

No. 637,619.

Patented Nov. 21, 1899.

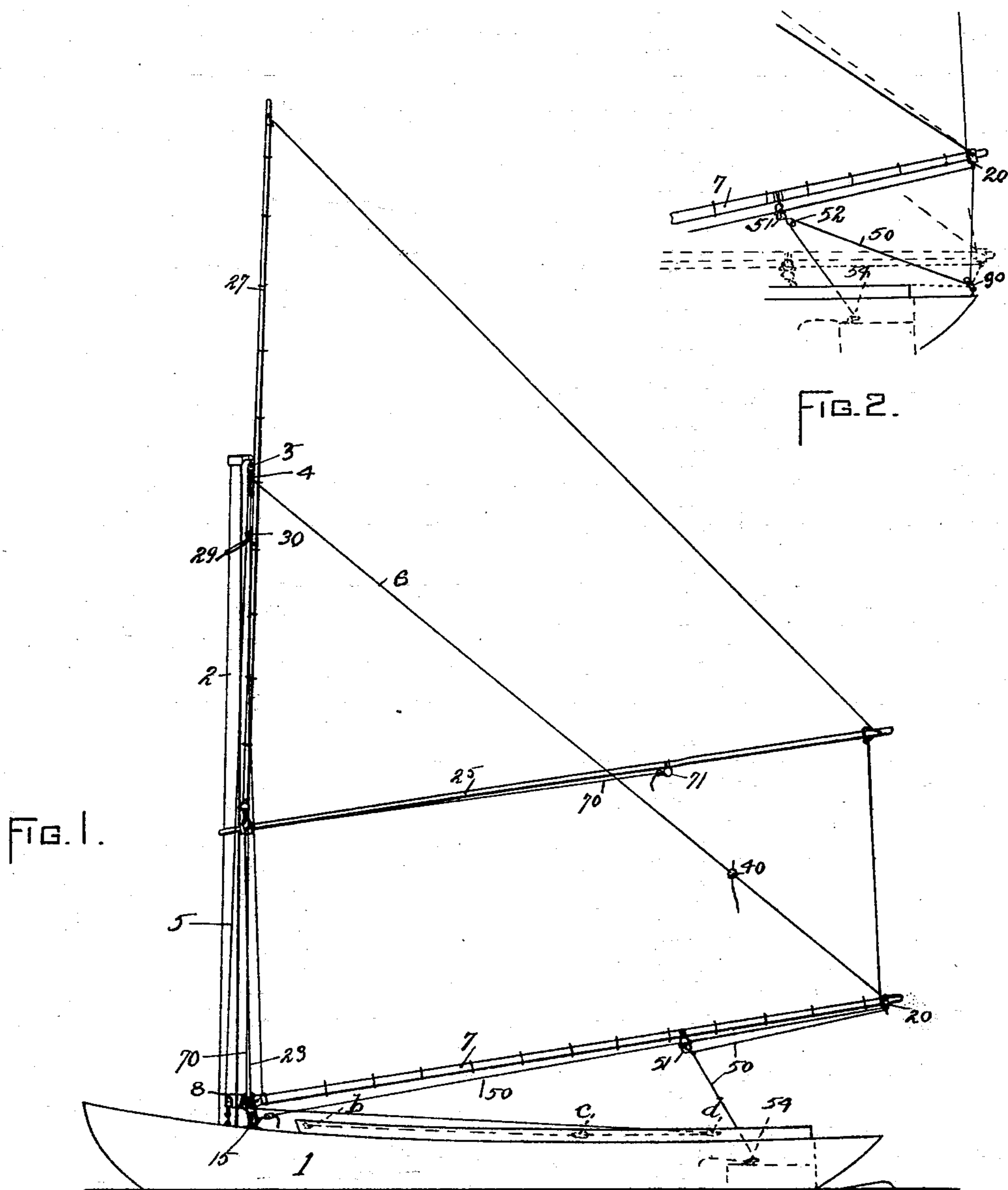
L. A. KIMBALL.

SELF-REEFING SAIL FOR CANOES, &c.

(Application filed Feb. 8, 1897.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

INVENTOR:

Henry J. Garceau
James D. Richardson

Lucian A. Kimball
BY Henry Marsh J. ATTY.

No. 637,619.

Patented Nov. 21, 1899.

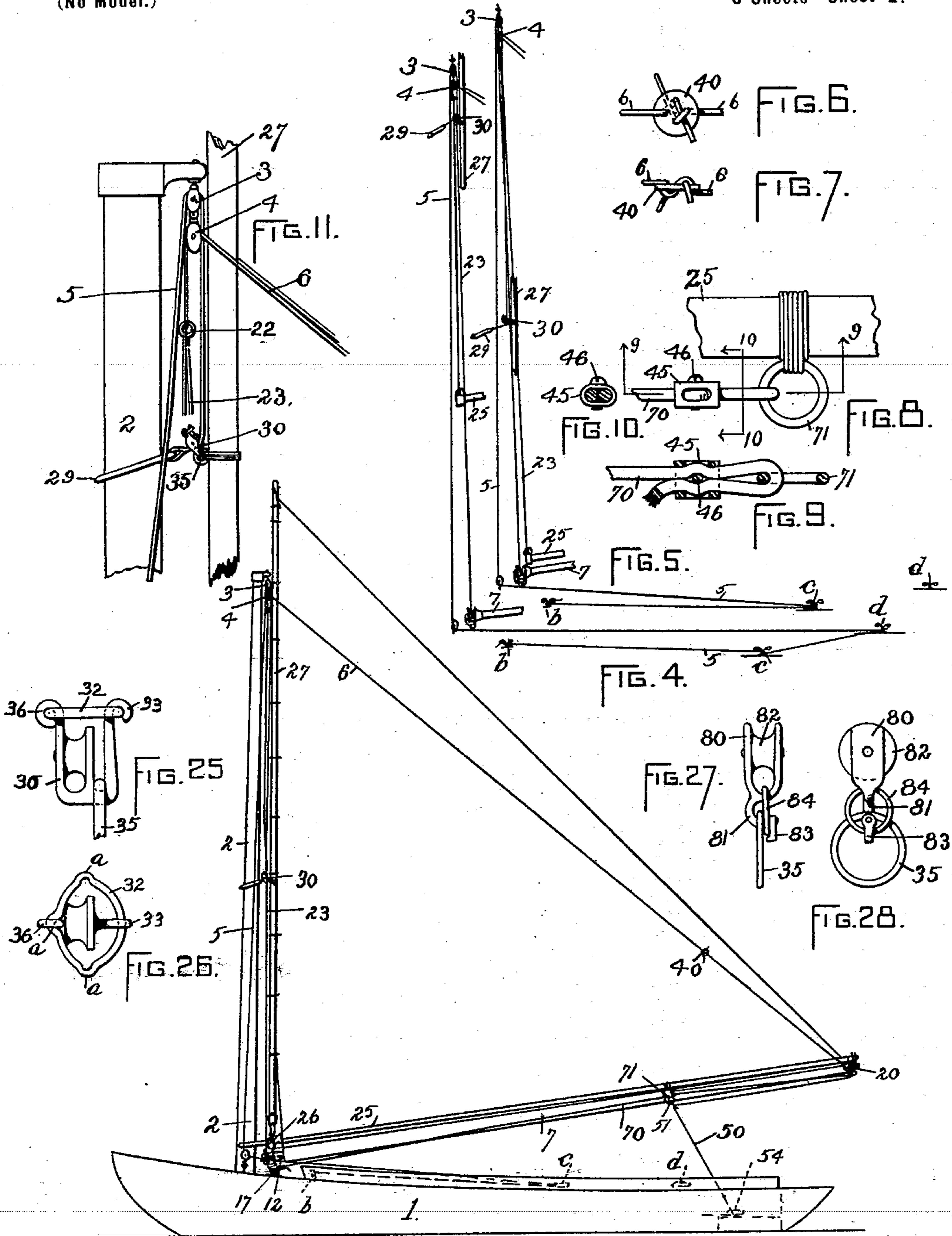
L. A. KIMBALL.

