

No. 678,122.

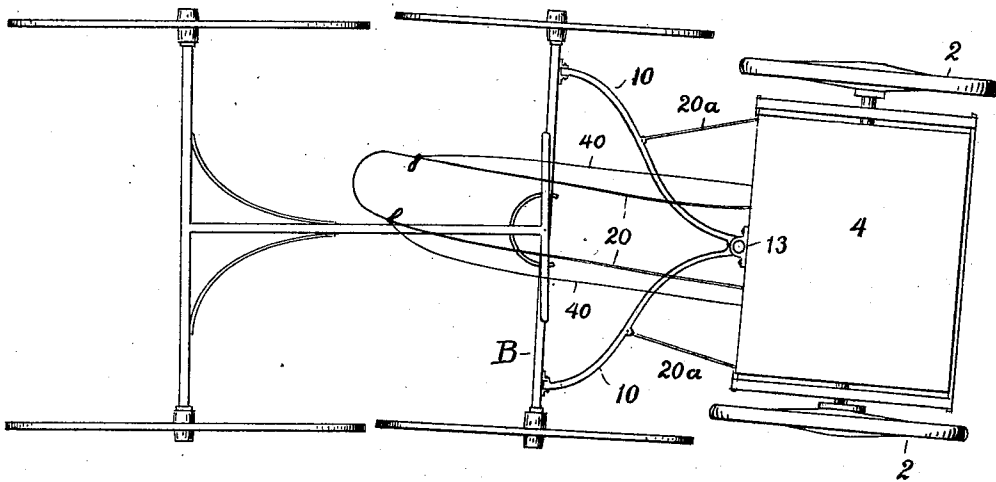
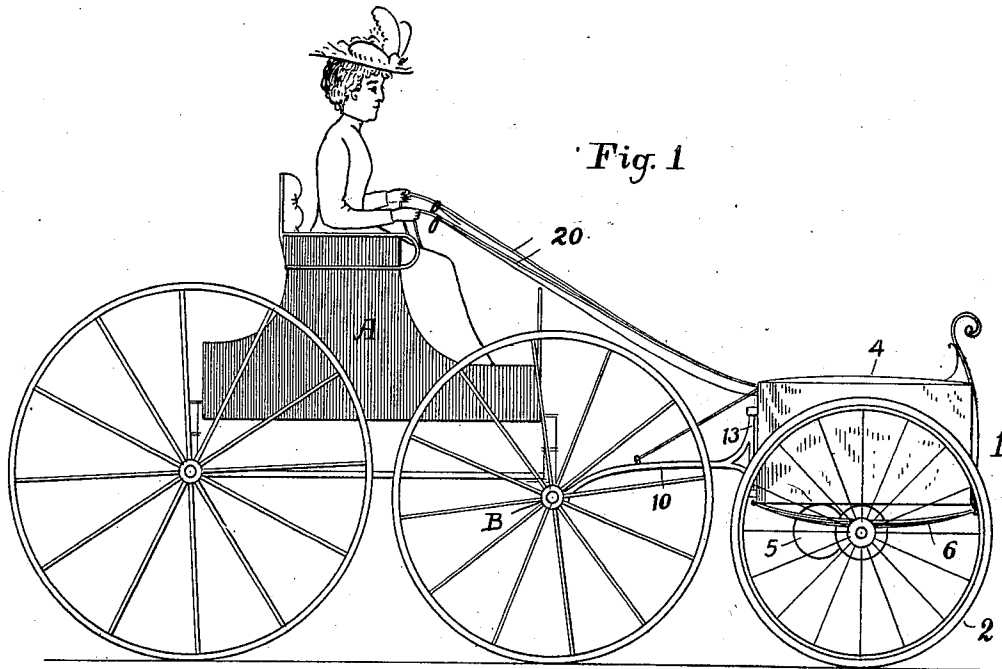
Patented July 9, 1901.

L. M. MAXHAM & A. B. UPHAM.
TRACTION MOTOR.

(No Model.)

(Application filed Nov. 23, 1898.)

2 Sheets—Sheet 1.



Witnesses;

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2 Sheets—Sheet 2.

