No. 654,798. Patented July 31, 1900.

J. J. LEARY.

REVERSING MECHANISM.

(Application filed July 13, 1899.)

(No Model.)

Fig. I.

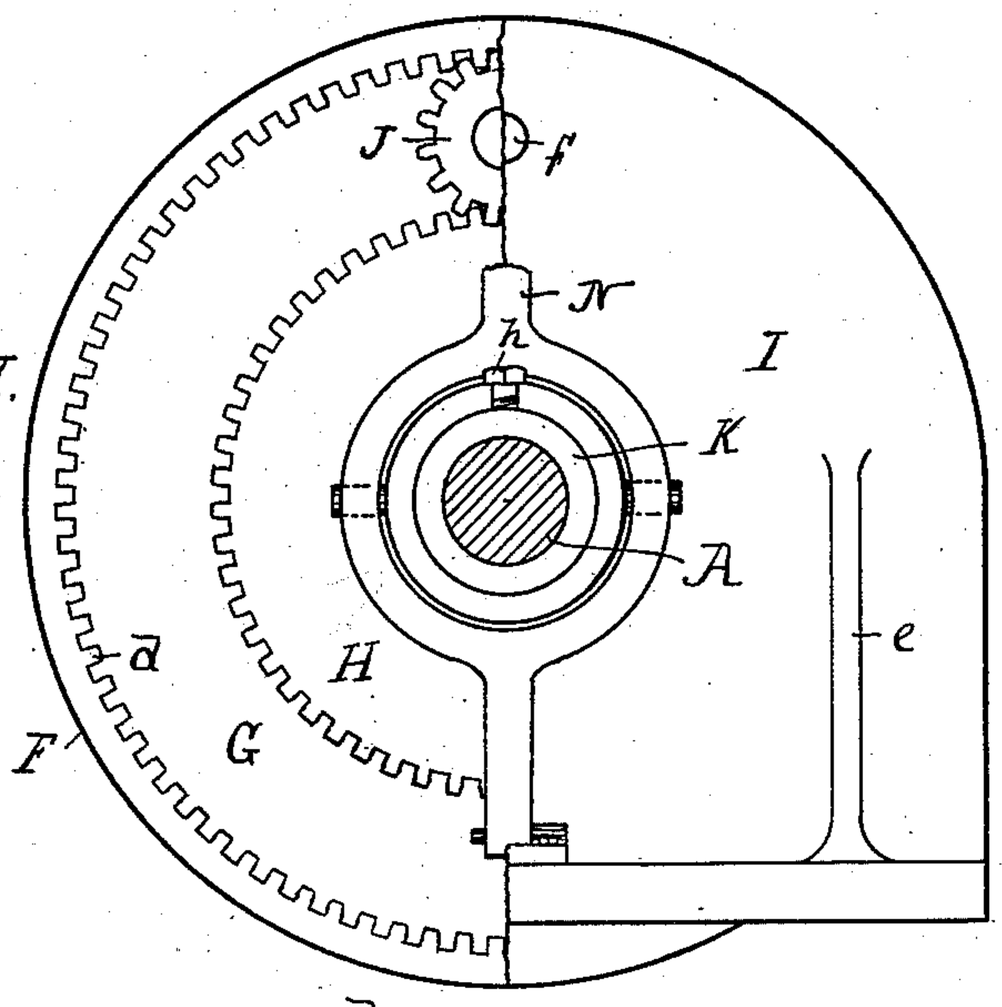
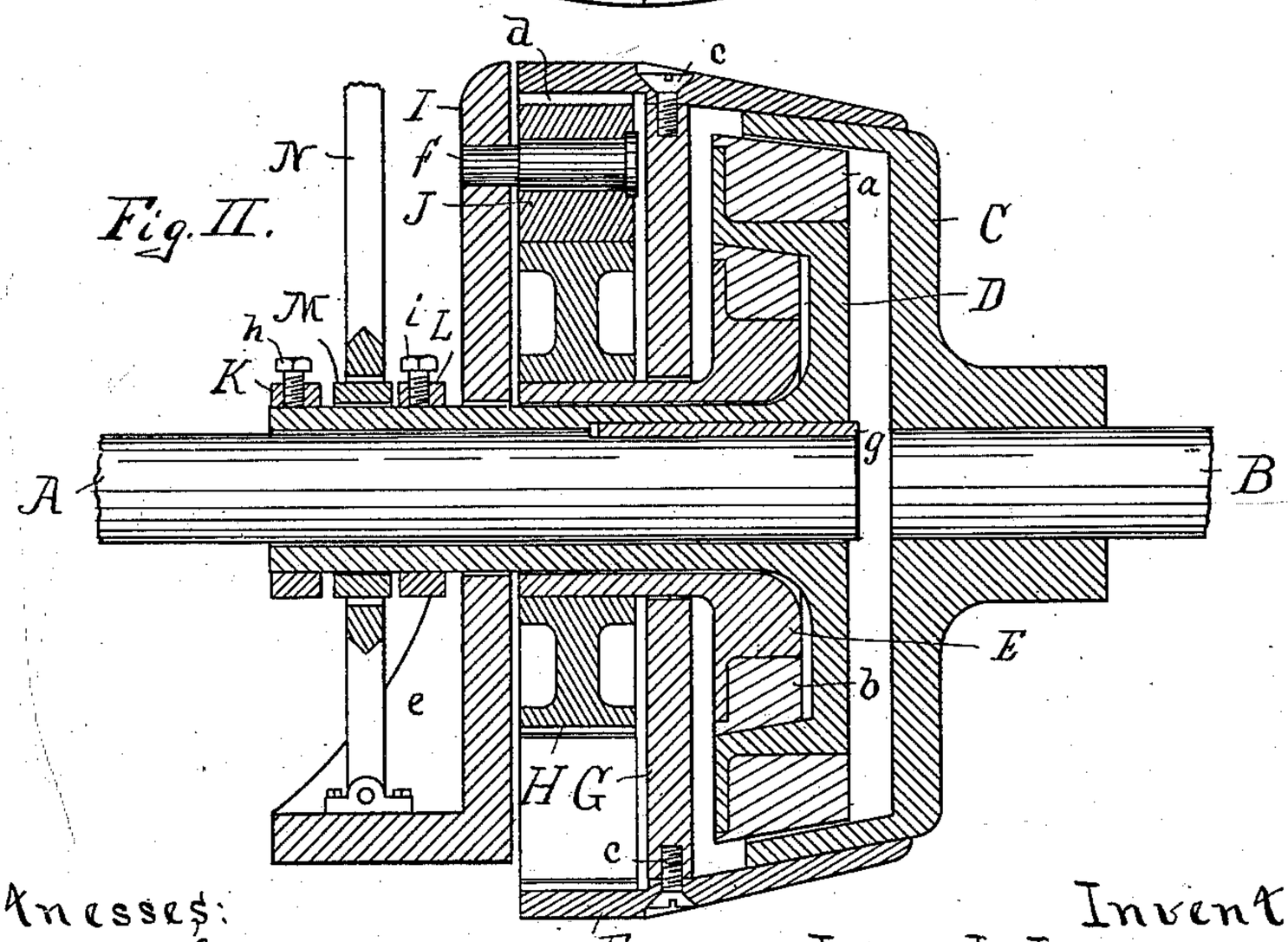


