United States Patent [19]

Dopyera

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[45] **Oct. 7, 1975**

[54] **APPARATUS FOR PROTECTING UNDERWATER EQUIPMENT**

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[22] Filed: **July 2, 1973**

[21] Appl. No.: **375,469**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 194,832, Nov. 2, 1971, abandoned.

[52] **U.S. Cl.** **61/46;** 61/69; 61/72.3

[51] **Int. Cl.²** **E02D 29/12**

[58] **Field of Search** 61/.5, 1, 46, 46.5, 69, 61/72.3; 52/80, 169; 166/.5; 175/219

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Primary Examiner—Peter M. Caun

Attorney, Agent, or Firm—W. F. Hyer; Marvin B. Eickenroht

[57] **ABSTRACT**

A hood of fiberglass adapted to be lowered over underwater equipment.

12 Claims, 11 Drawing Figures

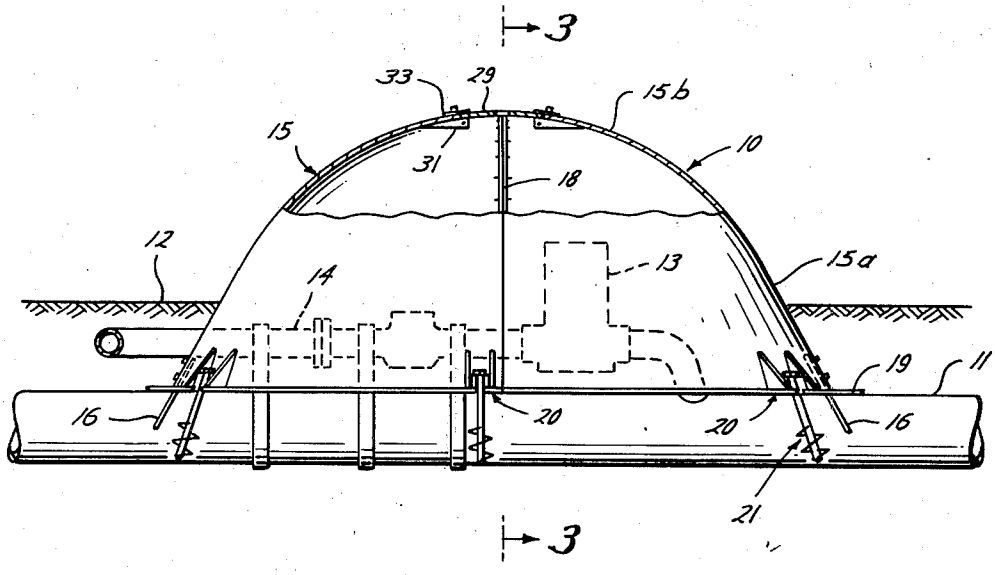

Fig. 1

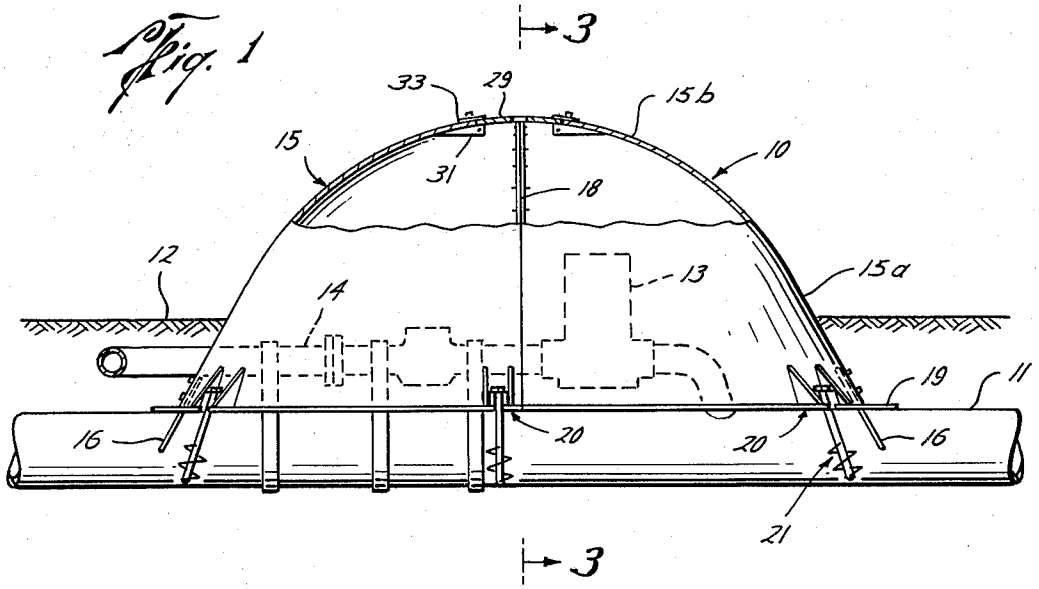
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Fig. 2