SELF-REEFING SAIL FOR CANOES, &c.

(Application filed Feb. 8, 1897.)

(No Model.)

3 Sheets—Sheet 2.



WITNESSES:

FIG. 3.

INVENTOR:

Harry J. Garceau
James D. Richardson

Lillian A. Kimball
BY Henry Marsh J.
ATTY.

No. 637,619.

Patented Nov. 21, 1899.

L. A. KIMBALL.

SELF-REEFING SAIL FOR CANOES, &c.

(Application filed Feb. 8, 1897.)

(No. Model.)

3 Sheets—Sheet 3.

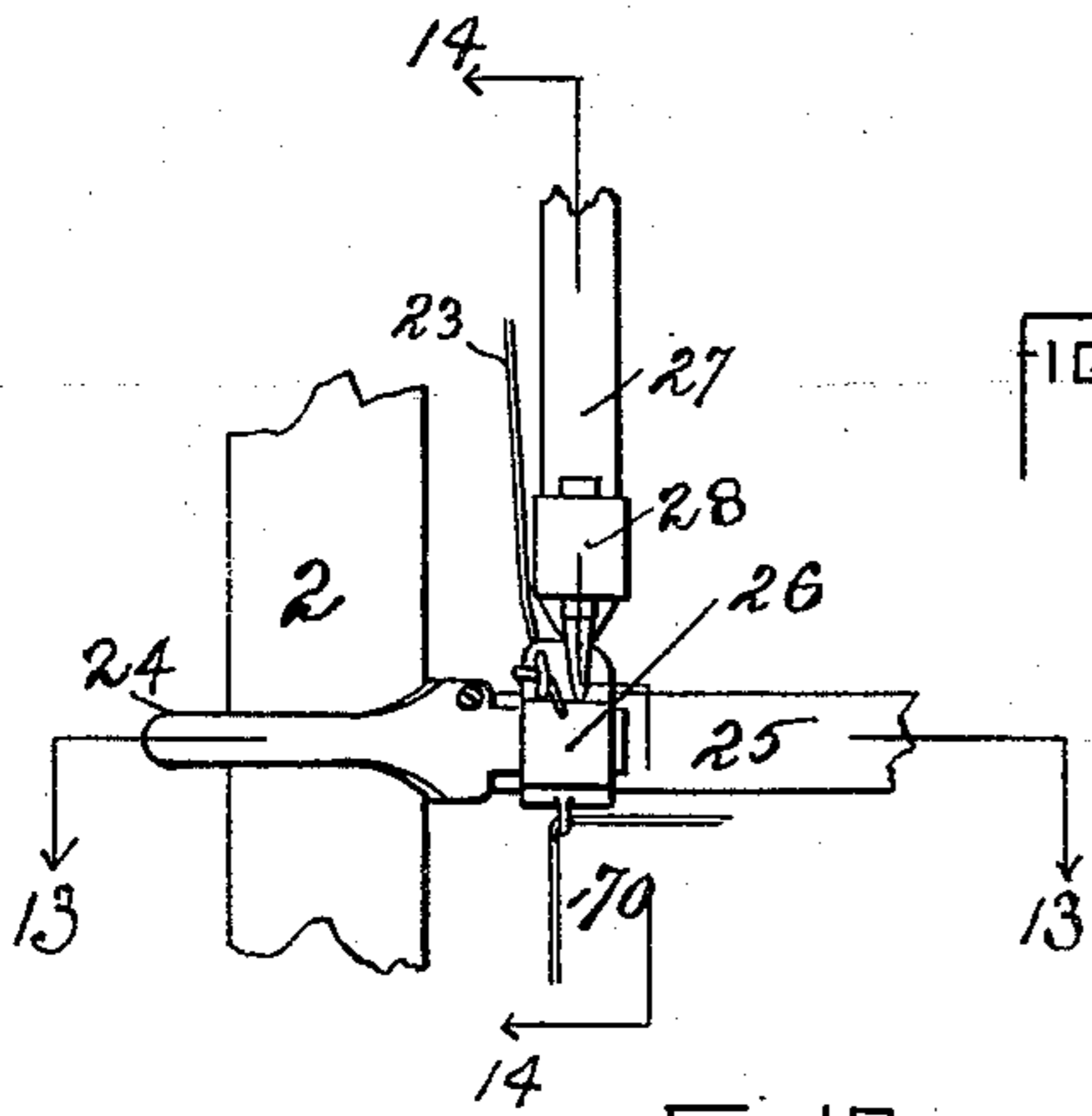


FIG. 14.

