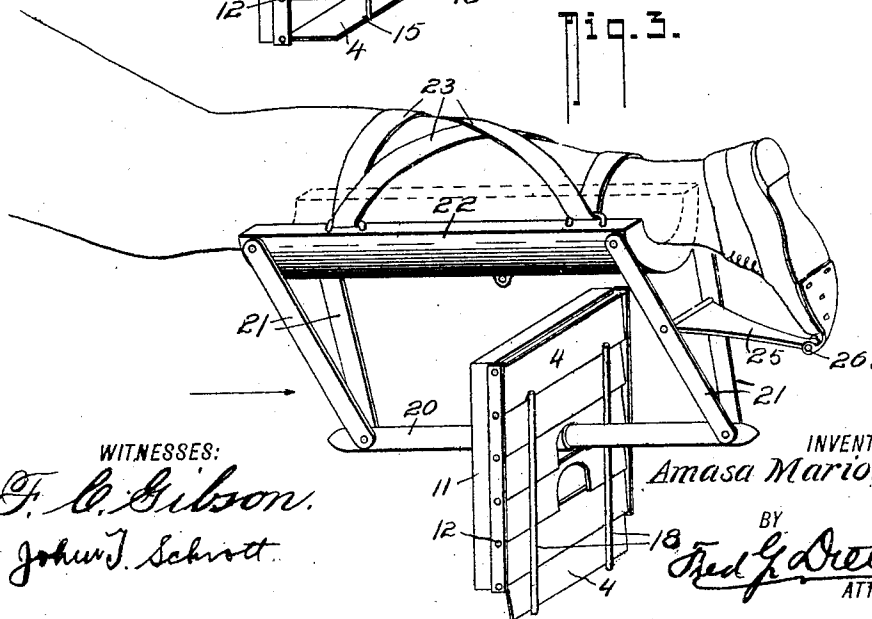
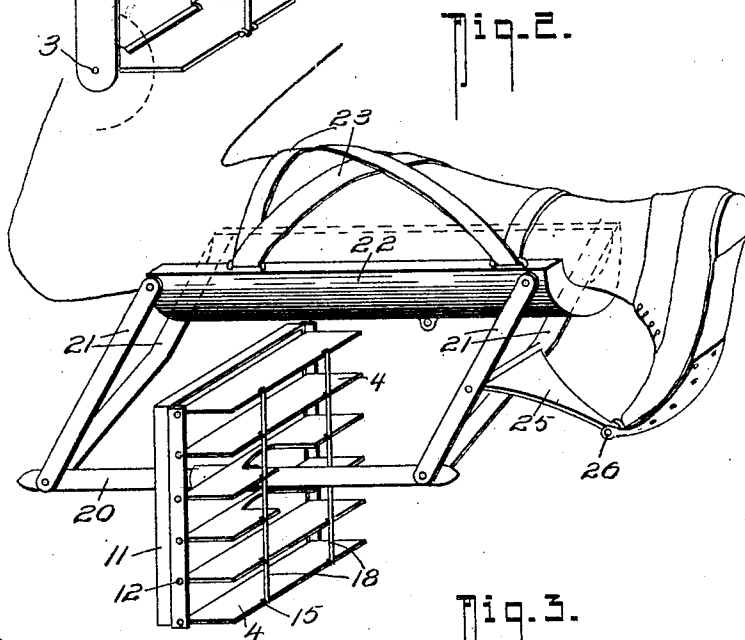
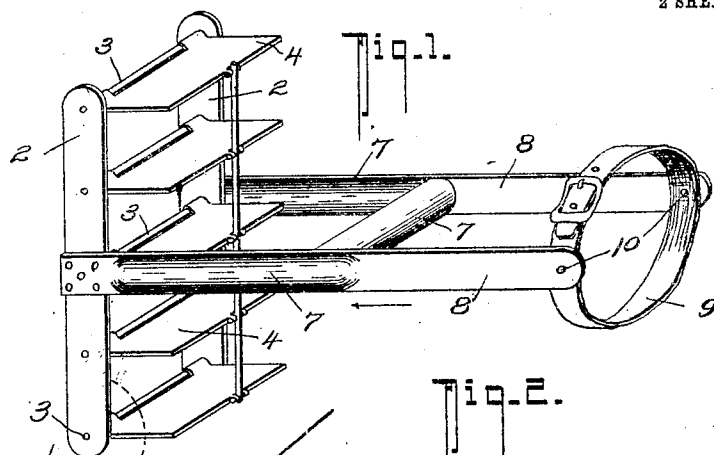


