A. J. LEWKOWICZ.

BOAT LAUNCHING AND STOWING APPARATUS.

APPLICATION FILED APR. 7, 1910.

1,009,758.

Patented Nov. 28, 1911.

6 SHEETS—SHEET 1.

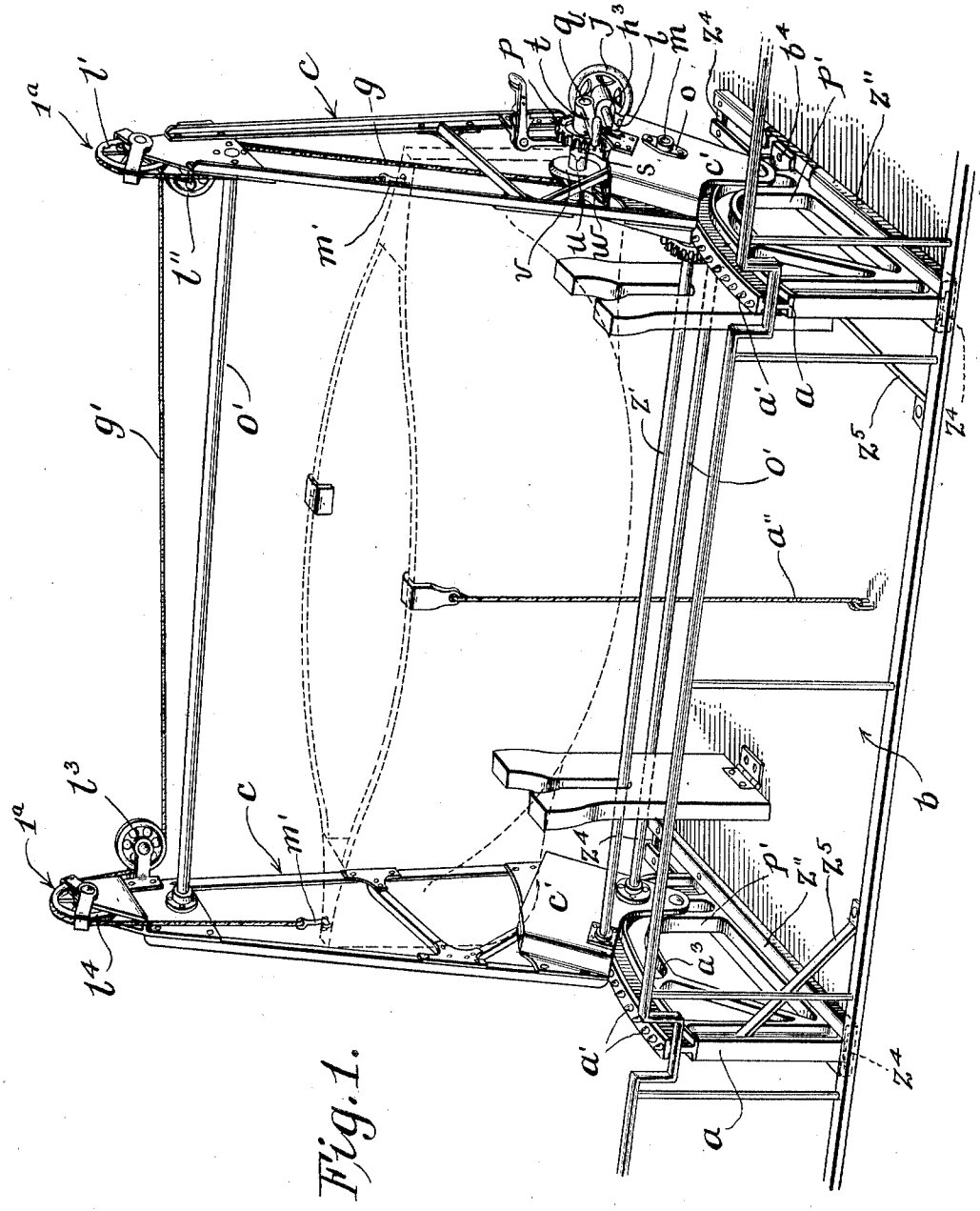


Fig. 1.