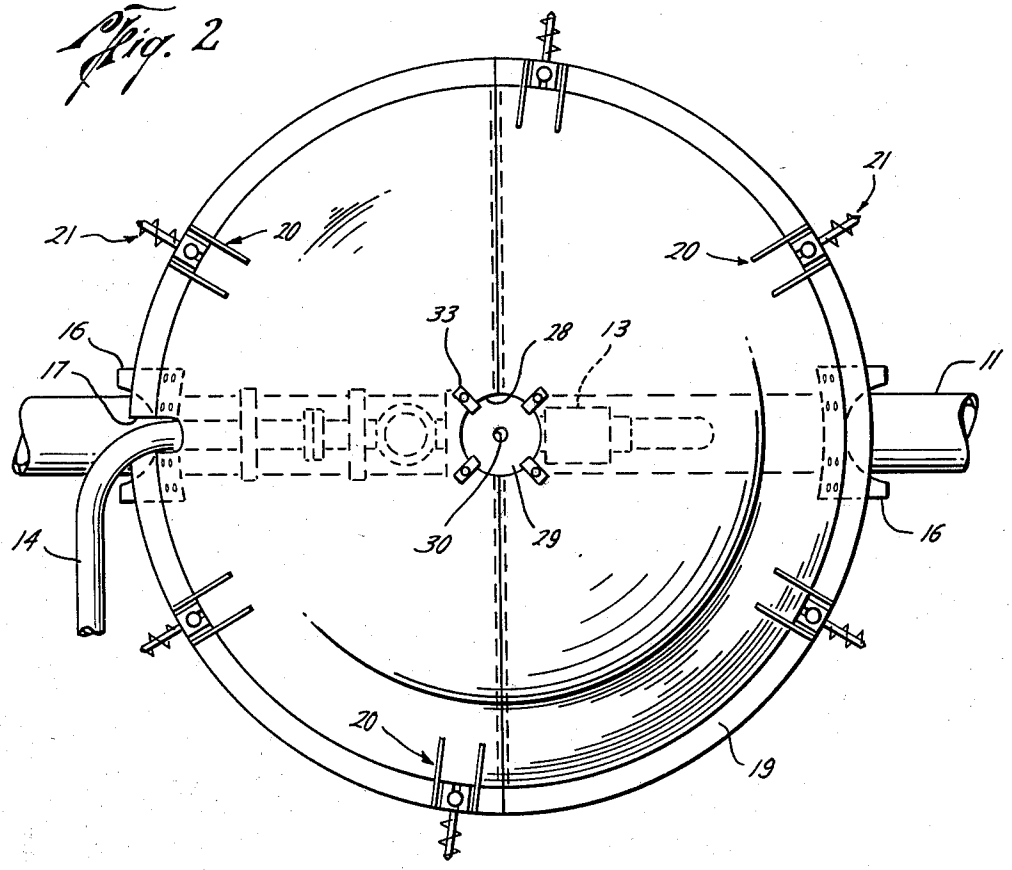
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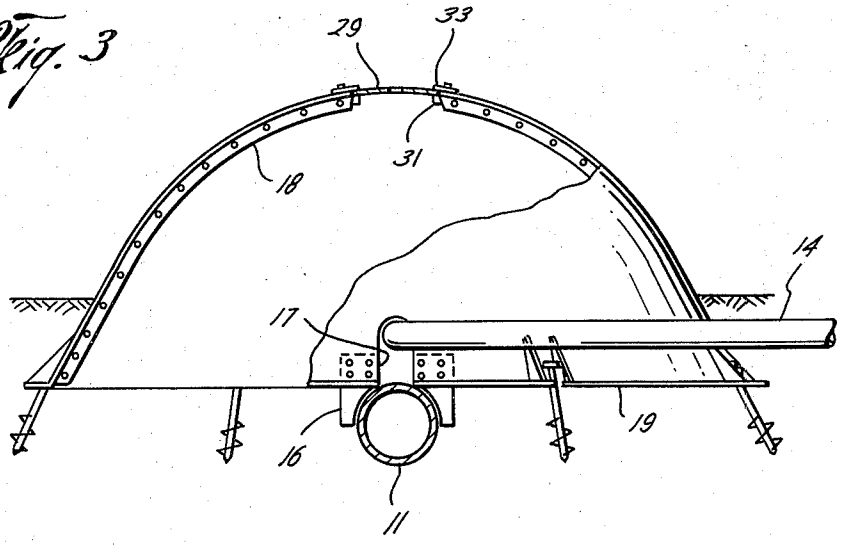
Fig. 3