Fig. II.



Witnesses:
Myra E. Snyder
J. W. Ellis

Inventor:
John J. Leary,
by his Attorney
William Macomber

UNITED STATES PATENT OFFICE.

JOHN J. LEARY, OF ROCHESTER, NEW YORK, ASSIGNOR OF TWO-THIRDS TO FRANK F. WELLS, OF SAME PLACE, AND CALVIN P. H. VARY, OF NEWARK, NEW YORK.

REVERSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 654,798, dated July 31, 1900.

Application filed July 13, 1899. Serial No. 723,696. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. LEARY, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Reversing Mechanism, of which the following is a full, clear, and exact description.

My invention relates to reversible friction-clutches, and more particularly to clutches used upon the divided shaft of a propeller and similar uses.

My invention has for its object means for driving, stopping, and reversing the propeller in connection with a driving-shaft which has a continuous rotation in one direction, and more particularly means for accomplishing these three operations which are at once simple and efficient.

While I do not wish to limit my invention to marine uses, it will be apparent to one skilled in the art that the above distinction is basic in marine construction and at once points out the vital requirements which I have met.

Referring to the drawings herewith, consisting of one sheet and two figures, in which like letters refer to like parts, Figure I is an end elevation with a portion cut away to show the gear mechanism. Fig. II is a longitudinal central section.

A is the driving-shaft, and B is the driven shaft.

