Dec. 23, 1952 D. E. DODGSON 2,622,251

DAVIT CONTROL MECHANISM

Filed May 31, 1949 3 Sheets-Sheet 1

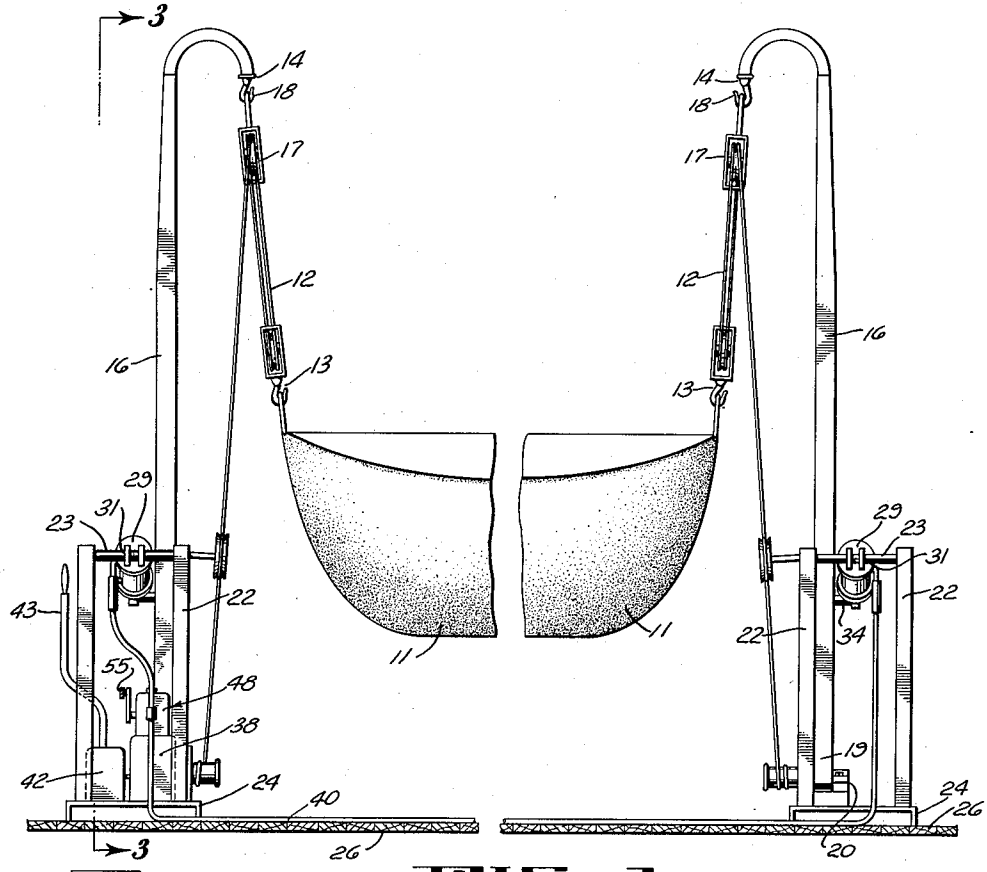



FIG. 1.

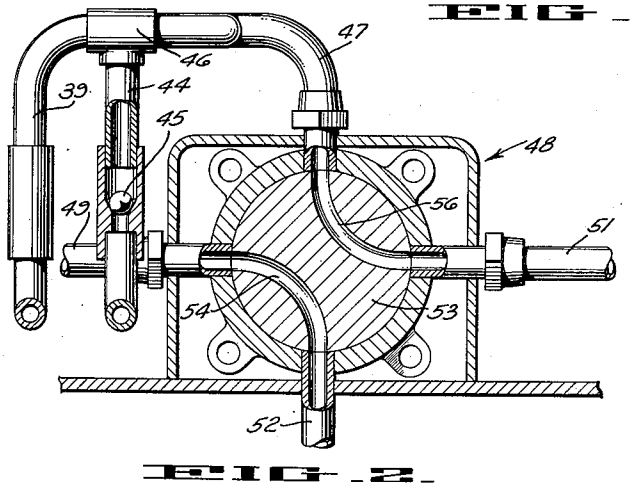



FIG. 2.