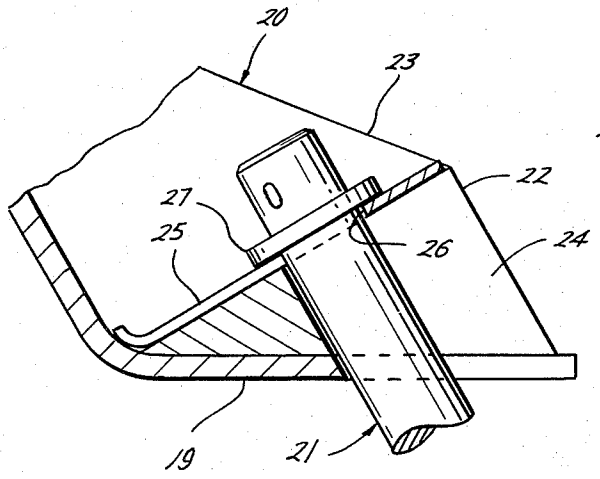


Fig. 4

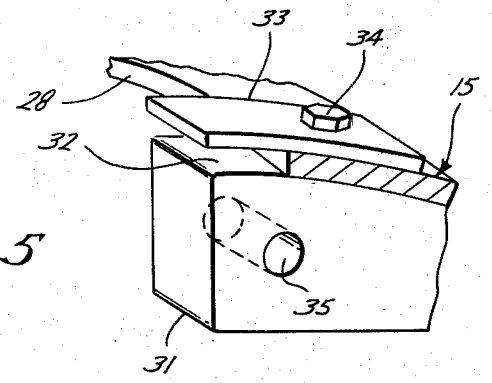


Fig. 5

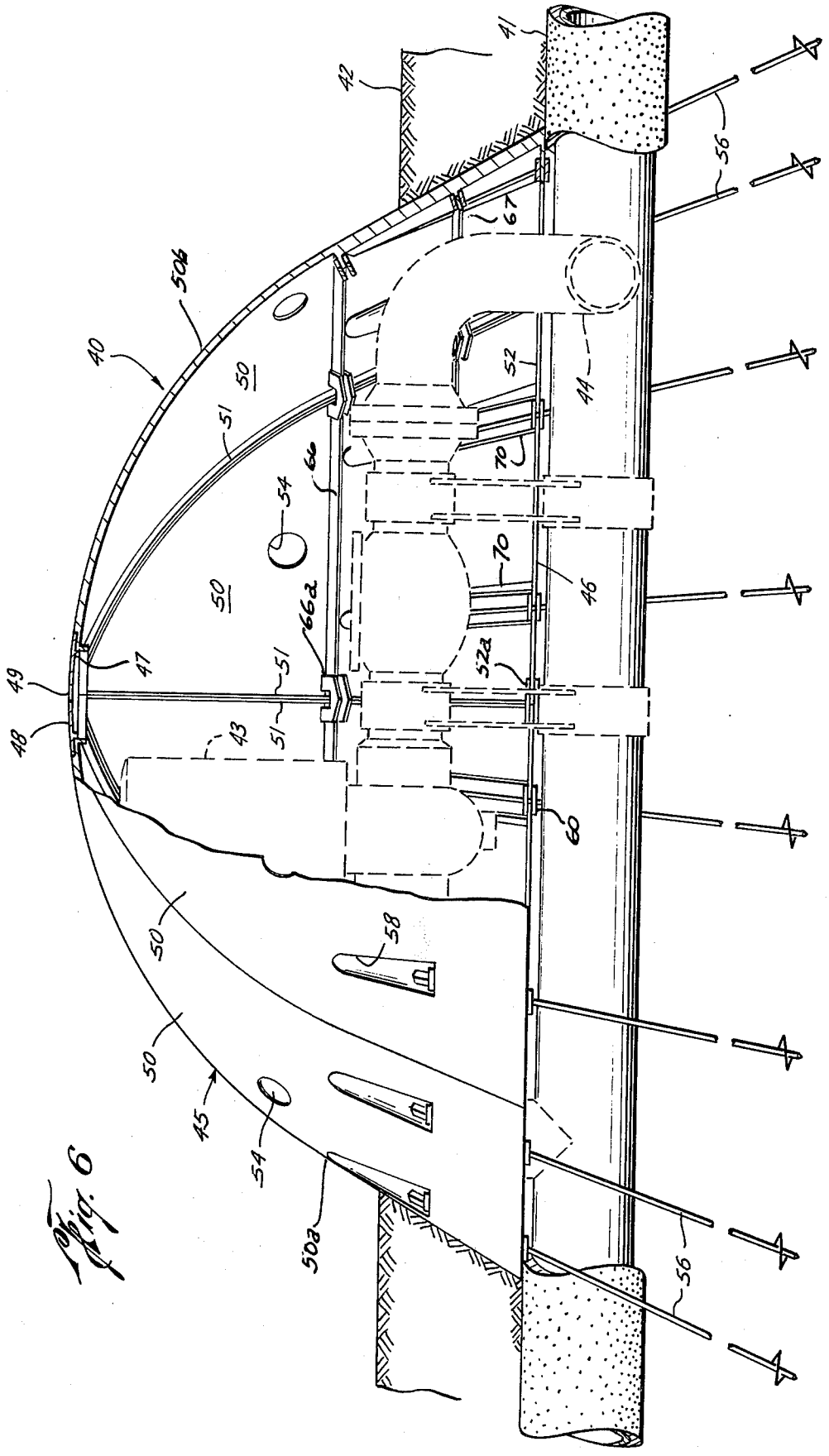

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Fig. 6

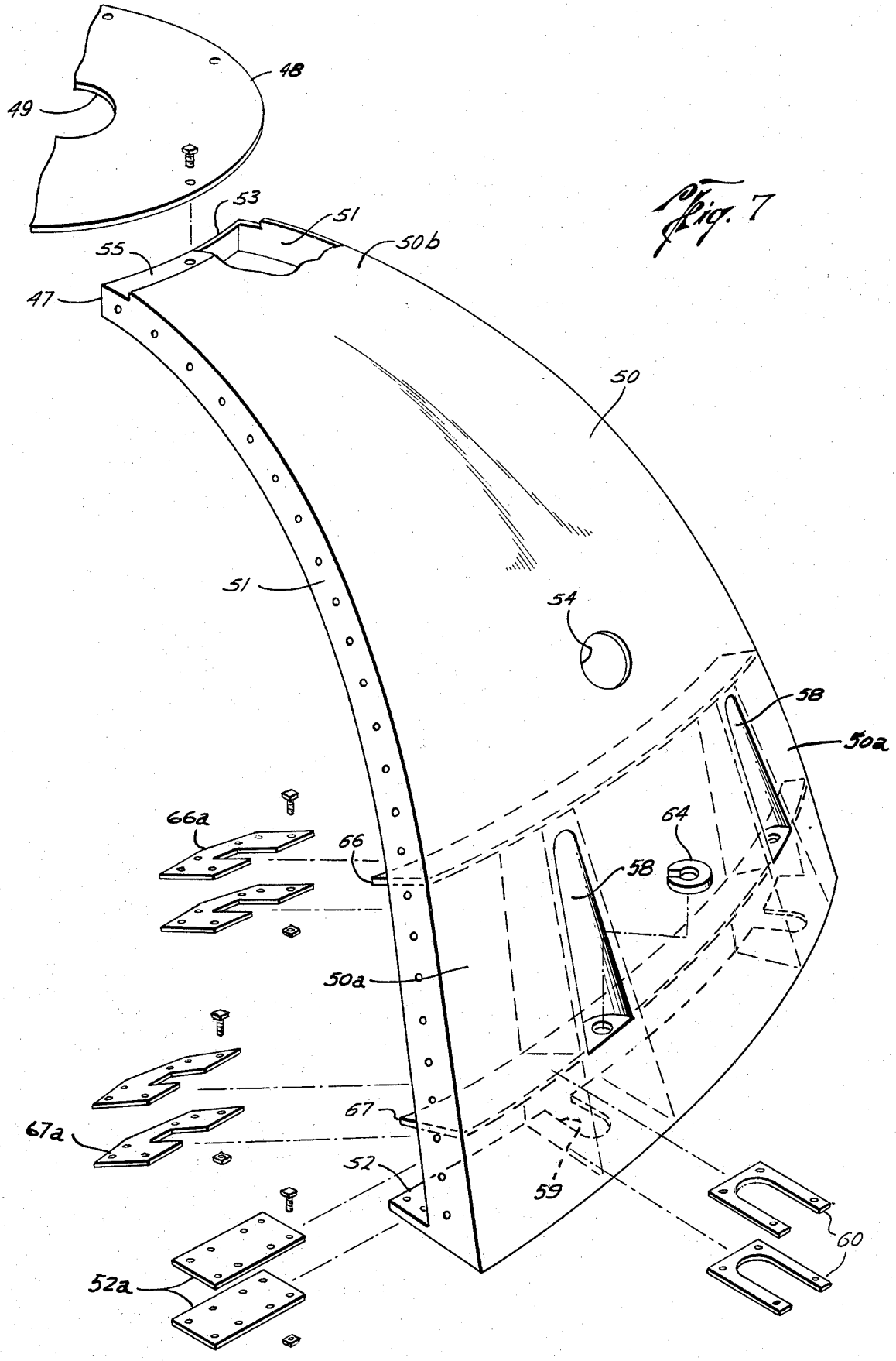
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Fig. 7