A. M. BULLOCK.
SWIMMING DEVICE.

APPLICATION FILED OCT. 18, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

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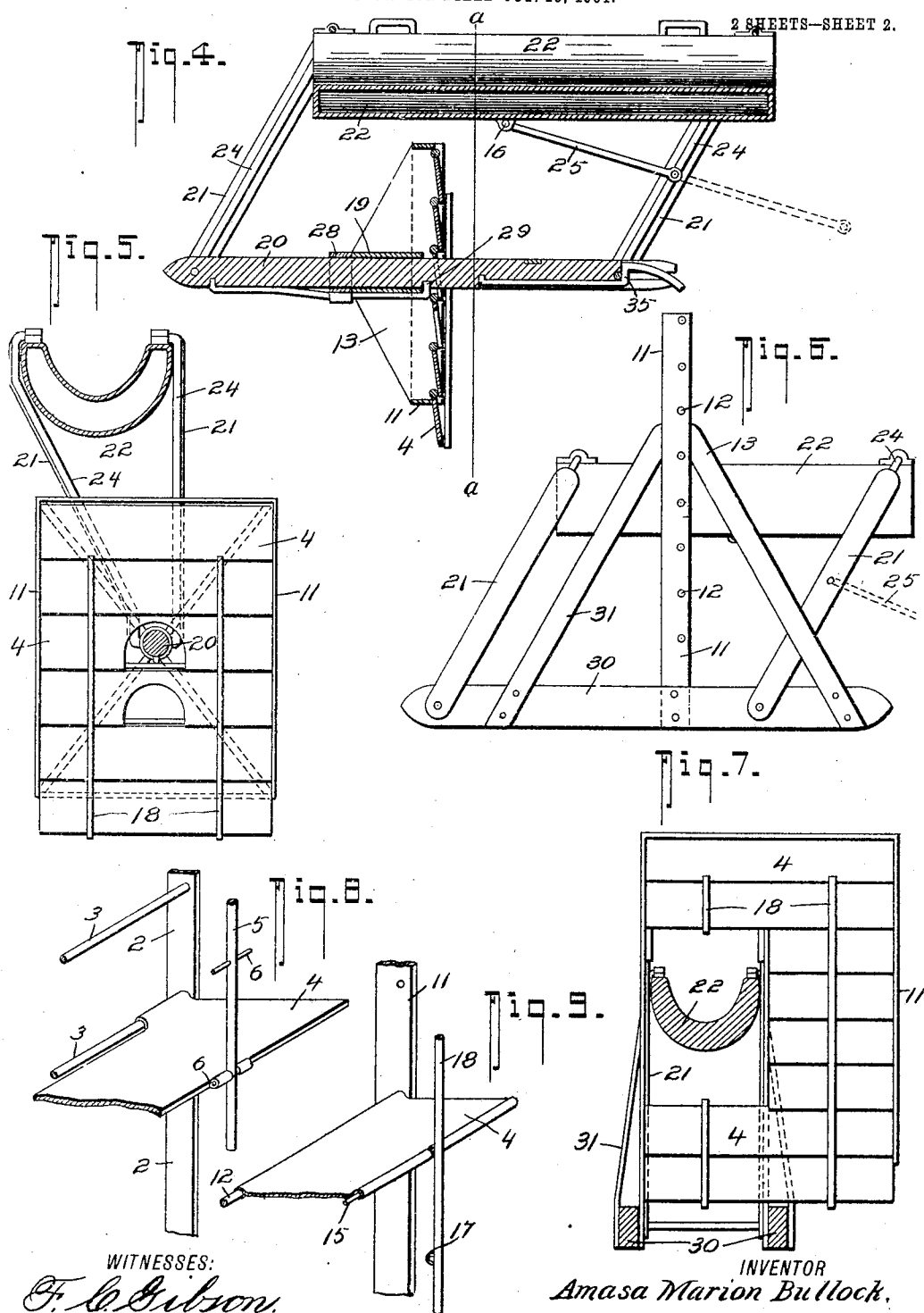
No. 805,525.

