C. W. HILL.

FOOT OR LEG ATTACHMENT FOR USE IN SWIMMING.

APPLICATION FILED MAY 25, 1908.

913,382. Patented Feb. 23, 1909.

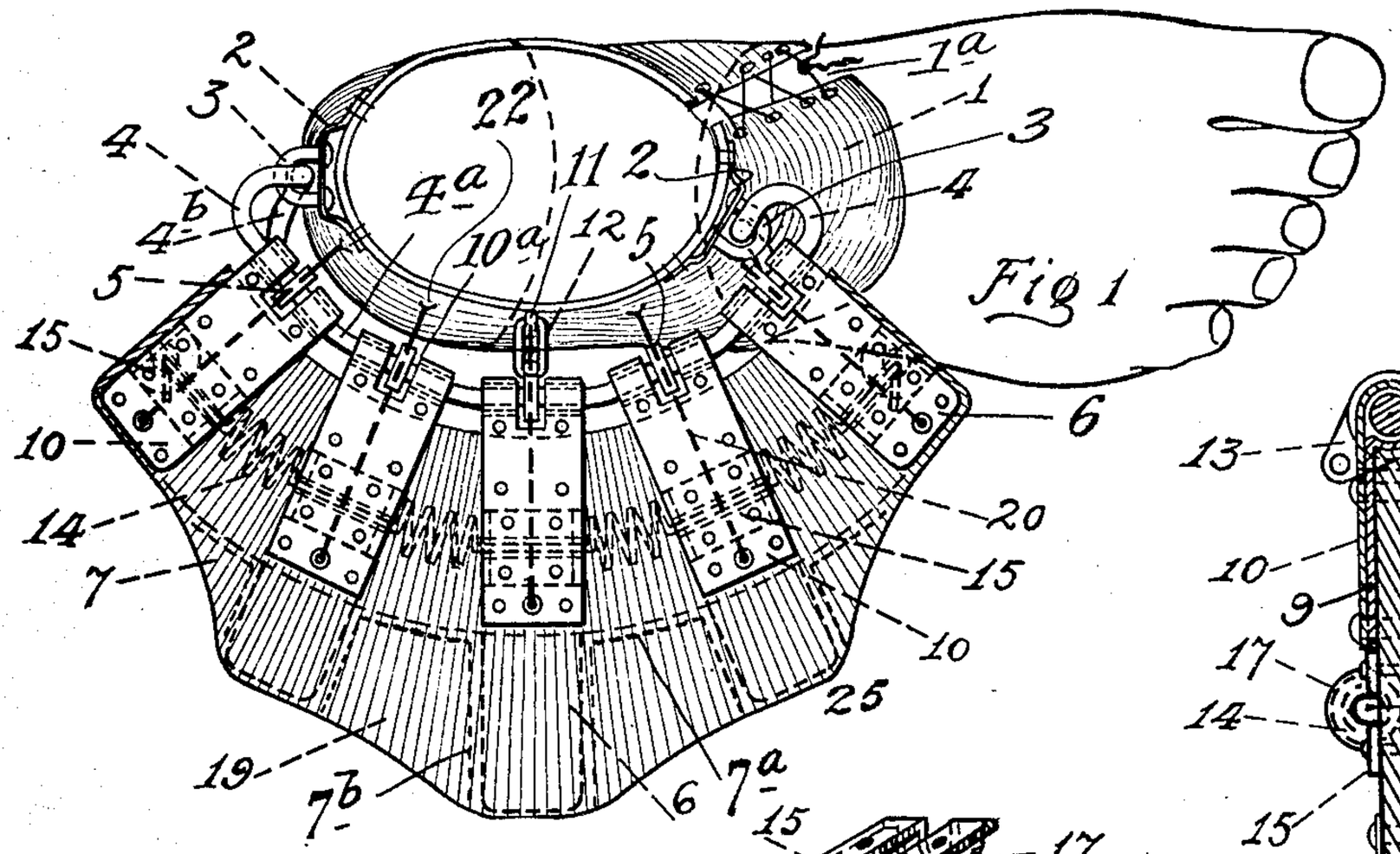

Fig 1

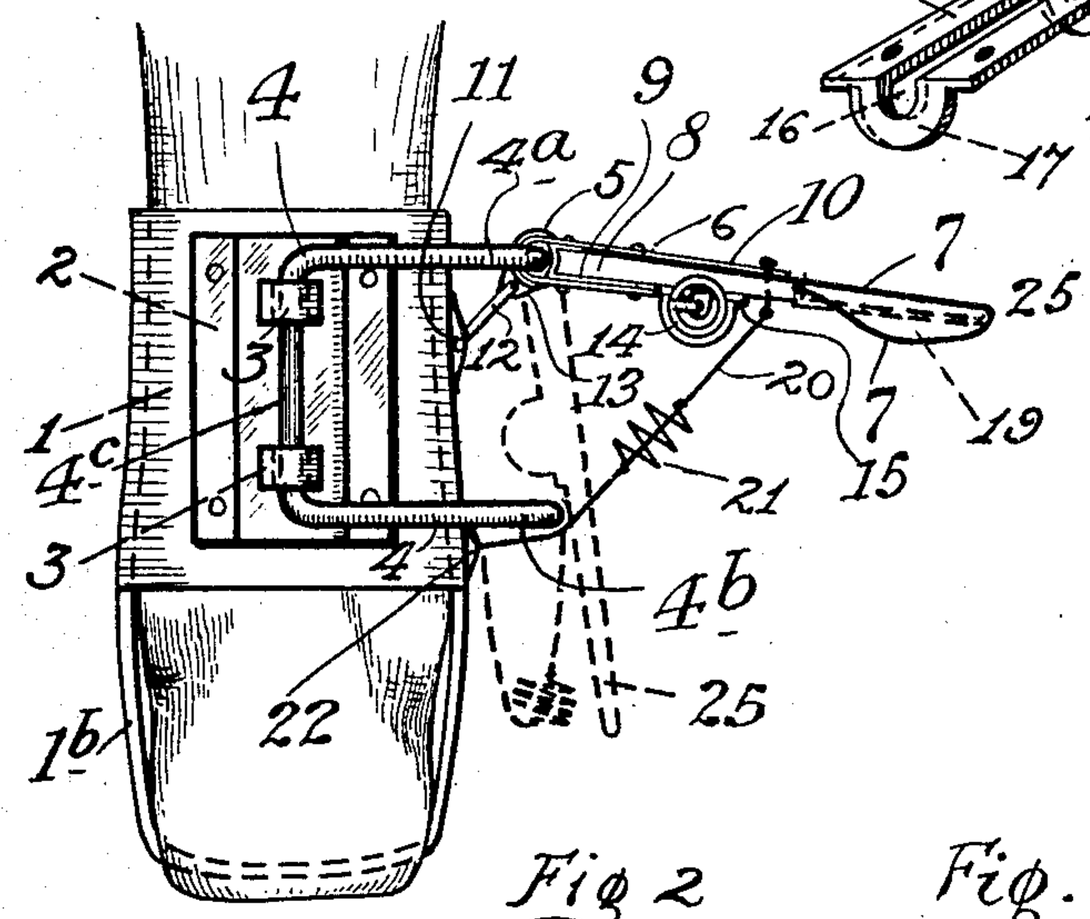

Fig 2

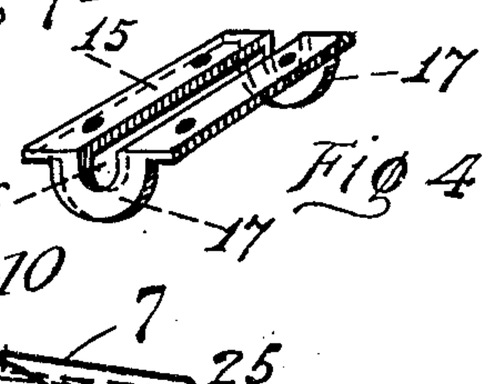

Fig 4

Fig. 3.

