No. 666,909.

Patented Jan. 29, 1901.

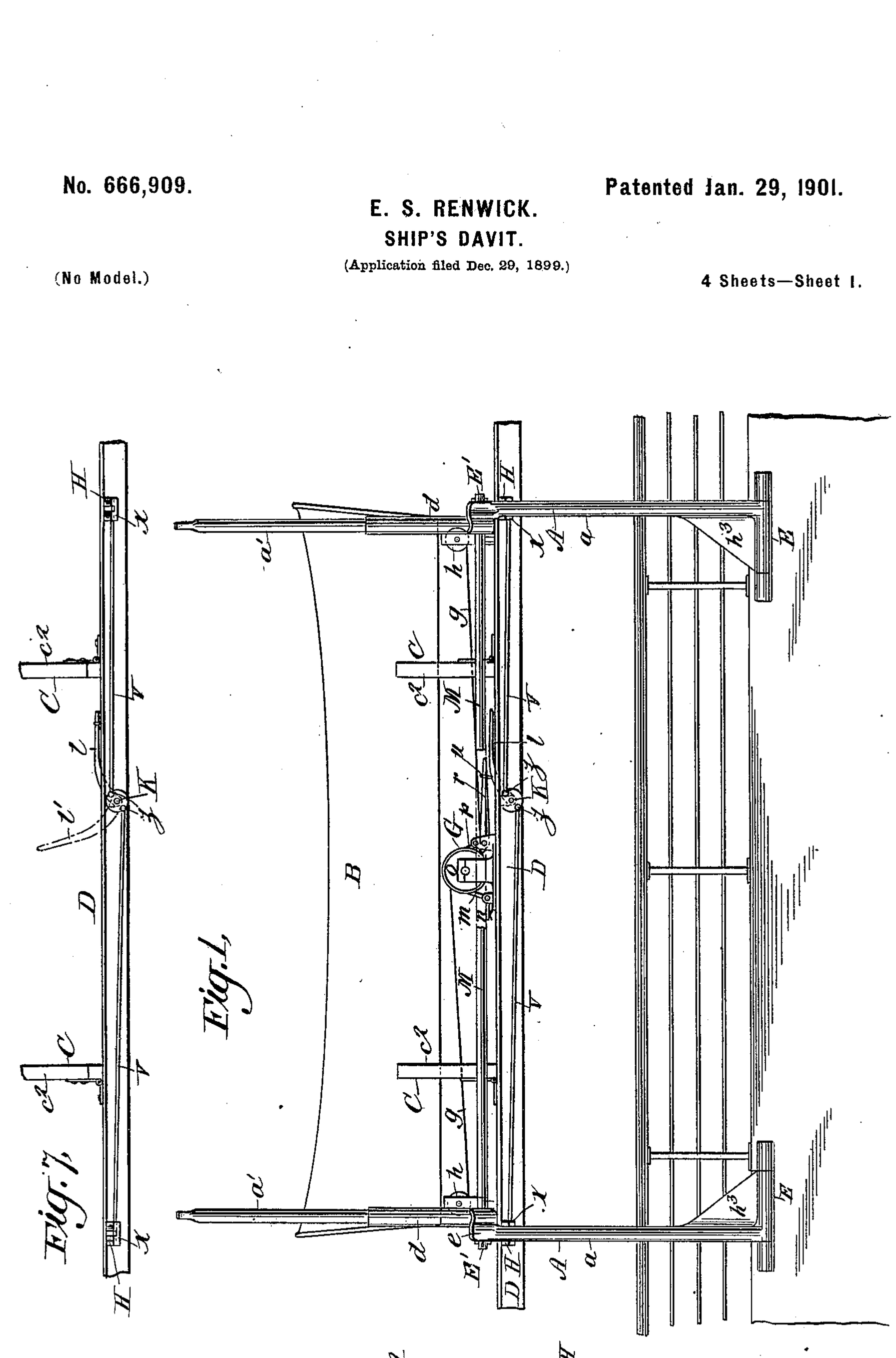
E. S. RENWICK.

SHIP'S DAVIT.

(Application filed Dec. 29, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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4 Sheets—Sheet 2.

