No. 702,503. Patented June 17, 1902.

# S. N. STEWART.

## DEVICE FOR GUIDING WAGONS ON TRACKS.

(Application filed Apr. 8, 1901.)

(No Model.)

Fig: 6.

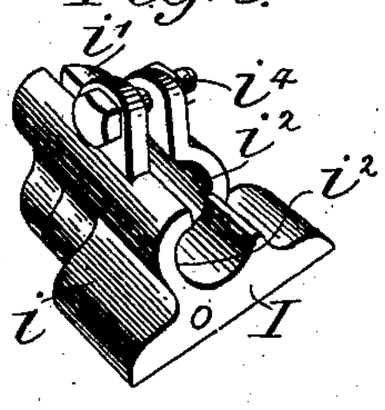



Fig: 1.

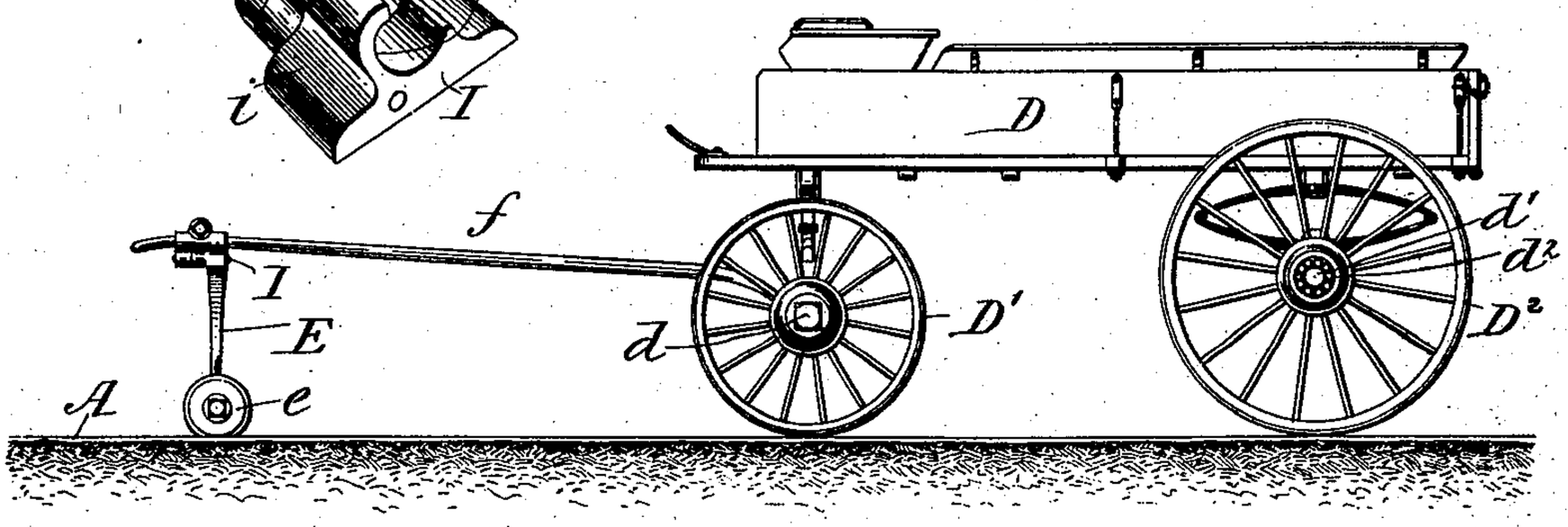



Fig: 2.

