May 16, 1933. E. B. JACKSON 1,909,180

LIFE SAVING GARMENT

Original Filed March 5, 1931 3 Sheets-Sheet 1

Fig. 1.

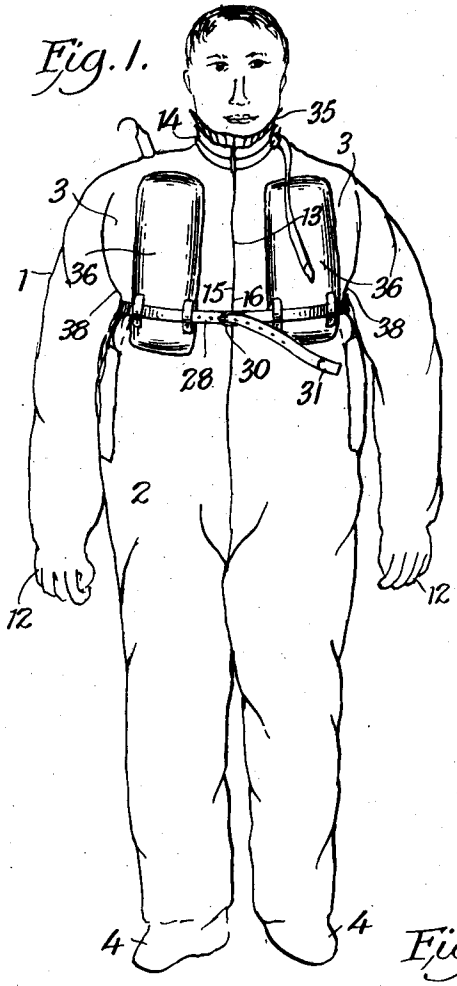


Fig. 2.

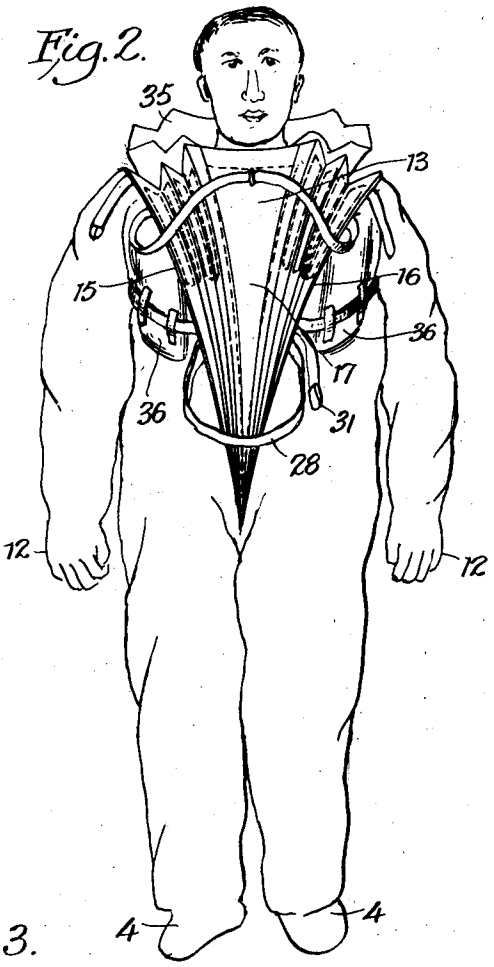
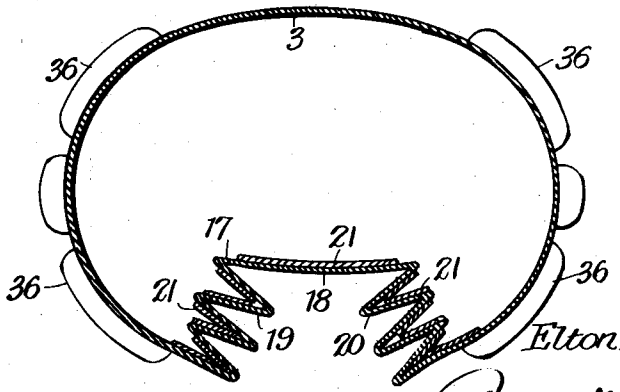


Fig. 3.