PATENTED NOV. 28, 1905.

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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

AMASA MARION BULLOCK, OF VANCOUVER, CANADA.

SWIMMING DEVICE.

No. 805,525.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed October 18, 1904. Serial No. 228,965.

To all whom it may concern:

Be it known that I, AMASA MARION BULLOCK, a citizen of the United States of America, residing at Vancouver, in the Province of British Columbia, Canada, have invented new and useful Improvements in Swimming Devices, of which the following is a specification.

My invention relates to a device which being worn by a swimmer will facilitate his progress by affording him an enlarged area with which to push himself forward in the water. I attain this object by providing for hands and legs an open rectangular framework, within which are suspended a series of light vanes hinged along one edge to the open framework in such a manner as to be susceptible of setting themselves with the current of water through them as the arm of the swimmer is extended or as the legs are drawn forward or bent for the stroke and that will close and form a plane normal to the movement during the stroke or back thrust. A framework of vanes of this kind is supported from each limb of the swimmer, to which it is secured in an approved manner by bands or straps, certain portions of the frame being made buoyant to an extent sufficient to sustain the weight of the device in the water. This constitutes the primary element of the device, the form and manner of attachment being modified to the requirements of arm and leg; but to supplement the leg movement with the instep action of the foot the vane-frame of the leg device is connected to the leg attachment by a system of parallel links pivotally secured, which link-motion is connected by a light rod to an attachment secured to the toe of a sandal or shoe on the foot. By this means the movement of the leg-vane frames is amplified by the instep action.

The particular construction and operation of the device is fully described in the following specification and illustrated in the drawings which accompany it.

Figure 1 is a perspective view of the device as applicable to the hands of the swimmer; Fig. 2, a similar view of the device as applied to the leg, showing the vanes open, as when the leg of the swimmer is drawn up for the stroke; Fig. 3, a similar view of the leg device during the stroke; Fig. 4, a longitudinal section showing the method of removably connecting the vane-frame to the parallel-link motion; Fig. 5, a cross-section through the leg attachment on the line A A in Fig. 4, showing the vane-frame in plan; Figs. 6 and 7, a side

elevation and cross-section showing a modified form of the leg vane-frame, and Figs. 8 and 9 details of the vane connection to the stems.

In the application of the light-hinged vanes to the requirements of a swimming device I find that the rectangular form of frame is the most convenient, and this construction is therefore common to both hand and leg devices.

For the hand attachment (see Fig. 1) the vane-frame is composed of two side members 2, maintained the required distance apart by light distance-rods 3, which are riveted or otherwise secured into the side members 2 and form the hinge-pins on which the vanes 4 are secured, the vanes being allowed free movement to either side, as indicated by the arc in dot and dash.

The free ends of the vanes are connected by a light wire stem 5, pivotally attached to each vane by small cross-pins 6, (see Fig. 8,) secured to the stem in such a manner that the stem will not interfere with the movement of the vanes to either side in assuming the closed position.

Toward the middle of the side members 2 is attached the handle-frame 7, which may be tubular in cross-section, so as to impart sufficient buoyancy to sustain the weight of the device when immersed in the water. The latter members of the handle-frame may be continued backward, as drawn at 8, and have a strap 9 secured to them by pins 10, so that the strap being secured round the forearm the handle may be released by the swimmer and the device will fall clear and set his hands free to grasp any desired object, or the backwardly-extended portions of the handle-frame may be omitted and the device merely attached to the wrist by a thong or cord.

