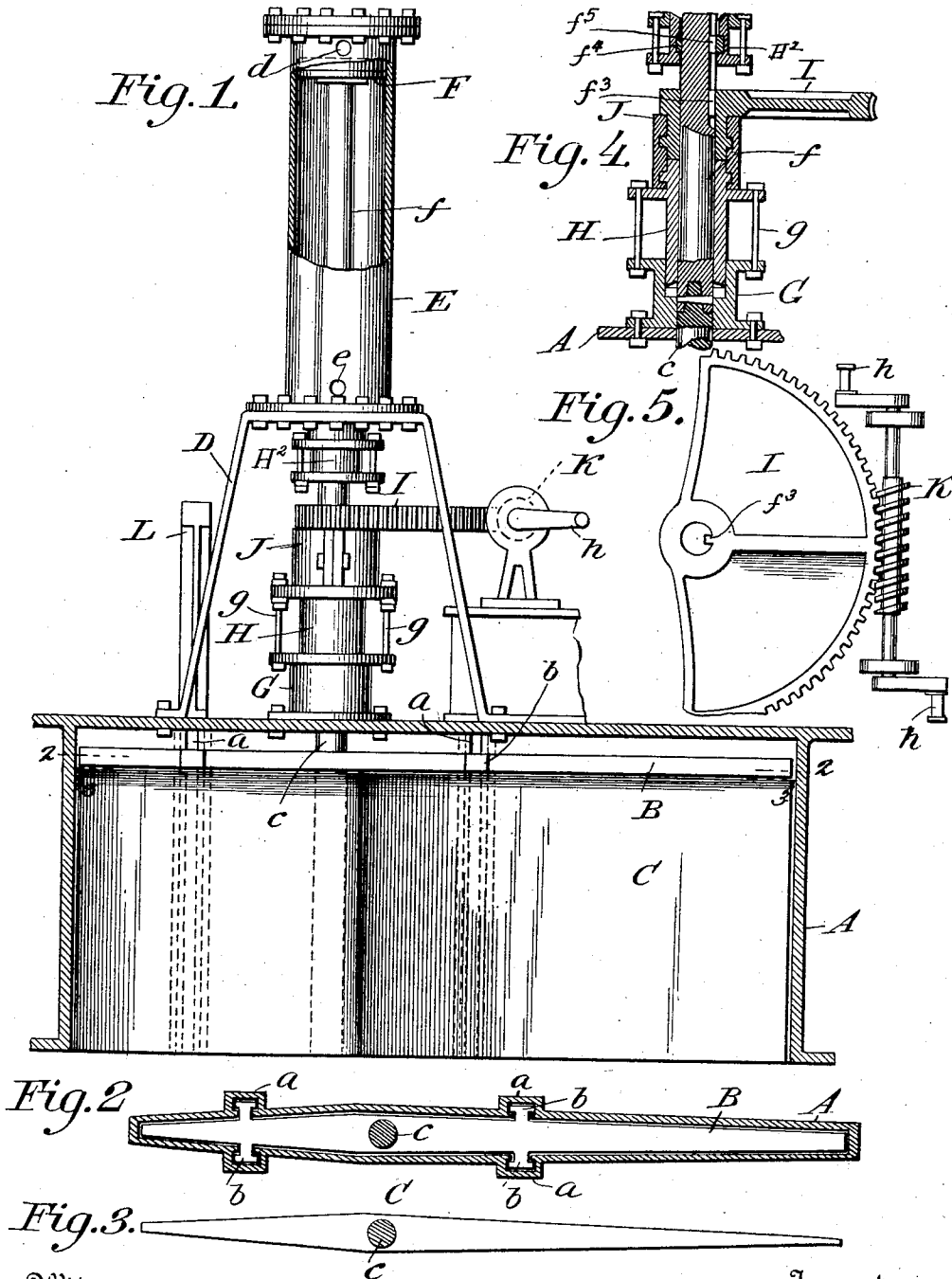


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KEEL STEERING MECHANISM.
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Patented July 16, 1912.



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FRANK J. TILTON, OF NEW ORLEANS, LOUISIANA.

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To all whom it may concern:

Be it known that I, FRANK J. TILTON, citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Keel Steering Mechanism, of which the following is a specification.

My invention pertains to ships and more particularly to keel steering mechanism therefor; and it has for its object to provide a simple, compact and durable keel steering mechanism and one that is easily controlled and operated and is well adapted to withstand the usage to which such devices are ordinarily subjected.

My invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings which are hereby made a part hereof: Figure 1 is a view, partly in side elevation and partly in vertical section, of my novel keel steering mechanism. Fig. 2 is a horizontal section taken in the plane indicated by the line 2—2 of Fig. 1 and showing the guide that is located above the rudder. Fig. 3 is a section taken in the plane indicated by the line 3—3 of Fig. 1, and showing the rudder in plan section. Fig. 4 is a detail vertical section illustrating the bearings in which the rudder stem is journaled and movable vertically. Fig. 5 is a detail plan view showing the quadrant gear and the worm screw with which the same is intermeshed.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which:

A, Figs. 1 and 2, is the rudder well comprised in my improvements. The said well is suitably fixed in a vessel hull in proper position, and preferably just aft of the forefoot of the vessel; and it is provided at each of its sides with two vertically disposed guideways *a*, of T-form in cross-section, which guideways extend throughout its height, as indicated by dotted lines in Fig. 1. Disposed and movable vertically in the well A is the rudder guide B of my improvements. The said guide is preferably of the proportional size shown in Figs. 1 and 2, and is provided at each of its opposite sides with lateral projections *b*, of T-form in

cross-section, arranged and movable vertically in the before-mentioned guideways *a* of the well.

C is the keel rudder disposed immediately below the guide B and movable downward and out of the well and upward and into the well—i. e., into the position shown in Fig. 1. The rudder is fixed to and carried by a stem or stalk *c* which extends upward through and is adapted to turn about its axis in the guide B.

D is a frame or stand fixed immediately above the well A.

E is a cylinder fixed on the stand D and having ports *d* and *e* adjacent its ends for the entry and exit of steam or any other suitable fluid under pressure.

F is a piston movable vertically in the cylinder E and having a rod *f* connected to the rudder stalk *c*, preferably in the manner shown in Fig. 4.

G is a stuffing box fixed on the well A and receiving the rudder stalk *c*. H is a packing gland also receiving said stalk and connected by bolts *g* with the box G.

I is a horizontally-disposed quadrant gear arranged and adapted to turn on the gland H and connected through the medium of a collar J therewith.

K is a worm screw mounted in suitable bearings and intermeshed with the gear I and provided with cranks *h* or other suitable means through the medium of which it may be readily turned by power or manually, as desired, and L is a suitable upright stop fixed on the well A, at the opposite side of the quadrant gear I with reference to the worm screw K, and having for its office to limit the opposite swinging movements of the said quadrant gear. It will also be observed by reference to Fig. 4, that the piston rod *f* is provided with a longitudinal groove *f*² to receive a key *f*³ on the quadrant gear I, and that a disk *f*⁴ is preferably employed in the gland H² of the cylinder E for the purpose of preventing the escape of steam or other fluid under pressure through the said groove *f*² in the piston rod; the said disk *f*⁴ being provided with a key *f*⁵ and being adapted to rotate with the piston rod so that the said key *f*⁵ will always be positioned in the groove *f*² to serve the purpose stated, and yet will not interfere with the reciprocatory movements of the piston rod.

In the practical operation of my improvements it will be understood that when fluid

under pressure is let into the cylinder E through the port *d*, the piston F and the rudder C connected therewith will be forced downward until the rudder is entirely below the well A, whereupon by the application of power to the worm screw K, the rudder C may be swung in either direction as occasion demands. It will also be understood in this connection that the guide B will follow the rudder and will assume a position in the lowermost portion of the well A, and in such position will serve to prevent the imposition of undue lateral strain on the rudder stem. It will further be understood here that when steam or other fluid under pressure is let into the port *e* of the cylinder E, the rudder C will be drawn up into and retained in the well A; the guide B in such case being raised upon the rudder and serving to facilitate the upward movement of the rudder in the well.

As before stated, my novel keel rudder is designed to be arranged just aft of the fore-foot of a vessel; and it is also designed to be used in conjunction with the ordinary stern rudder with a view of facilitating the turning and other maneuvering of a vessel.

Inasmuch as the rudder is adapted when not in use to be disposed in the well A, and the lower end of the said well is disposed flush with or slightly above the keel of a vessel, it follows that the rudder is especially advantageous when used on sailing vessels and other craft which ply in shallow water.

The construction herein illustrated and described constitutes the best practical embodiment of my invention that I have as yet devised, but it is obvious that in the future practice of the invention such changes or modifications may be made as do not involve departure from the scope of my invention as defined in the claims appended.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In keel steering mechanism, the combination of a well open at its bottom and having vertically disposed guideways, of T-form in cross-section, at intermediate points in the length of its sides, a vertically movable rudder guide disposed in said well and having lateral, T-shaped projections disposed in said guideways, a rudder disposed and movable vertically in the well, below the rudder guide, and also movable out of and into the well, a stalk fixed to the rudder and adapted to turn about its axis in the rudder guide, a stand fixed above the well, a cylinder fixed on said stem and having ports for the admission and escape of fluid under pressure, a piston movable in said cylinder and having a rod connected with the rudder stalk and forming therewith a stem and having a longitudinal

groove, a stuffing box fixed on the well and receiving said stem, a gland connected with said stuffing box and also receiving the stem, a quadrant gear mounted upon and connected with said gland and having a key disposed in the said groove of the piston rod, a revoluble disk connected with the cylinder and having a projection disposed in the groove of the piston rod, and a worm screw intermeshed with the said quadrant gear.

