

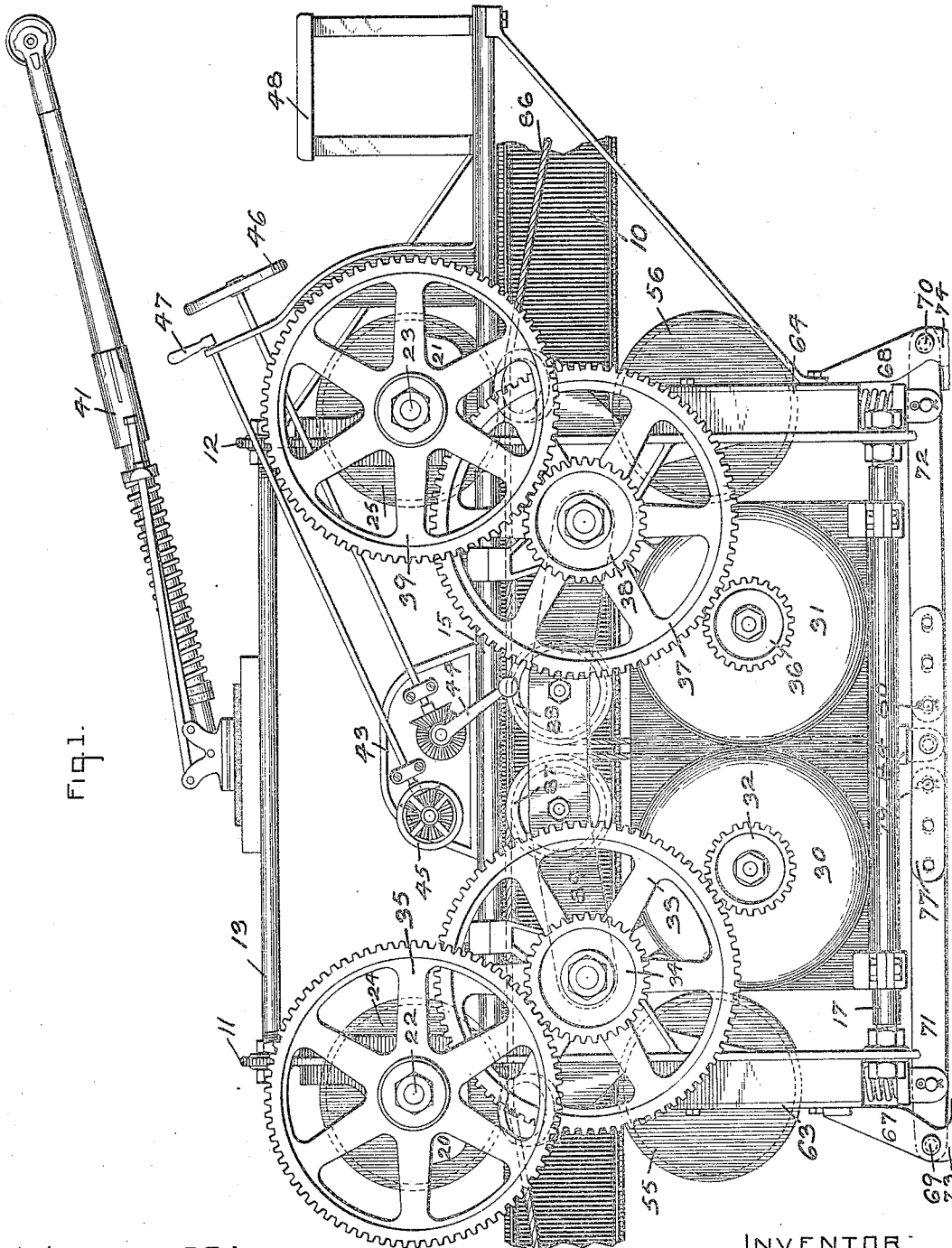
C. W. LARSON.
TOWING DEVICE.

APPLICATION FILED AUG. 14, 1908.

942,450.

Patented Dec. 7, 1909.