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Fig. 4.

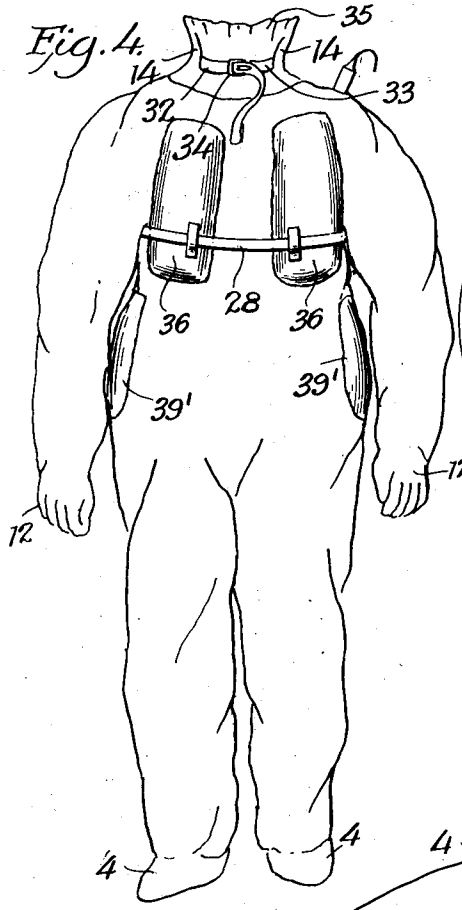


Fig. 5.

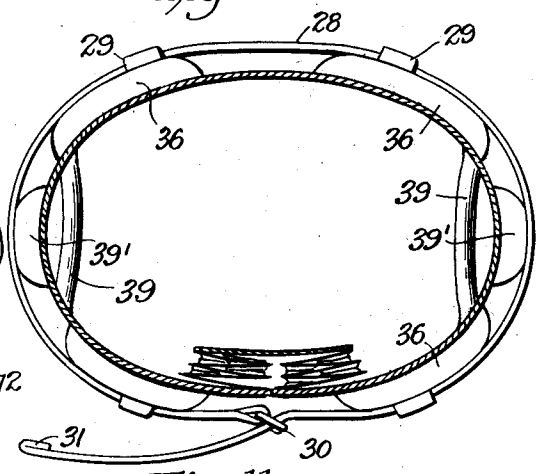


Fig. 11.

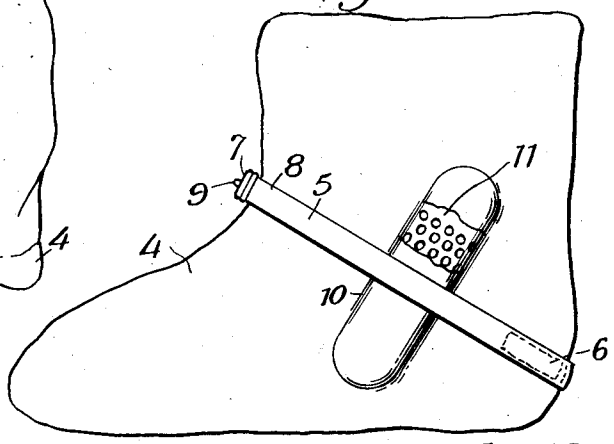


Fig. 6.

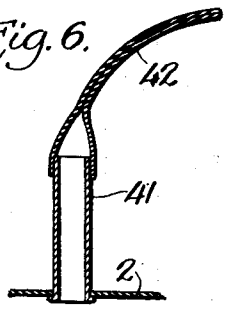


Fig. 10.

