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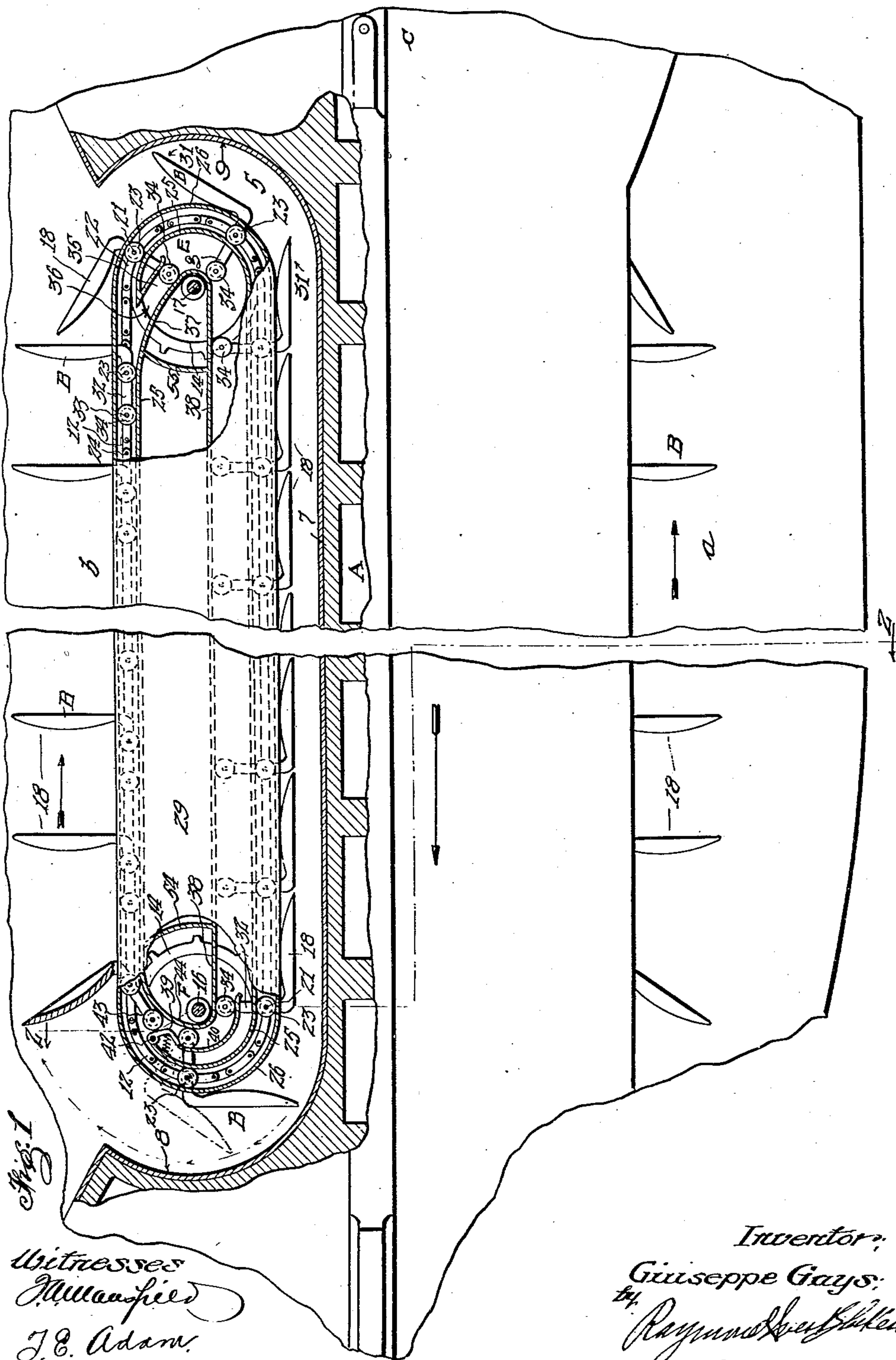
BOAT PROPULSION.

APPLICATION FILED JUNE 16, 1908.

921,823.

Patented May 18, 1909.

2 SHEETS—SHEET 1.



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# UNITED STATES PATENT OFFICE.

GIUSEPPE GAYS, OF LOS ANGELES, CALIFORNIA.

## BOAT PROPULSION.

No. 921,823.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed June 16, 1908. Serial No. 438,817.

*To all whom it may concern:*

Be it known that I, GIUSEPPE GAYS, a subject of the King of Italy, who have declared my intention of becoming a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Boat Propulsion, of which the following is a specification.

