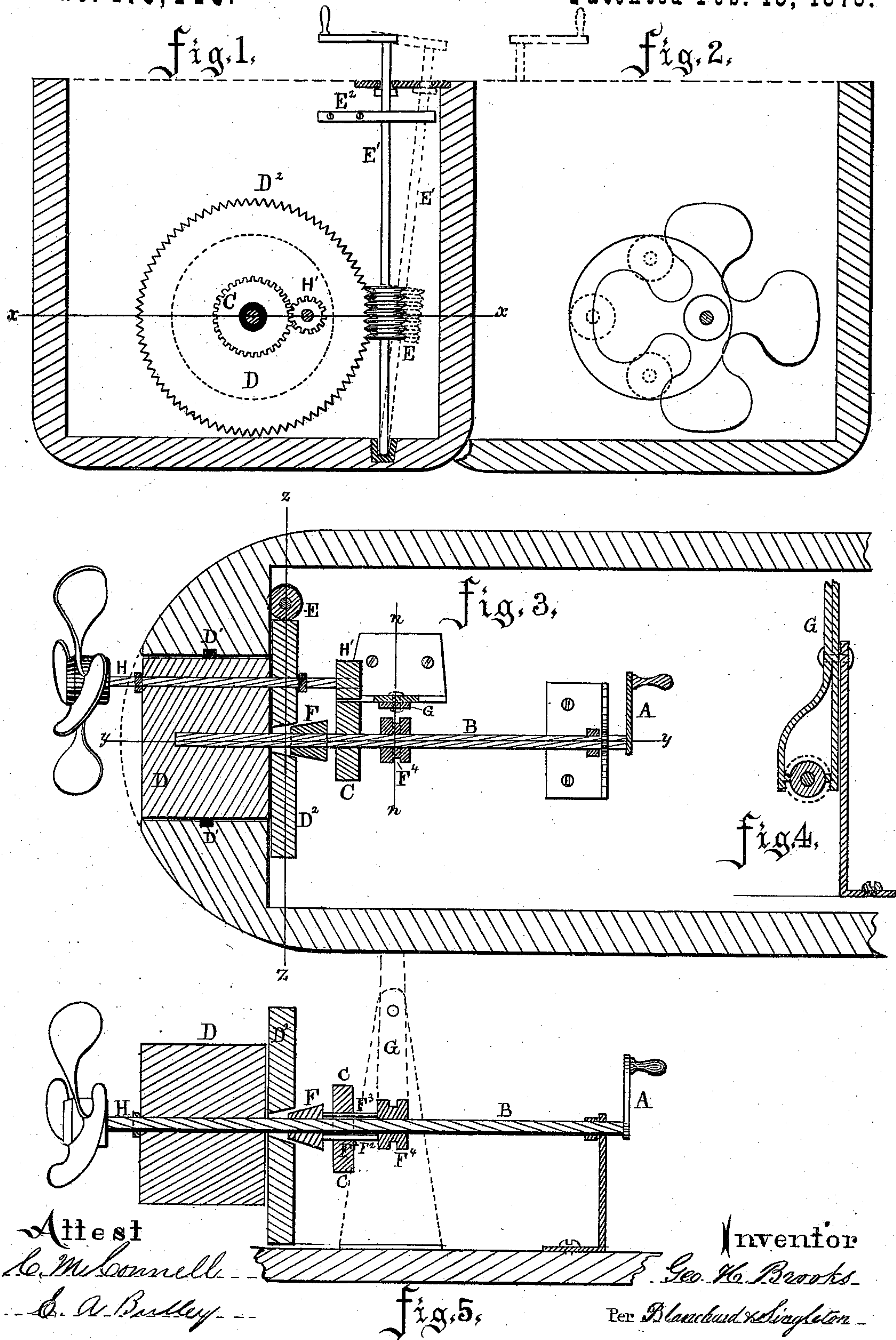


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MECHANISM FOR CHANGING POSITION OF PROPELLERS.