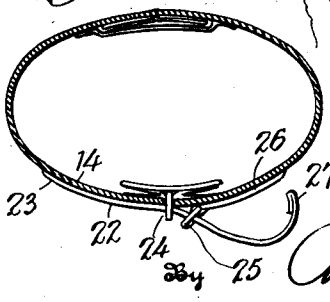
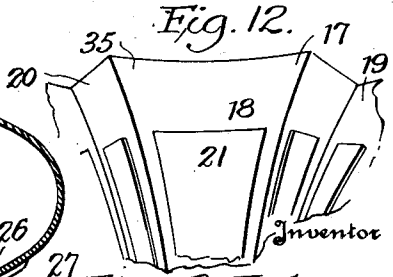


Fig. 12.



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LIFE SAVING GARMENT

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Fig. 7.

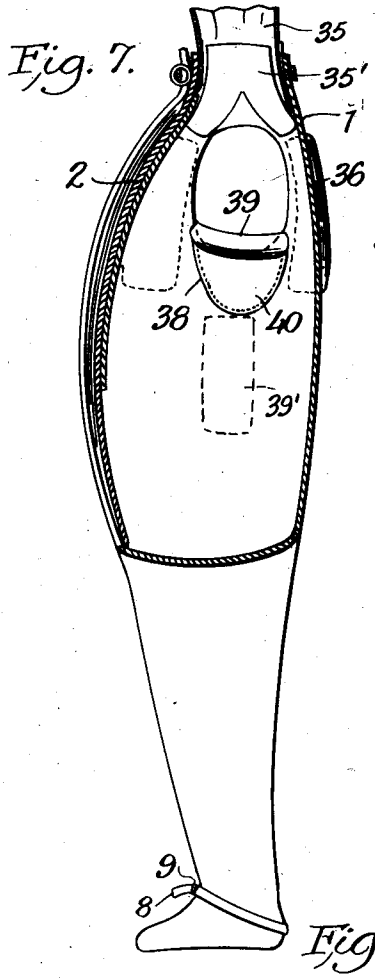


Fig. 8.

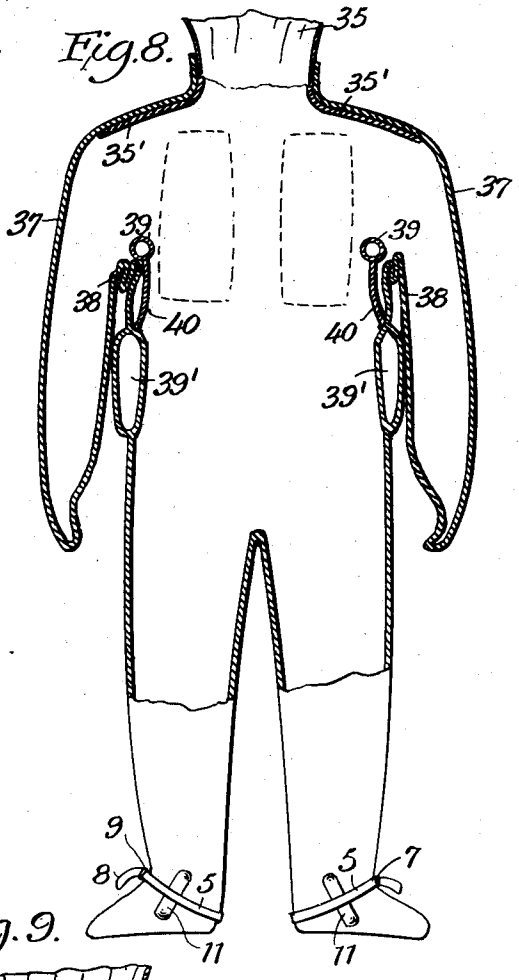
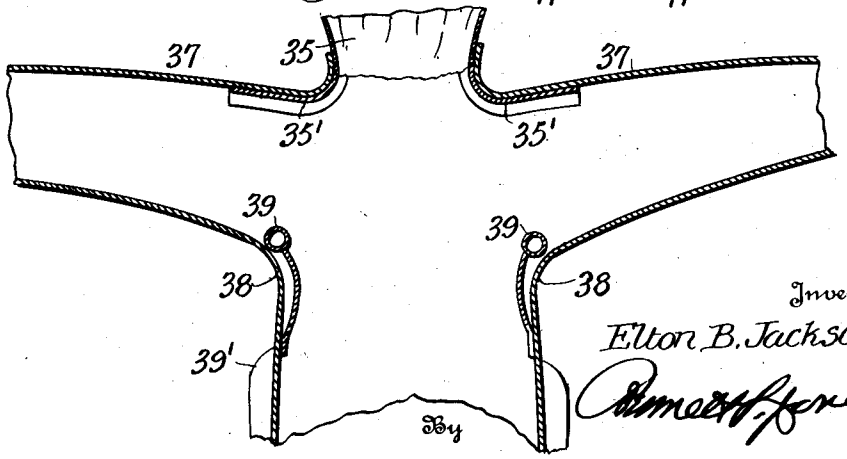