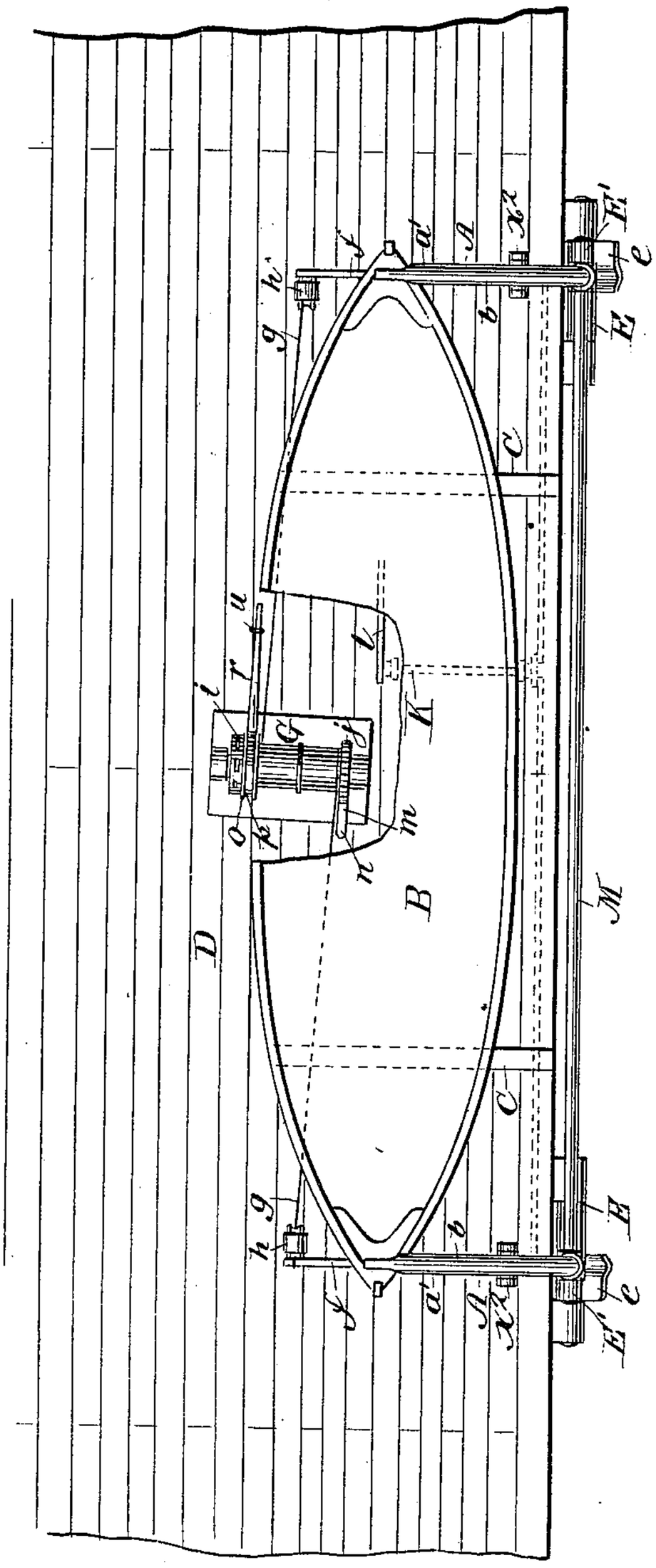

Fig. 2.

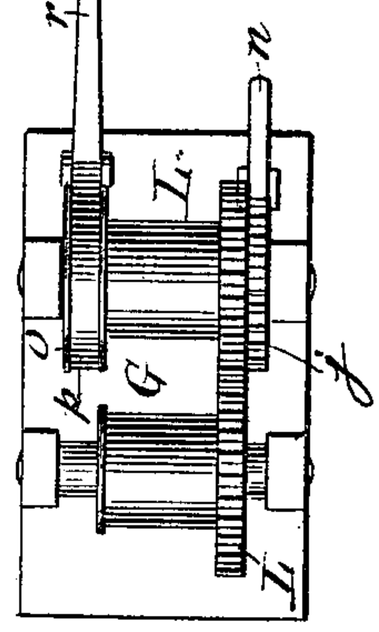

Fig. 6

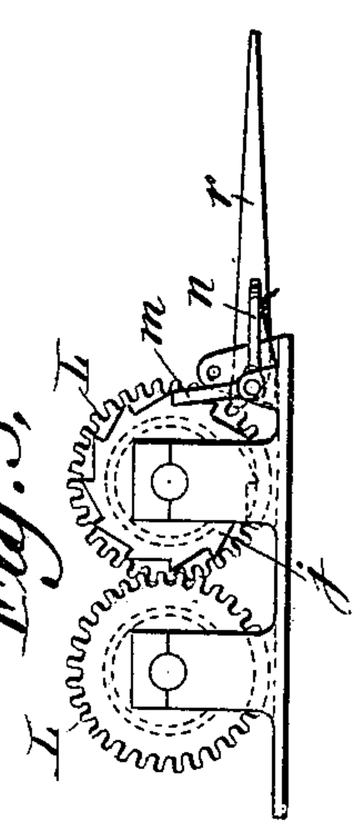

Fig. 5.