3 SHEETS—SHEET 1.



WITNESSES:

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Green Oxford

INVENTOR:
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ATTY.

C. W. LARSON.
TOWING DEVICE.

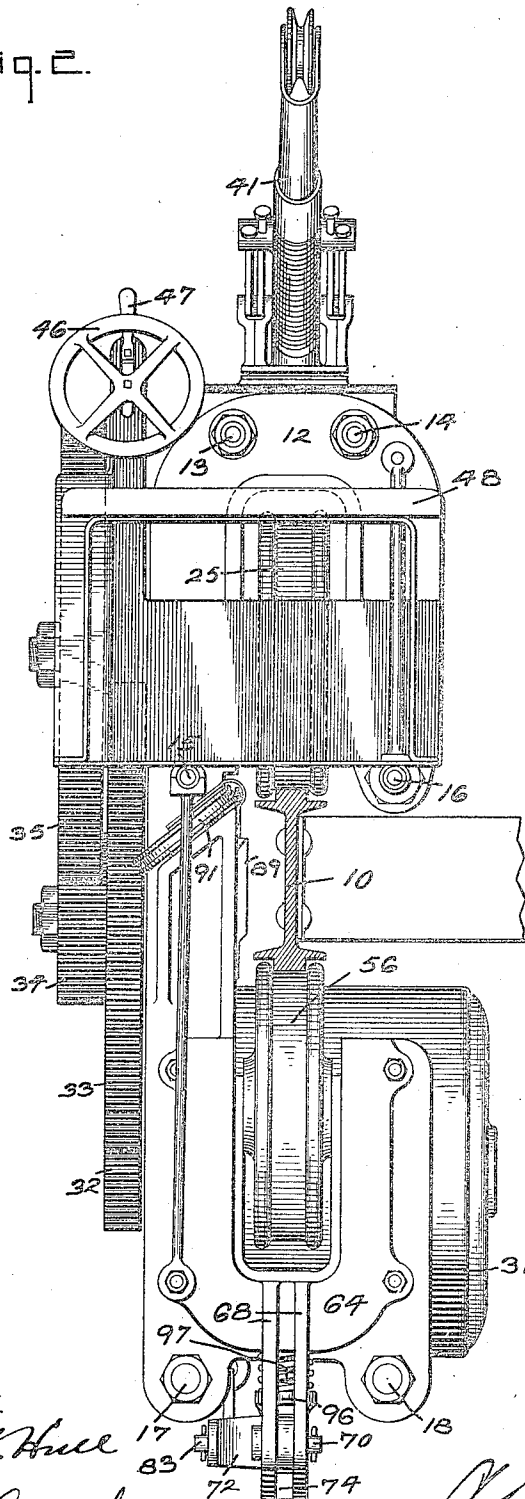
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3 SHEETS—SHEET 2.

Fig. 2.