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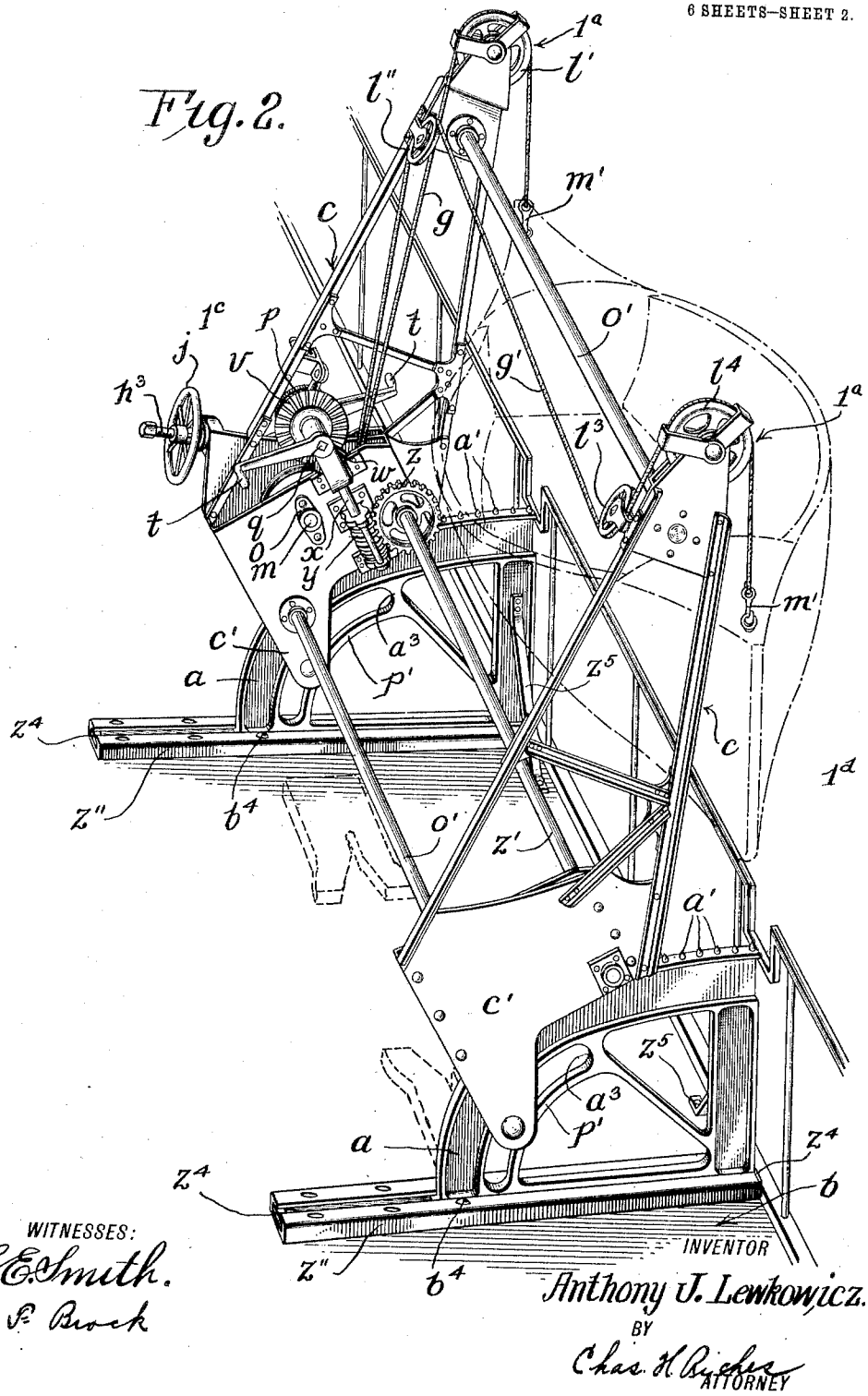
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6 SHEETS—SHEET 2.

Fig. 2.



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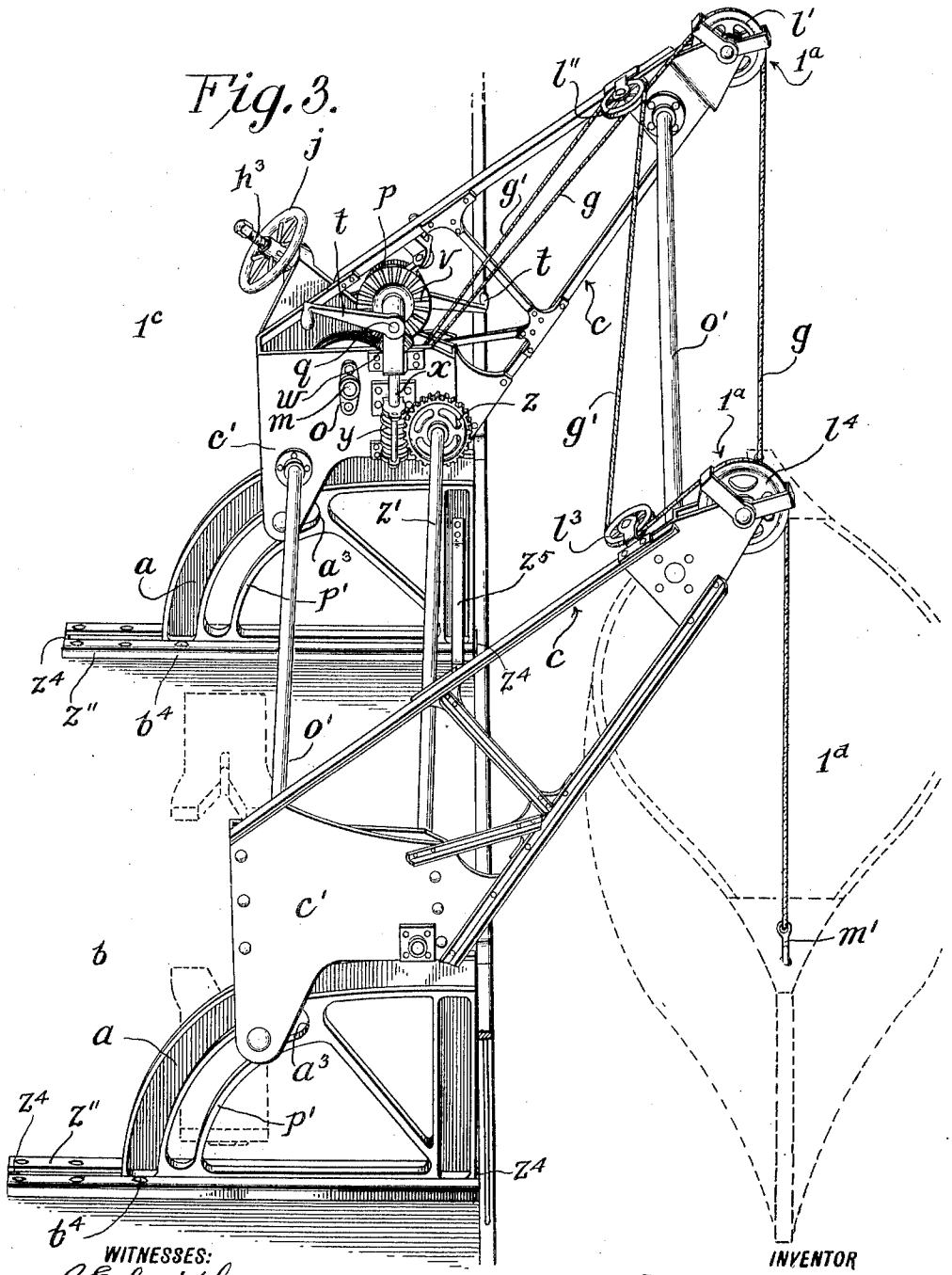
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6 SHEETS—SHEET 3.