Fig. 9.



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UNITED STATES PATENT OFFICE

ELTON B. JACKSON, OF BALTIMORE, MARYLAND, ASSIGNOR TO SAFETY DEVICES CORPORATION, OF DOVER, DELAWARE, A CORPORATION OF DELAWARE

LIFE SAVING GARMENT

Application filed March 5, 1931, Serial No. 520,381. Renewed July 25, 1932.

This invention relates to life saving garments, and particularly to waterproof garments of the one-piece or union type, such as disclosed in my prior application for patent, filed June 5, 1929, Serial No. 368,501, in which the construction is such that the wearer steps into and out of the garment.

One object of my present invention is to provide a garment, which, like the garment disclosed in my said application Serial No. 368,501, is devoid of any entrance and exit openings except a neck opening and means for permitting necessary expansion and contraction of the garment, whereby the necessity of employing fastening means for closing the entrance and exit openings in a manner to seal the same against the entrance of water is practically avoided, the present invention furnishing a garment in which the number of fastening connections required is reduced to a minimum.

A further object of the invention is to provide a garment having a jacket portion provided with a slit extending from the neck to the crotch and a gusset closing the opening, which gusset is formed with a central non-folding section, and a plurality of folding sections connecting the same with the margins of the gusset, whereby the sides of the gusset are adapted to fold in an accordion pleated form, and which non-folding and folding portions are stiffened or reinforced in such manner as to ensure their correct folding in the operation of donning the garment.

A still further object of the invention is to provide a simplified and improved construction of neck portion of the garment in which the neck opening will be sealed against the entrance of water up to substantially the level of the chin of the wearer, while maintaining sufficient flexibility of the neck portion to prevent discomfort to the wearer and allow the wearer to have free and unrestricted movements of the head and neck.

A still further object of the invention is to provide a life saving garment in which the buoying members or pockets are disposed upon the exterior of the garment, so as to adapt the garment to better fit the wearer and prevent pocketing of air within the garment and buoying disturbances as a result thereof, and which buoying members are so arranged upon the upper part of the garment as to make the center of buoyancy sufficiently high to keep the wearer properly balanced and in erect position in the water.

A still further object of the invention is to provide a construction of the sleeves of the garment which will prevent them from being accidentally torn by strain when the arms of the wearer are raised to a high elevation, and which embodies buoying members arranged in the region of the arm pits to limit the upward movement of the garment on a person, in the event that the garment should be too long for a person donning the same, thereby preventing the center of buoyancy from being too high for such person.

A still further object of the invention is to provide simple and effective means whereby the jacket part of the garment may be drawn taut about the wearer in a practically instantaneous manner and without the necessity of manipulating a number of fastening devices.

A still further object of the invention is to provide novel weighting and securing means for the foot portions of the garment, whereby the operation of fitting the feet therein is facilitated and other advantages obtained.

