C. ANDRADE, Jr.

WINDLASS.

APPLICATION FILED MAY 14, 1910.

974,456. **Patented Nov. 1, 1910.**

3 SHEETS—SHEET 1.

Fig. 1

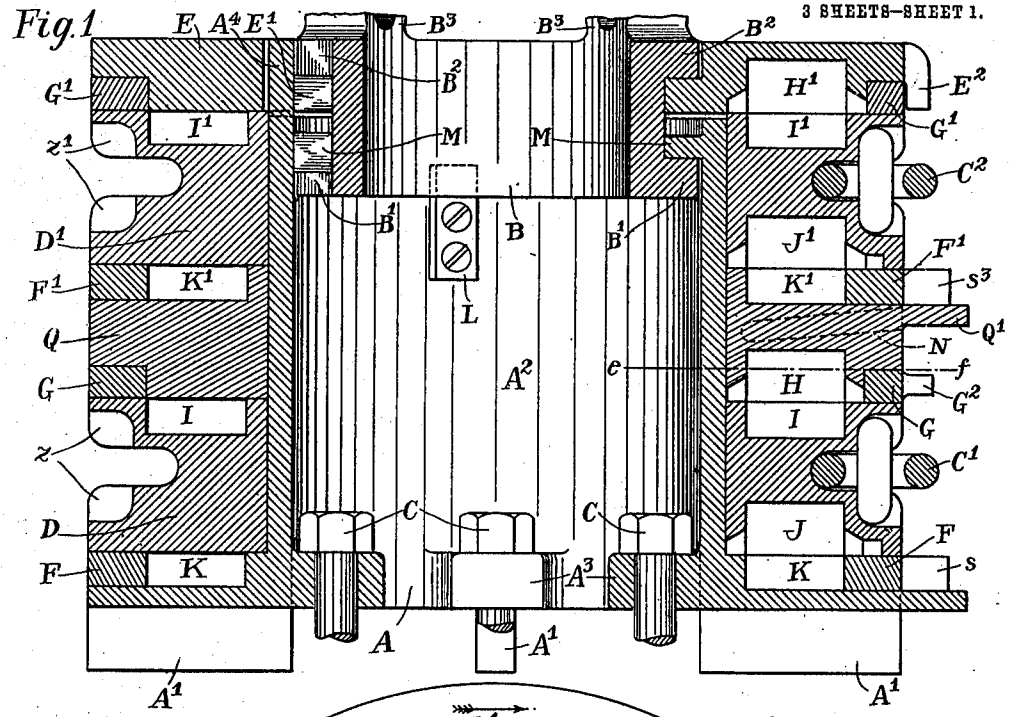
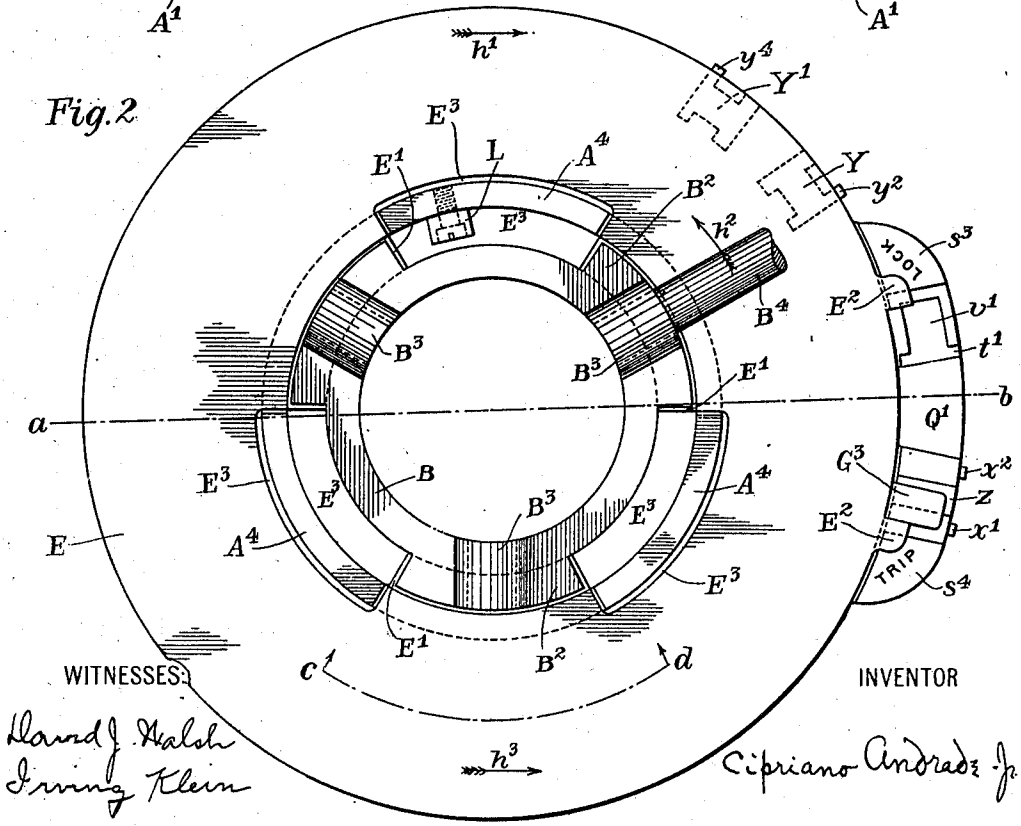