Fig. 3.



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6 SHEETS—SHEET 4.

Fig. 4.

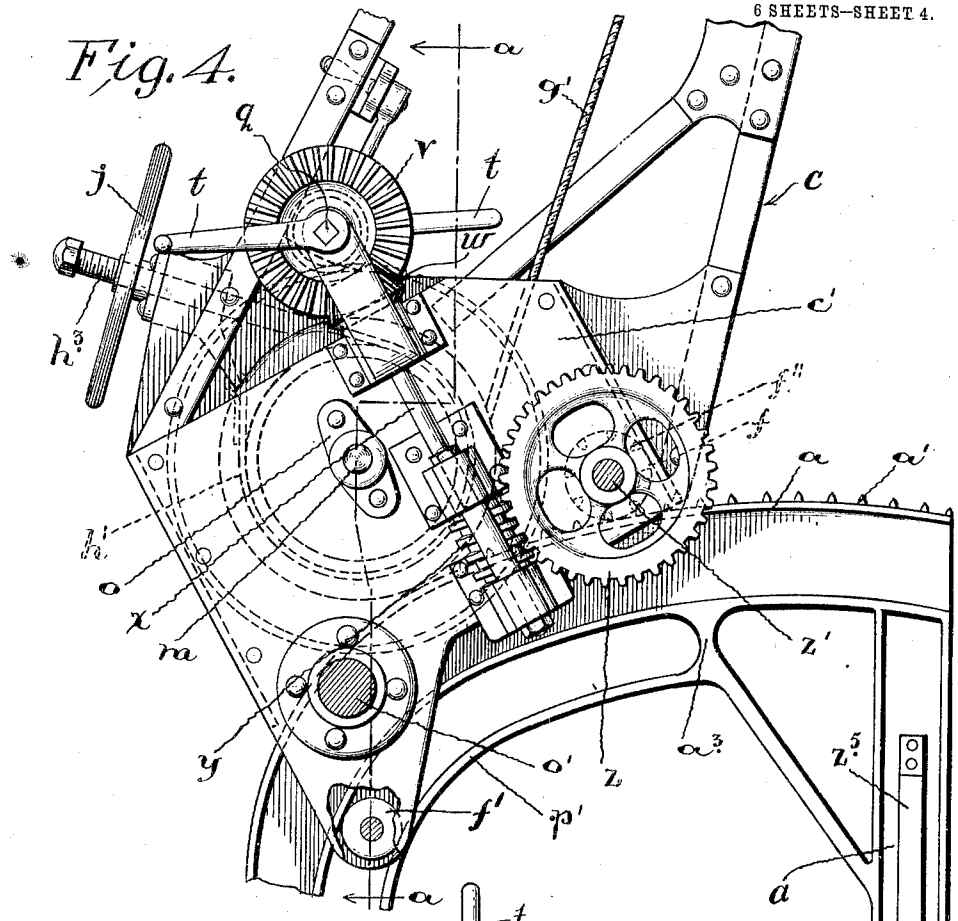
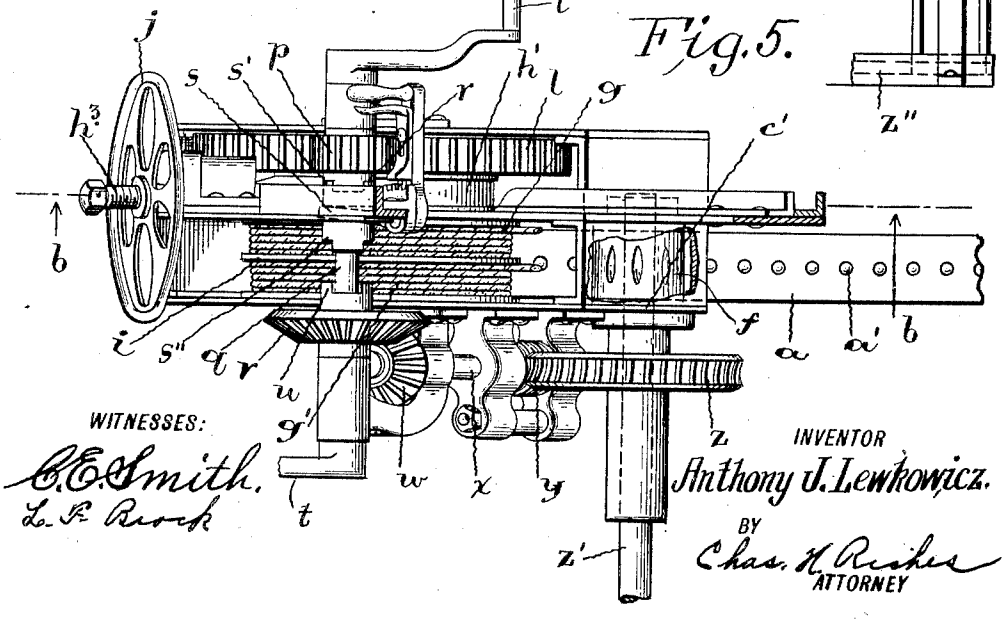


Fig. 5.



