

(No Model.)

J. JOHANNSEN.
STEERING APPARATUS.

No. 578,879.

Patented Mar. 16, 1897.

Fig. 1.

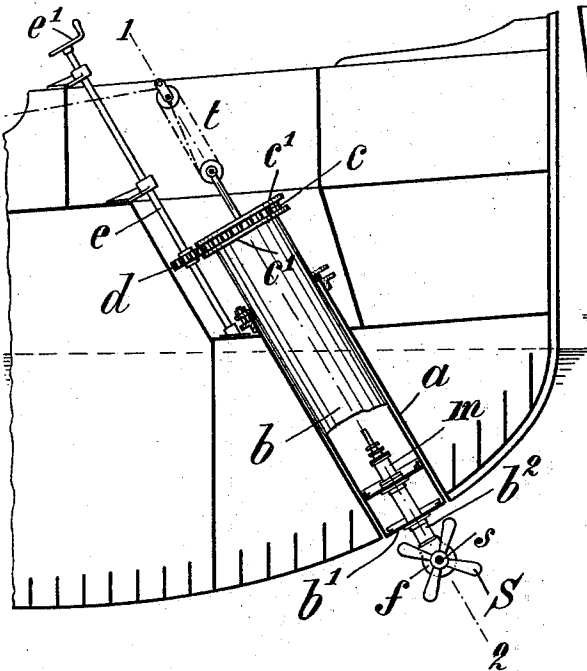


Fig. 2.

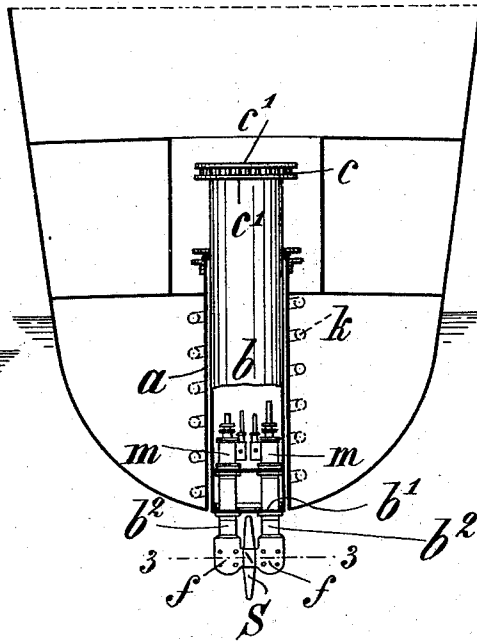


Fig. 3.

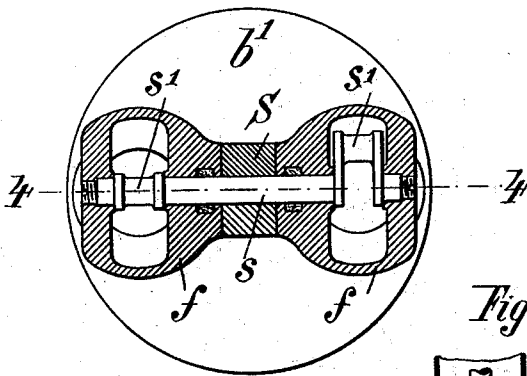


Fig. 4.

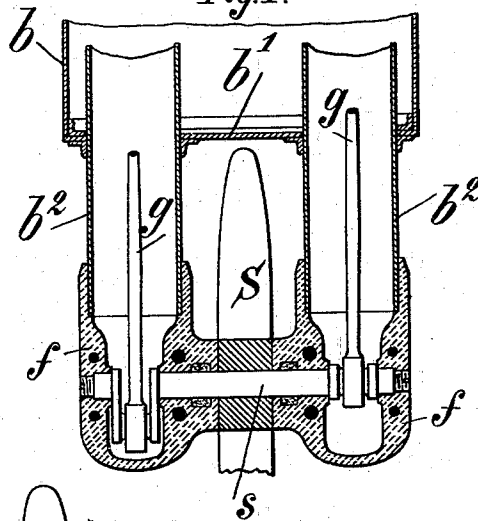
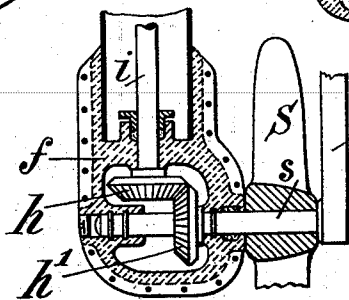


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOACHIM JOHANNSEN, OF LÜBECK, GERMANY.

STEERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 578,879, dated March 16, 1897.

Application filed August 1, 1896. Serial No. 601,350. (No model.)

To all whom it may concern:

Be it known that I, JOACHIM JOHANNSEN, a subject of the German Emperor, and a resident of Lübeck, in the Empire of Germany, have invented certain new and useful Improvements in Steering Apparatus, of which the following is a specification.

My invention relates to improvements in steering apparatus in which transverse steering-propellers are used to assist the action of the ordinary steering device in order to increase the steerage of a ship; and it more particularly consists in certain novel features and modification of the construction and arrangement shown and described in the specification of my Letters Patent No. 550,046, dated November 10, 1895.

The objects of the improvements of my present invention are, first, to dispense with the transverse well or passage and to pass the well arranged in the vertical plane more or less inclined through the bottom of the ship, so that the steering-propeller when lowered down projects out of the hull and directly into the water under the keel or stern, respectively, and, second, to provide means whereby the casing containing the steering apparatus may also be rotated in the said well on its longitudinal axis in order to adjust the position of the steering-propeller so as to act in any desired direction to the keel-line of the ship.

In the accompanying drawings, in which similar letters refer to similar parts throughout the several views, Figure 1 is a vertical section through the forebody or bow of a ship provided with my improved steering apparatus. Fig. 2 is a transverse section of Fig. 1 on about the line 1 2. Fig. 3 is a horizontal section on the line 3 3, Fig. 2, showing in an enlarged scale the crank-shaft and its bearings. Fig. 4 is a vertical section on the line 4 4, Fig. 3. Fig. 5 is a similar view like Fig. 4, showing in a somewhat smaller scale a modification.

In accordance with my invention the fore part or bow of the ship is provided with a downward-extending well *a*, which, according to the particular form or outline of the ship, may be more or less inclined. In this well *a* there is arranged a tube-shaped casing *b*, capable of being lifted or lowered as well

as revolved around its longitudinal axis in the said well by any suitable means. For lifting and lowering the casing *b* I have shown a tackle *t*, Fig. 1, while for rotating the same I prefer to use the driving-gear shown in Figs. 1 and 2. The latter consists of an annular rack or gear *c*, provided with upper and lower flanges or rims *c'* *c'* and attached to the head or top of the casing *b*. This annular rack meshes with a toothed wheel *d*, mounted on a driving spindle or shaft *e* and capable to slide along on this driving-shaft in unison with the up or down motion of the casing *b* as the said wheel *d* is carried along by the flanges *c'* *c'* of the gear *c* in one or the other direction. By rotating the shaft *e* with the aid of its crank-handle *e'* or any other suitable means the driving-gear *d c* will be operated and the casing *b* turned around its axis into the position required.

From the bottom plate *b'* of the movable casing *b* are projecting two hollow arms or brackets *b²*, the lower ends of which being closed by means of suitable caps *f*, securely fixed to the tubular arms *b²* and adapted to receive the shaft of the steering-propeller. For this reason the crank-shaft *s*, carrying the steering-propeller *S*, is journaled in the sides of the caps *f*, the steering-propeller *S* thus being held between the arms *b²* and beneath the bottom plate *b'*, and may be lifted and lowered or turned, respectively, with the casing *b*. The propeller-shaft *s* may be driven by any suitable motive-power engine arranged in the interior or on the top of the said propeller-casing *b*, so as to be moved up and down and turned around with the latter, or the engine may be placed aside of the casing *b* and the motion of the engine being transmitted to the propeller-shaft by any known means. In the drawings I have shown, as an example, a motive-power engine or motor *m* placed in the interior of the casing *b*, the motion being transmitted to the cranks *s'* of the crank-shaft *s* by means of connecting-rods *g*.

