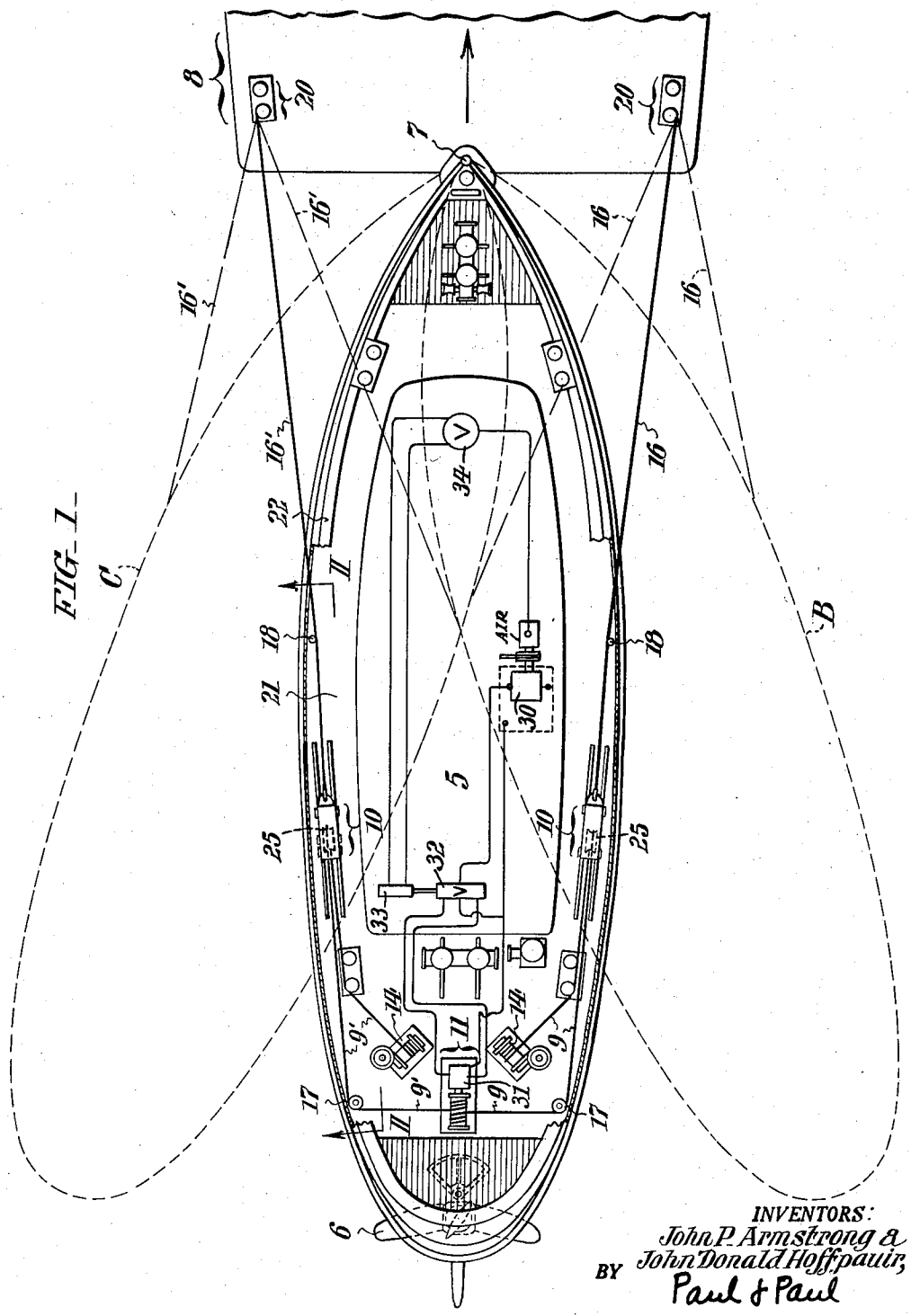
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COUPLING AND STEERING APPARATUS FOR A SINGLE SCREW TUG

