

No. 670,831.

Patented Mar. 26, 1901.

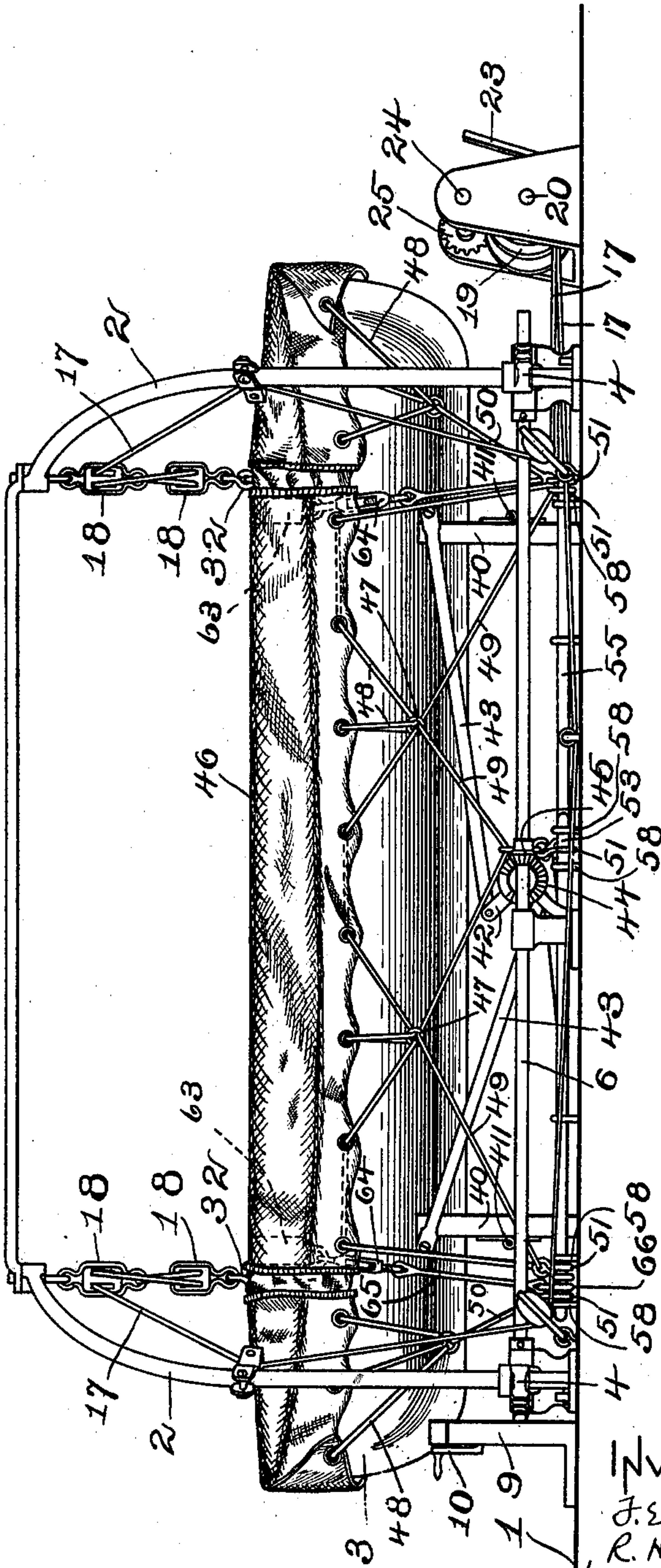
F. E. ALLEN & R. H. DANFORTH.
BOAT LOWERING DEVICE.

(No Model.)

(Application filed June 21, 1900.)

5 Sheets—Sheet 1.

FIG. 1.



