April 9, 1963 L. F. JOHNSON 3,084,656

SAIL DRAFT CONTROL

Filed March 12, 1962 2 Sheets-Sheet 1

Fig. 1.

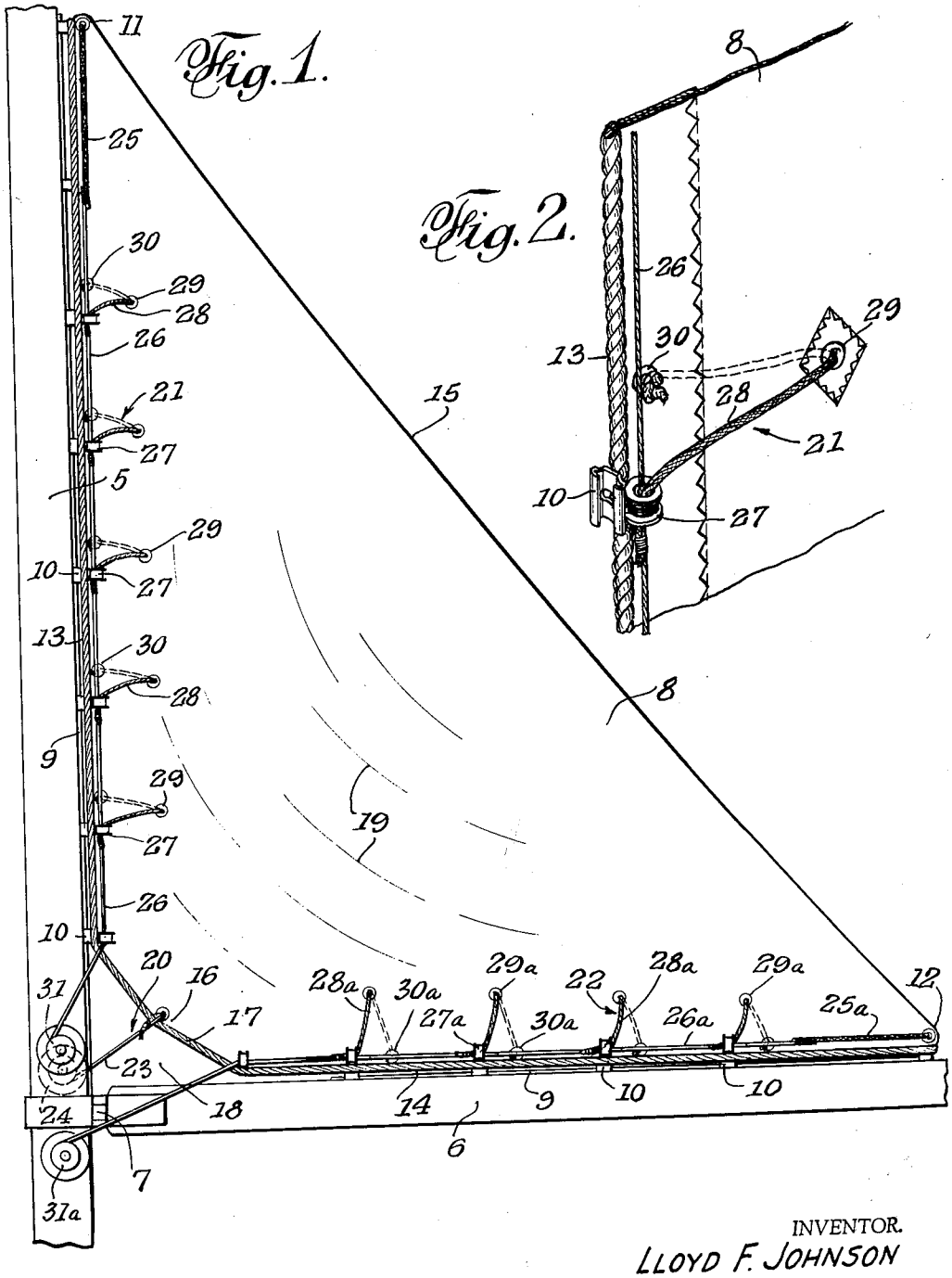


Fig. 2.

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Filed March 12, 1962 2 Sheets-Sheet 2

Fig. 3.