No. 173,443.

Patented Feb. 15, 1876.



Attest  
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# UNITED STATES PATENT OFFICE.

GEORGE H. BROOKS, OF HANCOCK, MARYLAND.

## IMPROVEMENT IN MECHANISMS FOR CHANGING POSITION OF PROPELLERS.

Specification forming part of Letters Patent No. 173,443, dated February 15, 1876; application filed December 30, 1875.

*To all whom it may concern :*

Be it known that I, GEORGE H. BROOKS, of Hancock, in the county of Washington and State of Maryland, have invented certain new and useful Improvements in Mechanism for Adjusting Propellers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a sectional elevation on line *z z* of Fig. 3, showing the shaft which is driven by the engine, and a gear-wheel mounted thereon, a pinion upon the propeller-shaft, the revolving cylinder, in which the propeller-shaft has its bearings, with a worm-wheel upon it, and a worm and its shaft and crank for changing the position of the propeller and its shaft, or for securing the same in their adjusted positions. Fig. 2 is an end view, showing the revolving cylinder, the propeller, and, in dotted lines, some of the positions in which it may be placed. Fig. 3 is a section on line *x x*, Fig. 1, showing the revolving cylinder, the propeller and its shaft in position, the engine-shaft and its gearing, and a friction-clutch, which enters the end of the cylinder, for the purpose of changing the position of the propeller, and it also shows the worm for making such change by hand. Fig. 4 is a sectional elevation on line *n n*, Fig. 3, showing the lever for throwing the frictional clutch into gear with the revolving drum; and Fig. 5 is a section on line *y y* of Fig. 3, showing the revolving drum, the friction-clutch, the engine-shaft, and the propeller.

Corresponding letters refer to like parts in the several figures.

This invention relates to mechanism for raising and lowering the propellers of vessels and boats propelled by steam or other similar power, and also for changing their position horizontally with reference to a line drawn vertically through the center of the vessel or boat; and it consists of a revolving cylinder or drum placed in the shell or frame-work thereof, and so constructed and arranged that the shaft to which the propeller is attached

may have its bearings formed in or upon the same, and so that by a full or partial rotation of said cylinder the position of the propeller may be changed, for the purpose of adapting it to the propulsion of an empty or loaded, or partially-loaded vessel or boat, and so that when the same is used in canals or narrow streams of water, and when coming alongside of docks or wharves, it may be shifted from the side of the center line of the vessel or boat, on which it would be most exposed to injury, to the opposite side, where it would be the least exposed; and it further consists in the construction, combination, and arrangement of some of the parts, as will be more fully explained hereinafter.

It is well known that in order that propellers for canal-boats, and for boats which run upon narrow streams, may be thoroughly effective in their work, they should be so arranged that when the boats are empty, the same may be lowered, so as to have the proper proportion of their blades below the surface of the water; and it is of still more importance that they should be capable of such an adjustment as will bring them into such a position when partially or fully loaded. It is also important that for the class of boats alluded to their propellers should be capable of such an adjustment as will enable their operators to change them from the side of the center of the boat which is nearest to the bank of the canal or river to that side thereof which is farthest therefrom, where the water is of greater depth, and where the blades are less liable to come in contact with the banks or other solid substances which would be likely to damage them; and the object of this invention is the production of mechanism that will produce the results above alluded to.

For the purpose of putting my improved mechanism into practical operation there is placed in any convenient part of the boat a steam or other engine, which is so arranged that its connecting-rod may be attached to a crank, A, which is secured to a shaft, B, placed in suitable bearings, and which is extended rearward far enough to cause its rear end to enter a revolving cylinder or drum, soon to be described.

Upon the shaft B there is secured a gear-



wheel, C, which is to be of such a diameter as to cause it to give to the propeller the required number of revolutions to every revolution of the engine-shaft.