WITNESSES:
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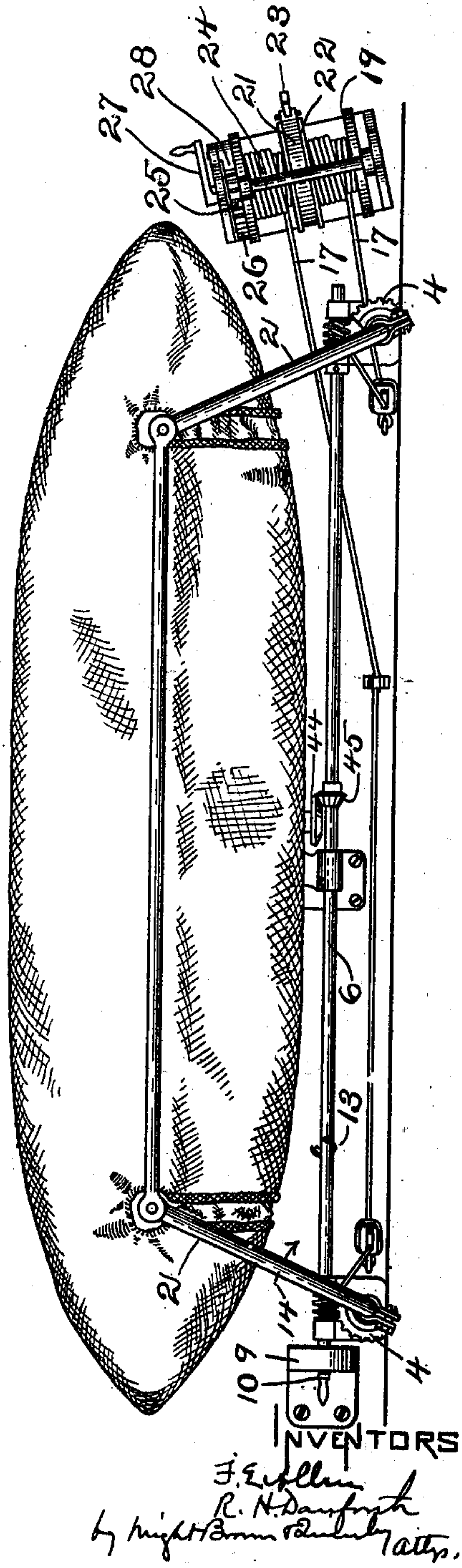
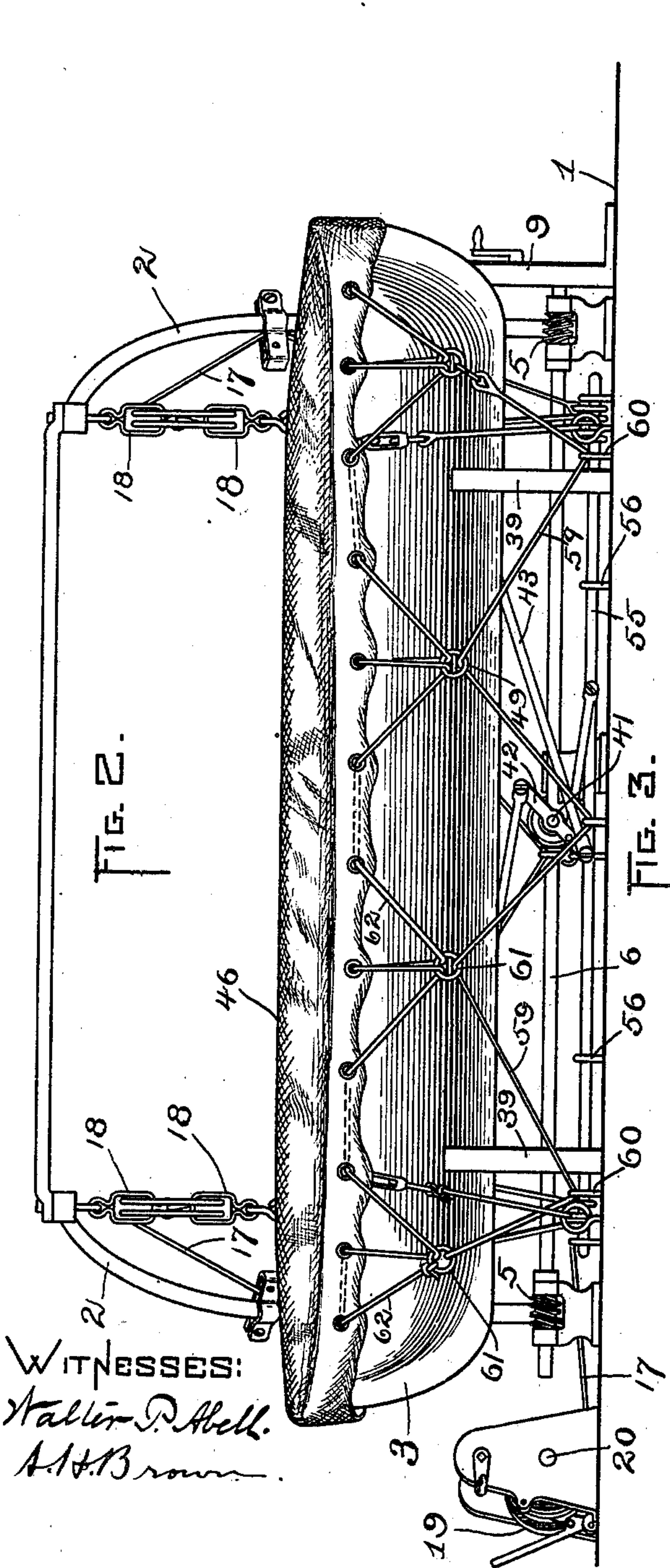
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