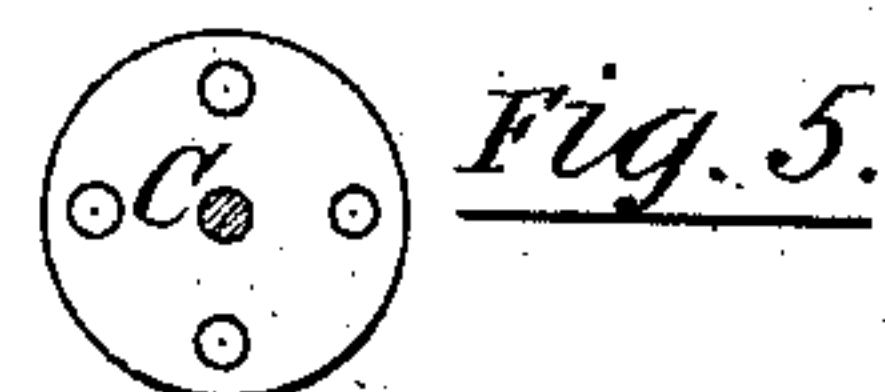
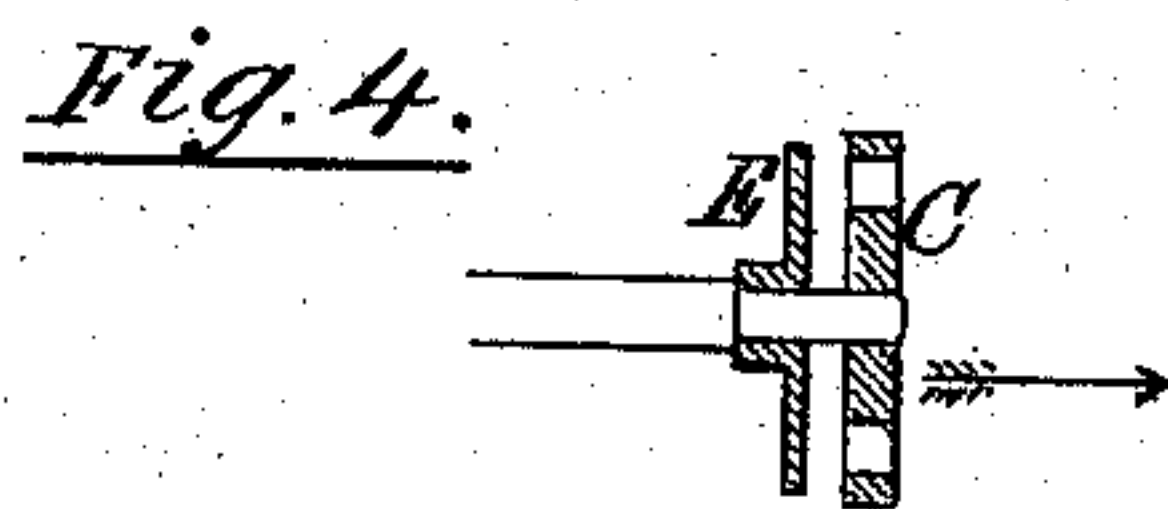
