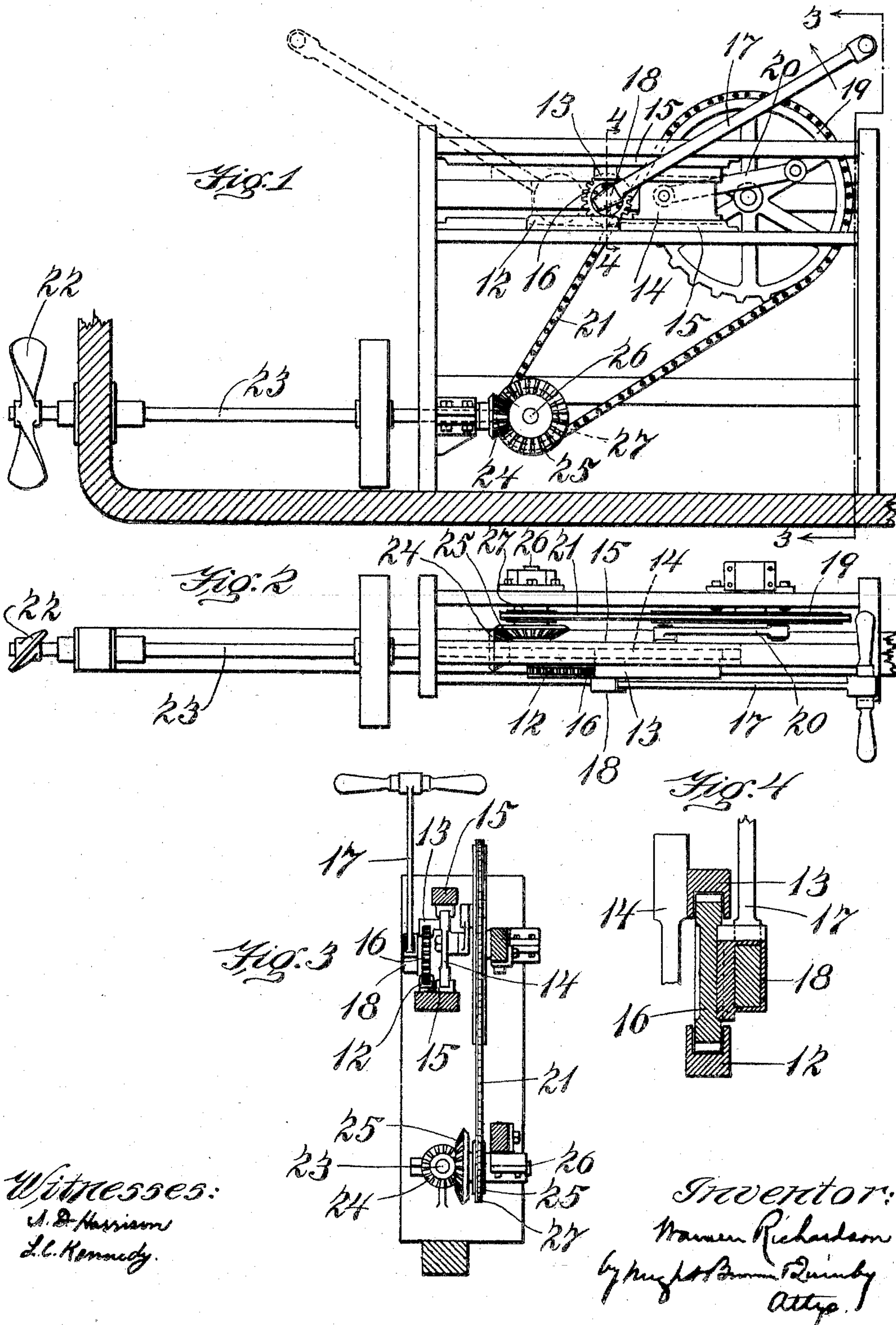


No. 767,085.

PATENTED AUG. 9, 1904.

W. RICHARDSON.
MECHANICAL MOVEMENT.
APPLICATION FILED SEPT. 22, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

WARREN RICHARDSON, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH TO C. WALTER TOLSTRUP, OF MAPLEWOOD, MALDEN, MASSACHUSETTS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 767,085, dated August 9, 1904.

