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PATENTED APR. 4, 1905.

F. HAYES & W. CLIFFORD.
MOORING MACHINE.

APPLICATION FILED APR. 15, 1904.

2 SHEETS—SHEET 1.

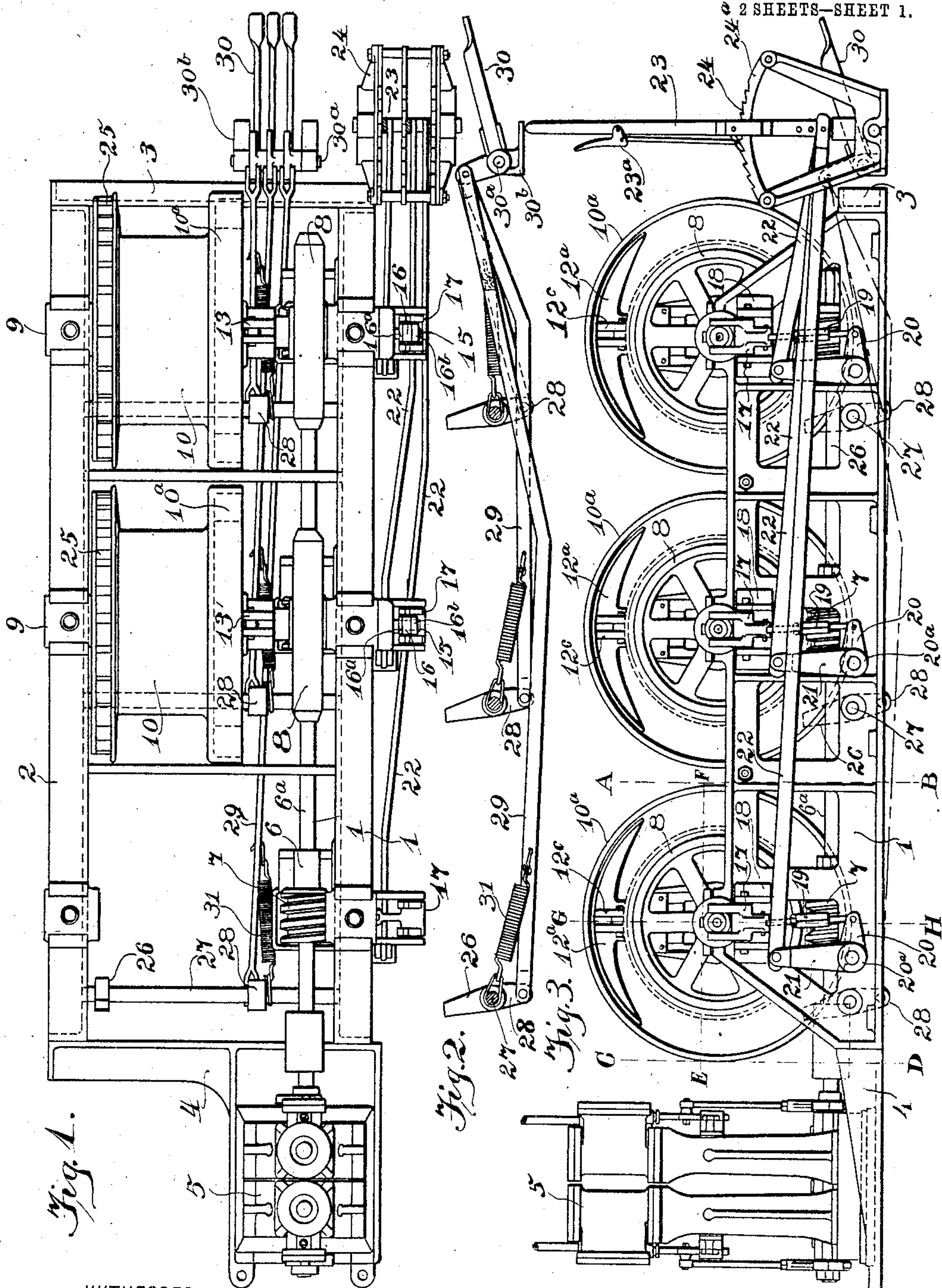


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

Wellington M. Blewett
W. H. Smallwood Jr.