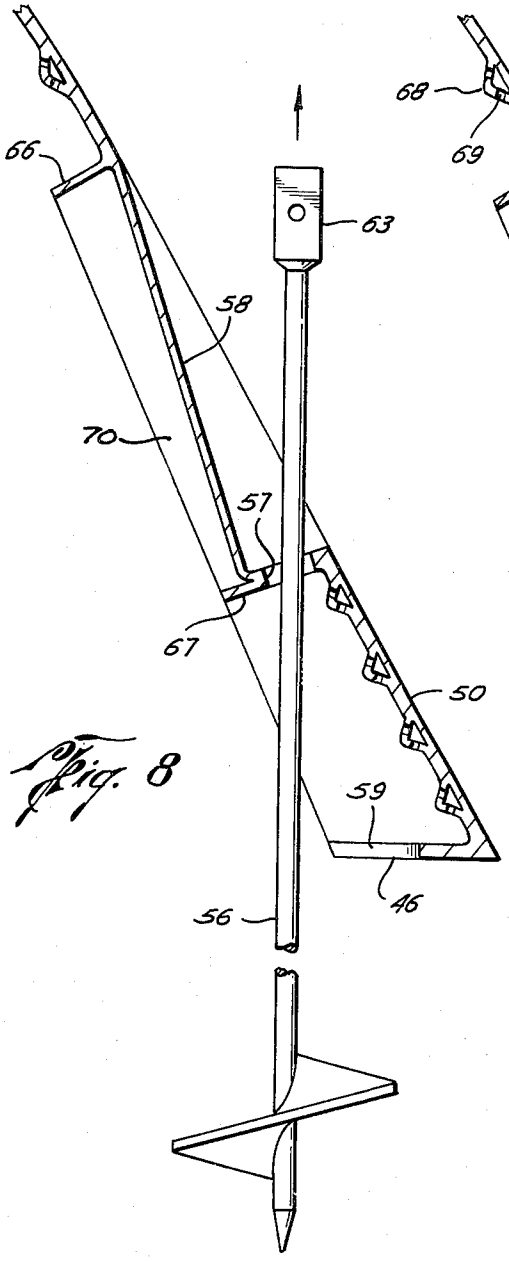


Fig. 8

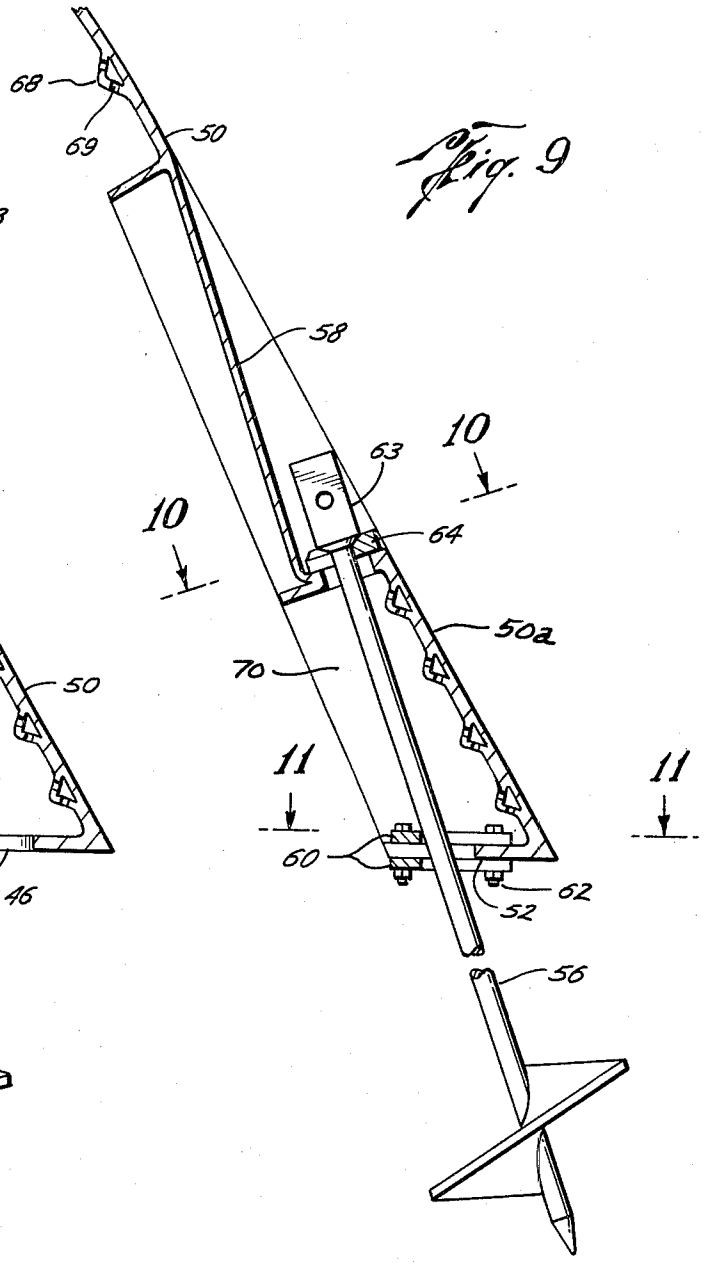


Fig. 9

Fig. 10

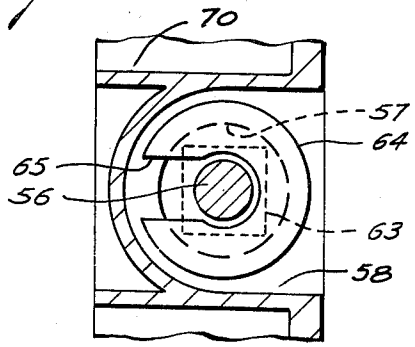
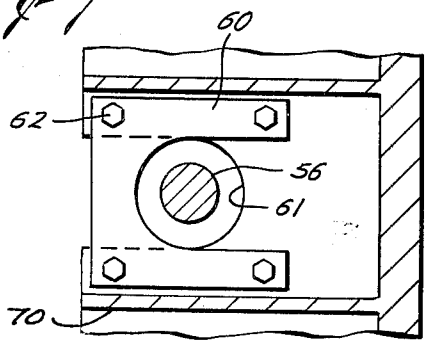