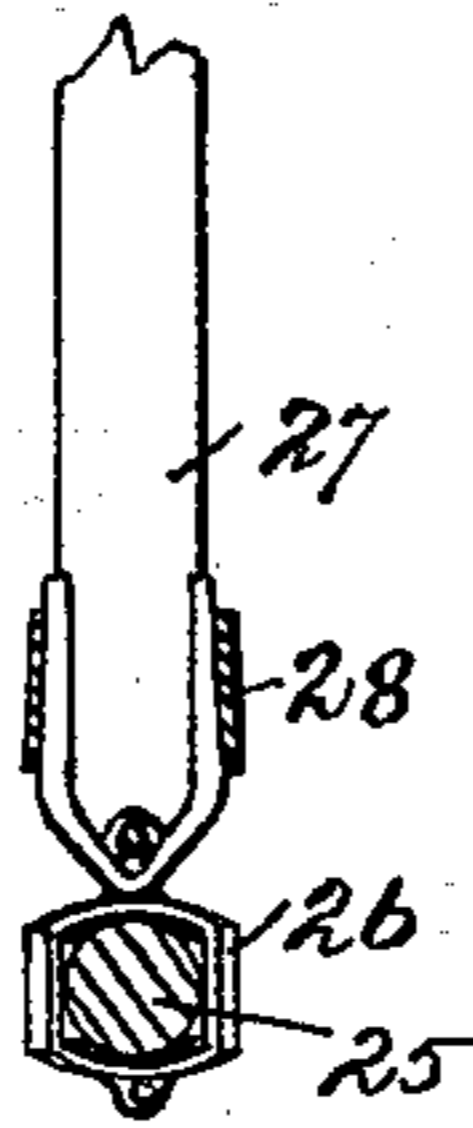


FIG. 18.

FIG. 12.

FIG. 13.

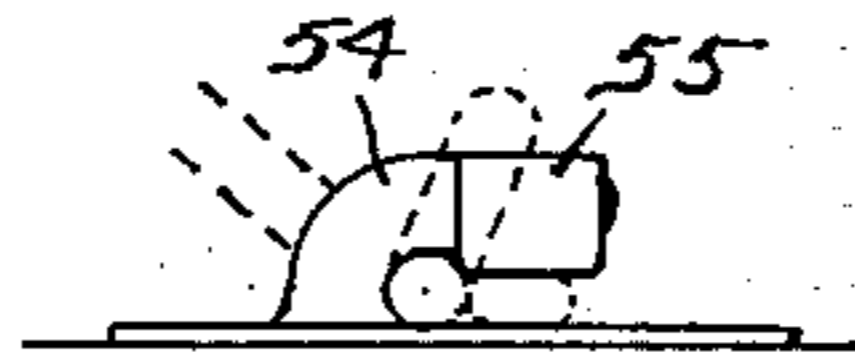
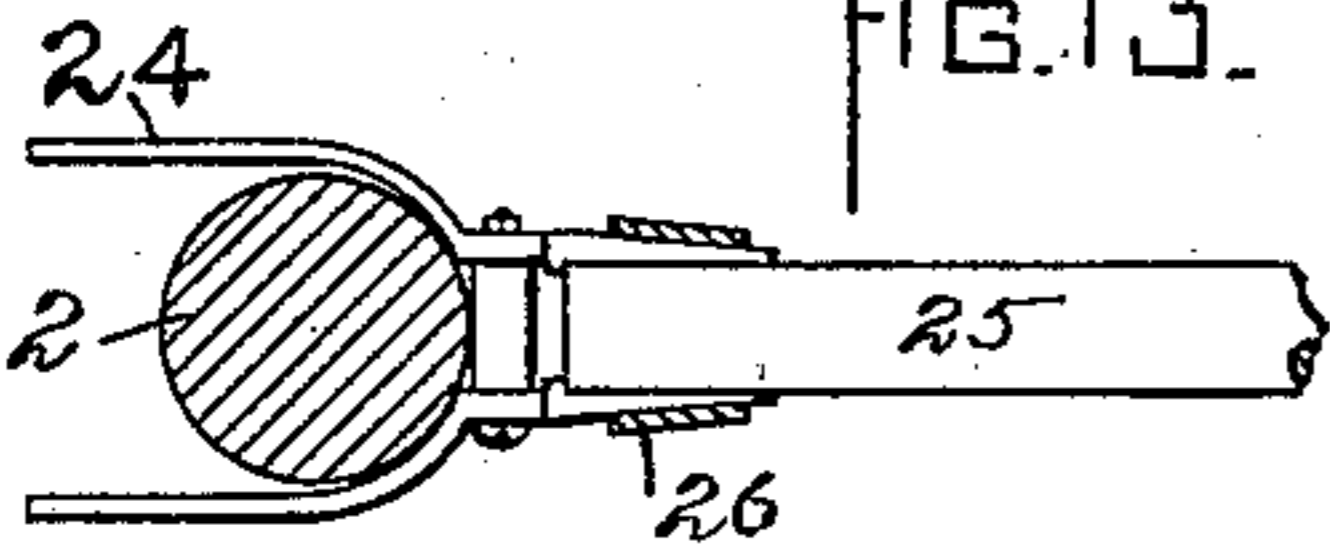


FIG. 19.



FIG. 20.

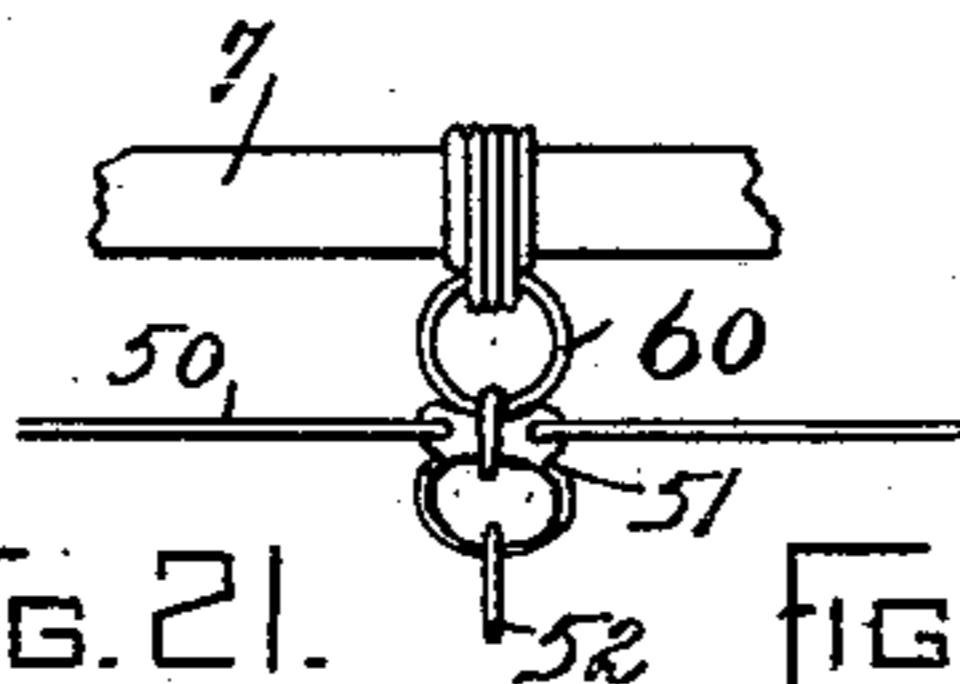


FIG. 21.



