(No Model.) 2 Sheets—Sheet 1.

G. F. CLEMONS.

SHIP STEERING MECHANISM.

No. 305,741. Patented Sept. 30, 1884.

Fig 1

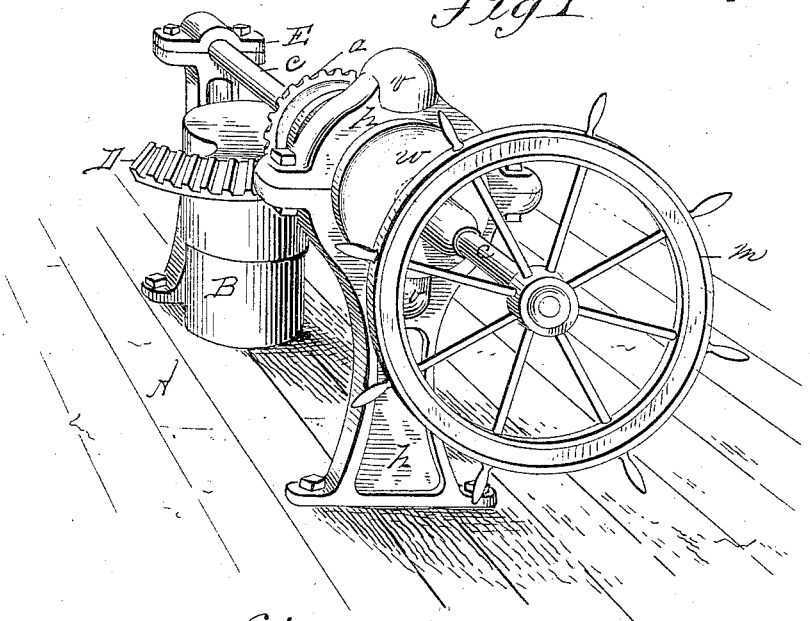


Fig 2

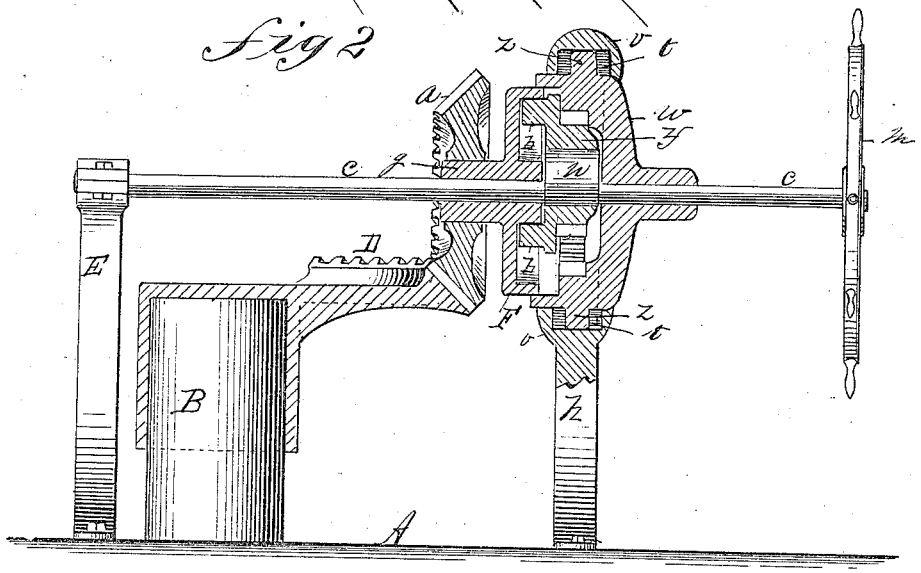
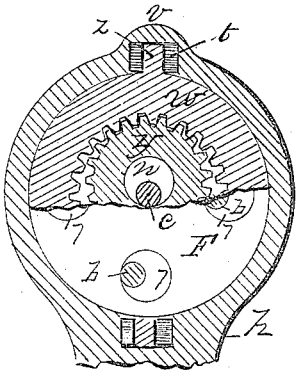


Fig 3



WITNESSES:

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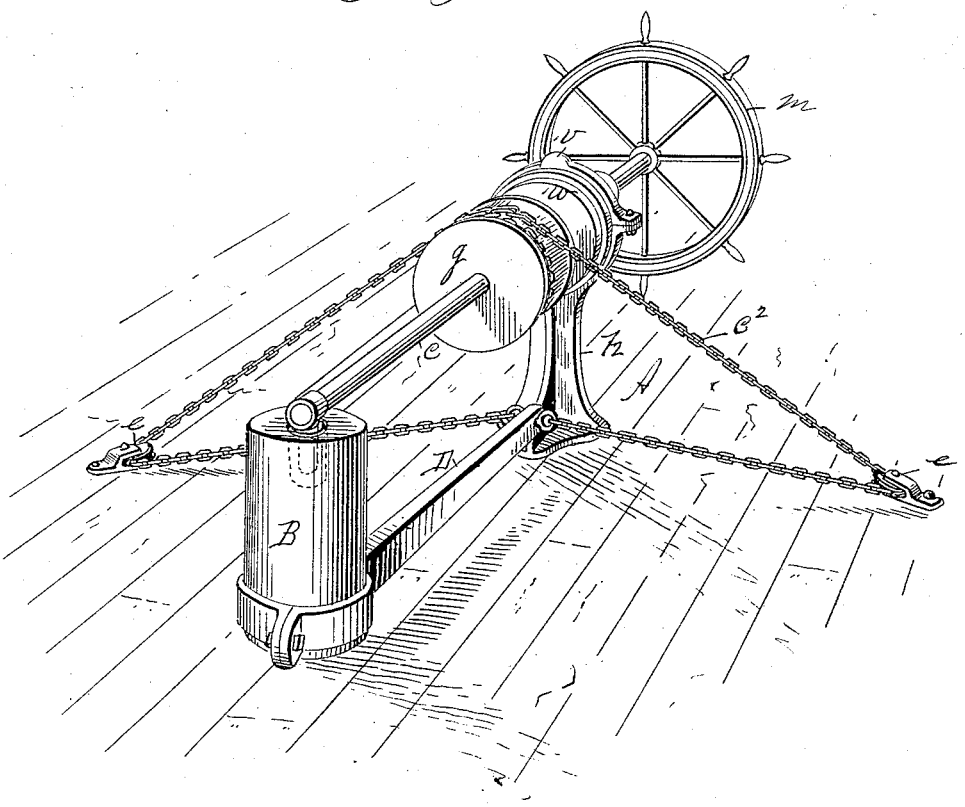
Fig 4



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UNITED STATES PATENT OFFICE.

GEORGE F. CLEMONS, OF SPRINGFIELD, MASSACHUSETTS.

SHIP-STEERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 305,741, dated September 30, 1884.

Application filed December 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CLEMONS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Ship-Steering Mechanism, of which the following is a specification.

This invention relates to improvements in ship-steering devices adapted to be operated by hand or otherwise, the object being to provide mechanism, connected with the rudder by chains, ropes, gearing, or other suitable means, of such power that one man only is required to control and operate it, and which is constructed to of itself hold the rudder in any position to which it may have been turned or against any strain of currents or waves without locking it and independent of any power exerted upon the wheel, and yet which is always free to be operated without delay.

In the drawings forming part of this specification, Figure 1 is a perspective view showing a portion of a ship's deck, together with the upper end of the rudder-post and of steering devices geared to the latter embodying my improvements. Fig. 2 is a side elevation, partly in section. Fig. 3 is a front view, partly in section, of parts of the operating mechanism. Fig. 4 is a perspective view illustrating my improvements connected with the rudder-post by chains and lever.

The mechanism of this device, which is connected with the ordinary steering-wheel and its shaft and with the rudder by gearing, chains, or otherwise, is substantially that described and shown in my patent dated May 1, 1883, for "apparatus for transmitting differential rotary motion," to which reference may be had.