In place of the commonly-used cranks and connecting-rods for rotating the propeller-shaft, in some cases a suitable bevel-gearing *h h'*, Fig. 5, may be provided, so as to transmit through the medium of the wheel *h* the rotary motion of an upright-extending shaft *i* to a bevel-wheel *h'* at one end of the pro-

5 peller-shaft *s*. This bevel-gearing *h h'* may
 be received within one of the hollow caps *f*
 forming the bearings for the propeller-shaft,
 while the other cap *f*, as well as its arm *b²*,
 10 in this case need not be hollow, but may be
 replaced by an ordinary axle-bearing *f'*, ex-
 tending from the bottom plate *b'* of the cas-
 ing *b*.

15 For using the steering apparatus the casing
 10 *b* is lowered in the well so that the steering-
 propeller projects out of the well or the hull
 of the ship directly into the water under the
 keel or stern. It is evident that in this po-
 sition the steering-propeller when set in mo-
 15 tion will act upon the water in the direction
 of its shaft. As on turning the casing in the
 well *a* the position of the propeller-shaft in
 relation to the keel-line of the ship may be
 adjusted, the propeller acts in a more or less
 20 acute angle to the vertical longitudinal plane
 of the ship, as it may be required.

25 In order to prevent the revoluble casing *b*
 in winter-time from freezing fast in the well
a, a suitable heating-coil *k* may be arranged
 around the latter, as shown by dotted lines in
 Fig. 2.

30 When not in use, the said improved auxil-
 iary steering apparatus or the casing *b*, re-
 spectively, may be lifted or hoisted up into the
 well *a* and the bottom opening or lower en-
 trance of the latter shut up or closed by a
 suitable slide-plate, door, or the like, operated
 in a well-known manner.

35 Having fully described my invention, what
 I desire to claim and secure by Letters Pat-
 ent is—

1. The combination with a vessel provided
 with a well opening into the water on a line
 with the keel and at a point distant from the
 40 driving-propeller, of a casing closed at bot-
 tom and adapted to be displaced in said well
 in the plane of and about its longitudinal
 axis, a steering-propeller, its shaft revoluble
 in bearings secured to the bottom of said cas-
 45 ing, a motor and suitable connections for
 transmitting power from said motor to the
 propeller-shaft and revolving the same, for
 the purpose set forth.

2. The combination with a vessel provided
 50 with a well having a forward inclination and
 opening into the water at a point of the keel
 near the bow, of a casing closed at bottom

and adapted to be displaced in said well in
 the plane of and about its longitudinal axis,
 bearings secured to the bottom of the casing,
 55 a steering-propeller, its shaft revoluble in
 said bearings, a motor, and suitable connec-
 tions for transmitting power to and revolving
 the propeller-shaft, for the purpose set forth.

3. The combination in a vessel provided 60
 with a well opening into the water, of a cas-
 ing closed at bottom and adapted to be dis-
 placed in said well in the plane of and about
 its longitudinal axis, a steering-propeller revol-
 65 ubly supported below said casing, a motor
 carried by the latter, and suitable connections
 between a driving element of the motor and
 the propeller-shaft, for the purpose set forth.

4. The combination with a vessel provided 70
 with a well opening into the water, of a cas-
 ing closed at bottom and adapted to be dis-
 placed in said well in the plane of and about
 its longitudinal axis, tubular legs projecting
 from the bottom of the casing and leading
 into the same, two-part housings secured to
 75 said tubular legs, a crank-shaft having its
 bearings in said housings, a steering-propel-
 ler secured to the crank-shaft between the
 housings and a suitable motor and trans-
 mitting appliances for revolving said shaft,
 80 substantially as and for the purpose set forth.

5. The combination with a vessel provided 85
 with a well opening into the water, a casing
 closed at bottom and adapted to be displaced
 in said well in the plane of and about its lon-
 gitudinal axis, housings, tubular connections
 extending from the bottom of and leading
 into the casing and connecting said housings
 thereto, a crank-shaft revoluble in bearings
 90 in said housings, a steering-propeller secured
 to the crank-shaft between the housings, a
 motor contained in the casing, and suitable
 connecting-rods connecting the driving ele-
 ment of the motor with the cranks of the
 crank-shaft, substantially as and for the pur- 95
 pose set forth.

In testimony that I claim the foregoing as
 my invention I have signed my name, in
 presence of two witnesses, this 18th day of
 July, 1896.

JOACHIM JOHANNSEN.

Witnesses:

EMIL ADOLPH JOHANNES JOACHIM BERTRAM,
 JOHANNES JULIUS THEODOR KRIEGER.