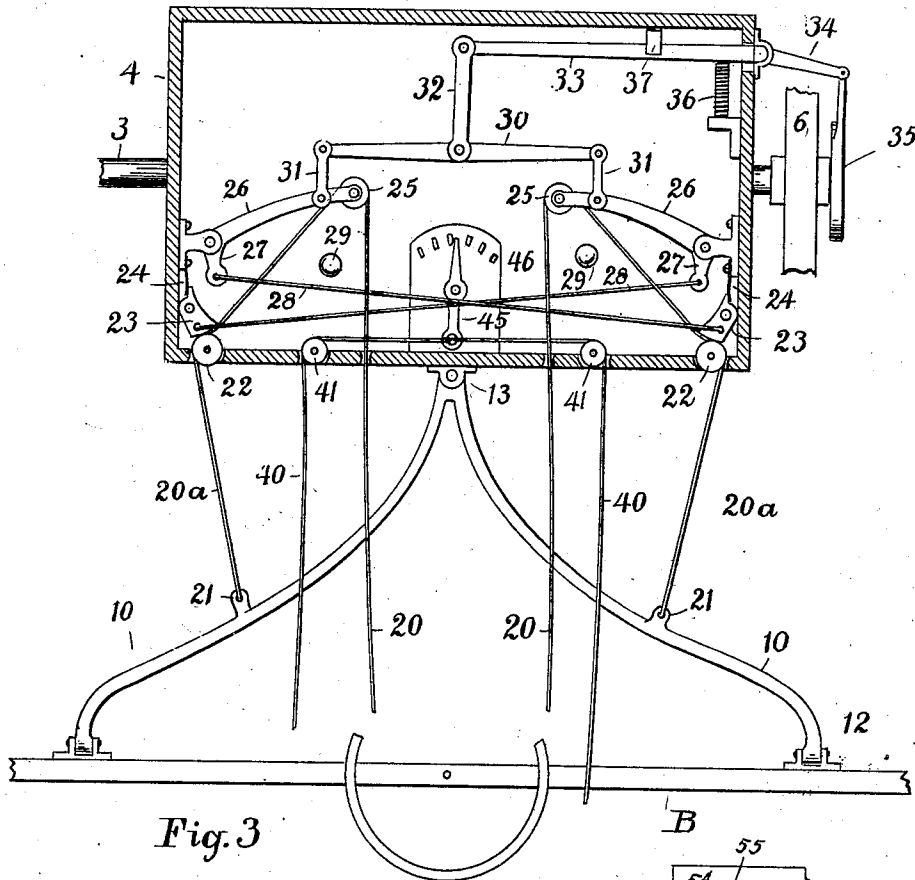


Fig. 3



Fig. 6

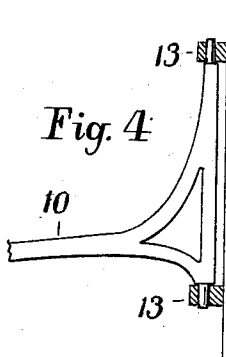


Fig. 4

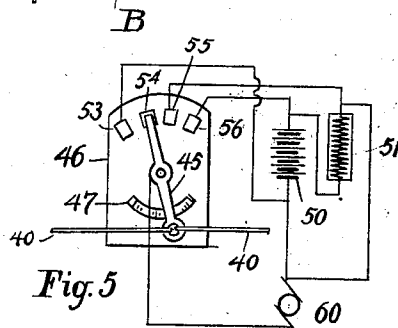


Fig. 5

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UNITED STATES PATENT OFFICE.

LOWELL M. MAXHAM AND ARTEMAS B. UPHAM, OF BOSTON,
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TRACTION-MOTOR.

SPECIFICATION forming part of Letters Patent No. 678,122, dated July 9, 1901.

Application filed November 23, 1899. Serial No. 738,047. (No model.)

To all whom it may concern:

Be it known that we, LOWELL M. MAXHAM and ARTEMAS B. UPHAM, citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Traction-Motor, of which the following is a full, clear, and exact description.

This invention is in the line of propelling-machines for road-vehicles in which such machine is connected with the front axle of an ordinary carriage or other vehicle usually drawn by horses; and the object of this invention is to enable the occupants of the vehicle to guide and otherwise control the traction-motor by means of reins used in substantially the same manner as they would be if a horse were the motive power.

Referring to the drawings forming part of this specification, Figure 1 is a side view of a carriage or buggy and of our traction-motor attached thereto. Fig. 2 is a plan view of the traction-motor and of the running-gear of a carriage drawn thereby. Fig. 3 is a sectional plan view on a larger scale, giving the details of the devices for enabling a pair of reins to properly control the traction-motor. Fig. 4 is a side view of the pivotal connection of the thills to the traction-motor, and Figs. 5 and 6 are detail views showing the current-reversing devices.

