

E. DALGLEISH.
TOWING MACHINE.

APPLICATION FILED JULY 12, 1909.

977,277.

Patented Nov. 29, 1910.

3 SHEETS—SHEET 1.

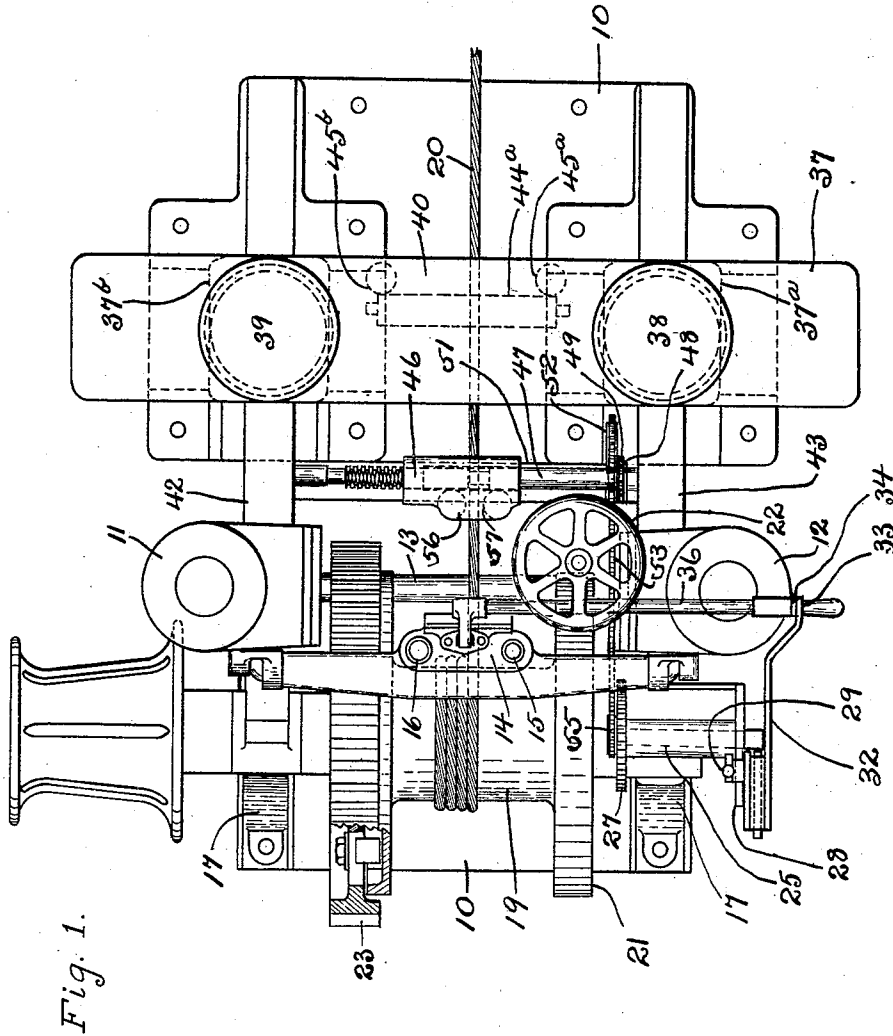


Fig. 1.

WITNESSES
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INVENTOR
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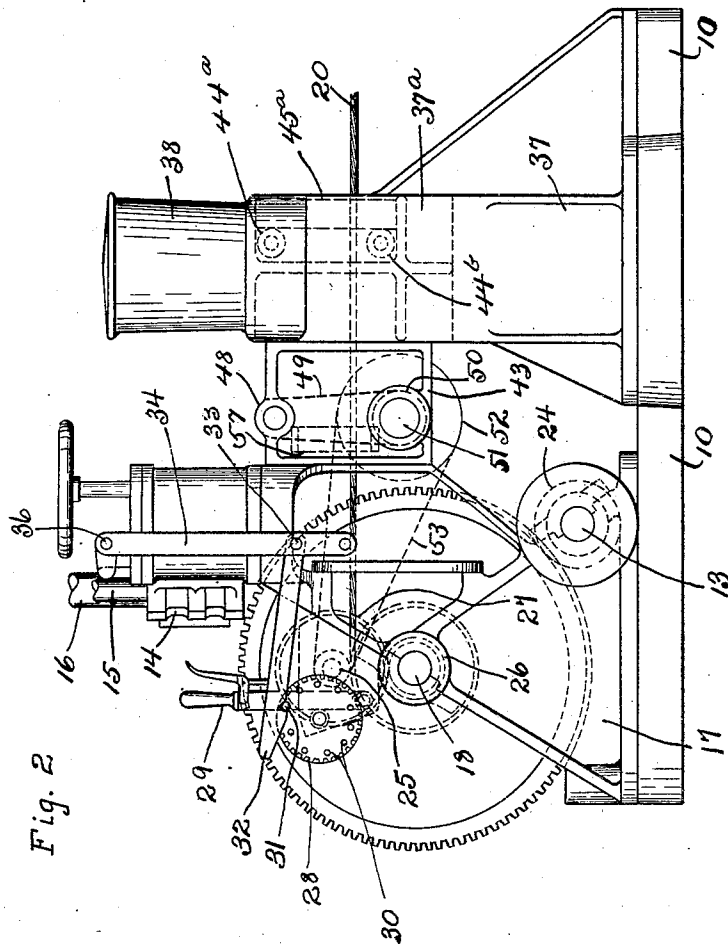