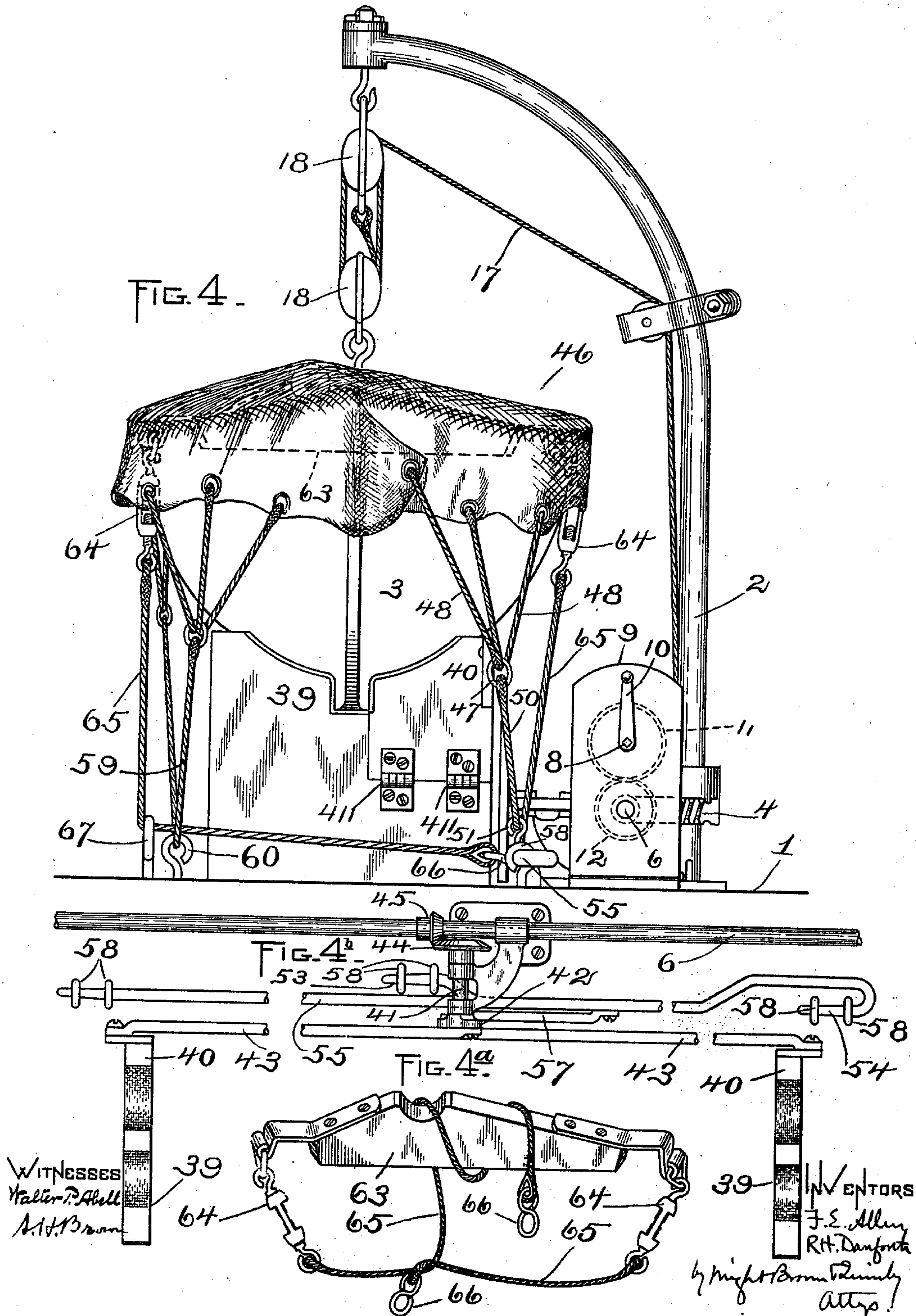
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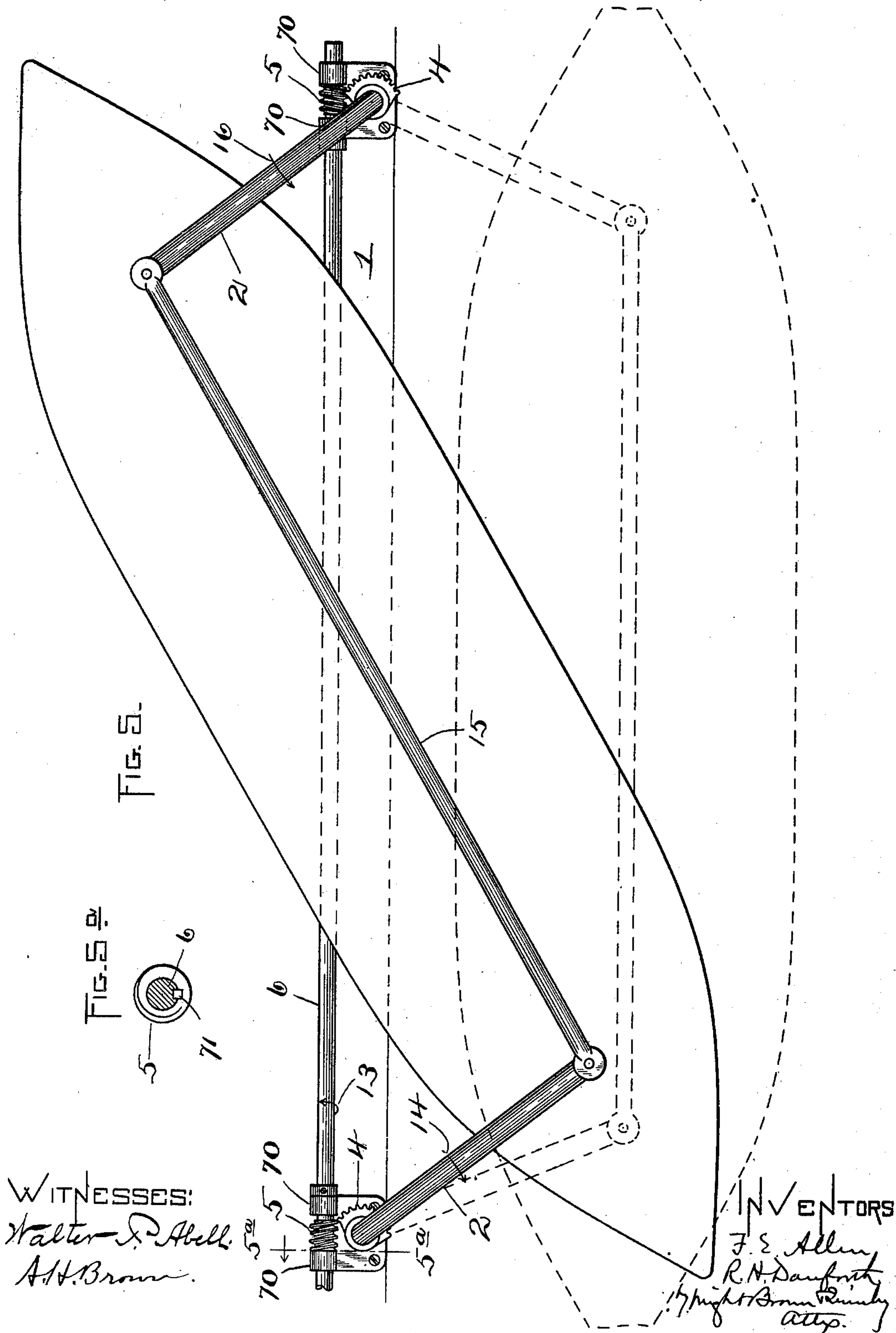
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(No Model.)