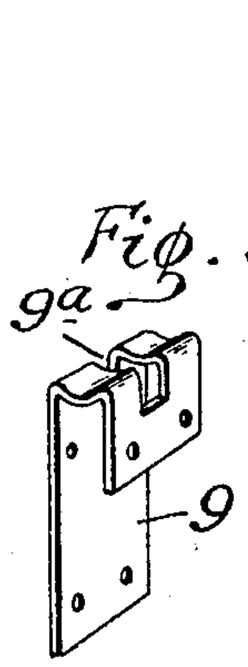

Fig. 5.

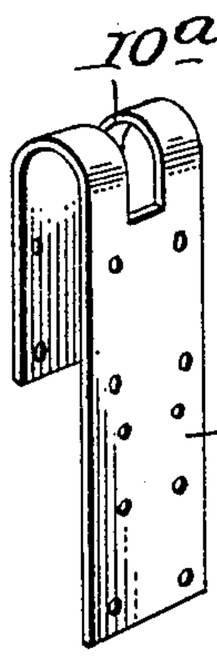

Fig. 6.

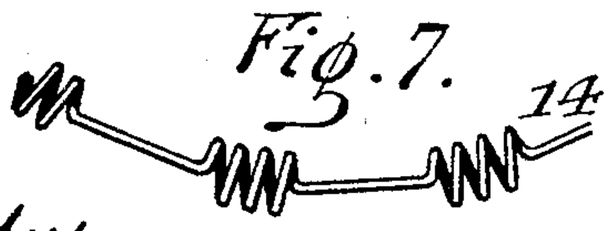

Fig. 7.

Witnesses:-
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UNITED STATES PATENT OFFICE.

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FOOT OR LEG ATTACHMENT FOR USE IN SWIMMING.

No. 913,382. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed May 25, 1908. Serial No. 434,707.

To all whom it may concern:

Be it known that I, CHARLES W. HILL, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Foot or Leg Attachments for Use in Swimming, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improved attachments for the legs or feet in swimming, and the object thereof is to provide an improved attachment or attachments of this class which are simple in construction and operation and adapted to expand in the downward or backward movement or stroke of the legs and contract in the forward, upward or return movement or stroke, the expansion of said attachment during the downward or backward stroke of the legs giving greater power and speed to the swimmer, and both of said operations being performed automatically with the least possible amount of friction or resistance, means being also provided for preventing interference of the device with walking or diving.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvements are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a plan view of my improved attachment showing a method of connecting it with the right foot or ankle; and showing the device in its expanded position, Fig. 2 a rear view of the device as shown in Fig. 1, and showing the parts of the attachment in different positions in full and dotted lines, Fig. 3 a section on an enlarged scale of part of the attachment detached, the section being taken on line 3—3 of Fig. 1, Figs. 4, 5 and 6 perspective views of parts of the attachment also on an enlarged scale, and;—Fig. 7 a detail view of a spring employed in the construction of my improved attachment.

Referring to the drawing for a more particular description of my invention the numeral 1 designates a foot and ankle attachment shoe or cover consisting preferably of a wide band of any suitable flexible material, the separate ends of which are adapted to be laced together as shown at 1^a, the said device being also provided with a strap, band or member 1^b adapted to be passed around the bottom of the foot, the operative parts of the swimming attachment being connected with the said foot and ankle attachment as hereinafter described. The part 1 is provided at the front and back thereof with suitably shaped plates 2 which are riveted thereto or secured thereto in any desired manner, and to which are riveted loop-shaped keepers 3 with which is connected a continuous frame 4 composed of segmental top and bottom side members 4^a and 4^b connected at their ends by end members 4^c which pass through the keepers 3. The end members 4^c of the frame 4 are preferably curved inwardly or set inwardly, and when the foot or ankle member 1 is secured in position, the top and bottom segmental frame members 4^a and 4^b are supported at a predetermined distance from the foot or ankle member as clearly shown in Figs. 1 and 2, and preferably only on the outer side of said foot or ankle as shown. Mounted on the top frame member 4^a are several ribs or arms 6 preferably composed of a central core member 8 of wood or other buoyant material or construction, and said ribs or arms are preferably radially arranged and connected one to the other by a web member 7 and a spring 14. Each rib 6 is also provided at its inner end with a yoke-shaped shoe 9 the upper side of which is preferably shorter than the under side; one of which is shown also in perspective in Fig. 5, and over which are secured yoke-shaped members or shoes 10, the under side of which is preferably shorter than the upper side; one of which is shown also in Fig. 6.

