(No Model.)

M. F. DAVIS.

Oar and Scull.

No. 231,016. Patented Aug. 10, 1880.

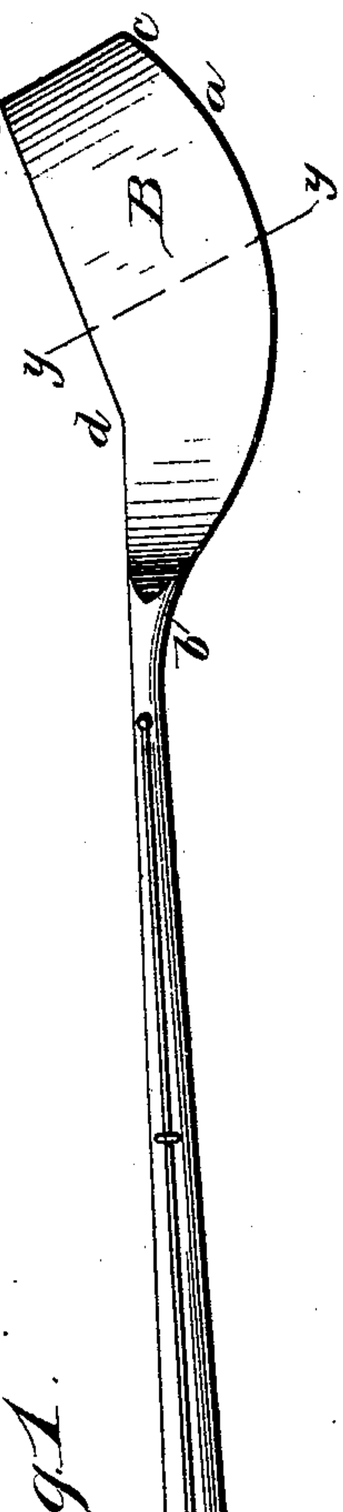

Fig. 1.

Fig. 2.

Fig. 5.

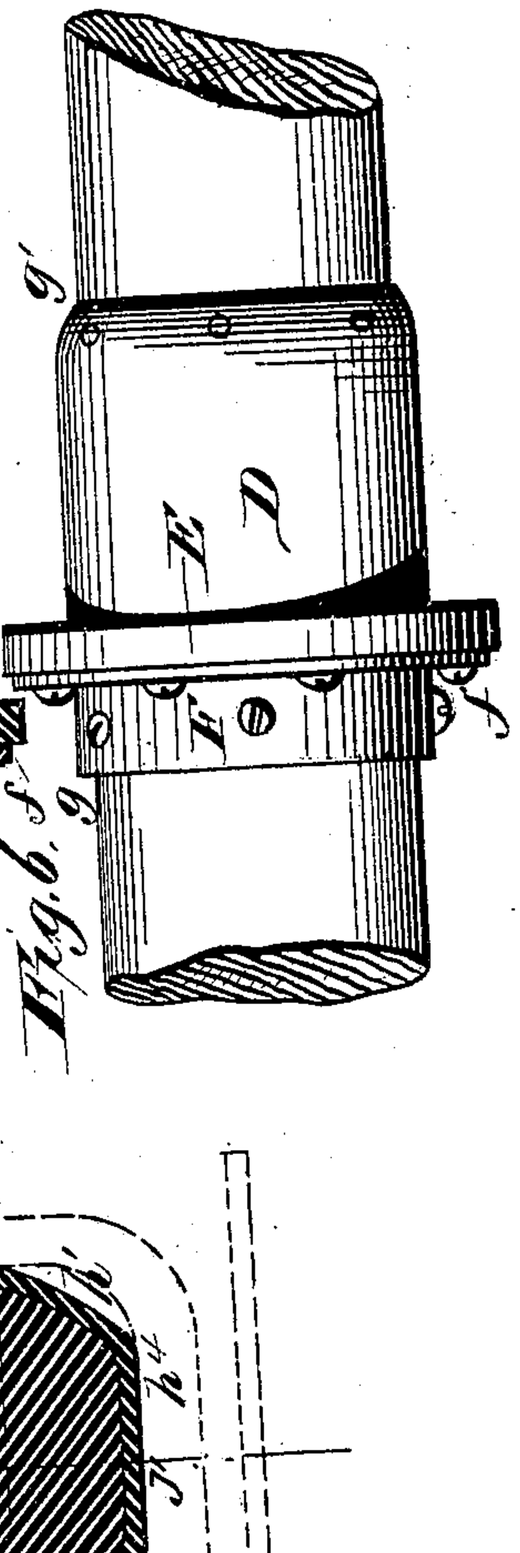

Fig. 6.

