

No. 772,309.

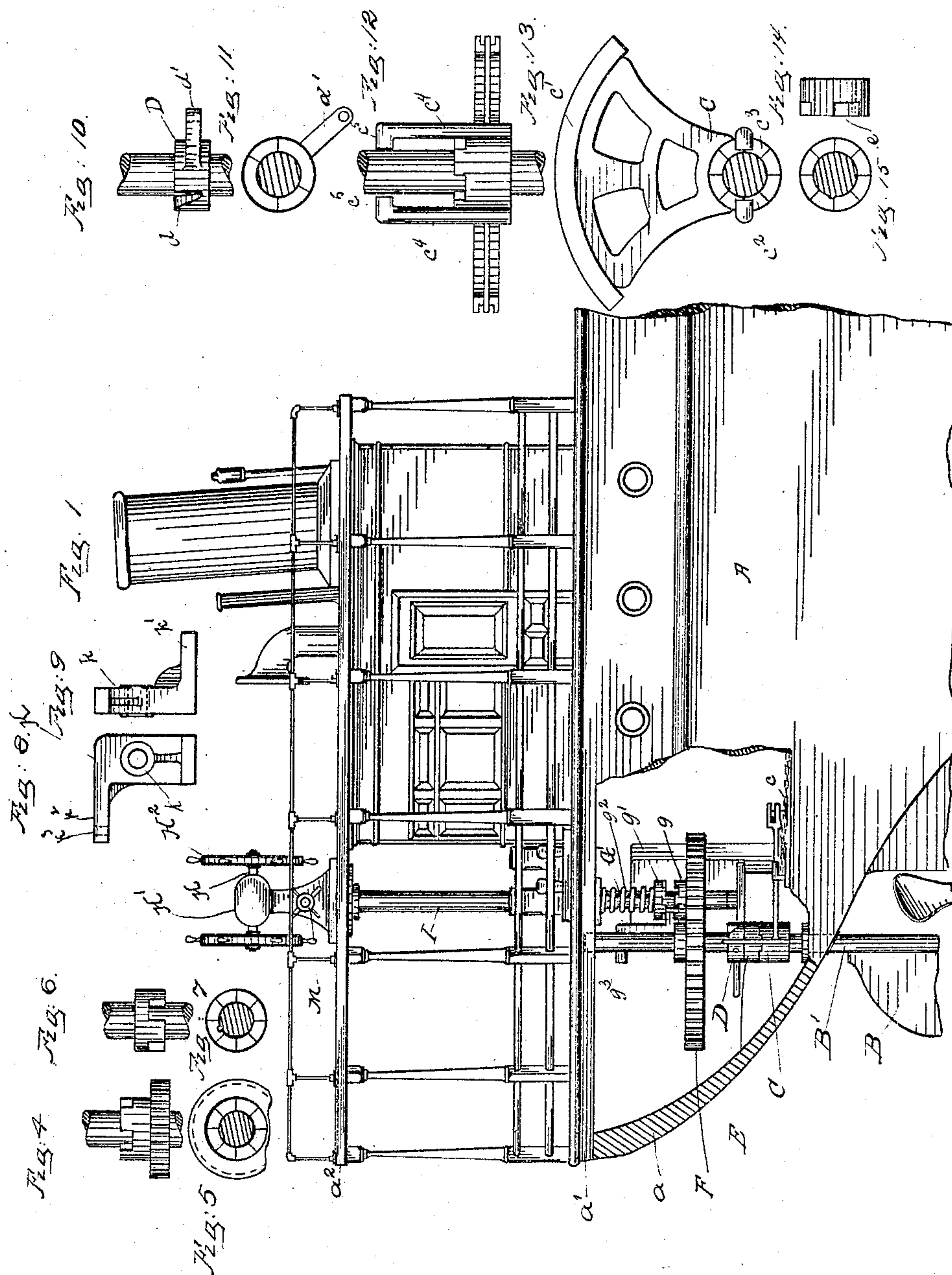
PATENTED OCT. 11, 1904.

E. C. AKERS.
AUXILIARY STEERING GEAR FOR SHIPS.

APPLICATION FILED JAN. 29, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.
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Fig. 3.