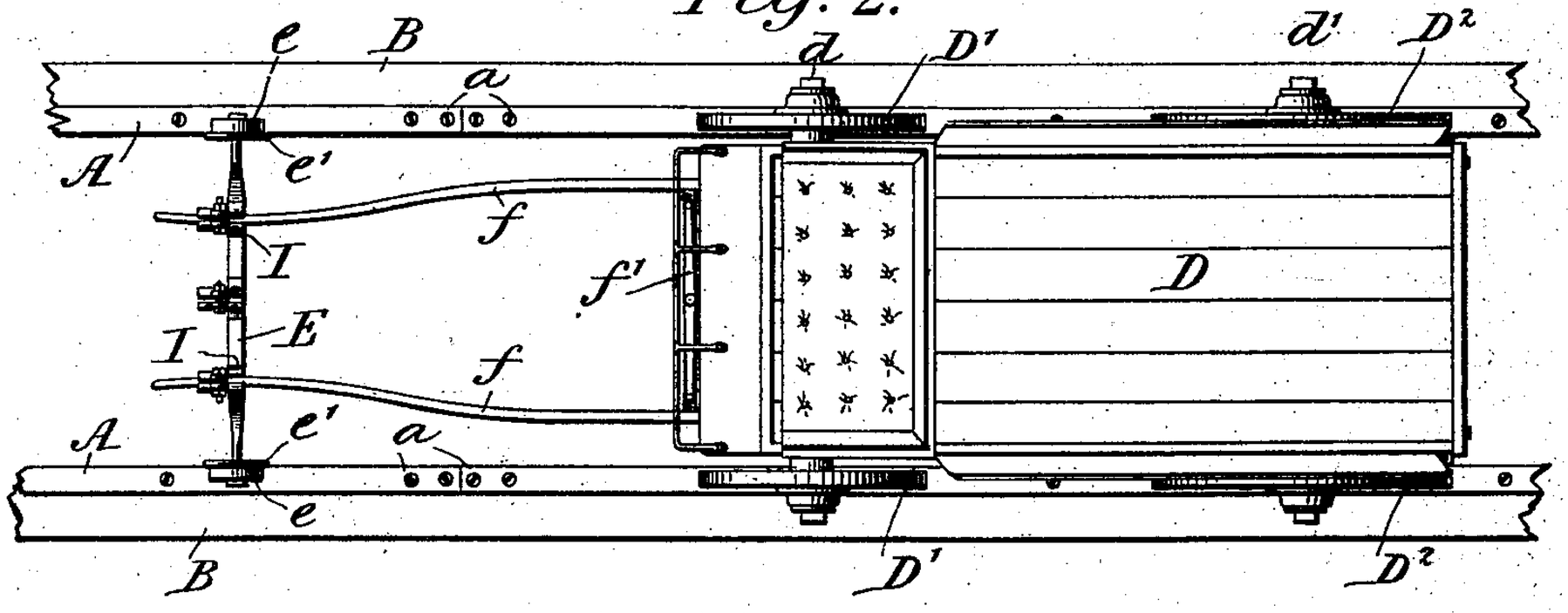



Fig: 4.

