

No. 724,368.

PATENTED MAR. 31, 1903.

S. W. WOOD.
ELECTRICAL TOWAGE ON CANALS.

APPLICATION FILED JUNE 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

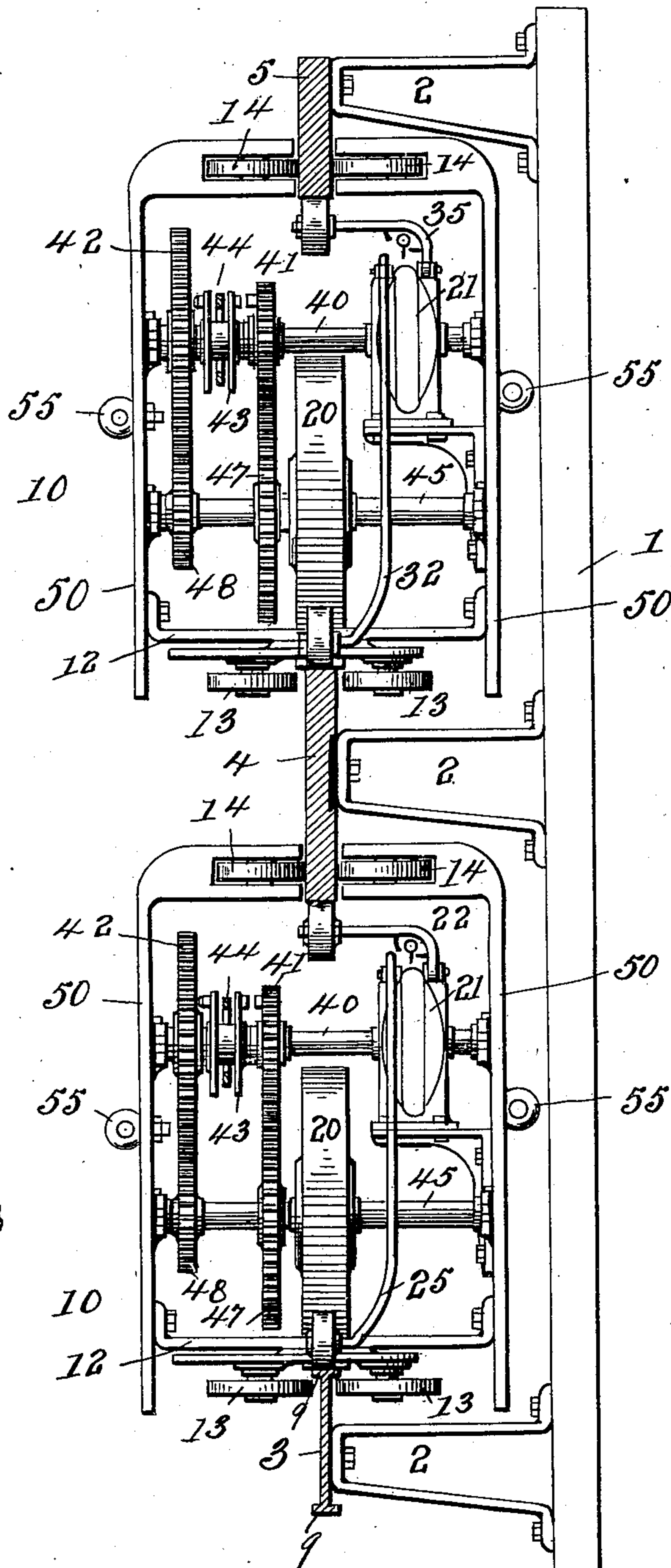
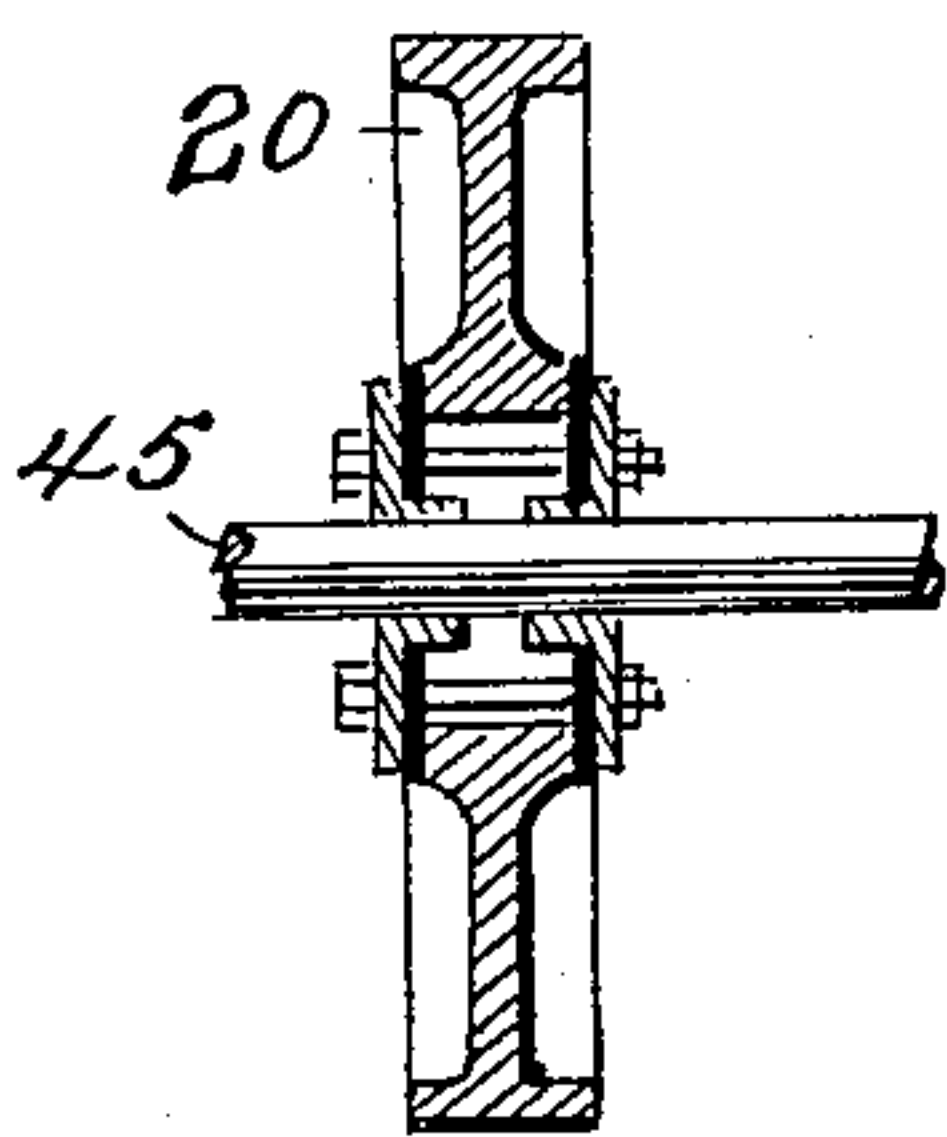


