of a pin or stud, secured to the adjustable end of the belt or band, and said nut and pin or stud, substantially as shown and described.

E. J. KERNS.

Witnesses:
J. C. DEWEY,
M. J. GALVIN.