(No Model.)

G. D. TURNER & G. W. CUMMINGS.

GOVERNOR FOR PROPELLERS.

No. 573,116. Patented Dec. 15, 1896.

Fig. 1.

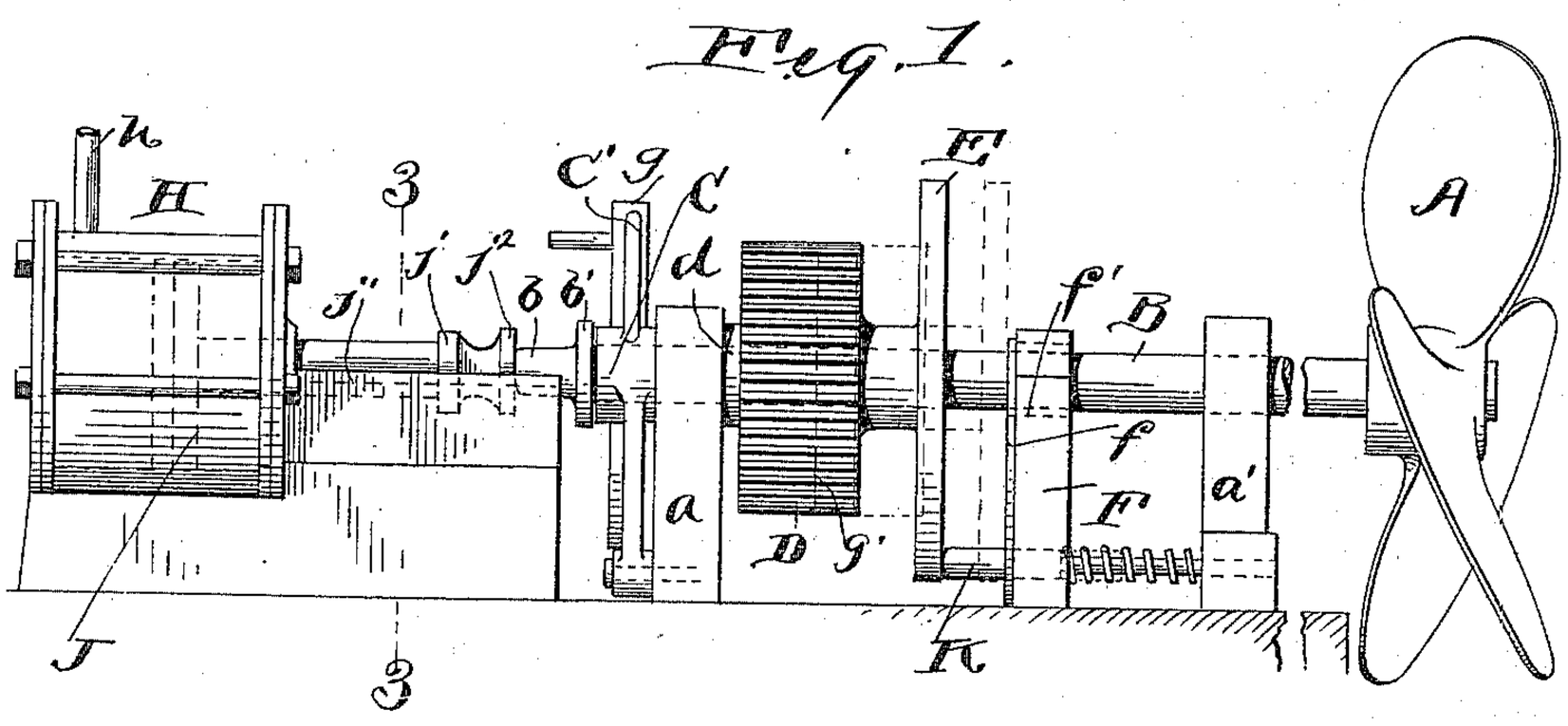


Fig. 2.

