(No Model.)

W. L. COOP.

EXERCISING APPARATUS.

No. 445,726. Patented Feb. 3, 1891.

Fig. 1.

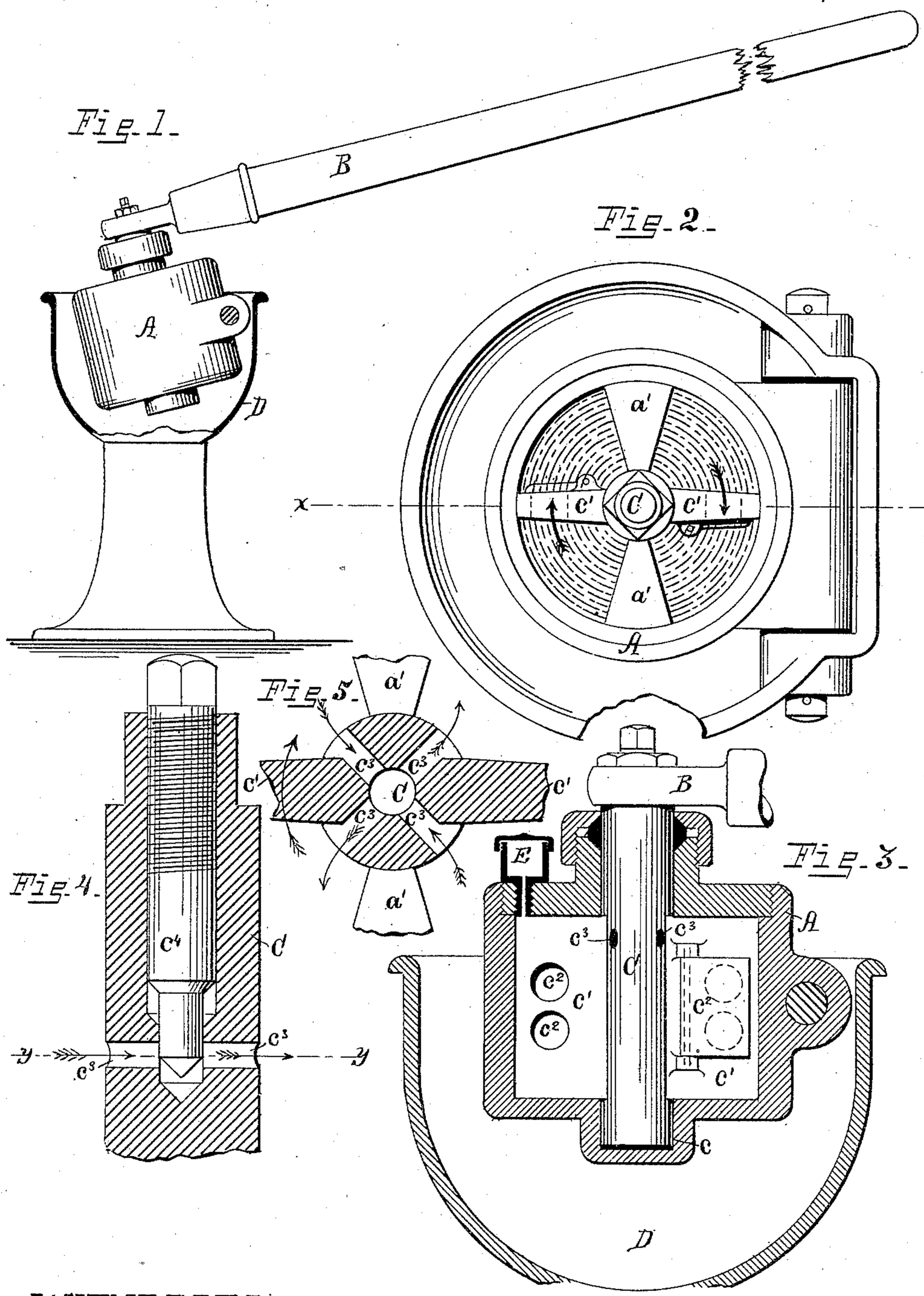

Fig. 2.

Fig. 5.

Fig. 4.

Fig. 3.

WITNESSES:

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EXERCISING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 445,726, dated February 3, 1891.