5 Sheets—Sheet 4



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(No Model.)

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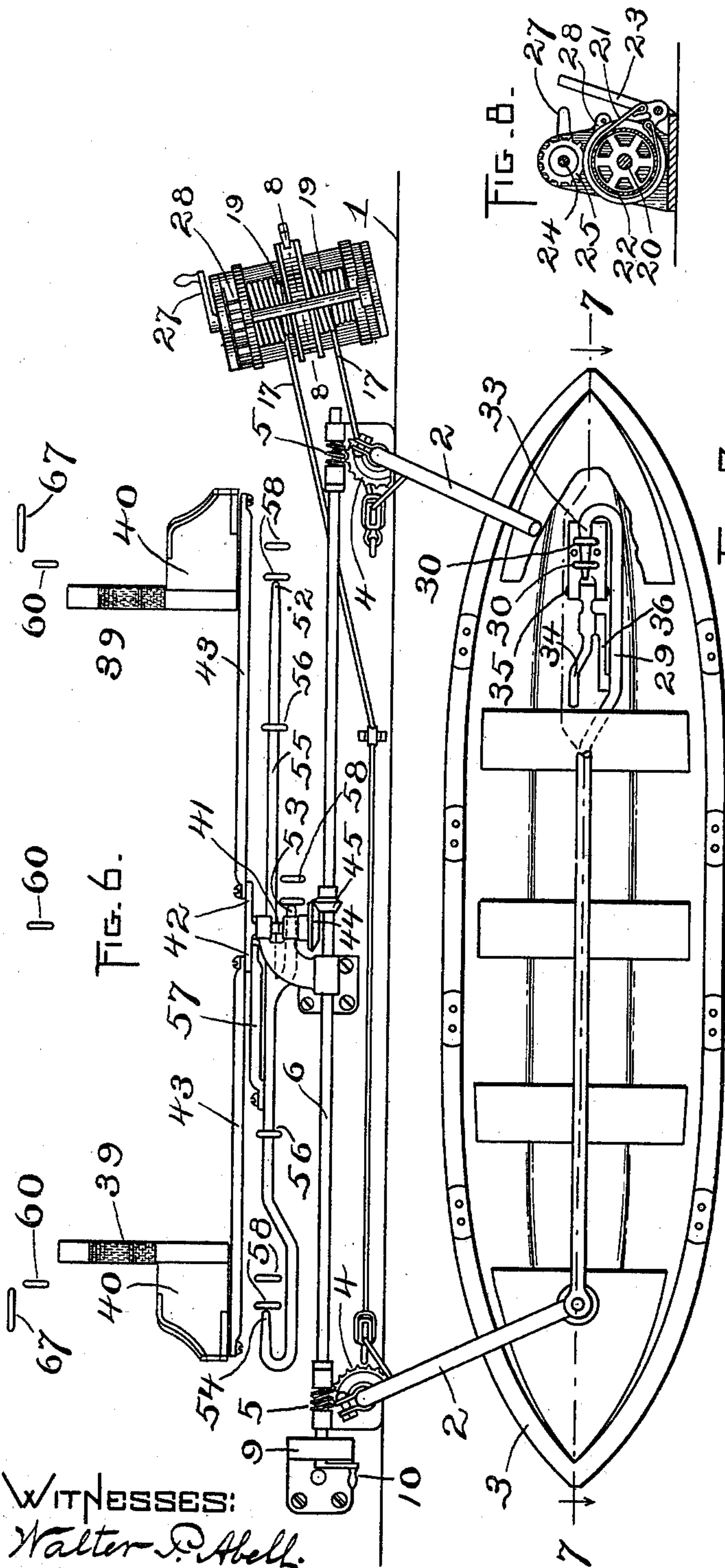


FIG. 6.