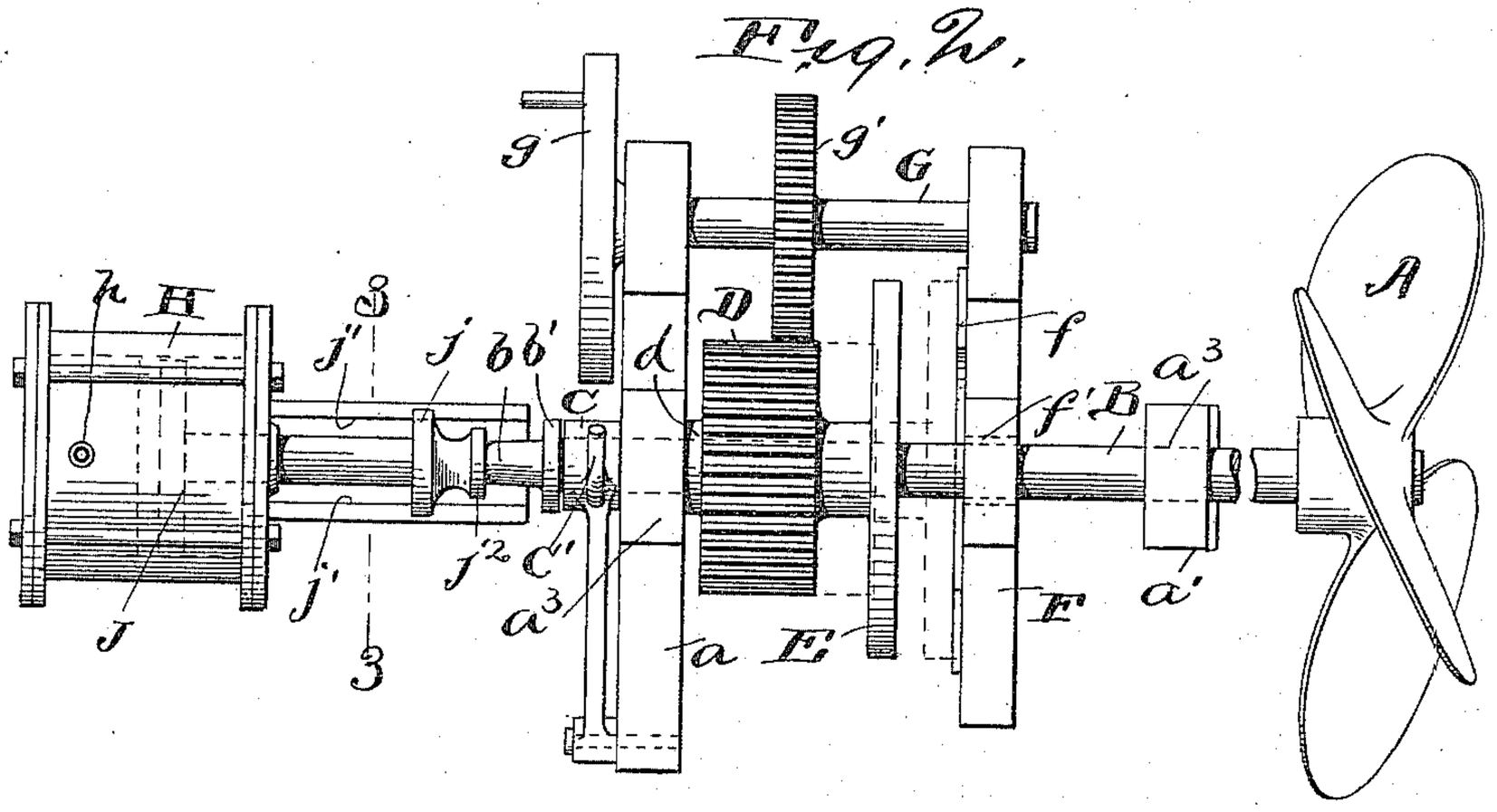
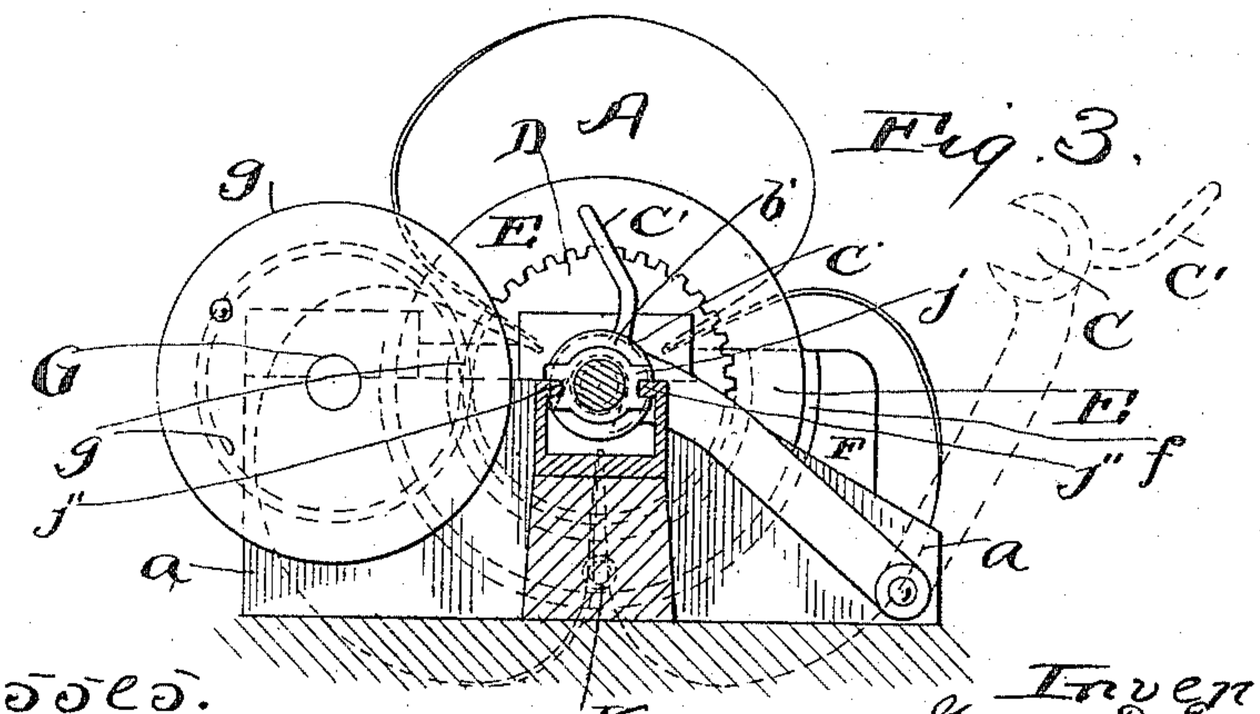


