R. BEHR.

BOW FACING OAR.

APPLICATION FILED FEB. 15, 1910.

981,361. Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

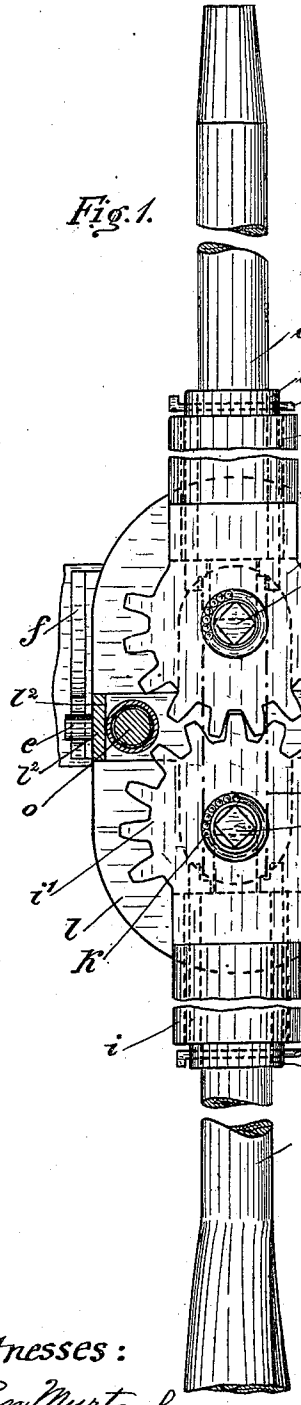


Fig. 2

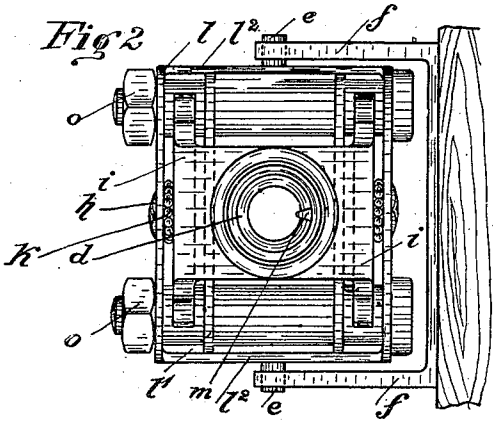
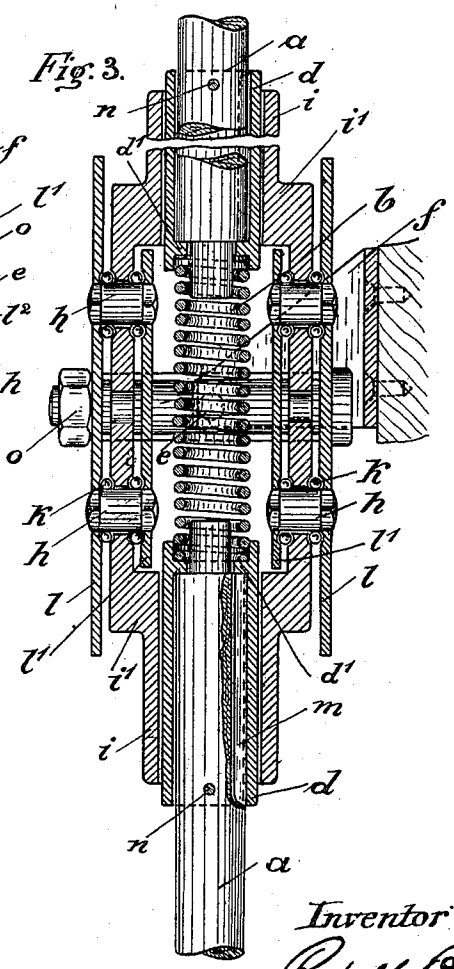


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 6.