INVENTORS
Frank Hayes
William Clifford
BY
James T. Watson
Their ATTORNEY

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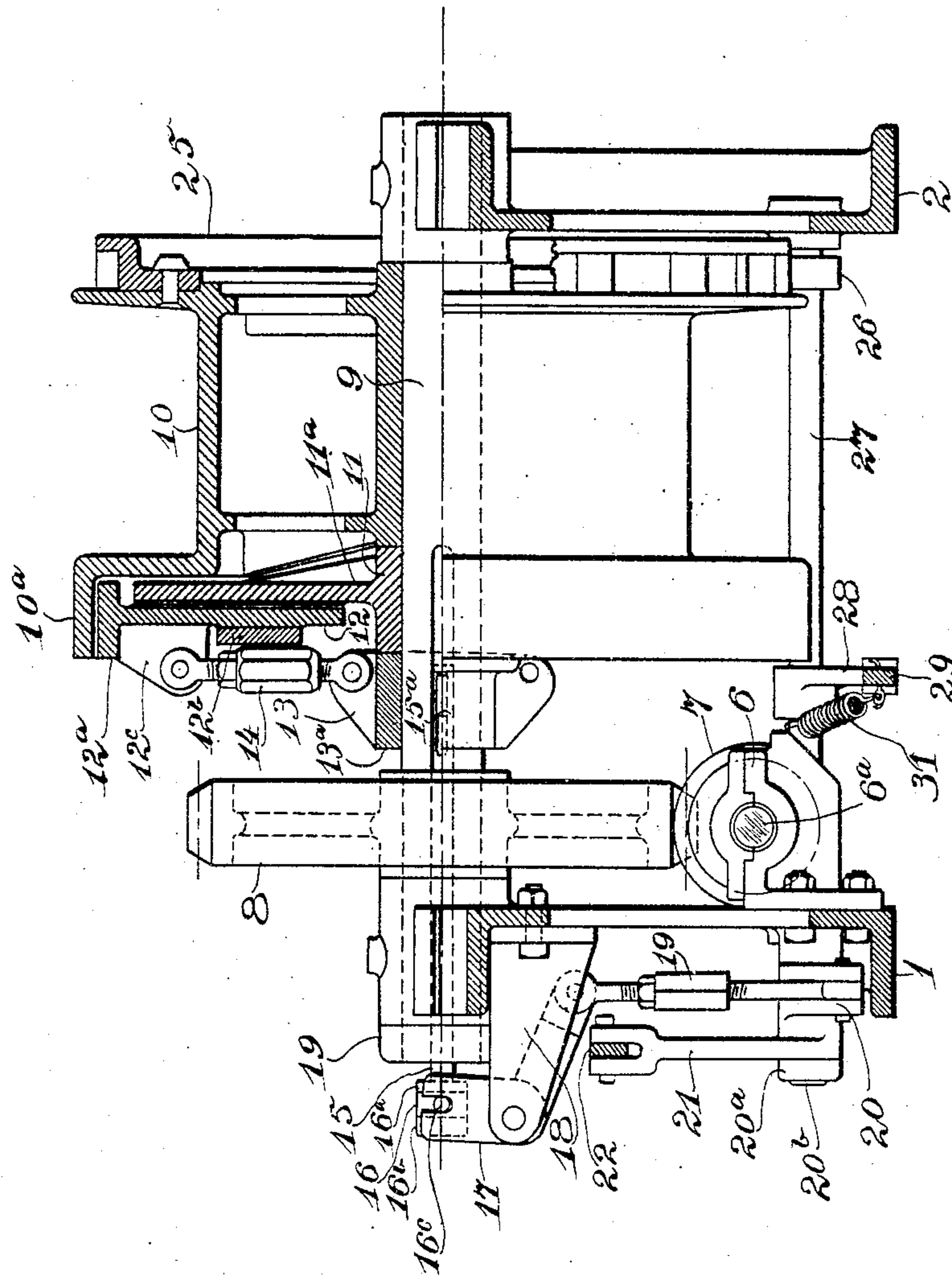
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Fig 4.



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UNITED STATES PATENT OFFICE.

FRANK HAYES, OF SUPERIOR, WISCONSIN, AND WILLIAM CLIFFORD, OF DULUTH, MINNESOTA.

MOORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 786,287, dated April 4, 1905.

Application filed April 15, 1904. Serial No. 203,308.

To all whom it may concern:

Be it known that we, FRANK HAYES, residing at Superior, Douglas county, Wisconsin, and WILLIAM CLIFFORD, residing at Duluth, Minnesota, citizens of the United States, have invented certain new and useful Improvements in Mooring-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to mooring-machines, and has for its object the provision of means by which metallic mooring-cables can be conveniently handled.

It consists, in combination with an engine and a suitable support, of a loose windlass mounted on said support, disengageable means for transmitting power from said engine to said windlass to operate the same, and disengageable means for preventing the reverse movement of said windlass.

It also consists of certain other constructions, combinations, and arrangements of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of said invention with one of the windlasses 10 and one of the gears 8 omitted. Fig. 2 is a side elevation of a portion of said invention, showing the means for disengaging the windlass-retaining pawls. Fig. 3 is a side elevation of said invention, and Fig. 4 is a vertical transverse section of said invention on the line A B of Fig. 3, omitting all parts in rear of the line C D and showing a vertical section on the line G H of those portions of the windlass, ratchet-rim, and brake-shoe which are above the line E F of said Fig. 3.

Our invention is especially designed for use in mooring scows to dredges, but may be used for mooring vessels to wharves or as a substitute for a towing-post or for such other purposes as may seem practical. It is especially designed to handle metallic cables or large stiff manila cables, which are difficult or impossible to handle manually under all circumstances.