FIG. 22.

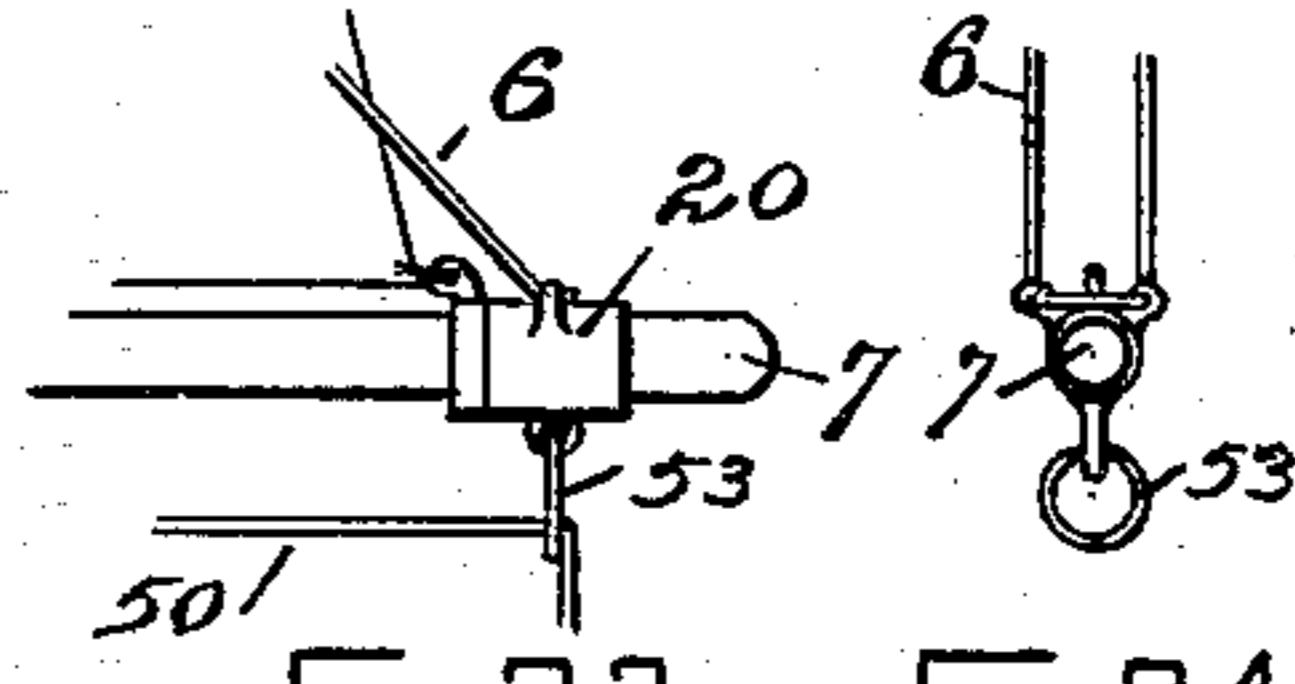


FIG. 23.

FIG. 24.

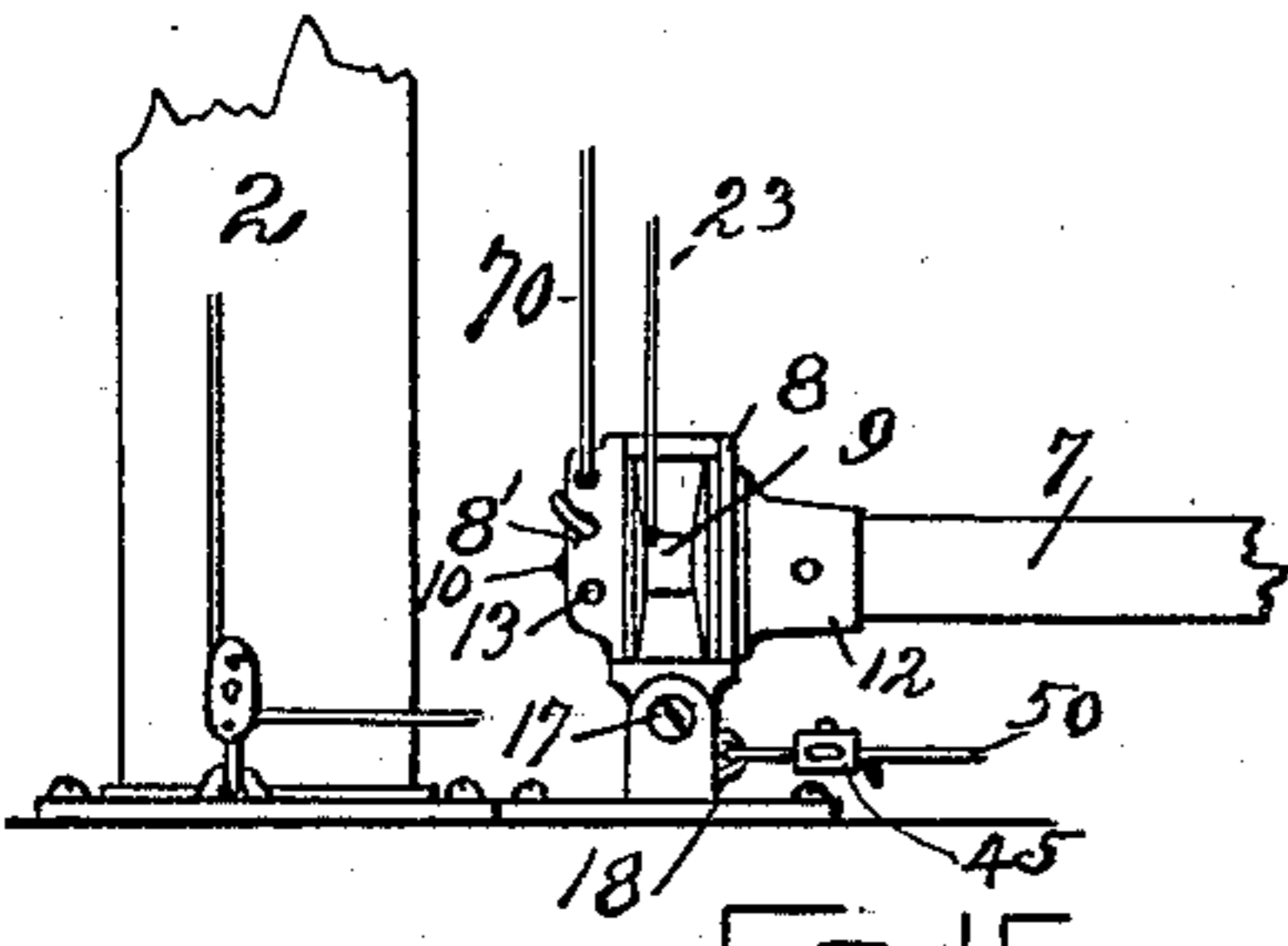


FIG. 15.