Fig. 11



APPARATUS FOR PROTECTING UNDERWATER EQUIPMENT

This application is a continuation-in-part of my copending application, Ser. No. 194,832, filed Nov. 2, 1971 now abandoned, and entitled "Apparatus for Protecting Underwater Equipment".

This invention relates generally to apparatus for protecting equipment, such as pipeline valves and wellheads, located at the surface beneath the water. More particularly, it relates to improvements in apparatus for protecting such equipment against damage by anchors, anchor cables, trawler nets, draglines and the like, which are frequently moved laterally along such surfaces.

Heretofore, attempts have been made to protect such equipment by means of metal frameworks over and around it. However, the anchors and other parts which might otherwise damage the equipment are caused to be hung up or otherwise fouled on the framework, or possibly to damage or remove the framework from its position above the equipment.

In Johnson Pat. No. 3,247,672, it has also been proposed to protect wellhead equipment by encasing it within a structure comprising a floor and a dome made of reinforced concrete. Such a structure is an improvement over metal frameworks, as above described, in that anchors and other parts which would be fouled by or damage the framework would merely slide over or around the dome.

However, the structure shown in the Johnson patent cannot be lowered over an existing wellhead, or other existing underwater equipment for that matter. Instead, it is especially constructed to permit a well to be drilled and completed through it, after which it serves to protect the wellhead.

An object of this invention is to provide apparatus for protecting underwater equipment which has the advantages of the structure of the Johnson patent, but is not so limited in use in that it can be installed over existing equipment.

Another object is to provide such apparatus which is much lighter, and thus easier to handle, as well as less expensive to manufacture, than the structure of the Johnson patent, but which is nevertheless adapted to be securely anchored to the underwater surface.

A further object is to provide such apparatus which will not foul or be damaged by the anchors or other parts regardless of the depth to which it's partially buried in the mud surface beneath the water.

Still another object is to provide such apparatus which will permit the detection of gas leaks from the protected underwater equipment.

Yet another object is to provide such apparatus which, when securely anchored to the underwater surface, has no outwardly protruding surfaces with which nets or other parts might engage.

Yet a further object is to provide such apparatus which consists of parts which are either readily available or easily fabricated.

These and other objects are accomplished, in accordance with the illustrated embodiment of the present invention, by apparatus comprising a hood adapted to be lowered over the equipment and having a rim about its lower end adapted, when so lowered, to surround the equipment, and be anchored to the underwater surface. In the preferred embodiment of the invention, the hood is made of reinforced fiberglass, which is of light

weight, and thus easy to handle during installation or removal of the apparatus, and which may be molded in accordance with known practices which are simple and inexpensive to follow. At the same time, the fiberglass hood is strong enough and securely anchored in such a manner as to resist the lateral forces of the anchors or other parts.

The hood is so anchored by means of elongate anchors guidably received in the rim on its lower end in position to be driven into the underwater level. Preferably, the rim is first jetted into the mud at the underwater level, in accordance with well known practices, so as to at least partially bury it, not only to assist the anchors in holding the hood down, but also to provide a firmer base into which the anchors may be driven and to insure that the rim is below the anchors or other parts.

The hood has a hole in its upper end so that in the event of a gas leak from the protected equipment, gas bubbles will escape from the hood and rise to the water surface to permit detection. This hole is formed in a hatch which is removably supported within a relatively large access opening in the upper end of the hood.

The side walls of the hood include a lower conical portion extending upwardly from the rim and an upper spherical portion forming a smooth continuation of the lower conical portion and extending over the upper end of the hood. In this way, the side walls present a surface above mudline which forms a small angle with respect to the underwater surface, regardless of the depth to which the rim of the hood is buried. This novel hood construction is to be compared with one wherein the entire side walls are part of a hemispherical surface, such as in the Johnson patent, whereby burying of the rim to a shallow depth would present lower side wall surfaces forming a large angle with the underwater surface, and thus increasing the possibility of fouling of and damage by the anchors and other parts.

In a first embodiment of the invention, the rim extends outwardly from the lower ends of the side walls of the hood, and the elongate anchors are guidably received within slots formed in wedges above the rim. In a second embodiment of the invention, however, the rim instead extends inwardly, and the elongate anchors are received through holes provided in recesses formed in the side walls of the hood. In this way, the hood including the rim may be molded in one piece, and the upper ends of the anchors, when driven into the underwater surface, are within the recesses, and thus do not protrude from the hood.

In the drawings, wherein like reference characters are used throughout to designate like parts:

FIG. 1 is a side view, partly in section, of apparatus constructed in accordance with the first embodiment of this invention, and installed over an underwater pipeline valve and related equipment;

FIG. 2 is a top plan view of the apparatus of FIG. 1;

FIG. 3 is an end view of the apparatus, partly in section, along line 3—3 of FIG. 1;

FIG. 4 is an enlarged sectional view of the mounting of an anchor from the lower end of the hood of the apparatus;

FIG. 5 is an enlarged perspective view of a portion of the access opening in which the hatch is adapted to be removably supported;

FIG. 6 is a side view, partly in section, of apparatus constructed in accordance with the second embodi-

ment of this invention, and, as in the case of the first embodiment shown in FIG. 1, installed over an underwater pipeline valve and related equipment;

FIG. 7 is an exploded perspective view of a section of the hood of the apparatus of FIG. 6;

FIG. 8 is a cross-sectional view of the side wall of the hood, during mounting of an elongate anchor thereon;

FIG. 9 is a cross-sectional view similar to FIG. 8, but with the anchor mounted on the side wall; and

FIGS. 10 and 11 are cross-sectional views of the side wall of the hood and the mounted anchor, as seen along broken lines 10—10 and 11—11, respectively, of FIG. 9.