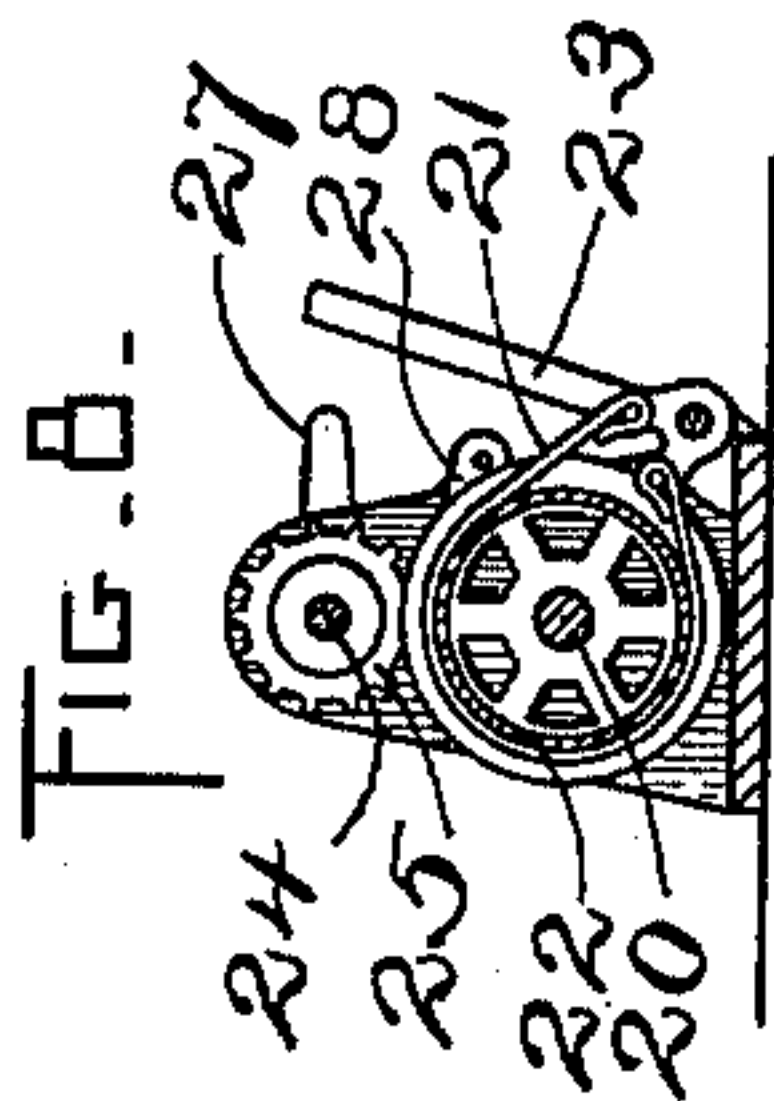


FIG. 7.

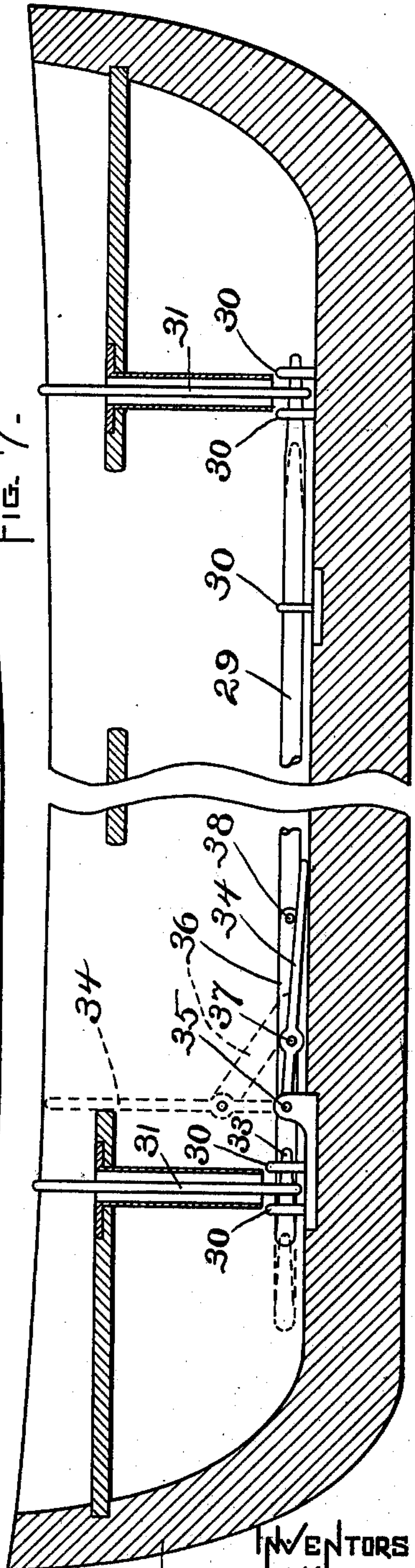


FIG. 8.

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UNITED STATES PATENT OFFICE.

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BOAT-LOWERING DEVICE.

SPECIFICATION forming part of Letters Patent No. 670,831, dated March 26, 1901.

Application filed June 21, 1900. Serial No. 21,092. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK E. ALLEN, of Boston, in the county of Suffolk, and RAYMOND H. DANFORTH, of Salem, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Boat-Launching Devices, of which the following is a specification.

This invention has for its object to provide effective and reliable means for swinging a boat from the position it occupies when on board ship outwardly and then lowering it into the water in such manner as to insure speed in the operation of floating the boat and to prevent possibility of lowering either end of the boat prematurely.

The invention also has for its object to provide other improvements relating to the storage of a boat upon a ship and to the transference of the boat to the water.

The invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a boat-handling apparatus embodying our invention, the boat being shown stored above the deck. Fig. 2 represents an elevation from the opposite side from that shown in Fig. 1. Fig. 3 represents a top plan view. Fig. 4 represents an end elevation. Fig. 4^a represents one of the holding-bars. Fig. 4^b represents a plan view of parts of the mechanism. Fig. 5 represents a top plan view showing in full lines a boat partly swung outward over the side of the ship and in dotted lines the position of the boat after it has been entirely swung out and ready to be lowered. Fig. 5^a represents a section on line 5^a 5^a of Fig. 5. Fig. 6 represents a plan view showing the boat in full lines swung outboard preparatory to being lowered and also showing the detaching apparatus within the boat. Fig. 7 represents a section on line 7 7 of Fig. 6. Fig. 8 represents a section on line 8 8 of Fig. 6.

The same reference characters indicate the same parts in all the figures.

In the drawings, 1 represents the deck of a vessel.