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FIG. 1



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FIG. 2

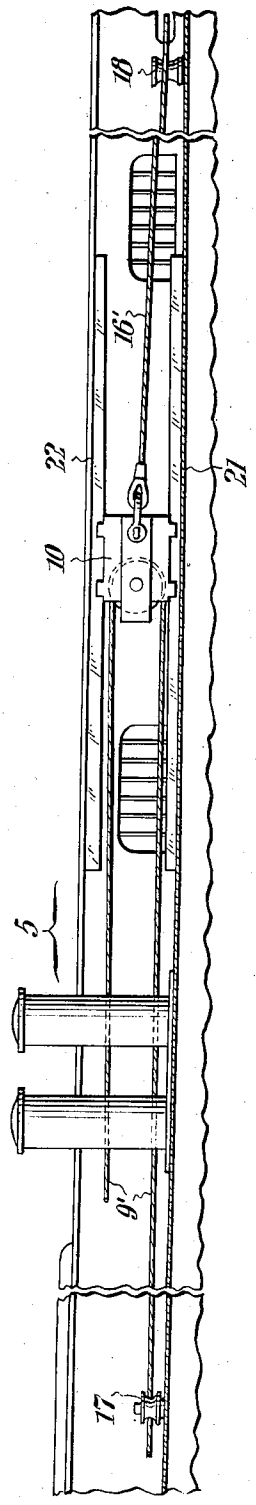


FIG. 4

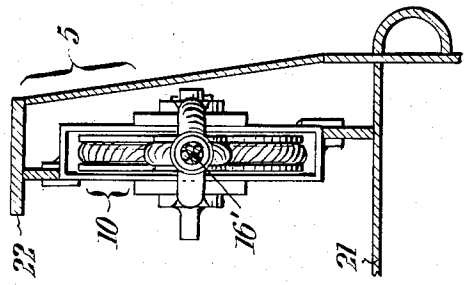
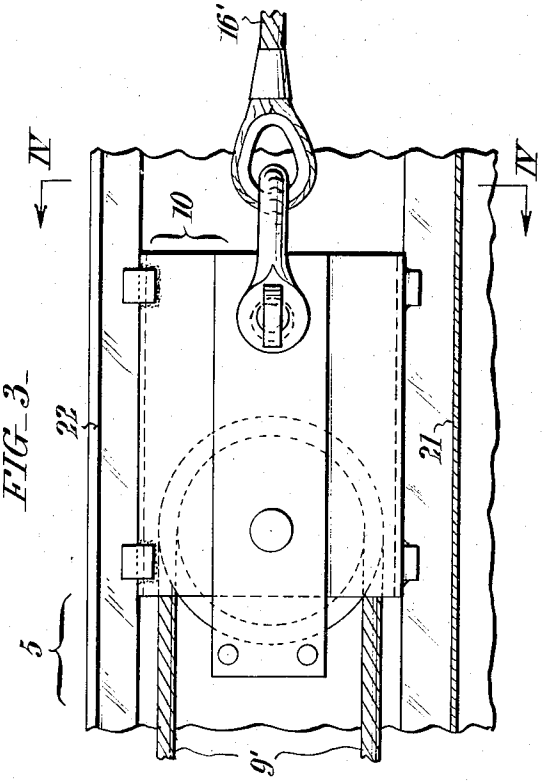


FIG. 3



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COUPLING AND STEERING APPARATUS FOR A SINGLE SCREW TUG

John Percy Armstrong and John Donald Hoffpauir, Orange, Tex.

Application November 23, 1955, Serial No. 548,651

3 Claims. (Cl. 114—236)

This invention relates to a device for permitting the backing or stopping of a single screw tug. The invention further concerns a coupling and steering apparatus for bringing a single screw tug to a controlled position with respect to a lighter or barge which is being pushed by the tug.

It is an object of this invention to provide a relatively simple and easily operated device for accomplishing the results set forth above. A more specific object is to provide an apparatus of this type having means for counteracting the sidewise thrust of a single screw tug while backing. Still another object is to provide a novel means for steering a single screw tug with respect to the tow during backing and stopping operations.

Other objects and advantages of this invention will further become apparent hereinafter, and in the drawings, whereof:

Fig. 1 represents a plan view of a single screw tug, showing how it is connected to the tow in accordance with a preferred embodiment of this invention;

Fig. 2 represents a sectional view looking outboard, as indicated by the lines and arrows II—II which appear in Fig. 1;

Fig. 3 represents an enlarged view in side elevation of a sheave block shown in Fig. 2; and

Fig. 4 represents a sectional view taken as indicated by the lines and arrows IV—IV which appear in Fig. 3.

Turning to the drawings, a tug **5** has a single screw **6**. Its bow is connected pivotally at **7** to a barge **8**.

Located on the stern deck of tug **5** is a power winch **11** accommodating two cables **9**, **9'** which are wound in opposite directions on each end of the cable drum of the winch **11**. Cables **9**, **9'** are heavy cables, preferably about 1¼ inches in diameter. Winch **11** is powered by a hydraulic pump **30**, a hydraulic motor **31**, and a four-way valve **32**. The valve **32** may be located on the stern deck near the motor **31**, or elsewhere. The valve **32** may be operated pneumatically by means of an air cylinder **33** attached to the valve **32** which in turn is connected to and controlled by an air valve **34** located in the pilot house. Other conventional control means may, of course, be substituted.

