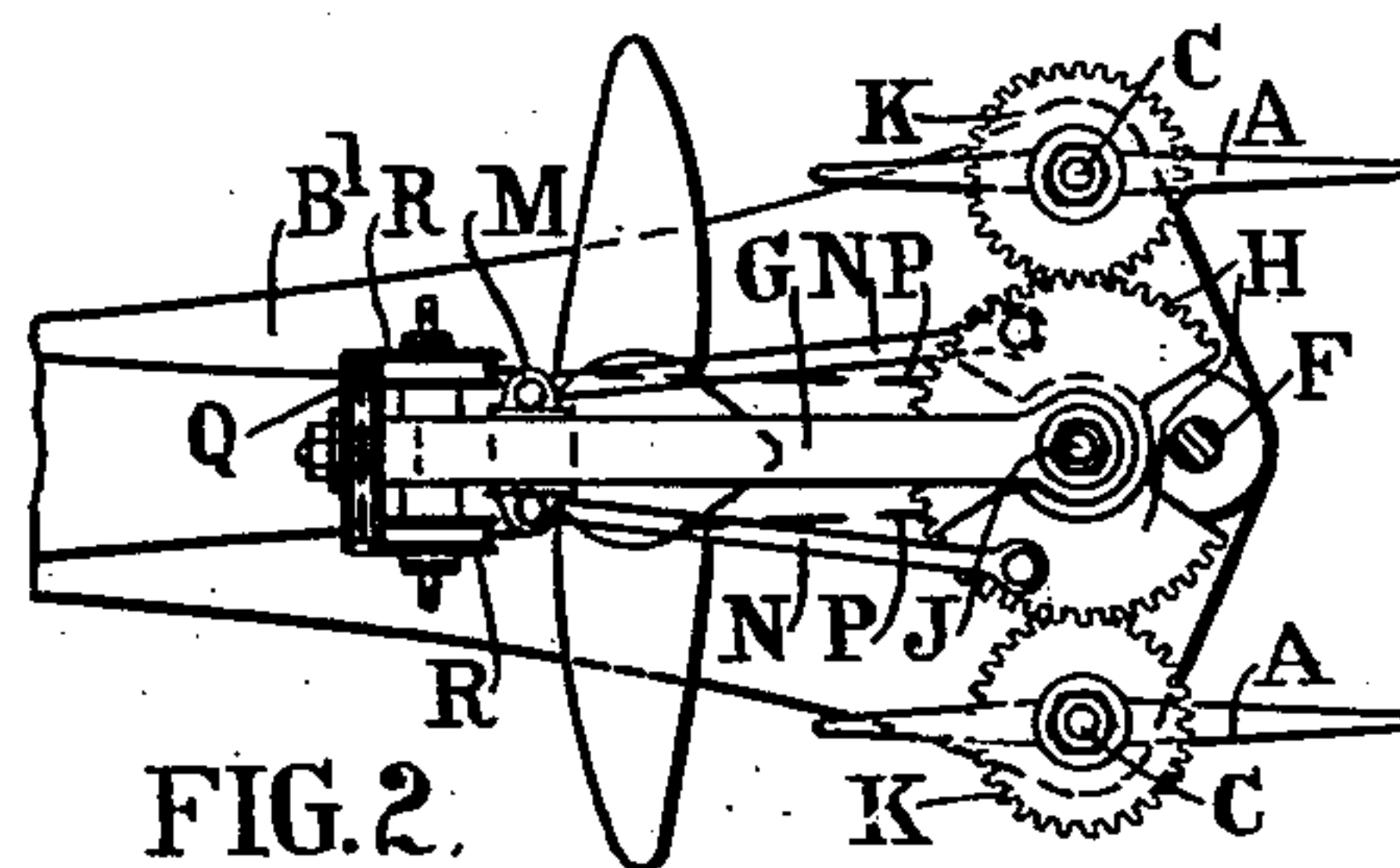
