(No Model.)

J. D. WILLIAMSON, Jr.

STEERING APPARATUS.

No. 472,324. Patented Apr. 5, 1892.

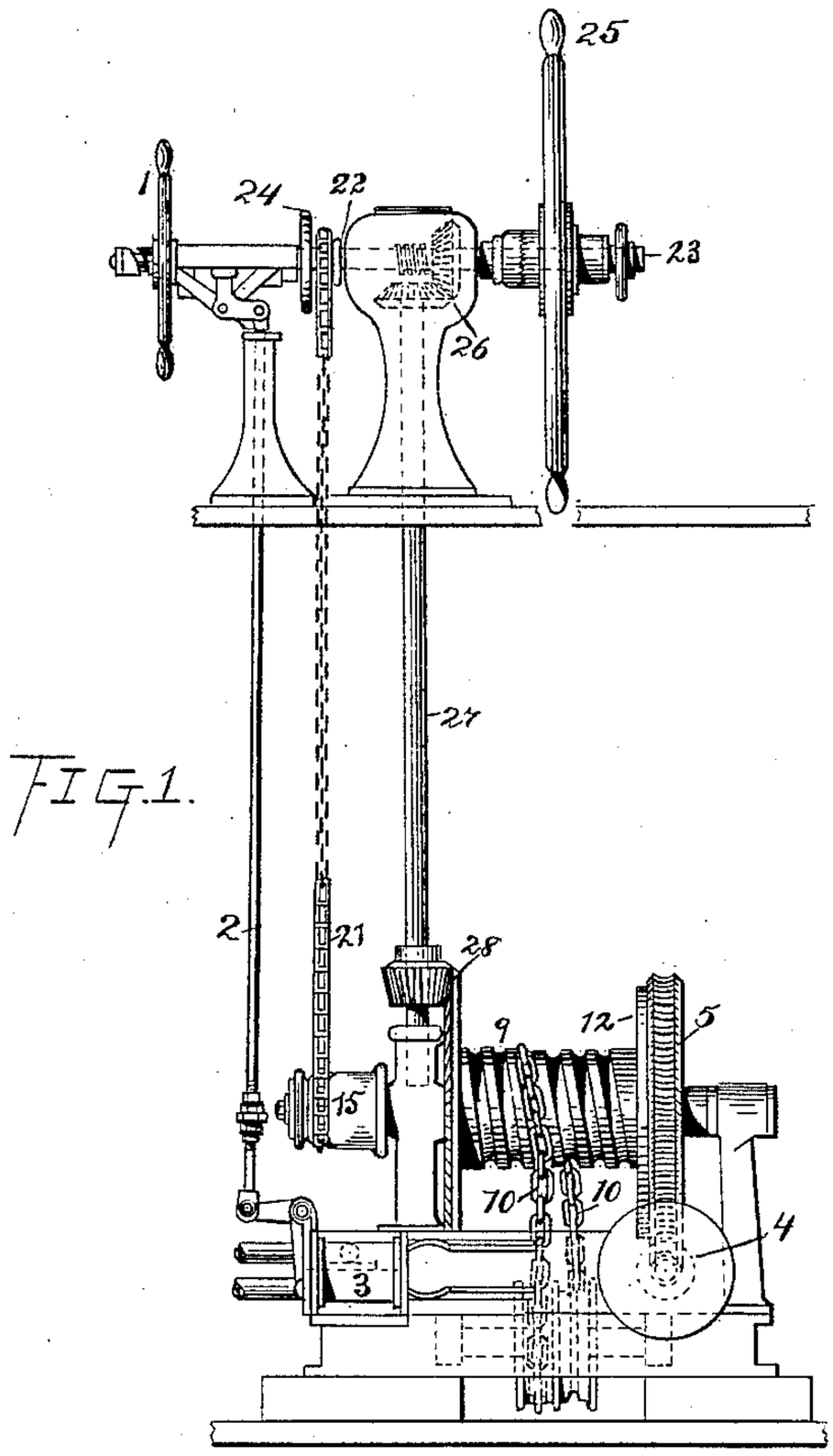


FIG. 1.