Fig. 2



WITNESSES:

Harold J. Walsh

Irving Klein

INVENTOR

Cipriano Andrade Jr.

C. ANDRADE, JR.

WINDLASS.

APPLICATION FILED MAY 14, 1910.

974,456.

Patented Nov. 1, 1910.

3 SHEETS—SHEET 2.

Fig. 3

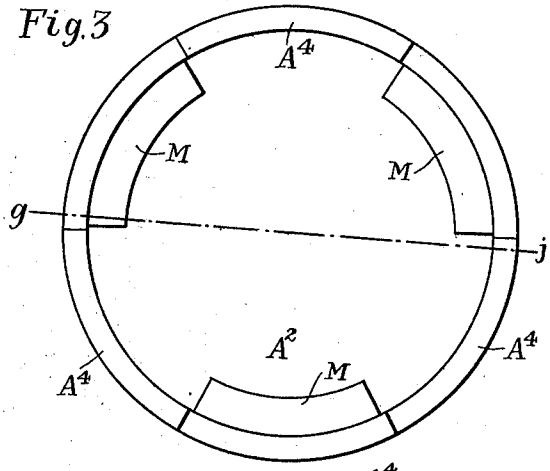


Fig. 5

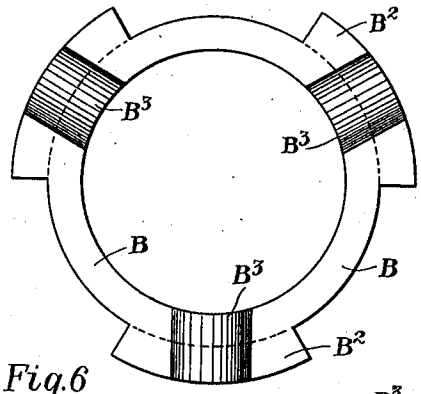


Fig. 4

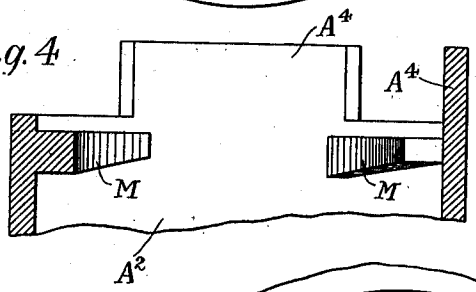


Fig. 6

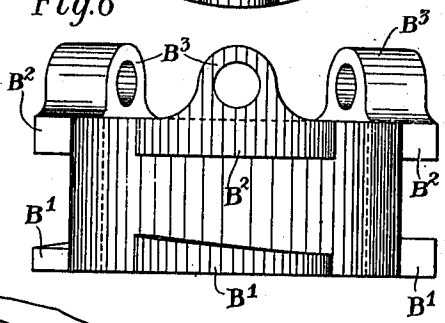


Fig. 7

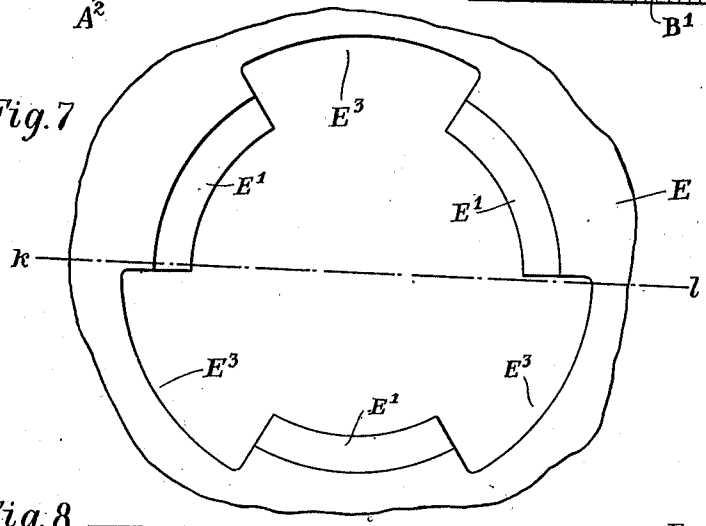
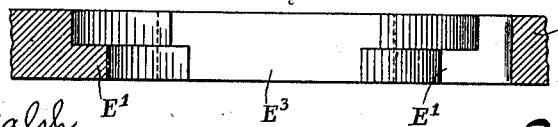


Fig. 8



WITNESSES:

David J. Walsh

Irving Klein

INVENTOR

Cipriano Andrade Jr.

C. ANDRADE, Jr.

WINDLASS.

