

Nov. 17, 1964

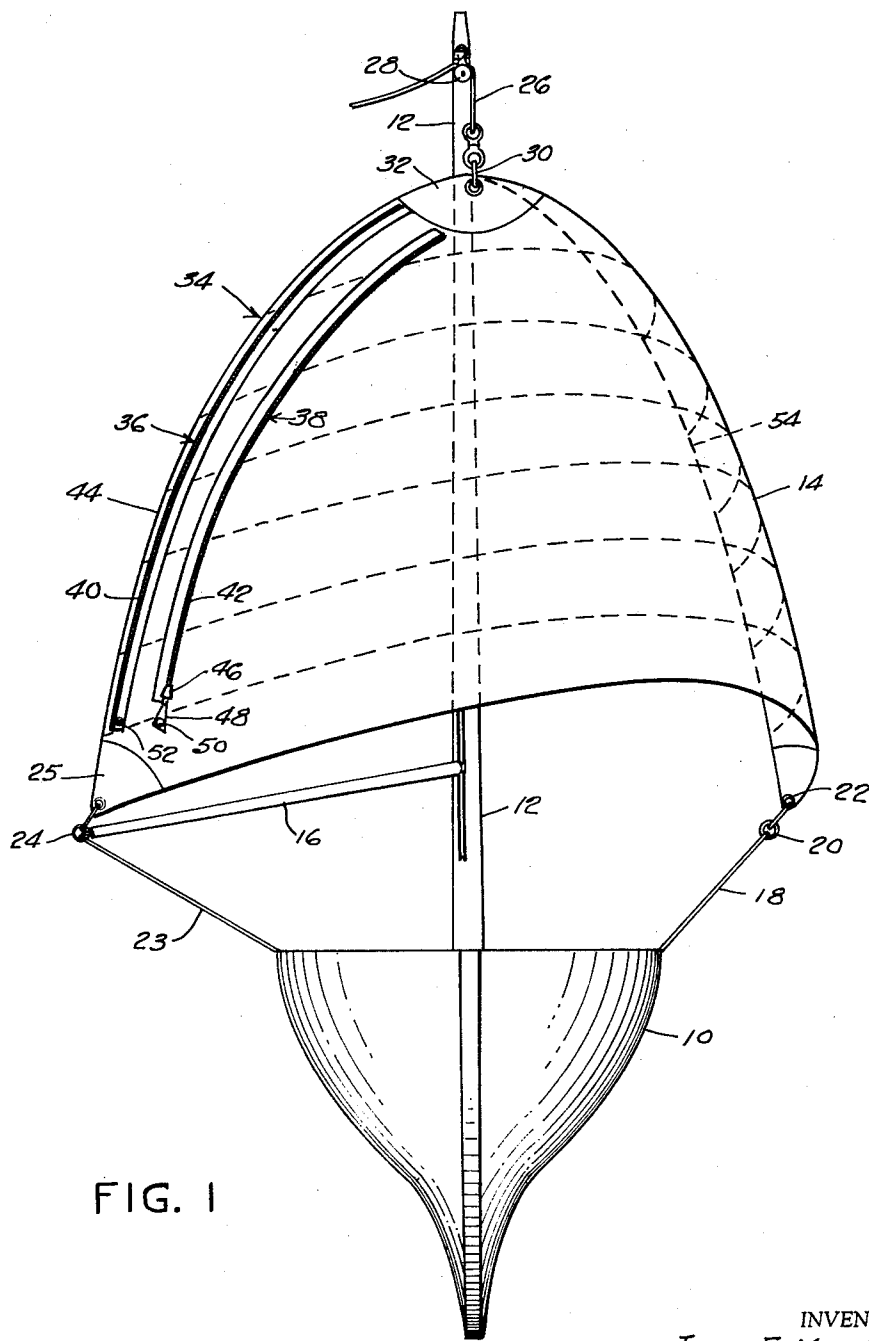
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3,157,149