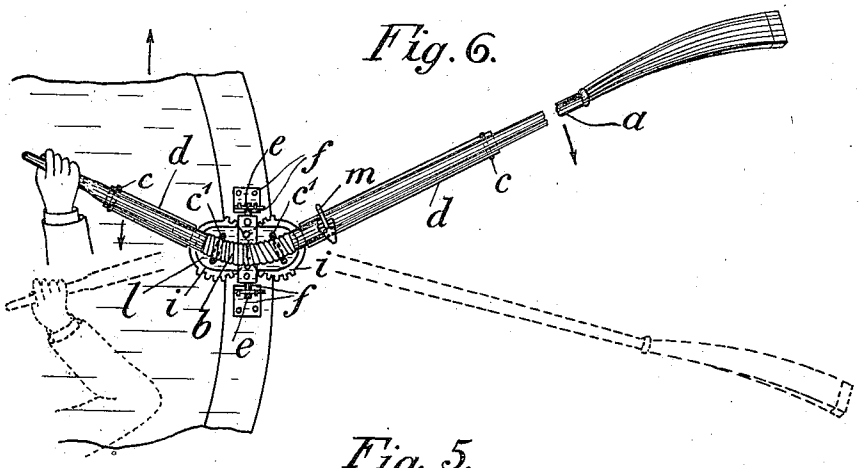


Fig. 5.

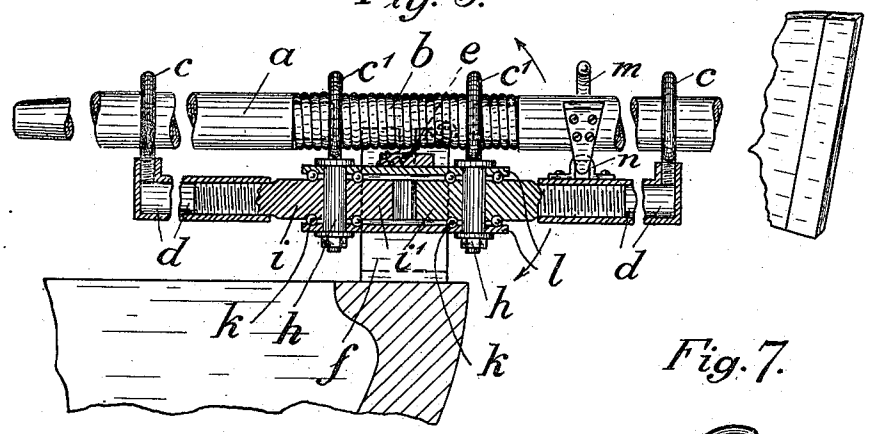


Fig. 7.

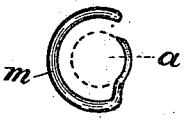
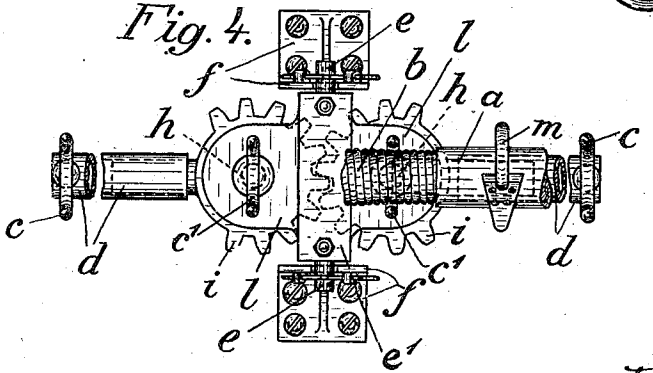


Fig. 4.



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UNITED STATES PATENT OFFICE.

RUDOLF BEHR, OF KOLBERG, GERMANY.

BOW-FACING OAR.

981,361. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed February 15, 1910. Serial No. 544,009.

To all whom it may concern:

Be it known that I, RUDOLF BEHR, a citizen of the German Empire, residing at Kolberg, Germany, have invented certain new and useful Improvements in Bow-Facing Oars, of which the following is a specification.