2. In keel steering mechanism, the combination of a well open at its bottom and having vertically disposed guideways in its sides, a vertically movable rudder guide disposed in said well and having lateral projections disposed in said guideways, a rudder disposed and movable vertically in the well, below the rudder guide, and also movable out of and into the well, a stalk fixed to the rudder and adapted to turn about its axis in the rudder guide, a cylinder fixed above the well and having ports for the admission and exhaust of fluid under pressure, a piston movable in said cylinder and having a rod connected with the rudder stalk, and means for turning the stem formed by the rudder stalk and piston rod without interfering with the vertical movement of said stem.

3. In keel steering mechanism, the combination of a well open at its bottom and having vertically disposed guideways in its sides, a vertically movable rudder guide disposed in said well and having lateral projections disposed in said guideways, a rudder disposed and movable vertically in the well, below the rudder guide, and also movable out of and into the well, and a stalk fixed to the rudder and extending upward through the rudder guide and the top of the well and adapted to be turned about its axis in the rudder guide and the well top and also adapted to be moved vertically through said top.

4. In keel steering mechanism, the combination of a well open at its bottom, a vertically movable rudder guide disposed in said well, a rudder disposed and movable vertically in the well, below the rudder guide, and also movable out of and into the well, and a stalk fixed to the rudder and extending upward through the rudder guide and the top of the well and adapted to be turned about its axis in the rudder guide and the well top and also adapted to be moved vertically through said top.

5. In keel steering mechanism, the combination of a well open at its bottom, a vertically movable rudder disposed in the well and movable out of and into the same and also movable laterally, a stalk fixed to the rudder and movable vertically and about its axis in the well top, a cylinder fixed above the well and having ports for the admission and ex-

haust of fluid under pressure, a piston movable in said cylinder and having a rod connected with the rudder stalk, a horizontally disposed gear keyed to the stem formed by
 5 rudder stalks and piston rod, whereby it is enabled to turn said stem about its axis without interfering with vertical movement thereof, and means connected with said gear for transmitting motion thereto.

10 6. In a vessel, a rudder normally positioned within the hull of the vessel and movable to the outside of the same, means for moving said rudder, means for operating said rudder to steer the vessel, and a guide
 15 member loosely associated with said rudder and positioned in said well.

7. In a vessel, a well lying within the hull of the vessel and having an opening through the hull, a rudder adapted to be positioned
 20 within said well and movable through said opening to the outside of the hull, and a guide member movable within said well, and movable with respect to said rudder.

8. In a vessel, a well having guides, a rudder slidable within said well and adapted to be projected from the same, a stem rigid
 25 with said rudder, a member for guiding said rudder into and out of said well and in movable engagement with said guides, means for moving said stem in the direction of its
 30 length, and means for turning said stem about its longitudinal axis, said member being loosely associated with said stem.

9. In a vessel, a well located within the same and having an open bottom, a rudder
 35 movable within said well and adapted to be projected through said open bottom, a stem rigid with said rudder, a member within said well and movably engaging the same,
 40 said member being in slidable engagement with said stem, means for moving said stem longitudinally to project said rudder, and means for turning said stem to turn said
 rudder.

45 10. In a vessel, a well located within the same and having an open bottom, said well having internal guides, a rudder movable within said well and adapted to be projected
 50 through said open bottom, a stem rigid with said rudder, a guide member movable within said well and having parts slidably engaging said guides, said member having an opening, said stem passing loosely through
 said opening, means for moving said stem

longitudinally to project and retract said
 55 rudder, and means for turning said stem to turn said rudder.

11. In a vessel, an open well, a rudder movable within said well and adapted to be projected therefrom, a cylinder having a
 60 piston therein, an elongated member connecting said piston and said rudder, said well having a stuffing box through which said member passes, a toothed segment associated with said member, said member being
 65 slidable with respect to said segment, in the direction of its length and being constrained to turn with said segment, and means for operatively connecting said segment with a steering gear.

12. In a vessel, a well, a rudder movable within said well and adapted to be projected therefrom, a cylinder having a piston therein, a piston rod rigid with said piston, said
 75 rudder having a stem, a connecting member between said piston rod and said stem, said well having a stuffing box adapted to have said stem, said connecting member and said piston rod slide therethrough, said stuffing
 80 box including a gland having a grooved extension, a segment having a hub receiving said piston rod, said hub having a grooved extension, and a ribbed collar encompassing said extensions, said piston rod having a longitudinal
 85 recess, said segment having a key slidably engaging said recess, and said segment being adapted to be operated by a steering gear.

13. In a vessel, a well having an open bottom a rudder within said well and adapted
 90 to be projected from the same, a stem rigid with said rudder, a movable guide member within said well and movably engaging said stem, a cylinder adapted to receive a motive fluid and having a piston
 95 therein, means connecting said stem and said piston, and a member adapted to be connected to a steering gear and controlling said connection between said piston and said
 100 stem to turn said rudder.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK J. TILTON.

Witnesses:

SAM BARBARA,
 ARISTOLE PANALLE.