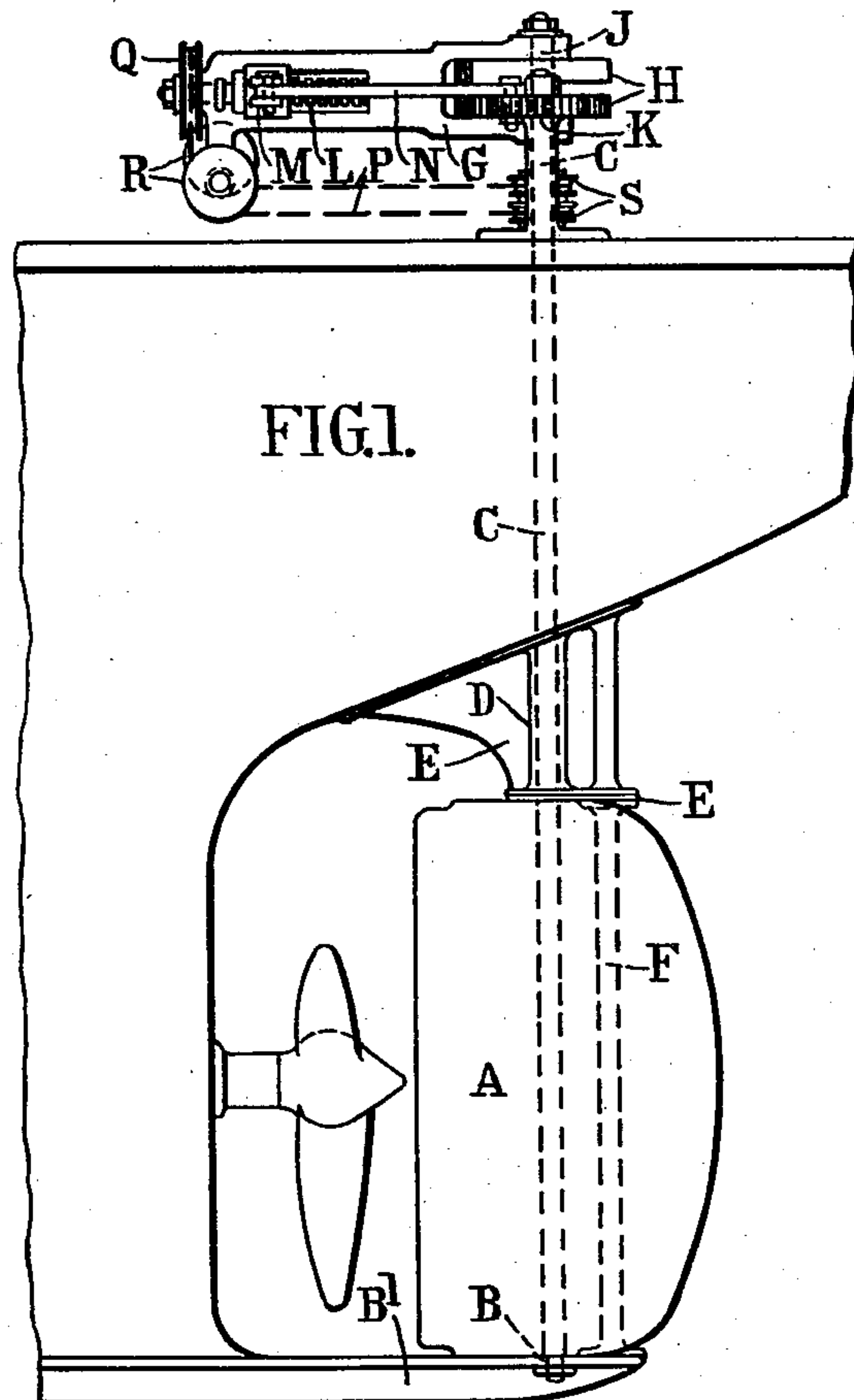