APPLICATION FILED MAY 14, 1910.

974,456.

Patented Nov. 1, 1910.

3 SHEETS—SHEET 3.

Fig. 9

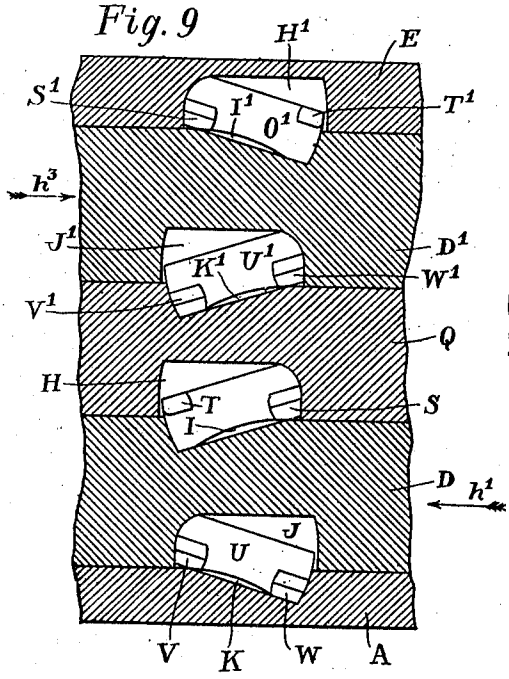


Fig. 10

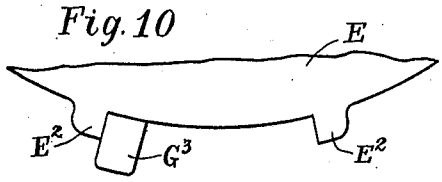


Fig. 11

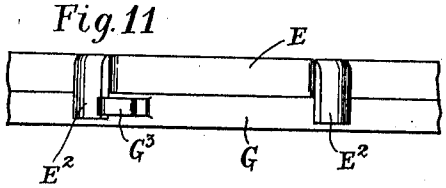


Fig. 12

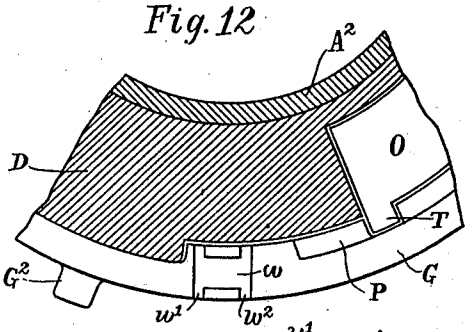
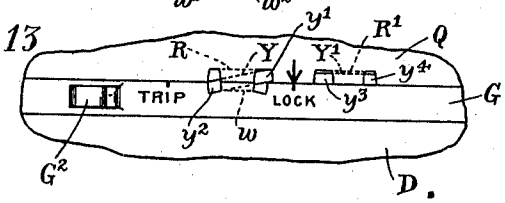


Fig. 13



WITNESSES:

David J. Walsh

Irving Klein.

INVENTOR

Cipriano Andrade Jr.

UNITED STATES PATENT OFFICE.

CIPRIANO ANDRADE, JR., OF NEW YORK, N. Y.

WINDLASS.

974,456. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed May 14, 1910. Serial No. 561,363.