Fig. 4.

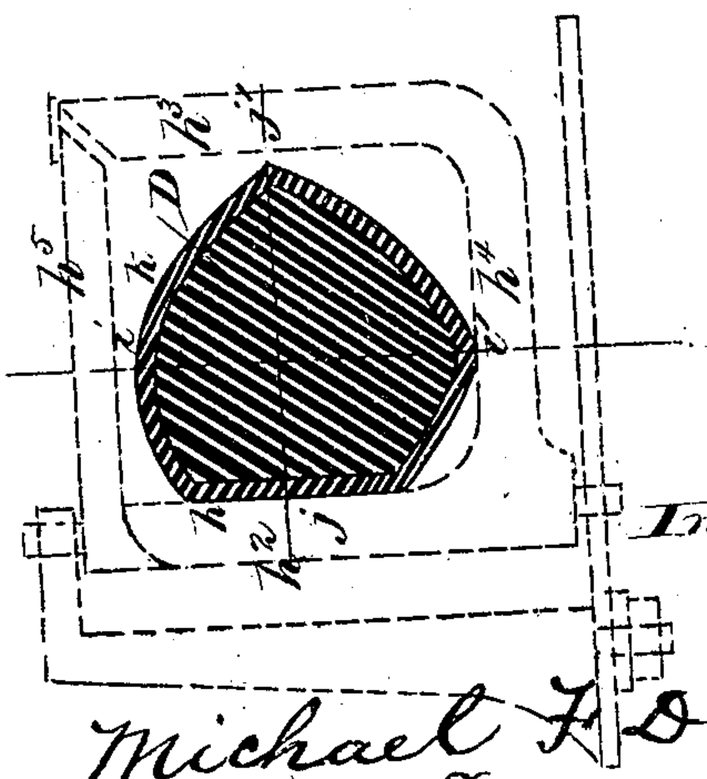

Fig. 3

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OAR AND SCULL.

SPECIFICATION forming part of Letters Patent No. 231,016, dated August 10, 1880.

Application filed March 18, 1880. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL F. DAVIS, of the city of Portland, in the State of Maine, have invented a new and useful Improvement in Oars and Sculls, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a side view of an oar that embodies my invention. Fig. 2 is an edge view of the same. Fig. 3 is a cross-section on line *x x*, Figs. 1 and 2, showing also a side elevation of a rowlock with the oar in the lock in position for giving the stroke. Fig. 4 is a similar view, showing the oar in position for feathering; and Figs. 5 and 6 are respectively a longitudinal central section and a side view of that portion of the loom of the oar which occupies the rowlock in rowing.

Inasmuch as in rowing the oarsman is capable of exerting only a certain amount of force, it of course follows that whatever part of that force is expended otherwise than in the direct propulsion of his boat, whether it be in raising or lowering his oar, in holding it in the proper position to give the stroke or for feathering, in rotating it in the rowlock, in lost motion in the rowlock, or otherwise, by just so much will be diminished the speed of his boat which the application of his entire force to its direct propulsion would attain. In other words, just in proportion as the shape and position of his oar and the quickness, ease, and directness with which it catches the water, and as the hold it gets upon the water obviates slipping, and as the manner in which it leaves the water in feathering avoids back-acting resistance, and as vertical motion of the hands of the oarsman required to dip the oar-blade into and take it from the water is rendered unnecessary, as the oar assumes and maintains its various positions requisite in rowing without the direct effort of the oarsman, in the same proportion is the oarsman enabled to apply his whole force to the direct propulsion of his boat, and the nearer will he approach to attaining a speed that is the equivalent of the entire force expended.

The object of my invention is to secure by the peculiar form of the oar or scull and relative size and proportions of its several parts the results above mentioned.