Each cable **9**, **9'** passes around a pulley **17**, through a sheave **25** on a traveling sheave block **10**, and the bitter end of each cable **9**, **9'** is attached to a small hand winch **14** located at the stern of the tug. Two cables **16**, **16'** are attached to the sheave blocks **10**, extend around roller chocks **18**, and are secured to the bitts **20** of the barge **8**.

As appears in Figs. 2, 3 and 4, each sheave block **10** is located between the deck **21** and the rail **22** and has capacity for reciprocating movement fore and aft.

In operation, the small hand winches **14** are used to tighten the cables **9**, **9'** and **16**, **16'** when the tug is attached to the barge, and to slacken the cable when the tub is released. As either cable **9**, **9'** is tightened or loosened, the corresponding sheave block **10** moves aft

or forward, respectively. When the cable **9** is drawn taut by the power winch **11**, the cable **9'** is let out and the tub assumes an angular position relative to the barge as shown by the dash lines B in Fig. 1. Conversely, when the cable **9'** is tightened by the winch **11**, the cable **9** is slackened and the tug assumes an angular position as illustrated by the dash lines C, for example. In any event, the relative angular position of the tug is controllable from the pilot house.

This invention enables the tug to be steered in such manner that the tug and barges are steered as a unit. In backing or stopping, the position of the tug and barges can be controlled to port or starboard as conditions require by simply operating the winch **11** in the desired direction. This is an advantageous feature, since steering while backing or stopping has heretofore been very difficult when using a single screw tug. The arrangement of this invention is further advantageous in that it counteracts the sidewise thrust of a single screw tug while backing.

Although this invention has been described with reference to a specific form thereof, it will be appreciated that various modifications may be made in the form of the control means and in the manner of actuation of the power winch, and that various equivalent elements may be substituted for those specifically shown and described. Moreover, parts may be reversed and certain features may be used independently of others, all without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described our invention, we claim:

1. In combination, a single screw tug and a barge, means pivotally connecting the forward end of said tug to an end of said barge, a pair of sheave carriers slidably connected to said tug, one at each side thereof, with capacity for sliding movement forwardly and rearwardly of said tug, a pair of sheaves, one carried by each of said sheave carriers, a pair of lines, one trained around each of said sheaves, means maintaining an end of each of said lines in adjusted and fixed position relative to said tug, a pair of winch means on said tug connected to the other ends of said lines, each winch means being connected to a respective end, for paying out and winding in said lines, and a pair of sheave carrier positioning lines, each fixed respectively to one of said sheave carriers and each of said positioning lines extending forwardly of said tug to a corresponding side of said barge and secured thereto.

2. In combination, a single-screw tug and a barge, means connecting said tug to said barge, a pair of sheave means slidably connected to said tug one at each side thereof, each said sheave means including a sheave and a slidable carrier therefor, means supporting each said sheave carrier means for reciprocating sliding movement forwardly and rearwardly along said side of said tug toward and away from said barge, a power winch mounted on said tug at a location remote from said barge, a pair of lines each connected to said power winch, for letting out and winding in said lines, one of said lines being let out whenever the other is wound in, said lines extending from said power winch each to an opposite side of said tug at a location more distant from said tow than said sheave means, and each said line then extending along its side of said tug generally toward said tow and around the corresponding sheave, means fixing the free end of each of said lines to the tug, and a pair of sheave carrier positioning lines, each fixed respectively to one of said sheave carrier means and extending forwardly of said tug to a corresponding side of said barge and connected thereto.

3. In combination, a single-screw tug and barge,

means pivotally connecting the forward end of said tug centrally to an end of said barge, a pair of sheave carriers slidably connected to said tug, one at each side thereof, with capacity for sliding movement forwardly and rearwardly along opposite sides of said tug, a sheave pivotally mounted on each of said sheave carriers for rotation thereon, a pair of hand winches fixed to the tug rearwardly of said sheave carriers, a power winch also fixed to said tug rearwardly of said sheave carriers, said power winch having a cable winding drum rotatable about an axis which extends substantially in the direction of the longitudinal axis of said tug, a pair of cable pulleys fixed to said tug adjacent the sides thereof and rearwardly of said sheave carriers, cables extending from each hand winch around the corresponding sheave around said cable

pulley and on said drum, said cables being wound in opposite directions on said drum so that either cable is let out when the other is wound up, roller chocks carried by the tug forwardly of said slidable sheave carriers, and cables fixed to said sheave carriers independently of said sheaves, said cables extending against said roller chocks and fixed to corners of the end of the barge.

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