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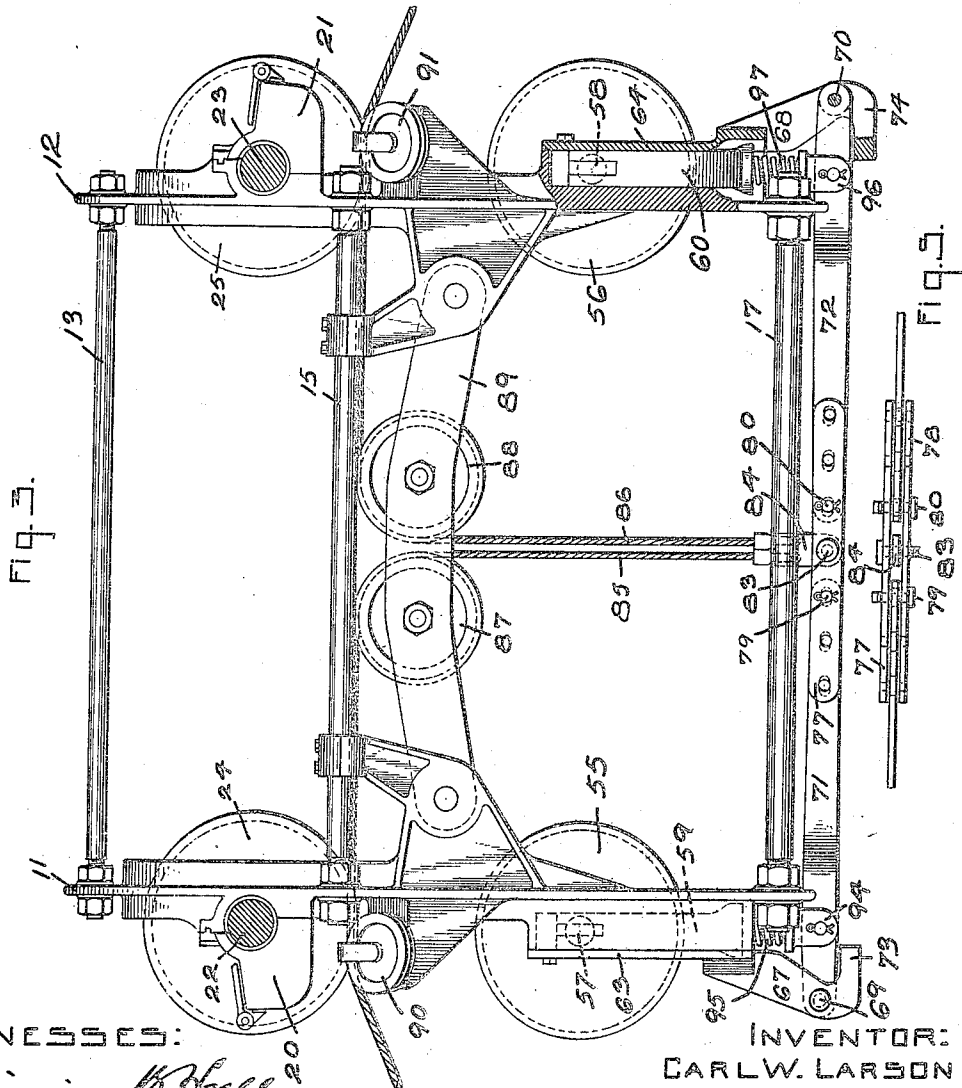
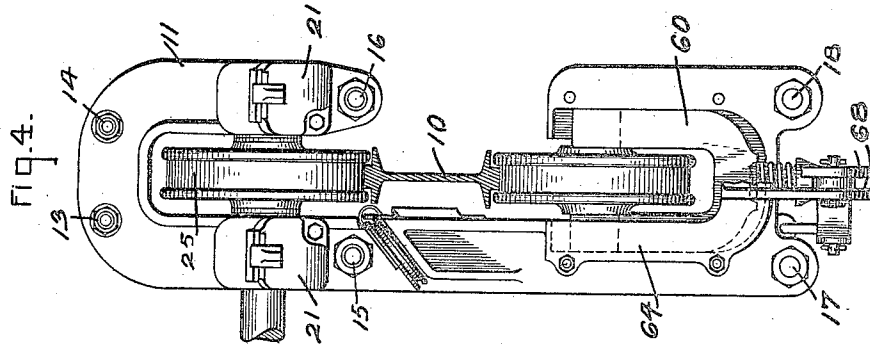
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CARL W. LARSON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TOWING DEVICE.

942,450.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed August 14, 1908. Serial No. 448,517.

To all whom it may concern:

Be it known that I, CARL W. LARSON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Towing Devices, of which the following is a specification.

My invention relates to towing devices, and particularly to that class of devices often referred to as "electric mules" and used in connection with canals and other waterways for towing barges and ships.

It is an object of my invention to provide a new and improved form of towing device, and to this end my invention comprises the device hereinafter described and shown in the accompanying drawings.

In the drawings, Figure 1 is a side elevation of a towing device built in accordance with my invention; Fig. 2 is an end elevation of said device, the rail upon which it runs being shown in cross-section; Fig. 3 is a side elevation, partly in section, similar to Fig. 1, the rail and certain parts of the device being omitted; Fig. 4 is an end elevation of the parts shown in Fig. 3; and Fig. 5 is a bottom plan view of a portion of the equalizing levers shown in Fig. 3.

