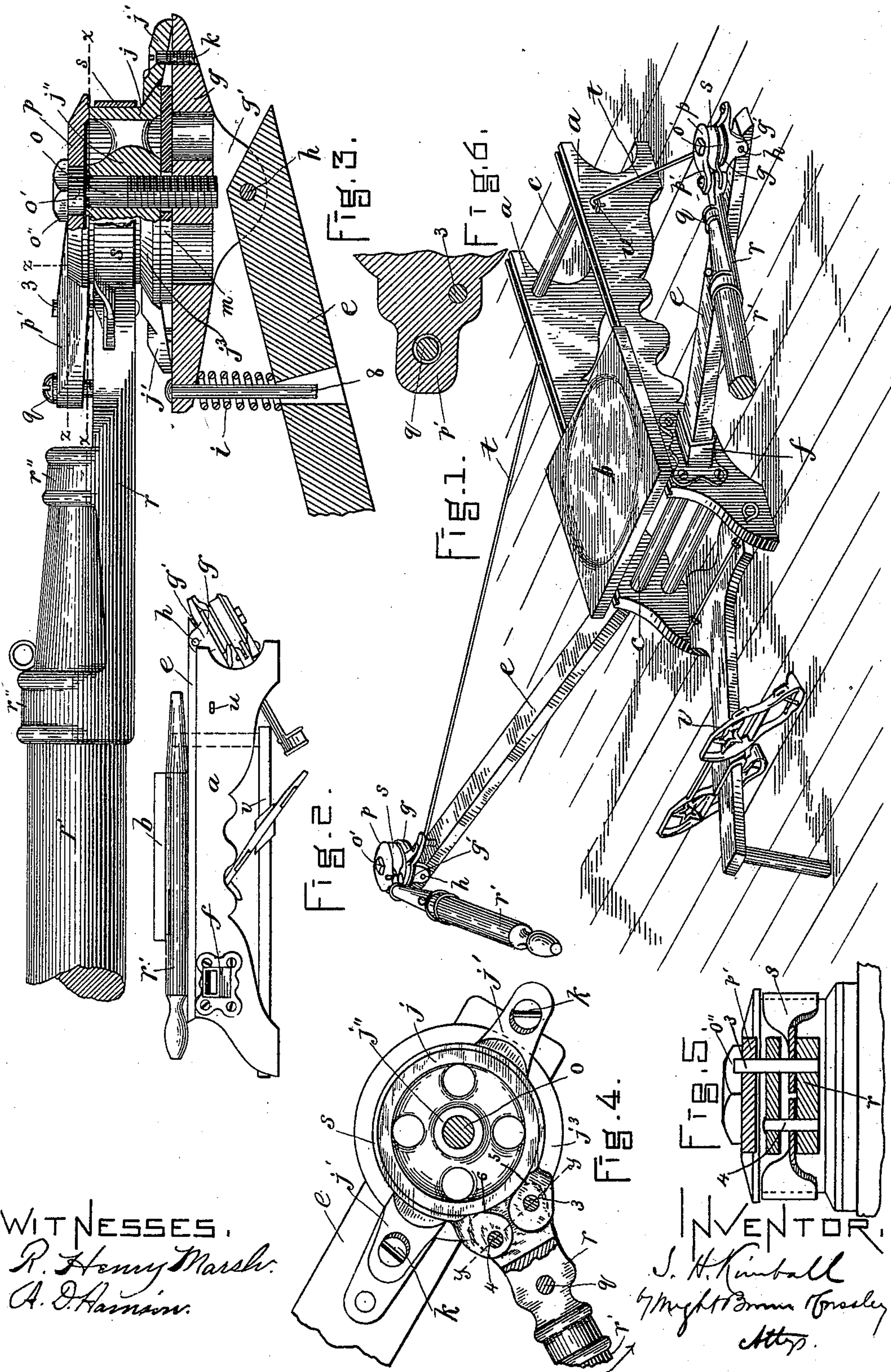


(No Model.)

S. H. KIMBALL.  
ROWING MACHINE.

No. 441,765.

Patented Dec. 2, 1890.



WITNESSES.

R. Henry Marsh.  
A. O. Harniss.

INVENTOR.

S. H. Kimball  
by Wright & Brown, Counselors  
Attys.



# UNITED STATES PATENT OFFICE.

STEPHEN H. KIMBALL, OF EVERETT, MASSACHUSETTS.

## ROWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 441,765, dated December 2, 1890.

Application filed December 13, 1888. Serial No. 293,461. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN H. KIMBALL, of Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Rowing-Machines or Exercising Apparatus, of which the following is a specification.

This invention has for its object to provide a rowing machine for exercising purposes of simple construction and capable of being folded in compact form, and in which the recovering movement shall be substantially free from resistance, the application of force being substantially confined to the stroke, as in rowing a boat.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of my improved rowing-machine, one of the oars being broken off. Fig. 2 represents a side view of the same when folded for storage or transportation. Fig. 3 represents a longitudinal section of the outer end of one of the oar-supporting arms and a partial section and partial side elevation of the devices connecting the oar to said arm. Fig. 4 represents a section on line  $x x$ , Fig. 3. Fig. 5 represents a section on line  $y y$ , Fig. 4. Fig. 6 represents a section on line  $z z$ , Fig. 3.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings,  $a a$  represent the guides on which the seat  $b$  slides, said guides being connected by suitable tie-rods  $c c$ , and provided with grooves in their upper edges in which are fitted tongues or projections on the bottom of the seat, said guides and tie-rods constituting a seat-supporting frame.

$e e$  represent arms, the inner ends of which are inserted in sockets  $f$ , attached to the guides  $a a$ , said arms being removable from the sockets. To the outer end of each of the arms  $e$  is pivoted a plate  $g$ , having downwardly-projecting ears  $g'$ , through which the pivot-pin  $h$  passes. One end of said plate bears on a spring  $i$  interposed between the

plate  $g$  and the supporting-arm  $e$ , said spring supporting the plate in its normal position and permitting it to tip from said position.

$j$  represents a cylinder, having at its lower edge a flange  $j^3$ . Said cylinder bears on a disk  $m$ , of leather or other like yielding material, interposed between its lower portion and the plate  $g$ . A bolt  $o$ , which is screwed into a tapped socket in the plate  $g$ , has a shoulder  $o'$ , which bears on the hub  $j''$  of said cylinder and presses the latter forcibly against the leather disk  $m$ . Clamps  $j' j'$ , attached by screws  $k k$  to the plate  $g$ , bear on the flange  $j^3$ . The cylinder is capable of being rotated on the plate  $g$ ; but its rotation is resisted by the friction caused by its pressure against the disk  $m$  and by the contact of the bolt-head  $o'$  and the clamps  $j' j'$  with the hub  $j''$  and flange  $j^3$ , so that a considerable degree of force is required to rotate the cylinder.

On the upper edge of the cylinder  $j$  rests lightly a cap or plate  $p$ , which is held in place without any considerable pressure on the cylinder by a head  $o''$ , formed on the bolt  $o$  above the shoulder  $o'$ . An arm  $p'$  is formed on said plate and projects therefrom, as shown.

$r$  represents the oar, or, more properly, the holder of the oar, said holder having sockets  $r'' r''$ , which receive the body  $r'$  of the oar, said body being a wooden bar or shank formed like the handle portion of an oar and capable of turning in the holder  $r$  to give the operator a muscular action like that involved in feathering an oar. The holder  $r$  is pivotally connected at its inner end with the arm  $p'$  by a pin 3, which is closely fitted in a socket in said arm. The sockets  $r''$  are made of different sizes to receive an oar-handle of tapering form. The holder  $r$  is provided with a headed stud  $q$ , rigidly attached to the holder and projecting upwardly therefrom through a hole in the arm  $p'$ , said hole being larger than the stud and permitting a slight lateral movement of the stud and holder independently of the arm. To the inner end of the holder are connected the ends of a metal strap or clamp  $s$ , which encircles the cylinder  $j$ , one end of said clamp being secured by the pin 3,



which also connects the holder *r* with the arm *p'*, while the other end of the clamp is connected with the holder *r* by a pin 4, the latter being secured only to the holder and not to the arm *p'*.