Application filed September 22, 1903. Serial No. 174,227. (No model.)

To all whom it may concern:

Be it known that I, WARREN RICHARDSON, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention has for its object to provide means for advantageously imparting move-
10 ment to propellers and other devices by hand-power.

The invention consists in the improved mechanical movements, which I will now proceed to describe and claim.

15 Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a mechanical movement embodying my invention applied to a propeller-shaft. Fig. 2 represents a top plan
20 view of the same. Fig. 3 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a section on line 4 4 of Fig. 1.

The same numerals of reference indicate the same parts in all the figures.

25 In the drawings, 12 represents a fixed rack secured to a supporting-frame and preferably arranged horizontally.

13 represents a rack which is adapted to reciprocate endwise in a path parallel with
30 the rack 12, the said movable rack 13 being movable in fixed guides attached to the supporting-frame. The rack 13 is here shown as formed on a cross-head 14, the edges of which are engaged with horizontal guides 15
35 15, fixed to the supporting-frame, the rack 13 and the cross-head 14 being adapted to reciprocate in said guides.

16 represents a pinion which is interposed between the racks 12 and 13 and is engaged
40 with said racks. To the pinion 16 is affixed a handle or lever 17, which is preferably engaged with the pinion by means of a socket 18, affixed to one side of the pinion, the lever being inserted in said socket. When the lever
45 17 is moved in the direction indicated by the arrow thereon in Fig. 1, the pinion 16 is partially rotated and caused to roll along the fixed rack 12 and to impart endwise motion to the movable rack 13 and cross-head 14. When

the lever 17 is moved in the opposite direction, 50 endwise movement is in like manner imparted to the rack 13 and cross-head 14 in the opposite direction. It will be seen, therefore, that by oscillating the lever 17 the movable rack and cross-head are reciprocated. 55

19 represents a rotary body, here shown as a sprocket-wheel, the shaft of which is jour-
naled in bearings on the supporting-frame. The reciprocating movements of the movable rack 13 are caused to rotate the rotary body 60 or wheel 19 through a pitman 20, connected with the cross-head 14 and with the wheel, as indicated in Fig. 1. A continuous rotary movement in one direction may thus be im-
parted to the wheel 19, and motion may be 65 communicated from said wheel to any desired mechanism through a sprocket-chain 21. I have here shown a propeller 22 as the object to be driven by the described mechanical move-
ment, said propeller being affixed to the shaft 70 23 and connected by bevel-gears 24 25 with a shaft 26, to which is affixed a sprocket-wheel 27, engaging the chain 21.

I have found that by the described mechanism I am enabled to apply hand-power ad- 75 vantageously to any light mechanism to be driven. A propeller of suitable size to propel a small boat may be advantageously driven by the means described, and said means may be applied to the driving of various other ar- 80 ticles, such as circular saws, &c.

It will be seen that the fixed rack 12 and the pinion 16, affixed to the lever 17, constitute a means for moving the fulcrum of the lever progressively in a rectilinear direction 85 when the lever is swinging on said fulcrum, the latter being reciprocated by the oscillation of the lever. It will also be seen that the movable rack 13 and the pinion 16 constitute a means for augmenting the rectilinear move- 90 ments of the fulcrum, and thus increasing the amplitude of the endwise movements of the rod or pitman 20, so that the length of the oscillating movements of the lever is reduced to the minimum, while its force is fully utilized. 95

I claim—

1. A mechanical movement comprising a fixed rack, an opposed rack movable in a path

adjacent to the fixed rack, a cross-head affixed to said movable rack, fixed guides for the cross-head, a pinion meshing with said racks, a lever secured to the pinion, a rotatable body
5 and a pitman connecting the cross-head with said body.

2. A mechanical movement comprising a pair of opposed fixed guides, a cross-head fitted to slide between said guides and having
10 a rack formed therewith, a fixed rack opposed to the cross-head rack, a pinion between and meshing with said racks, a lever secured to

the pinion, a body mounted to rotate on an axis substantially in the plane of reciprocations of the cross-head, and a direct pitman
15 connection between the cross-head and said rotatable body.

In testimony whereof I have affixed my signature in presence of two witnesses.

WARREN RICHARDSON.

Witnesses:

C. F. BROWN,

A. D. HARRISON.