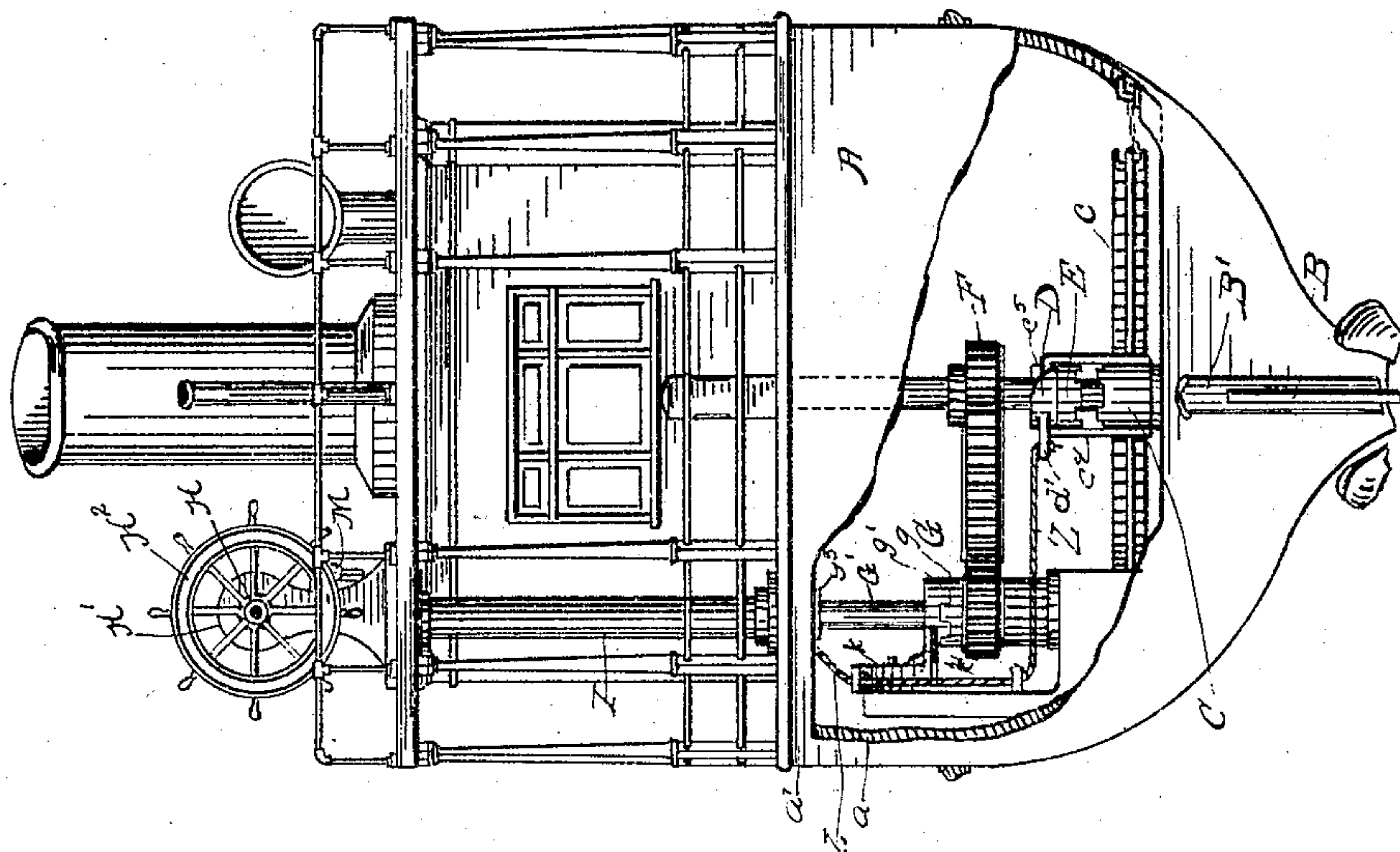