The subject of the invention is an apparatus which is designed to permit rowing in the direction of vision. This apparatus permits not only the handling of the oars in the ordinary manner, but also "feathering" or turning of the oars; for which purpose the handle, as in the ordinary oars made in one piece, turns on the rowlock. Moreover the improved rowing apparatus has the advantage that the oars can be easily detached from the apparatus.

The above mentioned advantages are obtained by making the oar in three parts, namely, the handle, the blade and a flexible connecting piece between the two. This oar, which forms a whole, is combined with gearing which by the interengagement of two toothed wheels is brought into an angular or bent position during the rowing.

The invention above characterized is shown in two constructional forms in the accompanying drawings.

Figure 1 shows the first constructional form in plan, the upper cover plate being removed. Fig. 2 shows an end elevation looking toward the handle. Fig. 3 is a vertical section along the longitudinal axis of the oar, of the arrangement shown in Fig. 1. In Figs. 4 to 7, a second constructional form of the rowing apparatus is shown. Here Fig. 4 is a plan with the oar removed. Fig. 5 a vertical section along the longitudinal axis of the oar through the gearing. Fig. 6 is a plan illustrating the operation of the apparatus and Fig. 7 shows to an enlarged scale an arrangement for holding the oar in the rowlock.

Referring to Figs. 1 to 3 of the drawings, a is the oar, which consists of the handle and the blade. These two parts a, a are connected together by a flexible shaft b which is formed by a powerful spiral spring. For this purpose, the ends of the spiral spring are pushed over the thinner journal-shaped ends of the members a, a. Preferably the members a, a are inserted into and rigidly secured to sleeves d, d, which have inwardly-projecting flanges d^1, against each of which the corresponding end convolution of the spring b bears. The oars a obviously should not themselves turn in the sleeves d. For this purpose, the members a, a are provided with a groove, in which engages a feather m on the inner wall of the sleeve d, so that, in the turning of the oar about its own axis, the sleeve is turned with it. The oars are held against endwise displacement from the sleeves d, d by means of cross-pins n passing through the oars and sleeves. These sleeves turn in cylindrical projections i on the toothed segments i^1. These toothed segments turn loosely about bolts or pivot-pins h, which are squared at their ends. Over these squared ends of the bolts h are placed plates l and l^1 and these plates are connected together by screw bolts o and stays l^2. In this manner, the separate parts are connected to form a whole, so that the entire apparatus can be pivotally suspended about journals e on the stays l^2 in the rowlock f, so as to be capable of oscillating. It is thus possible to lift the whole apparatus out of the rowlocks f and also to withdraw the oars a, b, a together with the sleeves d, d from the apparatus. In order to permit easy turning of the toothed segments i^1, balls k are arranged between the plates l and l^1 around the bolts h.

The operation of the apparatus is as follows:—The parts a, a of the oar are first introduced into the sleeves d, d and these two parts connected together by the flexible shaft b in such a manner that the movement of the handle is transmitted by the flexible shaft to the blade-part of the oar. The flexible shaft must obviously be so connected to the sleeves d that it will turn simultaneously therewith. After the oar a, b, a, d thus made has been introduced into the frame, so that it now rests in the projecting parts i, i of the toothed segments i^1, the whole rowing apparatus can be suspended in the rowlock f by means of its journals e, e. The rower seats himself with his face in the direction of motion and pulls the handles of the oars in the same manner as when rowing with his back toward the direction of mo-

tion. Thus if the oars are to be placed in the water, the rower first pushes the handles forward to make the forward or non-propulsive stroke. By the turning of the toothed segments i^1 about their bolts or pivot-pins h, h by reason of the engagement of the toothed segments i^1, i^1, with each other, the blades will be simultaneously moved forward, see Fig. 6. In this operation, the shaft b bends. If now the rower pulls the handles toward him, after he has dipped the oars into the water, the oars will move in the water in such a manner as to drive the boat forward in the direction of the arrow. After the stroke is completed, the rower again pushes the handles forward and the operation begins afresh. During this last mentioned motion, the rower can turn the handles to feather the oars and this turning motion is transmitted to the blade-part of the oar, so that the blade now sets itself parallel to the surface of the water, in order to enable the oar to cut through the air better during its return stroke.