Fig. 2

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3 SHEETS-SHEET 3.

Fig. 4.

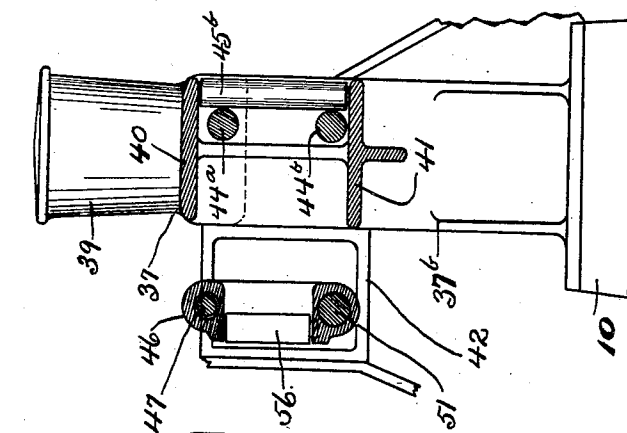
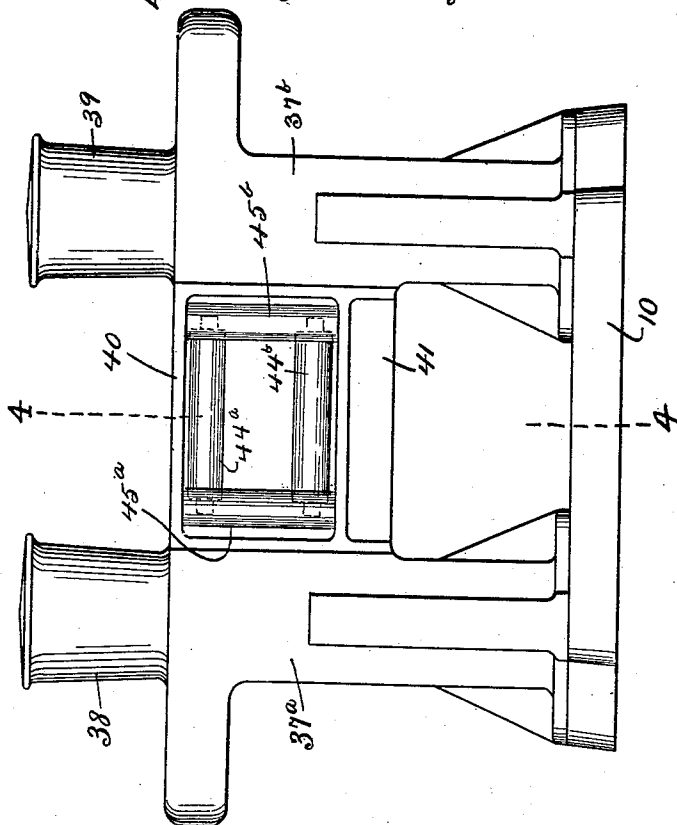


Fig. 3



WITNESSES
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UNITED STATES PATENT OFFICE.

EDMUND DALGLEISH, OF CLEVELAND, OHIO.

TOWING-MACHINE.

977,277.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed July 12, 1909. Serial No. 507,101.

To all whom it may concern:

Be it known that I, EDMUND DALGLEISH, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Towing-Machines; and I 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 pertains to make and use the same.

This invention relates to towing machine, and particularly to that type of towing machine having means for automatically controlling the engine so that it will pay out or wind in the tow line as the load temporarily increases or decreases.

Before the introduction of towing machines, it was customary to employ Manila hawsers secured to rigid towing posts or bitts, and this method of towing is still in ordinary use. Although automatic towing machines are now well known to persons familiar with towing on vessels, it would be desirable for a number of reasons that a boat, and particularly a tug boat, be so equipped that either or both of these methods of towing could be employed; that is that it be equipped with both the towing machine and wire tow line or hawser, and tow bitts for the use of the Manila hawsers.