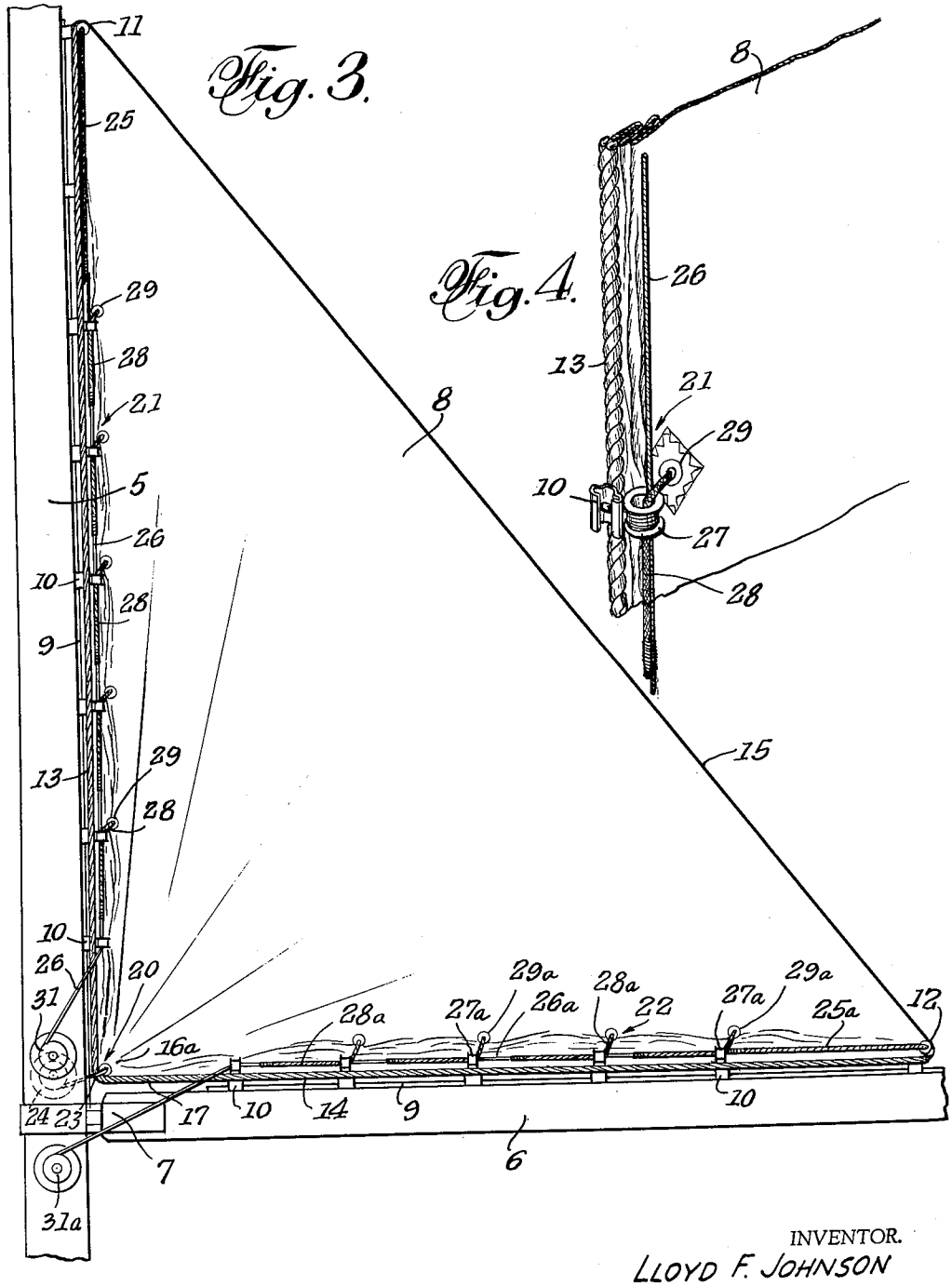


Fig. 4.

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SAIL DRAFT CONTROL

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9 Claims. (Cl. 114—105)

This invention relates to control of the draft of sails, particularly fore-and-aft sails, and has for an object to provide novel and improved means and a novel method for trimming fore-and-aft sails from a position at the tack thereof.