Like parts are referred to throughout the several views by the same reference characters.

The particular form of device herein set forth is intended for operation upon a single rail 10 which may be supported in any suitable manner along the bank of a canal or other waterway. The main frame of the towing device may be made up of C-shaped end frames 11 and 12, of any suitable form, which may be connected rigidly together by a plurality of bars or pipes 13, 14, 15, 16, 17 and 18 bolted to the frames 11 and 12 and arranged as clearly shown in the drawings. Mounted in suitable journals 20 and 21 in the frames 11 and 12, respectively, are axles 22 and 23 upon which are mounted driving and supporting wheels 24 and 25 which run upon the top of the rail 10, being preferably provided with flanges, as best shown in Figs. 2 and 4, which insure the wheels remaining upon the rail 10.

In the form of device shown, the motive power is furnished by two electric motors 30 and 31 which may be built in one frame and mounted upon the bars 17 and 18, as best shown in Fig. 1. The motor 30 drives the

wheel 24 through a train of gearing consisting of a pinion 32 secured to the motor armature shaft, a gear 33 mounted for rotation on a stud projecting outwardly from the frame 11, a pinion 34 arranged to rotate with the gear 33 and a gear 35 secured to the axle of the wheel 24. In a similar manner the motor 31 drives the wheel 25 through the pinion 36 on the armature shaft, gear 37 rotating on a stud projecting from the frame 12, pinion 38 rotating with the gear 37 and gear 39 secured to the shaft of the wheel 25. Current for the motors 30 and 31 may be supplied from an overhead conductor engaged by a trolley 41 mounted upon the rods 13 and 14, as shown, the rail 10 being utilized as a ground return. A controller 43 for the motors, of any suitable type, may be mounted upon the rods 15 and 16, as shown, and its main handle 44 and its reversing handle 45 may be rotated from a wheel 46 and a handle 47 through suitable rods and beveled gears, as clearly shown in Fig. 1. A seat for the operator is indicated at 48. The electrical connections between the trolley, controller and motor are not shown in the drawings, since they and the particular arrangement of controller and trolley may, of course, be modified as desired.

In order to increase the tractive effort of which the towing device is capable, I provide it with traction increasing wheels 55 and 56 which may be similar in form to the wheels 24 and 25 and engage the bottom of the rail 10. The wheels 55 and 56 rotate on shafts 57 and 58, the ends of which, as shown in Figs. 3 and 4, are rectangular and are supported in U-shaped members 59 and 60 arranged for sliding movement in recesses in the frames 11 and 12, respectively, being held therein by U-shaped plates 63 and 64 bolted to the frames 11 and 12, as clearly shown in the drawings. Extending downwardly from the plates 63 and 64 or from the frames 11 and 12 are brackets 67 and 68 in which at 69 and 70 are pivoted levers 71 and 72, extensions 73 and 74 on the brackets serving to prevent the levers 71 and 72 from falling beyond a certain point. The levers 71 and 72 are connected at their adjacent ends by a link connection made up of bars 77 and 78 and pins 79 and 80 which pass through holes in the levers and plates as clearly shown in Figs. 3 and 4. The holes in the levers 71 and 72 are made elon-

gated, as shown, and a plurality of sets of holes are provided in the levers 71 and 72 and the bars 77 and 78 for purposes hereinafter explained. Through the middle of the bars 77 and 78 a pin 83 passes, and pivoted on this pin is a member 84 in which the ends of the tow-ropes 85 and 86, one for each direction of travel, are secured. The ropes 85 and 86 pass, respectively, over sheaves 87 and 88 mounted for rotation on studs secured to a bar 89 secured at its ends to the frames 11 and 12. The ropes 85 and 86 also pass over pulleys 90 and 91 mounted, respectively, on the frames 11 and 12 in a plane at an angle to the horizontal, as shown in the various figures of the drawings.