With reference now to the details of the above-described drawings, and particularly FIGS. 1 to 5, the first embodiment of the apparatus, which is indicated in its entirety by reference character 10, is shown in FIG. 1 to be installed over a pipeline 11 and related equipment (broken lines) buried at a relatively shallow depth between the mud surface 12 beneath the water. As shown in each of FIGS. 1 and 2, this equipment includes a valve 13 connected in a branch line 14 extending longitudinally above the pipeline 11 for a relatively short distance and then laterally with respect thereto. This valve extends partially above the mud surface 12, and thus, in the absence of the apparatus 10, might be damaged by anchors and other parts of the type above described. Obviously, however, this is just one example of the type of equipment which may be protected by the apparatus of this invention.

The apparatus 10 includes a hood 15 made of reinforced fiberglass and having a rim about its lower end adapted to be lowered onto the mud surface 12 in surrounding relation to the equipment to be protected, and then jetted to a desired level beneath such surface in a manner which is well known in the art, and which therefore need not be described. As further well known in the art, upon completion of the jetting operation, the mud would normally form back around the lower outer surface of the hood 15, as shown in FIG. 1, and in any case may be caused to so form by back filling.

In the illustrated installation of the apparatus, the rim of the lower end of the hood has been jetted down to a level for resting upon the upper side of the pipeline 11. In order to guide the rim into place, and also to prevent lateral movement of the hood when lowered onto the pipeline, guide plates 16 are secured to the rim and slotted along their lower edges for fitting over the pipeline. Also, as best shown in FIG. 2, the lower end of the hood above the lateral extension of branch line 14 is further slotted at 17 for fitting over the branch line 14, which requires that the guide plate 16 be formed in two parts for securement to the lower portion of the dome on opposite sides of the slot 17.

The hood 15 is molded in two halves which are separated from one another along a vertical plane. Each half has a flange 18 about its vertical edge for securement to the flange of the other half. Obviously, however, it may be found possible to mold the hood in one piece, or, on the other hand, preferred to mold it in three or more pieces. In any case, the side walls of the hood have a lower conical portion 15*a* and an upper spherical portion 15*b*. As shown in the drawings, the conical portion extends upwardly at an angle of about 60° to the horizontal from the lower end of the hood to approximately its vertical midpoint, and the spherical portion 15*b* thereof forms a smooth continuation of the conical portion and extends over the upper end of the hood.

As previously mentioned, this construction of the side walls of the hood makes it possible to bury the lower end of the hood at a wide latitude of depths beneath the mud surface, and still provide an outer surface above the mud surface which forms only a relatively small angle with respect to the horizontal. Thus, regardless of the depth to which the lower end of the dome has been buried, it presents a surface over or about which anchors and other parts will slide, rather than hanging up. As previously mentioned, this novel side wall construction of the hood of the apparatus 10 provides a distinct advantage over previous structures whose side walls are formed entirely by a hemispherical surface, such as in Johnson Pat. No. 3,247,672, because in the latter, burying of the lower end of the dome to a shallow depth beneath the mud surface results in an exposed outer surface on the dome which is almost vertical and which thus has a tendency to cause the anchors or other parts to hang up.

Each half portion of the hood 15 also has a flange 19 about its rim, which, upon connection of the halves to one another, provides a flange about the entire lower end of the hood. This flange is advantageous not only from a structural standpoint, but also in that it provides a convenient means upon which a series of mounts 20 may be carried at circumferentially spaced-apart locations about the lower end of the hood, each for guidably receiving an elongate anchor 21. Thus, as best shown in FIG. 4, each such mount includes an upwardly and outwardly tapering wedge 22, which is also formed of reinforced fiberglass and adapted to receive and guide the anchor as it is driven into the mud at the underwater surface. More particularly, and as will be described to follow, the wedge guides the anchor for movement in a downward and outward direction generally parallel to the lower side wall portions of the hood, thus providing anchoring forces having optimum mechanical advantage.

Each wedge 22 is securely supported upon the flange 19 at the lower end of the hood by means of gusset plates 23 on its opposite sides, which plates may also be made of reinforced fiberglass. A slot 24 is formed in the outer end of each wedge as well as in the flange 19 beneath the wedge and has an inner end which extends generally parallel to the lower side wall portions of the hood. This slot 24 is of a width to closely receive the anchor 21, and its inner end is preferably curved to fit closely about the anchor.

As shown in the drawings, the anchor is in the form of an auger having a helical blade about its lower end. Thus, in order to assemble the anchor on its mount 20, it's necessary that its upper end be moved laterally into the slot 24. When the anchor is so moved, it is locked within the slot, and thus maintained against movement laterally outwardly from the wedge, by means of a plate 25 having a slot 26 in its inner end of substantially the same width as the slot 24 and curved at its inner end for fitting closely about the anchor.

As shown, the upper surface of the wedge 22 over which the plate 26 is disposed extends generally perpendicularly to the length of the anchor 21, and the upper end of the anchor is provided with a collar 27 near its upper end for seating firmly on the upper side of the plate 25 when the anchor has been driven into the mud surface.

In the installation of the apparatus **10**, the anchors **21** are held by soft lines in raised positions within their mounts **20** as the rim about the lower end of the dome is jetted into the mud surface. When the rim has reached the desired level, the soft lines are cut and the anchors driven into the mud in any suitable manner. At this stage of the installation, the jetting will normally have removed much of the soil in and around the rim of the hood so that no difficulty is encountered in obtaining access to the upper end of the anchor **21** for screwing it into the subsurface. Preferably, each of the anchors is driven to the maximum extent so as to cause the collar **27** to engage the lock plate **25**.

