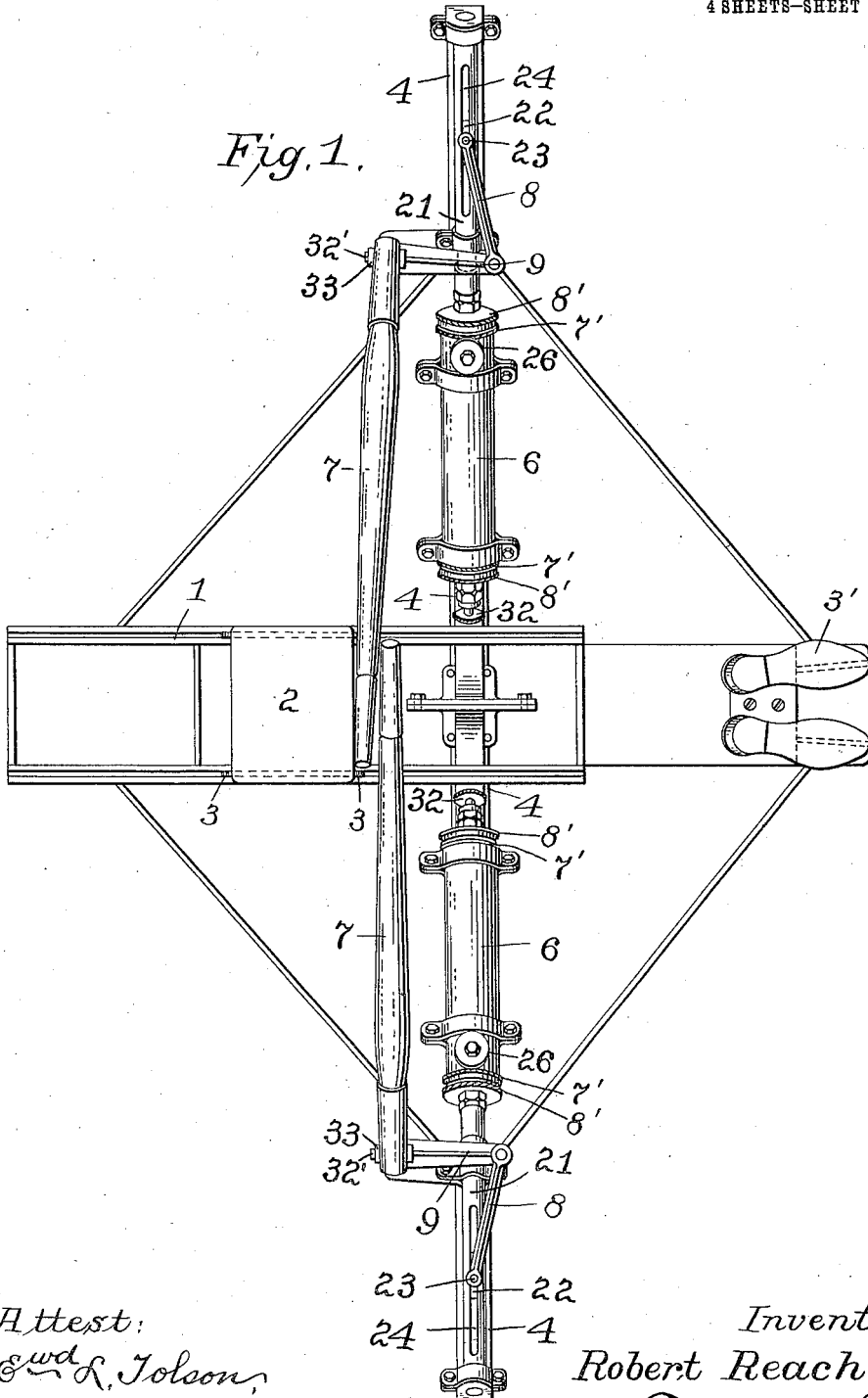


R. REACH.  
 GYMNASIUM ROWING APPARATUS.  
 APPLICATION FILED AUG. 28, 1911.

1,015,071.

Patented Jan. 16, 1912.