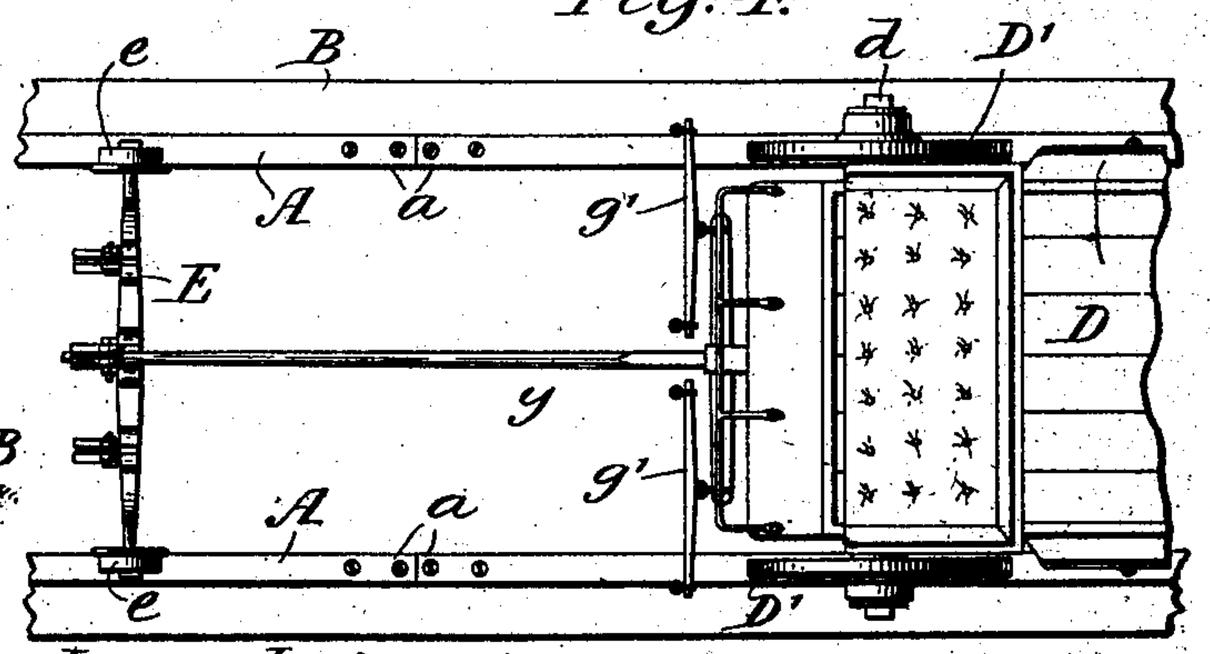



Fig: 3.

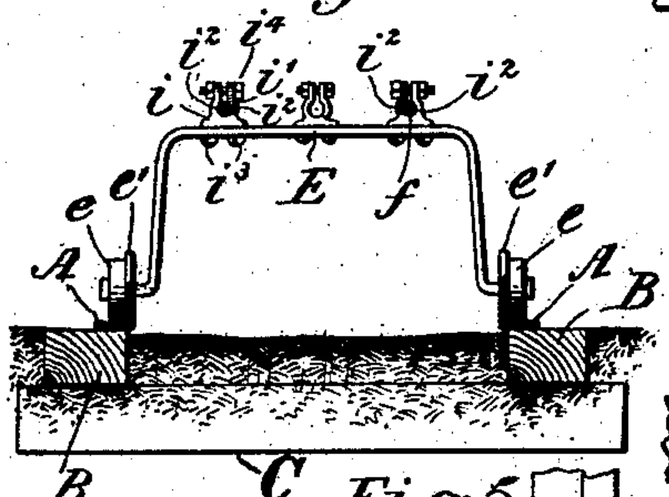
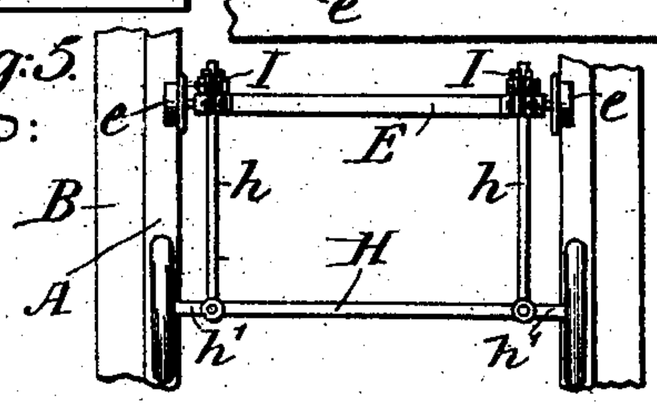



Fig: 5.




Witnesses:
S. Van Kirk
R. F. Lucey.

Inventor:
Sylvester N. Stewart,
By Wright, Brown, Quinby & Wheeler,
his Attorneys.

# UNITED STATES PATENT OFFICE.

SYLVESTER N. STEWART, OF BROOKLYN, NEW YORK.

## DEVICE FOR GUIDING WAGONS ON TRACKS.

SPECIFICATION forming part of Letters Patent No. 702,503, dated June 17, 1902.

Application filed April 8, 1901. Serial No. 54,798. (No model.)

*To all whom it may concern:*

Be it known that I, SYLVESTER N. STEWART, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Devices for Guiding Wagons and other Vehicles on Tracks or Tramways, of which the following is a specification.