Application filed September 20, 1889. Serial No. 324,517. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. COOP, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement 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 a device for causing resistance in an exercising apparatus to the force exerted; and it consists in the peculiar and novel construction of a piston moving in a cylinder containing any suitable liquid, byways for the passage of the liquid, means for regulating the discharge through the byways, and a check-valve or valves facilitating the return of the piston, as will be more fully set forth hereinafter.

The object of the invention is to produce a resistance to the force exerted in an exercising-machine differing from a spring or a weight resistance, in that the resistance increases with the speed at a greater ratio and in readily adjusting to the force exerted.

Figure 1 is a view of an oar or sweep secured to the shaft of an oscillating piston. Fig. 2 is a horizontal section of the cylinder and oscillating piston. Fig. 3 is a vertical section of the same on a line X X in Fig. 2. Fig. 4 is a vertical section of the central shaft in the resistance-box. Fig. 5 is a horizontal section of the same on the line Y Y.

Similar letters of reference indicate corresponding parts throughout.

The invention is shown in the drawings in the form of an oscillating piston provided with the check-valves and adjustable byways as applied to a rowing-machine in which the fluid resistance acts similar to the water on the blade of the oar.

I do not wish to confine myself to the exact construction shown, as it is evident that a reciprocating piston may be used in place of the oscillating piston.

A in Fig. 1 is what I term a "resistance-box," consisting of a short cylinder in which two valves oscillate, and in this case is pivoted at one side, so that its weight acts to balance the oar B. The stand supporting the pivotal bearing is formed into a bowl D to catch any of the resisting-fluid that may leak out. For rowing-exercises any form of slide may be used in connection with this device. Oar B is attached to shaft C, which passes through the resistance-box A to a bearing *c* at its bottom, and is provided with one or more wings or pistons *c'*, which oscillate in the cylinder of the resistance-box A and are fitted closely at their peripherv to the interior of the same. The pistons *c'* are provided with valves c^2, which permit the easy passage of a resisting-fluid when moving in one direction and close to prevent the passage of said fluid when moving in the reverse direction. The chamber E may be attached to the upper side of the resistance-box A for convenience in filling the same and to insure its being completely filled with resisting-fluid. As illustrated in the drawings, the resistance-box A is circular, being turned out inside and provided with dividing-partitions that extend from the inner circumference of the box to the central shaft C, thus dividing the box in two parts. Passing through the shaft C are openings c^3, which are controlled by a valve c^4 to govern the flow of the resisting-fluid, as will be hereinafter more fully described.

In operation the resistance-box A is completely filled with resisting-fluid, which may be any liquid possessing lubricating qualities, and which acts as follows: As the shaft is rotated, as indicated by the arrows in Figs. 2 and 5, the valves c^2 close, and the fluid, having no other means of escape, is forced through the opening c^3 and passes round to the opposite side of the piston, the rapidity of its passage being governed by valve c^4 at the operator's will. When a stroke is completed, the rotation of the shaft is reversed, valve c^2 opens and allows an easy passage of the resisting-fluid until the return-stroke is completed, when the valves close and the resisting-fluid is again forced through the openings c^3.

It is evident that each side of the resisting-box A may act independently of the other side. Hence there might be only one semicircular-shaped resistance-box, which would still act on the same principle and not depart from the spirit of my invention.

Any common form of packing may be used to prevent the escape of the resisting-fluid round the shaft C where it passes out at the top of the resistance-box.

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

1. A device for resisting the force exerted in a rowing-machine, consisting of a cylinder divided by a partition into two sections, an oar or handle secured to a central shaft provided with two pistons, and adjustable byways, as described.

2. A device for resisting the force exerted in an exercising-machine, consisting of an oar or handle secured to the shaft of an oscillating piston provided with an opening closed automatically when the piston moves in one direction and opening automatically when moving in the opposite direction, a casing in which the piston oscillates, closely fitting the sides of the piston, and byways, as described.

3. A hydraulic device for resisting the force exerted in a rowing-machine, pivotally supported outside its center of gravity to counterbalance or partly counterbalance the oar or handle B.

4. The combination, with the support D, of the box A, pivotally secured, the shaft C, the passages c^3, screw c^4, and openings c^2, and the oar B, as described.

In witness whereof I have hereunto set my hand.

WM. L. COOP.

Witnesses:
M. F. BLIGH,
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