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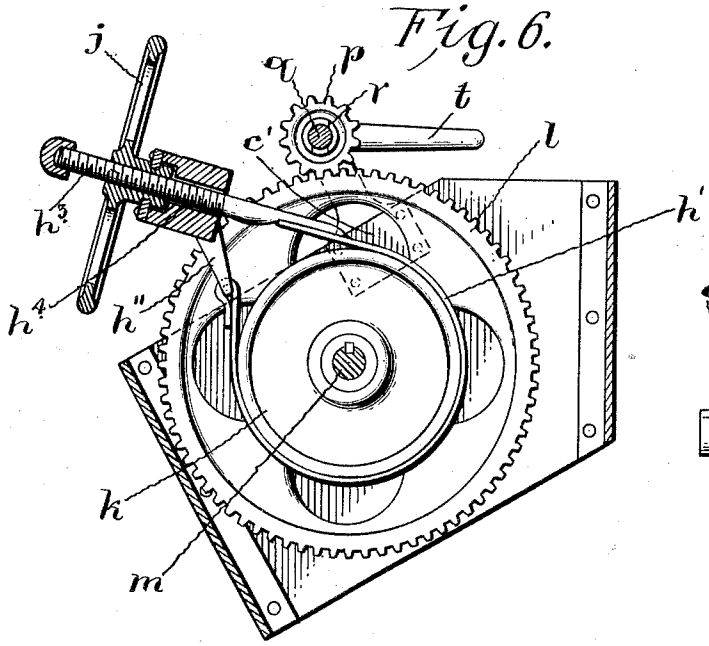
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6 SHEETS—SHEET 5.

Fig. 6.



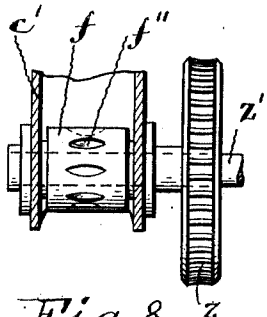


Fig. 8.

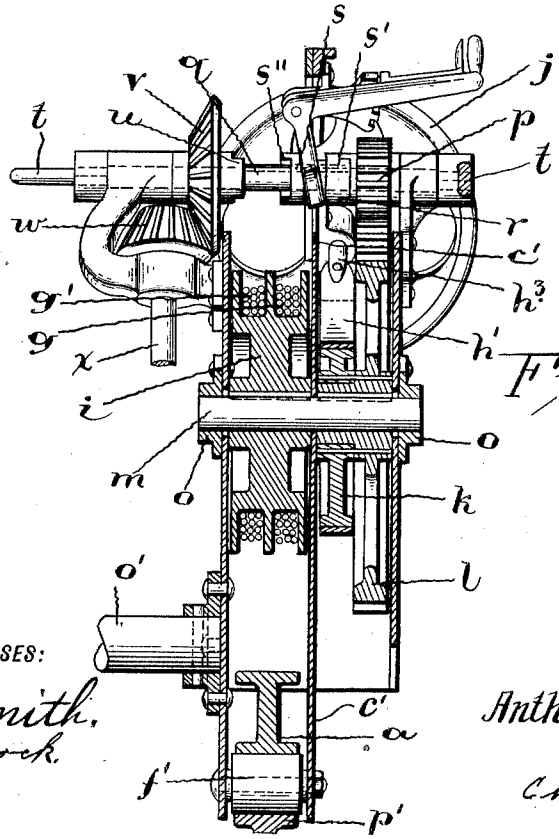


Fig. 7.

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BOAT LAUNCHING AND STOWING APPARATUS.

APPLICATION FILED APR. 7, 1910.

1,009,758.

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6 SHEETS—SHEET 6.

Fig. 9c.

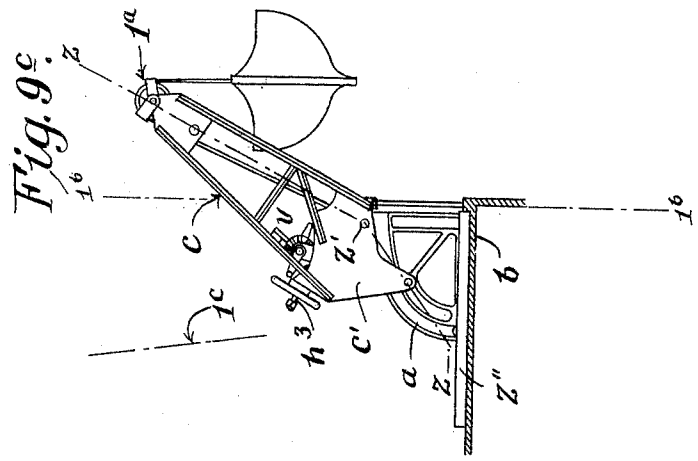


Fig. 9b.

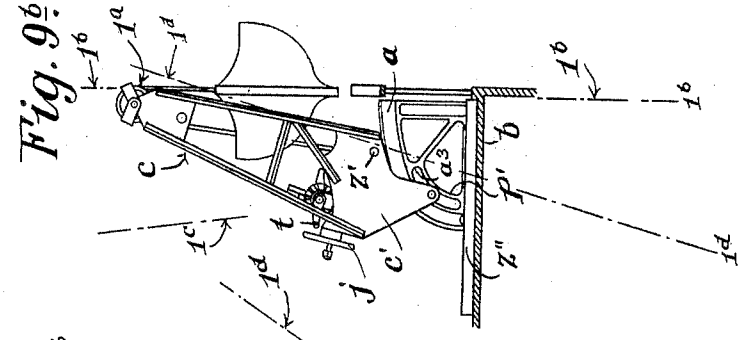


Fig. 9a.

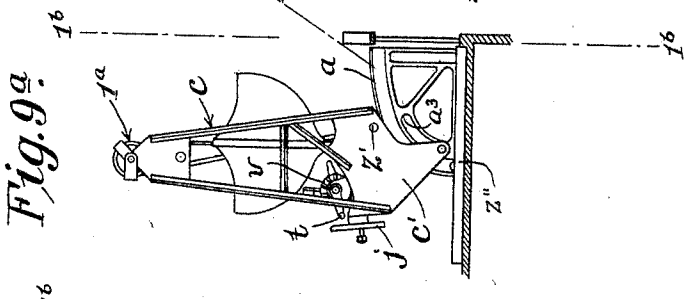
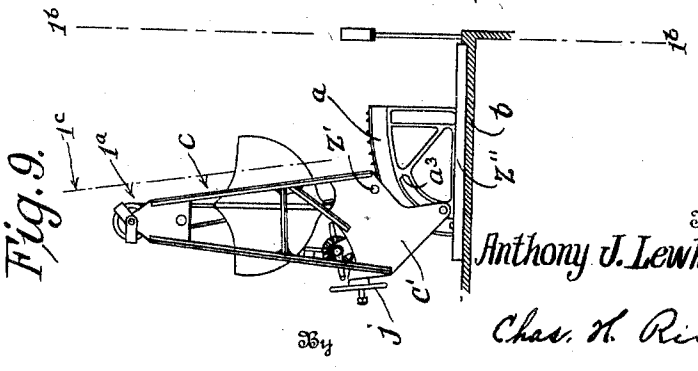


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

ANTHONY J. LEWKOWICZ, OF NEW YORK, N. Y., ASSIGNOR TO THE MARTIN MARINE LIFE SAVING DEVICES, LIMITED, OF TORONTO, CANADA, A CORPORATION.