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Filed Jan. 13, 1964

6 Sheets-Sheet 1



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6 Sheets-Sheet 2

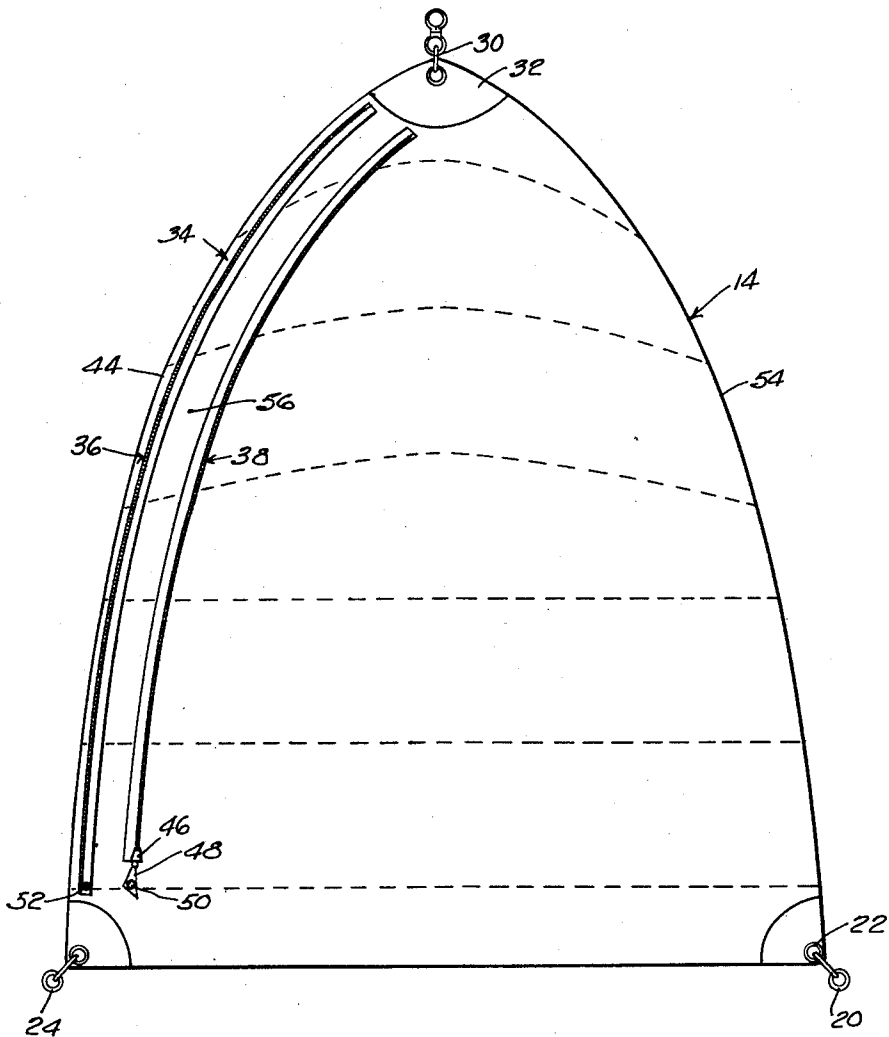


FIG. 2

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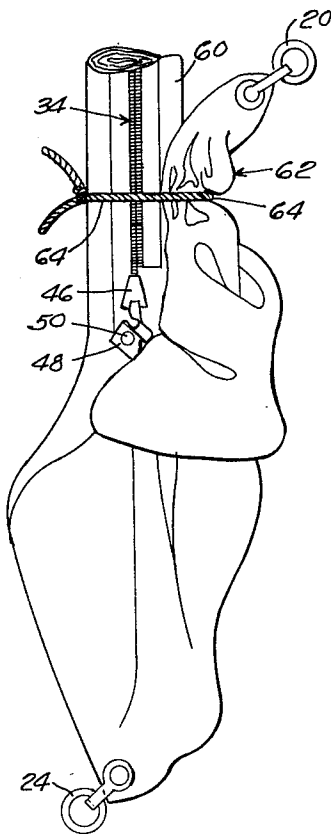
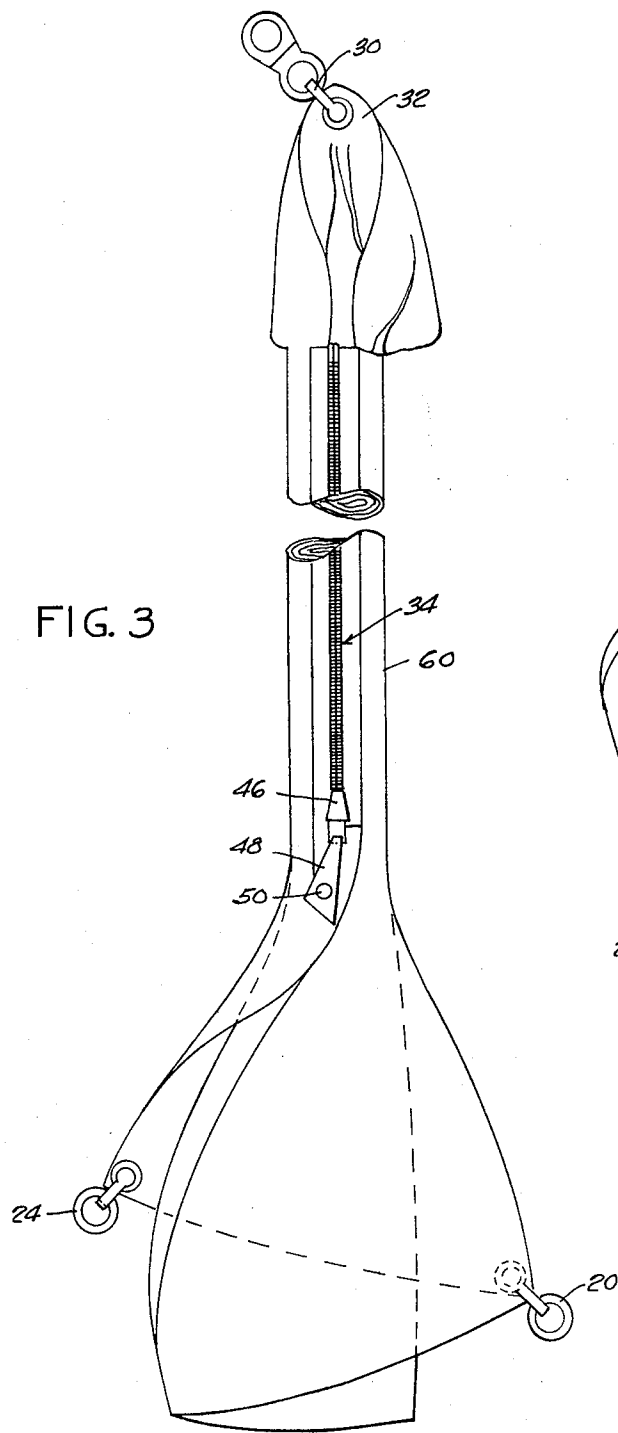
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6 Sheets-Sheet 3