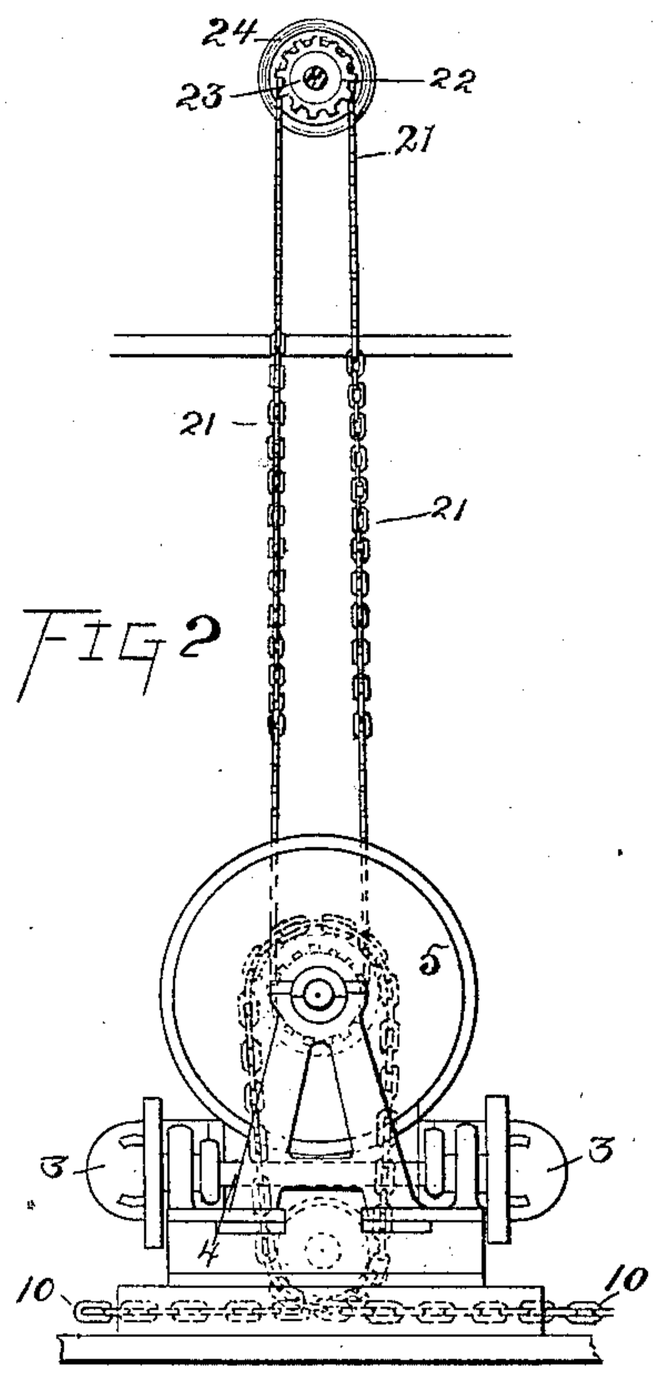
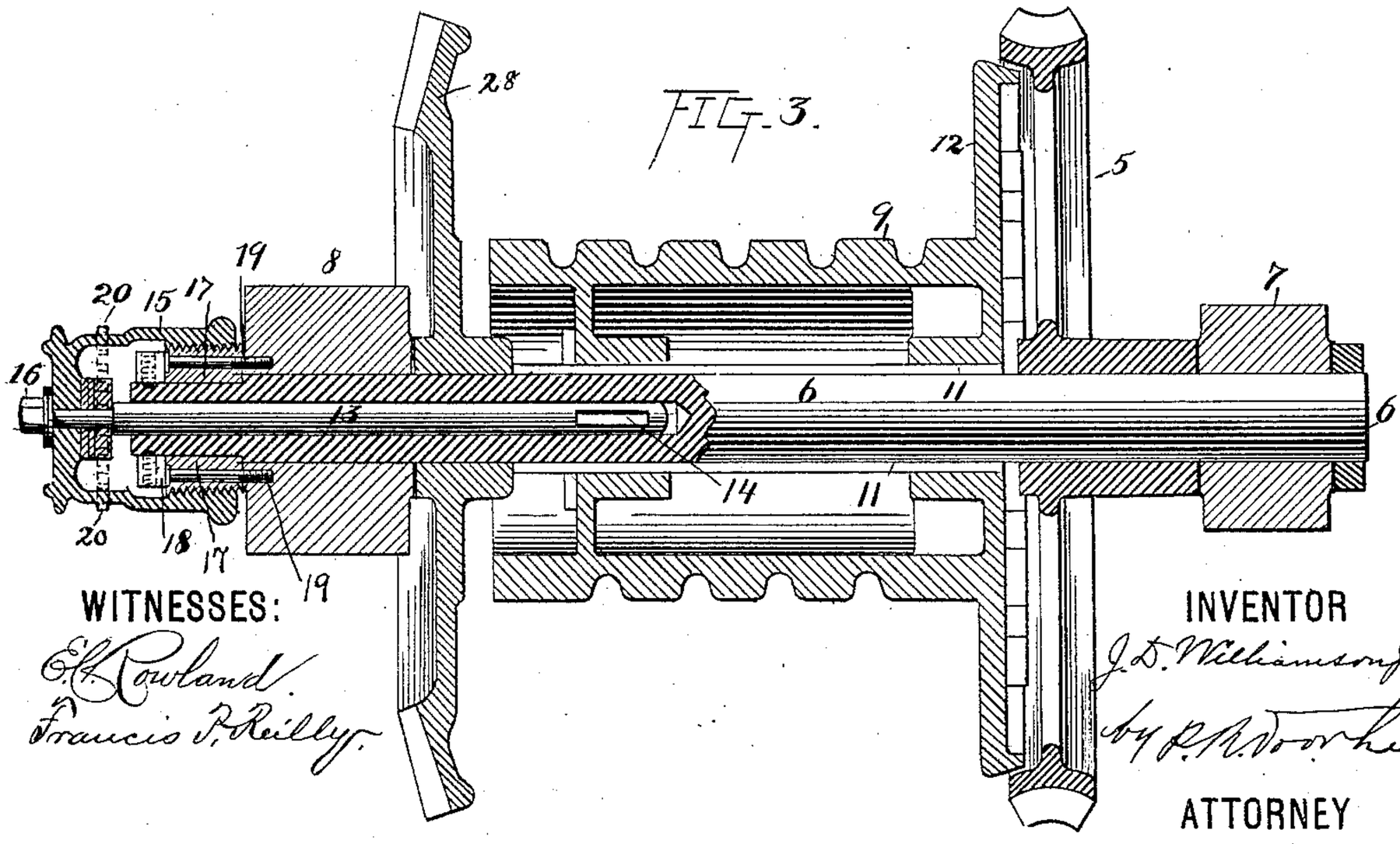