A still further object of the invention is to provide simple, reliable and efficient automatic means for allowing air to escape from the garment when the same is applied.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:

Fig. 1 is a view showing the garment as applied for use.

Fig. 2 is a similar view showing the garment applied but with the accordion pleated gusset in opened or extended condition.

Fig. 3 is a horizontal transverse section through the garment taken on a line between the arm pits and the shoulders and showing the accordion pleated gusset in partly folded condition.

Fig. 4 is a rear view of the garment shown in Figs. 1 and 2.

Fig. 5 is a sectional plan view similar to Fig. 3, taken on a line just below the arm pits and showing the garment in closed condition.

Fig. 6 is a sectional view thru the air vent showing the same in open condition.

Fig. 7 is a central front-to-rear section through the closed garment.

Fig. 8 is a vertical transverse section thereof.

Fig. 9 is a section through the jacket part of the garment showing particularly the sleeve construction.

Fig. 10 is a horizontal section through the neck portion of the garment.

Fig. 11 is a view of a foot portion of the garment.

Fig. 12 is a fragmentary view looking from the inside toward the accordion pleated gusset and showing the same outspread.

Referring now more particularly to the drawings, 1 designates the garment, which is made of suitable waterproof material and comprises the trousers portion 2 and jacket portion 3 integrally connected to form a one-piece or union garment. The trousers portion 2 is provided at the free ends of the leg sections thereof with foot receiving portions 4. Each of these portions is provided with a band or strap 5 to hold the foot portion in applied position about the foot of the wearer. The strap 5 is secured centrally of its length at the heel, as indicated at 6, and its free ends 7 and 8 are adapted to be extended diagonally toward the front of the foot and across the instep, the end 7 being provided with a buckle portion 9 for securing the end 8 in position. Applied at each side of the foot portion is a sack or receptacle 10 containing shot or other weights 11 to keep the lower portion of the body of the wearer down in the water and thereby assist in maintaining the body of the wearer in an erect position. These receptacles 10 are preferably disposed diagonally of the foot portion or at an angle between the vertical and horizontal and are crossed and engaged by the sides of the strap 5, to hold the receptacles from sagging and to keep the foot portion in a snug position on the wearer. This arrangement of the receptacles 10 adapts the intervening portions of the sides of the foot portions between the heel and ankle to readily yield or give to permit escape of air upwardly into the garment when the feet are inserted, and allow the feet of the wearer to be more quickly and easily inserted in place. The arm sections of the jacket portion 3 of the garment are provided with mittens or gloves 12 to encase the hands of the wearer and which, as shown, are preferably integral with the sections of the garment of which they comprise a part.

In accordance with my invention, the garment is provided with a normally closed opening 13 at the front, that is to say, the front of the garment is divided between the neckband 14 and the crotch to provide placket edges 15 and 16 permanently united at the crotch and thence free from connection up to and through the neckband so as to spread in V fashion to a greater or less extent. This opening 13 is normally closed by an expansible and contractible gusset 17, which extends from the crotch to the neck, and is made, like the body of the garment, of waterproof material and permits of the use of a neck opening of adequate size to allow a person to step through the neck opening into and out of the garment, and also permits of the expansion and contraction of the gusset portion of the garment so that persons of any predetermined size or sizes may easily enter the garment and then, by contracting the expansible and contractible portion, the garment may be drawn snugly about the body of the entered person.