In the application of the vanes of the leg device the vane-carrying frame may be constructed in the manner just described or, as shown in Figs. 4, 5, and 9, may consist of an open rectangular frame 11, into the side members of which the projecting ends of the hinge-wires 12 are inserted, the hinge-wires being secured to one edge of the vanes. The free edges of the vanes may also be wired, as at 15, (see Fig. 9,) and connected together, so as to move simultaneously, by wire stems 18, having loops 17 round the edge wire of each.

The frame 11, as shown in Fig. 4, is supported by diagonal webs 13 to a center boss or sleeve 19, by which the frame is removably secured to a rod 20, which forms a member of a parallel-link motion, the links 21 of which

are pivotally connected to a buoyant leg attachment 22, the buoyancy of which is designed to sustain the immersed weight of the device and which, partially encircling the front of the lower leg, is secured thereto by straps 23 or other suitable means. This buoyancy may be insured either by making the part hollow, as drawn, or by constructing it of buoyant material, such as cork, the surface in contact with the leg being padded with felt or other suitable material.

The pivotal connection of the link-motion may be conveniently made by reinforcing the thin flat links 21 with a wire 24, (see Fig. 5,) secured to them and which may be bent at the ends to form the pivots, as illustrated in Figs. 4 and 5.

The movement of the link-frame may be prevented and the vane-frame rigidly secured to the leg attachment 22 by a diagonal link 25, which is pivotally connected toward the center of the lower pair of links 21—that is, the pair nearer to the foot—and can be fastened when desired to the eye 16. (See Fig. 4.) This diagonal link may be disconnected from its attachment to 22 and being turned down may be connected to a pin attachment 26 toward the toe of a flexible shoe or sandal, when the movement of the instep of the foot can be made use of to amplify the leg movement of the vane-frame.

The vane-frame 11 is removably secured on the stem 20 of the parallel frame by a spring-latch 29, which secures it against a shoulder 28 on the stem, while a similar latch 35 secures the pivotal connection of the lower pair of links 21 and enables it to be removed for the withdrawal of the vane-frame over the end of the stem.

The position of the vane-frame may be more centrally disposed in relation to the leg by the adoption of a modification such as is shown in Figs. 6 and 7, where instead of the parallel motion-links being connected to a central stem 20 they connect to the ends of two members 30, to which the lower corners of the rectangular frame are secured, the upper portion of the frame being braced by diagonal stays 31.

I dispose the vanes horizontally, that their weight will tend to close them, and as they are free to turn either way the swimmer may turn on his back and they will work equally well; but although I prefer this arrangement I do not desire to be confined to it, as the vane-hinges may be placed vertically without departing from the spirit of the invention.

In the use of the device, although in the various applications of it the operation of the vanes is identical, the action of the limbs in applying the resistance of the vanes to the purpose of swimming may be considerably varied. Thus with the hand device where the handle-frame is not provided with the backward extension and strap as a means to secure it to the forearm the handle is merely grasped

with the vane-frame projecting in front, and the arms are thrown forward for the stroke with a slight outward curve and thereafter drawn back with a full-length stroke of the arms past the body, the handle being allowed to slip in the hand during the stroke; but where the handle-frame is provided with the backward extension, the frame being secured to the forearm, the arms are merely thrust forward and drawn directly back as far as the chest, with which movement, although the stroke is limited, a more effective use is made of the powerful arm and shoulder muscles.

With the leg-vanes the action of the limbs is very much the same as in swimming without their aid—namely, the legs are drawn up and under the body and are thrust back for the stroke, being kept merely far enough apart to avoid striking the frames together, as the wedge action of the recovery as in ordinary swimming is not necessary. It will be noticed that the vane-frames are thrown to the outer side of the legs to avoid the liability of one clashing with the other.

The manner illustrated in Figs. 4 and 5 of attaching the vane-frame to the stem of the parallel motion and of suspending the parallel links to the buoyant leg portion enables the device to be quickly taken apart and conveniently packed in small bulk for transportation, as when the vane-frame is removed the links will fold over on the leg attachment in a compact bulk.

The feet instead of acting merely as paddles are utilized to impart their considerable muscular power to propel the body forward, their effort being communicated to the vane-frame by connecting-links 25 through the parallel motion-links 21.