In practice the yoke-shaped shoe members 9 are first placed in position on the inner ends of the arm members 8 as shown in Fig. 3, after which the yoke-shaped shoe members 10 are slipped into position over the top frame member 4^a and onto the ends of said arms, said yoke-shaped shoe members being provided in the folded ends thereof with slots or recesses 9^a and 10^a respectively arranged to engage with or straddle collars or projections 5 secured to the frame member 4^a, said collars being spaced to correspond with the position of the arms 6, and being

secured in place before the yoke-shaped shoe members 10 are passed on over the frame member 4ª and secured to the arm 6. The central collar 5 is provided with a backwardly and downwardly directed projection 13 with which is connected a link 12, and the link 12 is connected with the foot and ankle member 1 at 11, and each of the collars 5 may be provided with a link 12 if desired. The rib members 6 are all connected one to the other by a spirally curved spring 14 formed with alternating coiled and uncoiled divisions which is secured to the bottom of said arms by means of plates 15 which are attached transversely of said arms and provided with longitudinal slots 16 and yoke-shaped end members 17. In this operation the spring 14 is placed in proper position on the bottoms of said ribs with the coiled division between said ribs, after which the plates 14 are secured in position over the uncoiled division, the yoke-shaped end members 17 of the plates 15 fitting between the coils of the spring and holding the same in proper position.

The web member 7 is formed in one piece and covers the top portion of the ribs or arms 6, with the exception of the yoke-shaped shoe members 10, and is turned under the bottom of said arms and extended backwardly to about the end of the longer or upper side of the yoke-shaped shoe members 10, and at the ends of the arms 6 or the body portions 8 thereof are placed cushions 18 held in place by the web member 7, and the top and bottom parts of the web member 7 are stitched or otherwise joined between the arms 6 as shown at 7ª and around said arms as shown at 7ᵇ, this last stitching forming pockets to receive the ends of the arms 6 or the body portions 8 thereof, and between the ends of said arms the stitching at 7ª and 7ᵇ form air pockets 19, said web 7 being attached to the rib 6 by the yoke member 10.

Connected with each of the arms 6 is a cord 20, these cords being connected with the foot and ankle member 1 at 22; each of the cords 20 is provided with a spring 21, and these springs are expanded when the arms 6 are in their extended position as shown in full lines in Fig. 2 and contracted when the arms 6 are folded as shown in dotted lines in Fig. 2. The arms 6 and web member 7 connected as described form a flap or wing 25 which is free to swing vertically on the top frame member 4ª, the said arms 6 being held in position by the said frame member 4ª on which they are mounted; and the collars 5 secured to said frame and the cords 20 limiting the upward movement of the flap or wing 25 and the bottom frame member 4ᵇ limiting the downward movement thereof, the springs 21 serving to prevent a shock or jar when the flap or wing 25 reaches the limit of its upward movement or the movement occasioned by the backward or downward movement of the feet in swimming. The cushions 18 at the ends of the arms 6 serve to prevent shock or jar if said arms should come in contact with any external object, the spring 14 normally serves to pull the flap or wing 25 downwardly or into the position shown in dotted lines in Fig. 2, and holds said flap in this position if the wearer of the device is out of the water or diving, but the said flap or wing is always held, when in its inoperative position, as shown in dotted lines in Fig. 2 so that the backward or downward movement of the feet will catch the inner side thereof and force it outwardly into the position shown in full lines in Fig. 2, in which position it will catch the water in the downward or backward movement of the feet and force the swimmer forwardly and in the upward or forward movement of the feet the said flap or wing will swing into the position shown in dotted lines in Fig. 2, and will pass through the water with the least possible amount of friction.