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6 Sheets-Sheet 4

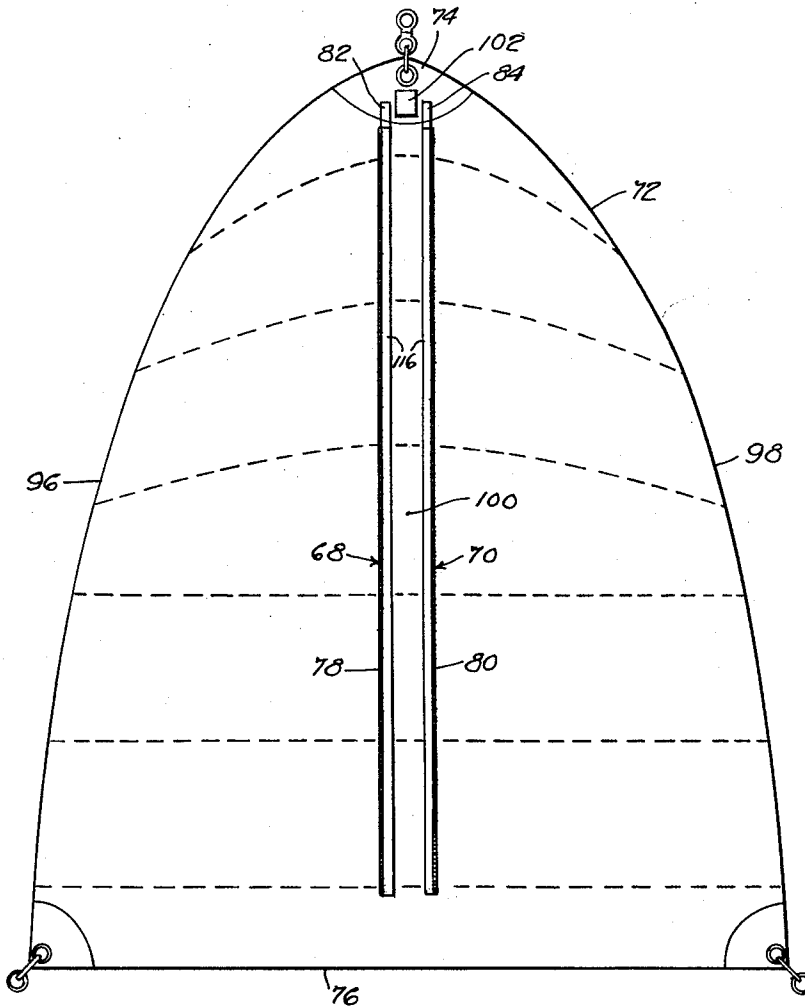


FIG. 5

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6 Sheets-Sheet 5

FIG. 6

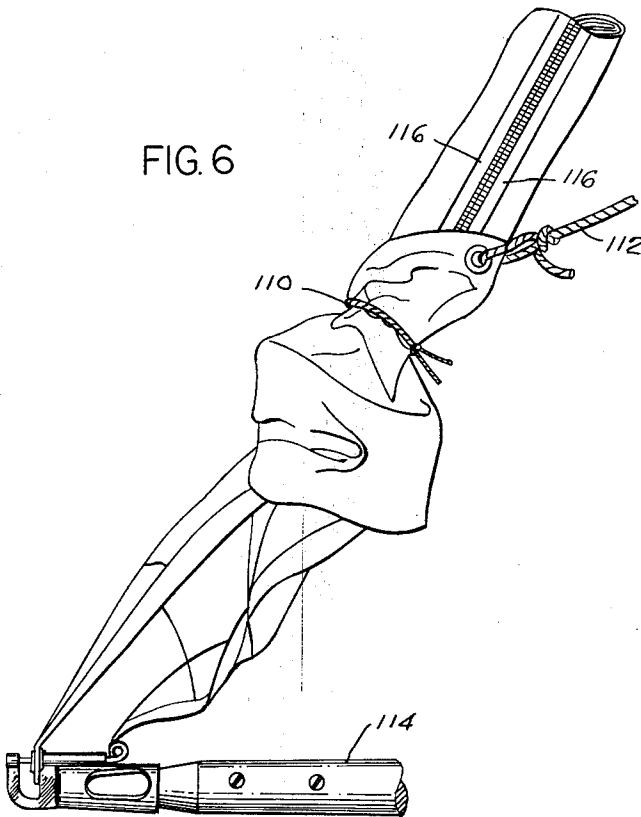