If the feet of the swimmer become tired, the instep action may be disconnected, and, the link 25 being attached to the eye 16, the vane-frame becomes rigidly braced to the leg and the leg movement alone is used.

In this application I make no claim to the detailed structure of the swimming device which is adapted to be attached to the hand or forearm of the swimmer and as shown in Fig. 1 of the drawings, as the same forms the subject-matter of my copending application, filed February 21, 1905, Serial No. 246,719, and a divisional part of this application.

Having now particularly described my invention and the manner of its operation, I declare that what I claim as new, and desire to be protected in by Letters Patent, is—

1. As a swimming device; an open frame comprising side members provided at intervals with cross-wires secured to both side members as distance-pieces, vanes hinged by one edge on the cross-wires and extending across the space between the side frames and between the wires, a link rod or rods connecting the free ends of the vanes in such a manner as to allow unrestricted movement of the vanes to

either side of the horizontal and means for securing the vane-frame to the limb of a swimmer.

2. As a swimming device, an open rectangular frame, a series of light vanes hinged at each end of one edge of the opposite sides of the open frame, such vanes being wider than the distance between the hinges, a link-rod connecting the free ends of the vanes together so as to allow unrestricted movement of the vanes to either side of the horizontal, and means for securing the vane-frame to the limb of the swimmer.

3. As a swimming device, a rectangular open frame and a series of parallelly-hinged vanes across the frame, the width of each vane being greater than the distance between the hinges, a buoyant frame secured to the rectangular frame, and means for attaching the buoyant frame to the limb of the operator.

4. As a swimming device; an open rectangular frame having a series of parallel hinged vanes across it susceptible of closing onto the approximate edge plane of the frame, means for securing such vane-frame to the leg of a swimmer, comprising a buoyant leg attachment adapted to fit and be secured on the front of the lower leg, a boss or sleeve secured to the vane-frame toward the center of its inclosed area, a rod or stem through the sleeve, parallel links connecting the ends of the stem to the buoyant leg attachment, a connecting-link pivotally attached to the links toward the foot, and means for connecting the other end of the connecting-link to the toe of a sandal or shoe on the foot of the swimmer.

5. As a swimming device; an open rectangular frame having a series of parallel vanes hinged within the frame, the free end of such vanes being connected by a stem or stems that will constrain them to move together without restricting their free movement, means for securing the vane-frame to the leg of a swimmer, comprising a buoyant leg attachment adapted to fit the front of the lower leg and be secured thereto, a sleeve or boss secured to the vane-frame toward its center, a rod or stem through the boss to which it is

removably secured, two pairs of pivotally-connected parallel links from the buoyant leg attachment to the ends of the rod or stem, a link pivotally attached to the pair of links toward the foot, means for securing the free end of such link to the toe of a sandal or shoe, and means for connecting the free end of the link when disengaged from the toe to the buoyant leg attachment.

6. In a swimming device; means for securing a rectangular vane-frame of the character described to the connecting-stem of a parallel-link motion by which the frame is secured to the leg attachment, comprising a central boss or sleeve forming part of the vane-frame and designed to fit the link-connecting stem, a shoulder on the connecting-stem against which the sleeve is checked, a spring-latch secured to the stem and designed to retain the sleeve against the shoulder, and a spring-latch to retain one of the link connections to the stem.

7. As a swimming device, an open rectangular frame, a series of vanes hinged across the frame and opening to one side, means for connecting the free edge of the vanes together to move in unison, a buoyant frame secured to the rectangular frame; and means for securing the buoyant frame to the limb of the operator.

8. As a swimming device, an open rectangular frame, a series of vanes hinged across the frame and opening to one side, means for connecting the free edge of the vanes together, to move in unison, a buoyant frame secured to the rectangular frame, means for securing the buoyant frame to the limb of the operator, and means secured to the foot of the operator and coöperatively joined with the connection between the rectangular and buoyant frames for imparting motion to the rectangular frame from the foot of the operator.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AMASA MARION BULLOCK.

Witnesses:

A. E. LEES,
ROWLAND BRITAIN.