Since in ordinary tug boats there is a very large horse power developed in a small hull, it is important that the machinery be very compact. It is also essential for the proper handling of the boat that the tow line lead from a position some distance forward of the stern of the tug and be able to swing unobstructedly across the stern in order that the tug may be readily steered and held in its direction when pulling sidewise on a tow. It is well understood by naval architects and tug boatmen that the lead point or the position from which the tow line should swing, must be accurately determined and that any material change in the location of this lead point either forward or aft has a considerable effect upon the action of the tug or the handling thereof. It is, therefore, important if the tug boat is to be used sometimes with the towing machine and wire hawser and sometimes with towing bitts and Manila hawsers, that the location on the hull, from which the wire hawser or the Manila hawser may swing, should be the same in both cases.

One of the objects, therefore, of the in-

vention is the provision of a towing apparatus including an automatic towing machine for the use of a wire line or hawser and towing bitts for the use of one or more Manila hawsers, which is very compact and strong and is particularly adapted for small towing boats, such as tug boats.

A further object is the provision of a combined automatic towing machine and towing bitt wherein either or both the wire and Manila hawsers may be employed, and having an arrangement and construction such that the lead or swing point is the same for both the wire or the Manila hawsers and such that neither the wire hawser nor the Manila hawser will interfere with the use of the other.

A still further object is to provide an improved form of towing bitt wherein the usual provision is made for attaching one or more Manila hawsers, and which also supports a nest of lead rollers between which the line from the automatic towing machine may pass and about which it may freely swing.

The invention may be briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

For an understanding of my invention reference is had to the accompanying sheets of drawings in which—

Figure 1 is a plan view of the towing apparatus constructed in accordance with my invention. Fig. 2 is a side view of the same. Fig. 3 is a view in elevation of a double towing bitt which I employ in my improved towing apparatus. Fig. 4 is a section through the towing bitt substantially along the line 4—4, Fig. 3, and showing also a small portion of the engine frame to which the towing bitt is attached and also in section a traveling carriage or guide which is designed for securing an even winding of the wire tow line or hawser on the winding drum.

Referring to the figures of the drawings, 10 represents the base upon which the engine or other parts of a towing apparatus are supported. In order that the towing machine may be as compact as possible and occupy very little space, I employ a vertical engine having two vertical cylinders 11 and 12 provided with the usual pistons (not shown) which will be connected to a crank

shaft 13 supported in suitable bearings below the cylinders and near the base 10. Supported between the cylinders 11 and 12 is a throttle valve 14 which may be of any suitable construction and which is connected with a steam supply (not shown) by a vertical pipe 15 and with the cylinders of the engine in the usual manner. The throttle valve also has a vertical exhaust pipe 16 connected thereto as shown in Figs. 1 and 2. Supported on the base 10 adjacent to the engine by means of bearings 17, one of which is clearly shown in Fig. 2 is a shaft 18 having a drum 19 on which the tow line or hawser 20, which is generally a wire line, is adapted to be wound, and having also a brake disk 21 adapted to be engaged by a suitable brake band which may be controlled manually by a brake wheel 22. The shaft and drum are rotated by means of a large gear 23 secured to the drum 19, as shown in Fig. 1, and by means of a small gear or pinion 24 (see Fig. 2) which is secured to the crank shaft 13.

The throttle valve 14, previously referred to, as in well known forms of automatic towing machines, is designed to be operated by the towing drum through suitable mechanism so as to increase or decrease the volume of steam admitted to the engine when the load is increased temporarily and the line is paid out or when the load is decreased and the line is again wound upon the drum. Any suitable automatic mechanism may be employed for this purpose, but, for the sake of illustration, I have shown somewhat conventionally automatic valve operating mechanism somewhat similar to that shown in the patent to Edmund Dalglish, No. 788,190, April 25, 1905.