BOAT LAUNCHING AND STOWING APPARATUS.

1,009,758. Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed April 7, 1910. Serial No. 554,014.

To all whom it may concern:

Be it known that I, ANTHONY J. LEWKOWICZ, of New York, county of New York, and State of New York, have invented a new and useful Improvement in Boat Launching and Stowing Apparatus; and I hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to a boat launching and stowing apparatus comprising a trackway and davit cranes movable thereon one of its objects being to economize the deck space required for the apparatus, the distance the davit cranes shift, and the power and time to move them, between their inboard and outboard positions, this object being attained by so constructing the trackway that it will be of a greater length than a straight line between its terminals, thus producing an arc which will change the angular relation of the davit cranes to the vertical as they shift between their inboard and outboard positions.

A further object of my invention is to construct the davit cranes and the operating and controlling mechanisms so that one operator can actuate the crane moving mechanism and control the boat lowering mechanism, both of which are carried by one of the davit cranes for that purpose.

Other features and objects of my invention relate to the general and specific construction and arrangement of the means and parts by which the first two objects are carried into practice.

For an understanding of my invention reference is to be had to the following description and to the accompanying drawings in which:

Figure 1, is a perspective view of the apparatus from an outboard position. Fig. 2, is a perspective view of the apparatus from an inboard position. Fig. 3, is a perspective view showing the davit cranes at the outboard ends of the trackway with the boat swung clear of the operating platform and partly lowered. Fig. 4, is a side elevation of the lower part of one of the davit cranes showing the operating mechanism. Fig. 5, is a plan view of the construction shown in Fig. 4. Fig. 5, is a section on the line *b*—*b* Fig. 5, showing the brake and hoisting mechanism. Fig. 7, is a section on the line *a*—*a* Fig. 4, and Fig. 8, is a detail of one of the driving wheels. Fig. 9, is a diagrammatic view showing the angular relation of the davit cranes to the operating platform, when they and the tracks are at their extreme inboard position. Fig. 9^a is a similar view with the tracks at their outboard position. Fig. 9^b is a similar view with the tracks positioned as shown in Fig. 9^a and the davit cranes moving from their inboard to their outboard position. Fig. 9^c is a similar view with the davit cranes at their outboard position.

Like characters of reference refer to like parts throughout the specification and drawings.

The operating platform *b* is provided with slideways z'' extending inboard from the ship's side for the lengthwise adjustment of the parallel tracks *a*. The slideways are provided at their inboard and outboard ends with arresting stops z^4 limiting the adjustment of the tracks in each direction, and suitable fastening means b^4 are provided by which the tracks can be secured in any adjusted position within the limits of the slideway.

To maintain the tracks, when adjusted, in parallel relation to each other, and in correct angular relation to the operating platform, braces z^5 are permanently connected to the tracks and removably connected to the operating platform, these braces when connected to the operating platform, assisting the fastening means b^4 to hold the tracks in their adjusted position.

The adjustment of the tracks provides for variations of location for the apparatus within the limits of such adjustment, such variations of location being desirable owing to the different requirements for deck space when the vessel is in port and at sea, the vessel when in port requiring less deck space and further inboard stowage for the apparatus than when at sea where deck space is valuable.

The tracks *a* are arched so that the davit cranes *c* will preferably assume an inboard angle, from the vertical, when at their inboard position, and when at their outboard position will assume an outboard angle, from the vertical, sufficient to project the fall suspension points 1^a beyond the ship's side the whole length of the davit cranes, or as much thereof as may be necessary, to

swing a boat clear of the vessel, the projection of the fall suspension points being determined by the arc of the tracks and the relative angle formed by the centers of the fall suspension points 1^a, driving wheels f and the thrust rollers f', this angle being shown by the line z—z Fig. 9^c.

The "inboard position" of the davit cranes on the tracks is usually used when the ship is at the dock, and this position may if desired be brought further inboard, by the adjustment of the tracks, to the inboard end of the slideways, the "outboard position" is used for the launching of the life boat, and a position between the inboard and outboard positions, which may for convenience be termed the "intermediate inboard position" is used on large ships at sea, the life boat in the latter position slightly overhanging the ship's side.

The arc of the tracks is preferably such that, when the davit cranes are at their intermediate inboard position, the fall suspension points 1^a will be coincident with, or slightly inboard of, vertical lines 1^b drawn through the crests of the tracks, so that the fall suspension points will move on a descending arc until the davit cranes reach the outboard end of their movement, limited only by the stops a^3, with which the tracks are provided.

The treads of the tracks are provided with conical teeth a', and the driving wheels f are provided with corresponding coniform recesses f''. This arrangement forms a pinion and gear segment engagement, while the peculiar shape of the teeth and cavities is adapted to crush ice and clear it away. If the accumulation of ice is too great to be removed in this way, it may be easily knocked off with a hammer or bar, as there are no crevices between the teeth to retain it.