2 2 represent davits, which are journaled in suitable bearings and are of the usual general form, their upper ends being curved to project over the boat 3, as shown in Fig. 4. To the vertical portions of the davits 2 are affixed worm-gear segments 4 4, meshing with worms 5 5, affixed to a shaft 6, which is journaled in suitable bearings affixed to the vessel. Suitable means are provided for rotating the shaft 6, the means here shown being a short shaft 8, Fig. 4, journaled in a fixed casing 9 and provided with a crank 10, a gear 11, affixed to the shaft 8, and a gear 12, affixed to the shaft 6 and meshing with the gear 11. The rotation of the crank 10 by an attendant on the deck imparts a rotary motion to the shaft 6. The worm-gear segments 4 4 are so arranged relatively to the worms 5 5 that one of the segments 4 is disengaged from its worm just as the other segment commences to engage the other worm. The relative arrangement is clearly shown in Figs. 3 and 6, Fig. 3 showing the relative positions of the segments 4 and worms 5 when the boat is swung inwardly over the deck, while Fig. 6 shows the relative arrangement when the boat is swung outwardly and is ready to be lowered. It will be seen by an inspection of Fig. 3 that when the boat is stored over the deck the segment 4 at the left-hand end is in engagement with the corresponding worm, the other segment 4 being out of engagement. By reference to Fig. 6 it will be seen that the segment 4 at the right-hand end is engaged with the corresponding worm, while the segment at the opposite end is out of engagement.

In shifting the boat from the position shown in Fig. 3 to that shown in Fig. 6 an attendant rotates the shaft 6 in the direction indicated by the arrow 13 in Fig. 3, thus causing the intermeshing worm and worm-segment to swing the left-hand davit positively outward in the direction indicated by the arrow 14, Fig. 3, the other davit for the time being loose, so that it swings freely and conforms to the movements of the positively-moved davit. In this way one end of the boat is swung outwardly over the side of the deck, the other end remaining inboard, as indicated in Fig. 5. When the boat reaches this position, the

rod 15, connecting the swinging ends of the two davits, causes the right-hand davit to swing sufficiently to bring its worm-segment 4 into engagement with the corresponding worm 5, so that the continued rotation of the shaft 6 moves the right-hand davit outwardly in the direction indicated by the arrow 16, Fig. 5, this movement continuing until the last-mentioned davit is in the position shown in Fig. 6, the boat being then swung entirely clear from the side of the ship, so that it may be lowered into the water by the means hereinafter described. The boat may be swung inwardly from the position shown in Fig. 6 to the position shown in Fig. 3 by reversing the rotation of the shaft 6, the davits being thus swung successively, so that one end of the boat is first swung inwardly until the segment 4 of the right-hand davit is disengaged from its worm, the other end being then swung inwardly by the engagement of the segment of the other davit with the other worm. It is to be noted that each segment is moved out of engagement with its worm just after the other segment is moved into engagement with the other worm. This mechanism enables the boat to be very quickly and conveniently swung between the two davits from the position over the deck to the position over the water, and vice versa, wholly by the rotation of the shaft 6.

The boat is suspended from the davits by means of ropes 17, with which are combined sheaves 18, suitably connected with the boat and arranged so that when the ropes 17 are let out the boat will be lowered. The ropes 17 are connected with drums 19 19, both affixed to a single shaft 20, journaled in bearings on the ship. When the boat is ready to be lowered, the drums 19 19 are released, allowing the ropes 17 to be paid out, thus lowering the boat, the two ropes being paid out uniformly on account of the rigid connection between the two drums, causing them to rotate in unison. The rate of rotation of the drums and the descent of the boat may be governed by means of a band-brake 21, which surrounds a disk 22, affixed to the drums 19, the band-brake being controlled by a lever 23, by which it may be pressed with greater or less force against the periphery of the disk. The drums may be rotated to wind up the ropes and raise the boat by means of a shaft 24, having a gear 25, meshing with a gear 26, affixed to the shaft 20, the said shaft 24 having a crank 27, which enables an attendant on the deck to rotate the drums through the described connection. A locking-dog 28, Figs. 3 and 6, is arranged to engage the gear 25 and prevent the backward rotation of the drums and the lowering of the boat whenever this is desired.

29, Figs. 6 and 7, represents a bolt which is longitudinally movable through eyes or guides 30, affixed to the bottom of the boat, the bolt 29 extending lengthwise of the boat and being movable endwise into and out of

engagement with links 31 31, which are connected by chains 32 or other flexible connections with the lower pulley-blocks 18. One end of the bolt 29 is bent backwardly upon itself, as shown at 33, so that a movement of the bolt 29 in one direction will disengage it simultaneously from the two links 31, thus releasing the boat simultaneously at both ends. The bolt 29 may be moved lengthwise to engage it with and disengage it from the links 31 by means of a lever 34, pivoted at 35 to a bracket affixed to the bottom of the boat and connected with the bolt 29 by means of a link 36, pivoted at 37 to the lever and at 38 to the bolt. When the lever is depressed, as shown in full lines in Fig. 7, the bolt is in position to engage the links 31 31; but when the lever is raised, as shown in dotted lines in Fig. 7, the bolt is moved out of engagement with said links.