Fig. 3.



Witnesses.
E. B. Gilchrist
A. M. Austin.

Inventors.
George D. Turner
and
George W. Cummings.
By
Lynch, Dorer & Donnelly
Their Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE D. TURNER, OF CLEVELAND, OHIO, AND GEORGE W. CUMMINGS, OF MONROE CENTRE, MICHIGAN; SAID TURNER ASSIGNOR TO SAID CUMMINGS.

GOVERNOR FOR PROPELLERS.

SPECIFICATION forming part of Letters Patent No. 573,116, dated December 15, 1896.

Application filed April 9, 1896. Serial No. 586,895. (No model.)

To all whom it may concern:

Be it known that we, GEORGE D. TURNER, of Cleveland, Cuyahoga county, Ohio, and GEORGE W. CUMMINGS, of Monroe Centre, Grand Traverse county, Michigan, have invented certain new and useful Improvements in Governors for Propellers; and we 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 pertains to make and use the same.

Our invention relates to a device for preventing sudden variations in the speed of a ship's engines; and it consists in a means of applying resistance to the motion of the propeller-shaft when the resistance offered by the water to a ship's propeller is lessened or removed.

It further consists in certain features of construction and combinations of parts hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a plan view of our invention; and Fig. 3 is a cross-section on line 3 3, Figs. 1 and 2.

Referring to the drawings, A represents the propeller-wheel attached to the end of propeller-shaft B. Said shaft is journaled in suitable bearings a^3 a^3, provided by pillow-blocks a and a', which are disposed at suitable distances apart. Said shaft is permitted a limited amount of longitudinal motion in the direction of its axis in said bearings. The end b of the shaft extends beyond pillow-block a and at or near said end is provided with the collar b'. Suitably fastened and adapted to engage the shaft between said collar b' and pillow-block a is the pawl C for locking said sliding shaft, provided with the handle C′ for operating the same.

Rigidly attached to the propeller-shaft B and adjacent to pillow-block a is gear-wheel D. The width of said gear-wheel D is preferably equal to the greatest desired longitudinal movement of said propeller-shaft and is adapted to always mesh with a driving gear-wheel g' in the various positions assumed by said longitudinally-moving shaft. Contiguous to said gear-wheel D is the collar d, adapted to bear against pillow-block a and prevent wearing of said pillow-block upon shaft B, and rigidly attached thereto. Between gear-wheel D and propeller A is mounted friction-disk E. It will be observed that any device adapted to engage a friction-shoe and retard the motion of the propeller-shaft when so engaged may be used. We prefer, however, the disk E, which may be made of metal and of any desired size, according to the amount of friction required.

Adjacent to disk I and between said disk and the propeller-wheel is a standard F, provided with an opening f', through which the propeller-shaft B freely passes. Said standard is also provided with the metal segment or brake-shoe f, adapted to engage the face of friction-disk E and retard the motion of propeller-shaft, upon which the said disk is mounted.

Parallel to shaft B and adjacent thereto is shaft G, journaled in suitable bearings provided by pillow-block a and standard F. Mounted on said shaft is the gear or pinion wheel g', adapted to mesh with and operate gear-wheel D. Said shaft G may be operated by crank-wheel g, driven by an engine or by any suitable means.