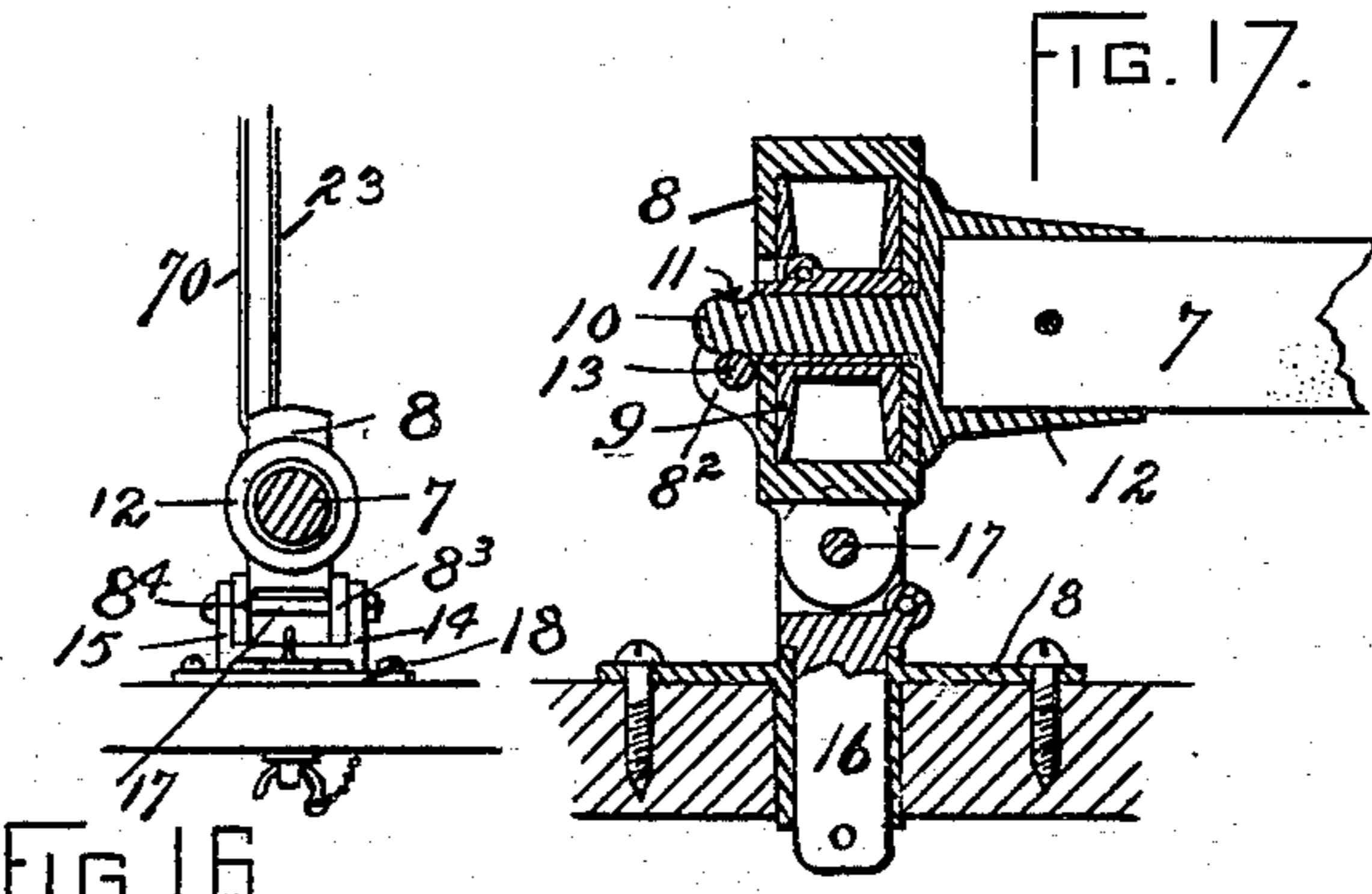


FIG. 16.

FIG. 17.

WITNESSES:

Harry J. Garceau
James S. Richardson

INVENTOR:

Lucian A. Kimball
BY Henry Marsh Jr.
ATTY.

UNITED STATES PATENT OFFICE.

LUCIAN A. KIMBALL, OF PROVIDENCE, RHODE ISLAND.

SELF-REEFING SAIL FOR CANOES, &c.

SPECIFICATION forming part of Letters Patent No. 637,619, dated November 21, 1899.

Application filed February 8, 1897. Serial No. 622,490. (No model.)

To all whom it may concern:

Be it known that I, LUCIAN A. KIMBALL, a citizen of the United States, residing in the city and county of Providence, in the State of Rhode Island, have invented a new and useful Self-Reefing Sail-Rig for Canoes and Small Boats, of which the following is a specification.

Sail-rigs heretofore used on canoes and small boats have not been safe or convenient to handle for the reason that they could not be quickly reefed in an emergency nor could they be hoisted, reefed, or lowered without the boatman changing his position in the boat, and thereby increasing the liability to capsize. Again, the multiplicity of ropes and halyards, necessarily used with such rigs, lying loose about the deck were liable to become fouled or tangled, and thus rendered inoperative in an emergency, and were, moreover, the cause of great delay and trouble in removing the rig from or applying it to the boat.

The purpose of my invention is to provide a sail-rig for canoes and small boats which can be hoisted, reefed, and lowered without the boatman leaving his seat in the boat, which will require the use of few lines or halyards, thereby removing the liability to foul, which will have no loose lines or rope lying about the deck to get fouled, and which can be readily removed from the boat and easily and quickly rigged thereon.

In ordinary-sized sail-rigs made according to my invention the weight of the sail in dropping causes the boom to revolve and wind the sail upon it to reef quickly and surely. In case the sail is so very small that possibly its weight would not be sufficient in dropping to revolve the boom a haul-down line secured at one end to a point near the deck and running up through a ring or block attached to the under side of the batten of the sail and extending aft under said batten within easy reach of the boatman serves as an effective means for pulling down on the sail, and thereby revolving the boom to reef the sail. Said haul-down line also serves as a means for fastening the boom, batten, sail, and extension-mast (where one is used) together for removal from the boat.