This invention relates to improvements in boat propulsion; and has for its object to provide improved means for propelling marine vessels of various types, which shall be superior in point of positiveness in operation, economy of power, speed attainment, stability and general efficiency and serviceability.

A particular object of the invention consists in the provision of means for boat propulsion which operate in a path or paths substantially longitudinal of the hull of the boat or vessel, in counter-distinction from lateral rotary paddles and stern paddles or propellers.

The invention consists in the novel provision, construction, combination, association and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawings, and finally pointed out in claims.

In the drawings:—Figure 1 is a sectional plan view, taken upon the line 1—1, Fig. 2, and looking in the direction of the appended arrows of a portion of the hull of a vessel provided with improvements in boat propulsion constituting the invention; parts being broken away for clearness of illustration; Fig. 2 is a vertical transverse sectional view of the same, taken upon the line 2—2, Fig. 1 and looking in the direction of the appended arrows; and, Fig. 3 is an enlarged fragmentary and sectional view, of a portion of the showing in Fig. 1, means being included for controlling certain elements of the invention; in reversal of operation of the means for propulsion.

Corresponding parts in all the figures are denoted by the same reference character.

Referring with particularity to the drawings, the improved propulsion means A, comprising preferably, as shown in the drawings, two members or units *a* and *b* arranged at either side of the longitudinal medial line of the hull or body *c* of the vessel which is shown fragmentarily in the several views of the drawing, comprises, in each member or unit,

a plurality of paddles or buckets *B*; driving means *C* for the paddles or buckets; a bucket carrier *D* for each of the members or units *a* and *b*; and bucket trip means, *E* and *F*, respectively, arranged respectively, at the opposite ends of the paths of travel of the buckets *B* of each of the members or units *a* and *b*. The paddles or buckets are caused to traverse, in each of said members or units, paths of travel including inboard and outboard faces, in the former of which said buckets are inoperative, and in the latter of which said buckets are applied to the water surrounding the vessel. The paddles or buckets and bucket carrier of each member or unit are arranged and operate in a substantially horizontal plane or path of travel; both such planes or paths of travel being preferably in the same transverse and horizontal plane of the vessel. Each of the members or units *a* and *b* is operatively mounted in a separate compartment or chamber, 4 and 5, respectively, formed each at one side of the hull or body of the vessel and closed inwardly by wall or partition, 6 and 7, respectively; said chambers 4 and 5 communicating laterally with the surrounding water; each of said chambers having forwardly and rearwardly curved forward and rear walls, 8 and 9, respectively, which walls, and the respective wall 6 or 7, the buckets *B*, freely clear in their traverse of the respective chamber 4 or 5.

The driving means *C* may comprise a main drive shaft 10 directly geared in connection with the member *a* and indirectly geared in connection with the member *b* by a transverse shaft 11. The driving means *C* serve to operate both of the members or units *a* and *b* simultaneously; but of course, although not shown, said members may be disconnected for independent operation, as for instance, to assist in steering the vessel; and the said members may be reversed in operation.

As the members or units *a* or *b* are duplicates in the provision, construction, and combination of parts, members and features, I will proceed to describe one of said members, *b*, as to the details of the last mentioned particulars. A particular description, to that end, is as follows:—The bucket carrier *D* comprises an upper link-conveyer 12 and a lower link-conveyer 13, each of said conveyers being supported in spaced hori-



zontal planes by two spaced upper sprocket wheels 14 and two spaced lower sprocket wheels 15, respectively. Said sprocket wheels are fixed in pairs to spaced vertical shafts, 16 and 17, respectively, with which the driving means C are operatively connected, as by the shaft 16; and said shafts are journaled at top and bottom in the walls of the chamber 5. The buckets or paddles B, preferably comprise dished disks 18, which are pivotally connected with bolts of the link conveyers 12 and 13 by short arms 19 provided with bored heads 20 which surround a shaft or rod 21 passing through both of the conveyers and constituting, preferably, a link-pin for two of the links 22, of said conveyer; said shafts or rods 21 with their respective buckets being properly spaced apart for accommodation of the buckets in their pivotal play as hereinafter described. The heads 20 surround the shaft or rod 21 exteriorly or laterally of the conveyers, said shaft or rod being extended to that end, and further extended, at each end portion, to accommodate a roller 23; such a roller being provided at each end portion of each shaft or rod 21, for the purpose hereinafter set forth. If desired, other rollers 23 may be provided on projected end portions of link-pins 24 between the shafts or rods 21. The rollers 23 serve to maintain the conveyers with the paddles or buckets in proper course of travel, traversing paths between upper, inner and outer guides 25 and 26, respectively, and lower, inner and outer guides, 27 and 28, respectively. Said guides are substantially unbroken, excepting as hereinafter provided for, in connection with the provision of the bucket-trip means E and F; and said guides project vertically from an upper cap-plate and a lower cap-plate, 29 and 30, respectively; which cap-plates are connected with the walls of the chamber 5.