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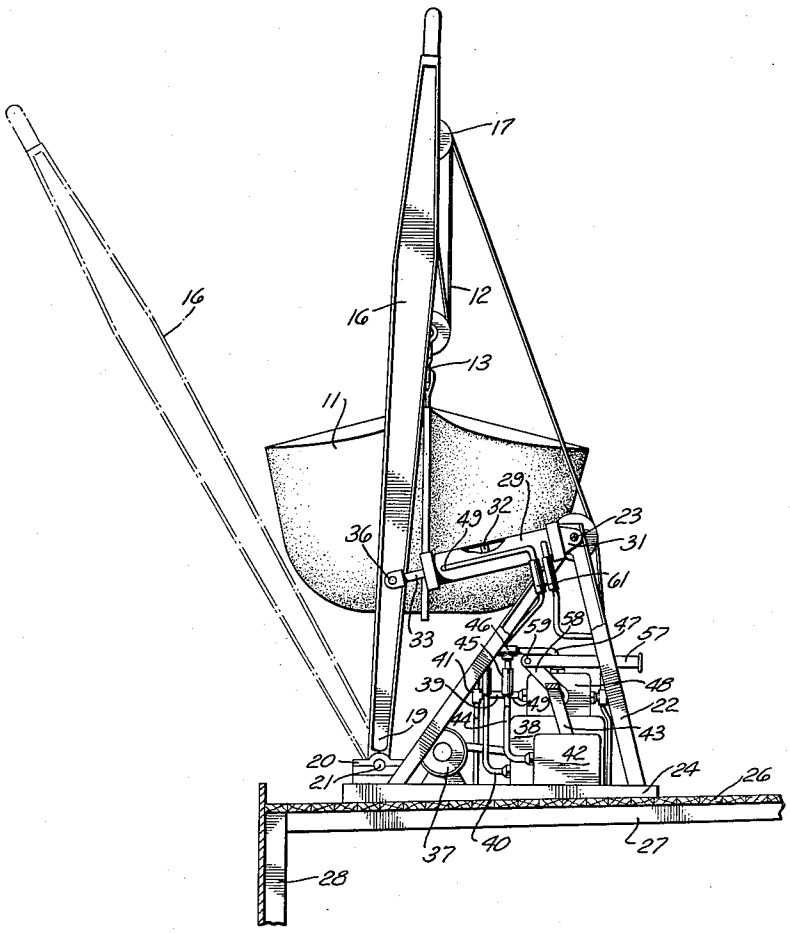



FIG. 3.

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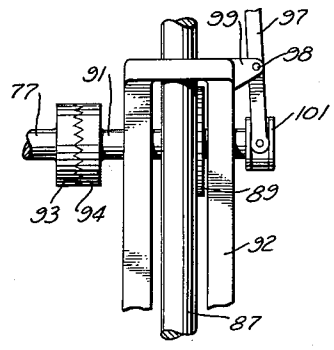