The vehicle shown is an ordinary buggy A, although a carriage, cab, wagon, truck, or delivery-wagon could be shown with equal propriety. To the front axle B of the vehicle is attached in the usual manner an abbreviated pair of thills, the front ends of which are brought together and pivoted to the rear of the motor-box 4 of the traction-motor 1. As shown in Figs. 1 and 4, said pivot 13 of the thills 10 is vertical, and its bearing-points are sufficiently separated to brace the traction-motor against rocking upon the shaft 3. To guide this traction-motor, it is simply necessary to turn the same to one side or the other about this pivot 13, as set forth more at length in a companion application, Serial No. 736,521. Our means for enabling the driver to thus control the traction-motor consists of a pair of reins connected thereto at opposite sides of the pivot, so that

by pulling upon, for instance, the right-hand rein and easing up on the left-hand one the traction-motor is turned toward the right, and vice versa. Such an arrangement alone, however, is quite imperfect, for the reason that any relaxation upon the reins would endanger a sudden ditching of the entire equipage at the side of the road, a slight obstruction against one of the wheels 2 being enough to turn the traction-motor to one side and cause the disaster quoted. To absolutely insure against any such lapse of control and yet to enable those accustomed to driving a horse to drive this autohorse by means of reins in precisely the same manner, we have perfected the same in the following way:

Referring to Fig. 3, 20 indicates a pair of reins which instead of being attached to the motor-box pass about pulleys in said box and are terminally fastened to the thills 10 at 21. This alone is a considerable improvement over the method first described, since it requires but one-half the energy to turn the traction-motor in either direction; but this is not enough. It is necessary to automatically lock the traction-motor against any accidental deflection of the same, even should the reins be entirely dropped. To do this, we provide a cam 23 for each pulley 22, which by its clamping action against the part of the rein passing between it and the pulley 22 prevents the rein ends 20^a from pulling away from the motor-box. Hence, said rein ends being firmly anchored both to the thills and motor-box, the traction-motor is rigidly held from turning. To automatically release this clamping device from one rein when the opposite one is pulled by the driver, the pulleys 25, about which the reins pass, are mounted at the free ends of the levers 26. Each of said levers has its shorter arm 27 connected by a slender rod or wire 28 to the clamping-cam 23 of the other rein in such a manner that when either rein is pulled the other rein is released and the traction-motor can by a continuation of such pull be turned to the side of such forcibly-moved rein. The instant the pull ceases, the spring 24 instantly again actuates the clamping device. To prevent the levers 26 from being drawn forward too far, a stop 29 is provided for each. This arrangement ren-

ders the guidance of the traction-motor by means of reins entirely practicable and easy; but to make the management of the traction-motor still further under the control of the reins, so that a strong pull upon both reins simultaneously will both apply the brake and shut off the power, although neither rein alone will do anything of the sort, we have devised the following construction: United to the levers 26 by suitable pivoted links 31 is a bar 30, the median point of which is connected to the brake-arm 33. The outer end 34 of this brake-arm operates a band-brake 35 of the usual form, a coiled strut-spring 36 serving to normally hold this arm and brake out of action. When either lever 26 is drawn forward by its rein, the bar 30 simply swings upon its link 32 as a center, moving the other lever backward, and so does not affect the brake-arm 33; but when both reins are forcibly pulled the bar 30 advances bodily and the brake is operated.

We prefer to have the spring 36 strong enough to support the brake-arm against the effect of the reins during all ordinary use thereof, and thereby to enable the driver to keep a steady grip upon the reins. In other words, the driver can be drawing upon both reins strong enough to hold them taut and in condition for instant use in guidance without setting the brake; but the moment he eases up on one rein the other immediately draws its lever 26 forward, unclamps the relaxed rein's cam 23, and permits the traction-motor to be guided toward the side of the taut rein.

The rods or wires 28, which join the short arms of the levers 26 to the clamping-cams 23, are made sufficiently slender to act as a means of traction alone; otherwise when through the pull of one rein its lever 26 advances and the bar 30 moves the other lever backward the clamping device of the retracted rein would be pressed so firmly against such rein as to unduly wear the same.

In case storage batteries are used for the motive power of our traction-motor we make the brake-arm 33 and the contact 37 a portion of the circuit between the batteries and the motor. Hence when the brake-arm is drawn forward under the action of both reins and the brake is set the circuit between such motor and its batteries is broken and the power shut off simultaneously with the application of the brake. Then when the reins are relaxed the spring 36 presses back the brake-arm, the brake is released, and the power again put into action. In this manner the vehicle occupants have the traction-motor under perfect control. They can guide the vehicle to right or left, stop, or start ahead again, all by means of a single pair of reins continuously gripped in their hands. If, going ahead rapidly, the driver finds it necessary to shut off power and apply the brake while continuing to guide the vehicle to one side of an obstruction past which the

momentum of the vehicle will take him, his strong pull upon both reins together does the first part of the task, while making the two pulls relatively unequal turns the traction-motor in the direction desired.