4 SHEETS—SHEET 1.



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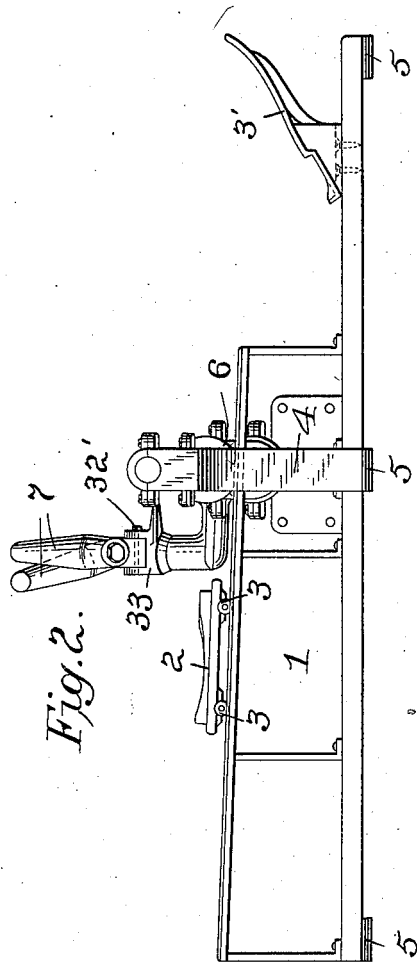
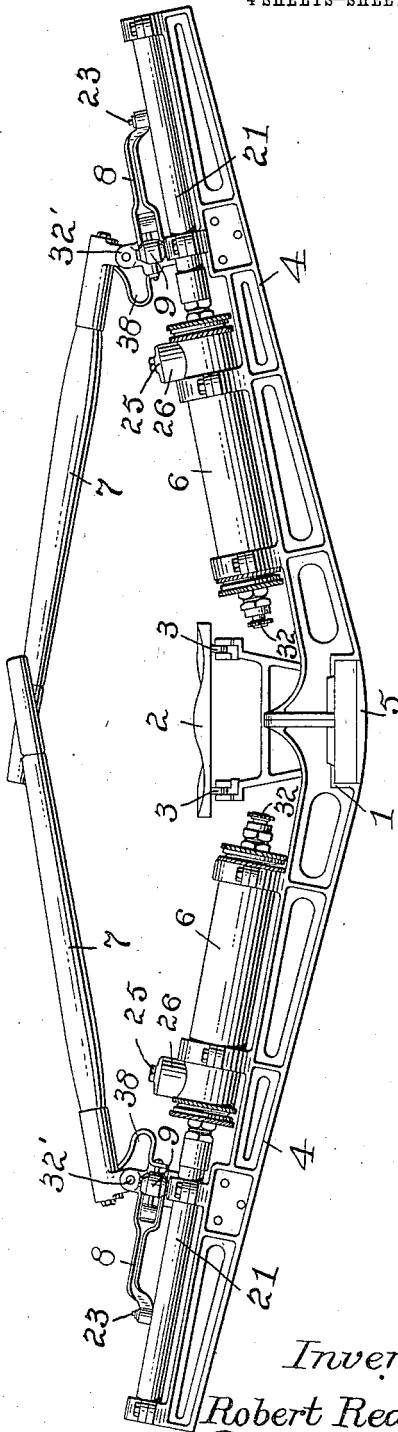


Fig. 3.



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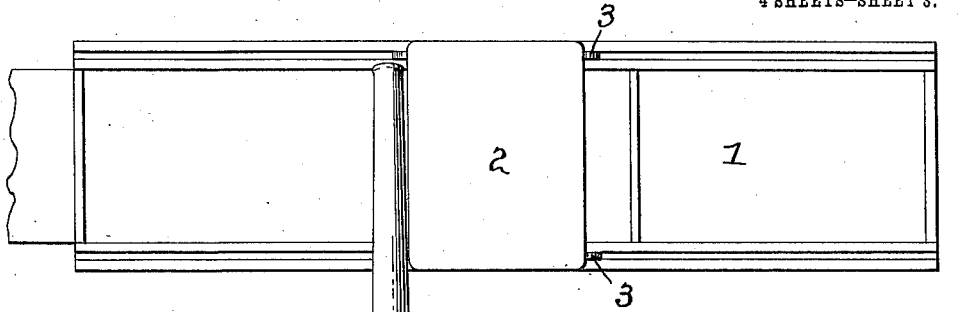


Fig. 4.