Fig. 3.



Witnesses
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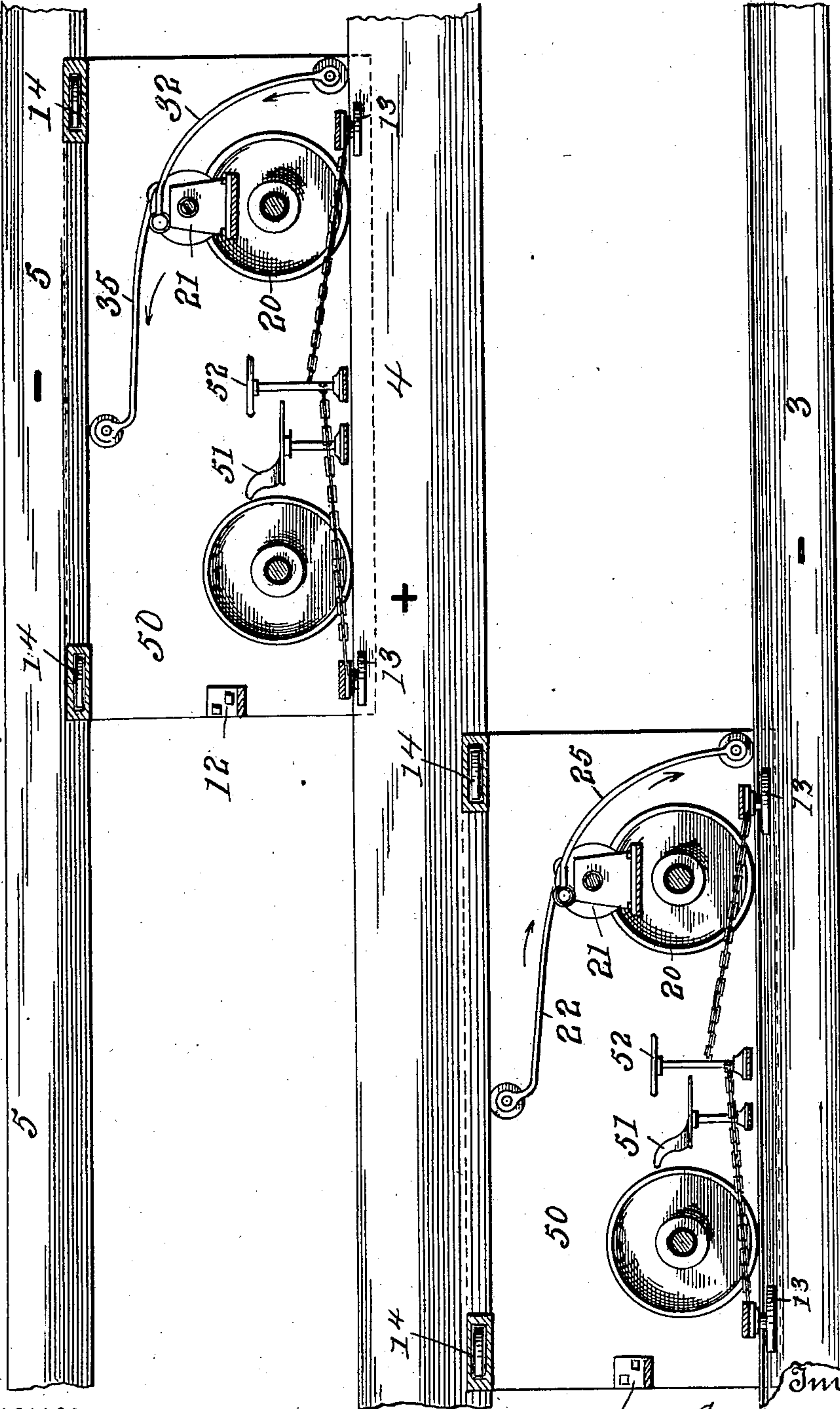
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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