FIG 2

FIG. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN D. WILLIAMSON, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, GEORGE W. WILLIAMSON, AND WILLIAM C. WILLIAMSON, OF SAME PLACE.

STEERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 472,324, dated April 5, 1892.

Application filed September 15, 1890. Serial No. 364,987. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. WILLIAMSON, Jr., of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Steam and Hand Steering Apparatus for Ships, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide certain means for throwing the steering-drum either in or out of gear with the engine-shaft, according as it is desired to steer by steam or other engine power or by hand-power, and to quickly accomplish this throwing in and out of gear in the pilot-house or by the helmsman tending the wheel.

The invention will first be described in detail, and then particularly set forth in the claim.

In the accompanying drawings, Figure 1 is a side elevation of a combined hand and steam steering apparatus embodying the invention herein described. Fig. 2 is an end elevation of Fig. 1, looking to the right, the steering-wheels being omitted. Fig. 3 shows in longitudinal section, upon an enlarged scale, part of the improvement constituting the invention herein described and certain parts of the power driving mechanism, including the steering-drum, which may be operated either by steam-power or by hand, as hereinafter described.

In the figures the several parts are respectively indicated by reference-numbers, as follows, the parts not numbered forming no part of this invention.

The smaller hand-wheel 1, by means of the rod 2 and connecting-levers and other mechanism at each end of said rod, Fig. 1, by its revolution in either direction, correspondingly starts the steam-engines 3, which engines, by a worm on one common crank-shaft 4, rotate the worm-wheel 5, keyed fast to a drum-shaft 6, mounted in suitable frames or bearings 7 8. When said hand-wheel is held at rest, the engines quickly come to a state of rest and remain in such state, holding the rudder at the desired angle through the intervention of the steering-drum 9 and the chains 10 so long as said drum is coupled to the worm-wheel 5. For convenience, said drum is mounted loosely on the shaft 6, but capable of sliding longitudinally thereon a certain distance upon a feather or feathers 11 on said shaft.

A clutch-coupling of any approved form, and as such forming no part of this invention, is formed between a disk or flange 12 on one end of the steering-drum 9 and in one side of the worm-wheel 5. If said drum, therefore, be slid on the shaft 6 until its flange 12 couples with the worm-wheel 5, the rudder will be operated by the application of the steam-power, as just described; but when said drum is slid in the opposite direction, so that the clutch will uncouple from the worm-wheel 5, the steam-power is entirely disconnected from the steering-drum and no operation of it will affect the rudder in any way nor hinder the movement of the rudder by any other applied power. Such detaching or throwing out of gear of steering-drum and engine connection has heretofore been effected by devices connected to said drum and operated at the points of their connection thereto, and in ships the apparatus carrying the drum is generally located more or less remote from the location of the pilot-house or helmsman's wheel, usually at one deck distant at least. Hence when it is desired to disconnect the steam-power more or less time is necessarily lost in going below to get at and operate the detaching device.