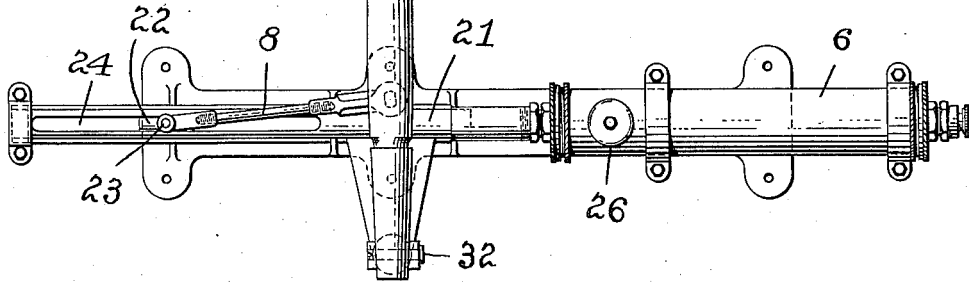
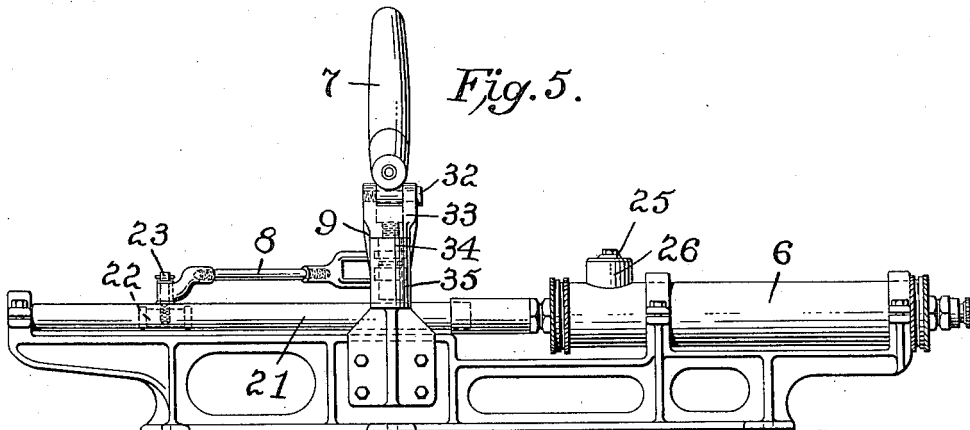


Fig. 5.



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4 SHEETS-SHEET 4.

Fig. 6.

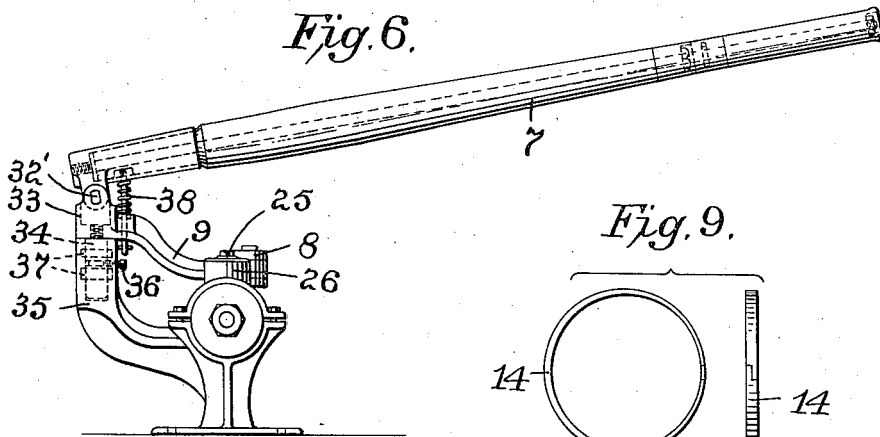


Fig. 9.

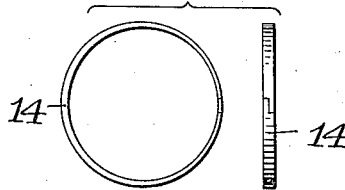


Fig. 7.