A cylinder H is placed a suitable distance from the end b of the propeller-shaft and is supplied by the feed-pipe h with steam from the boiler or main steam-pipe. The piston J of said cylinder is axially in line with the propeller-shaft B and is provided with cross-head j, working in slides j' j', which extend slightly beyond and on each side of the end b of said propeller-shaft. The stroke of said piston is of sufficient length to cause shaft B to move the required distance longitudinally in its bearings. The piston-rod head j^2 may be a disk rotatable on said piston-rod as an axis in order to reduce wear.

We do not confine ourselves to the use of steam only, but may use hydraulic or other power to cause the piston-rod head or other bearing-surface to press against the propeller-shaft.

Between pillow-block a' and standard F we place the spring-controlled and yielding rod K. Said rod passes through an opening in standard F and is adapted to bear against disk E when said disk, being mounted on

shaft B, is forced toward the friction-shoe by the pressure of a piston against the longitudinally-movable propeller-shaft and by compression of the spring prevents too sudden contact between said shoe and friction-shoe.

Our invention is of especial value in rough seas, when the propeller or paddle wheel is often lifted partially or entirely out of the water, thus causing what is called "racing" of the ship's engines.

The operation of our invention is as follows: The locking-pawl C having been disengaged from the propeller-shaft, steam is turned into the cylinder H, thus causing the piston-rod J to bear continuously against the end of piston-shaft B. The pressure of the steam should be equal to about two-thirds the pressure of the forward thrust of the propeller-wheel against the water. When by the action of the waves the propeller-wheel is lifted out of the water and the resistance of the water is thus removed, the piston forces the shaft B outward until the friction-disk comes into contact with the friction-shoe, which retards the revolution of the propeller-shaft. When the propeller-wheel again strikes the water, the resistance of the water causes the wheel and shaft to move forward and the piston will be forced back, compressing the steam and driving it back through feed-pipe and throttle, thus allowing the wheel and shaft to come gradually to their normal position.

It will be observed that the width of gear-wheel D is sufficient to enable it always to mesh with pinion g' and that the longitudinal movement of shaft B does not interfere with the rotary motion of said shaft or of propeller-wheels.

In calm weather or when the ship moves backward the adjustable pawl C is thrown on and the longitudinal movement of the shaft is prevented.

Our invention is equally useful in ships and boats using paddle-wheels instead of propellers, and we do not intend to confine ourselves to either class.

What we claim is—

1. In a governor for a propeller, the combination with a rotatably and longitudinally moving propeller-shaft, provided with a friction-disk rigidly attached to said shaft, of a piston-rod axially in line with said propeller-shaft and a cylinder for operating the same, substantially as and for the purpose shown and described.

2. In a governor for a propeller, the combination with a rotatably and longitudinally moving propeller-shaft provided with a friction-disk rigidly attached to said shaft, of a friction-shoe suitably disposed and adapted to be engaged by the face of said friction-disk, substantially as and for the purpose shown and described.

3. In a governor for a propeller, the combination with a propeller-shaft rotatably and longitudinally movable in suitable bearing, of a piston-rod, provided with an end disk, rotatable on said piston-rod and a cylinder for operating the same, substantially as and for the purpose shown and described.

4. In a governor for a propeller, the combination with a propeller-shaft rotatably and longitudinally movable in suitable bearings, said shaft being provided with a collar, of a movable pawl adapted to engage said shaft between the said collar and bearing and prevent longitudinal motion of said shaft, substantially as and for the purpose shown and described.

5. In a governor for a propeller, a propeller-shaft rotatably and longitudinally movable in suitable bearings, provided with a friction-disk rigidly attached thereto; and a gear-wheel also attached to said shaft and having the pinion-wheel connected with suitable power and adapted to mesh with the said gear-wheel; arranged substantially as and for the purpose shown and described.

6. In a steam-governor for a propeller, a propeller-shaft rotatably and longitudinally movable in suitable bearings, a friction-disk rigidly attached to said shaft adapted to engage a friction-shoe fixed to a standard suitably disposed; a spring yielding rod to prevent too sudden contact between said friction-disk and friction-shoe, a gear-wheel also attached to said propeller-shaft and having its face of sufficient width to always mesh with a power-driven pinion-wheel and a collar on said shaft arranged substantially as and for the purpose shown and described.

In testimony whereof we sign this specification, in the presence of two witnesses, this 25th day of February, 1896.

GEORGE D. TURNER.
GEORGE W. CUMMINGS.

Witnesses as to George D. Turner:
ELLA E. TILDEN,
ALBERT M. AUSTIN.
Witnesses for George W. Cummings:
BYRON CRAIN,
AHIRA. B. CRAIN.