The cranes are provided with thrust rollers f' which engage the lower surfaces of the tracks, these thrust rollers f' together with the driving wheels f, maintaining the proper relation of the cranes to the tracks, for which purpose the driving wheels are located at the outboard side and the thrust rollers at the inboard side of the base. The shape of the davit cranes is preferably such that radial lines from the centers of the arcs of the tracks to the fall suspension points 1^a will always have such fixed relation to radial lines from the same centers to the centers of the driving wheels f, that the fall suspension points 1^a when they pass the crest of the trackway will be constantly in advance of the driving wheels f, during the outboard movement of the davit cranes, the purpose of this construction being to facilitate the outboard movement of the davit cranes by utilizing the weight suspended from the fall suspension points 1^a, that is, the weight of the life boat and its contents, to draw the davit cranes along the tracks when the fall suspension points pass the vertical lines 1^b, projected radially through the highest points of the arcs.

When the davit cranes are at their intermediate inboard position, lines drawn from the centers of the driving wheels f to the fall suspension points 1^a will incline forwardly, slightly beyond the perpendicular, with regard to the plane of the operating deck, and when the davit cranes are at their inboard position, lines drawn between the same two points will assume a pronounced inclined position, which may, if necessary, approximate the horizontal plane of the operating platform. As the radii from the centers of the arcs to the fall suspension points are greater than those from the centers of the arcs to the centers of the driving wheels f, the fall suspension points will advance faster than the centers of the driving wheels f in the ratio of their respective distances from the centers of the arcs, thus when the radii between the centers of the arcs and centers of the fall suspension points 1^a are twice those of the radii between the centers of the arcs and the centers of the driving wheels f, the fall suspension points 1^a will move at twice the rate of speed at which the driving wheels f are moving, thus reducing by one-half the time required to move the boat from its inboard to its outboard position, this reduction being of great importance when it becomes necessary to quickly launch the boat in an emergency.

As the davit cranes advance from their inboard position, the front boundary of which is marked by the line 1^c, see Figs. 9, 9^a to the place marked by the line 1^d, see Fig. 9^b the fall suspension points 1^a follow an upward arc which brings them coincident with the vertical lines 1^b.

During the upward movement of the fall suspension points, the boat is lifted sufficiently to relieve the chocks, when used, of its weight, without operating the winding mechanism. The fall suspension points 1^a after passing the vertical lines 1^b, move on a descending arc in an outboard direction, and the weight of the boat is then utilized to assist the applied power in advancing the davit cranes along the tracks until the motion of the davit cranes at their outboard ends is arrested by the stops a^3, the davit cranes then projecting beyond the operating platform sufficiently to swing the boat clear of the ship's side.

The driving wheels f are secured to the shaft z' mounted in bearings in the base c' of the davit cranes, and a double jaw clutch s is provided having jaws s'' which may be engaged with the clutch jaws u of the bevel gear wheel v to cause the latter to revolve with the crank shaft q and transmit motion to the bevel pinion w, worm shaft x and worm y. The worm y engages with the

worm wheel z to revolve the driving shaft z' and driving wheels f. Movement of the crank shaft q in one direction will move the davit cranes toward the outboard position, and turning the crank in the other direction, will move the cranes along the arched tracks to the inboard position.

Referring to the hoisting mechanism, the hoisting gear wheel l meshes with the hoisting pinion wheel p loosely mounted on the crank shaft q. The hoisting pinion wheel p is provided on its inner side face with the clutch jaws r, and meshing with the clutch jaws r is said double jaw clutch s, slidably keyed to the crank shaft q. The crank shaft q is provided at each end with a crank t by which it is turned to wind the davit falls on the fall drum when the jaws s' of the sliding clutch s are in engagement with the clutch jaws r of the hoisting pinion wheel p, or to impart motion to the driving wheels f when the jaws s'' of the sliding clutch s are in engagement with the clutch jaws u of the bevel gear wheel v, loosely mounted on the crank shaft q.

The brake consists of a strap h' secured at one end to the lug h'' of the base c', and provided at the other end with a screw h^3, which extends through a bore h^4, in the base, and is fitted with a controlling wheel j, regulating the pressure of the brake strap against the brake wheel k.

The brake wheel k forms a unitary part of the hoisting gear wheel l, keyed to the winding shaft m, mounted in bearings o in the base c'. Keyed to the winding shaft m is the duplex fall drum i, upon which are wound the davit falls g g'. When the brake is loosened, the weight of the boat and its contents draw the davit falls from the fall drum i, causing the fall drum, winding shaft, and hoisting gear wheel and brake wheel to revolve in the unwinding direction. By operating the controlling wheel j, the speed of the unwinding action of the fall drum and its associated parts is regulated to allow the boat and its contents to descend at any desired speed, that is, by loosening the brake strap from the brake wheel, the boat and its contents can rapidly descend, and by tightening the brake strap against the brake wheel, the boat and its contents can be caused to slowly descend or be stopped in their descent at any place between the fall suspension points and the water.

When the boat has been swung clear of the ship's side, the brake strap h' is released to permit of the davit falls g g' unwinding from the duplex fall drum i, the speed of the unwinding movement being controlled by the adjustment of the brake strap h'. Normally the brake strap h' is adjusted to prevent the revolution of the fall drum with the jaws s'' of the sliding clutch s in engagement with the clutch jaws u, and out of engagement with the clutch jaws r of the hoisting pinion wheel, so that the apparatus is always ready to be moved outboard when motion is applied to the crank shaft. The davit falls should have almost the full strain of the lifeboat, the chocks being only employed to prevent it swaying. These chocks should be of a type that can be easily and quickly swung sidewise, knocked down, or entirely removed, so that when the lashings a'' are released, the unimpeded movement of the davit cranes in an outboard direction can commence. The davit falls maintain and hold the lifeboat on an even keel at its inboard position and throughout the launching operation. By turning the cranks in one direction, the driving wheels move the davit cranes to the outboard ends of the arched tracks where their motion is arrested by the stops a^3, and without changing the position of the sliding clutch s, the brake h is loosened to allow the davit falls to unwind from the fall drum until the boat is launched on the water.