Upon the inoperative movement of the buckets or paddles during the innermost phase of their travel, it is desirable they shall "feather" or present each a side edge, as 31, to the water within the chamber 5; and to bring the buckets into this feathering position and again out of the same when they are to be represented in angular projection for operative pressure upon the water exteriorly of the chamber 5, and to maintain said buckets in the latter position, the trip means E and F are respectively provided, together with bucket members *g* which cooperate with said trip members and with the upper guides 25 and 26. Said bucket members, one of which is provided for each of the buckets, comprises a rigid arm 32 constituting an extension of one of the arms 19, preferably the upper one of the bucket, and extending at an angle of substantially 90° rearwardly of the bucket. Said arm is provided

at its outer end with a lateral bearing 33 carrying a roller 34, which roller is admitted freely between the guides 25 and 26.

The trip-means E arranged at the rearward end of the phase of travel of the buckets comprises a guide 35 projecting inwardly at an acute angle from the guide 25, in which an opening 36 is formed sufficient to accommodate the rollers 34; the guide 25, at the forward limit of said opening 36 being deflected inwardly and around the shaft 17, as at 37, and thence forwardly, as at 38, parallel and within, and separated by a substantial space from the remaining portion of the guide 25. The major portion of the guide 25, rearwardly of the opening 36, extends in a curvature rearwardly of the shaft 17, and substantially spaced from the guide portions 37 and 38, and within the curved end portion of the guide 26.

The trip-means F comprise an angular inwardly bent pivoted dog 39 normally closing the space between one end of a supplemental curved guide 40 and curved forward end portions of the guide 25; said dog being maintained in such position by spring 41 fixed to the guide 25 and bearing upon the dog 39. Said dog is arranged outwardly of and adjacent to the shaft 16; and at the point where the buckets B begin to move rearwardly in their outer phase of travel. The supplemental guide 40 occupies but a small portion of the curvature at the forward end of the path of travel of the buckets B, being arranged within and slightly spaced from the guide 25, which, with the guide 26, curve from the inner to the outer portion of the path of travel of the buckets, in conformity with their curvature rearward of the shaft 17. The guide 25 is interrupted at the pivotal point 42 of the dog 39, forming an opening 43 between the curved portion of said guide and the longitudinal straight portion of said guide; and at the other extremity of said opening said guide 25 is inwardly deflected, as at 44, and directed around the shaft 16 to join the guide portion 38, which latter extends longitudinally within the path of travel of the buckets. The space between the supplemental guide 40 and the guide portion 44 is sufficient to permit the traverse of the rollers 34 upon the arms 32; but the angular dog 39 normally projects into the path of said rollers 34 as they leave said space. The angular dog 39, it will be noted, is arranged substantially at the point where the buckets B, enter the straight rearward path of their travel, from the curved forward end of their path of travel; and the guide 35 is arranged substantially at the point where the buckets B leave said straight path or rearward travel and enter the rearward curved portion of their path of travel.

Combined with the dog 39 is a deflector 45, movably mounted so that it may be low-



ered and engaged at one edge portion, as at 46, with the dog 39, adjacent to the pivotal point 42 thereof, in position to extend obliquely outwardly substantially to the guide 26; and so that said deflector may be raised upwardly into a chamber 47 which the upper cap-plate 29 is formed to include. The deflector 45 is swung during the outward movement against the spring 41, of the dog 39, and is carried by a rod 48 which has vertical play through the upper portion of the chamber 47 and is connected with a lever arm 49 loosely pivotally connected, as at 50, with a regulating arm 51, controlling the position of said deflector.

Inner and outer walls, 52 and 53, respectively, joined at their end portions and extending longitudinally of the chamber 5, are arranged within the path of travel of the conveyers 12 and 13 and the paths of travel of the sprocket wheels 14 and 15; 54 and 55 designating respectively the connecting end portions of said walls which are otherwise merged into the guide 25 and guide portion 38. Said walls 52 and 53 extend vertically between the upper and lower cap-plates and constitute a barrier between the outward and inward portions of the path of travel of the conveyers and buckets.