FIG. 6

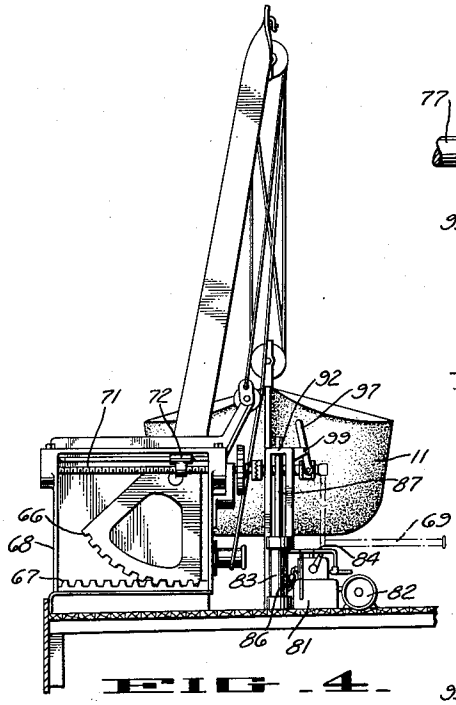



FIG. 4

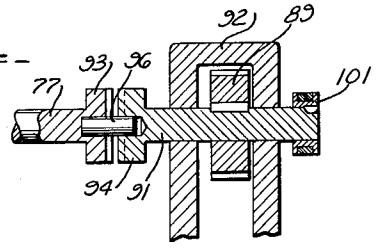



FIG. 7

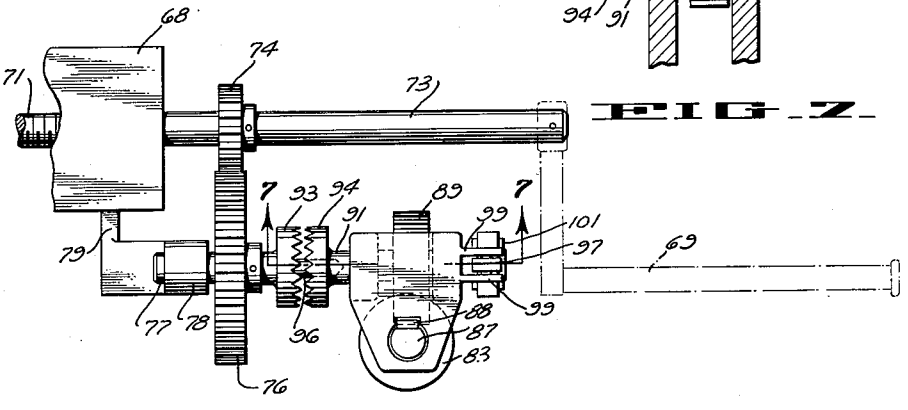



FIG. 5

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# UNITED STATES PATENT OFFICE

2,622,251

## DAVIT CONTROL MECHANISM

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Application May 31, 1949, Serial No. 96,326

2 Claims. (Cl. 9—37)

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This invention relates to davits and more particularly to hydraulically operated mechanism for selectively moving a pair of davit arms supporting a lifeboat or the like to inboard and outboard position.

Strict laws have been enacted requiring passenger and merchant vessels to be equipped with specified numbers of lifeboats, depending on the size of the vessel and the number of passengers and crew members carried. Such lifeboats are generally carried inboard under davits or chocks, and must be stowed in such a manner that they can be launched in the shortest possible time and under unfavorable conditions of vessel list and trim.

In general, there are three types of davits in present use for moving a boat from its inboard or stowed position to an outboard or launching position. The first of these types is the gravity davit wherein the lifeboat is carried on two cradles, mounted on rollers, which move over two parallel tracks at right angles to the side of the vessel. In operation, a lever controlling a brake is raised which permits the lifeboat and the entire assembly to roll down the tracks by gravity, stopping with the lifeboat suspended over the side of the vessel and at the level of the embarkation deck. This type of davit has certain advantages, but the tracks require a large amount of room inboard of the vessel, and consequently a certain proportion of overhead deck space is wasted. Furthermore, the cost of this system is very high and its use is therefore restricted by economic considerations. Another type is the radial or round bar davits in which the davits are rotated aft until the bow of the lifeboat clears the forward davit. The forward davit is then turned out so that the bow swings out, and the same procedure is then followed with the after davit. The third type is commonly referred to as quadrantal davits in which the davits are pivoted at their lower ends and are rotated outboard at right angles to the vessel's side by means of a crank operating a worm gear. This latter type of davit has been extensively used, particularly on merchant vessels, but has the primary disadvantage in that six or more men are required to operate the cranks to move the boat to its outboard position. This disadvantage is similarly present in the radial or round bar davit. Furthermore, a great deal of physical effort is required on the part of the crew to place the boat in position for launching, and a considerable amount of time is required for the operation.

It is therefore an object of my invention to provide operating mechanism for boat supporting davits which will cause the davits to move the boat to the outboard or launching position in a minimum period of time.

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A further object of the present invention is to provide a boat supporting davit which may be easily operated by a single individual.

Another object of my invention is to provide a davit operating mechanism which may be located on the deck of a vessel so as to take up a minimum amount of deck space.

A still further object of my invention is to provide a davit operating mechanism of the type described which may be installed at only a fraction of the cost of certain existing mechanisms.

Still another object of the invention is to provide automatic means for moving a davit from inboard to outboard position, such means being capable of installation on a new vessel or used in combination with the presently operated hand-cranked types of davits.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adapted within the scope of the invention as set forth in the claims.

Referring to the drawings:

Figure 1 is a side elevational view of a pair of boat supporting davits and operating mechanism embodying my invention.