The parts 9 and 10 serve to reinforce the arms 6 or the core or body portions 8 thereof, the part 10 also serving for connecting said arms with the frame member 4ª, and in securing the web member 7 to said arms; in practice the core or body portions 8 will be made of the most buoyant material or construction that can be employed.

It will be understood that one of these devices may be applied to each foot, and that the flaps or wings of said devices are arranged preferably on the outer sides of the feet to avoid interference with walking, running or jumping, but are always ready for use in swimming; and constructed in the manner described my improvement is perfectly adapted to accomplish the result for which it is intended, and is quickly and easily secured to the foot or feet, and as quickly and as easily detached therefrom whenever desired.

It will be apparent that many changes in and modifications of the details of construction herein shown and described may be made, within the scope of the appended claims, without departing from the spirit of my invention or sacrificing its advantages, and I reserve the right to make all such alterations therein as fairly come within the scope of the invention.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is;—

1. A swimming attachment adapted to be connected with a foot or ankle and provided with a segmental support which is on the outer side of the foot when the device is in position, and a flap or wing provided with radial ribs or arms rotatably mounted on said support, said radial ribs or arms being connected by a spring having alternate coiled

and uncoiled divisions, and means for limiting the movement of said flap or wing in both directions.

2. A swimming attachment adapted to be connected with a foot or ankle, and provided with a segmental support which is on the outer side of the foot when the device is in position, and a flexible flap or wing provided with radial arms rotatably mounted on said support, said radial arms being connected by a spiral spring secured to the bottom sides thereof, and means for limiting the movement of the flap or wing in both directions.

3. A swimming attachment for the feet comprising a foot and ankle member adapted to be secured to a foot, a frame composed of top and bottom segmental members connected with the front and back portions of the foot and ankle member, and on the outer side of the foot when the device is in position, and a flap or wing member composed or radial arms mounted on the top frame member and connected by a flexible web member, said flap or wing member being freely movable vertically on said top frame member, one movement thereof being limited by the bottom frame member, and the other by suitable stop devices connected therewith, the radial arms of the flap or wing member being connected by a spiral spring which normally serves to draw them downwardly.

4. A swimming attachment for the feet comprising a foot and ankle member adapted to be secured to the foot, a frame composed of top and bottom segmental members connected with the front and back portions of the foot and ankle member, and on the outer side of the foot when the device is in position, a flap or wing member composed of radial arms or ribs mounted on the top frame member and connected by a flexible web member, said flap or wing member being freely movable on said top frame member, the downward or backward movement thereof being limited by the bottom frame member, and spring cord devices connected therewith and with the foot and ankle member for limiting the upward or forward movement thereof.

5. A swimming attachment adapted to be connected with the foot and ankle and comprising a flexible ankle strap adapted to be passed around the ankle and having a cross strap connected with the bottom edge thereof adapted to be passed beneath the foot, means for connecting the ends of the ankle strap, keepers secured in pairs to the front and back portions of the ankle strap, a support comprising parallel outwardly curved members connected by end members which are passed through said keepers, said support being on the outer side of the ankle when the attachment is in position, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of said support, said radial ribs or arms being connected by a flexible web.