C is a friction-cone rigidly secured to the driven shaft B and provided with an external and internal conical bearing-surface.

D is a friction-sleeve splined to the shaft A, as shown at *g*, which is free to move (within established limits) longitudinally upon the shaft A. The exterior conical surface of this sleeve D is provided with any desirable surface to engage internally with the cone C, as shown at *a*.

E is a friction-sleeve which takes over the sleeve D and is free to move in rotation and axially within given limits. This friction-sleeve is in like manner provided with any desirable conical surface to engage internally with the friction-sleeve D, as shown at *b*.

F is a shell provided with an internal conical surface to engage with the external surface of the friction-cone C, and this sleeve is also provided with an internal gear for the purposes hereinafter described.

G is a disk which takes freely over the sleeve E and is rigidly secured to the sleeve F, as indicated by the screws *c*.

H is a spur-gear which is rigidly secured to the sleeve E. In the drawings I have shown but one spur-gear J; but I preferably use two or more.

I is a support with a central opening, through which the shaft A passes and which is properly braced, as shown at *e*, and bolted or otherwise secured to a proper foundation. To this support are revolubly secured spur-gears J upon pivots *f*. These spur-gears mesh with the spur-gear H and the internal gear *d*.

K and L are collars rigidly secured to the sleeve D by set-screws *h* and *i*.

M is a collar taking freely over the sleeve D and having an axial movement limited by the fixed collars K and L.

N is a lever pivoted at its foot and engaging with the collar M, by means of which the collar M is thrown into contact with the collar K or the collar L.

Having thus indicated the several parts of my device, I will now describe the method of operation.

The shaft A is driven continuously in one direction by any suitable power.

Going ahead: By the lever N the collar M is thrown against the collar L, forcing the sleeve D into contact with the cone C, and by friction imparts motion in rotation to the shaft B in the same direction with the shaft A. Thus in going ahead, which of course is the principal action, the driving and driven shafts are held up to action without other friction in rotation than that necessarily arising from the thrust of the propeller.

Stopping: This operation consists in throwing the collar M in the opposite direction (to the left in Fig. 2) by the lever N and freeing the sleeve D from the cone C.

Reversing: This operation consists in forcing the collar M against the collar K, drawing the sleeve D into frictional contact with the sleeve E, which carries the spur-gear H.

Immediately the spur-gear H begins to rotate in the same manner with the shaft A and meshing with the spear-gears J sets them in rotation in the opposite direction from the shaft A, and the spur-gears J meshing with the internal gear *d* the shell F is rotated in the opposite direction from the shaft A. The gearing and shell F now being in motion, further pressure of the collar M against the collar K forces the inner face of the sleeve E against the face of the disk G, which in turn carries the interior cone-surface of the shell F into frictional contact with the outer cone-surface of the cone C. Thus it will be seen that an initial motion is given to the reversing mechanism before the propeller-load is forced upon it, thus preventing shock to the gearing and strain upon the clutch.

Having thus described my invention, what I claim is—

1. In a reversible friction-clutch, a driving-shaft and a driven shaft having a common axis, a friction-cone rigidly secured to said driven shaft and provided with external and internal frictional surfaces for imparting motion to said driven shaft in opposite directions, a friction-sleeve secured in rotation with and movable axially upon said driving-shaft, a shell engaging frictionally with said fixed cone upon the driven shaft, a second sleeve engaging frictionally with said sleeve on said driving-shaft, a disk secured to said shell, interposed gearing, and means for imparting axial movement to said sleeve held in rotation with said driving-shaft, substantially as and for the purposes set forth.

2. A reversible friction-clutch, consisting of a driving and a driven shaft and a cone secured to said driven shaft, provided with an external and an internal bearing-surface, a sleeve splined to said driving-shaft provided with a face to engage with the internal surface of said cone; a second sleeve taking over said sleeve splined to said driving-shaft and frictionally engageable with it, a spur-gear on said second sleeve, a spur-gear meshing therewith and mounted on a fixed support, an external shell provided with an internal gear meshing with said last-mentioned spur-gears and with an interior conical face to engage frictionally with the external face of the cone upon the driven shaft, a disk secured to said shell, and means for throwing the several frictional contact-surfaces in and out of action through axial action imparted to the sleeve splined to the driving-shaft, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand, in the presence of two witnesses, this 23d day of June, 1899.

JOHN J. LEARY.

Witnesses:
GRACE S. BOYD,
CHAS. V. CASE.