# STEERING AND CONTROLLING DEVICE FOR SCREW PROPELLED VESSELS.

**969,642.**

2 SHEETS--SHEET 1.



Witness:  
F. R. Pitton  
J. J. J. J. J.

Johan P. H. Lund <sup>Inventor</sup>

By Richardson, J. & Wetherup

his attys.

J. P. H. LUND.

STEERING AND CONTROLLING DEVICE FOR SCREW PROPELLED VESSELS.

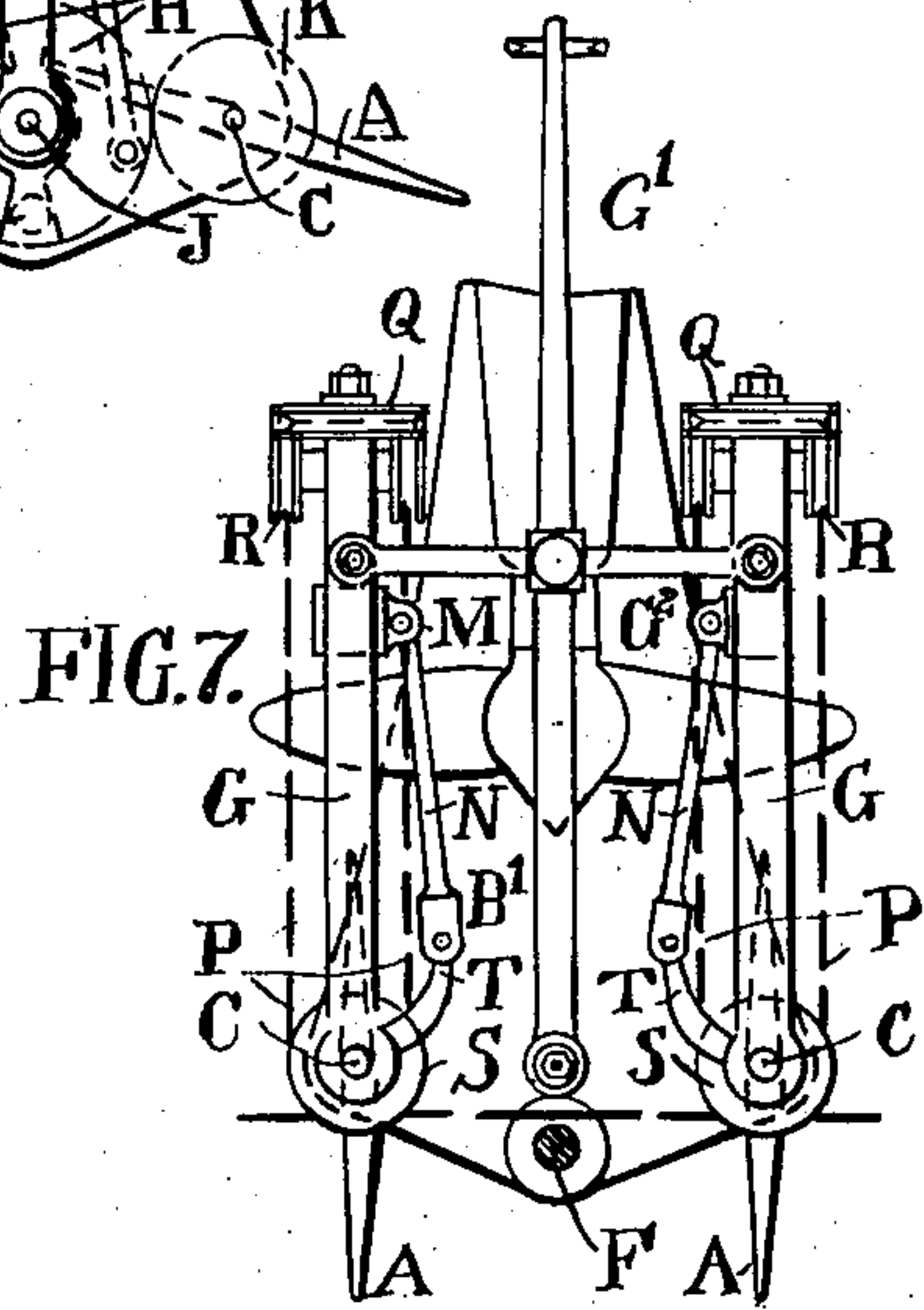
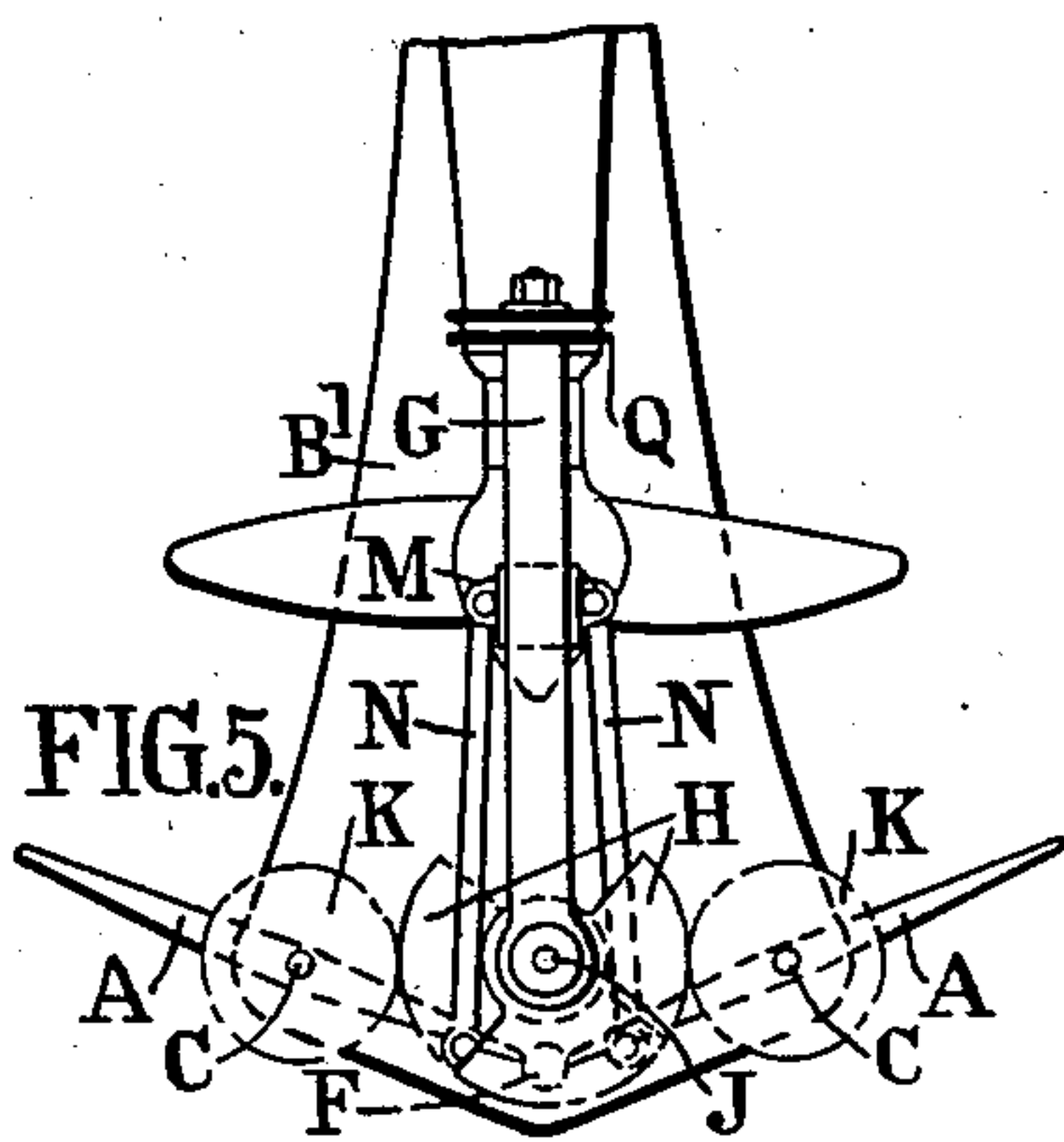
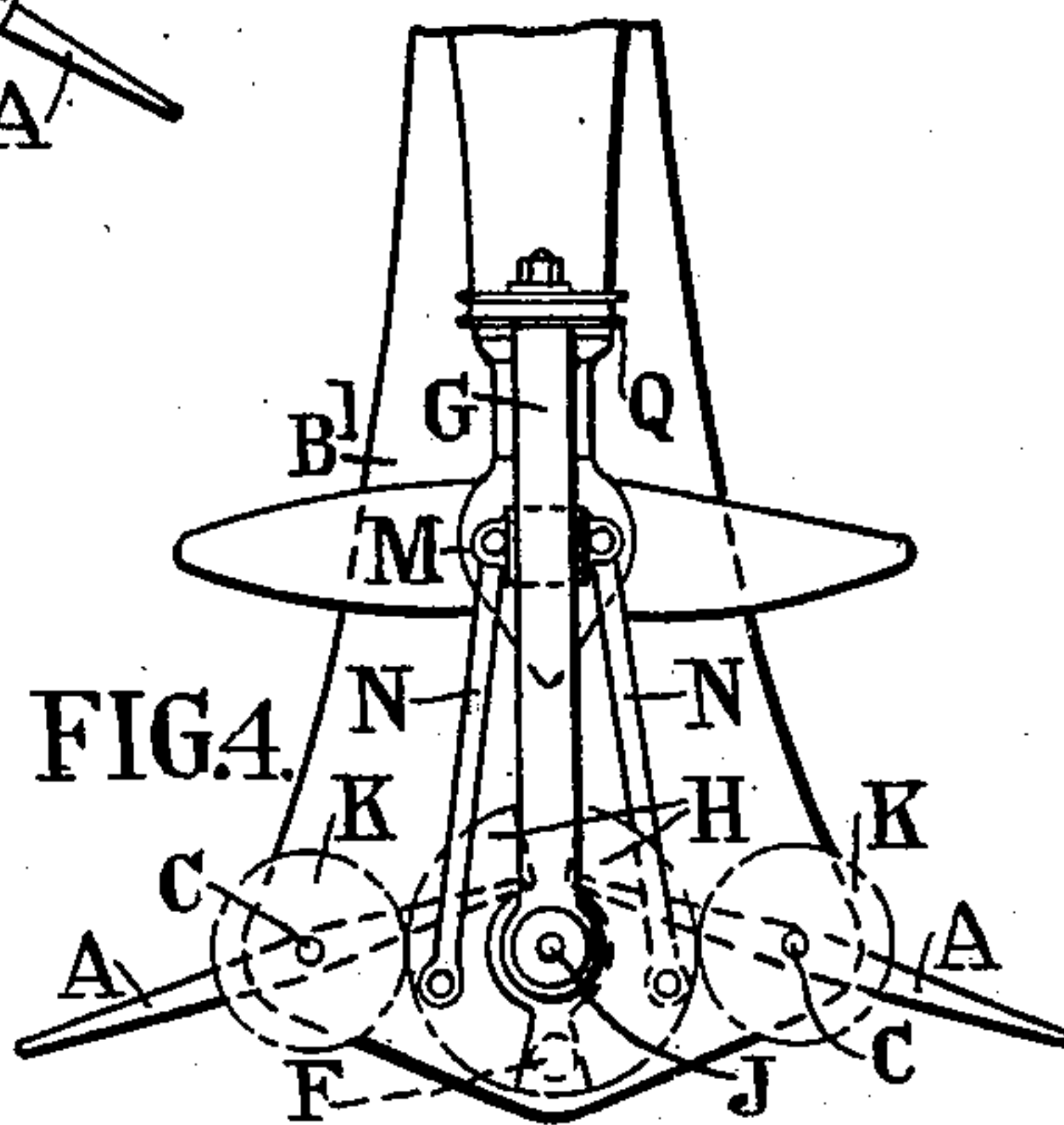