To all whom it may concern:

Be it known that I, CIPRIANO ANDRADE, Jr., a citizen of the United States, residing at 328 West Eighty-fourth street, in the city of New York, in the county of New York and State of New York, have invented a new and useful Windlass, of which the following is a specification.

My invention relates to improvements in windlasses; and the objects of my invention are; first to provide a form of windlass which shall occupy less space than the devices heretofore used for similar work; second, to provide a form of windlass which shall weigh less than the devices heretofore used for similar work; third, to provide a form of windlass which shall be cheaper and simpler to manufacture than the devices heretofore used for similar work; fourth, to provide a form of windlass which cannot be fouled by ropes or other articles on a vessel's deck or elsewhere; fifth, to provide a form of windlass that can be braked without the use of a brake band; sixth, to provide a compact form of double sheave windlass. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is a section in elevation of my device taken on the line *a—b* (Fig. 2). Fig. 2 is a plan view of the top of my device. Fig. 3 is a plan view of the top of the central pin. Fig. 4 is an elevation of the inside upper portion of the central pin, taken on *g—j* (Fig. 3). Fig. 5 is a plan view of the top of the brake drum. Fig. 6 is an elevation of the outside of the brake drum. Fig. 7 is a plan view of the central portion of the top plate. Fig. 8 is an elevation of the inside of the top plate, taken on section *k—l* (Fig. 7). Fig. 9 is a section elevation taken on the line *c—d* (Fig. 2) showing the pawl arrangement. Fig. 10 is a detail plan view of the trip ring handle device in the top plate. Fig. 11 is an elevation of the same trip ring handle device shown in Fig. 10. Fig. 12 is a plan section on the line *e—f* (Fig. 1) showing detail of trip ring locking device in the heaving ring. Fig. 13 is an elevation of the same part shown in Fig. 12.

Similar letters refer to similar parts throughout the several views.

A is a bed plate.

A′ are lugs on the bottom of bed plate A. These lugs A′ are countersunk into the deck or floor and prevent the bed plate from moving.

A^2 is a central hollow pin integral with bed plate A.

A^3 are lugs on bottom of bed plate A.

A^4 are castellated projections at the top of hollow pin A^2.

B is the brake drum.

B′ are wedge shaped lugs disposed about the lower circumference of drum B. B^2 are flange shaped lugs disposed about the upper circumference of drum B. In the drawings, I show lugs B′ and B^2 as registering with one another in plan, and I prefer that arrangement, although lugs B′ and B^2 need not necessarily register in plan. I also show three sets of lugs B′ and B^2, although one set or two sets or any greater number of sets would make an operative device. I have also shown the wedge lug B′ as engaging with a wedge shaped lug (M) on the central hollow pin A^2, the flange lug B^2 engaging with flange lugs E′ on top plate (E); although my device would operate equally well if lugs B^2 and E′ were wedge shaped, and lugs B′ and M were plain; or if lugs B^2 and E′ and B′ and M were all wedge shaped.

B^3 are brake bar sockets on top of brake drum B.

B^4 is a brake bar handle.

C are bolts running down through lugs A^3 to hold the windlass solidly to the deck or floor.

C′ is a section of chain in place on sheave D.

C^2 is a section of chain in place on sheave D′.

D is the lower sheave rotating freely about A^2 as an axis.

D′ is the upper sheave, rotating freely about A^2 as an axis.

E is the top plate.

E′ are flange lugs on top plate E, engaging lugs B^2 on brake drum B.

E^2 are stop lugs on top plate E, their function being to engage with handle G^3 on

trip ring G′ and thus limit the path of travel of trip ring G′.

E³ are segmental spaces cut out from top plate E, to clear projections A⁴.

F is the lower trip ring for the lower sheave D.

F′ is the lower trip ring for the upper sheave D′.

G is the upper trip ring for the lower sheave D.

G′ is the upper trip ring for the upper sheave D′.

G² is a handle on trip ring G.

H are the pawl spaces in bottom of heaving ring N.

H′ are the pawl spaces in bottom of top plate E.

I are pawl recesses in top of lower sheave D.

I′ are pawl recesses in top of upper sheave D′.

J are pawl spaces, in bottom of lower sheave D.

J′ are pawl spaces in bottom of upper sheave D′.

K are pawl recesses in top of bed plate A.

K′ are pawl recesses in top of heaving ring N.

L is a stop piece screwed to the inside of hollow pin A², its function being to engage with wedge lug B′ and thus prevent brake drum B from rotating too far backward.

M are wedge shaped lugs on the inside of hollow pin A².