When the boat is stored on deck, as shown in Figs. 1, 2, 3, and 4, it rests on chocks 39, which are formed, as shown in Fig. 4, to fit the bottom and keel of the boat. Each chock has a swinging section 40, which supports the boat at one side of the keel and is connected by hinges 41 1 with the fixed portion of the chock. These swinging sections 40 are between the keel of the boat and the side of the ship when the boat is stored, and when they are displaced, as they are adapted to be by the hinges 41 1, they are removed from the side of the boat and offer no obstruction to the outward horizontal sidewise movement of the boat. The swinging sections 40 are adapted to be displaced simultaneously to release the boat by means of a rock-shaft 41, journaled in a fixed bearing secured to the shaft and having two oppositely-projecting arms 42 42, which are connected by links 43 43 with the swinging chock-sections 40. When the rock-shaft 41 is rotated in one direction, it depresses the sections 40, and when rotated in the opposite direction it raises said sections. The rock-shaft 41 is provided with a bevel-gear segment 44, which meshes with a bevel-gear 45, affixed to the shaft 6. The segment 44 is arranged so that when the chock-sections 40 are in their operative position to support the boat the teeth of said segment are in mesh with the teeth of the gear 45. The first few turns of the shaft 6 in the direction required to swing the boat outwardly cause the gear 45 to rotate the segment 44 and the rock-shaft 41, thus turning the arms 42 to a horizontal position and moving the rods 43 endwise sufficiently to swing the chock-sections 40 downwardly, as shown in Fig. 6, the chock-sections being thus removed from engagement with the side and keel of the boat. When the chock-sections are thus displaced, the end of the gear-segment 44 leaves the gear 45, so that there is no further rotation of the rock-shaft during the succeeding swinging movements of the boat, the space between the ends of the gear-segment 44 being such that the teeth of the segment do not again

engage the teeth of the gear 45 until the reverse rotation of the shaft 6 swings the boat inwardly to position over the chocks. When the boat reaches the last-named position, the segment 44 may be again engaged with the gear 45 by slightly turning the rock-shaft 41 by hand, and when this is done a few additional turns of the shaft 6 will raise the chock-sections 40 to their operative position, so that when the boat is stored away and secured the segment 44 is in engagement with the gear 45, thus causing the first movements of the shaft in swinging the boat outwardly to displace the swinging chock-sections 40.

46 represents a flexible cover fitted to the boat and having eyes 47 suspended from its outer edge or the edge adjacent to the side of the ship by cords 48. The eyes 47 are connected by cords 49 and 50 with a series of eyes 51, which are adapted to be engaged by bolts 52 53 54, formed on a rod 55, which is longitudinally movable in guides 56, attached to the deck, the arrangement of said bolts being best shown in Fig. 6. The bolt 52 engages the eyes 51, connected with one end of the cover, while the bolt 53 engages an eye 51, connected with the central portion of the cover, and the bolt 54 engages eyes 51, connected with the opposite end of the cover, all as shown in Fig. 1. The bolt-carrying rod 55 is connected by a link 57 with one of the rock-shaft arms 42, the arrangement being such that when the arms 42 are in their chock-raising positions the bolts 52 53 54 will be projected into fixed eyes 58 and into the eyes 51, which are held between the eyes 58 to receive the said bolts. When the bolts are projected, therefore, they hold the outer edge of the cover upon the boat, and when they are retracted they release the outer edge of the cover and permit it to be removed from the boat and thrown inwardly upon the deck. The inner edge of the cover is or may be permanently connected with the deck by means of cords 59, engaged with fixed eyes 60 on the deck, the cords 59 being engaged with eyes 61, suspended from the inner edge of the cover by cords 62. This permanent connection between the inner edge of the cover and the deck and the detachable connection between the outer edge of the cover and the deck enables the outer edge of the cover to be released automatically by the withdrawal of the bolts 52 53 54, after which the cover can be thrown back off the boat and left on the deck without disturbing the connections between the inner edge of the cover and the deck.

The cover and the described connections between it and the deck constitute means for holding the boat down upon the chocks. As an additional holding-down means we may employ two cross-bars 63 of the form shown in Fig. 4^a and by dotted lines in Fig. 4, said bars extending across the boat and bearing upon the gunwales thereof, their outer ends projecting beyond the sides of the boat and

being connected by turnbuckles 64 and cords 65 with eyes 66, adapted to be engaged by the bolts 52 and 54, the cords 65, connected with the inner ends of the cross-bar 63, passing through fixed eyes 67, affixed to the deck. When the bolts 52 and 54 are retracted, they release the cords 65 and cross-bars 63 at the same time that the cover is released.

The operation of the described apparatus as a whole is as follows: The boat being stored and fastened, as shown in Figs. 1, 2, 3, and 4, an attendant stationed at the crank 10, through said crank and the gears 11 and 12, rotates the shaft 6 in the direction indicated by the arrow 13, Figs. 3 and 5. The first few turns of the shaft 6 simultaneously release the cover 46 and the cross-bar 63 and depress the chock-sections 40. The rotation of the shaft 6 is continued until the boat has been swung outwardly by the action of the two davits, as above described, the rotation of the shafts being stopped when the boat reaches the position shown in Fig. 6. An attendant at the drums 19 now releases the dog 28, holding said drums, and allows the ropes 17 to unwind from the drums, thus allowing the boat to descend to the water, the rapidity of the descent being controlled by the brake 21. When the boat reaches the water, an attendant in the boat by raising the lever 34 disconnects the boat simultaneously from the links 31, connected with the ropes 17, the boat being therefore free to move away from the side of the ship.

It will seen that during the entire operation of swinging the boat outwardly and lowering it it is under complete control and that the whole operation can be quickly and safely performed by two attendants, one at the crank 10 and the other at the drums 19. After the release of the cover and the cross-bar 63 these parts may be removed from the boat and laid upon the deck while the boat is being swung outwardly.