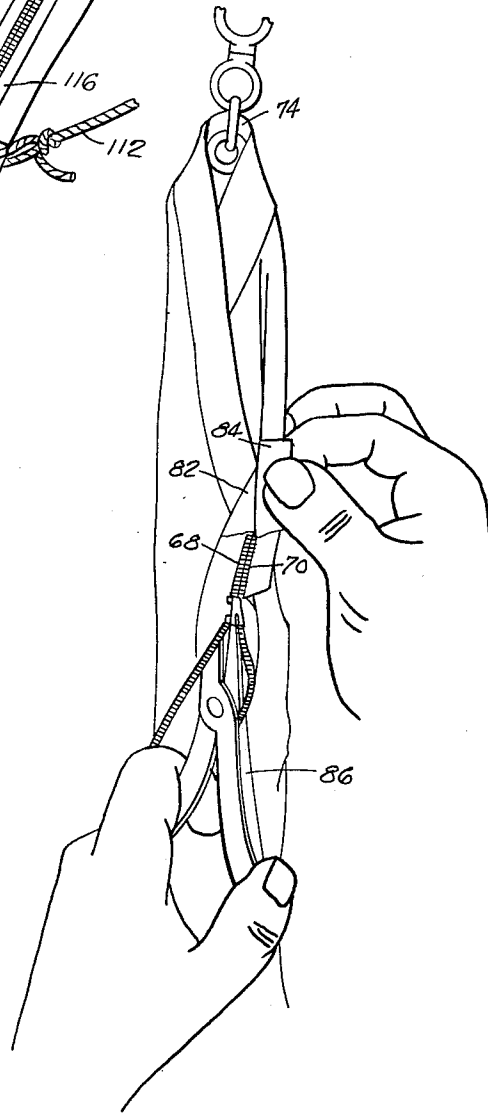


FIG. 7



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6 Sheets-Sheet 6

FIG. 8

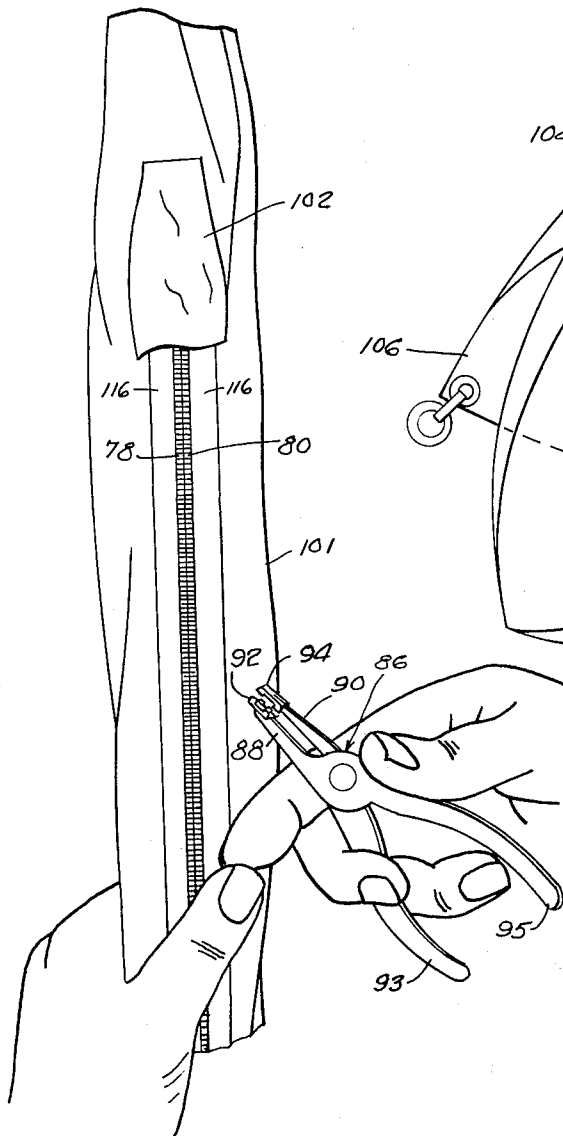
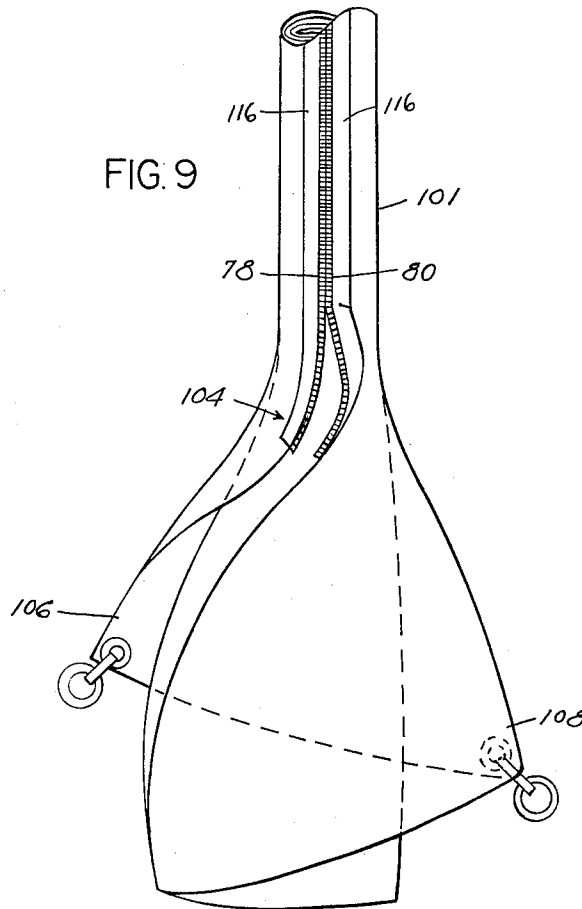