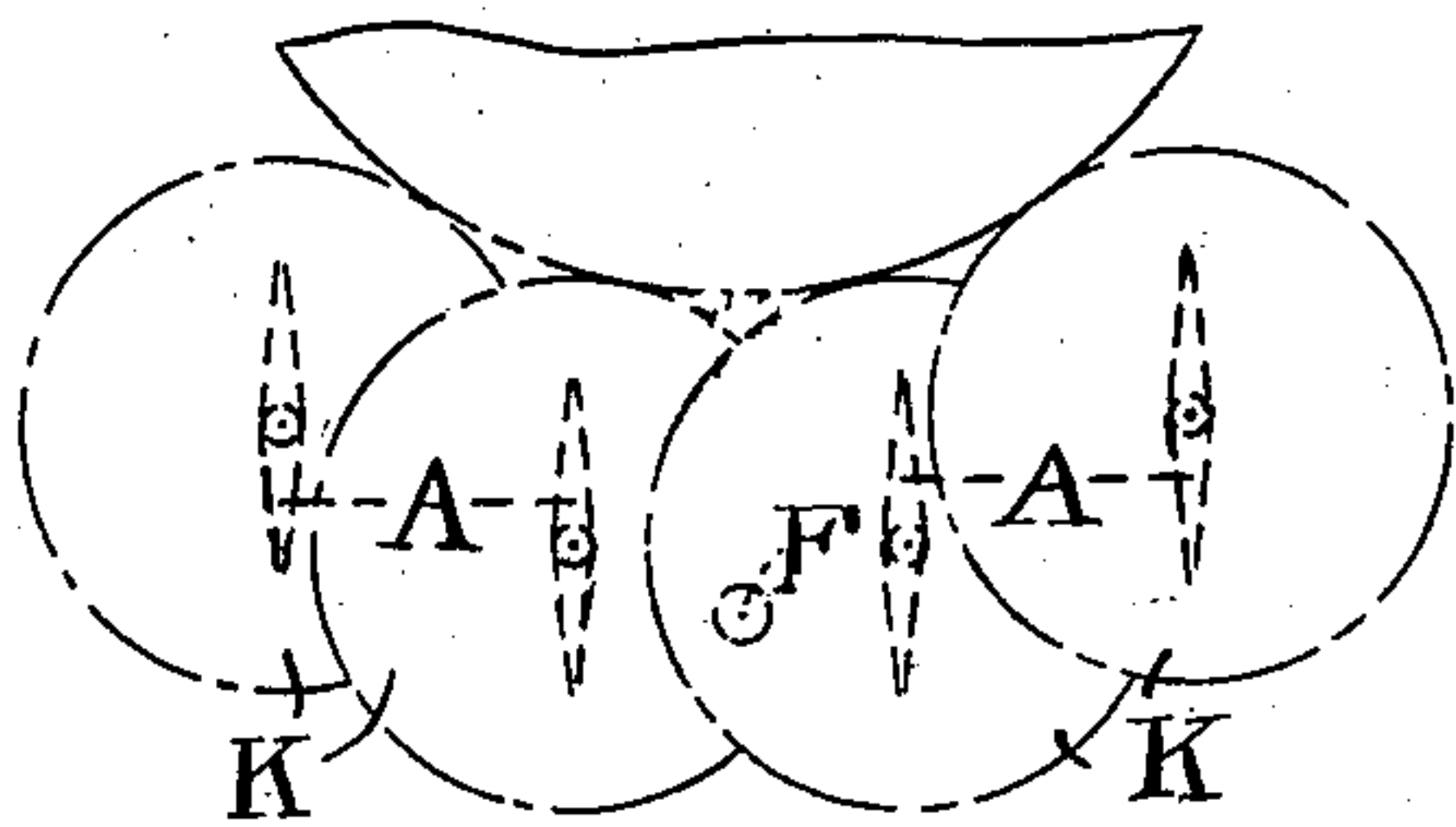
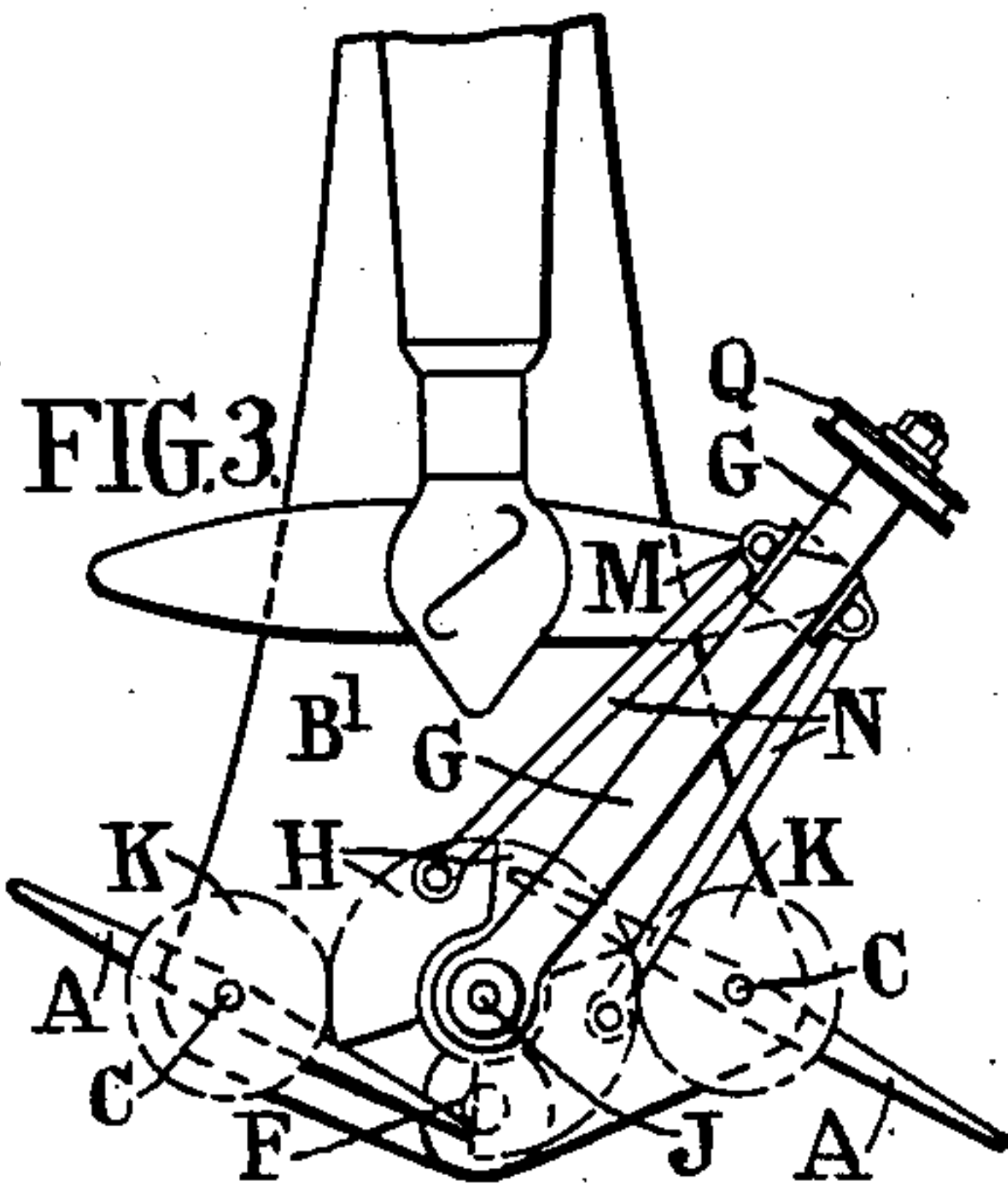
APPLICATION FILED SEPT. 30, 1909.