The gusset 17 comprises a central, substantially flat section 18 and side wings or walls 19 and 20 connecting said section 18 with the placket edges 15 and 16. The walls 19 and 20 may be of unitary type and made of some soft and flexible waterproof material, and said walls are accordion pleated or consist each of a plurality of sections adapted to fold one upon the other, accordion fashion, to permit contraction and expansion of the garment, Fig. 3 showing the arrangement when the pleated walls are partly expanded and Fig. 5 the arrangement when the pleated walls are collapsed or folded between the center or body wall 18 and the placket edges 15 and 16 to contract the garment about the body of the wearer. In order to prevent collapse of the wall 18 and to prevent the walls 19 and 20 from folding partly or wholly inside out, and to ensure said walls automatically folding in a proper manner when the gusset is contracted, the inner face of the wall 18 and the inner faces of the folds of the walls 19 and 20 are provided with stiffening plies 21, made of some flexible, waterproof material of less flexibility than said walls 18, 19 and 20 and sufficiently stiff for the purpose. These stiffening plies are V-shaped to conform to the shape of the wall 18 and pleats of the walls 19 and 20 and are of limited vertical extent, that is, said stiffening members extend from the base of the neckband 14 to a point about the lower end of the sternum or breast bone, so as to prevent rigidity of the suit below such line, so that the flexibility of the waist portion of the garment will not be interfered with and the wearer will be permitted to have free body movements at and in the region of the waistline. The described construction of the gusset 17 ensures a correct automatic folding of the gusset and closure of the jacket of the garment by the simple securing movement of a closure or fas-

tening member, and without the necessity of the wearer employing any manipulating movements of the gusset to secure a correct folding action thereof. The closure member for performing this function comprises a band or strap 22 secured at one end, as at 23, at one side of the front of the neckband 14 and having its free end passing through a guide loop 24 on the wall 18 of the gusset 17 and adapted for engagement at its free end with a buckle 24 on a keeper strap 26, secured to the front of the neckband at the opposite side thereof, so that by simply engaging and pulling upon the free end of strap 22, which is always engaged with members 24 and 25, the meeting edges 15 and 16 of the front portions of the jacket will be drawn together and the accordion pleated gusset simultaneously folded and closed. The strap 22 is provided at its free extremity with a doubled portion 27 forming a stop to prevent it from being withdrawn from engagement with the buckle loop 25. The strap 22 is sufficiently long to allow the meeting edges 15 and 16 and the gusset 17 to spread wide open, as shown in Fig. 2, and a single motion of this strap 22 adapts the jacket portion to be drawn instantaneously to a closed position. In addition to the strap 22 a second strap 28 may be employed below the arm pits and between the same and the waistline for the purpose of preventing any gapping or bulging of the meeting edges 15 and 16 of the front openings 13 in the body movements of the wearer. This strap is continuous and passes at the front and rear of the garment through guide loops 29, and one end of the strap is provided with a buckle 30 and the other end of the strap is adapted to be passed through the buckle and secured to the tongue thereof, the latter-named end of the strap having a folded over portion or stop 31 to prevent it from being drawn outward through the buckle loop 30, so that such end of the strap is always in position to be grasped for either a garment closing or a garment opening movement. According to circumstances, either strap 22 or 28 may first be manipulated for a closing action in which they are successively manipulated, upon the operation of which the garment will be closed in an absolutely secure manner.

The neckband 14 is of divided type, the same comprising portions having front end edges intersecting the meeting edges 15 and 16 and spaced rear end edges, as shown in Fig. 4, which rear end edges have secured thereto strap members 32 and 33, the latter having a buckle 34 at its free end through which the free end of the former is adapted to be passed to draw the portions of the band 14 together at the rear of the neck. The gusset 15 has a neck extension 35 which projects above the band 14 to a point up to about the level of the chin of the wearer. When the jacket is closed and the neckband drawn snugly about the neck by means of the straps 32 and 33 the accordion pleated flexible extension 35 of the gusset will be folded, as shown clearly in Fig. 1, and drawn snugly in contact with the neck of the wearer, closing the suit against access of water up to the point of the line of the chin of the wearer. The flexibility of this neck extension of the gusset allows of this operation, and also permits such neckband extension to freely flex and bend outwardly over the neckband so as to allow the wearer to have free neck movements and prevent any discomfort or objectionable pressure of such neck extension on the neck of the wearer. The construction of the gusset, as above described, not only adapts it to keep the jacket distended when in open position, but ensures the retention of the gusset in such position through the action of its stiffening plies, so that a person may step directly into the garment without the necessity of adjusting any portions thereof or of inserting his feet or legs or arms into wrong portions, and the strap fastenings adapt the garment as soon as the wearer pulls the same up over his shoulders to be immediately fastened in a secure manner even by a person in agitated condition.