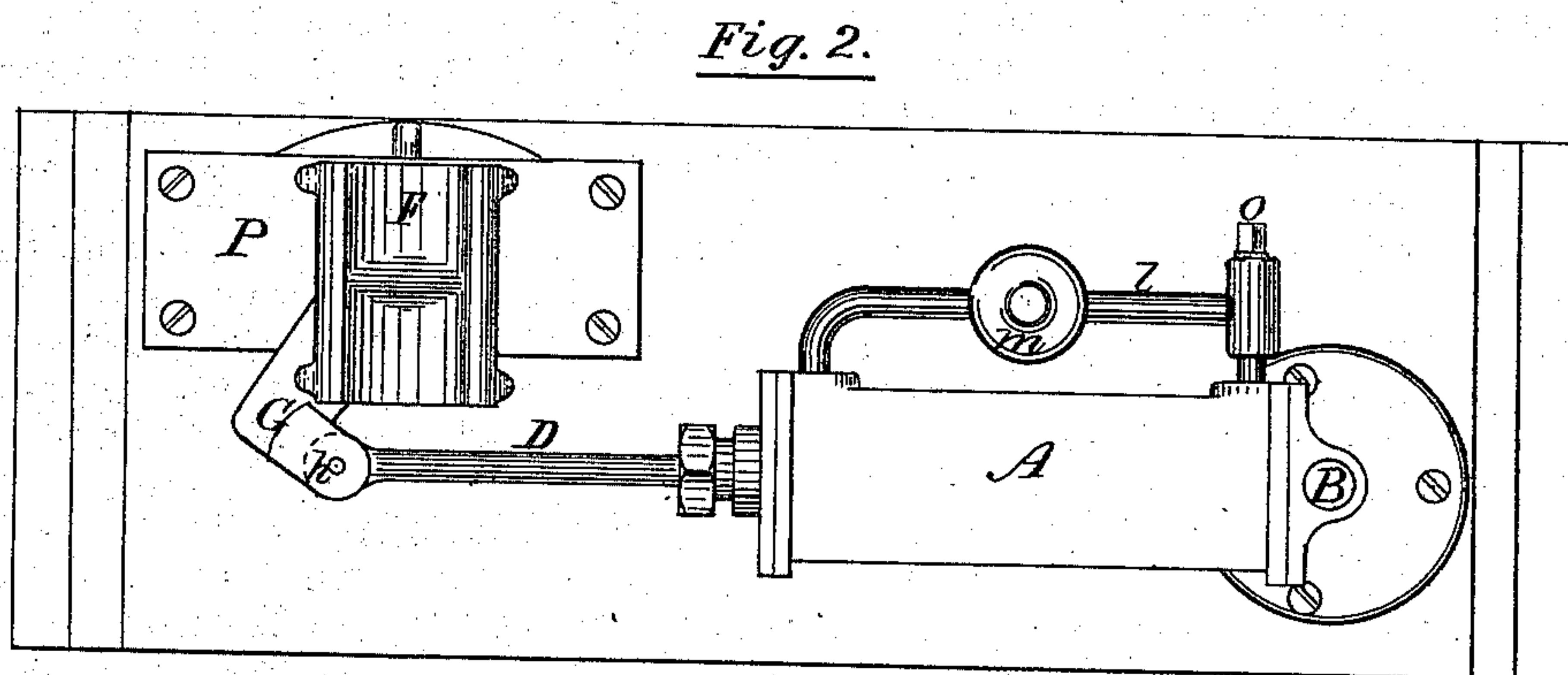
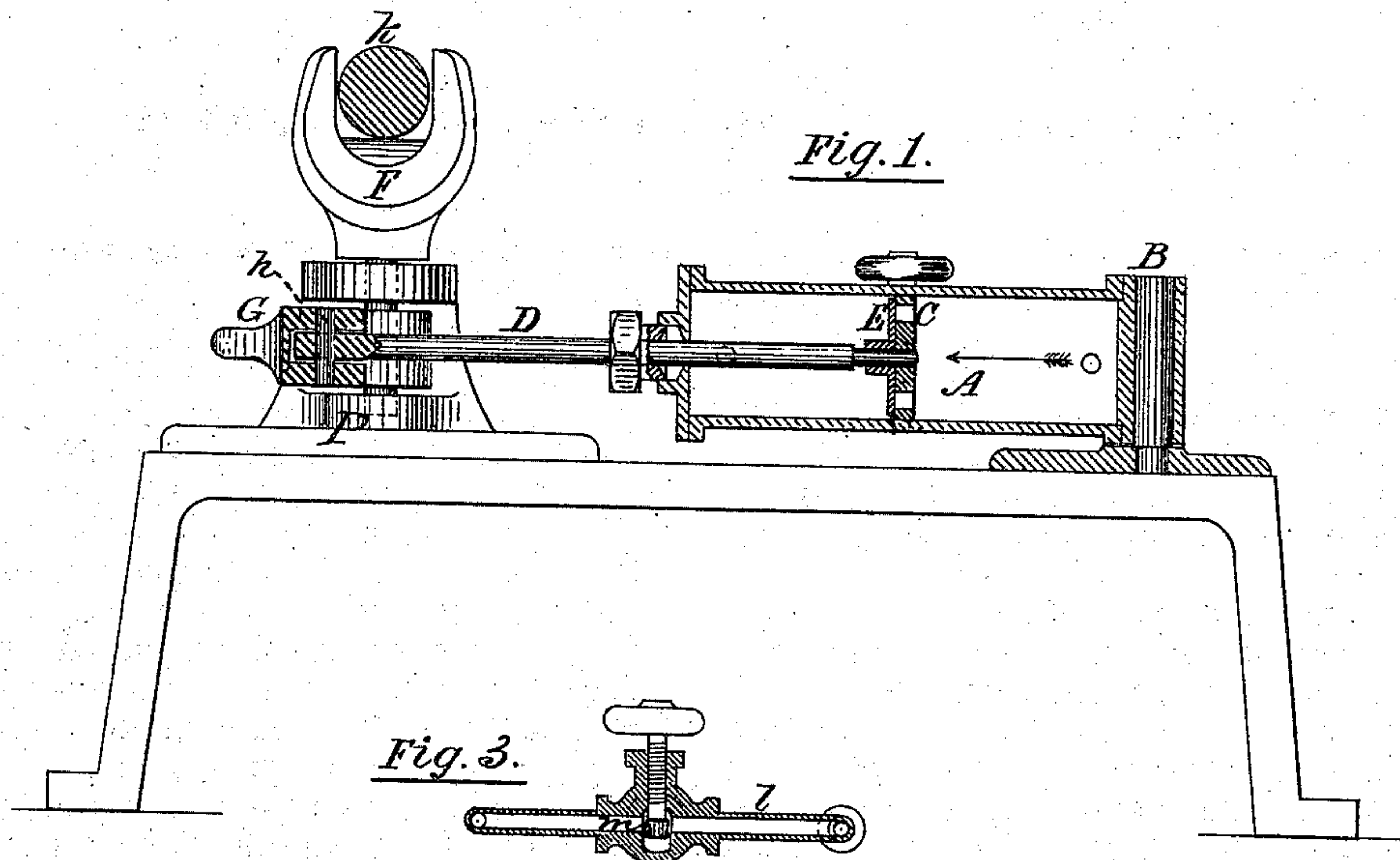