Directly in rear of the shaft B there is a cylinder or drum, D, which is fitted into an aperture in the stern of the boat, it having upon its periphery an annular projection, D<sup>1</sup>, or other suitable device for preventing the endwise movement of the same, and for preventing the water from passing it; or a stuffing-box may be placed at its outer end, and so arranged that by screwing up its gland the leakage will be prevented.

Upon the inner portion of the cylinder D there is a projecting flange, D<sup>2</sup>, the periphery of which is formed into cogs or teeth for the reception of the threads of a worm, E, as shown in Figs. 1 and 3, said worm being mounted upon a shaft, E<sup>1</sup>, the lower end of which rests in a step, while its upper end is held in position by a bracket, E<sup>2</sup>, in which it is made adjustable, as shown in Fig. 1, so that the worm may be made to mesh with the toothed periphery of the cylinder D, and thus, by being rotated by the crank upon its upper end, be made to rotate the cylinder and change the position of the propeller either vertically or horizontally. I have shown another method of changing the position of the propeller, which is the one I prefer to use, and which consists in forming in the inner head or end of the cylinder a tapering aperture for the reception of a conical clutch, F, which is made to slide freely upon the shaft B, with which it rotates, it being operated by means of two rods or levers, F<sup>2</sup> F<sup>3</sup>, which pass through grooves formed in the wheel C, and are connected to an annularly-grooved ring, F<sup>4</sup>, which is moved horizontally by means of a forked lever, G, the construction of which is shown in Fig. 4. When it becomes desirable to change the position of the propeller by means of this mechanism—as it generally will when the engine is in motion—the worm E is placed in the position shown in dotted lines in Fig. 1, and the lever G is placed in such a position as to cause the conical clutch to enter the cavity formed in the head of the cylinder, which will cause the same to be quickly rotated, and this movement will place the propeller in any of the four positions shown in Fig. 2, or at any point between either of them, its position being determined by observing the position of the pinion on the end of its shaft with reference to the wheel which drives it; or it may be by an indicator arranged for that purpose.

When the propeller has been properly adjusted, the worm may be placed in the position indicated by full lines in Fig. 1, and the cylinder will thus be held in its desired posi-

tion; or the same result may be accomplished by causing the surfaces that come in contact with the cylinder to hold the same by their friction, in which case the worm may be dispensed with. The shaft H, which carries upon its outer end the propeller, has its bearings in the cylinder D, it being arranged eccentric to the center thereof, and at such a distance therefrom as to cause the pinion H' upon its inner portion to mesh into and be driven by the gear-wheel C upon the engine shaft.

It will be seen that, as a consequence of the construction and arrangement of the parts, the shaft which carries the propeller and the pinion upon its end are free to revolve entirely around the engine-shaft, and that, as a consequence thereof, the same may be placed in any desired position within the range of its circuit around said shaft, and that it may be elevated or depressed, according to circumstances; or it may be changed from a dangerous position in shoal water to a position of comparative safety, and into deeper water, and that any of these changes can be made in a very short period of time.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A rotating cylinder or drum arranged in the frame-work of a vessel, and having bearings in or upon it for supporting the shaft of a propeller, substantially as and for the purpose set forth.

2. The combination and arrangement of the engine-shaft B, with its gear-wheel C, the propeller-shaft H, with its pinion H', and a revolving cylinder, D, the parts being arranged substantially as set forth, whereby the propeller-shaft and its pinion are allowed to rotate around the engine-shaft, for the purpose of adjusting the position of the propeller, as described.

3. The combination of the revolving cylinder with its toothed projection and worm E, they being arranged to operate substantially as and for the purposes set forth.

4. The combination of the revolving cylinder, the sliding friction-clutch, and the lever for moving said clutch, substantially as and for the purpose set forth.

5. The combination of the engine-shaft B, gear-wheel C, pinion H', shaft H, and the propeller, the parts being arranged to operate substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

GEO. H. BROOKS.

Witnesses:

GEORGE A. FREY,  
JOHN FREY.