With the ordinary earth roads in country districts and other locations the resistance opposed to the draft or propulsion of wagons and other wheeled vehicles is so great, as is well known, that only relatively light loads as compared with the power exerted can be transported, and as a result thereof the cost of this form of transportation when to a considerable distance, even when the roads are in fair condition, is so great as to be almost, if not quite, prohibitive. To remedy this, and thereby cheapen the cost of transit, it has been the custom in some instances to cover the surface of the road with small broken stone or to "macadamize" it, as it is sometimes called, and in others to either pave it with cobble or other forms of stone or cover the whole or portions of its surface with longitudinally-disposed planks, that are secured to transversely-arranged ties which are provided to receive them, and forming when thus constructed what is ordinarily known as a "plank road." These various forms of construction, while serving to remove a considerable portion of the resistance to the passage of the wagon or vehicle over them, and thereby allowing of the transportation of heavier loads, have been found more or less impracticable, except when the roads have extended through populous sections or between cities or larger towns or villages, because of the cost of their construction and the expense incident to the maintenance of them in repair.

In addition to the above it has likewise been essayed to employ metal tracks which are constructed from channel-beams laid end to end upon suitable stringers, with the flanges at their edges extending downward and the flangeless or smooth side laid uppermost to form smooth surfaces, upon which the wheels of the wagon or vehicle travel as they are passed over it. This construction, while presenting the ideal surface or roadway, because of the slight resistance opposed to the passage of the load over it, has, like the other above mentioned, been found too expensive for general adoption in consequence of the fact that with no means for guiding the wagon or vehicle other than that of the draft-animal or the hand of the driver the rails have of necessity to be made of a width that is at least eight or ten inches or even wider; otherwise the wheels of the wagon or vehicle cannot be maintained upon them.

The object of my invention is therefore to obviate the various objections thus specified and provide means whereby a roadway may be employed which, while possessing all the advantages of a metal-track road, shall at the same time be of such cheapness of construction as will permit of the transportation of freight and passengers over it to long distances, even through sections that are but thinly settled.

To these ends the invention consists in the construction and combinations of parts, all as will hereinafter more fully appear.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of a portion of the roadway with an express-wagon resting thereon and a guiding device constructed in accordance with my invention applied in connection therewith, the dust-cap and nut at one end of the rear axle being removed; Fig. 2, a plan view thereof with such dust-cap and nut secured in place; Fig. 3, a transverse vertical section of Fig. 2 looking toward the front in that figure; Fig. 4, a plan view of a portion of the roadway with a wagon of a slightly-modified construction resting thereon and with the rear portion of the latter broken away for convenience of illustration; Fig. 5, a diagrammatic plan view showing on a smaller scale a portion of the roadway, and the front wheels and axle of an automobile with my invention applied in connection therewith; and Fig. 6, an enlarged detail of one of the clamps by means of which the guiding device is detachably connected with the pole or thills of a wagon and the corresponding rods of an automobile.

In all the figures like letters of reference are employed to designate corresponding parts.

A and A indicate metal rails, upon which the wheels of the wagon or vehicle travel. These rails may be constructed of any approved form; but as shown in the drawings they are constructed of thin narrow steel bars or strips and are secured at the proper distance apart upon the upper inner edges of wooden string-pieces B and B by screws *a* or otherwise, with the string-pieces in turn supported at the proper distances apart on ties C, that are disposed beneath them. As thus arranged and supported the surface of the road-bed between and outside of the rails is either filled in with suitably-packed earth or paved, macadamized, or covered with planks, as may be desired, whereby to adapt it to the various uses to which a road-bed as ordinarily constructed is subjected. Upon the tracks as thus arranged and supported may travel the wheels of any of the wagons or vehicles usually employed for traffic or pleasure purposes, and in Figs. 1, 2, and 4 I have shown an ordinary express-wagon with the wheels thereof arranged to travel upon them. In these figures, D indicates the body of the wagon, D′ the front wheels, and $D^2$ the rear wheels thereof, of which the wheels of the front and rear pairs are respectively held at the proper distances apart to bring the longitudinal median line of the tire of each in substantial coincidence with the longitudinal median line of its respective supporting-rail by suitable axles *d* and *d′*, as shown.