STEPHEN W. WOOD, OF NEW YORK, N. Y.

ELECTRICAL TOWAGE ON CANALS.

SPECIFICATION forming part of Letters Patent No. 724,368, dated March 31, 1903.

Application filed June 25, 1902. Serial No. 113,178. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN W. WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electrical Towage on Canals, of which the following is a specification.

This invention relates to electrical traction-ways for towage on canals.

The object of the invention is to construct a traction-way along the bank of a canal on which electrically-driven tractors may run in either direction and be used for towing boats or trains of boats on the canal; and the invention consists in certain constructions and combinations of mechanical elements whereby a three-rail traction-way is made to sustain and direct the tractors and the tractors are adapted to operate on said rails, preferably receiving the operative electrical current from the middle rail, the upper and lower rails acting as return-conductors or ground-rails.

Figure 1 is a cross-section of a traction-way according to my invention, the tractors being shown in elevation with parts omitted. Fig. 2 is a front elevation of a portion of the traction-way, showing tractors in section. Fig. 3 is a section of one of the traction-wheels and parts closely related thereto.

The numeral 1 is supposed to represent one post of a series of posts arranged at the side of a canal, with brackets 2 projecting from one side of said posts, being the side toward the canal. On the brackets 2 the rails 3 4 5 are supported. The middle rail 4 being both a traction and a conduction rail should be insulated from its supports. The distance between the rails 4 and 3 is equal to the distance between the rails 4 and 5, so that a tractor which fits the upper space will also fit the lower space. The tractors 10 are mounted so as to travel in either direction between the rails and in either of the spaces. The tractor projects equally at each side of its supporting-rail—that is, away from and toward post 1—and may be turned with either side toward the supporting-posts. The frames of the tractors are substantially similar. Each frame is preferably composed of two side pieces 50 50, and these side pieces

are connected together by ties, as 12, passing through the spaces between the rails. The tractors may be made to grip the rails by gripping-wheels 13 13, substantially in the manner described in my application, Serial No. 113,177, filed June 25, 1902. The rails illustrated are merely suggestive, as any well-known form of rail suitable for the purpose might be used. The rail 3 is shown with a flange 9, under which flange the edge of the gripping-wheels may extend, and so hold the tractor firmly down upon this rail. Guide-wheels 14 bear upon the sides of the rail above the traction-rail—that is, the rail 3 is a traction-rail, the rail 4 is both a traction and a guide rail, and the rail 5 is a guide-rail. The rails project vertically beyond the faces of their supporting-brackets, so that the guide and gripping wheels can grasp or bear against the vertical faces of the rails.

The driving-wheel 20 is insulated from the engine and is driven from an electrical motor 21. The lower motor 21 receives its electrical current from rail 4 through trolley 22, which trolley runs on the lower edge of the insulated current-supporting rail 4. The motor or engine may be of any usual construction. The return-current passes through trolley 25 to the return or ground rail 3. The tractor on the upper track receives its motor-current from rail 4 through trolley 32, and the return-current passes through trolley 35 to the grounded or return rail 5. Thus both the tractors shown take their driving electrical currents from the rail 4 through trolleys running therefrom, and both make their "ground" on return-circuit through the rail at the opposite side of the tractor from said current or positive rail 4 through a second trolley. The current does not reach the engine nor leave the tractor through the traction-wheels, the same being insulated. When a motor is changed from the upper to the lower passage, or vice versa, between the rails, the electric current is shunted by any usual construction of electrical switch, so as to reach the engine from the proper direction. In other respects the action is similar whether the engine runs in the upper or the lower passage.