FIG. 9



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12 Claims. (Cl. 114-104)

This invention relates to a sail and means for furling the same.

The invention has for a principal object a sail embodying novel self-contained furling means which is characterized by separable and interengageable, readily releasable means for enabling a sail to be furled and unfurled in a rapid and efficient manner.

The invention has for another object to provide a sail, and a spinnaker in particular, embodying novel and improved furling and unfurling means characterized by structure enabling the spinnaker to be handled and set in a rapid and efficient manner.

With these general objects in view and such others as may hereinafter appear, the invention consists in the sail embodying novel and improved self-contained means for furling and unfurling the same hereinafter described and fully defined in the claims at the end of this specification.

In the drawings:

FIG. 1 is a front elevation of a sailboat rigged with a spinnaker embodying the present invention;

FIG. 2 is a plan view of a sail embodying one form of the invention;

FIG. 3 is a fragmentary view of a sail embodying the present invention illustrating the sail in a furled position;

FIG. 4 is a partial detail view of the sail in a furled and secured position;

FIG. 5 is a plan view of a sail embodying the present furling means in another position;

FIG. 6 is a partial detail view of the present sail hoisted in a furled position;

FIG. 7 is a partial detailed view of the present sail illustrating the initial steps of furling the same;

FIG. 8 is a fragmentary view of the sail embodying one form of the invention illustrating the furling means; and

FIG. 9 is a partial detail view of the furled sail embodying the present invention prior to securing the furling means.

In general, the present invention contemplates a sail embodying novel and improved self-contained readily releasable means for enabling a sail to be furled and unfurled in a rapid and efficient manner. The present novel means for enabling a sail to be furled and unfurled is particularly adapted for use as a so-called "spinnaker turtle" wherein the sail may be rapidly and efficiently folded upon itself, or gathered between readily detachable fastening means and secured in the form of an elongated tube defined by a portion of the sail itself and which cannot be accidentally released by the pressure of the wind when the sail is hoisted and which may be rapidly released to permit the furled sail to be set with a minimum of time and effort being expended.

Prior to the present invention, in order to handle headsails, such as spinnakers, particularly in moderate wind, it was necessary to "stop" the sail prior to use by gathering the sail into the form of an elongated bundle and to secure the same in such position by wrapping and tying spaced pieces of light yarn or easily breakable string around the gathered sail. In addition, the stopped sail was then folded into a separate container prior to use. These containers are commonly referred to as "spinnaker turtles" and have taken various forms, such as plastic buckets, rubber bags and even paper shopping bags. In order to set a spinnaker in accordance with the prior practice, the "turtle" containing the "stopped" spinnaker is carried onto

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the fore deck of the boat, generally just prior to or immediately after the boat turns the windward racing buoy and is brought on a course to "run" before the wind. The spinnaker halyard is attached to the head of the sail, the sheet and guy are attached to the tack and clew, respectively, of the sail, and the spinnaker pole is secured to either the tack or clew, depending upon the direction of the wind, in any usual manner. The sail is then hoisted by the halyard, and the pole is clipped into a fitting on the mast of the boat. In order to break out the sail the sheet is abruptly pulled, and the spaced pieces of yarn are broken, thereby permitting the wind to fill the sail. It will be apparent that the prior method of setting a spinnaker, particularly in a moderate wind and rough sea, has numerous disadvantages, the principal one being that it is difficult for a crewman to stand on a heaving deck and secure the halyard, sheet, guy and pole to the sail. The danger of having the sail blown into the water is ever-present, and the length of time required to set the sail and to have it draw efficiently is usually considerable. In addition, the sail, "stopped" by the yarn or string method, is bulky and is likely to be caught by the wind or sea and drawn over the bow of the boat into the water or break-out prematurely and thus be very difficult, if not impossible, to handle. Further, it is not desirable to affect the balance of the boat by having one or more of the crew stand on the bow of the boat for any length of time. The "turtle" also usually must be returned to the cockpit of the boat during the time it is not in use.

