(No Model.)

J. NORDWALL.

ROWING MECHANISM.

No. 577,200. Patented Feb. 16, 1897.

Fig. 1

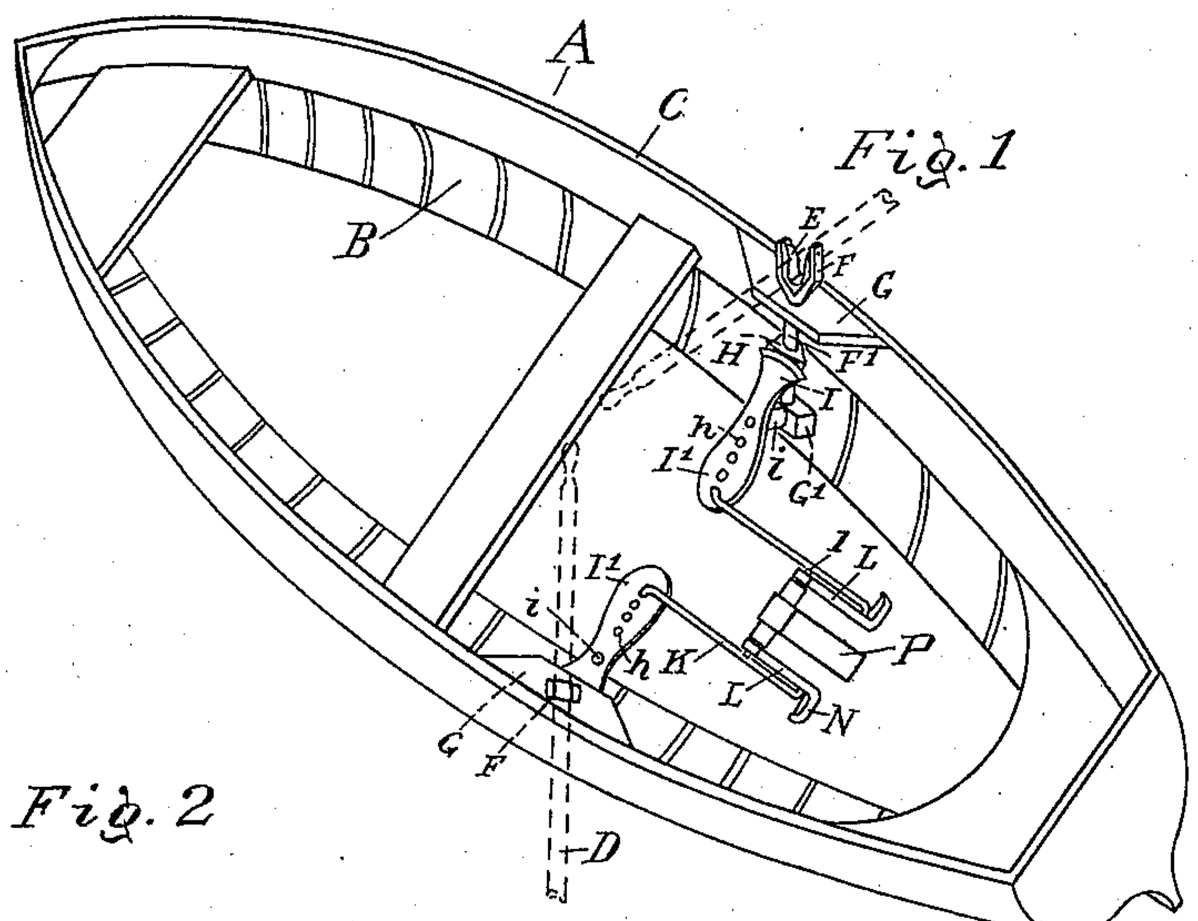
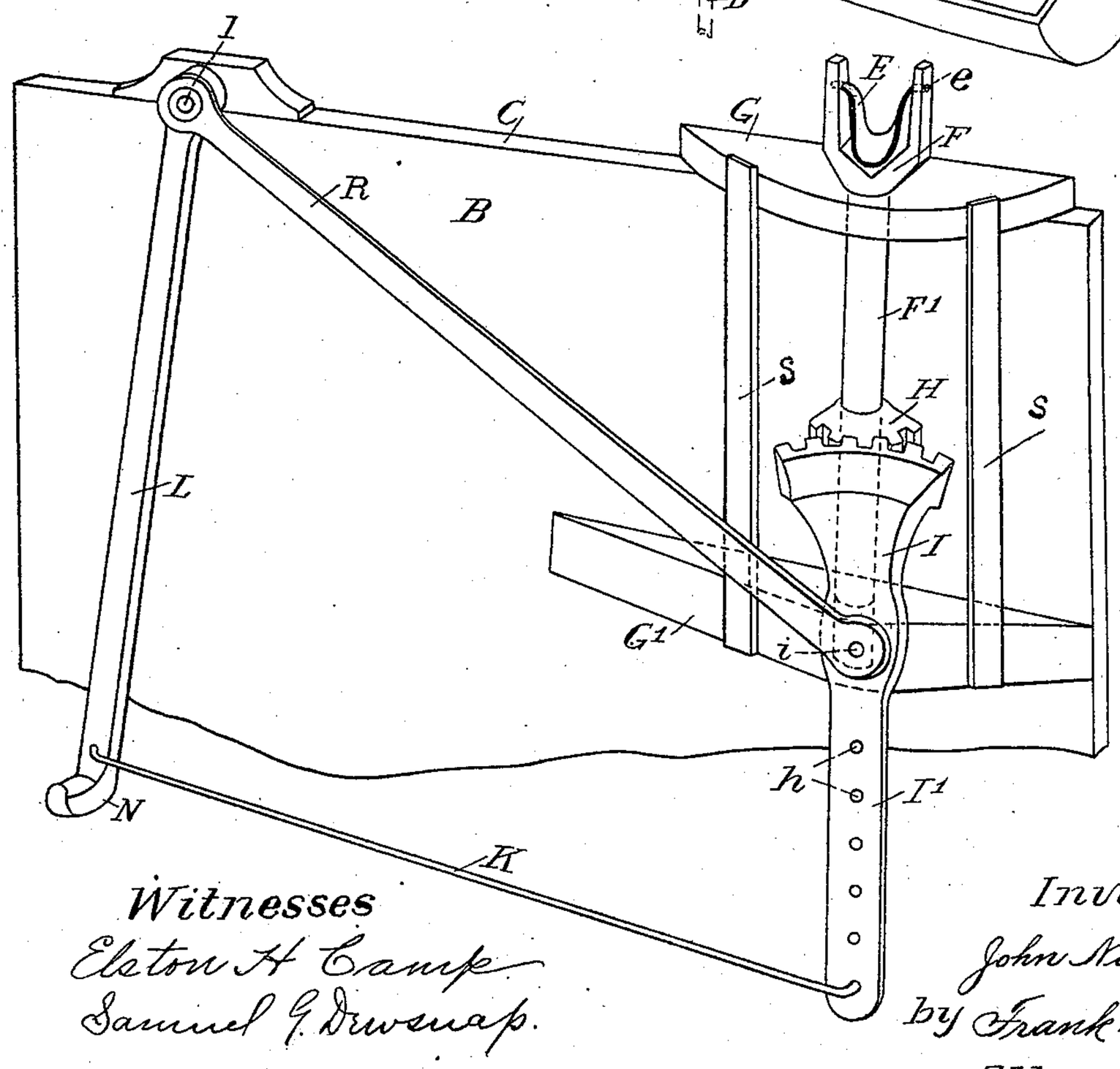


Fig. 2



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JOHN NORDWALL, OF SEATTLE, WASHINGTON.

ROWING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 577,200, dated February 16, 1897.

Application filed July 29, 1896. Serial No. 600,998. (No model.)

To all whom it may concern:

Be it known that I, JOHN NORDWALL, a citizen of the United States, residing at Seattle, county of King, and State of Washington, have invented new and useful Rowing Mechanism, of which the following is a specification.

My invention relates to improvements in rowing mechanism which is adapted to transmit the force of the legs to the oars, thereby assisting the arms of the oarsman in rowing; and the objects of my invention are, first, to provide means whereby the force exerted in straightening the legs may be transmitted from reciprocating foot-rests to the rowlocks in such a manner as to materially assist the arms of the oarsman in rowing; second, to provide means for an adjustment of the reciprocating movement of the foot-rest proportionate to the length of the stroke and limbs of the oarsman; third, to provide means for avoiding the wear on the loom of the oar by the rowlock; fourth, to produce rowing mechanism in compact form, adapting the force of the legs to the oars in rowing without the use of ropes, foot-straps, or heel-catches, thereby avoiding the danger of entanglement of the occupants or operator therewith in case the boat should capsize. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a boat provided with a modified form of my rowing mechanism; Fig. 2, a perspective view of larger size, showing the usual method of construction and the application to the boat, a broken portion of the gunwale and side being shown.

Similar letters refer to similar parts throughout both views.

In the drawings letter A indicates any ordinary boat adapted to propulsion by oars, B the sides thereof, and C the gunwale.

My rowing mechanism consists of the following parts: oars D, which are securely seated in the swinging hangers E, which are pivotally connected to the forks of the rowlocks F, having shanks F′ bearing in the brackets G and G′, and pinion-sectors H, which may be either spur or bevel, fast thereto intermediate the brackets. These pinion-sectors H have engagement with wheel-sectors I of similar form, adapted to oscillate upon pivots *i*, attached to the brackets G′ by means of the pendent arms I′ or the sector-pinions H. To the arms I′ are pivotally attached the ends of the connecting-rods K, the other ends of which are similarly attached to the treadles L, adapted to swing or oscillate upon the pivots *l*, projecting from the sides of the boat, or attached in a center post P, as shown in Fig. 1. These swinging treadles are provided with foot-rests N and are adapted to oscillate by the force of the legs or by the operation of the arms I′.

As indicated in Fig. 2, the several brackets and pivots of my rowing mechanism may be connected and strengthened by the brace-rod R, placed intermediate the pivots *i* and *l*, and the slats S, connecting the brackets G and G′, which are attached to the sides and gunwale of the boat, though the arrangements of brackets and supports are immaterial and may be varied or omitted, as may best suit the construction of the boat to which my rowing mechanism may be attached.

In the pendent arms I′ are provided apertures *h* to permit of the change of the rods K from one aperture to the other and a consequent variation in the length of the swing of the treadle L, adapting the mechanism to the varying proportionment of individual operators, as two rowers occupying the same seat, but operating opposite oars, might require different apportionments in the mechanism to accommodate their accustomed length of stroke to the length of swing of the treadle permitted by the most natural bend of the knee and length of leg. This would also be true in the case of individual operation of the boat by different persons.

The swing-hanger E is provided with pivots *e* and when the oar is placed therein is adapted to swing upon said pivot with the dip of oar, thus avoiding the wear of the loom by the rowlock or the weakening of the oar by a pivot driven therethrough when desirable to make pivotal connection with the rowlock. It is also made to conform closely to the shape of and fit snugly about the loom of the oar and is of sufficient length of bearing to transmit the force of the leg exerted upon the shank

F′ from the treadle L and to assist the oarsman in rotating the shank F′ by means of the oar when returning for a new stroke, and thereby swinging the foot-rest H forward for a new stroke upon the bending of the knee.

The gear-sectors may be spurs or of any bevel determined upon in construction adapting them to the form of the particular boat in which they are to be placed.

In operating my rowing mechanism the feet of the oarsman are placed upon the foot-rest N and a pair of ordinary oars are inserted in the swinging hangers E, and in taking a stroke the legs are straightened simultaneously with the pull of the arms upon the oars. This swings the treadle L toward the stern of the boat, causing the arms I′ to swing by means of the connecting-rods K, and gear-sectors I and H transmit the force thus exerted by the legs to the oars D through the shank F′, rowlock F, and swinging hanger E. In returning for a new stroke the oarsman uses the arms to push the oars from the body rotating the shank F′ in a reverse direction than when pulling and thereby returning the foot-rest to a position for the next stroke.

It will be clearly seen that the mechanism on each side of the boat is independent of the other and may be adjusted as heretofore explained; also, that the connecting-rods K may be disconnected from the arms I′ and the rowlocks F used in the ordinary manner, but with the desirable result of protection of the oars from wear furnished the looms of the oars by the swinging hangers E.

I am aware that prior to my invention numerous devices have been employed to assist the arms of the rowers in rowing by the force of the legs. I do not therefore claim such an invention broadly; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination with a boat, of the rowlock with a gear-sector thereon, a second gear-sector engaging therewith having a pendent arm, and a swinging treadle, all pivoted in said boat, and a connecting-rod intermediate said arm and treadle, substantially as shown and set forth.

2. In rowing mechanism adapted to utilize the force of the legs, the rowlocks thereof having a gear-sector thereon, in combination with a second gear-sector engaging therewith, having connection with a swinging treadle adapted to rotation by said force, substantially as shown and set forth.

3. The combination of the oar, the rowlock, the swinging hanger pivoted therein, the gear-sector thereon, a second gear-sector engaging therewith and a swinging treadle having connection with said second gear-sector, substantially as shown and set forth.

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Witnesses:
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