An opening **28** (see FIGS. **2** and **5**) is formed in the upper end of the hood **15** by means of aligned semicircular cut out portions in each half of the dome. The opening is preferably circular so as to receive a circular hatch **29** for fitting relatively closely therein. Upon removal of the hatch, the opening permits access to the protected equipment through a relatively large cross-sectional area. The hatch has a hole **30** formed centrally therein, and thus at the upper end of the hood **15**, so that, as previously mentioned, bubbles of gas which might leak from the protected equipment will pass upwardly through this hole and thus permit detection at the water surface.

The hatch **29** is supported by means of a plurality of arms **31** which are secured to the inner side of the upper end of the hood in any suitable manner so as to extend into the opening **28**, as best shown in FIG. **5**. As indicated in FIG. **2**, there are four such arms, each providing a supporting surface **32** forming a continuation of the inner side of the hood adjacent the hatch opening **28**.

When the hatch is supported on the surfaces **32**, it is secured in place by small plates **33** pivotally connected to the hood adjacent the opening **28** by means of pins **34** for swinging between securing and releasing positions. Also, each arm has a hole **35** extending laterally through it close to the opening **28** to receive hooks or other hoisting equipment for use in raising or lowering the hood.

With reference now to the details of FIGS. **6** to **11**, the second embodiment of the apparatus, which is indicated in its entirety by reference character **40**, is shown in FIG. **6** to be installed over a pipeline **41** and related equipment (shown in broken lines) buried at a relatively shallow depth beneath the mud surface **42** below the water. As shown by the broken lines in FIG. **6**, the underwater equipment includes a valve **43** connected in a branch line **44** extending longitudinally of the pipeline **41** for a relatively short distance and then laterally with respect thereto. At least the valve **43** extends above the mud surface **42**, so that, in the absence of the apparatus **40**, it might be damaged by anchors, nets, or other parts of the type previously mentioned. However, as mentioned in connection with FIGS. **1** and **2**, the equipment to be protected by the apparatus **40** may be of another type, and that shown and described above is merely exemplary.

The apparatus **40** includes a hood **45** which is preferably made of reinforced fiberglass and which has a rim **46** about the lower edges of its side walls. The rim is adapted to be lowered onto the mud surface **42** in surrounding relation to the equipment to be protected, and then jetted to a desired level beneath the surface. As described in connection with the first embodiment, the rim is interrupted by means of slots formed in the lower edges of the side walls for fitting over the pipeline **41** and branch line **44**. When so disposed, the hood is anchored in place, in a manner to be described hereinafter. For a purpose described in connection with the first embodiment, an opening **47** is formed in the upper end of the hood **45** and normally closed by a hatch **48** removably supported over the opening and having a hole **49** formed in its center.

The hood **45** is molded in several sections **50** which are separated from one another along vertical planes and bolted to one another by means of flanges **51** extending inwardly along their side edges. Each such hood section also has a flange **52** extending inwardly from the lower edge of its side wall and adapted to be connected to a lower flange of an adjacent section by means of overlapping plates **52***a* which are bolted to such lower flanges in a manner which will be obvious from FIG. **7**. When the sections are connected together, their side edges abut so that the exterior surface of the hood is smooth, and their lower flanges form continuations of one another to provide the rim **46**.

The upper edges of the side walls of the sections are arcuate and define the hatch opening **47**, and a flange **53** extends downwardly from each such upper edge. Thus, when the sections are connected together, the upper flanges **53** form a collar about the opening **47**. The flanges **51**, **52** and **53** connect with one another to provide a box-like reinforcement for each hood section **50**.

In a manner and for the purpose described in connection with the first embodiment, the side walls of each hood section, and thus the hood as a whole, have lower conical portions **50***a* and upper spherical portions **50***b*. As also illustrated, the conical portions of the side walls extend upwardly at an angle of about 60° with respect to the horizontal to a level approximately intermediate the upper and lower edge of the hood, and the lower edges of the spherical portions **50***b* form smooth continuations of the upper edges of the conical portions.

Portholes **54** are formed in the side walls of the hood so as to lessen the likelihood of collapse or damage of the hood due to wave action. Preferably, one porthole is formed in each hood section **50** generally intermediate its side edges and its upper and lower ends.

As best shown in FIG. **7**, the arcuate upper edge of each hood section is recessed to provide a ledge **55** on which the outer edge of the hatch **49** may be seated in such a manner as to form a substantially smooth continuation of the upper portion of the side wall of the hood section. When so seated, the hatch is secured to the hood sections by means of bolts, as indicated in FIG. **7**.

As in the case of the rim of the first embodiment, the rim **46** of the apparatus **40** not only strengthens the hood as a whole, but also provides a means through which elongate, auger-type anchors **56** may guidably extend as they are driven into the subsurface in a direction generally parallel to the lower side wall portions of the hood. However, as distinguished from the first embodiment, the rim **46** extends inwardly from the lower edges of the side walls of the hood in position to receive and guide the anchors **46** which are passed through holes **57** in the side walls of the hood above the rim **46**. Each hole **57** is formed in a recess **58** in the side wall of a hood section, and there are a pair of recesses and holes **57** in each hood section, so that each such section is secured to the surface by means of a pair of elongate

anchors **56.** As will be appreciated, this construction facilitates construction of the hood in that it permits the rim to be molded integrally with the side walls.

As best shown in FIGS. **8** and **9,** each recess **58** is formed by a curved wall whose inner side extends downwardly and outwardly at a small angle with respect to the side wall of the hood section, and a bottom wall which extends generally perpendicularly to the side walls of the hood section. The hole **57** is formed in the bottom wall thereof so that its axis is generally parallel to the lower side wall portion of each hood section. As also shown in FIGS. **8** and **9,** the lower flange **52** of each hood section is provided with a pair of slots **59,** each of which is generally axially aligned with one of the holes **57.** Thus, an elongate anchor **56** may be passed through the hole and slot so as to extend in a direction generally parallel to the lower portion of the side wall of the hood section, as shown in FIG. **9.**

When so extended, each anchor is retained in a slot **59** by means of a pair of "U"-shaped plates **60** which are adapted to be disposed over the top and bottom of each slot **59.** Thus, the slots in the plates may be moved over the anchors to form with the slot **59** an opening **61** about the anchor **56,** and the plates **60** may then be secured to the flange **52** by means of bolts **62.**

As shown in FIGS. **8** and **9,** the hole **57** in the recess **58** is sufficiently large to pass the enlarged upper end **63** of the anchor **56.** Thus, in the mounting of the anchors on the hood, the upper end **63** of the anchors may be passed upwardly through the holes **67,** as illustrated in FIG. **8,** and then swung in a counterclockwise direction into the slot **59,** after which the plates **60** are moved into place and secured to the flange **52,** as above described.

