(No Model.)

W. L. COOP.

EXERCISING APPARATUS.

No. 457,602. Patented Aug. 11, 1891.

Fig. 1.

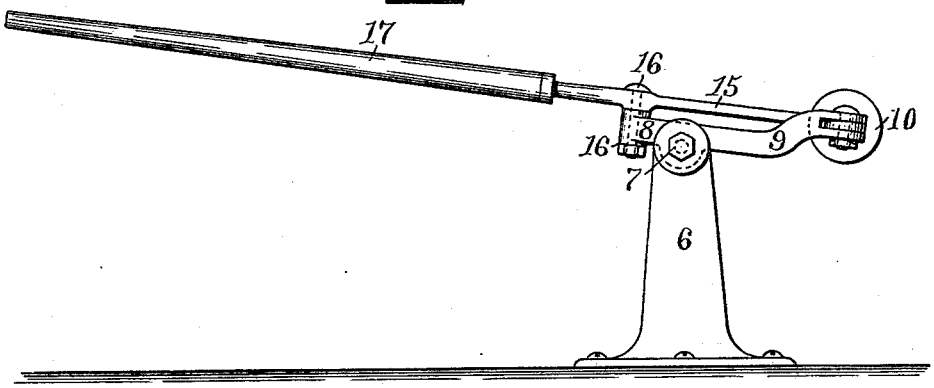


Fig. 2.

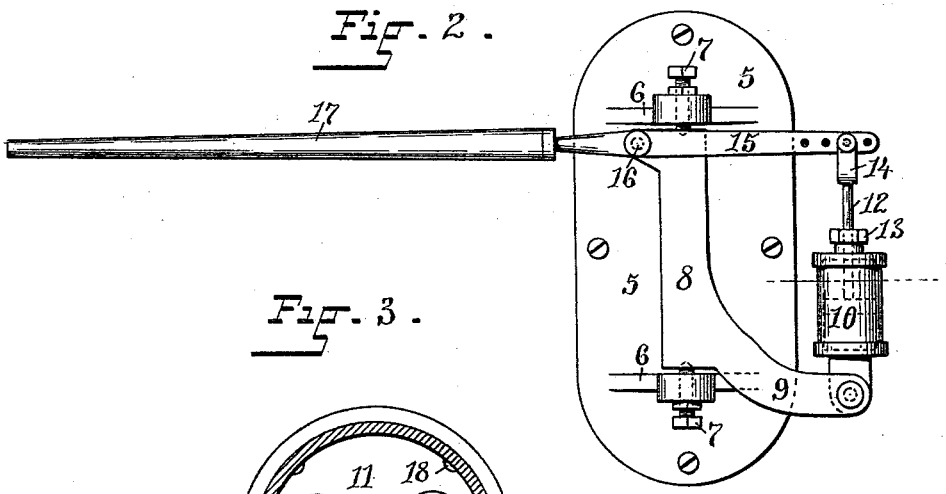
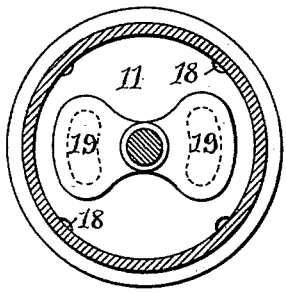


Fig. 3.



WITNESSES:

Chas. H. Luther Jr

M. F. Bleigh.

INVENTOR:

William L. Coop,

by Joseph A. Miller & Co.,

atty's.

UNITED STATES PATENT OFFICE.

WILLIAM L. COOP, OF PROVIDENCE, RHODE ISLAND.

EXERCISING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 457,602, dated August 11, 1891.

Application filed January 13, 1890. Serial No. 336,729. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. COOP, of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Exercising Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in a device for resisting and regulating the movements of the human body when using exercising apparatus.

The invention consists in the peculiar and novel construction of a support on which an oar-lever is pivoted and connected with the piston of a horizontal cylinder secured to the support, so that the oar and the cylinder will yield to the motion of the operator and the strain on the oar will be yieldingly resisted to imitate the resistance of an oar in rowing in a boat, as will be more fully set forth hereinafter.