The garment is provided with a novel construction and arrangement of buoying means for keeping the wearer afloat in the water. This buoying means is arranged, with a particular exception, on the outside of the garment so that the garment may be drawn close to the person of the wearer and so that the formation of buoyancy-disturbing air pockets in the garment may be prevented. As shown, buoyancy sacks or members 36 are disposed at the front and back of the jacket 3 between the center of the garment and the shoulders, each member being elongated in a vertical direction and extending from a point near the waistline to a point near the shoulder. These buoying members may consist of kapok or other suitable waterproof buoying material enclosed in a sack or casing of rubber or rubberized fabric which is sewed, cemented, or secured in both ways to the garment. By being arranged in the manner described they make the buoyancy point or center just high enough to keep the wearer stably erect in the water, without making the garment unduly large or bulge at any point or causing interference with the body or arm movements of the wearer. In addition to these buoying members, I provide a special construction of the sleeves of the garment and arrangement of auxiliary buoying members for coaction therewith. As shown particularly in Figs. 7, 8 and 9, each sleeve or arm section 37 is provided with a depressed, slack or abnormally full arm pit portion 38, which allows the sleeve and adjacent portion of the garment to be moved

upwardly without imposing strain upon the arm pit portion of the garment. Hence a person wearing the garment may, when submerged in the water, raise his arms fully upward for the purpose of grasping and climbing into a boat, or for the purpose of climbing up a ladder on the side of the vessel, without danger of causing strain which ordinarily might be sufficient to cause the arm pit portion to break, since the depressed or slack portion 38 will permit of this upward movement of the garment portions without strain. Arranged on the inside of the garment and extending across the sides of each sleeve opening above the depressed portion 38 is a buoying member 39 of slightly curved or segmental form and made of kapok or the like enclosed in a flexible tubular casing, allowing bending of said member in the arm movements of the wearer. From this member 39 depends a flexible apron or shield 40 which is secured to the margins of the depressed portion 38 of the sleeve and closes the space between the margins of said depressed portion and the buoying member, so as to prevent a person in donning the garment from sticking his arm into the sleeve below the buoying member instead of at the proper point. The function of these arm pit buoying members is, while allowing free upward movement of the sleeve, to draw the garment upward so that the members 39 will fit beneath the arm pits of the wearer, while preventing any further upward movement. By this means proper automatic positioning of the garment on the wearer is ensured, while at the same time the members 39, in case of a short person being compelled to use a suit normally too long for him, will prevent the garment from rising too high on such person and the center of buoyancy, therefore, from being arranged at too high a point on the body of such person. Hence, even in the event that a suit is too long for a person of given size, such suit may be worn with perfect safety by the person.

Small buoying members 39′ are preferably applied to the suit under the arm pits to assist the buoying members 39 in performing their function. Applied to the suit at a suitable high point is an air escape valve device comprising a rigid tubular stem 41 having a normally flat soft rubber tube 42 extending therefrom. Under pressure the member 42 will be dilated and opened to allow air to escape from the suit and will then collapse and close to prevent inlet of air therethrough.

From the foregoing description, taken in connection with the accompanying drawings, the construction, mode of operation and advantages of my improved life saving garment will be readily understood and such changes appreciated by those versed in the art. While the construction of parts shown is preferred, it will, of course, be understood that changes in the form, arrangement and construction of the parts may be made, within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, I claim:—

1. A life saving garment having a jacket provided with a neck opening having a collar and a vertical slit intersecting said opening, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, and stiffening plies secured to the central section and pleats of the folding walls to adapt the same to always fold in one and the same direction.