In order to adjust conventional fore-and-aft sails for more draft, the outhaul at the clew must be slackened, and the boom must be let up. Such conventional sails are limited by bands on both the luff and foot. Therefore, letup of the boom makes the sail smaller than its limiting band at a time when the largest sail area is needed, especially in light winds. Moreover, the clew, being at the end of the boom in fore-and-aft sails, is inaccessible when the boom is out, as in a roller reef screw outhaul, or a double purchase outhaul.

The present invention seeks to obviate the above undesired conditions and to provide for positive draft control by adjusting a sail from normal draft to drafty easily and quickly at the tack.

Another object of the invention is to provide novel, simple and improved means for increasing the area of a sail when being trimmed to increased draft and for reducing the area when being trimmed to reduced draft.

This invention also has for its objects to provide a novel, economical and convenient method or process of superior utility, and to provide apparatus that is positive in operation, convenient in use, easily installed in working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also contemplates novel combinations of method steps as well as novel details of construction and novel combinations and arrangements of parts, which will appear more fully in the course of the following description, which is based on the accompanying drawings. However, said drawings merely show and the following description merely describes, the invention with respect to a preferred method and apparatus, the same, nevertheless, being given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

FIG. 1 is a side elevational view of a fore-and-aft sail in position supported by a mast and boom, and shown trimmed for maximum draft.

FIG. 2 is an enlarged and broken perspective view of a structural detail as in the position of FIG. 1.

FIG. 3 is a side elevational view of said sail in position supported by a mast and boom, and shown trimmed for lesser draft.

FIG. 4 is a view, similar to FIG. 2, showing the mentioned structural detail, as in the position of FIG. 3.

In the drawing, the mast **5** is generally conventional, as is the boom **6** as well as the connecting fitting **7**. The sail **8**—a fore-and-aft sail—is shown with its luff and foot conventionally engaged with the mast and boom, respectively, as by tracks **9** and slide fittings **10**, but it will be understood that the same is not part of the present invention and that the sail may have either regular reef points or roller reefing. It will also be understood that the sail head **11** and the clew **12** are respectively connected to the masthead and the end of the boom in typical ways.

The present sail **8** has the usual luff **13**, foot **14**, and outer leech **15**. In this case, instead of the tack **16** extending, in the usual way, to form a normal angle where the luff and foot meet, the same describes an angular edge **17** generally parallel to the outer leech, thereby leaving a small triangular space **18** where the usual sail tack has been omitted. As shown by the arcuate lines **19**, the sail above described is drafty rather than flat when the luff **13**, foot **14** and outer leech **15**, but not the tack edge **17**, are drawn taut. Whether or not initially provided in the sail, the draft therein soon increases under normal use and, for the purposes of this invention, the sail has a natural billow when the luff, foot and outer leech are taut.

The present improvements comprise, generally, means **20**, connected to the tack **16**, to draw the same along a line that is a bisector of the luff and foot, luff-pursing means **21**, and foot-pursing means **22**, the means **21** and **22** being similar except as conforming to the luff and foot, respectively.

The means **20** is shown as a wire, cord or rope **23** that, at one end, is connected to the middle part of the tack **16** and, at the other end, is connected to the middle part of the tack **16** and, at the other end, is connected to a winch, cleat or the like **24** that is here shown as carried by the mast but may be fixedly mounted on the deck. In any case, the device **24** constitutes a means for pulling on the wire **23** or slackening off thereon, as desired. Thus, the tack **16** may be defined by the edge **17** (FIG. 1) when the wire is slacked off or said tack, designated **16***a* in FIG. 3, is drawn tautly into the angle formed by the mast and boom.

The luff-pursing means **21** comprises an elastic cord **25** connected at one end to the sail head **11**, an elongated pursing wire **26** connected to the other end of cord **25** and extending along the luff **13**, is a set of vertically spaced thimbles, pulleys or the like **27** through which said wire **26** may run, a set of lines **28**, each connected at one end to the wire **26** and extending upwardly through an adjacent thimble, through a grommet **29** in the sail in spaced relation, as desired, from the luff of the sail and then back to a point of attachment of its other end with a grommet **30** or the like closely adjacent to the luff. It will be clear that the lines **28** form a set of loops and that said loops, drawn up by a downward pull on the wire **26**, will purse that portion of the sail that is adjacent to the luff from the position shown in FIGS. 1 and 2 to the position of FIGS. 3 and 4. A winch **31** may be used for pulling on the pursing wire **26**, it being clear that the elastic cord **25** elongates, accordingly, and that the lines **28** are drawn through the respective thimbles **27**.