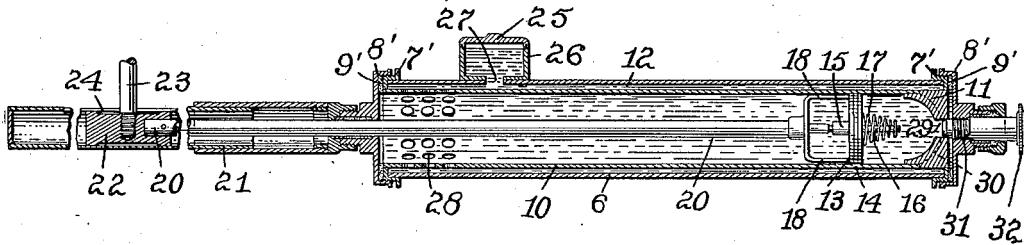


Fig. 7a

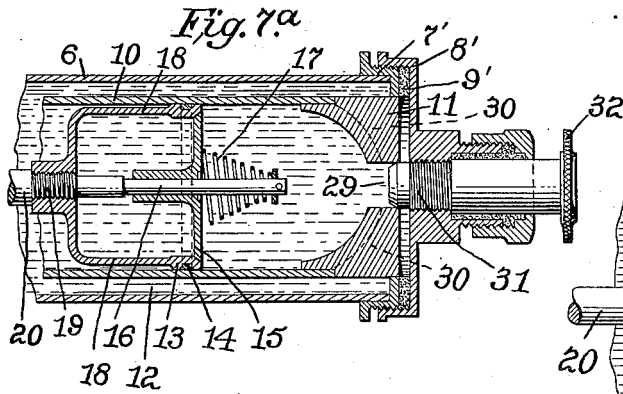
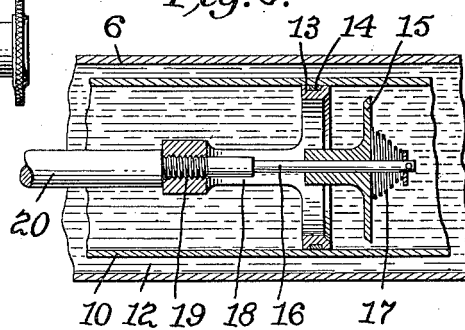


Fig. 8.



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# UNITED STATES PATENT OFFICE.

ROBERT REACH, OF SPRINGFIELD, MASSACHUSETTS.

GYMNASIUM ROWING APPARATUS.

1,015,071.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed August 28, 1911. Serial No. 646,464.

*To all whom it may concern:*

Be it known that I, ROBERT REACH, citizen of the United States, residing at Springfield, Massachusetts, have invented certain new and useful Improvements in Gymnasium Rowing Apparatus, of which the following is a specification.

It is the object of my invention to provide a gymnasium apparatus by which the user can obtain the same exercise and development as in rowing, and my invention consists in the features and arrangement and combination of parts hereinafter described and particularly pointed out in the claims.

In the accompanying drawings Figure 1 is a plan view of a single scull rowing apparatus; Fig. 2 is a side view of the same; Fig. 3 is an end view; Fig. 4 represents a plan view of my invention as embodied in a sweep machine; Fig. 5 is a side elevation of Fig. 4; Fig. 6 is an end view of the apparatus shown in Figs. 4 and 5; Fig. 7 is a sectional view taken longitudinally through the cylinders, piston, and piston rod guides; Fig. 7<sup>a</sup> is an enlarged view of one end of the cylinder, in section, together with the piston and associated parts; Fig. 8 is a detail view showing the valve in section and in a different position from that of Fig. 7; Fig. 9 is a side view and an edge view of the piston ring.

Referring to Figs. 1, 2 and 3, 1 indicates the main frame of the apparatus upon which the seat 2 is mounted to slide longitudinally thereof, and I preferably employ rollers at 3 mounted on the seat adapted to run on suitable tracks on the main frame. At 3' are shown the foot rests. The main frame also comprises laterally extending arms or out-riggers 4, which are located about centrally of the length of the main frame, and inclined upwardly from said main frame, as shown in Fig. 3. The central main frame portion is rounded or curved on its under side, as shown at 5, so that the entire apparatus may rock laterally. Upon the out-rigger portions 4 are supported cylinders 6 which will be described hereinafter, said cylinders containing water or oil, and the pistons of these cylinders are connected with the oars 7 through links 8 which are pivotally connected with arms 9 extending substantially at right angles to the oars. The operator sitting upon the seat 2 and working the oars can secure substantially the same effect as in actual rowing, the necessary resistance being afforded by the pistons work-

ing in the cylinders against a body of water or oil contained therein, and the lateral rocking motion similar to that of the boat or shell is secured by the rocking movement of the frame resulting from the use of the curved bottom surface 5 of the main frame.