The object of this invention, therefore, as hereinbefore stated, is to provide a ready means near the hand of the helmsman by which he, while at the wheel, or any one near him, can quickly detach the steam-power, leaving the hand-power free to operate the steering-drum for the control of the rudder. This is effected in the following manner by the parts below described: The drum-shaft 6 is bored out a portion of its length, as shown in Fig. 3. Within said bore is placed a coupling-rod 13, keyed through a slot in said shaft by a cross-key 14 to the steering-drum 9, said slot being long enough to admit of said key having linear travel therein with the sliding of said drum. The outer end of said rod, reduced in diameter, passes through the eye of a boss in the outer end of a coupling nut or sleeve 15. Said sleeve and rod are secured

together by a nut 16 on the outer end of said rod, so that the sleeve 15 and rod 13 can each rotate independently of the other, the rod being keyed at its inner end through a slot in the shaft 6 to the drum 9, as hereinbefore described. The sleeve 15 is threaded, so that it will screw a certain distance on and off a threaded projection or annular bolt 17, secured to the frame or bearing 8 by a collar 18 and bolts 19; but the bolt 17, instead of being secured to the part 8, may be formed integral therewith. The sleeve 15 is fitted with a number of teeth or sprockets 20, around which is passed an endless sprocket band or chain 21, which band passes upward over a sprocket-sleeve 22, loosely mounted on the hand-wheel shaft 23. The sleeve 22 is provided for convenience with a disk handle or wheel 24.

The operation of the invention is very simple and quite obvious. When it is desired to change from steam-steering to hand-steering, it is only necessary, the engines being at rest, to turn the disk handle or wheel 24 in the required direction to cause the sleeve 15 to back off its bolt 17 a short distance. This linear travel of the nut or sleeve 15 will pull on the rod 13, which, keyed to the drum 9, will pull the same along the shaft 6, uncoupling the clutch 12 from the worm-wheel 5. This being done by moving the large hand-wheel 25, hand-power is transmitted through the gearing 26, shaft 27, and gearing 28 to the drum-shaft 6, which, being thus rotated, revolves the drum 9, and thus, through the chains 10, controls the rudder. The reverse movement of the disk-handle 24, it is obvious, will, by imparting a reverse movement to the coupling-rod 13, again couple the drum to the engine-power mechanism when desired. It is obvious that the sleeve 22, with its disk-handle 24, instead of being mounted on the wheel-shaft, may be mounted upon a special shaft or center of its own at any point within convenient reach of the helmsman, as upon a bulk-head or wall of the pilot-house. It is likewise obvious that the sprocket member or nut 15, instead of having a female screw within a hollow hub, may operate as a male screw within a sleeve or nut in line with the drum-shaft. A sliding friction-clutch or spring-clutch of any well-known form may be substituted for the clutch shown, as the form of the clutch constitutes no part of this invention; nor is it material to this invention by what kind of gearing the drum-shaft is driven, or whether directly by the engine-power and hand-power without the intervention of gearing in either or both cases.

While sprocket-gearing such as illustrated in the drawings is preferable from its positive character, yet of course any band or belt may be substituted therefor that will transmit the motion of the sleeve or hub 22 to the member 15.

Having thus fully described my said invention, I claim—

In a steering apparatus for ships, in combination with a power-driven wheel and a steering-drum separately connected by a coupling between them and mounted upon a shaft 6, a rod 13, keyed at one end to said drum within a bore in said shaft, a screw-threaded nut 15, a fixed threaded bolt 17, said rod 13 being secured to said nut at its outer end by a nut and collar and said nut 15 being mounted on said bolt 17 to rotate thereon, and a sleeve or pulley 22, mounted on a fixed center, so as to rotate thereon and connected by an endless belt or chain to said nut 15, whereby upon the rotation of said sleeve the power-driven wheel and the steering-drum are either connected or disconnected, as may be desired, for the purposes set forth.

JOHN D. WILLIAMSON, JR.

Witnesses:
C. WESLEY RUFFELL,
MATHIAS SEDDINGER.

Corrections in Letters Patent No. 472,324.

It is hereby certified that Letters Patent No. 472,324, granted April 5, 1892, upon the application of John D. Williamson, jr., of Philadelphia, Pennsylvania, for an improvement in "Steering Apparatus," was erroneously issued to the inventor and George W. Williamson and William C. Williamson, as joint owners of said invention; whereas the patent should have been granted to said *George W. Williamson and William C. Williamson and one John D. Williamson*, they being owners of the entire interest as shown by the assignments of record in the Patent Office; and it is further certified that an error appears in the printed specification requiring correction, as follows: In line 70, page 2, the word "separately" should read *separably;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 26th day of April, A. D. 1892.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

W. E. SIMONDS,
Commissioner of Patents.