In stowing the boat, the clutch jaws s' are moved into engagement with the clutch jaws r so that the revolution of the crank shaft q will cause, through the meshing of the hoisting pinion wheel p and hoisting gear wheel l, the winding revolution of the fall drum, the winding revolution being continued until the keel of the boat is lifted above the plane of the chocks on the operating platform. The brake is then tightened to prevent the unwinding of the davit falls and the sliding clutch s is then moved to disengage the clutch jaws s' from the clutch jaws r of the hoisting pinion wheel and to bring the jaws s'' into engagement with the clutch jaws u, so that the turning of the crank shaft will cause the driving wheels f to move the davit cranes in an inboard direction and restore all the parts of the apparatus to their normal inboard position where the boat is lashed to the chocks.

The davit fall g passes direct from the fall drum i over the idler l', connected to the davit crane carrying the hoisting and moving mechanism, and the other davit fall g' passes over the idler l'' secured to the same davit crane and then around the idlers l^3 and l^4 secured to the other davit crane from whence they pass to the life boat, both davit falls being connected to the latter by any of the usual type of boat hooks m', the idlers l'', l', l^3, and l^4 being fixedly connected or swiveled to the davit cranes as may be found most suitable.

The davit cranes are held in fixed relation to each other by braces o', which resist the lateral strain of the davit fall g', and, to enable the davit crane to resist the strains imposed by the weight of the boat and its

contents, the bases of the davit cranes are provided with the thrust rollers f' engaging the under surfaces of the arched tracks, and, the upper surfaces of a guide track p' to prevent the davit cranes tilting inboard when relieved of the weight of the boat and its contents, when the davit cranes are at their inboard position.

Before the outboard movement of the davit cranes is started, the lashings a'' are released, and motion is then applied to the driving wheels, which by the engagement of the coniform cavities f'' with the conical teeth a', causes the simultaneous steady advance of the davit cranes until they are arrested by the stops a^3 at the outboard end of the tracks.

If desired to bring the life boat farther inboard than its normal inboard position, the fastenings for the arched trackways may be released and the latter moved bodily inboard, carrying with them the davit cranes and boat.

The advantages of my invention result primarily from the use of the arched tracks changing the angle of the davit cranes during their inboard and outboard movements and causing them to travel over a line longer than a direct line between the outboard and inboard ends of the tracks thus economizing space which is of special importance on vessels at sea. The curvature or shape resulting from the above construction produces an arc which enables the motive power to be effectively applied and assisted by the weight of the boat and contents during their outward travel after the crest of the arc is passed. In other words, it will be observed that the cam-shaped tracks each have arcs of a greater radius of curvature at their outboard than at their inboard ends, and that the supporting connections comprising the driving wheels f and the thrust rollers f' are so spaced and disposed relatively to each other that when the wheels f during the outboard movement of the davits, contact with the arcs of the greater radius, the thrust rollers f' will so move as to permit the rotation of said davits around an outwardly moving center in addition to said outward movement. This rotary motion of the davits accelerates the first mentioned outward movement, and gives to the fall suspension points an accelerated downward movement over a long portion of their paths, while the bases of the davits are passing over the outboard portions of said arcs. It is obvious, however, that those skilled in the art may vary the details of construction and the arrangement of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

What I claim is:—

1. In a boat launching and stowing apparatus, the combination of a crane, a cam-shaped trackway associated with said crane, and movable supporting connections comprising track engaging and thrust members between said trackway and crane so disposed as to provide an accelerated movement to said crane during a portion of its movement over said trackway.

2. In a boat launching and stowing apparatus, the combination of a crane, a cam-shaped trackway associated with said crane having an arc of a greater radius of curvature at its outboard end than at its inboard end, and movable supporting connections comprising track engaging and thrust rollers so located between said trackway and crane that an accelerated movement will be imparted to said crane during a portion of its movement over said trackway.

3. In a boat launching apparatus, the combination of a crane, a cam-shaped trackway higher at its outboard than at its inboard end, and movable supporting connections comprising track engaging and thrust rollers between said crane and trackway so disposed as to cause the extreme end of said crane to revolve around a movable center and to move at different angular velocities while moving over equal arcs of said trackway.

4. In a boat launching and stowing apparatus, the combination of a crane, a cam-shaped trackway associated with said crane having an arc of a greater radius of curvature at its outboard than at its inboard end, movable connections comprising a thrust roller, a supporting roller, and gearing between said trackway and crane so disposed as to cause said crane to revolve about a movable center, to assume an inboard angle from the vertical, and to cause an accelerated movement to be imparted to said crane during a portion of its movement over said trackway.

5. In a boat launching and stowing apparatus, the combination of a cam-shaped trackway having an inboard arc of a less radius of curvature and lower than its outboard arc, a crane associated with said trackway, movable supporting connections between said crane and said trackway, so disposed as to cause said crane to revolve around a movable center and to have an accelerated movement over a portion of said trackway, and means for securing said crane at an inboard angle from the vertical when in its inboard position and for holding said crane in its reverse angle position.

6. In a boat launching and stowing apparatus, the combination of a platform, a cam-shaped trackway, means connecting said trackway to said platform, sliding connections between said means and said trackway for the adjustment of the latter, a crane carried by said trackway, and movable sup-

porting connections between said crane and trackway so disposed as to cause said crane to have an accelerated movement over a portion of its travel.

7. In a boat launching and stowing apparatus an operating platform having parallel slideways in its operative surface, arched tracks having slides movable lengthwise in the slideways, arresting stops limiting the movement of the arched tracks, and clamping means for holding the arched tracks in their adjusted position.

8. In a boat launching and stowing apparatus, an operating platform having parallel slideways, arched cam shaped tracks having slides movable lengthwise of said slideways, arresting stops limiting the movement of said tracks, diagonal stays rigidly connected to said tracks, and detachable attachments between said stays and said platform, and cranes having movable supporting connections with said tracks.