Referring to Fig. 7, the outer cylinder is provided with caps 7' upon which are screw-threaded stuffing boxes 8' with packing material 9' between these parts. Within the outer cylinder a secondary cylinder 10 is arranged, this bearing at one end upon the packing 9', and at its other end having a head 11. There is an annular space 12 between the inner cylinder and the outer cylinder, which latter forms the casing for the inner cylinder, and within the inner cylinder a piston is adapted to reciprocate, this piston consisting of a ring-shaped member 13 grooved to receive a piston ring 14, the ring-shaped member forming also a seat for a valve plate or disk 15 which is adapted to slide on the rod 16, but being normally seated by a spring 17. The piston member is connected by arms 18 in the form of a yoke, with a screw-threaded part 19 of the piston rod 20. This piston rod extends out through the forward stuffing box, and along a guide tube or casing 21 in which the piston rod guide 22 is slidably mounted. Connection with this piston rod guide block 22 is made through a bolt 23 with the oar, as will be more particularly described hereinafter. The piston rod guide tube or casing is slotted at 24 for the passage of the bolt 23. The outer casing 6 and inner cylinder 10 are filled with water or oil which is introduced by removing a cap 25 of a reservoir 26, which surmounts the outer casing and connects with the interior thereof through an opening 27. The inner cylinder communicates with the outer casing at its front end through openings 28, and communication between the outer casing and the inner cylinder at the rear is afforded through a port 29 and passages 30 extending through the rear head of the inner cylinder, these passages being controlled by a valve 31 mounted in the stuffing box and having a handle portion 32 by which the valve may be adjusted to increase or decrease the area of the passage or passages between the inner cylinder and the outer casing.

In the operation of the apparatus a pull upon the oar or oars will move the piston rearwardly in the inner cylinder, and the

necessary resistance will be afforded by the water or oil in rear of the piston, and by the extent of opening of the passages leading from the inner cylinder to the space 12  
 5 between said inner cylinder and the outer casing, which passages, as before set forth, are regulated as to area by the adjusting screw or valve 31, and thus the user of the apparatus may secure a resistance suited to  
 10 his strength. The water or oil forced from the rear of the inner cylinder passes into the intermediate space 12, and oil or water from this space is free to pass through the openings 28 into the forward portion of the  
 15 inner cylinder, and as the reservoir 26 surmounts the outer case, and extends above the same a sufficient height, the inner cylinder and the casing will be completely filled with the liquid, and the action of the piston will  
 20 be uniform and regular at all points of the stroke. The reservoir contains a sufficient surplus of liquid to insure the maintenance of the full supply within the inner cylinder and casing, and prevent the existence of air  
 25 pockets within the casing or cylinder, it being only necessary to keep the reservoir supplied with liquid a sufficient height to secure a uniform action of the apparatus. On the forward stroke of the piston, the  
 30 valve 15 will open, allowing the liquid to pass freely from the front side to the rear side of the piston, this forward stroke taking place as the oars are moved forward to begin a new stroke.

35 I prefer to form the piston ring as shown in Fig. 9 of spring material, decreasing in thickness to the point where the ends of the split ring meet. By this construction of  
 40 spring ring it will accommodate itself to any irregularities in the bore of the inner cylinder. The guide tube or casing 21 will serve to hold lubricant for the piston rod guide block.

45 The guide tube 21 fits into an enlarged portion or chamber screwed to the stuffing box, so that as this stuffing box is adjusted the enlarged portion or casing will slide on the end of the guide tube 21 and maintain  
 50 an oil tight joint therewith, it being understood that the guide tube 21 is fixed rigidly in the supporting frame, this being shown in Fig. 3 being connected at its outer end with said frame.