In case a hydrocarbon internal-combustion engine is used for the motive power the circuit of the electric igniter can be broken by the movement of the brake-arm 33 in the same manner as described for the storage batteries and motor, or if a steam boiler and engine are used for the propulsion of the traction-motor the throttle-valve thereof can be readily connected with the brake-arm and so actuated thereby.

As shown in Fig. 2, the thills 10 can be pressed toward or from each other to enable their rear ends to be applied to the usual fastening devices of different makes of vehicles, these thills being secured together at their front ends alone and made sufficiently slender and resilient to allow of such variations in spread. This same resilience of the thills permits a sufficient torsional yielding of their pivoted end to allow the traction-motor wheels and the wheels of the swiveled axle B to all rest solidly upon all ordinarily uneven ground. With respect, however, to the vehicle-axle B the thills form a laterally-inflexible coupling connecting the same to the traction-motor.

While the application of the brake serves also to temporarily shut off the power, a more lengthy cessation of power is obtained by means of the right-hand cord 40, passing about a friction-pulley 41 and attached to the switch-lever 45. By pulling upon this cord the switch is moved from contact to contact of the switch 46, shunting off more and more of the power, until at next to the last contact the circuit is entirely broken. By pulling the left-hand cord 40 the power is turned on in a similar manner. This is indicated in Fig. 5, where the contact 56 is shown as closing the circuit between the battery 50 and the motor 60. The contact 54 introduces the resistance-box 51 and so reduces the electrical energy supplied to the motor. The contact 54 is dead and breaks the circuit when the switch-arm is thereat, while the contact 53 is so connected with the battery and resistance-box as to reverse the current supplied to the motor.

To prevent the switch-arm from passing on from the dead-point 54 to the reversing-contact 53 and so backing the vehicle when it is simply desired to stop it, we have devised means whereby it is made considerably harder to move the said arm to the reverse-contact than to the other contacts. This means consists of the undulatory plate 47, having the switch-arm 45 resiliently pressed against it. (See Fig. 6.) The slight depressions into which said arm sinks and is thereby held in exact position for the different contacts are substantially equal for all the contacts but the reverse one, 53. For that one the switch-arm must be forced up a higher rise suffi-

ciently pronounced to insure against the driver's moving said arm to that point when shutting off the current. Hence when the current is to be shut off and the motor stopped the driver gives a pull to the right-hand cord 40 sufficiently strong to force the switch-arm past all the elevations of the undulatory plate 47 save the last. If he then wishes to back the traction-motor, he gives a much stronger pull to said cord, and thereby moves the switch-arm to the proper contact.

What we claim as our invention, and for which we desire Letters Patent, is as follows, to wit:

1. The combination with a four-wheeled vehicle having its front wheels mounted on a centrally-swiveled axle, of a traction-motor mounted upon its individual supporting and driving wheels, couplings uniting said traction-motor and said axle, and reins connected with said traction-motor for guiding and controlling the same, substantially as set forth.

2. The combination of the vehicle, the traction-motor comprising a pair of wheels on a single shaft and motive power therefor, an inflexible coupling attached to said vehicle and pivoted to said traction-motor midway between its wheels, and a pair of reins connected with said traction-motor at opposite sides of said pivotal point, substantially as set forth.

3. The combination of a vehicle, the traction-motor, an inflexible coupling attached to said vehicle and pivoted to said traction-motor, antifriction devices carried by said traction-motor, and a pair of reins each fastened to said inflexible coupling and passing through said antifriction devices back to the vehicle, substantially as set forth.

4. The combination with the traction-motor and the laterally-inflexible coupling pivoted thereto, of the antifriction-pulleys carried by said traction-motor, and the reins fastened to said coupling and passing about said pulleys back to the vehicle, substantially as set forth.

5. The combination of the vehicle, the traction-motor, the laterally-inflexible coupling uniting the same, the reins adapted when either is pulled to guide the traction-motor to such side, and a brake adapted to be actuated when both of said reins are pulled but not when either alone is pulled, substantially as set forth.

6. The combination of the traction-motor, the inflexible coupling pivoted thereto, the reins adapted when either is pulled to guide the traction-motor to such side, and controlling devices adapted to be actuated when both of said reins are pulled but not when one alone is acted upon, substantially as set forth.