The present invention provides, in effect, a sail having a self-contained "turtle" which eliminates substantially all of the aforementioned difficulties. It is, therefore, a principal object of the present invention to provide a sail having novel and improved self-contained separable and interengageable readily releasable means for furling or stopping a sail before and after use and for enabling the sail to be rapidly and efficiently furled and unfurled or set for use whereby separate devices, such as pieces of yarn and cumbersome "turtles" are eliminated.

The present invention is particularly effective in enabling the sail to be set rapidly and efficiently whereby the time required to unfurl a sail or set a spinnaker is substantially reduced. In racing sailboats, a few seconds often means the difference between winning and losing a race and, therefore, it is essential to be able to properly set the spinnaker as quickly as possible to be able to take full and complete advantage of its pulling power.

While the invention has been herein described, for the purpose of illustration and not by way of limitation, as particularly adapted for use in connection with a spinnaker, it may also be used for furling and unfurling other types of sails, for example, light air headsails, such as genoas, drifters and reaching jibs, and can be used to furl mainsails.

Referring now to the drawings illustrating the preferred embodiment of the present invention, a sailing vessel 10 is shown in FIG. 1 having a main mast 12, a spinnaker 14 and a spinnaker pole 16. FIG. 1 also shows a spinnaker sheet 18 detachably secured to a ring 20 at the clew 22 of the spinnaker and a guy 23 detachably secured to the ring 24 at the tack 25 of the spinnaker. The spinnaker 14 is illustrated in its set position with the pole 16 clipped at one end into a suitable fitting on the mast 12 of the vessel and at the other end to the ring 24. Thus, the spinnaker is supported to catch the breeze and thereby assist in propelling the vessel faster on a run or reach before or "off" the wind. The spinnaker is hoisted by means of a halyard 26 running through pulley 28 adjacent the top of the mast 12 and is detachably secured to a ring 30 of the head 32 of the sail.

In accordance with one form of the invention, as shown in FIGS. 1 and 2, the spinnaker 14 is provided with self-

contained furling or stopping means indicated generally at 34 comprising an elongated fastening device comprising two elongated zipper chains 36, 38, each having a plurality of teeth 40, 42 along one edge, as shown, which are sewn or otherwise secured to a surface of the sail. One chain 36 is preferably sewn along the luff edge 44 of the sail, and the other chain 38 is spaced inwardly from the luff edge chain and is also sewn to the sail. In practice the distance between the respective spaced zipper chains is preferably substantially equal to the circumference of the longitudinally gathered spinnaker, and the area of the sail between the chains forms the outside of a tube or "turtle" when the sail is gathered, and the separable and interengaging zipper teeth on each of the chains are engaged as will hereinafter be described. As shown, the two zipper chains 36, 38 are sewn to the sail such that the teeth 40, 42 face in opposite directions, and chain 36 is longer than chain 38 to permit the slide fastener 46 to be pulled beyond the end of the shorter chain 38 for releasing the interengaged teeth and to permit the gathered sail to be released. The chains 36, 38 preferably extend from a position adjacent the head 32 of the spinnaker toward the tack 25 and generally follow the curvature of the sail. In order to interengage the teeth slider 46 is operatively secured to and arranged to slide on teeth 42 and is provided with a tab 48 having the female portion of the snap fastener 50 thereon. The male portion 52 of the snap fastener is secured adjacent the lower end of chain 36 as shown. Thus, when the teeth 40, 42 are interengaged by the slider 46, and it is in a down position, it may be secured upon engagement of the male and female portions of the snap fastener and the interengaged teeth held in their engaged relation.

In order to furl or "stop" the spinnaker for subsequent use, it is gathered from the zipper-free edge 54 toward and under the area 56 between the spaced zipper chains 36, 38. The chains 36, 38 are folded around the gathered portions of the sail toward each other, and the opposed teeth are operatively interengaged by the slider as the slider is pulled downwardly, in the manner shown in FIG. 3, whereby to fully enclose the gathered portion of the sail in the form of a tube or "turtle" 60, the major portion of the sail being enclosed within the area of the sail between the zipper chains.

As illustrated in FIG. 3, preferably, the elongated separable and interengageable fastening device or zipper does not extend the full of the sail; therefore, the clew and tack portions 22, 25 are not enclosed within the area 56 of the sail 14 between the interengaged teeth 40, 42 of the zipper forming the "turtle" and are free to enable the spinnaker sheet 18 and guy 23 to be secured thereto prior to the time for hoisting and breaking out the sail for use.

In the form of the invention shown in FIG. 3, after the teeth 40, 42 have been fully interengaged by the slider 46, i.e., the slider having been drawn downwardly as far as it will go on chain 38, the male and female portions of the snap fastener 50 may be secured to prevent the interengaged teeth 40, 42 from being prematurely disengaged. When it is desired to set or break-out the sail the snap fastener may be released and the spinnaker broken out by pulling on either the sheet or guy.