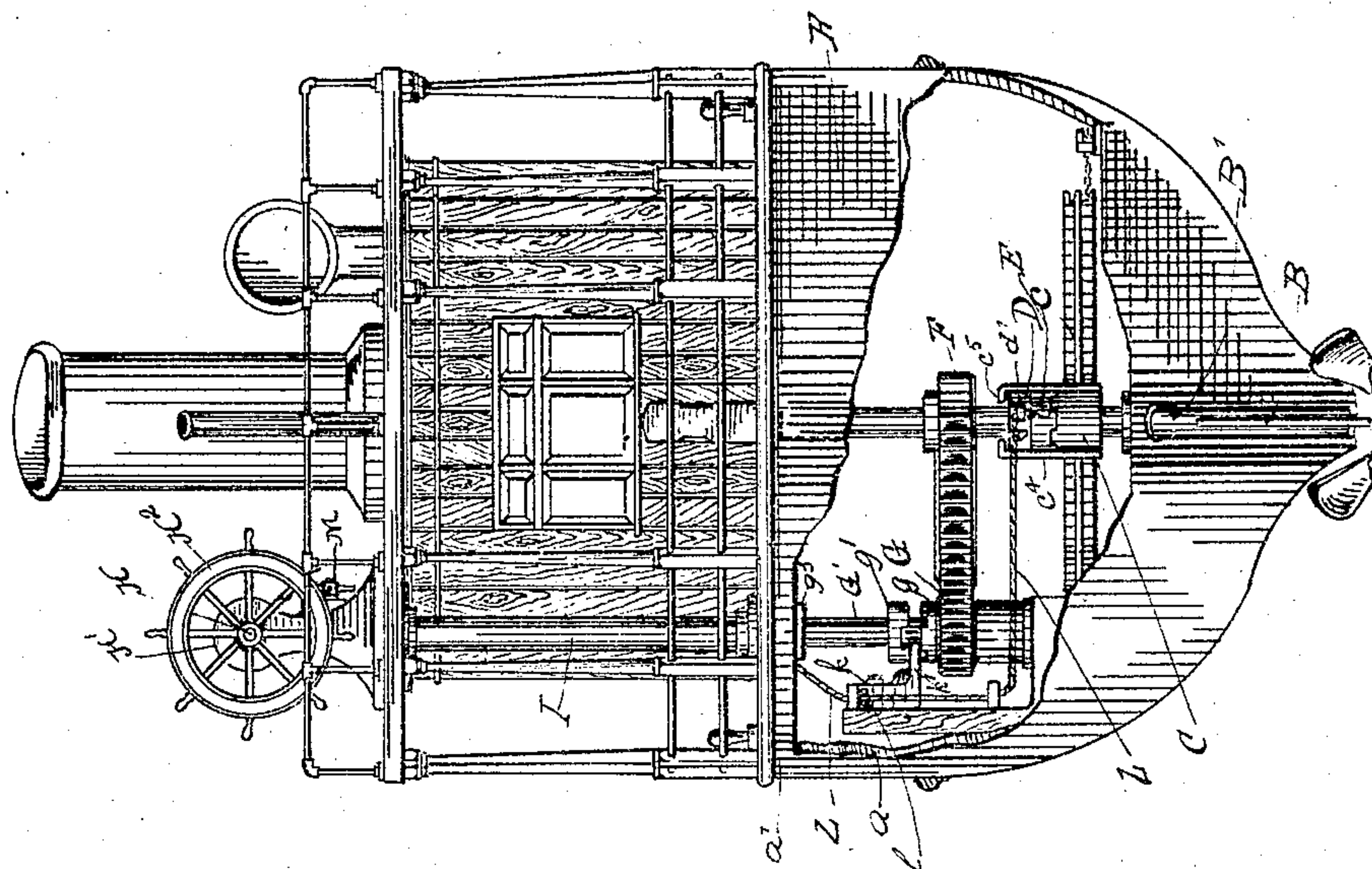