2. A life saving garment having a jacket provided with a neck opening having a collar and a vertical slit intersecting said opening, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, said collar comprising sections spaced at the back and said gusset having an extension projecting upwardly above the front and sides of the collar, a draw strap for closing the collar sections at the rear, and a draw strap attached to the collar sections at the front for drawing the same together, said draw strap having a guided running engagement with the central section of the gusset.

3. A life saving garment having a jacket provided with a neck opening having a collar and a vertical slit intersecting said opening, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, and a draw strap attached to the collar sections at the front for drawing the same together, said strap having a guided running connection with the central section of the gusset.

4. A life saving garment having a jacket provided with a neck opening having a collar and a vertical slit intersecting said opening, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, stiffening plies secured to the central section and pleats of the folding walls to adapt the same to always fold in one and the same direction, said collar comprising sections spaced at the back and said gusset having an extension projecting upwardly above the front and sides of the collar, a draw strap for closing the collar sections at the rear, and a draw strap attached to the collar sections at the front for drawing the same together, said draw strap having a guided

running engagement with the central section of the gusset.

5. A life saving garment having a jacket provided with a neck opening having a collar and a vertical slit intersecting said opening, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, stiffening plies secured to the central section and pleats of the folding walls to adapt the same to always fold in one and the same direction, and a draw strap attached to the collar sections at the front for drawing the same together, said strap having a guided running connection with the central section of the gusset.

6. A life saving garment embodying a jacket having a neck opening provided with a two-part collar and a vertical slit intersecting the neck opening, an annular series of buoying members at the front and back of the jacket between the collar and a point above the waistline, a draw strap for drawing together the collar sections at the rear, a draw strap for drawing together the collar sections at the front, and a draw strap for drawing together the meeting edges of the slit on a line below the arm pits.

7. A life saving garment embodying a jacket having a neck opening provided with a two-part collar and a vertical slit intersecting the neck opening, an annular series of buoying members at the front and back of the jacket between the collar and a point above the waistline, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, draw straps for drawing together the collar sections at the rear and front, and a draw strap for drawing together the meeting edges of the slit on a line below the arm pits.

8. A life saving garment embodying a jacket having a neck opening provided with a two-part collar and a vertical slit intersecting the neck opening, an annular series of buoying members at the front and back of the jacket between the collar and a point above the waistline, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, and means for closing the collar including a draw strap having a guided running engagement with the central section of the gusset.

9. A life saving garment embodying a jacket having a neck opening provided with a two-part collar and a vertical slit intersecting the neck opening, an annular series of buoying members at the front and back of the jacket between the collar and a point above the waistline, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, and stiffening plies secured to the central section and pleats of the folding walls to adapt the same to always fold in one and the same direction.

10. A life saving garment embodying a jacket having a neck opening provided with a two-part collar and a vertical slit intersecting the neck opening, an annular series of buoying members at the front and back of the jacket betwen the collar and a point above the waistline, a gusset on the inner side of the garment comprising a central triangular section and accordion pleated folding side walls connecting the same with the jacket on opposite sides of the slit, stiffening plies secured to the central section and pleats of the folding walls to adapt the same to always fold in one and the same direction, said collar comprising sections spaced at the back and said gusset having an extension projecting upwardly above the front and sides of the collar, a draw strap for closing the collar sections at the rear, and a draw strap attached to the collar sections at the front for drawing the same together, said draw strap having a guided running engagement with the central section of the gusset.

11. In a life saving garment, a jacket having sleeves each provided with a downwardly elongated or depressed arm pit portion, a buoying member across the sleeve opening in the body above the base of said depressed portion, and an obstructing apron covering the sleeve opening between said member and the base of said depression.

12. In a life saving garment, trousers having foot portions, each provided with diagonally arranged elongated buoying members at the sides thereof, and a strap secured to the heel of the foot portion and having ends crossing the buoying members and adapted to be passed over the instep of the foot portion and united.

In testimony whereof I affix my signature.

ELTON B. JACKSON.