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Fig. 3,

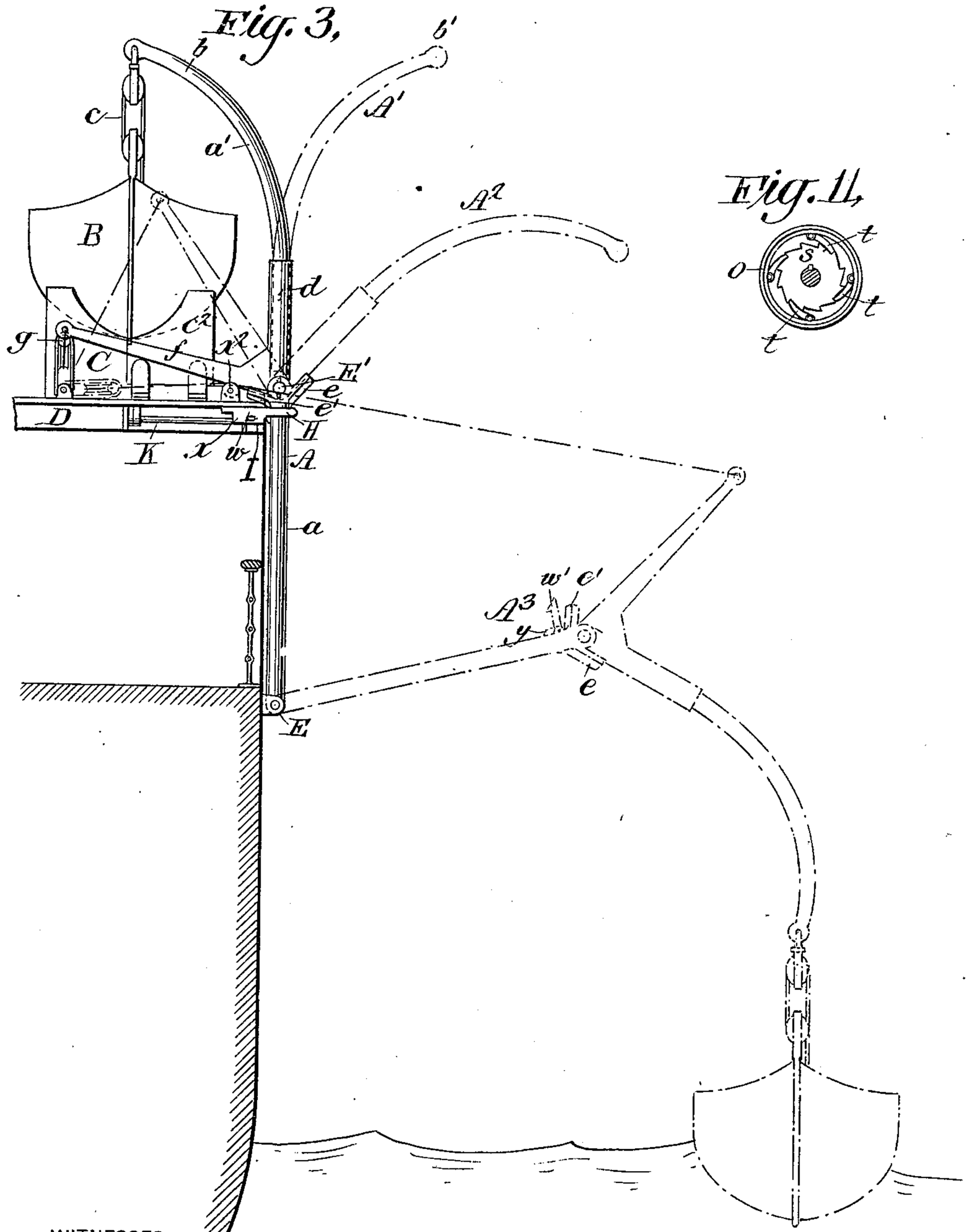

Fig. 11,

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4 Sheets—Sheet 4.