6. A swimming attachment adapted to be connected with the foot and ankle and comprising a flexible ankle strap adapted to be passed around the ankle and having a cross strap connected with the bottom edge thereof adapted to be passed beneath the foot, means for connecting the ends of the ankle strap, keepers secured in pairs to the front and back portions of the ankle strap, a support comprising parallel outwardly curved members connected by end members which are passed through said keepers, said support being on the outer side of the ankle when the attachment is in position, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of said support, said radial ribs or arms being connected by a flexible web, the movement of said flap or wing in one direction being limited by the bottom member of the support, and means connected with said ribs or arms and with the ankle strap for limiting said movement in the opposite direction.

7. A swimming attachment adapted to be connected with the foot and ankle and comprising a flexible ankle strap adapted to be passed around the ankle and having a cross strap connected with the bottom edge thereof adapted to be passed beneath the foot, means for connecting the ends of the ankle strap, keepers secured in pairs to the front and back portions of the ankle strap, a support comprising parallel outwardly curved members connected by end members which are passed through said keepers, said support being on the outer side of the ankle when the attachment is in position, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of said support, said radial ribs or arms being connected by a flexible web, the movement of said flap or wing in one direction being limited by the bottom member of the support, and means connected with said ribs or arms and with the ankle strap for limiting said movement in the opposite direction consisting of cords connected with said ribs or arms and with said ankle strap below the bottom member of the support.

8. A swimming attachment adapted to be connected with the foot and ankle, said attachment being provided with front and back keepers, a support connected with said keepers and comprising outwardly curved top and bottom members connected by end members which are passed through said keepers, said top and bottom members being off-set from the ankle when the attachment is in position, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of the support, the movement of said flap or wing in one direction

being limited by the bottom member of said support, and means for limiting said movement in the opposite direction.

9. A swimming attachment adapted to be secured to the foot and ankle and provided with an outwardly curved support which is off-set from the outer side of the ankle when the attachment is in position and which consists of top and bottom members, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of the support and connected by a flexible web, the movement of said flap or wing downwardly or backwardly being limited by the bottom member of the support, and means for limiting said movement in the upward or forward direction.

10. A swimming attachment adapted to be secured to the foot and ankle and provided with an outwardly curved support which is off-set from the outer side of the ankle when the attachment is in position and which consists of top and bottom members, and a flap or wing provided with radial ribs or arms rotatably mounted on the top member of the support and connected by a flexible web, the movement of said flap or wing downwardly or backwardly being limited by the bottom member of the support, and means for limiting said movement in the upward or forward direction consisting of cords connected with said ribs or arms and with the ankle attachment below the bottom member of the support.

11. A swimming attachment adapted to be connected with the foot and ankle, said attachment being provided with outwardly curved supports 4^a and 4^b which are off-set from the ankle when the attachment is in position, and a flap or wing composed of radially arranged ribs or arms connected by a flexible web, said radially arranged ribs or arms being loosely and rotatably mounted on the top member of the support and comprising buoyant core pieces having metal shoes connected with the inner ends thereof and provided with heads through which the top member of the support passes.

12. A swimming attachment adapted to be connected with the foot and ankle, said attachment being provided with outwardly curved supports 4^a and 4^b which are off-set from the ankle when the attachment is in position, and a flap or wing composed of radially arranged ribs or arms connected by a flexible web, said radially arranged ribs or arms being loosely and rotatably mounted on the top member of the support and comprising buoyant core pieces having metal shoes connected with the inner ends thereof and provided with heads through which the top member of the support passes, the central rib or arm being longer than the others, the lengths of which decrease to the front and back ribs or arms.

13. A swimming attachment adapted to be connected with the foot and ankle and provided with outwardly curved supports which are on the outer side of the ankle when the attachment is in position and one of which is above the other, and a flap or wing provided with radial ribs or arms which are loosely mounted on the top support and adapted to turn thereon and connected by a flexible web provided with pockets into which the outer ends of said ribs or arms are passed, that part of said web between said ribs or arms being provided with air pockets, the movement of said flap or wing in one direction being limited by the bottom support, and means for limiting said movement in the opposite direction.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 23rd day of May, 1908.

CHARLES W. HILL.

Witnesses:
M. E. Doody,
A. R. Appleman.