From the description thus far it will be apparent that the present invention provides a sail embodying novel and improved self-contained, separable, interengageable and quickly releasable means for furling or "stopping" the sail prior to use wherein the major portion of the sail is retained in a compact tubular form ready for use and which may be broken out and set in a rapid and efficient manner. It will be also apparent that the spinnaker in its furled form, as shown in FIG. 3, may be hoisted, the pole, sheet and guy attached prior to rounding the windward mark of the race course since the sail retained by the self-contained tubular "turtle" offers a minimum of wind resistance and cannot break-out prematurely.

FIG. 4 illustrates another means of securing the furled

sail for preventing it from breaking out prematurely and for enabling it to be rapidly unfurled or set when desired which comprises detachably securing the ungathered portion of the sail adjacent the tack and clew after the major portion of the sail has been folded and secured within the self-contained "turtle."

As shown in FIG. 4, after the sail has been gathered and enclosed within the area 56 of the sail between chains 36, 38 and teeth 40, 42 interengaged by slider 46 drawn downwardly to the end of tape 38, a portion 62 of the sail between the tack and the clew is folded upwardly and secured against tube 60 by a piece of "rotten" string or light yarn 64, the clew and tack rings 20, 24 remaining free to facilitate attachment thereto of the sheet, guy and spinnaker pole. After the portion 62 is secured by a piece of yarn 64 the slider 46 may be pulled downwardly on chain 36 beyond the end of chain 38 whereby the lower portion of the interengaged teeth is free to be disengaged. In order to break-out the sail after it has been hoisted, pressure is exerted on the sheet and/or guy, the yarn is broken and the interengaged teeth separate as the sail catches the wind, the sail being broken-out as shown in FIG. 1.

In another form of the invention illustrated in FIG. 5, separate lengths of zipper chain 68, 70 are sewn in the center of the sail 72 in spaced relation to each other and extend longitudinally from a point adjacent the head 74 of the sail to a point adjacent the foot 76 thereof and are arranged such that the teeth 78, 80 face in opposite directions from each other. In order to facilitate the initial interengagement of the teeth 78, 80 of the zipper chains, tabs 82, 84 are secured to the upper ends of the chains as shown in FIG. 7. Separate means comprising a pair of pliers 86 is provided for manually grasping and interengaging the teeth of the zipper chains as will be described. As best shown in FIG. 8, the jaws 88, 90 of the pliers 86 are each provided with a cooperating slider member 92, 94 which are adapted to engage the opposite sides of the zipper chains to progressively urge the teeth into interengaging relation as pressure is applied to the handles 93, 95 of the pliers, and the pliers are drawn toward the foot of the sail.

In order to furl the sail it is gathered inwardly from its marginal edges 96, 98 under and into the area 100 between the spaced zipper chains 68, 70. The zipper chains 68, 70 are folded around the initially gathered portion of the sail, and tabs 82, 84 are superimposed one upon the other and held between a person's fingers, as shown, such that the teeth at the upper end of the zipper chains 68, 70 are substantially aligned and against one another. The pliers 86 are then inserted such that the cooperating slider members 92, 94 engage the opposite sides of the superimposed zipper chains. Pressure is then applied to the handles 93, 95 to initially clamp and interengage the leading teeth between the jaws. As the pliers are drawn downwardly the sail 72 is progressively gathered within area 100 between the spaced zipper chains and is enclosed by the progressively interengaged teeth of zipper chains 68, 70 in the form of a tube 101. After the desired length of the zipper chains is interengaged, tabs 82, 84 are folded into pocket 102 which is secured adjacent the head of sail 72 above the upper ends of the zipper chains 68, 70 as best shown in FIG. 8. After the sail has been gathered and secured within the tube the pliers are removed. As illustrated in FIG. 9, the lower portion 104 of the zipper chain teeth 78, 80 are not interengaged. It will be apparent that having the portion of the chains unengaged at the lower end of the chains facilitates disengagement of the entire zipper and release of the gathered sail in the manner hereinafter to be described.

A portion of the sail adjacent the tack 106 and clew 108 which is not gathered and secured within the area 100 is then folded upwardly and secured against the tube 101 above the portion of the zipper chains 68, 70

which have not been interengaged by means of a piece of easily breakable yarn or string 110 in the manner illustrated in FIGS. 4 and 6. In this manner the interengaged portion of the zipper is maintained in interengaged relation and the sail retained in gathered and tubular form ready for use. In operation, as shown in FIG. 6, the sheet 112, guy (not shown) and spinnaker pole 114 may be attached and the furled sail hoisted prior to rounding the windward mark, and spinnaker 72 may be rapidly broken-out or merely by abruptly exerting pressure on the sheet or guy sufficient to break the yarn 110. As soon as the yarn is broken, the wind is able to catch the freed portion of the sail, and the remaining interengaged portions of the zipper chains are disengaged whereby the gathered sail is released and set.

In practice, the zipper chain preferably comprises a plastic material, such as nylon, or nylon reinforced with Fiberglas sewn or otherwise secured to nylon or cotton tapes 116 in any conventional manner. The use of such plastic material substantially eliminates the possibility of corrosion which would render the zipper inoperable. As may be understood, the separable and interengageable fastening means described in connection with this embodiment of the invention includes no metal parts which may corrode and no conventional slider member which may become lost.