969,642.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 2.

FIG. 6.



Witness  
F. R. Fulton  
J. S. Minto

Inventor.  
John P. H. Lund  
by Thompson, Fisher & Witherston  
his Atty.



# UNITED STATES PATENT OFFICE.

JOHAN PETER HEMME LUND, OF ROCKHAMPTON, QUEENSLAND, AUSTRALIA.

STEERING AND CONTROLLING DEVICE FOR SCREW-PROPELLED VESSELS.

969,642.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed September 30, 1909. Serial No. 520,421.

*To all whom it may concern:*

Be it known that I, JOHAN PETER HEMME LUND, a subject of the King of Great Britain, residing at The Waterworks, Rockhampton, Queensland, Australia, engineer, have invented certain new and useful Improvements in Steering and Controlling Devices for Screw-Propelled Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to double or quadruple balanced rudders of the type that can be put to different angles in relation to each other, and is well adapted for launches or comparatively small vessels, having rudders of limited area, which readily lend themselves to the special construction and require but small power to operate them. Further experiments made by me have however proved that better steering, retarding, reversing and maneuvering effects can be obtained by the use of two or four separate and distinct rudders of the balanced type than with a single rudder and I place them at such a distance apart that when put at or nearly at right angles to the keel of the vessel they shall present a surface whose area is slightly greater than (but concentric with) the area swept by the propeller.

The opening, closing and turning of my improved balanced duplex or quadruplex rudder is performed and controlled more readily by the helmsman or navigator from his usual position on the vessel, and is transmitted to the rudders by suitable mechanical means either by hand power, steam, oil, gas, hydraulic, electricity, compressed air, or whichever power may be most convenient according to the size and requirements of the vessel or airship.

The engines in a vessel fitted with my improved invention may be, of the simplest kind and constructed for going ahead only, and as the propeller is never disconnected, or in any way relieved of its resistance (except if desired in starting the engines) no throttling or governing mechanism need be provided. In the case of engines not readily reversed such as gas, oil or turbine engines the usual reversing gear, disengaging clutch, or reversing propeller may be entirely dispensed with. In order, however, that my invention may be clearly understood I will

now describe it, reference being made to the accompanying drawings in which—

Figure 1 is a side elevation showing a duplex rudder in the normal or go-ahead position. Fig. 2 is a plan of same. Fig. 3 is a plan showing the rudders in one "hard over" position. Fig. 4 is a plan showing the rudders in approximately the "stop" position. Fig. 5 is a plan showing the rudders in the "go-astern" position. Fig. 6 is a diagrammatic plan of a quadruple rudder, and gearing. Fig. 7 is a plan showing an alternative arrangement for controlling the movements of the rudders.

Referring to the drawings, (particularly to Figs. 1-6) it will be seen that each rudder A is of the fully balanced type, the lower ends being supported by a heel brace or footstep B carried in a fantail extension of the sole piece B' while the rudder head or shank C is carried in the usual way but preferably in a downwardly extended trunk D secured to a suitable bracket E to give it the required strength.

Centrally and slightly behind the rudder heads or shanks C is a stern post F not only to strengthen the stern construction but also to stop the rush of the water through the slight opening that occurs between rudders A when in the go-astern position.