Fig. 2.



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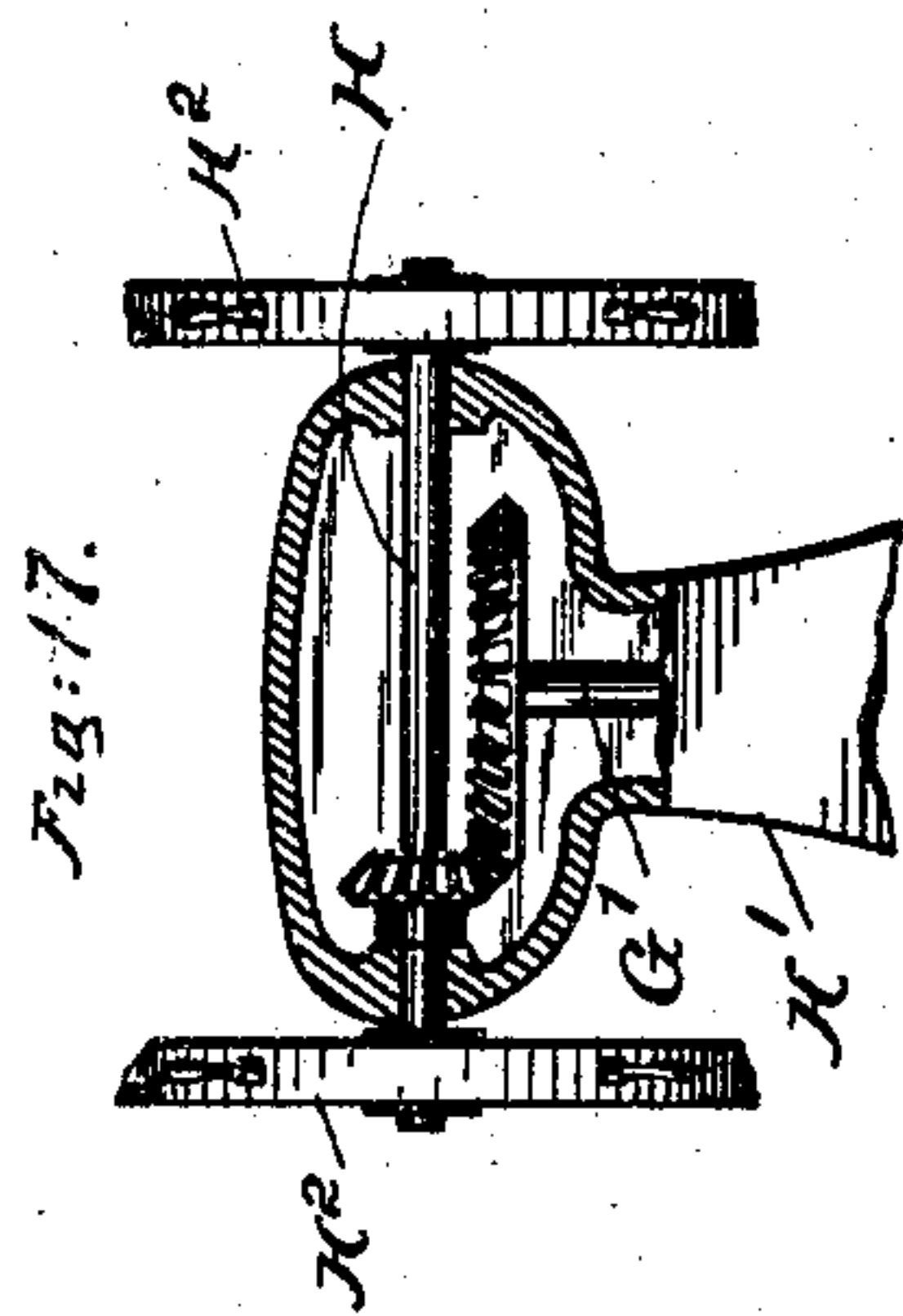
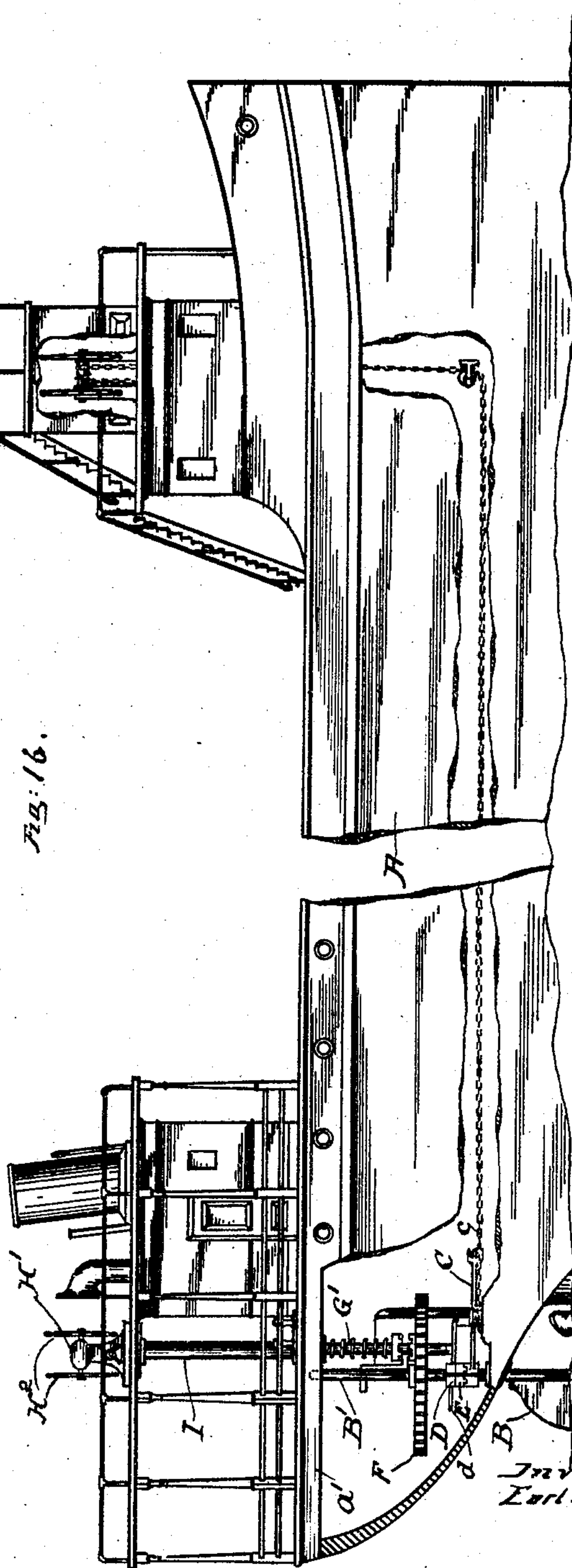