Fig. 4,

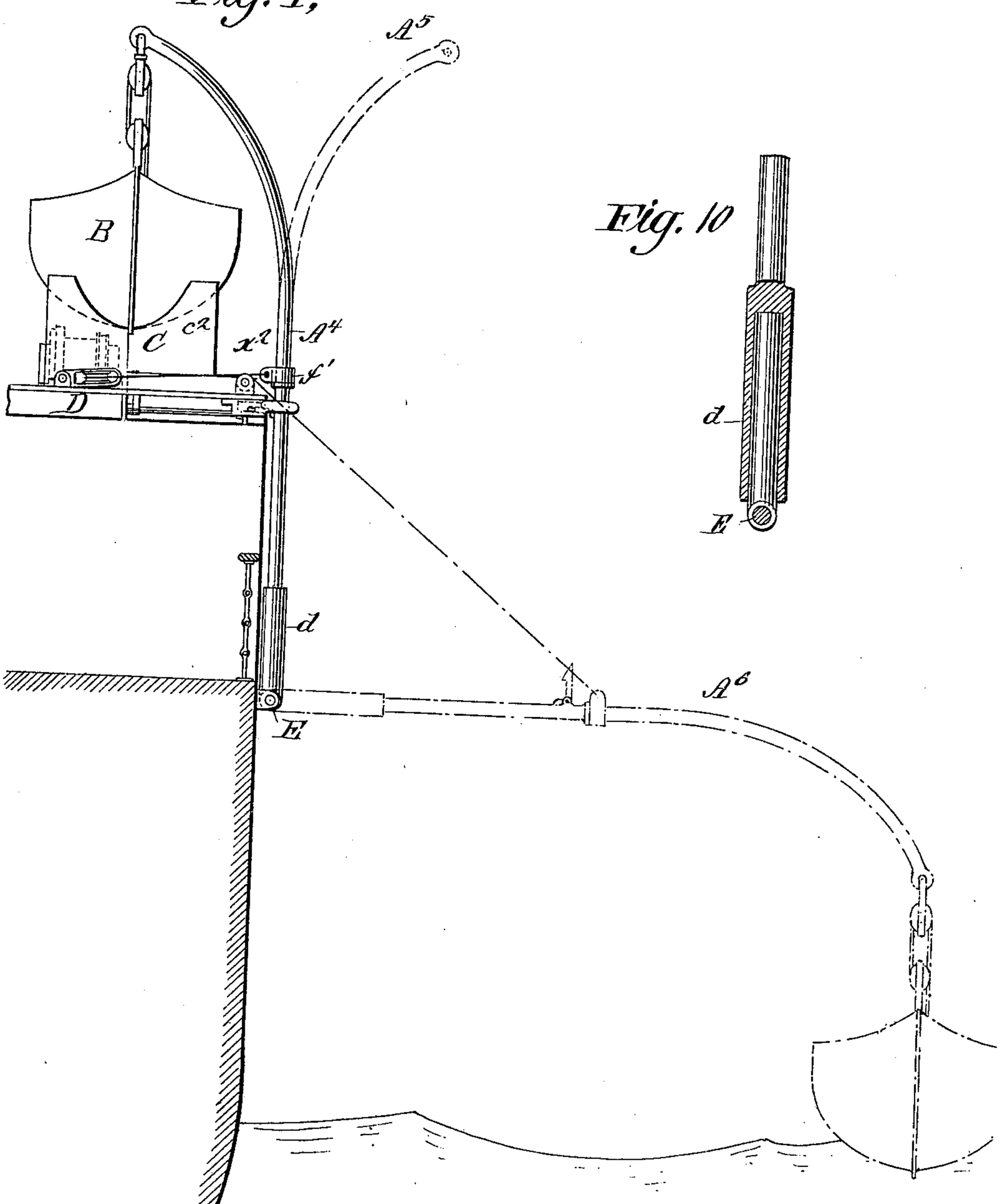

Fig. 10

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EDWARD SABINE RENWICK, OF MILLBURN, NEW JERSEY.

SHIP'S DAVIT.

SPECIFICATION forming part of Letters Patent No. 666,909, dated January 29, 1901.