While the present separable and interengageable and readily releasable fastening means for furling and unfurling a sail has been illustrated and described as comprising a zipper, it is to be understood that other continuous, separable, interengageable and readily releasable fastening devices may be used.

From the foregoing description it will be apparent that the present invention provides a sail embodying a novel and improved self-contained spinnaker "turtle" which enables the sail to be furled or unfurled in a rapid and efficient manner whereby a substantial amount of time is saved, both in furling as well as in setting the sail even under adverse weather conditions and the possibility of having the sail torn or ripped is substantially reduced.

Having thus described the invention, what is claimed is:

1. A sail for use on a sailboat, said sail embodying self-contained means for furling and unfurling the sail comprising elongated, separable and interengageable fastening means, said fastening means comprising a first means secured to a surface of the sail and a second means secured to said sail in spaced relation to said first means and manually interengageable and disengageable at will with said first means forming a tubular closure around the body of the sail gathered and enclosed within the area of the sail between said spaced first and second means whereby the sail may be readily furled or unfurled.

2. A sail for use on a sailboat, said sail embodying self-contained means for furling and unfurling the sail comprising elongated, separable and interengageable fastening means, said fastening means comprising a first means secured to a surface of the sail and a second means secured to said sail in spaced relation to said first means and manually interengageable and disengageable at will with said first means forming a tubular closure around the body of the sail gathered and enclosed within the area of the sail between said spaced first and second means, said area between said first and second means being substantially equal to the circumference of the gathered sail whereby the sail may be readily furled or unfurled.

3. A sail for use on a sailboat, said sail embodying self-contained means for furling and unfurling the sail comprising elongated, separable and interengageable fastening means, said fastening means comprising a first means secured to a surface of the sail and a second means secured to said sail in spaced relation to said first means and manually interengageable and disengageable at will with a major portion of said first means forming a tubular enclosure around the major portion of the body of

the sail gathered and enclosed within the area of the sail between said spaced first and second means, and breakable means for securing the ungathered portion of the sail against the tubular closure to retain and maintain said sail in furled relation until said breakable means is broken and the interengageable means released to unfurl the sail.

4. A sail embodying self-contained furling means, said furling means comprising an elongated fastening device comprising two elongated chains having quickly releasable interengaging means thereon, said chains being secured to a surface of the sail in spaced relation to each other and extending longitudinally of the sail, the body of the sail being gathered under the portion of the sail between the chains and enclosed thereby upon engagement of the interengaging means.

5. A sail embodying self-contained furling means, said furling means comprising an elongated fastening device comprising two elongated chains having quickly releasable interengaging means thereon, said chains being secured to a surface of the sail in spaced relation to each other and extending longitudinally of the sail, the body of the sail being gathered under the portion of the sail between the chains and enclosed thereby upon engagement of the interengaging means, said furling means being quickly releasable and the sail unfurled by the abrupt application of tension on the sail adjacent the lower portion of the interengageable means.

6. A sail embodying self-contained furling means, said furling means comprising an elongated slide fastener including two toothed chains and a slider member, said chains being secured to a surface of the sail in spaced relation to each other and extending from adjacent the head of the sail toward the foot thereof, the body of the sail being folded under the portion thereof between the chains and enclosed thereby upon interengagement of the slide fastener teeth whereby to provide a smooth elongated tube.

7. A sail as defined in claim 4 wherein one of said chains is longer than the other chain whereby the teeth may be disengaged by extending the slider the full length of the longer chain to disassemble the tube.

8. A sail as defined in claim 6 wherein the chains are secured in spaced relation adjacent one edge of the sail.

9. A sail as defined in claim 6 wherein the chains are secured substantially midway between the edges of the sail, and the remaining portions of the sail are each gathered within the area of the sail between the chains and releasably secured in the form of a tube upon interengagement of the slide fastener teeth and readily releasable upon disengagement of the fastening means.

10. A sail as defined in claim 6 wherein releasable locking means is provided adjacent the lower end of the slide fastener teeth chains to maintain the sail in tubular form until said locking means is released and the slide fastener chain teeth are manually disengaged.

11. A sail embodying self-contained furling means, said furling means comprising an elongated, separable and interengageable fastening means, said fastening means comprising a first means secured to a surface of said sail, a second means secured to said sail in spaced relation to said first means and engageable and disengageable with said first means, the body of the sail being progressively gathered under and within the area between said spaced first and second means and separate means for progressively interengaging said first and second means around said gathered sail forming a tubular closure around the sail to furl the sail, said first and second means being readily disengageable at will to unfurl the sail.

12. A sail as defined in claim 11 wherein said separate means for progressively interengaging said first and second means comprises a tool having cooperating jaws adapted to engage opposed sides of the first and second means and urge the same into interengagement.

No references cited.

**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,157,149

November 17, 1964

Isaac F. Manchester, Jr.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 25, for "affect" read -- effect --;
column 3, line 45, for "FIG. 3" read -- FIG. 2 --; line 47,
after "full" insert -- length --.

Signed and sealed this 4th day of May 1965.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents