J. E. GOLDTHWAIT.

ROWBOAT SEAT.

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1,245,098. Patented Oct. 30, 1917.

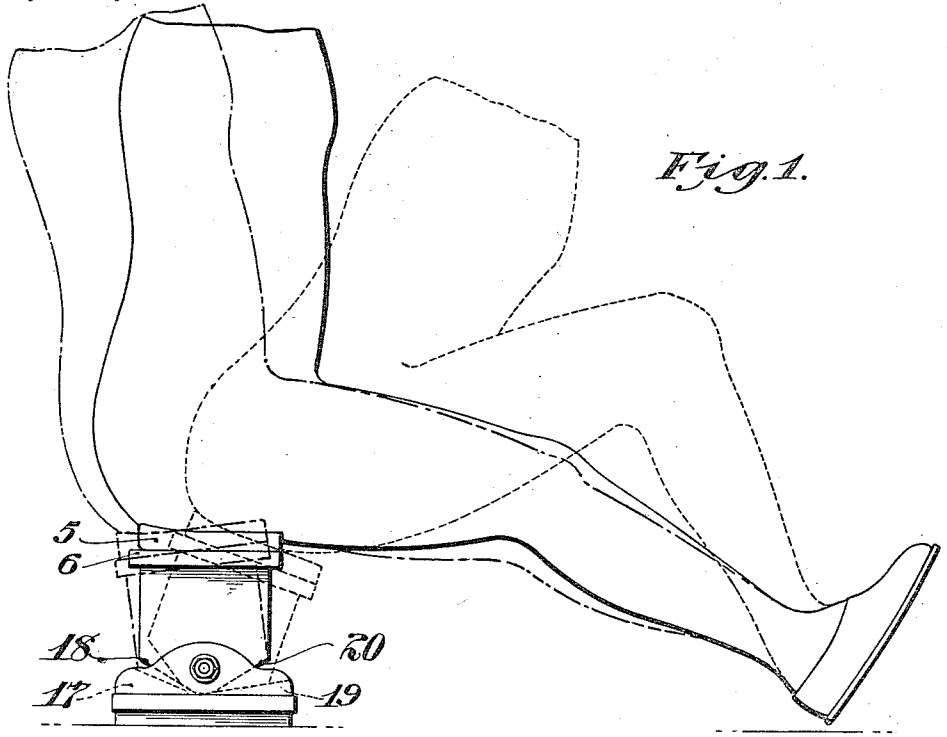


Fig. 1.

Fig. 2.

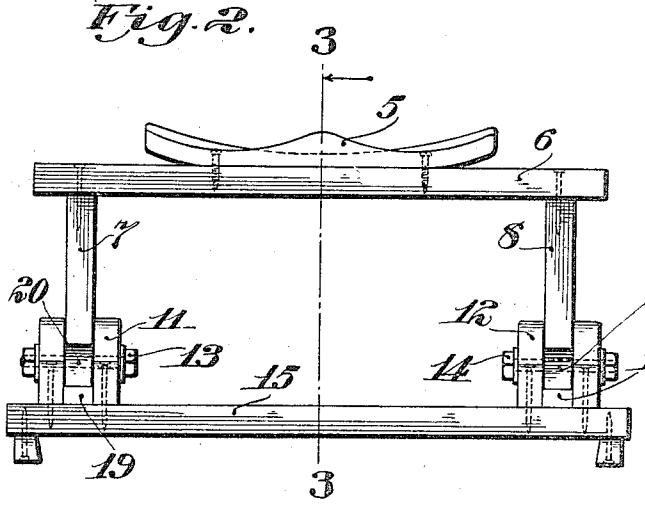
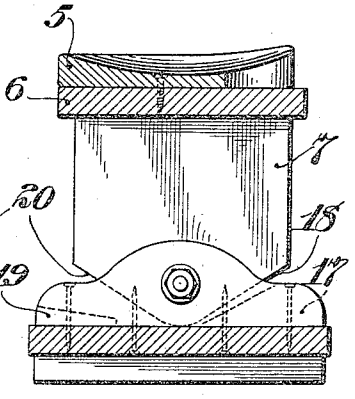


Fig. 3.



Inventor:
Joel E. Goldthwait
by his attorneys
Phillips, Van Fleet & Fisk

UNITED STATES PATENT OFFICE.

JOEL E. GOLDTHWAIT, OF BOSTON, MASSACHUSETTS.

ROWBOAT-SEAT.

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To all whom it may concern:

Be it known that I, JOEL E. GOLDTHWAIT, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Rowboat-Seats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in rowboat seats, and more particularly to an improvement in seats for racing rowboats or shells.

Rowing in long, narrow rowboats called shells, whether for pleasure, exercise, or in contest, if properly performed constitutes one of the most healthful and delightful of sports and recreations. In common with other sports, there is a proper way of rowing and an improper way of rowing. If the sport is indulged in only for the sake of the keen pleasure it affords, an improper manner of holding the body while rowing may not have an injurious after effect if the exercise is not kept up for too long a period. It is in the long course racing contests, however, that the injurious and often deleterious effects of improper rowing are manifest. The aftermath of an intercollegiate contest is all too frequently a seriously or permanently injured man. Where a crew is under the instructions of a competent coach, harmful methods of rowing will of course be largely eliminated, but many crews are in the hands of incompetent coaches, and others have no coaches at all. In these cases oarsmen almost invariably fall into harmful and injurious ways of holding the body while rowing. This is especially so at the beginning and at the finish of the stroke.

When an oarsman rows in proper form in a racing shell, the trunk or torso of his body should be held straight at all times throughout the length of the stroke and the recovery. This is not an easy feat to accomplish with the construction of seat usually employed in racing shells. This seat is made to slide backward and forward with the oarsman so as to enable the oarsman to put the power and strength of his legs into his stroke. At the beginning of the stroke the torso of the oarsman leans well forward at an acute angle with the axis of the shell, his knees are drawn up, the thighs and lower portions of the legs forming substantially acute angles, and his arms stretched forward in front of him, with the sliding seat drawn well up under him. After dipping his oar into the water for the catch of the stroke, he first begins to straighten out his legs, which act as a powerful toggle joint, and by this means the greatest power of which his body is capable is transmitted through his torso and arms to the oar. As the oarsman's legs are straightening, the upper part of his body is moving rearwardly, the arms remaining in fixed relation with the torso until the hands and the handle of the oar are about over his knees; and then, as the stroke is finishing and the oarsman's legs are coming to a straightened position, the hands are drawn toward the breast. During the stroke the sliding seat has slid toward the bow of the boat to the limit of its forward movement. As the stroke is finishing it is necessary for the oarsman to feather his oar and remove it from the water. If he is rowing in proper form, his torso will be straight and inclined rearwardly at such an angle that the arc through which his hands and the end of the handle of the oar must traverse will not intersect the upper surface of his abdominal region. If it does, the oarsman will be compelled to bend at the waist line in order to enable him to get his oar out of the water. This is known as bucking the oar, and is recognized not only as bad form, in that it suddenly throws the weight of the body downwardly against the shell and thereby causes it to sag, which retards its progress, but it compresses the stomach on the solar plexus, which has a very exhausting effect on the oarsman and is the chief cause of frequent collapses.

It is the object of the present invention to produce a rowboat seat of such construction that the oarsman using it will automatically be compelled to keep the torso of his body straight at all times throughout the length of the stroke. With his torso held straight, there will be no exhausting strain upon the essential organs at the waist line, and consequently, the endurance of the oarsman will depend, as it ought, entirely upon the strength of his muscular organs. Incidentally, sagging of the boat and its consequent retardation will be practically eliminated.

This object is accomplished by so con-

structing the seat that the body supporting portion thereof, or the body rest, as it will be hereinafter termed, is moved through an arc of the same angle as the sector traversed by the torso. The center of swing of the seat will therefore be the center of the sector traversed by the torso as the oarsman moves forward and rearwardly. As seats for racing shells have heretofore been constructed, the body rest portion of the seat remains substantially on a horizontal plane, and consequently the torso fulcrums on a sliding pivot point. As a result of this shifting or unstable pivot point for the fulcruming of his torso, the thrust thereof, which ought naturally to be against a fixed point, must be taken up largely by the body itself, and therefore necessarily imposes on the oarsman a strain which if eliminated would enable him to hold out longer. In the construction of seat of the present invention, on the contrary, the torso fulcrums about a fixed pivot point, and for this reason the natural tendency is for the oarsman to hold his torso straight, because the thrust thereof being against a fixed point the strain on the body will not be so great as with the sliding seat, and consequently the weakest point of the body, namely, the abdominal region, will not be so likely to slump in or buckle.

The preferred form of the invention is illustrated in the accompanying drawings, in which Figure 1 is an end elevation of the improved seat showing diagrammatically the positions of the torso at the beginning and at the finish of a stroke; Fig. 2 is an enlarged view in front elevation; and Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

The improved boat seat illustrated in the drawings showing the preferred form in which it is proposed to embody the features of the present invention, comprises a body rest 5 of usual form secured to a support 6 arranged transversely of the shell in which the seat is to be used. The transverse support 6 is fixedly mounted on the upper ends of two uprights 7 and 8. The lower ends of these uprights are loosely received respectively in slots formed in standards 11 and 12. The uprights 7 and 8 are pivotally connected with the standards 11 and 12 on bolts or studs 13 and 14 respectively, so that the upper part of the seat may have an oscillatory or rocking motion. Both sides of the lower ends of the uprights are cut away at an angle to their vertical axis, as shown in Fig. 3, so as to permit the rocking movement of the upper part of the seat. The standards 11 and 12 are secured to a base 15, which may be fastened to the body of the shell at the proper distance from the oar locks. The radial distance of the body rest from its axis of oscillation is determined by the length of the arc through which the body rest is to rock or swing, which, in turn, is dependent on the length of stroke it is found most feasible to maintain.

With the rocking body rest of the present invention under him, when the oarsman leans forward for the reach or catch of the stroke the body rest is tilted forward into its position of stroke reach, and as the oarsman draws up his knees to a sharp angle, the body rest and his thighs move relatively to each other, but the point on the body rest upon which the body is supported is in the line of the thrust of the torso against the pivot of the seat. The position of the body at this time is shown in dotted lines in Fig. 1. It requires very little effort, therefore, for the oarsman to hold his torso straight; in fact, it might well be said that the sharp forward tilting of the body rest automatically compels him to keep his torso straight, and consequently no unnecessary strain is imposed upon the abdominal region. When the usual form of sliding seat is used and the oarsman is in the position he assumes at the beginning or catch of the stroke, by reason of the fact that the thrust of the torso must not be along its axis, because in that event the sliding seat would have a tendency to slide toward the bow of the boat, it requires a considerable effort to maintain the torso straight, and hence it often happens that with an uncoached or improperly coached man the torso is bent at the waist line, which, while it is an apparently comfortable position, is nevertheless a position in which the stomach is pressed against the solar plexus and consequently is exhausting upon the oarsman.

With the seat of the present invention, when the oarsman has finished his stroke and his torso is inclined rearwardly, as shown in dot and dash lines in Fig. 1, the body rest is tilted rearwardly into its position of stroke finish. The angle of inclination of the body at this time is such that the arc described by the handle of the oar as the oarsman feathers it and removes it from the water. does not intersect the upper surface of the abdominal region, and consequently, there would be no necessity, in the first place, for him to buck his oar; and secondly, there would be no tendency for him to do so, because while he is in this position the thrust of his torso is again against a fixed point in line with the axis thereof. In order to prevent the oarsman from tilting too far rearwardly, stops 17 fixed on the base 15 in the rear end of the slots are provided, against which the cut away portion 18 of the uprights is adapted to rest while the seat is in its position of stroke finish.

With the elimination of all necessity and tendency for bucking the oar, the speed retarding sagging of the boat as the oar is re-

moved from the water will be reduced to a minimum, and therefore the retardation of the impetus given to it by the stroke will be negligible. It is not so necessary to provide a stop to limit the forward tilt of the body rest as it is to provide a stop to limit the rearward movement. It is found expedient, however, not to allow the seat to tilt forward too far, and so stops 19 are provided against which the cut away portion 20 of the uprights may abut to limit the forward tilt of the body rest. It will be observed, however, that the angle through which the body rest may tilt forward is sufficient to permit the oarsman to draw his knees well up in order to give him the reach necessary for the predetermined length of stroke.

With the present form of seat construction, the oarsman begins and finishes his stroke in substantially the same way as with the sliding form of seat, except that the torso is automatically and necessarily held straight. At the beginning of the stroke the knees are well drawn up under the torso, which is automatically held straight, the knees being sharply bent so that the thighs and the lower portions of the legs are at substantially an acute angle, and the arms are forward and in fixed position with the torso. During the first part of the stroke the legs are used as a toggle joint and the arms are held in fixed relation with the body until the hands are about over the knees, at which point, as the legs are straightened the hands move toward the torso. The radial distance of the body seat from the axis of its rocking movement may, of course be such as to give any desired stroke, but it has been found preferable to limit the length of stroke, as it is found that by the use of the rocking body rest a quicker recovery may be made from the stroke finish than it is possible to make with the sliding form of seat, and that, consequently, it is practicable to take more strokes per minute and thereby make up for any power lost by using the shorter stroke.

It will be recognized from the foregoing description that with the present form of seat for rowboats, racing shells and the like, the thrust of the torso is at all times throughout the length of the stroke and the recovery upon a constant point. The tendency of the oarsman is, therefore, to hold his torso straight, and so all unnecessary strain on the abdominal region is eliminated. Consequently, the strength of the oarsman is conserved and his endurance is lengthened, with the result that the exercise of rowing may be freely indulged in without expert coaching and without the liability of the deleterious effects which are consequent upon a constant bending at the waist line. The action of the oarsman upon this rocking seat is as though a rigid bar lay along the axis of his torso through the body rest to the pivot thereof. The oscillations of the torso of the oarsman on the body rest about the pivot of the latter, are conceived as being similar to the oscillations of a bar about a pivot.

It will be observed in the foregoing description that where the body rest is described as tilting forwardly or rearwardly, these directions have reference only to the position of the oarsman, and not to the boat; and that where the oarsman is described as leaning forwardly or rearwardly, these directions have reference to the front and rear sides respectively of his body. It will be borne in mind, of course, that the oarsman faces the rear end or stern of the boat; and hence no confusion will result in the terms of direction as used.

In the preferred form of the invention the body rest portion is shown as supported by uprights pivoted upon a fixed base. The torso of the oarsman moves through a sector with its pivot as a center, which is therefore a constant point of thrust. But, viewed in its broader aspects, the invention contemplates a body rest which inclines forwardly at the reach and which changes its angle during the stroke so that it inclines rearwardly at the finish, so as to envelop a curve convex on its upper side. The invention, therefore, is not restricted to the form shown in the drawings and described in the foregoing description, as it may be embodied in other forms without departing from the spirit of the following claim.

Having thus described the invention, what is claimed is:

A seat for racing shells and the like comprising uprights fulcrumed to the shell on fixed pivots having their axes in alinement transverse to the axis of the shell, and a body rest for supporting the torso of the oarsman, secured to the uprights and being connected with the shell only through the pivotal mounting of the uprights, said pivots being below the body rest and at such distance therefrom that the oarsman is permitted, without shifting the position of his feet, to lean forward at the reach of the stroke with his knees sharply bent and to lean backward at the finish of the stroke with his legs straight, the body rest swinging forward to permit the genuflection at the reach and swinging back at the finish without slipping of the body on the rest.

JOEL E. GOLDTHWAIT.

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