Figure 1 is an end view of a rowing exercising apparatus. Fig. 2 is a top or plan view of the same. Fig. 3 is a cross-section of the cylinder, showing the piston provided with two check-valves and four byways.

Similar numbers of reference indicate corresponding parts throughout.

In the drawings, the number 5 indicates a base or plate adapted to be secured firmly to a floor or platform. The standards 6 extend from the base 5 and are provided with the screws 7, the projecting ends of which form the pivotal bearings for the rocking supporting plate or bracket 8, to the projecting arm 9 of which the cylinder 10 is pivotally connected, so that the cylinder can oscillate on this pivotal connection. The cylinder 10 is provided with the piston 11, from which the piston-rod 12 extends through the packing-box 13. The end of the piston-rod 12 is provided with the fork 14, which is connected, by a pin passing through one of a series of holes, with the arm 15, secured pivotally to the bracket 8 or to a lateral projection of the bracket, as shown in Figs. 1 and 2, by the wrist-pin 16. To the opposite end of the arm 15 the lever 17 is secured. The piston 11 is fitted so as to move in frictional contact with the inside of the cylinder 10, having a sliding fit therein. The piston is provided with the byways 18 and with the two check-valves 19. The size of the openings of these valves is indicated in broken lines in Fig. 3. These check-valves are shown in the drawings as made similar to the foot-valves in pumps by securing a stout piece of leather on one side to the face of the piston and allowing the other side to open by bending the leather. Any other form of check-valve may, however, be used.

The operation of the exercising-machine is as follows: The bracket 8 is supported in bearings in practically a horizontal plane. Being pivoted on the screws 7, the cylinder 10 will overbalance the weight of the extended lever 17, which represents an oar. To imitate the usual position of an oar in a boat, the arm 9 is so formed that when the lever 17 is released the arm 9 will come into contact with the standard 6 and hold the whole in the position shown in Fig. 1. The cylinder 10 is filled with glycerine, oil, or any other suitable liquid. When, now, the piston is drawn through the cylinder in one direction, the pressure of the liquid holds the valves tight to their seats and prevents the liquid from passing through either one or both of the valves. The liquid is thereby forced to pass through the narrow byways 18, formed on the edge of the piston, as is shown in Fig. 3, or through small holes which may be bored into the body of the piston to form the byways. As these small byways allow but a limited amount of liquid to pass, the resistance to the piston increases with the speed. When, however, the piston is moved in the opposite direction, the liquid acts on the opposite sides of the check-valves, which yield to this pressure and permit the liquid to quickly pass through these large openings of the check-valves, and thus relieves the resistance of the liquid. The piston will therefore move in the cylinder against the resistance of the liquid confined in front of the piston in one direction, while it will pass through the cylinder in the opposite direction with less resistance, thus approximating the resistance offered to an oar in rowing.

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

1. In an exercising-machine, the combination, with an oar-lever pivoted on a wrist or fulcrum pin and connected at one end with a piston-rod, and a cylinder provided with a piston connected with the piston-rod, of a support for the oar and the cylinder journaled in practically horizontal bearings adapted to yield to the motion of the operator and yieldingly resist the motion of the oar, as described.

2. The combination, with the pivoted bracket 8, having the arm 9, and the oar-lever pivoted on the bracket, of the cylinder 10, pivotally secured to the arm 9 on one side of the pivotal support, so as to overbalance the oar-lever, the piston 11, and the piston-rod 12, connected with the oar-lever, as described.

3. The combination, with the standards 6 and the pivoted bracket 8, provided with the arm 9, of the cylinder 10, pivotally secured to the arm 9, the piston 11, provided with a check-valve and byways, the lever 17, and the arm 15, pivoted on the wrist-pin 16, and the piston-rod 12, adjustably connected with the arm 15, as described.

WILLIAM L. COOP.

Witnesses:
J. A. MILLER, Jr.,
M. F. BLIGH.