Pivottally mounted on the lever 71, is a block 94 between the top of which and the U-shaped member 59 is a spiral spring 95. A block 96 and a spring 97 are interposed in a similar manner between the lever 72 and the U-shaped member 60. With this arrangement the pull on either tow-line is transmitted through the system of equalizing levers to the springs 95 and 97 compressing the latter and producing an upward thrust on the U-shaped members 59 and 60, thereby forcing the traction increasing wheels 55 and 56 into engagement with the bottom of the rail 10. It is obvious, therefore, that the pull on the tow-line is utilized to increase the tractive effort in direct proportion to the pull, and that with the system of levers shown the pressure of the wheels 55 and 56 on the bottom of the rail is maintained substantially equal under all conditions of track. The effective length of the levers 71 and 72 may be adjusted by moving the pins 79 and 80 from one set of holes to another, and the pressure with which the wheels 55 and 56 engage the bottom of the rail 10 thereby regulated. By making the holes through the levers 71 and 72 elongated the increased length from the pin 69 to the pin 70 through the levers and bars, due to the upward movement of the pin 83, is taken care of.

While I have shown but one form in which my invention may be embodied, I do not wish to be understood as limiting myself thereto, but aim to include in the following claims all modifications which come within the scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A towing device comprising a frame made up of C-shaped end members connected rigidly together by bars, driving and supporting wheels journaled in the top of said C-shaped end members, traction increasing wheels, U-shaped members supporting said traction increasing wheels and arranged for vertical sliding movement in the bottom of said C-shaped members, and a system of equalizing levers for transmit-

ting the pull of the tow line to the U-shaped members to produce a tendency for the latter with the traction increasing wheels to move upward.

2. A towing device intended for operation on a single rail comprising a frame made up of C-shaped end members rigidly secured together by bars, a driving and supporting wheel journaled in the top of each end member and arranged to engage the top of the rail, traction increasing wheels arranged to engage the bottom of the rail, a U-shaped member in which each of said traction increasing wheels is supported arranged for vertical movement in the bottom of said C-shaped members, and a system of equalizing levers to which the tow line is connected for transmitting the pull of the tow line to said U-shaped supporting members for the traction increasing wheels to cause the latter forcibly to engage the rail with substantially equal pressure.

3. A towing device intended for operation on a single rail comprising a frame made up of C-shaped end members rigidly secured together by bars, a driving and supporting wheel journaled in the top of each end member and arranged to engage the top of the rail, traction increasing wheels arranged to engage the bottom of the rail, U-shaped members in which said traction increasing wheels are supported arranged for vertical movement in ways in the bottom of said C-shaped members, levers pivoted in each C-shaped end member and extending toward one another inwardly under said U-shaped members and cooperating therewith, and a link to which the tow line is secured connecting the adjacent ends of said levers to form an equalizing system whereby the pull of the tow line is transmitted to the traction increasing wheels to cause the latter to forcibly engage the rail with substantially equal pressure.

4. A towing device intended for operation on a single rail comprising a frame, driving and supporting wheels journaled in said frame and arranged to engage the top of said rail, traction increasing wheels supported in said frame and capable of vertical movement therein and arranged to engage the bottom of said rail, levers pivoted in said frame and extending toward one another and under said traction increasing wheels, connections between said levers and said traction increasing wheels, and a link connecting the adjacent ends of said levers to which link the tow line is secured whereby the pull of the tow line is transmitted to said traction increasing wheels to cause the latter to forcibly engage the rail with substantially equal pressure.

5. A towing device intended for operation on a single rail comprising a frame, driving and supporting wheels journaled in said

frame and arranged to engage the top of
said rail, traction increasing wheels sup-
ported for vertical movement in the frame
and arranged to engage the bottom of said
5 rail, levers pivoted in said frame and ex-
tending under said traction increasing
wheels, connections between said levers
and said traction increasing wheels, and an
adjustable link connection between said
10 levers to which the tow line is secured where-
by the pull of the tow line is transmitted to

said traction increasing wheels to cause the
latter to forcibly engage the rail with sub-
stantially equal pressure capable of regula-
tion.

In witness whereof, I have hereunto set
my hand this 13th day of August, 1908.

15

CARL W. LARSON.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.