The novel constructions, combinations, and arrangement of the several parts of my invention will be more fully described hereinafter.

In the accompanying drawings, Figure 1 is a side elevation showing my sail-rig in its raised position applied to a canoe. Fig 2 is an elevation showing the sheet rigged with a traveler. Fig. 3 is a side elevation of the sail, showing the sail reefed or rolled up on the boom and the batten lying upon the latter. Fig. 4 is a view illustrating the arrangement of the cleats and hoist-halyards when the sail is raised. Fig. 5 is a view illustrating the arrangement of the same parts of the rig when the sail is reefed. Figs. 6 and 7 are respectively a plan and a side elevation of the rope adjusting and fastening device. Fig. 8 is an elevation showing the manner of fastening a ring to the batten or boom and also the device for securing the bight of a rope to such ring. Fig. 9 is a section on line 9 9 of Fig. 8. Fig. 10 is a section on line 10 10 of Fig. 8. Fig. 11 is an elevation showing the top-rigging and the arrangement of the halyards and the halyard-blocks, with the extension-mast shown broken away at each end. Fig. 12 is an elevation showing the device for securing the batten to the mast and the extension-mast to the batten. Fig. 13 is a section on line 13 13 of Fig. 12. Fig. 14 is a section on line 14 14 of Fig. 12. Fig. 15 is an elevation showing the manner of securing the boom to the deck. Fig. 16 is an end view of Fig. 15. Fig. 17 is an enlarged vertical section of the device shown in Fig. 15. Fig. 18 is an elevation of the halyard-cleat. Figs. 19 and 20 are respectively a side and an end elevation of the jam-cleat for securing the sheet, the ends of the sheet, and hoist-halyard. Figs. 21 and 22 are respectively a front and an edge view showing the manner of detachably securing the sheet-rope to the boom and batten. Figs. 23 and 24 are respectively a side and an end elevation of the loose ring supporting the outer end of the boom and showing the arrangement of the top-lift and sheet lines thereat. Figs. 25 and 26 are respectively an elevation and a plan view of the snatch-block by which the extension-mast is raised and lowered. Figs. 27

and 28 are respectively an edge and a side elevation of a modified form of said snatch-block.

Similar reference letters and numerals indicate like parts where they occur in the drawings.

1 represents a canoe, and 2 the mast, which is stepped therein in the ordinary manner and provided at its top with a clamping-ring, which supports the blocks 3 and 4, through which, respectively, are run the hoist and top-lift lines 5 and 6.

The batten 25 is secured at its inner end to a yoke 24, made in two parts bolted together to form two oppositely-directed pairs of jaws, the larger of which is adapted to slide freely vertically of the mast and also to swing freely laterally on the mast. In the smaller jaws is inserted the inner end of the batten, which is firmly held therein by a collar 26, adapted to be crowded upon the inclined sides of said yoke for binding purposes, Figs. 12 and 13. Said collar is provided on its under side with an eye through which is rove the downhaul-line 70 and on its upper side with a lug or ear in which is hinged for vertical or lateral movements a yoke or U-shaped strap 28, provided with tapered sides and adapted to receive and hold the lower end of the extension-mast 27, which is firmly secured therein by a collar adapted to be crowded thereon in the same manner as the one which binds the batten and its yoke together. Said collar 26 is also provided with apertures to receive and fasten one end of the reefing-line 23, Fig. 14.

The extension-mast 27 and the connected batten 25, yoke 24, and sail are raised and lowered by means of the hoist-halyard 5, which is secured at one end to a sliding ring 29 upon the mast 2, and passing through a snatch-block 30 is run through the hoist-block 3, thence down alongside the mast 2 and through another block at or near the deck, and then aft within reach of the boatman. The haul-down line 70 is secured at one end to a ring 71, secured upon the batten 25, and running through the eye on the under side of the collar 24 and thence downward is fastened to the boom-holding device, hereinafter described. The snatch-block 30 is of novel construction. It is a block-sheave through which the halyard is rove, and it is provided with a hook integral with the block, adapted for removable engagement with a ring 35, lashed or otherwise firmly secured to the extension-mast 27, and with means for locking it upon said ring. To this end it is provided with an eye 36, in which is loosely secured an elliptical ring 32, in turn provided with notches or offsets *a a a* and adapted for engagement with the outwardly-turned end of the hook 33 and can be readily turned to prevent the block from becoming disengaged from the ring and also to permit the removal of the block from said ring, Figs. 25 and 26. In cases where it is desired to bring the exten-

sion-mast in closer to the mast 2 I prefer to use the modified form of block shown in Figs. 27 and 28, where the hook 81 is located below the sheave instead of at one side thereof, and the locking-ring 84 instead of being fastened by engagement of notches with the hook is locked by a pivoted latch 83.

Instead of securing the boom 7 upon the mast in the usual way I have invented a novel device (illustrated in Figs. 1, 3, 15, 16, and 17) whereby the inner end of the boom is mounted independently of the mast and is adapted for independent pivotal, vertical, and revoluble movements, as well as for easy unshipping and removal. In a housing 8 is journaled a spool or pulley 9, axially bored and key-slotted to removably receive a spindle 10, provided with (preferably) an integral key, and also on one end with a groove 11 and at its opposite end with a thimble 12, in which is secured the inner end of the boom 7. Said spindle is removably held in the axial bore in said pulley and housing by means of a removable transverse bolt (or preferably a spring-pin) 13, held in the oppositely-located lateral lugs 8' 8², (preferably integral with the housing 8,) suitably bored for the purpose, so that it will engage with the groove 11, Figs. 15 and 17; and when so connected said spindle is revoluble with and by said pulley. Said housing 8 is provided further with downwardly-extending lugs 8³ 8⁴, adapted for engagement with the upwardly-extending jaws 14 and 15 of the pintle 16, and pivotally secured therein by a transverse bolt 17, passed through said jaws and lugs, Fig. 16. Said pintle extends down through the deck, with freedom to turn therein, and is there removably secured. In this connection I prefer to use a deck-plate 18 as a bearing-surface upon which the whole device can rest and in which said pintle is free to turn as the boom is swung in its horizontal plane. It will thus be seen that by the use of the above-described device the boom is adapted to perform three independent movements—namely, revoluble, lateral, and vertical—the boom being revolubly supported at its outer end in a loose ring 20, through which is run the endless top-lift line 6, Figs. 23 and 24.