L. D. TICE.
Rowing Exercise Apparatus.

No. 156,392.

Patented Oct. 27, 1874.



Witnesses:

L. A. Chas.

Inventor:

Leonard D. Tice.

UNITED STATES PATENT OFFICE.

LEONARD D. TICE, OF NEW YORK, N. Y.

IMPROVEMENT IN ROWING-EXERCISE APPARATUS.

Specification forming part of Letters Patent No. **156,392**, dated October 27, 1874; application filed April 21, 1874.

To all whom it may concern:

Be it known that I, LEONARD D. TICE, of New York, N. Y., have invented a Rowing-Machine, of which the following is a specification:

The nature and object of my invention consists in providing a means for exercise, analogous to the exercise obtained in rowing a boat. During a large part of each year oarsmen of the north are unable to exercise upon the water, and the result is that much valuable time is lost at the beginning of each boating season, in the necessary preparation and practice for effective rowing. Gymnastic exercise is resorted to by many oarsmen during the winter months, but the use of the ordinary gymnastic apparatus is of little benefit in comparison with rowing exercise, which more fully equalizes all the muscles and fits them for the work in hand.

Figure 1 is a vertical section through the cylinder, piston-rod, stud, piston-valve, and oar-lock arm. Fig. 2 is a top view of the same, more clearly showing the oar-lock arm, the oar-lock stand, and the pipe communicating with both ends of the cylinder. Fig. 3 is a section through the communicating-pipe and the regulating-valve. Fig. 4 is a sectional view of the piston and piston-valve, showing the position of the valve when open, or upon the return of the oar or levers for a stroke. Fig. 5 is an end view of the piston, showing the openings or ports through which the water passes when the valve is open.

A, Fig. 1, represents the cylinder; B, the stud by which the cylinder is held in position and upon which it fits loosely and is allowed to swing. C is the piston; D, the piston-rod; E, the piston-valve; F, the oar-lock; G, the oar-lock arm; *h*, the pin connecting the piston-rod and oar-lock arm; K, the oar or lever; and L, the oar-lock stand. *l*, Fig 2, is

a communicating-pipe; *m*, the regulating-valve; and *o*, the plug in the pipe through which the cylinder is filled with water.

The operation of the machine is as follows: At the beginning of the stroke of the oar or lever the piston is at the rear end of the cylinder, and the piston-valve is closed, as shown in Fig. 1. As the stroke is made the water is forced through the communicating-pipe, the opening of which is regulated by the valve *m*, into the rear or opposite end of the cylinder. The return of the oar opens the piston-valve, as shown at Fig. 4, and the piston is returned to its first position without resistance, the water passing through the valve-openings.

By the arrangement of the cylinder upon the stud, which allows it to swing with the oar-lock and arm, a stroke is obtained identical with the stroke of an oar in the water, the resistance being greatest at the center, and gradually diminishing to the end.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An exercising-machine, consisting essentially of a water-cylinder, having its ends put in communication through an outer connecting-pipe, and a valved piston arranged to work within the cylinder, in combination with suitable operative mechanism, substantially as and for the purpose described.

2. The rowing-exercise apparatus, substantially as described, consisting of the cylinder and its connections, in combination with the row-lock F, and arm G, as set forth.

3. The combination of the cylinder A, pipe *l*, adjusting-valve *m*, piston C, valve E, and rod D, with the row-lock F, substantially as specified.

LEONARD D. TICE.

Witnesses:

JUDAH SWIFT,

H. E. SCHOONMAKER.