55 Referring to the mounting of the oar, this is pivoted at 32' to have vertical pivotal movement, and the bracket or fitting 33 in which the oar is pivoted has the arm 9 extending therefrom downwardly toward the  
 60 piston rod from which the link 8 extends and connects with the bolt 23. This fitting or bracket 33 has a stem 34 extending into a socket of a bearing bracket 35 in which it is retained by a set screw 36 entering a  
 65 groove extending circumferentially of the stud or pin 34. The chamber within the

bearing bracket is enlarged to receive a supply of oil at 37 by which the stud 34 is lubricated. A spring 38 presses the oar normally upwardly.

In the form of the invention shown in 70 Figs. 1, 2 and 3, the cylinders extend in a direction transversely of the apparatus, being mounted upon the out-rigger arms, whereas in the form of the invention shown in Figs. 4, 5 and 6, the cylinders or casings 75 for the liquid and the piston rod guide casing extend in a direction parallel with the direction of movement of the seat for the general, and I have indicated in Fig. 4 the general relation of the sliding seat to the sweep. 80 The oar in this case when in intermediate position, extends at right angles to the axial line of the cylinder and casing, whereas in the form first described the oar extends, when in intermediate position, in a plane 85 parallel with the axis of the cylinder.

I claim as my invention:

1. In combination in a rowing machine, a horizontal cylinder, a piston therein, connections between the same and the oar handle, 90 an outer casing, with a space between the same and the cylinder communicating with the ends of the cylinder and containing therewith a body of liquid extending horizontally, and a reservoir having communication 95 with the casing containing said horizontal body of liquid, said reservoir containing a supplementary liquid supply whereby a full supply of liquid is maintained in the casing and cylinder from end to end thereof. 100

2. In apparatus of the class described, resistance means consisting of a piston and cylinder, an oar handle, a bracket to which the said oar handle is pivoted and which 105 handle has vertical movement, a second bracket having a socket in which the first bracket is swiveled, and a connection between the piston and the first mentioned bracket, substantially as described.

3. In a rowing apparatus, a piston and 110 cylinder, a piston rod, an oar handle pivoted at a point elevated in respect to the piston rod, a swiveled bracket in which the oar handle is pivoted, said bracket having an arm extending outwardly and downwardly 115 toward the plane of the piston rod, and a connection between the said arm and the piston rod, substantially as described.

4. In combination with a main frame, a cylinder, a piston in said cylinder, an oar 120 handle swiveled above the cylinder, an arm extending from the oar handle, a piston rod, and a link connecting the said arm with the piston rod, substantially as described.

5. In combination in a rowing machine, 125 a piston and cylinder, an oar handle, a bracket in which said oar handle is pivotally mounted and having a pintle, a second bracket having a socket to contain grease and to receive said pintle by which the 130

bracket first mentioned is swiveled, and means for retaining the pintle in the socket while permitting it to turn, substantially as described.

5 6. In combination in a rowing machine, a piston and cylinder, a piston rod, a guide for the piston rod to contain oil, a stuffing box therefor, a casing to contain oil attached to the stuffing box to be adjustable there-  
10 with, said casing telescoping with the piston rod guide, means for supporting the guide, and an oar handle connected with the piston rod, substantially as described.

15 7. In a gymnasium rowing apparatus, a frame, a seat slidably mounted on said frame, outrigger arms extending laterally from the said frame, resistance means supported by said outrigger arms and consist-  
20 ing of a cylinder on each arm arranged with its axis transverse to the direction of movement of the sliding seat, pistons in the said cylinders, and oar handles pivotally mount-  
25 ed on the outrigger arms, and connections from said oar handles to the pistons of the cylinders, substantially as described.

8. In combination a frame arranged to

rock laterally, a sliding seat mounted on the frame, laterally extending outrigger arms, cylinders supported on said outrigger arms and extending with their axes in a direction  
30 transverse to the frame, oar handles pivotally mounted on the outrigger arms, pistons within the cylinders and connections between the oar handles and the pistons, substantially as described.

35 9. In combination with the cylinder and its surrounding casings, communicating with each other and containing liquid, a piston, a piston rod, a guide block for the piston rod, a casing surrounding the piston rod  
40 and receiving the guide block to guide the same, said casing being slotted, a bolt extending from the guide block through the slot, an oar handle, and a connection between the  
45 same and the said bolt, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses:

ROBERT REACH.

Witnesses:

MILTON REACH,  
R. W. BURKE.