The automatic valve operating mechanism as here shown is constructed and arranged as follows. Mounted in suitable bearings on the frame of the machine above the shaft 18 is a small shaft 25 which is geared to the shaft 18 so as to be rotated thereby, the gears being shown by dotted lines in Fig. 2, at 26 and 27, respectively, and the gear on the shaft 25 being shown in full lines in Fig. 1. The valve 14 is operated by the rotation of the shaft 25 through suitable mechanism including a disk or wheel 28 which has an operative driving connection with the shaft 25 and which is carried by a lever 29 which is pivoted in any suitable manner on the frame of the machine and may be swung so as to disconnect the disk 28 and the shaft 25. The disk is provided with a series of teeth 30 of a certain size and a longer tooth 31 adapted to normally engage within a notch in a link 32 which is pivotally connected at 33 to an upright link 34 which, in turn, is rigidly connected to a rotatable shaft 36 which actuates the movable portion of the throttle valve 14 so that

when the disk or wheel 28 is turned in one direction or the other by the rotation of the drum 19, shaft 18 and small shaft 25, it will by means of the teeth thereon shift the link 32, link 34 and shaft 36 so as to operate the throttle valve 14 and increase or decrease the volume of steam which is supplied to the cylinders. Inasmuch as this automatic valve operating mechanism forms no part of my invention and is fully described in the patent to Dalglish referred to, it is believed further illustration and description of the same is unnecessary.

In order that either the wire tow line 20 or Manila hawsers may be employed, and in order that either may swing freely about the same lead point without interfering in the least with the use of the other, I have secured upon the base 10 by bolts or other means a double tow bitt 37 including two uprights portions 37^a and 37^b which are provided respectively with prongs 38 and 39 upon which Manila hawsers may be secured, and which are connected together by integral portions 40 and 41. This double tow bitt 37 is arranged on the base near the engine and is connected to the frame of the latter by two connecting bars or members 42 and 43 in a manner such that there will be a mutual bracing action between the double tow bitt and the engine, and a strong and compact combination is provided.

Carried by the tow bitt between the prongs 38 and 39 and between the connecting members 40 and 41 of the two portions 37^a and 37^b of the double tow bitt is a nest of rollers consisting of two spaced horizontal rollers 44^a and 44^b and two vertical rollers 45^a and 45^b. These rollers by their arrangement form a rectangular opening or space through which the tow line 20, which is carried by the drum 19, passes and which, therefore, rectifies the direction of pull on the line of the towing machine and reduces the side strain on the latter. Thus it will be seen that Manila hawsers may be secured to the prongs 38 and 39 and may be employed simultaneously with or independently of the tow line 20 and that the use of either the Manila hawsers of the tow line will not interfere with the use of the other. At the same time the rollers are so arranged that the lead or swing point of both the Manila hawsers or the tow line 20 is the same. With the construction just described the tow line 20 may swing freely to the right or left or in a vertical direction, and since in its movement it may engage the rollers it cannot be worn or injured by engagement with the tow bitt.

In order that the tow line 20 may be wound evenly upon the drum 19, I have provided a traveling guide or carriage 46 which is designed to move back and forth

upon a horizontal shaft 47 rotatably mounted in the connecting members 42 and 43 between the tow bitt and engine frame and provided with a right and left thread adapted to be engaged by a member on the carriage in a well known manner so as to move back and forth along the length of the shaft as the latter is rotated. The shaft 47 is rotated by means of suitable gearing including a sprocket wheel 48 on the shaft 47 driven by a chain 49 engaging the lower sprocket wheel 50 mounted upon a suitable shaft 51 also extending between the members 42 and 43 and by means of a larger sprocket wheel 52 which rotates with the sprocket wheel 50 and is driven by means of a chain 53 which engages a small sprocket wheel 55 secured to the shaft 25 which as stated before is operated through the gears 26 and 27 by the drum 19. The shaft 51, which, as stated before, extends between the bracing members 42 and 43, also serves as a guide for the carriage 46 as the latter is reciprocated by means of the threaded shaft 47. The carriage 46 is provided with a pair of spaced vertical rollers 56 and 57 between which the line extends, both the rollers being shown by dotted lines in Fig. 1 and one of which is shown in Fig. 4.

What I claim is,—

1. In combination, a towing machine comprising a drum adapted to carry a line and an engine for operating the drum, a towing bitt arranged adjacent the engine

and provided with a set of rollers between which the line may be led, and a reciprocating or traveling guide or carriage receiving the line and arranged to cause even winding thereof on the drum.

2. In combination with a base, a towing machine mounted on said base, said towing machine comprising a towing drum and a vertical engine for rotating the drum, a pair of uprights mounted on said base and rigidly braced to the towing machine and means arranged between said uprights for guiding the line as it is wound on or off of the said drum.

3. In combination with a base, a towing machine mounted on the base, said towing machine comprising a towing drum and a vertical engine for rotating the drum, a pair of uprights mounted on said base and rigidly braced to the towing machine, a set of rollers mounted on the said uprights between which the line may be led and a reciprocating guide arranged between said uprights and the drum adapted to receive the line and cause even winding thereof on the drum and means operatively connecting said guide and said engine.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

EDMUND DALGLEISH.

Witnesses:

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