Application filed December 29, 1899. Serial No. 742,011. (No model.)

To all whom it may concern:

Be it known that I, EDWARD SABINE RENWICK, of Millburn, in the county of Essex and State of New Jersey, have made an invention of certain new and useful Improvements in Ships' Davits and Their Appurtenances; and I declare that the following, in connection with the accompanying drawings, is a full, clear, and exact description and specification of the same.

My invention relates to the davits and their appurtenances by means of which the boats of vessels are lowered and raised.

The ordinary ship's davit consists of an upright iron stem curved at its upper end and pivotally connected with the side of a vessel with its curved upper end projecting inward over the deck of the vessel on which the boat is supported. The boat is connected with the curved end of the davit by tackle consisting of pulley blocks and ropes. Consequently by turning the davits pivotally the boat can be swung from the deck outward over the side of the vessel and can then be lowered to the water by the tackle. One of the disadvantages of such davits is that the boat can be lowered only close to the side of the vessel, and if the side of the vessel be inclined, so that it is inside of a vertical line from the water upward, (as is frequently the case with wrecked vessels,) the boat in descending comes in contact with the side of the vessel and is generally upset, together with the people within it. Another disadvantage is that the tackle at one end of the boat may be loosened while that at the other end is fast and while the boat is at a distance from the water, in which event one end of the boat is dropped before the other end and the boat takes in water and may be swamped.

My invention is designed, primarily, to obviate the above disadvantages of the common davit; and it consists, first, of what I denominate a "pivotal boom-davit," which is arranged at the outer side of a vessel and is fitted both to turn pivotally and to swing laterally from the side of a vessel like the boom of a boom-derrick, so that the boat held in chocks on the deck of a vessel can not only be handled in the present ordinary way, but can in addition be swung outward or boomed off from the side of the vessel, so as to be lowered to the water at a much greater distance from said side than the curved upward end of the ordinary davit would permit.

My invention consists, further, of certain appurtenances connected with said pivotal boom-davit by means of which it can be conveniently manipulated and both ends of a boat can be lowered simultaneously. Some of these improvements can be used in connection with the ordinary davits.

My said improvements are specified in detail at the close of this specification, and some of them may be used without others, as found expedient.

In order that my said invention may be fully understood, I have represented in the accompanying drawings and will proceed to describe the forms in which I prefer to embody my said invention for practical use, with the understanding that these may be varied as circumstances or the views of different constructors or users may render expedient.

In said drawings, Figure 1 represents a side view of a pair of ship's boom-davits and their appurtenances embodying all parts of my invention in the preferred forms, as well as a ship's boat and certain parts of the ship to which the boom-davits are applied. Fig. 2 represents a plan of the same with some parts removed in order to enable others to be better seen. Fig. 3 represents a view of the same seen endwise of the boat and showing in dotted lines different positions of the boom-davits. Fig. 4 represents a corresponding view of a boom-davit and its appurtenances embodying parts of my invention. Figs. 5 and 6 represent a side view and plan of a modified form of windlass for manipulating the boom-davits. Figs. 7 to 11, inclusive, represent details of the invention, as will be hereinafter more particularly described. Figs. 5, 6, 8, 9, 10, and 11 are on a larger scale than the other figures.

Portions of some of the devices represented are removed to enable those behind them to be shown more clearly.

In the form of the invention represented at Figs. 1 to 3, inclusive, there are the two boom-davits A A to handle the boat B, which in its normal position is supported on chocks C C of the ordinary construction, secured to the deck D of a ship. In this case each boom-

davit is constructed of two members a a', the lower a of which is arranged at the outer side of the vessel and is fitted at its lower end with a hinge-joint E, whose hinge-pin is transverse or crosswise of the stem of the davit and is parallel, or thereabout, with the side of the ship at which the hinge-joint is secured, so that when the davit swings upon this lower hinge-joint it will swing outward from the side of a ship like the boom of a boom-derrick. This hinge-joint combines the pivotal boom-davit with the side of the vessel. The upper member a' of this form of boom-davit is of the form of an ordinary davit having its upper end curved or bent, and in its normal position it has its curved upper end b projecting over the boat B on the deck of the vessel and connected therewith by boat-tackle c of the usual construction. The lower end of this upper member is constructed to turn pivotally in a socket d, connected to the lower member a, so that the upper end of the boom-davit can be turned pivotally from its normal position to the position represented in dotted lines at A', Fig. 3, for the purpose of swinging the boat from over the deck to the outside of the vessel. The connection of the socket d and of the upper member held in it with the lower member a of the boom-davit by an intermediate hinge-joint E', which permits the upper member to swing outward from the vessel independently of the lower member, as represented at the dotted lines A^2, Fig. 3, and the extent to which it can thus swing independently, is limited by a stop e. When the swinging movement of the upper member has been limited by the stop, the upper member and the lower member can swing outward on the hinge-joint E as if rigidly connected to any desired position—as, for example, to that indicated by the dotted lines A^3, Fig. 3—and consequently the boat connected with the ends of the pair of boom-davits will be swung outward from the side of the ship, and, if not touching the water at once at a distance from the ship's side, can be lowered further by the ordinary boat-tackles.