9. In a boat launching and stowing apparatus, the combination of a plurality of davit cranes having fall suspension points, cam-shaped trackways having their outboard ends higher than their inboard ends, over which said cranes travel, and movable supporting connections comprising track wheels and thrust rollers connecting said cranes and tracks adapted to impart an accelerated movement to said fall suspension points when said cranes are passing over said higher portions of said tracks and to cause said cranes to assume an inclined inboard position when resting on said inboard ends.

10. In a boat launching and stowing apparatus, the combination of a plurality of davit cranes having fall suspension points, cam-shaped trackways having their outboard ends higher than their inboard ends over which said cranes travel, slideways in which said tracks are adjustable, and movable supporting connections comprising track wheels and thrust rollers connecting said cranes and tracks adapted to impart an accelerated movement to said points when said cranes are passing over said higher portions of said tracks and to cause said cranes to assume an inclined inboard position when resting on said inboard ends.

11. In a boat launching and stowing apparatus, the combination of a crane, a cam-shaped trackway higher at its out board than at its inboard end, and movable supporting connections between said crane and trackway comprising a track wheel movable on said track, and a thrust roller engaging said trackway adapted to cause the extreme end of said crane to move at different angular velocities while moving over equal arcs of said trackway.

12. In a boat launching and stowing apparatus, the combination of a platform, a pair of davit cranes carried thereby, parallel cam-shaped tracks each having an arc of a greater radius of curvature at its outboard than at its inboard end, and movable supporting connections comprising track engaging and thrust rollers between said davit cranes and said tracks so disposed as to cause said cranes to revolve around movable centers, to be inclined inboard from the vertical when over the inboard ends of said arcs, their extreme ends to move first upwardly from this inclined position when being carried to their outboard positions and to cause said ends to move downwardly at an accelerated velocity and to overhang the platform when assuming said outboard position.

13. In a boat launching and stowing apparatus an arched trackway having its outboard end higher than its inboard end, and davit cranes movable thereon, provided with track wheels engaging the top surface, and with thrust rollers engaging the bottom of the track way, the thrust rollers and track wheels maintaining the correct angular relation of the davit cranes to the trackway, the track wheels being located at the outboard ends, and the thrust rollers at the inboard ends of the bases of the davit cranes, and fall suspension points for the davit cranes constantly in advance of the driving wheels during the outboard movement of the davit cranes.

14. In a boat launching and stowing apparatus, a davit crane, a winding shaft, a fall drum and a hoisting gear wheel mounted on the winding shaft, a brake wheel revoluble with the hoisting gear wheel, a crank shaft, a hoisting pinion wheel loosely mounted on the crank shaft, a clutch member for the hoisting pinion wheel, a double clutch slidably secured on the crank shaft engaging with the clutch of the hoisting pinion wheel when moved in one direction, a bevel gear wheel loosely mounted on the crank shaft having a clutch member engaged by the sliding clutch when moved in the other direction, a worm shaft, a bevel pinion mounted on the worm shaft meshing with the bevel gear wheel, a worm on the worm shaft, a driving shaft, a worm wheel fixed on the driving shaft meshing with the worm, and track wheels on the driving shaft.

15. In a boat launching and stowing apparatus a davit crane, a winding shaft, a fall drum and a hoisting gear wheel mounted on the winding shaft, a brake wheel revoluble with the hoisting gear wheel, a crank shaft, a hoisting pinion wheel loosely mounted on the crank shaft, a clutch member for the hoisting pinion wheel, a double clutch slidably secured on the crank shaft engaging with the clutch of the hoisting pinion wheel when moved in one direction, a bevel gear wheel loosely mounted on the

crank shaft having a clutch member engaged by the sliding clutch when moved in the other direction, a worm shaft, a bevel pinion mounted on the worm shaft meshing with the bevel gear wheel, a worm on the worm shaft, a driving shaft, a worm wheel fixed on the driving shaft meshing with the worm, and track wheels on the driving shaft having coniform cavities in their tread surface, and track ways having conical projections engaging in the coniform cavities of the track wheels.

16. In a boat launching and stowing apparatus, the combination of a davit crane, a winding mechanism carried by said crane, a brake mechanism associated with said winding mechanism, a controlling wheel carried by the brake mechanism, a cam-shaped track over which said crane is adapted to move, and movable supporting connections comprising a track wheel connecting said crane and track.

17. In a boat launching and stowing apparatus, the combination of a pair of davit cranes, a winding mechanism carried by one of said cranes comprising a drum, a brace connecting said cranes, a brake mechanism, a pair of cam-shaped tracks over which said cranes move, means for adjusting said tracks, and movable supporting connections between said cranes and tracks.

18. In a boat launching and stowing apparatus, the combination of a pair of davit cranes, a winding mechanism carried by one of said cranes comprising a drum, two davit falls passing around said drum, one of said falls passing to one of said cranes, and the other fall passing diagonally to the other crane, a horizontal brace connecting said cranes, a brake mechanism, a pair of cam-shaped tracks over which said cranes move, means for adjusting said tracks, and movable supporting connections between said cranes and tracks.

19. In a boat launching and stowing apparatus, the combination of a crane; a cam shaped trackway associated with said crane; and connections between said trackway and crane, adapted to impart an accelerated movement to said crane during a portion of its travel over said trackway, substantially as described.

20. In a boat launching apparatus, the combination of a crane; cam shaped trackway associated with said crane and having an arc of a greater radius of curvature at its outboard than at its inboard end; and movable connections between said trackway and crane adapted to impart an accelerated movement to said crane during a portion of its travel on said trackway, substantially as described.

21. In a boat launching apparatus, the combination of a crane; a cam shaped trackway having cone shaped teeth associated with said crane; and connections between said crane and trackway comprising a roller having holes fitting said teeth, said connections adapted to impart an accelerated movement to said crane during a portion of its movement over said trackway, substantially as described.

Toronto, December 27th, 1909.

ANTHONY J. LEWKOWICZ.

Signed in the presence of—
OLIVER BATEMAN,
CHAS. H. RICHES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."