The inner end of the holder *r* bears on the periphery of the cylinder *j* and is adapted to slide thereon. When the oar and its holder *r* are moved in the direction indicated by the arrow in Fig. 4, the holder turns slightly on the pivot-pin 3, and the forward portion 5 of its inner end is thereby caused to bear forcibly against the periphery of the cylinder *j*, the rear portion 6 of said end being at the same time drawn outwardly from the periphery of the cylinder. The major portion of the clamp is thus drawn closely against the periphery of the cylinder, and this, together with the binding-pressure of the holder *r* at 5 against the cylinder, locks the cylinder to the holder so that they move together in the direction indicated, said movement being resisted by the friction caused by the pressure of the cylinder against the leather disk or seat *m* and by the bearing of the bolt-shoulder *o'* and ears *j' j'* on the hub and flange of the cylinder. Said resistance may be adjusted by means of the bolt *o* and screws *k k*, so as to call forth any desired degree of muscular force. When the oar is moved in the opposite direction by the backward or recovering movement of the oar, the holder *r* turns on the pin 3 in the direction required to decrease its own pressure and that of the clamp *s* on the cylinder, so that the clamp slips loosely on the cylinder during the said movement, the cylinder remaining stationary. It will be seen, therefore, that the cylinder is moved only by the forward or stroke movement of the oar, said cylinder being rotated in one direction only, the oar-holder and clamp being alternately locked to and released from the cylinder. Every forward or stroke movement is therefore opposed by the friction to which the cylinder is subjected, while the backward or recovering movements are practically unopposed. The muscular action involved in the use of the apparatus is therefore the same that is involved in ordinary rowing.

The outer ends of the oar-supporting arms *e* are supported by braces *t t*, which are jointed or detachably connected to the oar-supporting plates *g* at the outer portions of the arms and have hooks at their inner ends engaging staples *u u* on the seat-supporting frame. The arms thus supported may be made of wood and sufficiently slender to enable them to yield or twist slightly under the strain imposed upon them at the commencement of the stroke, so that the operator will not experience a shock or jar at the commencement of the stroke. When the braces *t* are detached from the staples *u*, the arms *e* may be withdrawn from the sockets *f* and placed between the guides *a*. The oars *r'*

may be also removed and placed side by side on the arms *e*, and the foot-rest *v* may be swung under the guides, all as shown in Fig. 2, the apparatus being thus reduced to compact form.

The pivotal connection of the plate *g* to the supporting-arm *e* by means of the ears *g'* and bolt *h* enables the tipping or dip motion of the bar to be effected without wear of the arm *e*, all the wear being sustained by the said ears and bolt.

I claim—

1. The combination of an oar-support, as *g*, a cylinder pivoted thereto, friction devices whereby the rotation of said cylinder on its support is resisted, an arm, as *p'*, pivotally connected to the oar-support and adapted to rotate independently of the cylinder, an oar or oar-holder connected with said arm and having its inner end 5 6 formed to bear on the periphery of said cylinder, and a band or clamp secured at its ends to said holder and surrounding the cylinder, the oar-holder having a limited independent movement, as described, whereby when the oar is moved in one direction the holder is rocked on the fulcrum provided by the bearing of its end portion 6 on the cylinder, and is thereby locked to the cylinder, and when the oar is moved in the opposite direction said holder is released, as set forth.

2. The combination of the plate or support *g*, the cylinder *j*, pivotally secured thereto, the frictional seat *m*, interposed between the cylinder and its support, adjustable means for pressing the cylinder against said seat, whereby the resistance to the rotation of the cylinder may be regulated, an arm, as *p'*, pivotally connected to the oar-support, an oar or oar-holder connected with said arm, as described, and having a limited independent motion thereon, and a clamp carried by the oar-holder, whereby the latter is locked to the cylinder during a forward movement of the oar, as set forth.

3. The combination of the plate or support *g*, the cylinder *j* thereon, the frictional seat *m*, interposed between the support and the cylinder, the bolt *o*, having a shoulder *o'* bearing on the hub of the cylinder, the clamps *j'*, screwed to the support *g*, the arm *p'*, mounted to swing on the bolt *o*, the oar-holder connected with said arm by the pivot 3 and provided with a stud which has a limited motion in a hole in the arm *p'*, and the flexible band or clamp *s*, surrounding the cylinder and engaged at its ends with the oar-holder, the latter being formed to bear on the cylinder, as set forth.

4. In an exercising-machine, the combination of an arm or fixed support, as *e*, an oar-supporting plate or fixture, as *g*, pivoted to said arm to give a dipping motion to the oar, and a spring interposed between said arm and pivoted oar-support, whereby the latter is yieldingly held in its normal position.



5 5. The plate or oar-support *g*, having the ears *g'* *g'* and rod or bolt 8, combined with the arm *e*, the bolt *h*, connecting said ears with the arm, and the spring *i*, interposed between one end of the plate and the arm and held in place by the rod 8, as set forth.

In testimony whereof I have signed my

name to this specification, in the presence of two subscribing witnesses, this 11th day of December, A. D. 1888.

STEPHEN H. KIMBALL.

Witnesses:

C. F. BROWN,

A. D. HARRISON.