In order to manipulate the above-described form of pivotal boom-davit, the upper member is fitted with an arm f, which is connected with the pivotal socket d. In the normal position of the two pivotal boom-davits for a boat each of these arms f projects over the deck of the vessel, as shown more particularly in Fig. 3, and its inner end is connected by a chain or cable (indicated by lines g g in Figs. 1 and 2) with the barrel of a windlass G, the said chains being passed through pulley-blocks h h on their way to the windlass. The slacking of these chains permits the boom-davits to swing outward and downward, as previously described, and as the pulleys h h are connected with the vessel so as to swivel they adapt themselves to the change of direction of the chains. When the davits are down, as at A^3, Fig. 3, the winding of each of these chains upon the windlass will draw the davits upward and inward toward the side of the vessel until the upper ends of the lower members strike the side of the vessel or, preferably, some projection therefrom, whereupon the continued winding up of the chains will cause the upper members to turn toward the vessel until further movement of each is prevented by a second stop e', Fig. 3, secured, preferably, to the lower member a. Each upper member will then have its stem upright and can be turned pivotally inward to swing the boat over its chocks.

It is preferred to place the windlass and its appurtenances beneath the boat when in the chocks, because in this position the handles or levers hereinafter described cannot readily be tampered with until the boat is removed from over them to the outer side of the vessel by turning the davits pivotally. In order that the windlass may be turned to raise the boom-davits from their lowered positions, the windlass is fitted with a capstan-head i, to the sockets of which a handspike may be applied, and in order that the windlass may be secured or locked as the chains are wound up it is fitted with a ratchet-wheel j, controlled by a spring-pawl m. The pawl is preferably fitted with a treadle n, on which the foot of an operator can be stamped to disengage the pawl from the ratchet-wheel and free the windlass, so that it may turn to slack the chains. In order that the lowering of the boom-davits may be controlled, the windlass is fitted with a brake-wheel o, whose band p is connected with a brake-lever r, by manipulating which the lowering of the boom-davits and of the boat hanging from them may be permitted to be fast or slow, as deemed expedient. It is preferred to construct this brake-wheel so as to be loose on the windlass-shaft and to connect the two by a ratchet-wheel and pawls. I prefer also to have the ratchet-wheel s made fast to the shaft of the windlass, as shown in Fig. 11, and to have the pawls t connected with brake-wheel o, as shown in the same Fig. 11. Then when the windlass is turned to wind up the chains the ratchet-wheel will turn with the windlass without turning the brake-wheel; but when the windlass is to be allowed to turn to unwind the chains its turning will be controlled by the brake-wheel. A movable hook u may be applied to the brake-lever r to hold it in its normal position.

It is desirable that the pivotal boom-davits when upright should be prevented from working forward and aftward of the ship by its motion in a seaway. For this purpose a forked guard H for each pivotal boom-davit is secured to the side of the ship, so that the stem of the davit is received into the fork when the davit is raised. This fork also forms a projection against which the davit abuts when raised. It is desirable also that the boom-davits when in their normal or upright positions should be secured there independ-