Figure 2 is a detailed sectional view of the valve system used in my hydraulic operating mechanism.

Figure 3 is an end elevational view of the boat supporting davit taken along the plane indicated by line 3—3 of Figure 1, the full lines indicating the normal inboard position of the davit, and the dotted lines the outboard or boat launching position.

Figure 4 is an end elevational view similar to Figure 3 illustrating the application of my invention to a crank-operated quadrantal type of davit.

Figure 5 is a detailed plan view of the operating mechanism used in the embodiment illustrated in Figure 4.

Figure 6 is an enlarged elevational view of a portion of the operating mechanism disclosed in Figure 4 showing engagement of the clutch.

Figure 7 is a sectional view of a portion of the operating mechanism taken on plane 7—7 of Figure 5.

As previously stated, there are numerous types of boat supporting davits in current use, but in general, such davits have undesirable features such as expensive installation, excessive bulk, or difficulty in operation. Many improvements have been suggested for eliminating one or more of these difficulties, but none of these improvements have met with too favorable a reaction in the trade. While certain of these improvements have obviated one of the undesirable features, it has generally been at the expense of one of the other features. In an attempt to improve upon existing davit installations and to develop a new type of davit for future installations, the present invention was made.

Referring to the drawings, and with particular reference to Figures 1 and 2, the boat supporting davits are positioned inboard of the vessel side and are arranged for pivotal movement outboard of the vessel whereby a lifeboat may be moved from a stowed to a launching position. A lifeboat 11 is here shown as being supported on suitable conventional falls 12 and releasing gear 13 permitting the release of the falls from the boat either before the boat is waterborne or immediately thereafter. The falls are connected to and supported from the distal ends 14 of a pair of davits 16 in any suitable manner but preferably by means of a block and tackle 17 hanging from a hook 18 at the end 15 of the davit, the lower end 19 of the davit being pivotally connected to the vessel by means of a pin 21 extending through suitable apertures in the davits and in channel shaped support members 23.

Means are provided for moving the davits around the pivot pin 21 from their vertical or stowed position to their outboard or launching position indicated by the dash-dot lines in Figure 3. Although numerous power methods could be utilized for moving the davits, it is imperative that the boats also be capable of being launched by manual operation, maritime law requiring such a safeguard in case of power failure on board the vessel. Therefore, I have illustrated a preferred method of davit operation which includes the use of a two-way hydraulic cylinder operable either by hand or power actuated pumps, although it will be clear to those skilled in the art that other hand or power actuated means could be used. Referring again to Figures 1 and 3, a pair of A-frames 22 are provided at each davit, being interconnected at their upper ends by a preferably cylindrical shaft 23 journaled or otherwise affixed to the frames. The frames are here shown as being supported on a member 24 secured to the decking 26 of the vessel in any suitable manner, but desirably tied in to the deck stringers 27 or the ribs 28 to lend structural stability to the entire operating mechanism. Interposed between the shaft 23 and the davit 16 is a hydraulic cylinder 29 provided at one end thereof with a pair of ears 31 with apertures therein for receiving the shaft 23 and effecting a pivotal connection between the shaft and cylinder. The cylinder is also provided with a piston 32 secured to an operating rod 33 extending through one end of the cylinder and pivotally connected to a bracket extension 34 of the davit with a pivot pin 36. In this manner, the cylinder is pivotally supported at its rearward end, and by extending or retracting the piston and its associated rod, it is apparent that the davit may be selectively moved to its inboard and outboard position.