At the same time, a washer **64** may be moved into position over the bottom wall of the recess **58** for supporting the upper end **63** of the anchor **56** when the anchor is moved downwardly to the position shown in FIG. **9.** For this purpose, the washer is larger than the hole **57,** but has a central opening therein smaller than the enlarged upper end **63** of the anchor. The washer also has a side opening or slot **65** of such size as to permit it to be moved sidewise over the anchor **56.**

As in the case of the first embodiment of the invention, the hood may be lowered into position with the thusly mounted anchors held in a raised position by any suitable means. Then, upon jetting of the lower end of the hood to the desired level, the anchors may be released and then driven into the subsurface, preferably to a depth at which their upper enlarged ends **63** rest on the washers **64.** As shown in FIG. **9,** when the anchors are driven into place, their upper ends **63** are disposed within the recess **58.** Thus, no portions of the anchors protrude from the outer side walls of the hood, thereby further eliminating the possibility of damage due to anchors, nets, or the like.

As best shown in FIGS. **8** and **9,** intermediate flanges **66** and **67** extend laterally along the inner side walls of the hood sections, so as to connect at opposite ends with the side flanges **51.** The upper intermediate flange **67** extends inwardly from the side wall adjacent the upper ends of the recesses **58,** and the lower intermediate flanges **67** extend inwardly from the side walls adjacent the bottom walls of the recesses **58.** Also, U-shaped plates **66***a* and **67***a* are adapted to be passed over the flanges **51** and bolted to the flanges **66** and **67** to provide additional connections between the hood sections. Additionally, flanges **70** extend vertically along opposite sides of each curved wall of a recess **58** to connect the intermediate and lower flanges with one another.

The hood sections are further reinforced by means of ribs **68** which extend laterally of the inner sides of the side walls. As best shown in FIGS. **8** and **9,** the ribs **68** are hollow and provided with ports **69** to prevent the accumulation of air within them.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment, said hood having a plurality of circumferentially spaced-apart upwardly and outwardly tapering wedges about its lower end, each wedge having a slot extending inwardly from its outer end to receive an anchor, and a plurality of plates each having a slot on its inner end and slidable over the upper side of a wedge to cooperate with the slot in the wedge for holding the anchor therebetween.

2. Apparatus of the character defined in claim **1,** wherein the slot in the wedge extends substantially perpendicular to the upper side of the wedge.

3. Apparatus of the character defined in claim **2,** wherein the lower portion of the side wall of the hood extends upwardly and outwardly generally parallel to the slot in the wedge.

4. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment and having an outwardly extending rim about its lower end, said rim having a plurality of circumferentially spaced, inwardly extending slots about its outer edge, means on the side walls of the hood forming an inwardly extending slot above and aligned with each slot in the rim to form a guideway therewith for an elongate anchor, and means for retaining an anchor in each guideway comprising a plurality of plates each mountable on a slot forming means and having a slot therein to face the slot so formed to define a hole therewith to receive an anchor.

5. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment and having an outwardly extending rim about its lower end, said rim having a plurality of circumferentially spaced, inwardly extending slots about its outer edge, means on the side walls of the hood forming an inwardly extending slot above and aligned with each slot in the rim to form a guideway therewith for an elongate anchor, and means for retaining an anchor in each guideway, said hood also having reinforc-

ing walls extending vertically upwardly from the rim on opposite sides of each slot forming means.

6. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment and having an outwardly extending rim about its lower end, the portion of the side walls of the hood above the rim extending upwardly and inwardly therefrom, said rim having a plurality of circumferentially spaced, inwardly extending slots about its outer edge, means on the side walls of the hood forming an inwardly extending slot above and aligned with each slot in the rim to form a guideway therewith for an elongate anchor which extends generally parallel to the adjacent side wall portion of the hood, said slot forming means having a surface which extends generally perpendicular to the adjacent side wall portion of the hood, and means for retaining an anchor in each guideway comprising a plurality of plates each disposable over said surface and having a slot therein to face a slot in said means on the hood, when so disposed, to define a hole to receive an anchor.

7. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment, said hood having downwardly and outwardly extending side walls, said side walls having a plurality of circumferentially spaced-apart recesses formed therein, each recess having a bottom wall through which a hole extends, and a plurality of elongate anchors each adapted to extend through one of said holes in a direction generally parallel to the adjacent side wall of the hood.

8. Apparatus of the character defined in claim 7, wherein each anchor has an upper end which is received in the recess when driven into the ground.

9. Apparatus of the character defined in claim 8, wherein the upper ends of the anchors are enlarged but small enough to pass through the holes, and a washer is seatable over each hole in the bottom wall of a recess to support the enlarged upper end of an anchor, said washer having a side opening from the slot for passing sidewise over the anchor beneath its upper end.

10. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment, said hood having downwardly and outwardly extending side walls and a rim extending inwardly from the lower ends of the side walls, said side walls having recesses formed therein and a hole located in each recess, and a plurality of elongate anchors each adapted to extend through one of the holes and the rim therebelow in a direction generally parallel to the adjacent side wall of the hood.

11. Apparatus of the character defined in claim 10, wherein each anchor has an upper end which is received in the recess when driven into the ground.

12. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment, said hood having downwardly and outwardly extending side walls and a rim extending inwardly from the lower ends of the side walls, means providing holes in the side walls, said rim having a plurality of slots therein, a plurality of elongate anchors each adapted to extend through one of the holes and slots in a direction generally parallel to the adjacent side wall of the hood, and a plurality of plates each disposable over the rim and having a slot therein to face a slot in the rim to define a hole through which an anchor extends.

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