ently of the chains and windlass. For this purpose a lock I is provided for each boom-davit, and the case of this lock is by preference constructed in one piece with the forked guard H. The form of the lock may be varied; but the form which I prefer to use consists of a bolt *w*, Figs. 3, 8, and 9, sliding transversely in the lock-case *x*, and the boom-davit A is fitted with a hinged hook *w'* to engage with the lock-bolt. The hook has a heel *y*, Fig. 9, which bears against the stem of the boom-davit and causes the hook to project in the proper position to enter a recess in the lock-case and engage with the lock-bolt, and when the lock-bolt and hook are thus engaged the boom-davit is secured in its upright or normal position. In order to free the boom-davits, I prefer to connect the two lock-bolts for a pair of boom-davits by rods *v v* with two crank-pins *z z*, Figs. 1 and 7, one for each lock-bolt, which are secured to a rock-shaft K, and to fit this rock-shaft with a lever *l*. By moving this one lock-lever *l* from its normal position to the position represented in dotted lines at *l'*, Fig. 7, the crank-pins are turned, both lock-bolts are simultaneously withdrawn from engagement with their respective hooks *w'*, and the two boom-davits are simultaneously left free to be controlled for lowering by the windlass. It is preferred to arrange this lock-lever beneath the boat when on the chocks, so that the former cannot readily be manipulated until the boom-davits are turned pivotally and the boat is swung outside the side of the vessel. It is expedient also to connect the upper members *a' a'* of the above-described form of boom-davit by means of a rock-shaft M, Fig. 1, whose ends form the hinge-pins of the intermediate joints E' E', as by this construction the upper members are prevented from working fore and aft of the vessel in their swinging movements. In this construction the sockets *d* may be welded to the rock-shaft, and its ends may turn in broad eyes formed at the upper ends of the lower members *a* and may be prevented from escaping from the eyes by linch-pins or split keys.

In order that the boat may be lowered with the mechanism thus described, the boat is first freed from the grasp of the chocks by turning the hinged part c^2 of each chock downward in the usual manner. Then the boom-davits are turned pivotally to swing the boat outside the vessel, so that each boom-davit is in the position shown in dotted lines at A', Fig. 3. When the boom-davits are in these positions, the boat may be lowered and hoisted by the usual boat-tackle of blocks and rope-fall, and this course is expedient when the vessel is upright in smooth water; but the boat is then always close to the side of the ship. If, however, the boat is to be lowered at a distance from the side of the ship, both boom-davits, after being turned pivotally outward, are simultaneously unlocked by moving the lock-lever *l*. Then the pawl *m* is withdrawn from the ratchet-wheel *j* by stamping upon the treadle *n* of the pawl, thus leaving the pair of boom-davits under the control of the brake and its brake-lever *r*, by slacking which the weight of the boat will first cause the upper member *a'* of each boom-davit of a pair to swing outward to the position shown in dotted lines at A^2, Fig. 3, and will then cause the pair of boom-davits to swing bodily to the position shown at A^3, Fig. 3, (or lower if the chains are long enough,) thus lowering both ends of the boat simultaneously at a distance from the ship's side. All the above operations for permitting the swinging of the boom-davits from the side of the vessel and the lowering of both ends of the boat simultaneously can be effected by one man, and if the boat does not strike the water when so lowered its further lowering may be effected by the ordinary boat-tackles controlled by men in the boat.

Instead of arranging the drums for the two chains of a pair of boom-davits upon one shaft they may be arranged upon two parallel shafts connected by cog-wheels L L, as shown in side view and plan at Figs. 5 and 6. In this latter case the ratchet-wheel *j* and brake-wheel *o* may be connected with one of the shafts, as shown in the drawings, and may control the other shaft through the cog-wheels L. It will be noticed that in these Figs. 5 and 6 the pawl *m* is arranged at the same side of the windlass as the brake-lever *r*, which is the preferable arrangement for convenience of operation by one man, and the pawl and brake-lever in Figs. 1 and 2 are arranged at opposite sides of the windlass simply for perspicuity. Of course the form and position of the pawl control the direction in which the windlass will turn, and the ratchet-wheels and chains must be arranged to suit the position of the pawl. It must be apparent that when the brake-wheel *o* is connected with the windlass by means of a ratchet-wheel and pawls, as represented at Fig. 11, the other ratchet-wheel *j* and its pawl *m* are not absolutely necessary to secure the windlass; but it is advisable to have this ratchet-wheel and its pawl for security; as it might happen if these were omitted that the brake-lever *r* might not be secured or held when the boom-davits were turned pivotally outward, and then the boat might fall without control.