N is a handle bar socket.

O are the upper pawls of the lower sheave D.

O′ are the upper pawls of the upper sheave D′.

P are trip wedges on the inner face of trip ring G. There are similar wedges on the inner face of trip ring G′.

Q is the heaving ring, rotating freely about pin A² as an axis.

Q′ is a projection integral with Q.

R is a recess in heaving ring Q, to take lock pawl Y. R′ is a similar recess in Q to take lock pawl Y′.

S are trunnions on pawls O.

S′ are trunnions on pawls O′.

T are trip lugs on pawls O.

T′ are trip lugs on pawls O′.

U are the lower pawls of the lower sheave D.

U′ are the lower pawls of the upper sheave D′.

V are trunnions on pawls U.

V′ are trip lugs on pawls U′.

W are trip lugs on pawls U.

W′ are trunnions on pawls U′.

Z is a handle on trip ring F′. There is a similar handle on trip ring F.

z are whelps on sheave D.

z′ are whelps on sheave D′.

s^3 and s^4 are stop lugs on heaving ring Q, their function being to act as stops to the path of travel of handle Z. *s* is one of two similar stop lugs on bed plate A, their function being to similarly limit the path of travel of trip ring F.

v′ is a recess in Q′, and *t′* is a groove at the lower end of recess *v′*.

x′ is a handle on the lock pawl in handle Z. *x′* engages in groove *t′*, when handle Z is thrown over to stop lug s^3. x^2 is another handle on the lock pawl in handle Z.

y′ is a trunnion on lock pawl Y.

y^3 is a trunnion on lock pawl Y′.

y^2 is a handle on lock pawl Y.

y^4 is a handle on lock pawl Y′.

w is a recess in the upper face of trip ring G.

w′ and w^2 are grooves projecting from the two ends of recess *w*.

In a general way, the functioning of the pawls and sheave in this type of windlass is fully explained in my pending application filed February 21, 1910, Serial Number 545,058. The functioning of the trip rings and trip lugs is fully explained in my pending application filed February 14, 1910, Serial No. 543,828, and in my pending application filed May 4, 1910, Serial Number 559,384. The functioning of the means for locking the trip rings in position is fully explained in my said application filed May 4, 1910.

The operation of my device is as follows: A handle bar is inserted into socket N, and a reciprocating motion of rotation is thereby imparted to heaving ring Q. Every time that Q moves in the direction *h′* (Figs. 2 and 9), sheave D is rotated in the direction *h′*, while sheave D′ is held motionless by pawls O′ engaging top plate E. Every time that Q moves in the direction h^3 (Figs. 2 and 9), sheave D′ is rotated in the direction h^3, while sheave D is held motionless by pawls U engaging in bed plate A.

Trip rings and trip lugs are provided on all four sets of pawls, and the method of tripping or locking the pawls is identical with that shown in my said pending applications. It will be noted that a number of combinations in the use of the trip rings is possible, with a variety of results. First: All the pawls can be locked, in which case, sheave D will steadily draw in chain from the direction *h′*, and sheave D′ will steadily draw in chain from the direction h^3. Second: Pawls O can be tripped (all the other pawls remaining locked), in which case sheave D will hold its chain motionless, while sheave D′ will draw in its chain from the direction h^3. Third: Pawls U′ can be tripped (all the other pawls remain-

ing locked), in which case, sheave D′ will holds its chain motionless, while sheave D will draw in its chain from the direction h'. Fourth: Pawls O and U can be tripped (pawls O′ and U′ remaining locked), in which case sheave D will pay out its chain against the direction h', while sheave D′ holds its chain motionless. Fifth: Pawls O′ and U′ can be tripped (pawls O and U remaining locked), in which case sheave D′ will pay out its chain against the direction h^3, while sheave D holds its chain motionless. Sixth: All four sets of pawls can be tripped at the same time, in which case sheave D will pay out its chain against the direction h', while sheave D′ pays out its chain against the direction h^3.

There are certain improvements in machine brake mechanisms, shown and described in the specification and the drawings accompanying the same, and originally claimed by me in this application, which I have been required to divide, and I am making a divisional application, Serial Number 571,069, to cover such machine brake mechanism.