The said patented device or mechanism consists, substantially, of the perforated disk F, having in this construction a hub, *g*, thereon, to which is fixed a gear, *a;* also, of a pinion, *y*, located by the side of said disk, and carrying on one of its faces a series of studs, *b*, which enter the perforations in disk F; also, of an eccentric, *n*, fixed in this machine on the wheel-shaft *c*, which, when said shaft is turned, carries the pinion *y* around in an eccentric path; and, also, of an internal gear, *w*, with which the teeth of said pinion engage, and whereby when the latter is carried around eccentrically, as aforesaid, said pinion is caused to rotate, giving rotary motion to the disk F and gear *a*. The rudder-post B stands up through the deck A, as usual, and has secured to it a geared segment, D, with which the gear *a* engages. The wheel-shaft *c*, having secured on it the usual steering-wheel, *m*, has its rear end supported in a suitable bearing on the standard E, which is bolted to the deck A in the rear of the rudder-post B. The internal gear, *w*, partly within which the disk F and pinion *y* operate, is supported in a yoke-frame, *h*, which is bolted to the deck in front of the rudder-post. The internal gear, *w*, has upon its outer face two studs, *z z*, opposite each other, upon which are placed heavy rubber springs *t*, of cylindrical form. Sockets *v v* are made in the yoke-frame *h* to receive the said studs and rubber springs, the yoke-frame encircling and supporting gear *w* and the parts within and passing through it, as shown in Fig. 2.

The operation of the above-described device is as follows: When shaft *c* is turned by wheel *m*, the eccentric *n* carries the pinion *y* around, rolling it against the teeth of gear *w*, and giving it a rotary motion on the said eccentric. As aforesaid, the studs *b* on the rear face of pinion *y* engage in the perforations 7 of the disk F, causing the latter and gear *a* on the hub *g* of said disk to be rotated, and since the gear *a* engages with the geared segment D on the rudder-post B the latter and the rudder are thereby turned in either direction by turning wheel *m*. The turning of the eccentric *n* in pinion *y* gives a rotary motion to gear *a;* but no amount of force exerted upon said gear by the rudder-post can rotate it, for the disk F is by said force turned against the studs *b* on pinion *y*, and the axis of the latter is eccentric to that of the disk F, and the periphery of said pinion engages with the teeth of the internal gear, *w*. Therefore the force of the rudder cannot rotate the parts so long as the internal gear is held so that it cannot turn in frame *h*.

The purpose of the springs *t* on the studs *z* of the gear *w* is to provide cushioned bearings for said studs, to relieve the parts somewhat from the great force of the waves when they strike the sides of the rudder and give a twisting movement to the rudder-post.

It will be understood from the above description that the rotary motion of the disk F is

less rapid than that of wheel *m*—about one to five, more or less—and that the differential mechanism itself, leaving the wheel *m* free, firmly holds the rudder in any position to which it may be turned.

Fig. 4 illustrates the application of my differential mechanism to a rudder-post provided with a tiller, D, and the usual chain, c^2, running through the roller-blocks *e* on the deck A to the hub *g*. In this construction the rear end of shaft *c* is supported in a swivel-bearing in the end of the rudder-post B. The yoke-frame *h* is the same as in Fig. 1.

The operating mechanism in Fig. 4 is identical with that above described in connection with Figs. 1 and 2, excepting that the hub *g* is enlarged to make it a proper size for a chain-drum on which to wind chain c^2, the gear *a* and segment D being dispensed with.

What I claim as my invention is—

1. In combination with the wheel-shaft *c*, eccentric *n*, and the rudder-post B, the perforated disk F, having hub *g* thereon, the pinion *y*, having studs *b* thereon, the internal gear, *w*, and means, substantially as described, to hold the latter and prevent it from rotating, and mechanism, substantially as described, connecting the hub *g* and the rudder-post B, substantially as set forth.

2. In combination, the yoke-frame *h*, having the sockets *v*, the internal gear, *w*, having the studs *z* to enter said sockets, the springs *t*, the wheel-shaft *c*, the eccentric *n*, pinion *y*, disk F, the rudder-post B, and means, substantially as described, for connecting the hub *g* and the rudder-post, substantially as set forth.

GEORGE F. CLEMONS.

Witnesses:
H. A. CHAPIN,
J. D. GARFIELD.