To effect movement of the piston within cylinder 29, hydraulic means are provided, and such means are capable of either mechanical or manual operation. In general, a motor driven pump and a hand-operated pump are arranged in parallel, whereby either pump may be actuated to force fluid into cylinder 29 and effect movement of the piston 32 therein. As shown in the drawing, a motor 37 is operatively connected to a hydraulic pump 38 which is in flow communication with cylinders 29 through a conduit 39. A T fitting 41 is also provided whereby each of the cylinders will be in communication with the pump 38 through the respective conduits 39 and 40. However, in case of an electrical power failure on board the vessel, I also provide a hand pump 42 with a suitable operating handle 43. This hand pump may be of conventional design, and as hand pumps, motors and hydraulic pumps are well known to those skilled in the art, and as they constitute no part of the present invention, no further description will be made herein. The hand pump 42 is in communication with cylinders 29 through a conduit 44 and to prevent back pressure from building up in the pump when the electrically operated pump is functioning, a ball-check valve 45 is provided in conduit 44. Conduits 39 and 44 are connected by a T 46 and enter a common conduit 47 leading to the cylinder. A two-way valve generally indicated by the numeral 48 is utilized to effect movement of the piston 32 in either direction in cylinder 29 whereby the davits may be selectively moved to inboard and outboard positions. Separate conduits 49 and 51 are respectively connected to the front and rear portions of cylinders 29 and conduit 52 is provided for draining fluid from one side of the piston to a suitable reservoir located in the pump housings when the piston is actuated toward said side. As best seen in Figure 3 the valve 48 has a rotary plug member 53 operable by handle 55 which has therein a pair of separate ducts 54 and 56 respectively arranged to connect adjacent pairs of the four peripherally disposed, equidistantly spaced ports with which the rotary plug member is provided. These parts are arranged to register and communicate with similarly arranged ports in the valve body. The ports of the valve body are connected to conduits 47, 49, 51 and 52 respectively. With the plug 53 positioned as shown in Figure 3, fluid entering conduit 47 from either pump will be caused to flow through duct 56 to conduit 51 thereby forcing the fluid under pressure to the rear end of cylinder 29 and urging the piston therein to its forward position, while at the same time conduit 49 which is connected to the front end of cylinder 29 will receive fluid being forced out of the cylinder by forward movement of the piston and the fluid will pass through duct 54 into conduit 52 and thence into selected reservoirs associated with pumps 38 and 42. By rotating plug member 53 ninety degrees, the duct 54 will register with conduits 47 and 49 and the duct 56 will register with conduits 51 and 52. Under the latter condition, fluid under pressure will be forced against the forward end of the piston and fluid behind the piston in the cylinder will be drained. To rotate plug member 53, a handle 57 is provided, and by means of suitable linkage 58 and a pivot pin 59, fore and aft movement of the handle will effect rotation of the plug member.

Suitable conduits are provided so that simultaneous reception of fluid in the same side of each cylinder is accomplished. As the cylinder is pivotally connected, it is necessary to provide flexible portions 61 on the conduits connected there-

with. It is understood of course, that the entire conduit system may be made of flexible tubing.

It will be apparent from the foregoing that a simple means of selectively moving davits to their inboard and outboard positions has been accomplished which is capable of being operated either mechanically or manually by a single individual in a fraction of the time heretofore required for the operation.

In Figures 4 through 8 is illustrated the application of hydraulic means in combination with the conventional type quadrantal davit which is generally provided with a plurality of teeth 66 formed along an arcuate path, the teeth being arranged to engage matching teeth 67 in the davit frame 68. To rock or pivot the davit around the frame, a hand crank 69 is provided which is secured to a threaded shaft 71 supported by suitable bearings in the frame. A threaded sleeve member 72 mounted on the davit is engaged on the shaft, and it is thus seen that by rotating the hand crank, member 72 will be caused to move inboard or outboard depending on the direction of rotation and effect the lowering or raising of the davit. While this system is satisfactory in certain aspects, a great deal of physical force is required to move the davits when a boat is supported thereon, and I have therefore provided means whereby the davits may be selectively pivoted by mechanical and hydraulic means as well as by use of the hand crank.