Fig. 16.



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UNITED STATES PATENT OFFICE.

EARL C. AKERS, OF PORT HURON, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AKERS STEERING GEAR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUXILIARY STEERING-GEAR FOR SHIPS.

SPECIFICATION forming part of Letters Patent No. 772,309, dated October 11, 1904.

Application filed January 29, 1902. Serial No. 91,681. (No model.)

To all whom it may concern:

Be it known that I, EARL C. AKERS, a resident of the city of Port Huron, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Auxiliary Steering-Gears for Ships, of which the following is a full, clear, and exact specification.

This invention relates to improvements in steering-gear mechanisms for boats, and refers more specifically to an improved auxiliary steering-gear which is so constructed as to be normally out of operative connection with the rudder of the boat and which may be promptly brought into connection therewith when the main steering mechanism is disconnected from the rudder, means being provided for disconnecting the main steering mechanism from the rudder at the time the spare or auxiliary gear is brought into operative connection therewith.

A further object of the invention is to provide means for connecting the auxiliary steering mechanism with the rudder or rudder-post, which means are operable at a point distant from the rudder—as, for instance, at a suitably-located spare wheel on the boat or other device for operating the auxiliary steering mechanism—whereby such connection of the auxiliary steering mechanism may be made with the rudder or rudder-post by the same person who operates or superintends the operation of the auxiliary steering mechanism and without the necessity of leaving the point on the boat from which power is communicated to operate the auxiliary steering mechanism.

In my prior United States Letters Patent for improvements in auxiliary steering-gears, No. 649,790, granted to me on the 15th day of May, A. D. 1900, I have shown means whereby the auxiliary gear may be thrown into connection with the rudder in case the main gear becomes disabled; but the construction disclosed in said patent does not provide means for disconnecting the main steering-gear from

the rudder, and thereby relieve the auxiliary gear of the stress and work of moving the tiller-chains and quadrant of the main steering gear or mechanism, both of which latter are liable to become jammed and disable the entire apparatus.

One of the objects of this invention is to provide means for disconnecting the main gear from the rudder at the time the auxiliary gear is brought into service, so that the work which devolves upon the auxiliary gear is only that of controlling the rudder.

The invention consists of the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view of the stern of a ship in side elevation, a portion of the hull being broken away fitted with a spare gear, the regular gear being shown in connection with the rudder and the spare gear in its normal inoperative position. Fig. 2 is an end view of the stern of the ship, portions of the hull being broken away, the parts being in the same relative position as in Fig. 1. Fig. 3 is an end view of the stern similar to Fig. 2, showing the main steering-gear disconnected and the auxiliary gear controlling the rudder. Fig. 4 is a view in detail in side elevation of a clutch-gear. Fig. 5 is a plan view of the clutch-gear. Fig. 6 is a view in side elevation of a clutch-gear collar. Fig. 7 is a plan view of the collar. Fig. 8 is a view in side elevation, slightly enlarged, of a gear-clutch trip. Fig. 9 is a view in side elevation of the clutch-trip taken in a plane at right angles to Fig. 8. Fig. 10 is a view in detail of a quadrant-clutch collar. Fig. 11 is a plan view of the quadrant-clutch. Fig. 12 is a view in side elevation of the main quadrant. Fig. 13 is a plan view of the main quadrant. Fig. 14 is a view in elevation of a main quadrant-clutch. Fig. 15 is a plan view of the main quadrant-clutch. Fig. 16 is a view in side elevation, partially broken away, of a vessel. Fig. 17 is a fragmentary view of a wheel-stand, showing the gear connections.