In the drawings, A represents the loom of the oar, or the part of it between the blade and the handle. B is the blade, and C the handle. The blade has the form shown clearly in Fig. 1. The lower edge, *a*, of the blade describes a convex curved line forming a segment lying below the longitudinal axial line of the loom, and extending from the loom at *b* to the angle *c* at the opposite end of the blade, the said two points being in such axial line. The upper edge of said blade extends in a line with the upper face of the loom to the angle *d*, then bends upward at that angle and extends on a straight line to *e*, the outer upper angle of the blade. The face of the blade is dishing or concave, with a slight twist, as seen in Fig. 2. The curvature forming the concave is forward of the plane of the face of the loom on the side opposite the face of the blade, as shown also in Fig. 2.

The angle which the line *d c* forms with the axis of the loom is such as to bring the said line or top edge of the oar parallel with the surface of the water when the blade is dipped into it to give the stroke. The face of the blade X, otherwise plane and without a central rib, is slightly twisted to the right and so formed that a line drawn across it at or near its longitudinal center, as at *y y*, is vertical to the plane of the base or bottom face of the rowlock. The back face of the blade is parallel, or nearly so, to the front of the face. The curved shape of the lower edge of the blade enables it to enter the water with the least possible resistance, and the concave and twisted curvature of its face enables it to take and retain hold of the water, so that slipping and splashing at the end of the stroke are in great measure obviated. Also, there is a greater return at the end of the stroke for the power expended in rowing, since the (point of resistance to the water in the part is) widest part of the oar then comes into a position nearer a right angle to the boat than the point of the blade. Also, at the end of the stroke the water will run off in a sheet toward the outer end of the curvature, thereby saving the oarsman's power. Also, there is a further saving of his

power as well as time, since the line in raising and lowering the oar is shortened at least six inches—say, three in the down into the water and three in lifting the oar out.

By this style of scull the oarsman can comfortably row in a depth of six inches of water, while in the best known style now in use nine inches of water are required.

It must also be noted that the curvature of the lower part blade will enable the oar, when used in shoal water, to slide upon or over any obstacle that may be encountered in the stroke, and thus obviate in a peculiar degree accident or breakage.

It will, of course, be obvious that a strictly curved line is not absolutely essential, since the line can be made somewhat angular and preserve all the general characteristics now aimed at.

The loom of the oar has its largest diameter at that portion which is to occupy the rowlock, and which may be called its "transverse axis," (represented in the drawings between *g g'*,) and which I designate by the letter D. From this part the loom tapers to the blade B and to the handle C. The taper, however, is so formed as to leave the loom straight from the handle to the blade on the side in line with the face of the blade, as seen in Fig. 2. The object of this is twofold. First, it renders the loom of the oar less flexible to resist the bending force of the stroke, the side opposite the face of the blade having the form of a double brace; and, second, it causes the rocking of the oar in the lock in feathering itself to lift the blade from the water, thus requiring less vertical movement of the handle in feathering than would be necessary if the taper were uniform around the loom.

The perimeter of the part D has the peculiar form shown in Figs. 3 and 4, and is in general that of a pentagon. The side opposite to the face of the blade is flat, as from *h* to *h'*. This flat face lies against the fulcrum-upright h^2 of the rowlock, as seen in Fig. 3, while the stroke is being given, and will manifestly tend to obviate the rocking or rotating of the oar and hold it steady in the proper position during the stroke without any direct effort of the oarsman to that end. When the stroke is completed and the feathering commences the oar is to be rocked over toward the oarsman into the position shown in Fig. 4, with the flat face *h h'* turned down upon the bottom of the rowlock.

Now, it is desirable that in rowing there shall be as little lost motion between the oar and rowlock as possible, as with lost motion there is necessarily more or less of a shock, since the oar strikes the sides of the lock, which has a disturbing and depressing influence upon the nerves of the oarsman, strained as they are to their utmost tension in match rowing. By the form shown all lost motion and consequent shock or jar are prevented.

The diameter of D through on line *i i'* is equal to the width of the space between the uprights h^2 h^3 of the rowlock, and the diameter through on line *j j'* about equal to the space between the base h^4 and cross-bar h^5 of the lock. Then between *h* and *i* and *h'* and *i'* the surface is curved so as to form segments of a circle drawn from different centers, and from *i* to *j* and *i'* to *j'* the surface forms longer segments of circles, the forms and proportions being such that when the oar is rocked in its seat in feathering the angle *i'* slides along the bottom of the lock and up the face of the upright h^3, while the angle *h* will slide down the face of h^2, the surface from *i'* to *h'* bearing meantime against h^3 and the surface *j'* to *i* bearing against the cross-bar h^5.