In carrying out the invention, it will be generally necessary to extend shaft 71 inboard of the frame 68 to provide a shaft extension 73 to which the hand crank is connected. Mounted on the extension 73 adjacent the frame 68 is a spur gear 74 in operative engagement with a gear 76 on a shaft 77 which is horizontally spaced from extension 73 and supported on one end by a bearing 78 mounted in an extension 79 of frame 68. Means are provided to effect rotation of gear 76 which in turn will cause rotation of gear 74 and shaft 71 and pivoting of the davit. Such means include a pump 81 driven by an electric motor 82, the pump being operatively connected to a hydraulic cylinder 83 through a valve similar to that shown in Figure 2 of the drawing. Cylinder 83 is the same as cylinder 29 and is provided with a piston and conduits 84 and 86 leading to the valve and to the cylinder of the other davit. The piston rod extension 87 is provided with teeth 88 to form a vertically extending rack, the teeth 88 engaging the teeth of a pinion gear 89 splined to a shaft 91 mounted in suitable bearings provided in a support frame 92. Thus, by raising or lowering the piston in the cylinder, the vertically moving rack will cause rotation of pinion 89 and shaft 91. To impart this rotation to shaft 77, a novel clutch arrangement is provided, and as here shown comprises matching dogs 93 and 94 mounted on adjacent ends of shafts 77 and 91 respectively. An alignment pin 96 is also provided to support one end of shaft 77 and to maintain the dogs in axial alignment. In order to provide selective separation or engagement of the clutch dogs, the shaft 91 may be moved axially in the frame 92 and such movement may be accomplished in several ways, but as here shown, comprises the use of a lever arm 97 pivoted at a center portion by means of a pivot pin 98 extending through a pair of ears 99 formed on frame 92 and pivoted at its distal end to a member 101 secured to the end of shaft 91. By pulling on the handle 97, the shaft 91 will be caused to withdraw through frame 92 and disengage the clutch dogs, and conversely, by pushing on the handle, clutch engagement is effected. It is to be noted that pinion 89 is somewhat wider than the rack teeth 88 whereby interengagement of the gears are not affected by the limited degree of axial movement of shaft 91 which is required to disengage the clutch dogs.

If it is desired to operate the davit mechanism by hand, lever 97 is pushed in disengaging the clutch dogs 93 and 94 and permitting manual operation of the hand crank 69. Or if it is desired to operate the mechanism mechanically, by pulling the lever 97, the clutch dogs will engage, and by aligning the proper ports of the valve mechanism with the appropriate conduits of cylinders 83, the piston will travel in the cylinder effecting vertical travel of the rack and subsequent rotation of pinion 89, gears 76 and 74, and shaft 71 which will impart the pivotal movement to the davit. In this manner, one person can easily bring a lifeboat to inboard or outboard position in a minimum period of time.

I claim:

1. Boat launching apparatus having a support platform, a substantially vertical davit having its lower end pivotally mounted on said platform, a substantially horizontal manually rotatable first shaft, means engageable with said davit and said first shaft for effecting pivotal movement of said davit upon rotation of said first shaft, a cylinder mounted on said platform and having a piston therein, means for selectively introducing fluid under pressure to said cylinder on either side of said piston, a piston rod having a plurality of teeth thereon, a second shaft having a pinion mounted thereon in engagement with said piston rod teeth, means for imparting rotation from said second shaft to said first shaft, and clutch means interposed between said shafts for selectively placing said shafts in and out of operative engagement.

2. Boat launching apparatus having a support platform and including a plurality of horizontally disposed teeth, a substantially vertical davit having a plurality of teeth formed along an arcuate path and engageable with said platform teeth, a susbtantially horizontal threaded first shaft longitudinally secured in said platform, means including an internally threaded sleeve secured to said davit and mounted on said shaft for imparting pivotal movement to said davit on rotation of the shaft, a gear mounted on said first shaft, a cylinder mounted on said platform and having a piston therein, means for selectively introducing fluid under pressure to said cylinder on either side of said piston, a piston rod attached to said piston and having a plurality of vertically spaced teeth thereon, a second shaft, means including a gear engageable with said rod teeth for effecting rotation of said second shaft on axial movement of said piston rod, a third shaft, means including a gear on said third shaft engaged with said first mentioned gear for interconnecting said first and third shafts for imparting simultaneous rotation therebetween, and clutch means interposed between said second and third shafts whereby said first shaft may be selectively placed in and out of operative engagement with said second shaft.

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(References on following page)

## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 840,876 | Steedman | Jan. 8, 1907 |
| 938,448 | Welin | Oct. 26, 1909 |
| 982,977 | Morgan | Jan. 31, 1911 |
| 1,011,477 | Norton | Dec. 12, 1911 |
| 1,128,845 | Broady | Feb. 16, 1915 |
| 1,162,497 | L'Heureux | Nov. 30, 1915 |
| 1,297,705 | L'Heureux | Mar. 18, 1919 |
| 1,326,228 | Turner | Dec. 30, 1919 |
| 2,049,066 | Kindelberger et al. | July 28, 1936 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 86,506 | Germany | Dec. 10, 1921 |