Referring to the drawings, A represents the hull of a boat, having the usual decks a' and a'' . Said vessel is provided with a rudder B, whose rudder-post B' is rotatively secured in the customary manner in the hull and whose upper end extends through the deck a' . Said rudder-post is provided with the usual quadrant C, from which tiller-chains c pass forward to the main steering-gear of the ship. Said quadrant comprises the usual segment c' and a hub c'' , which has sliding and rotative engagement on the rudder-post B'. The upper face of said hub is provided with a plurality of radially-disposed notches c^3 . A quadrant clutch-collar D has sliding engagement on the rudder-post B' above the quadrant-collar and is provided with two oppositely-disposed cam depressions d on its upper surface. An arm d' projects radially from said collar and affords a convenient means of attaching a rope, chain, or other flexible connection by which the collar may be rotated upon the rudder-post. A pair of upwardly-projecting rods c^4 , secured at opposite points on the quadrant-collar, have their upper ends bent inwardly at right angles to their main axis and adapted to ride upon the upper surface of the clutch-collar D.

Between the clutch-collar D and the quadrant-collar a clutch-ring E is interposed, said ring being keyed or splined to the rudder-post B' so as to rotate therewith. The under face of said ring E is provided with radially-disposed lugs e , which register in size and position with the radial slots c^3 in the quadrant-collar.

The operation of the device, so far as described, is obvious. When the main steering-gear is in connection with the main quadrant C, the parts are disposed in the position disclosed in Figs. 1 and 2, the clutch being held in engagement by the rods c^4 , which rest upon the plane face of the collar D near the cam depressions d . Consequently any oscillation of the quadrant C is communicated through the clutch-ring E to the rudder-post B'. In case the clutch-collar D is turned so as to bring the cam depressions d beneath the ends c^5 of the rods c^4 the latter slide down the inclined planes, thereby allowing the quadrant C to fall away and the clutch-rings to separate.

A gear F is keyed or otherwise secured to the rudder-post B' above the clutch-cam D and is in mesh with a pinion G. The latter is secured to a vertical shaft G', rotatively secured to the vessel and extending to the upper deck, where it is connected by bevel-gears in the well-known manner to a horizontal shaft H, rotating in a wheel-stand H' of the usual design and fitted with the usual steering-wheels H². A preferable form of construction for the parts is to inclose the portion of the vertical shaft between the main and upper decks in a hollow stanchion I, which serves also as a sup-

port to which the pedestal of the wheel-stand H' may be securely bolted. A clutch-collar g is formed integrally with the hub of said gear G and projects upwardly therefrom, so as to register with a clutch-collar g' , the two opposing faces of the collar and gear being correspondingly notched or slotted in the customary manner, so as to firmly engage each other when brought together. The collar g' has non-rotative sliding engagement on the vertical shaft G'. A spring g^2 in compression between the upper face of the collar g' and a suitable stop g^3 serves to force the parts together. When the spare gear is in its normal inoperative position, the clutch-collar g' is raised and rests upon a trip K. Said trip comprises a shank k , centrally pivoted on a suitable pivot-pin to a vertical support, so as to oscillate in a vertical plane. The lower end of said shank is provided with a horizontal arm k' , adapted to extend under the clutch-collar g' when the shank k is in a vertical position, and thereby afford a support for the said collar. The upper end of the shank k is provided with an arm extending at right angles to the shank and preferably in a plane transverse to the vertical plane of the lower arm k' . The upper end of the upper arm k^2 is provided with an aperture k^3 . A rope, chain, or other flexible connection L is fastened at one end to the outer end of the main-quadrant clutch-collar arm d' and is passed through suitable sheaves and through the orifice k^3 of the clutch-trip K and from there is preferably led up through the hollow stanchion I to the lower part of the wheel-stand H', where it is secured to a winch M of the ordinary pattern. A stop l is secured to said rope L beneath the arm k^2 of the clutch-trip K. Said rope is so adjusted as to be fairly taut between the stop l and the winch M when the parts are in the position shown in Figs. 1 and 2, while a sufficient amount of slack is provided between the stop and the main-quadrant clutch-arm d' to allow for oscillation with the rudder-post.

It will be noted from the above disposition of the parts also that the spare wheels H² may be at one side of the center of the boat, and consequently a man stationed there has a clear view of the front of the boat, his line of sight not being impeded by the spars, stacks, or other obstructions.

The operation of the device when the clutch is used is as follows: The parts being arranged in the position shown in Figs. 1 and 2, the main steering-gear is in control of the rudder, and the ship of course is guided in the usual manner. When the boat is laboring in a heavy sea or is approaching a tortuous or narrow channel or is subject to other conditions which are likely to part the main steering-tackle, a man is stationed on the upper deck near the auxiliary steering-wheels.