The operation, method of use, and advantages of the improvements in boat propulsion, constituting the invention will be readily understood from the foregoing description, taken in connection with the accompanying drawing and the following statement:—The two members or units *a* and *b* are simultaneously propelled or actuated so as to cause the buckets to move rearwardly in their outer phase of travel as designated by the arrows in Fig. 1. The buckets are guided and carried rearwardly by the conveyers 12 and 13 and the rollers 23 and 34 which traverse the guides 25 and 26; the arms 32 and said rollers sustaining the buckets in direct lateral projection to obtain the operative purchase upon the water. Adjacent to the rearward end of the rearward phase of travel of the buckets, the arms 32 are depressed by the pressure of the water upon the buckets, and the rollers 34 pass through the opening 36 and traverse the guide 35 and the guide portion 37, allowing the buckets to be inclined rearwardly upon their pivotal supports. The rollers 34 follow the guide portion 37 onto the guide portion 38 and the guide portion 38 is so far spaced from the inner portion of the guide 25 that the arms 32 are accommodated in rectangular inward projection with the disks 18 lying parallel with the conveyers during the forward phase of travel of the buckets, the rollers 34 bearing against the guide portion 38. At the termination of said forward movement, the rollers 34 engage with the supplemental curved guide 40 and are led

thereby to the pivoted dog 39, the angularity of which temporarily retards the rollers 40 forcing the disks 18 into outward projection. When the buckets are carried around the curved forward portion of their travel, the rollers 23 thus preceding the rollers 34, said rollers 34, under traction, force outwardly the dog 39 against the spring 41, and pass said dog, riding over the guide portion 44, the rollers 23 and 34 entering the straight space between the guides 25 and 26, upon their rearward travel. In the reverse actuation of either of the members *a* and *b*, exactly the reverse of the steps last described transpires, with the exception that the deflector 45 is forced downwardly by the controlling arm 51 so that it is engaged with the dog 39; and as the rollers 34, on the forward outward phase of the travel of the buckets, engage with said deflector they are moved inwardly against the dog 39 which latter is finally swung outwardly by the rollers or roller 34, swinging the deflector 45 inwardly and allowing the rollers, or roller 23, to pass said deflector, which again moves outwardly as the dog 39 reassumes its normal position.

The operation of both of the members *a* and *b* is the same, although their normal directions of movement are opposite.

The boat propulsion means constituting the invention serve to give the boat a propelling actuation on both sides and through a long range of activity, tending to utilize fully and effectually the power applied thereto and making for high speed attainment, positiveness of operation, and stability in the procedure of the vessel.

Having thus described my invention I claim and desire to secure by Letters Patent:—

1. Improved means for propelling vessels, comprising an endless conveyer disposed in part for travel in a straight line, a plurality of buckets pivotally connected with said conveyer, said conveyer being carried by the vessel in such manner that said buckets project laterally from the vessel in the movement of the conveyer in a straight line, means for actuating the conveyer, and trip-means at each end of the straight line of travel of said conveyer for respectively swinging said buckets into and out of lateral projection from said conveyer.

2. Improved means for propelling vessels, comprising an endless conveyer mounted in a compartment in the hull of a vessel, opening laterally of the hull and disposed in part for travel in a straight line, a plurality of buckets pivotally connected with said conveyer, means for actuating said conveyer, means for maintaining the buckets in lateral projection from the vessel in the movement of the conveyer in a straight line, and trip-means at each end of the straight line of travel of said conveyer for respectively swinging said buck-



ets into and out of lateral projection from said conveyer; one of said trip-means comprising a pivoted spring pressed dog.

3. Improved means for propelling vessels,  
5 comprising an endless conveyer disposed in part for travel in a straight line, a plurality of buckets pivotally connected with said conveyer, said conveyer being mounted in a chamber in the hull of the vessel opening laterally,  
10 guide means for said buckets in their path of travel including means maintaining said buckets in lateral projection from the vessel in the movement of the conveyer in a straight line, trip means at each end of the straight  
15 line of travel of said conveyer for respec-

tively swinging said buckets into and out of lateral projection from said conveyer; said trip-means in one instance including a pivoted spring pressed dog; and a deflector arranged for connection with said dog in movement of the buckets the reverse of the forward or normal movement. 20

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

GIUSEPPE GAYS.

Witnesses:

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