The top-lift line 6 in my present invention is made endless, and instead of being secured at the top of the mast 2, as is customary, is rove through a double block 4 and through a ring 22, through which latter is also rove the reefing-line 23, Fig. 11. This combination and arrangement of the top-lift and reefing lines (which is novel) enables me to utilize the weight of the outer end of the boom 7 to thereby keep the reefing-line taut at all times. The reefing-line 23 is secured at one end to the spool or pulley 9, and at its other end is secured to the eye on the upper side of the yoke-collar 26 and is unwound from said spool as the sail is lowered or reefed and wound thereon as the sail is hoisted.

I have also provided as a part of this sail-

rig a novel device for fastening the ends of a rope together, so as to admit of adjustment as desired. This device consists of a button 40, having a number of perforations through which the ends of the rope are passed in such manner that each end will underlie a bight of the rope, Figs. 6 and 7, and be thereby clamped against the surface of the button. Required adjustment of the rope is attained by loosening the bight and drawing the rope to or fro through the button, as may be necessary, and then tightening the bight again. The stronger the strain on the rope the more firmly will the ends of the rope be held.

Where it is necessary to fasten a rope (especially a braided rope) to a ring or spar or to splice a braided rope, I use a collar 45, through which I pass the rope and again draw the end back through said collar to form a bight about the fastening-point and there secure it by a pin or bolt 46, passed through said collar from side to side and between the two portions of the rope within said collar, thereby crowding them against the sides of the collar and firmly holding them. Upon removal of the pin the rope can be withdrawn.

Instead of fastening the sheet 50 in the usual way I fasten one end of it to the front of the housing 9 near the deck and reeve it through the eyes in the body of the sheet-hook 51, thence through a ring or block 53, depending from the loose ring 20 on the outer end of the boom, back through a ring 52, depending from the sheet-hook 51, and thence to a jam-cleat 54, secured to the seat or boat near the seat. When a traveler is used, the sheet 50 is run, as before, through the ring 20, then through the traveler 90, and then through the ring 52 to the jam-cleat. The sheet-hook 51 is hooked into a ring 60 (lashed or secured to the under side of the boom) when the sail is raised. When the sail is reefed, the said hook 51 is hooked into a ring 71, secured to the under side of the batten 25, and thus assists in holding the sail in reef.

The operation of my invention is as follows: To apply the rig to the boat, the boom, batten, sail, and extension-mast being already connected together, the inner end of the boom is secured in the housing 8, as already described, the loose ring 20 (through which are rove the endless top-lift line 6 and the sheet 50) is slipped on over the outer end of the boom, the sheet-hook 51 hooked into the ring 60, the reefing-line 23 secured at one end to the eye on the upper side of the collar 26 and at its opposite end to the pulley 9, the haul-down line 70 rove through the eye on the under side of the collar 26 and tied into the lug 8' of the housing, the snatch-block 30 secured to the ring 35 on the extension-mast, and the whole raised by means of the hoist-halyard 5. It will be seen that the reefing-line, being fastened at one end to the collar 26 and at its other end to the sheave 9 and being free to run through the ring 22, must necessarily be wound upon the said sheave

or pulley 9 as the sail is raised and unwound therefrom as the sail is lowered. To reef the sail, the hoist-halyard 5 is unhooked from cleat *d*, allowing the batten, extension-mast, and sail to drop and by their weight, exerted through the reefing-line 23, to cause the sheave 9 and boom 7 to revolve, and thereby wind the sail upon the boom until the batten lies upon the boom, the hook 51 being unhooked from the ring 60 and, after reefing, hooked into the ring 71 on the batten to assist in holding the sail in reef. In case the weight of the descending parts is not sufficient to operate the reefing-line to revolve the sheave and boom, the haul-down line 70 affords means for applying the power necessary for that purpose. The sail, batten, boom, and extension-mast can be quickly removed from the boat, leaving the halyards, reefing-line, and all blocks on the boat in proper and convenient position for applying the removed parts when desired quickly and without liability to foul or tangle any of the ropes. To effect this, the sail is reefed, as above described, but the hoist-halyard is further slackened by unhooking it from the cleat *c*, allowing the extension-mast to be swung down until it lies upon the batten and boom, the haul-down line 70 is unfastened from the lug 8' and drawn out of the eye on the under side of the collar 26, the reefing-line unfastened from said collar and secured to said lug, and, the hook 51 being free, the loose ring 20 is slipped off over the end of the boom and fastened to a cleat at the stern of the boat, and the boom unshipped by withdrawing the spring-pin 13. The sail, batten, boom, and extension-mast can then be rolled up together and there secured by winding the haul-down line about them. The hoist-halyard, reefing-line, sheet, mast, and all blocks will thus remain on the boat properly secured in position ready for use when the removed parts are to be again rigged on the boat. If desired, the mast and all the lines and halyards and blocks can be removed together from the boat by releasing the pintle, fastening below the deck and unshipping the mast, and the boat be used with paddles or oars.

In the sail illustrated the batten is about four feet above the boom when the sail is hoisted, and consequently about four feet is the length of sail (in this case) that is rolled up on the boom in reefing. A greater or less amount of reef may be required in different boats with larger or smaller sails.

It is obvious that unless cushioned in some manner the inner end of the batten and extension-mast when lowered would be liable to drop with too great force upon the boom and the device for supporting its inner end. To obviate this liability, I have invented a novel arrangement of cleats to which the hoist-halyard is secured. I secure to the inside caming of the boat three cleats *b*, *c*, and *d*, arranged in line with each other, and the two aftermost cleats *c* and *d* separated just half

the length of the reef, (as illustrated in the drawings they would be about two feet apart,) be it more or less. The hoist-halyard being rove through the block at the foot of the mast and its lower end being fastened to the cleat *b*, the bight is carried aft with a hitch around the cleat-hook *c*, and thence farther aft is hooked over the cleat *d*. Its length is so adjusted that the batten-yoke at its lowest position will be about one inch above the boom and its holding device. When it is desired to reef, the halyard is unhooked from the cleat *d* and let run until stopped by the cleat *c*. It will be seen that the halyard is thus allowed to run out double the distance from cleat *c* to cleat *d*, or, in the case illustrated, about four feet, and that the downward movement of the batten and extension-mast is stopped just before they reach the boom.

For the cleats *c d* and the cleat for securing the end of the sheet to the stern or seat of the boat I prefer to use the jam-cleat invented by me and shown in Figs. 19 and 20. This cleat is provided with a rigid arm 54 and an eccentrically-mounted revoluble jaw-piece 55, so adjusted that a single turn of a rope about the cleat will slip freely therein, but upon the rope being carried a second time around the cleat the jaw-piece 55 will be revolved to firmly clamp the rope and prevent it from slipping.