In Fig. 1 I show the engine 21 as mounted on a counter-shaft 40, and on said counter-shaft there are loose pinions 41 and 42, differ-

ing in size. A clutch member 43 between these two pinions can be shifted into engagement with either one of the two pinions by the action of lever 44. The clutch member 5 43 rotates with the counter-shaft in manner well known in gearing of this class and can be shifted so as to drive either pinion 41 42 with the counter-shaft or to permit these pinions to be idle. On the driving-axle 45 there 10 are fixed pinions 47 and 48, and these pinions are in gear with the pinions 41 and 42 on the counter-shaft 40. Thus when gear 41 is in coupling with the shaft 40 the driving-axle 45 and traction-wheel 20 are driven at a low 15 speed, while if the clutch be shifted so that pinions 42 and 48 are coupled the driving axle and wheel will be driven at a higher speed. A differential or change-speed gear of this character is very common in mechan- 20 ics. The form of differential gear is not material to the operation of the tractor, as any convenient known mechanism of this character may be adopted for the purpose. The extreme speed required from tractors of this 25 character in towing canal-boats is not likely to be above six miles per hour. Therefore the slow-speed gear is arranged to move the tractor at a much slower speed than this, and this slow speed is generally used in starting 30 a boat or tow of boats, after which the higher speed will usually be employed.

The sides 50 of the tractors are preferably duplicates of each other.

The seat 51 is preferably so disposed that 35 the operator will be within easy reach of the hand-wheel 52, by which the gripper-wheels are operated.

Of course it will be quite feasible to duplicate the engines and traction or driving 40 wheels; but this will not generally be necessary with tractors for inland canals.

Each tractor will have means at 55 connected with both sides by which a tow-line may be attached.

45 For fuller illustration of many of the details of the invention reference is made to my application above referred to.

What I claim is—

1. In a canal traction device the combina- 50 tion with suitable supports, of a vertical three-rail traction-way, and electrically-operated tractors running thereon, the tractors receiving the electrical current from the central rail, and passing the return or ground cur- 55 rent to the upper and lower rails.

2. The combination with the supports there- 60 for, of three rails arranged parallel and one above another, one of these rails being an electrical conductor, a tractor running on one of the rails while one of the other rails acts as a guide-rail therefor, a trolley with electrical connections leading from the conduc- 65 tor-rail to the engine, and a trolley running on another rail with electrical connections from the engine leading thereto.

3. In combination with the electrical con- ductor-rail, a tractor having a trolley in con- tact with said rail, electrical connections from this trolley to the engine, electrical connec- tions from the engine, and a second trolley 70 in contact with a second rail, whereby ground or circuit connections are made without passing through the traction-wheel.

4. The combination with suitable supports, of a three-rail traction-way, the rails arranged 75 one above another, the central rail being insulated and acting as an electrical supply a guide and a traction rail, the lower rail acting as a traction and as a ground or return circuit rail, and the upper rail acting as a guide 80 and as a return circuit rail, and tractors having trolley-conductors to the rail, substantially as described.

5. The combination with a traction-way consisting essentially of three rails arranged 85 parallel and one above another, tractors moving in the passages between these rails, means for insulating the central rail so that it will act as an electrical-supply rail to tractors in either passage between the rails, and trolleys 90 on the tractors connecting to said central rail.

6. The combination with the central, insu- 95 lated, electrical-supply rail, and return or ground rails arranged above and below the same, of tractors provided with insulated driving-wheels arranged to run on the lower and middle rails, and separate trolleys bearing on different rails and having conductors arranged to receive the electrical current from the middle rail without passing through 100 the traction-wheels, and trolleys arranged to conduct the ground or return current to the upper and lower rails.

7. The combination with the supporting- 105 posts, brackets extending at one side thereof, a central conducting-rail on said brackets and parallel conducting-rails above and below said conducting-rail, and a plurality of tractors on said rails each reversible so as to present either side toward the posts without obstruc- 110 tion, each tractor having trolley-supply connection from the engine to the central rail, and trolley connections from the engine to the upper and lower ground or return rail, and insulated drivers running on the trac- 115 tion-rails, substantially as described.

8. The combination with suitable supports along the line, of a plurality of metallic ways attached at different heights on said sup- 120 ports, independent electrical tractors traveling on the metallic ways, and a single electrical conductor to convey the electric current to such tractors.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN W. WOOD.

Witnesses:

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