Since the sail head **11** and clew **12** remain fixed, it will be clear that the pursing of the sail along the luff draws slack out of the sail and flattens the same. Such flattening of the sail is best accomplished after the tack **16** has been drawn taut by the wire **23**, this preliminary operation greatly reducing the amount of power needed for pulling on the pursing wire. Of course, the degree or amount of the sail that is pursed is determined by the takeup on wire **26**.

Returning the sail to greater draft is simply accomplished by slackening off on the wire **26**, the cord **25** contracting accordingly, and the loops of lines **28** slack off to allow the pursing folds of the sail to open up.

The foot-pursing means **22** is similar to the means **21** and need not be separately described, the comparable elements being given the same identifying numerals with the subindex *a*. Said foot-pursing means **22** functions in the same manner as does the luff-pursing means and said two means **21** and **22** may be used alone or together, it being evident that the flattest condition of the sail may

be obtained when both the luff and foot are pursed at their tightest, and that the most drafty condition may be obtained when the loop lines 28 and 28*a* are fully slacked off.

It will be evident from the foregoing that the sail is trimmed, as desired, in a safe and efficient manner from the tack.

While the foregoing illustrates and describes what is now contemplated to be the best mode of carrying out the invention with respect to both the method and apparatus, the same is, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, it is not desired to restrict the invention to the particular method steps or combination or sequence of steps described, nor to the particular form of construction illustrated and described, but to cover all equivalents or modifications of method and apparatus that may fall within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a fore-and-aft sail in operative position connected by the luff to a mast and by the foot to a boom with the sail head and clew fixed,

(*a*) means to purse the sail along the luff to draw draft out of the sail in a direction toward the mast, and

(*b*) means to purse the sail along the foot to draw draft out of the sail in a direction toward the boom,

(*c*) said sail including a leech and tack extending along parallel lines.

2. Sail-pursing means comprising

(*a*) a set of lines each having one end affixed adjacent to an edge of the sail,

(*b*) a pursing wire connected to the other end of each line,

(*c*) an elastic member connected to an end of said wire and stretched by a pull on the latter, and

(*d*) means connected to the sail in spaced relation to said sail edge to form loops of said lines, said loops, when the pursing wire is pulled, being contracted and pursing the sail along and between said edge and the loop-forming means.

3. Sail-pursing means according to claim 2 in which the loop-forming means comprise grommets through which the lines pass from one side of the sail to the other.

4. Sail-pursing means according to claim 2 provided with guide members affixed to the sail and through which

pass the ends of the respective lines that are connected to the pursing wire.

5. Sail-pursing means according to claim 2 provided with guide members affixed to the sail and through which pass the ends of the respective lines that are connected to the pursing wire, the pursing wire extending through all of said guide members.

6. A fore-and-aft sail structure comprising

(*a*) a sail defined by a luff, foot and outer leech, the area thereof being normally drafty,

(*b*) a tack on said sail defined by an angular edge generally parallel to the outer leech,

(*c*) means to pull on said tack to change the form of the angular edge thereof to a right angle corner, and

(*d*) means to purse said luff and foot individually, said tack, when pulled, and said luff and foot, when pursed, reducing the sail from its normally drafty condition to a flatter condition having a smaller draft area than the sail, when drafty.

7. A method for controlling draft of a fore-and-aft sail that consists in

(*a*) pursing the sail along the luff and foot while the sail head and clew are held fixed respectively to the masthead and boom end to flatten the draft of the sail,

(*b*) freeing the pursed portions of the sail to render the same drafty, and

(*c*) pulling on the tack before pursing said sail.

8. A method for controlling draft of a fore-and-aft sail that consists in

(*a*) pursing the sail along the luff and foot while the sail head and clew are held fixed respectively to the masthead and boom end to flatten the draft of the sail,

(*b*) freeing the pursed portions of the sail to render the same drafty,

(*c*) pulling on the tack before pursing, and

(*d*) releasing the tack before freeing the pursed portions of the sail.

9. The method according to claim 8 that consists in pulling and releasing the tack and pursing and freeing the sail from a position at the tack.

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