I claim as my invention and desire to secure by Letters Patent—

1. In a sail-rig, a boom revolubly supported at each end, and mounted independently of the mast for pivotal and vertical movement, means for releasably securing and supporting the inner end of said boom, and other means for revolubly supporting its outer end, a batten mounted for pivotal and vertical movement, a sail secured to said batten and boom, means for hoisting and lowering said sail and batten, and other means for revolving said boom, all combined with each other and with a mast and deck of a boat, and arranged and adapted to serve as specified.

2. In a sail-rig, a boom mounted independently of the mast, for pivotal and vertical movement, and revolubly supported at its ends, means for releasably supporting its inner end, and other means for revolubly supporting its outer end, combined with each other and with the hull and mast.

3. In a sail-rig, a boom mounted independently of the mast for pivotal and vertical movement, and revolubly supported at its ends, a batten and extension-mast mounted for conjoint pivotal and vertical movement, and provided with hoisting means in common, a reefing-line connecting the inner ends of the batten and boom, and a sail secured to the batten, extension-mast and boom, all combined with each other and with a mast and hull, and adapted to serve as specified to automatically wind said sail upon the boom when the batten and extension-mast are lowered, and to unwind the sail when the last-named parts are hoisted.

4. A self-reefing sail-rig, consisting of a boom mounted independently of the mast for pivotal and vertical movement, and revolubly supported at its ends, a batten mounted for pivotal and vertical movement, an extension-mast mounted on the inner end of said batten for pivotal movement thereon and vertical movement therewith, said batten and extension-mast being provided with hoisting means in common, a reefing-line secured at one end to the batten near its inner end, and at its other end secured to the inner end of the boom, an endless top-lift line rove through a ring or block common to it and the reefing-line, all combined with each other and with a sail, mast and hull of a boat.

5. An endless top-lift line, a reefing-line, and a ring or block common to both, combined with each other and with the mast, batten and boom, and adapted to serve and operate together as a means for the automatic regulation of the tension of the reefing-line.

6. In a sail-rig, a batten mounted for pivotal and vertical movement, an extension-mast mounted on the inner end of said batten for pivotal movement thereon and vertical movement therewith, combined with each other and with a mast and hoisting means.

7. In a sail-rig, a yoke provided with horizontally-extending open jaws, whereby it is mounted on the mast for pivotal and vertical movement, and with other open jaws extending in the opposite direction from the first-mentioned jaws, and adapted to receive the inner end of the batten, a collar or sleeve adapted to compress said last-mentioned jaws upon said batten, and provided with a superimposed vertically-directed slot, a batten, an extension-mast mounted for pivotal and vertical movement in said slot, combined with each other and with a mast and hoisting means, all arranged as shown and adapted to serve as and for the purposes specified.

8. In a sail-rig, a yoke mounted for pivotal and vertical movement, and provided with means for holding the inner end of a batten, and also with a superimposed vertically-directed slot or aperture, a batten having its inner end secured in said yoke, an extension-mast mounted for pivotal movement in said slot, and for vertical movement with said yoke, and means for hoisting the whole, combined with each other and with a mast, and arranged and adapted to serve as and for the purposes specified.

9. In a sail-rig, a boom mounted independently of the mast for pivotal and vertical movement, and revolubly supported at each end, a batten mounted for pivotal and vertical movement, an extension-mast mounted on the inner end of said batten for pivotal movement thereon and vertical movement therewith, hoisting means, a reefing-line secured to said batten and boom, an endless top-lift line rove through a ring common to it and said reefing-line, a haul-down line secured to said batten, and adapted to serve, as

shown and described, to assist the downward movement of said batten and extension-mast, combined with each other and with the sail, mast and hull of a boat.

5 10. A boom, 7, having an axially-directed spindle-shaped inner end, 10, grooved near its extremity, as at 11, a housing, 8, a pulley, 9, revolvably mounted in said housing, and adapted to releasably receive and hold said spindle, combined with each other and with means
10 as a pin, 13, for releasably securing said spindle in said housing and pulley.

11. The described means for supporting the inner end of the boom, independently of the
15 mast, for revolvable, pivotal and vertical movement, said means consisting of a housing, 8, a spool or pulley, 9, revolvably mounted therein, and a pintle, 16, pivotally secured to said housing, combined with each other and
20 with a deck or other support, and with means for pivotally securing said pintle therein.

12. In a sail-rig of the character herein described, the described means for adjustably securing the ends of ropes together, said
25 means consisting of a button 40, provided with a number of apertures, as shown and described, adapted to permit the passage through them of the ends of the rope in such manner that each end will underlie a bight of
30 the rope and be thereby clamped against the surface of the button.

13. In a sail-rig of the character herein described, the combination with a mast 27, mast-ring 35, and hoist-halyards, of a detachable snatch-block, 30, having a shell provided with an integral exteriorly-located
35 hook, 33, a sheave revolvably mounted in said shell, and means for releasably locking the whole to the sail.

40 14. The combination of the sheet 50, sheet-hook 51, block or ring 53, ring 20, ring 52, housing 9, with the boom and means for releasably securing the free end of the sheet 50.

15. The combination of the sheet 50, sheet-hook 51, block or ring 53, ring 20, ring 52, housing 9, ring 60, boom 7, and means for releasably securing the free end of the sheet 50. 45

16. The combination of the sheet 50, sheet-hook 51, block or ring 53, ring 20, ring 52, housing 9, boom 7, batten 25, and ring 71, with the mast and sail, all arranged and adapted to serve as specified to assist in holding the sail in reef. 50

17. In a sail-rig, the combination with a boom releasably supported at its ends, of a sheet secured at each of its ends independently of said boom, and means for releasably securing said sheet at a point near the end of said boom and also at another point intermediate of the length of said boom. 55 60

18. In a sail-rig, the combination with a mast, and a boom mounted independently of said mast, and releasably supported at each end, of an endless top-lift line releasably secured to the outer end of said boom. 65

19. In a sail-rig having a mast, a boom mounted independently of said mast, and releasably supported at its ends, an endless top-lift line releasably secured to the outer end of said boom and serving as a support thereof, a batten, a sail secured to said boom and batten, and means for hoisting and lowering said batten and sail, the combination with said parts of a reefing-line having one of its ends secured to said batten and its other end releasably secured independently of said batten, and a ring or block common to said top-lift and reefing lines. 70 75

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 80 4th day of February, 1897.

LUCIAN A. KIMBALL.

Witnesses:

WILLIAM ELY,

ROBERT FESSENDEN.