The second form of construction shown in Figs. 4 to 7 differs from the former only in that the oar, which here likewise consists of three parts a, b, a is not inserted into sleeves between the pairs of toothed segments i^1, i^1, but is suspended in forks above the toothed segments which can here be limited to one pair.

The modification shown in Figs. 4 to 5 consists only in that the toothed segments i^1, i^1 are combined with solid journals i, which are provided with screw-threads, in order to screw into sleeves d, d which are bent upward at right angles at their free ends and are provided with a hole, in which a female thread is cut. Into these female threads are screwed the forks c, c. In addition to these forks c, c two forks c^1, c^1 are also provided, which turn about the journals h, h which simultaneously form the axes of oscillation of the toothed segments i^1 and serve as carriers for the plates l, l, which also form bearing-members having races for the balls k, which are introduced between the toothed segments and the plates l, l. Plates e^1 are mounted on the upper plate l transversely to the longitudinal axis of the oar. These plates e^1 bear at their ends pivot-pins e, which are suspended in the rowlocks on the gunwale or thole-board of the boat. The forks c, c hold the loom-parts of the handle and of the blade, while the forks c^1, c^1 hold the flexible shaft b. Moreover a hook m *is* fixed in one of the fixed solid or loom-parts of the oar, which hook surrounds approximately half of the circumference, see Fig. 7. This hook is inserted into an eye n on one sleeve d. By means of this connection, the oar is securely connected to the apparatus, so that springing of the oar out of the forks c, c^1 cannot take place. The size of the curve m is such that detachment will not take place, even if the oar is released during the feathering in its return stroke.

The operation of the apparatus is the same as that already described above.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a rowing apparatus, the combination of an oar comprising two parts each adapted to rotate on its own axis, a spiral spring connection between the adjacent ends of said parts for communicating the axial rotation from one part to the other, and means for communicating swinging motion in opposite directions from one part to the other.

2. In a rowing apparatus, the combination of an oar comprising two parts adapted each to rotate on its own axis, a spiral spring connection between said parts for communicating the axial rotation from one part to the other, and intermeshing gears at the adjacent ends of said parts for communicating swinging motion in opposite directions from one part to the other.

3. In a rowing apparatus, the combination of an oar comprising two parts each adapted to rotate on its own axis, a spiral spring connection for communicating axial rotation from one part to the other, and means for communicating swinging motion from one part to the other.

4. In a rowing apparatus, the combination of an oar comprising two parts each adapted to rotate on its own axis, a flexible joint connection between the adjacent ends of said parts for communicating the axial rotation from one part to the other, and means for communicating swinging motion in the opposite direction from one part to the other, said flexible joint connection comprising a powerful spiral spring rigidly secured at its opposite ends to said adjacent ends respectively.

5. In a rowing apparatus, the combination of an oar comprising two rotatable parts, sleeves secured to the adjacent ends of said parts, a pair of pivotally mounted spaced plates, a pair of intermeshing toothed segments pivotally mounted between said plates and each provided with a cylindrical projection adapted to receive one of said sleeves, and a powerful spiral spring rigidly secured to the adjacent ends of said sleeves.

6. In a rowing apparatus, the combination of, a pair of pivotally mounted plates, a pair of journals connecting said plates, a pair of intermeshing toothed segments mounted on said journals and between said

plates and each carrying oar receiving forks, a pair of oar receiving forks carried one each on said journals, an oar comprising two rotatable parts received by said forks, and a strong spiral spring connecting the adjacent ends of said parts.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

RUDOLF BEHR.

Witnesses:
RUDOLF VOGEL,
J. MINDYLAFF.