If the main gear parts, a prearranged signal is given him by the officer in charge. By means of the winch M he trips the clutch-trip K, thereby connecting the pinion G with the vertical shaft G'. The same movement of the winch M draws the rope or other flexible connection below the trip K taut, and this swings the clutch-collar D round with respect to the rudder-post, and as a consequence the main quadrant C falls away from the clutch-ring E, the rod ends c^5 passing down the inclined cam-faces. This single movement of the winch M thus not only connects the spare steering-wheels H² with the rudder-post, but also disconnects all the chains and quadrant of the main gear, so that there is no dead-weight or slack chains to be moved through the tiller-sheaves. As a consequence the boat is instantly under control and can be held to its course until the main gear can be repaired. The ratio between the gear F and the pinion G, as well as that between the bevel-wheels connecting the hand-wheel shaft and gear-shaft, may be such as to allow a boat of large tonnage to be easily handled by the hand-wheels H².

Other means may be employed for disconnecting the tiller-chains from the rudder-post, if such connection be desired, which disconnection may not in all instances be deemed necessary. Other structural details may be varied without departing from the spirit of the invention, and I do not wish to be limited to such details except as herein specifically claimed.

I claim as my invention—

1. A ship's steering-gear comprising a main steering mechanism operatively connected with the rudder, a spare steering-gear normally disconnected from the rudder, and means operating to automatically release said main steering mechanism from the rudder when said spare gear is operatively connected with the rudder.

2. A ship's steering-gear comprising a main steering mechanism operatively connected with the rudder, a spare steering-gear normally disconnected from the rudder, and means acting to simultaneously disconnect said steering mechanism from the rudder and to connect said spare steering-gear with the rudder.

3. A ship's steering-gear comprising a main steering mechanism operatively connected with the rudder, a spare steering-wheel normally disconnected from the rudder, and means operating to automatically and simultaneously disconnect said main steering mechanism from the rudder and operatively connect said spare steering-wheel with the rudder.

4. A ship's steering-gear comprising a main steering-wheel, connections between said steering-wheel and the rudder, a spare steering-wheel normally disconnected from the rudder and means for operatively connecting

said spare steering-wheel with the rudder, and acting to disengage the connections between the main steering-wheel and said rudder.

5. A ship's steering-gear comprising a main steering-wheel operatively connected with the rudder, a spare steering-wheel, means on the rudder-post for connecting said spare wheel thereto, and normally disconnected from said spare wheel, and means for disconnecting said main steering-wheel from the rudder and acting to automatically connect the spare wheel with the rudder-post.

6. A ship's steering-gear comprising a main steering-wheel, tackle connecting said wheel with the rudder, a spare steering-wheel, a shaft operated by said spare steering-wheel and adapted to be brought into operative connection with the rudder-post, and means for disconnecting said tackle from the rudder and also for operating to connect said shaft with said rudder-post.

7. A ship's steering-gear comprising a main steering-wheel, tackle connecting said wheel with the rudder, a spare steering-wheel, a shaft operated by said spare steering-wheel and adapted to be brought into operative connection with the rudder-post, and means for disconnecting said tackle from the rudder and acting to simultaneously bring said shaft into operative connection with the rudder-post.

8. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a vertical revoluble shaft operated by said spare steering-wheel and adapted to be brought into operative connection with the rudder-post, and means acting to simultaneously disconnect said main steering mechanism from the rudder and bring said shaft into operative connection with the rudder-post.

9. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a shaft operated by said spare steering-wheel, a gear on the rudder-post, a pinion revoluble on said shaft and in mesh with said gear, a clutch on said shaft adapted to lock said pinion thereto, and means acting to disconnect the main steering mechanism from the rudder when said clutch is thrown into engagement with said pinion.

10. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a shaft operated by said spare steering-wheel, a gear on the rudder-post, a pinion revoluble on said shaft and in mesh with said gear, a clutch on said shaft adapted to lock said pinion thereto, and means adapted to simultaneously disconnect the main steering mechanism from the rudder and bring said clutch and pinion into engagement.

11. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a shaft, bevel-gears connecting said shaft and spare steering-

wheel, a gear on the rudder-post, a pinion revoluble on said shaft in mesh with said gear, a clutch on said shaft adapted to lock said pinion thereto, and means adapted to simultaneously disengage said main steering mechanism from the rudder and throw said clutch and pinion into engagement.

12. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a shaft operatively connected to said spare steering-wheel, a gear secured to the rudder-post, a pinion revoluble on said shaft in mesh with said gear, a clutch on said shaft adapted to lock said pinion thereto, a winch, and connecting means between said winch, clutch and main steering mechanism, adapted to simultaneously disconnect said main steering mechanism from the rudder and throw said clutch into engagement with said pinion.

13. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a vertical revoluble shaft operatively connected with said spare steering-wheel, a gear on the rudder-post, a pinion revoluble on said shaft and in mesh with said gear, a spring-actuated clutch on said shaft for locking said pinion to said shaft, a trip normally holding said clutch disengaged from said pinion, and means acting to disconnect said main steering mechanism from the rudder when said clutch is released by said trip.

14. A ship's steering-gear comprising a main steering mechanism connected with the rudder, a spare steering-wheel, a vertical revoluble shaft operatively connected with said spare steering-wheel, a gear secured to the rudder-post, a pinion revoluble on said shaft and in mesh with said gear, a spring-actuated clutch on said shaft for locking said pinion thereto, a trip normally holding said clutch disengaged from said pinion, and means acting to simultaneously disconnect said main steering mechanism from said rudder and release said clutch from said trip.

15. A ship's steering-gear comprising a main steering-wheel, a quadrant and rudder-post connected with the rudder, flexible connections between said main steering-wheel and quadrant, a spare steering-wheel, a gear secured to said rudder-post, a vertical revoluble shaft operatively connected to said spare steering-wheel, a pinion revoluble on said shaft and in mesh with said gear, a clutch on said shaft and adapted to lock said pinion thereto, and means acting to simultaneously disconnect said flexible connections from operative connection with the rudder-post and to bring said clutch into engagement with said gear.

16. A ship's steering-gear comprising a main steering-wheel, a quadrant and rudder-post connected with the rudder, flexible connections between said main steering-wheel and said quadrant, a spare steering-wheel, a gear

secured to said rudder-post, a vertical revoluble shaft operatively connected to said spare wheel, a pinion revoluble on said shaft and in mesh with said gear, a spring-actuated clutch on said shaft for locking said pinion to said shaft, a trip normally holding said clutch disengaged from said pinion, and means acting to simultaneously disconnect said flexible connections from the rudder-post, and release said clutch from said trip.

17. A ship's steering-gear comprising a main steering-wheel, a quadrant and rudder-post connected with the rudder, a spare steering-wheel, a revoluble shaft operatively connected with said spare steering-wheel, a gear secured to said rudder-post, a pinion revoluble on said shaft and in mesh with said gear, a clutch on said shaft adapted to lock said pinion thereto, a trip normally holding said clutch out of engagement with said pinion, means for disconnecting said main steering-wheel from said rudder-post and means acting to release said trip from said clutch.

18. The combination with the main steering mechanism of a boat, of an auxiliary steering mechanism, and means located adjacent to the rudder and operable by a device situated at a point distant from the rudder for disconnecting the rudder from the main steering mechanism when the auxiliary steering mechanism is brought into service.

19. In a steering-gear for boats, the combination with a main steering mechanism connected with the rudder, an auxiliary steering mechanism, gearing located immediately adjacent to the rudder-post, by which said auxiliary steering mechanism may be connected with the rudder, said gearing being normally inert to transmit motion from said auxiliary steering mechanism to the rudder, and means located at a point distant from the rudder for connecting the auxiliary steering mechanism with the rudder.

20. In a steering-gear for boats, the combination with a rudder and its post and a main steering mechanism connected with said rudder, of an auxiliary steering mechanism comprising a rotative shaft adjacent to the rudder-post, gears on the shaft and rudder-post which are normally inert to transmit motion from said shaft to the rudder-post, and means operable at a point distant from the rudder-post for operatively connecting said shaft with the rudder-post through said gears.

21. In a steering-gear for boats, the combination with the rudder and its post and a main steering mechanism connected with said rudder, of an auxiliary steering mechanism comprising a rotative shaft, a gear on the rudder-post, a pinion on the shaft which is in mesh with the rudder-post gear and is normally free to rotate idly on said shaft, and means operable at a point distant from the rudder for temporarily fixing said pinion to said shaft

22. In a steering-gear for boats, the combination with the rudder and its post and a main steering mechanism connected with said rudder, of an auxiliary steering mechanism comprising a rotative shaft, a gear on the rudder, a pinion on the shaft which is normally free to rotate on the shaft and is in mesh with the rudder-post gear, a clutch for locking said pinion to said shaft and means operable at a

point distant from the rudder for operating to said clutch to lock said pinion to said shaft.

In testimony whereof I have hereunto set my hand and seal this 25th day of January, A. D. 1902.

EARL C. AKERS. [L. s.]

Witnesses:

C. TH. DE KAM,

CHARLES R. MORRISON.