While a plural number of certain portions

of said invention are shown in the drawings, it is to be understood that we do not desire to limit ourselves to any special number of such parts, and the description of one of the windlass-drums shown and means for operating or controlling it will be sufficient.

Referring now to the drawings, 1 and 2 are respectively side frames connected by transverse bars 3 and 4, which latter bar has formed thereon a bed-plate or foundation for an engine 5, said engine being of any suitable construction well known to the art. Journaled in suitable bearings 6, formed on or secured to said frame 1, is a shaft 6^a, upon which is keyed a worm 7, adapted to mesh with and drive a gear 8, which is keyed to a transverse shaft 9. Upon said shaft 9 is journaled a loose windlass-drum 10. A collar 11, having the post 11^a, provided with guide-flanges 11^b, formed thereon, is rigidly secured to said shaft 9, and between said guides is positioned the stem of a friction clutch-shoe 12^a, the peripheral face of which shoe conforms to the arc of an overhanging flange 10^a, formed upon one end of said drum 10. Said stem is retained in said guides by a retaining-plate 12^b, secured to said post in any suitable manner against the edges of said flanges 11^b. The shoe 12^a is adapted to move in said guides 11^b radially with respect to said drum and is provided with transversely-directed flanges 12^c, to which is pivotally secured an extensible link 14, which is pivotally secured at its opposite ends to fins 13, formed upon a collar 13^a, which is slidably keyed to said shaft 9. The shaft 9 is axially bored to receive an operating-rod 15, which rod is connected with said collar by a key 15^a, projected through a transverse slot formed in said collar 13^a and through corresponding slots formed in said shaft 9 and rod 15. A loose collar 16 is journaled on the opposite end of said rod 15 between two fixed collars 16^a and 16^b and is provided with trunnions 16^c, which engage the slotted ends of a forked bell-crank lever 17, which lever is pivoted at its elbow to a bracket 18, secured to said frame 1. The opposite end of said bell-crank lever is pivotally secured to an extensible link 19, the opposite end of which latter link

is pivotally connected to radially-directed jaws 20, formed upon a hub 20^a, journaled upon a pin 20^b, formed upon or secured to said frame 1. There is also formed upon said hub
 5 an arm 21, extending at an angle to said jaws, to which arm is pivotally secured a draw-rod 22, which is pivotally secured at its opposite end to an operating-lever 23, which lever is provided with a latch 23^a, adapted to engage one
 10 or another of the notches 24 of a segment 24^a. In order to lock said drums against reverse revolution when the clutch embodying said shoes is disengaged from said drum, we have provided upon the opposite end of said drum
 15 a ratchet-rim 25, underlying which is positioned a pawl 26, which is keyed to a shaft 27, journaled in suitable bearings formed on or secured to said frames 1 and 2. Keyed to said shaft is the lever 28, to the free end of
 20 which is pivoted one end of a draw-rod 29, which is pivoted at its opposite end to a bell-crank foot-lever 30. The latter lever is journaled at its elbow upon a shaft 30^a, supported in suitable bearings 30^b. A spring 31 is se-
 25 cured at one end to the shaft 27 and at the opposite end to the rod 29, intermediate of the ends thereof, for drawing said rod into pawl-operating position.

One of the features of our said invention is
 30 the arrangement of parts by which we are enabled to drive a plural number of windlasses by one engine operating a single crank-shaft while retaining separate control of each windlass. To each of said windlasses is attached
 35 one end of a separate, preferably a metallic, cable, (not shown,) which cables are provided at their opposite ends with loops adapted to engage stanchions upon scows which it is de-

sired to moor to the structure upon which said windlass is mounted. 40

In operation said cables are led around suitable guide-wheels or guide-posts or through suitable hawse-holes upon or in the supporting structure and attached at their looped ends to the vessel to be moored, the deflection of
 45 said cables by said guides being prescribed by varying circumstances. The respective windlasses are then operated simultaneously or in twin or as circumstances may require until the vessel to be moored is brought to the de-
 50 sired position.

Having now described our invention, what we claim, and desire to secure by Letters Patent, is—

In a mooring-machine, the combination of
 55 a plural number of windlass-shafts arranged axially parallel to each other, windlass-drums loosely mounted on said shafts, clutches adapted in operation to key said windlass-drums to their corresponding shafts, means for operat-
 60 ing and retracting said clutches, a drive-shaft common to all of said windlass-shafts, means for driving said drive-shaft, means adapted in operation to prevent the counter rotation of the respective windlasses, means for oper-
 65 ating and retracting said preventive means and cables respectively engaged by the corresponding said windlasses, substantially as described.

In testimony whereof we hereunto affix our
 70 signatures in presence of two witnesses.

FRANK HAYES.

WILLIAM CLIFFORD.

Witnesses:

JAMES T. WATSON,

WELLINGTON M. BLEWETT.