When the blade has been lifted entirely out of the water the oar will be rocked so as to bring the flat surface *h h'* down upon the bottom of the lock, when the diameter *i i'* will fill the space between h^2 and h^3, so that the entire backward movement of the oar is made without lost motion of the oar in the lock.

I cover the part D with a thick strong leather envelope, *k*, which extends entirely around it. This forms a firm but slightly-elastic cushion, which relieves all jar or shock in case there should be any movement whatever of the oar in the lock, and retains the lubricator, and renders the action of the oar in the lock more agreeable and pleasant to the oarsman.

E is the button, which is formed preferably of thick belting-leather. It extends entirely around the oar, and is secured to the flange *f* of the metal sleeve F which is made fast to the oar. If desired, the mere form of the sleeve and its flange can be changed, or in its stead pieces of wood or metal can be used.

As will be manifest, the button, when thus extending entirely around the oar, performs an important part in connection with the movements of the oar in the lock before described; also that the button should thus extend around in order to enable such movements to be easily and conveniently performed.

The button made as above described can be easily removed as occasion may require and a new one substituted.

The handle C is offset from the longitudinal axis of the loom, as seen at *c*, the offset being usually to the extent of about the diameter of the loom at the handle. This offset performs a special and important function.

From the peculiar form of the blade described and its relation to the loom of the oar when the stroke is given, there will be some tendency in the oar to rock in its seat in the lock over toward the oarsman, which, if not otherwise counteracted, the oarsman will have to exert some force to prevent. This results from the fact that the larger portion of the outer end of the blade is above the longitudinal axial line of the oar-loom. To counteract this tendency to rotate, therefore, the handle is offset, and this offset will enable the oarsman to pull to better advantage and to feather and recover on the return. This will be found of

specially very large advantage in rowing in rough water. It must also be noted that with the handle thus made there will be found a double offset, so to speak—namely, one to the axial line of the oar as it is placed in the water, (see Fig. 1,) and the other to the axial line of the oar in the recovering, or as being taken from the water, as is shown in Fig. 2. In proportion as the width of the curved part of the blade increases from the axial downward the need for an offset becomes less, as in the case of an oar; but the other offset—that for the feather or recover—remains the same in sculls and oars.

The length of the offset should be greater or less in proportion to the surface of that part of the blade that extends above the longitudinal axial line of the loom as compared with that part of the outer half which is below such axial line.

G represents a stay, which may be a strong steel strap or wire secured on the face side of the oar, at either end, to the loom at or near its ends, and running over intermediate braces *m m'*. This serves to strengthen the loom and prevents its springing in rowing.

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

1. A continuous oar having a spoon-blade, that portion of which below the longitudinal axial line of the loom being curved, as between *b* and *c*, and the upper edge of which forms an angle with said axis, so as to bring said upper edge parallel, or nearly parallel, with the water when the oar is dipped in the act of giving the stroke in rowing, substantially as described.

2. An oar having the upper line of its blade inclined upward from at or near the shank to its outer end, said upper line being above the axial line of the loom, and with its lower portion in curved or angled lines sweeping from the end of the blade down and back to the shank, substantially as described.

3. An oar which on the face side is straight from end to end of the loom, and on the other sides tapers each way from the transverse axial portion D, which fits in the rowlock, substantially as described.

4. An oar the portion D of which that fits in the rowlock is in transverse section of a general pentagonal form, as described, whereby the oar may be rocked in the rowlock without lost motion between the oar and the rowlock, substantially as described.

5. A continuous oar having a blade of the form shown and described, and having a handle offset from the longitudinal axis of the loom, substantially as described.

6. An oar having a button on or adjacent to the part which fits in the rowlock, said button being stayed and supported by a separate flange, substantially as described.

7. A continuous oar provided with a handle offset from the axial line of the oar, substantially as described.

8. An oar having a stay fixed near the shank at one end and near the handle at the other end, and supported by suitable braces extending from the stay to the oar, substantially as described.

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