The operating mechanism consists of a forked tiller G mounted loosely, together with two separate toothed sectors H, on a vertical stud or pivot J, placed centrally between the two rudder heads or shanks C, the toothed sectors H each gearing with one pinion K on one shank C. The forward end of the tiller G carries a screw L which actuates a traversing nut or crosshead M, connected on either side by links N to disk cranks formed by their respective toothed sectors H. Both the screw L and the tiller G are operated and controlled by the helmsman or navigator from his usual position, by means similar to those commonly in use for steering, but, as the rudders are evenly balanced, little power is required to operate the rudders.

One method of operating my invention as illustrated in Figs. 1-6 is as follows:—Besides the ordinary steering chains leading from the steering wheel to the tiller G, a light driving chain P leads from the gypsy wheel Q attached to the screw L on the tiller G, round guide wheels R nearby and round guide sheaves S on the vertical stud J and



over suitable leads to a gypsy wheel independently mounted on the same spindle which carries the steering wheel and operated by a smaller spoke wheel. Under normal or "go ahead" conditions the rudders are as in Fig. 1, that is to say parallel to each other and in that position are moved in unison for ordinary steering purposes. If however the navigator desires to slow down the vessel, he causes the screw L to be rotated, the traversing nut M to move along the tiller G thus through the links N turning the toothed sectors H which in turn rotate the rudder heads or shanks C by means of the pinions K until the desired position is reached. Should it be necessary to stop the vessel further movement of the screw L is necessary and if desired to get sternway on, the nut M must travel to its limit when the rudders A will be found to be in the position shown in Fig. 5 when the column of water from the propeller will be diverted on either side of the ship thus causing her to gather sternway. It will be understood that during any of these movements of the rudders they may be moved in unison as already described. It will be understood that as the travel of the tiller is limited the ratio of the toothed sectors to the pinions would be such that while the tiller travels through a short arc, the rudders travel the required distance.

In the alternative method of controlling the rudders A as illustrated in Fig. 7, the tiller G and attendant parts (with the exception of the sectors H and pinions K) are constructed as already described, but these parts are duplicated or quadruplicated as the case may be, and placed one set on each rudder head or shank C so that the forked tillers G are free to move thereon. The sectors H (as in Figs. 1-6) are in this case dispensed with, the links N being connected to arms or cranks T rigidly attached to the rudder heads or shanks C and for steering purposes I may provide an intermediate tiller G' pivoted in a line with and between the rudder heads or shanks C, and connect these by means of a link G<sup>2</sup> or otherwise to the tillers G; or this intermediate tiller G' may be dispensed with and the two tillers operated in unison. The method of working this alternative is the same as that already described, and therefore requires no further description.

In the foregoing description only two rudders have been referred to but it will be clear that four can be used and may be found useful in special cases such as for shallow draft flat bottomed screw steamers,

in which case the total area of rudder would be divided up into two rudders on each side of the keel arranged as shown in Fig. 6 and be geared or connected together and to their respective mechanism on the tiller as already described.

The arrangement of two wheels to operate and steer a vessel is not new nor is it claimed alone. It has also been proposed in rudders of the hereinmentioned type to construct the two pivoted halves with well rounded corners, also to partly balance them, and also to be able to put one rudder at an angle to the other.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a ship, the combination of a plurality of shanks; rudders secured thereto; pinions also secured to said shanks; a stud J located between said shanks and provided with sectors engaging said pinions; means comprising links connected to said sectors; and means for operating the links, substantially as described.

2. In a ship the combination of a plurality of shanks; rudders secured thereto, and extending on two sides of the same; pinions also secured to said shanks; a stud J located between said shanks and provided with sectors engaging said pinions; links connected to said sectors and means comprising a screw, for operating the links, substantially as described.

3. In a ship, the combination of a plurality of shanks; rudders secured thereto; pinions also secured to said shanks; a stud J located between said shanks and provided with sectors engaging said pinions; links connected to said sectors; means comprising a screw and nut for operating the links; and a tiller carrying said screw and nut, for operating the links, substantially as described.

4. In a ship, the combination of a plurality of shanks; rudders secured thereto; pinions also secured to said shanks; a stud J located between said shanks and provided with sectors engaging with said pinions; links connected to said sectors; means comprising a screw and nut for operating the links; and a tiller provided with a wheel Q rigid with said screw for operating said screw and nut, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHAN PETER HEMME LUND.

Witnesses:

BERTRAM M. LILLEY,  
VOLINTOR ROCKHAMPTON.