7. The combination with a vehicle and steering-wheels therefor, of a pair of reins adapted for the guidance of said wheels, and a lock-

ing device for holding said steering-wheels, said locking device being adapted to be automatically unlocked by said reins, substantially as set forth.

8. The combination with the vehicle and steering-wheels therefor, of a pair of reins adapted for the guidance of said wheels, a locking device for each of said reins, and releasing devices adapted to be actuated by said reins and to release said reins from said locking devices, substantially as set forth.

9. The combination of the traction-motor, the inflexible coupling pivoted thereto, the pair of reins fastened to said coupling and passing therefrom into engagement with said traction-motor, locking devices for locking said reins, and means automatically operated by said reins for releasing the latter from said locking devices, substantially as set forth.

10. The combination of the traction-motor, the inflexible coupling pivoted thereto, the pair of reins fastened to said coupling, antifriction devices engaging said reins, a locking device for each of said reins, and releasing devices adapted to be actuated by each of said reins for releasing the other rein from its locking device, substantially as set forth.

11. The combination of the traction-motor, a laterally-inflexible coupling pivoted to said traction-motor, a pair of reins attached to said coupling, locking devices carried by said traction-motor and receiving said reins, pivoted levers loosely receiving said reins, and connections between said levers and locking devices, substantially as set forth.

12. The combination of the traction-motor, the inflexible coupling pivoted thereto, a pair of reins attached to said coupling, locking devices carried by said traction-motor and receiving said reins, the pivoted levers having the pulleys at their free ends for receiving said reins, and a connection between the lever of each rein and the locking device of the other rein, substantially as set forth.

13. The combination of the traction-motor, the coupling pivoted thereto, the reins attached to said coupling, antifriction devices carried by said traction-motor and receiving said reins, clamping-cams adapted for locking said reins to said traction-motor, and means automatically operated by said reins for releasing them from said clamping-cams, substantially as set forth.

14. The combination of the traction-motor, the coupling pivoted thereto, the reins attached to said coupling, locking devices carried by said traction-motor and receiving said reins, means for automatically unlocking said locking devices when either of said reins is pulled, and a brake connected with said unlocking means and adapted to be set when both of said reins are pulled but not when one alone is pulled, substantially as set forth.

15. The combination of the traction-motor, the coupling pivoted thereto, the pair of reins adapted for the guidance of said traction-motor, the bar terminally connected with said

reins, and the controlling devices loosely connected with the median point of said bar, whereby said controlling devices are affected when both of said reins are pulled but not when one alone is acted upon, substantially as set forth.

16. The combination of the traction-motor, the coupling pivoted thereto, the pair of reins attached to said coupling, antifriction devices carried by said traction-motor and receiving said reins, a bar terminally connected with said antifriction devices, and controlling devices loosely connected with the median point of said bar, substantially as set forth.

17. The combination of the traction-motor, the coupling pivoted thereto, the pair of reins attached to said coupling, locking devices carried by said traction-motor and receiving said reins, the pivoted levers loosely receiving said reins and adapted to unlock said locking devices, the bar terminally connected with said levers, and the brake-arm connected to the median point of said bar, substantially as set forth.

18. The combination of the traction-motor, the laterally-inflexible coupling, the pair of reins attached to said coupling, antifriction devices carried by said traction-motor and receiving said reins, the brake-arm adapted to be operated when both of said reins are pulled but not when one alone is pulled, an electric circuit, and means whereby the setting of said brake opens the circuit, substantially as set forth.

19. The combination of the vehicle, the traction-motor, and the single pair of thills attached to said vehicle and pivotally united at their front ends to the rear of said traction-motor, said pivotal connection being sufficiently prolonged vertically to prevent said traction-motor from rocking upon its supporting-wheels, substantially as set forth.

20. In a traction-motor, the combination of the switchboard, the switch-arm pivoted thereon, the two cords connected with said arm, and adapted to shift the same, a means for partially resisting the movements of said switch-arm from one contact to another, and an increased resistance from the point of "dead" contact and the reversing-contact, substantially as set forth.

21. In a traction-motor, the combination of the switchboard, the switch-arm pivoted thereon, the two cords connected with said arm, the undulatory plate resiliently coacting with said arm and having the higher rise at one end, and the electric circuit having contacts on said switchboard, substantially as set forth.

In testimony that we claim the foregoing invention we have hereunto set our hands this 22d day of November, 1899.

LOWELL M. MAXHAM.
ARTEMAS B. UPHAM.

Witnesses:

GUY H. HOLLIDAY,
HELEN A. SCOTT.