If it is desired to brake the chain while it is paying out either from sheave D or D′, brake handle bar B^4 should be rotated in the direction shown by arrow h^2 (Fig. 2), whereupon wedge lugs B′ engaging on wedge lugs M will force brake drum B downward, whereby flange lugs B^2 will press down on flange lugs E′, and thereby force top plate E down onto sheave D′, which in turn will press down on heaving ring Q, which in turn will press down on sheave D, which in turn will press down on bed plate A. The resulting friction on the sheaves will retard or totally stop their rotation as may be desired. To release the friction brake, turn brake handle bar B^4 back against the direction h^2 (Fig. 2).

I claim:

1. In windlasses, in combination; a bed plate, having recesses in its upper face; a central hollow pin perpendicular to said bed plate and integral therewith, said central pin having castellations at its upper portion; a lower sheave rotating freely about said pin as an axis, the lower face of said lower sheave resting on the upper face of said bed plate, said lower sheave having recesses in its top face; a heaving ring rotating freely about said pin as an axis, the lower face of said heaving ring resting on the upper face of said lower sheave, said heaving ring having recesses in its upper face; an upper sheave rotating freely about said pin as an axis, the lower face of said upper sheave resting on the upper face of said heaving ring, said upper sheave having recesses in its top face; a top plate with recesses segmental in plan, said recesses registering with the castellations on the upper end of the central hollow pin, and adapted for effective engagement with said castellations to prevent said top plate from rotating with reference to said pin, the lower face of said top plate resting on the upper face of said upper sheave; pawls let into the lower face of said top plate, said pawls engaging in said recesses in the upper face of said upper sheave, whereby said upper sheave is free to rotate in one direction with reference to said top plate, but not in the opposite direction; pawls let into the lower face of said upper sheave, said pawls engaging said recesses in the upper face of said heaving ring, and cooperating with said pawls in the lower face of said top plate, whereby said upper sheave is free to rotate in one direction with reference to said top plate and heaving ring, but not in the opposite direction; pawls let into the lower face of said heaving ring, said pawls engaging in said recesses in the upper face of said lower sheave, whereby said lower sheave is free to rotate in one direction with reference to said heaving ring but not in the opposite direction; pawls let into the lower face of said lower sheave, said pawls engaging in said recesses in the upper face of said bed plate, and coöperating with said pawls in the lower face of said heaving ring, whereby said lower sheave is free to rotate in one direction with reference to said bed plate and heaving ring, but not in the opposite direction; means for imparting a limited reciprocating motion of rotation to said heaving ring; means for securing said windlass solidly to the deck or floor.

2. In windlasses, in combination; a bed plate, having recesses in its upper face; a central hollow pin perpendicular to said bed plate and integral therewith, said central pin having castellations at its upper portion; a lower sheave rotating freely about said pin as an axis, the lower face of said lower sheave resting on the upper face of said bed plate, said lower sheave having recesses in its top face; a heaving ring rotating freely about said pin as an axis, the lower face of said heaving ring resting on the upper face of said lower sheave, said heaving ring having recesses in its upper face; an upper sheave rotating freely about said pin as an axis, the lower face of said upper sheave resting on the upper face of said heaving ring, said upper sheave having recesses in its top face; a top plate with recesses segmental in plan, said recesses registering with the castellations on the upper end of the central hollow pin, and adapted for effective engagement with said castellations to prevent said top plate from rotating with reference to said pin, the lower face of said top plate

resting on the upper face of said upper sheave; pawls let into the lower face of said top plate, said pawls engaging in said recesses in the upper face of said upper sheave, whereby said upper sheave is free to rotate in one direction with reference to said top plate, but not in the opposite direction; pawls let into the lower face of said upper sheave, said pawls engaging said recesses in the upper face of said heaving ring, and cooperating with said pawls in the lower face of said top plate, whereby said upper sheave is free to rotate in one direction with reference to said top plate and heaving ring, but not in the opposite direction; pawls let into the lower face of said heaving ring, said pawls engaging in said recesses in the upper face of said lower sheave, whereby said lower sheave is free to rotate in one direction with reference to said heaving ring but not in the opposite direction; pawls let into the lower face of said lower sheave, said pawls engaging in said recesses in the upper face of said bed plate, and coöperating with said pawls in the lower face of said heaving ring, whereby said lower sheave is free to rotate in one direction with reference to said bed plate and heaving ring, but not in the opposite direction; means for imparting a limited reciprocating motion of rotation to said heaving ring; means for securing said windlass solidly to the deck or floor; means for tripping all four sets of pawls; means as shown and described for forcing said covering member down with reference to said central pin.

CIPRIANO ANDRADE, Jr.

Witnesses:

Arthur C. Johnson,

Adolph Widder.