We do not limit ourselves to the employment of the rod or bar 15, connecting the swinging ends of the davits 2, as the boat itself will afford a sufficient connection between the davits to bring the segment 4 of one davit into engagement with the accompanying worm 5 just before the segment of the other davit moves out of engagement with the accompanying worm. We prefer the bar 15, however, as it constitutes a more positive connection between the two davits.

Each of the worms 5 is adapted to have a limited endwise movement between collars or stops 70, the worms being rotatively engaged with the shaft 6 and at the same time adapted to slide endwise between the stops 70 by splines 71, Fig. 5^a. The object of this loose endwise movement of the worms is to enable each segment 4 to engage its worm easily and without binding, this engagement being effected while the other segment is engaged with the other worm.

We do not limit ourselves to the details of

mechanism here shown and described, as the same may be variously modified without departing from the spirit of our invention.

We claim—

5 1. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, a rigid connection between said davits whereby positive movement of one davit will move the other, and
10 operating mechanism independent of said connection for swinging the davits, said mechanism being out of gear with one davit when the other is in gear, whereby positive movement of one davit will first swing the second
15 davit loosely by means of said connection and then bring the second davit into gear with the operating mechanism and disconnect the first davit.

2. An apparatus of the character specified,
20 comprising davits having means for supporting and lowering a boat, a rigid connection between said davits whereby positive movement of one davit will move the other, an operating-shaft, a gearing mechanism operated
25 by said shaft, said mechanism being out of gear with one davit when in gear with the other davit, whereby positive movement of one davit will first swing the second davit loosely by means of said connection and then
30 bring the second davit into gear with the operating mechanism and disconnect the first davit.

3. An apparatus of the character specified, comprising davits having means for supporting
35 and lowering a boat, each davit having a worm-gear segment, and an operating-shaft having worms arranged to engage said segments, the segment on each davit being set at a different angle from the segment on the
40 other davit, whereby the segments are engaged successively with the corresponding worms.

4. An apparatus of the character specified, comprising davits having means for supporting
45 and lowering a boat, a rigid bar connecting the swinging ends of the davits and operating mechanism out of gear with one davit when the other is in gear, whereby positive movement of one davit will first swing the
50 second davit loosely by means of said bar and then bring the second davit into gear with the operating mechanism and disconnect the first davit.

5. An apparatus of the character specified,
55 comprising davits, ropes and pulley-blocks supported by the davits and adapted for detachable connection with a boat, a drum to which said ropes are attached, means for locking the drum to prevent rotation of the same,
60 a rigid connection between said davits whereby positive movement of one davit will move the other, and operating mechanism independent of said connection for swinging the davits, said mechanism being out of gear
65 with one davit when the other is in gear, whereby positive movement of one davit will first swing the second davit loosely by means

of said connection and then bring the second davit into gear with the operating mechanism and disconnect the first davit. 70

6. An apparatus of the character specified, comprising davits, ropes and pulley-blocks supported by the davits and adapted for detachable connection with a boat, a drum to which said ropes are attached, a brake for
75 controlling the rotation of the drum, a rigid connection between said davits whereby positive movement of one davit will move the other, and operating mechanism independent of said connection for swinging the davits, 80 said mechanism being out of gear with one davit when the other is in gear, whereby positive movement of one davit will first swing the second davit loosely by means of said connection and then bring the second davit into
85 gear with the operating mechanism and disconnect the first davit.

7. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, boat-supporting
90 chocks having movable sections, mechanism for swinging the davits, and connections between the davit-swinging mechanism and the movable chock-sections.

8. An apparatus of the character specified, 95 comprising davits having means for supporting and lowering a boat, each davit having a worm-gear segment, an operating-shaft having worms arranged to engage said segments, boat-supporting chocks having movable sections, and connecting mechanism between the
100 shaft and the chock-sections, said mechanism including a gear and a gear-segment meshing therewith, whereby the period of operation of the said connecting mechanism is limited. 105

9. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, each davit having a worm-gear segment, an operating-shaft having means arranged to engage said segments, 110 said shaft having also a bevel-gear, boat-supporting chocks having movable sections, and a rock-shaft having arms connected by rods with the chock-sections, and a bevel-gear segment adapted to be alternately engaged with 115 and disengaged from the said bevel-gear.

10. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, a boat-cover having depending eyes, a plurality of rigidly-connected bolts adapted to engage and release
120 said eyes, and means for simultaneously operating said bolts.

11. An apparatus of the character specified, comprising davits having means for supporting
125 and lowering a boat, a boat-cover having depending eyes, connected bolts adapted to engage and release said eyes, mechanism for swinging the davits, and connections between the davit-swinging mechanism and the bolts. 130

12. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, holding-down bars adapted to extend across the boat, eyes flexi-

bly connected with said bars, connected bolts adapted to engage and release said eyes, and means for simultaneously operating said bolts.

- 5 13. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, davit-swinging mechanism organized to swing the davits successively, boat-supporting chocks having movable sections, a boat-cover having depending eyes, holding-down cross-bars also having depending eyes, bolts adapted to engage and release the eyes of the cover and cross-bars, and mechanism connecting the chock-sections
10 and the bolts with the davit-swinging mechanism.
15

14. An apparatus of the character specified, comprising davits having means for supporting and lowering a boat, each having a worm-gear segment, and an operating-shaft having worms arranged to engage said segments, the segments being set on the davits at different angles, and each worm having a loose end-wise movement on the shaft.

In testimony whereof we have affixed our signatures in presence of two witnesses.

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RAYMOND H. DANFORTH.

Witnesses:

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E. BATCHELDER.