The reason for the preferable construction of the boom-davit of two members connected by the intermediate hinge-joint E', Figs. 1, 2, and 3, is as follows: The outward swinging of the boom-davits should be effected by the weight of the boat. Now it may happen that the vessel is so inclined that its side slopes from the water toward the center of the vessel so far that when the boat is swung over the side of the ship by turning the boom-davits pivotally the center of gravity of the boat and its contents may be nearer the vessel than a line drawn from the lower hinge-joint E to the end *b'*, Fig. 3, of the boom-davit,

and if the boom-davits were then constructed of a single member without an intermediate joint the weight of the boat in such a case of inclination would not be likely to cause the boom-davit to swing outward. The construction of the boom-davit of two members connected by an intermediate hinge-joint obviates such a difficulty, as the center of gravity of the boat when the davits are turned outward will be outside of a line drawn from the intermediate hinge-joint E′ to the end of the boom-davit, and the weight of the boat will compel the boom-davit to swing outward, its upper member first swinging on the intermediate joint E′ until the stop *e* comes into action, and then the whole boom-davit swinging outward and downward on the lower hinge-joint E. The proportions of the parts shown in Figs. 1, 2, and 3 are such as to insure the swinging of the boom-davits by the weight of the boat when the side of the ship is inclined about thirty degrees. By varying the proportional lengths of the upper and lower members of the boom-davits they may be caused to swing outward by the weight of the boat when the inclination of the side of the ship is greater than thirty degrees. As some shipowners may be of opinion that a provision for so great an inclination of the side of a vessel is unnecessary, some parts of my invention may be used without others. Thus the boom-davit may be rigid or constructed of but one member without the intermediate joint, as represented at A^4, Fig. 4. In this case the lower end of the stem of the boom-davit may be constructed to turn pivotally in a socket *d*, connected with the side of the vessel by the hinge-joint E. In this case also the arms *f*, Fig. 3, of the boom-davits are not necessary, and each chain may be connected with its respective boom-davit by a loose band *f′*, Fig. 4. The rigid boom-davit when turned pivotally will assume the position shown in dotted lines at A^5, Fig. 4, and may then be permitted to swing outward, as shown by the dotted lines A^6.

If chain cables are used to operate the boom-davits, the drums of the windlass should be grooved helically to receive the upright links of the chains; but if rope cables are used the grooving is not necessary. In order to prevent the chains or cables from contact with the deck, rollers x^2 x^2, Figs. 2, 3, and 4, may be secured thereon. Instead of securing the sockets *d d* to the lower hinges they may be inverted and secured to the stems of the davits, and a short stem may be secured to the hinge-joint to enter into the inverted socket, as shown in section at Fig. 10. When a pair of boom-davits of the form shown at Fig. 4 are used, their hinge-pivots may be the ends of a rock-shaft, such as is represented at M, Fig. 2, as previously described, and the lower ends of the pivotal sockets may be welded or otherwise made fast to the rock-shaft, or if the sockets are inverted the short stems within the sockets may be welded or otherwise made fast to the rock-shaft. The effect of this fastening by welding or otherwise will be to keep the boom-davits from swaying fore and aft of the vessel while the boat is being lowered or hoisted, and the same effect may be secured by connecting the sockets of the boom-davits with the rock-shaft by braces, as shown at h^3 in Fig. 1.

It will be evident that if the falls from the boat-tackles at the two ends of a boat suspended by two davits of the ordinary construction are wound upon the windlass G both ends of the boat may be lowered simultaneously, and the lowering may be controlled by the brake-wheel and brake-lever.

I claim as my invention—

1. The pivoted boom-davit constructed and arranged at the outer side of the vessel substantially as before set forth, with its upper end curved and its lower end fitted with a pivotal socket and connected with the side of the vessel by a transverse hinge-joint, so that the boom-davit can be turned pivotally and permitted to swing outward from the side of the vessel with which it is connected.

2. The boom-davit constructed of two members connected by an intermediate hinge-joint, and fitted with a transverse hinge-joint at its lower end, and with a pivotal socket, substantially as before set forth.

3. The combination of a pair of pivotal boom-davits by means of a rock-shaft so that said davits are free to be turned pivotally while they are connected by the rock-shaft substantially as before set forth.

4. The combination of a pivotal boom-davit (constructed to both turn pivotally and swing laterally), arranged at the outer side of a vessel, with a fork at the side of the vessel, substantially as before set forth.

5. The combination of a pair of boom-davits with two locks connected with the same lock-lever by means of which the two boom-davits may be simultaneously freed, substantially as before set forth.

In witness whereof I have hereto set my hand this 21st day of December, A. D. 1899.

EDWARD SABINE RENWICK.

Witnesses:
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NATHANIEL P. BARR.