With the wheels of the various wagons and vehicles arranged to travel upon the tracks as thus described the draft or propulsion of the wagons or vehicles along the same may be accomplished by any of the various means usually employed for those purposes. In order, however, to permit of either of these results being effected and the wheels of the wagons or vehicles maintained at all times upon the tracks without leaving them, means for guiding them along the same is necessary, and it is to these means that my present invention more particularly relates. These means may be of various forms. I prefer, however, to construct them in the form of wheels *e*, which, constructed of small diameter and provided on the inner edges of their periphery with radially-extending flanges *e′*, are rotatively mounted upon the opposite ends of an axle E, that is made of the proper length to extend across from one of the tracks to the other, whereby to hold the flanges *e′* of their respective wheels closely against the inner edge of their appropriate rails. In some instances this axle E may be made straight, as when employed in connection with an automobile or when the wagon or carriage is propelled by manual power. In other instances, on the other hand, as when used with a horse or other animal, it may be bent upward in the form of an inverted **U**, whereby to permit of the hoofs or feet of the animal or animals working beneath the same without striking or interfering with it. As thus constructed this guiding device may be connected with the wagon or vehicle in various ways. When the draft or propulsion of the wagon or vehicle is effected by a single horse or animal, it will preferably be secured to the forward ends of the thills *f*, which in that case will be made of sufficient length for the purpose, as shown in Figs. 1 and 2, and the horse or other animal will be connected with the singletree *f′*, as is usual, without the thills being inserted in the harness-loops. On the other hand, when two or more horses or animals are employed the usual pole *g* will be made use of and the guiding device secured to its outer end, as shown in Fig. 4, with the horses or animals connected with their appropriate singletrees *g′* and the usual pole-straps omitted. Furthermore, the horizontal portion of the axle E supports the thills or the pole of the wagon at a suitable height above the roadway. While the connection of the guiding device with a wagon or other vehicle drawn or propelled by a single horse or animal or a plurality of them is thus effected, their connection with an automobile will preferably be through the rods *h*, which, detachably connected at their inner ends with the jointed bearing portions *h′* of the axle H, will be secured at their outer free ends to the guiding devices, as shown in Fig. 5. By these means, as will be seen, the accurate guiding of the wheels of the wagon or vehicle along the tracks will be insured and not only the employment of ordinary wagons or other vehicles permitted, but a reduction in the width of the rail to the minimum allowed as well.

For connecting the guiding device with the thills *f*, the pole *g*, or the rods *h* various forms of device may be employed. I prefer, however, to avail of the clamps I for the purpose and to construct them each with a fixed member *i* and a movable member *i′*, which are severally provided in their inner faces with circular recesses $i^2$, whereby to adapt them to receive the thill, pole, or rod that is to be clamped between them. As thus constructed these clamps are secured to the axle E by screws $i^3$ or otherwise and are each provided with a bolt $i^4$, which, passing through its fixed and movable member, serves as a means for clamping it upon and releasing it from its respective thill, pole, or rod, as may be required. With the connecting appliances constructed as thus described the guiding device may be employed in connection with any of the ordinary forms of wagons or vehicles now in use and the latter thereby adapted to travel upon metal tracks or left free and unencumbered for employment in other locations by simply connecting the guiding device therewith or disconnecting it therefrom, as the exigencies of its use may demand. Owing to the fact that there are three of the clamps I secured to the horizontal portion of the axle E, as shown in Figs. 2, 3, and 4, the said axle E may be applied either to the thills *f* or to a pole *g* interchangeably. Fur-

thermore, since the clamps I are formed with their recesses $i^2$ extending at a right angle to the axle E the said recesses $i^2$ are adapted to readily receive the thills or pole and to be secured thereto at such distance from the front axle of the vehicle as to enable the guiding device as a whole to obtain the proper amount of leverage for turning the front axle of the vehicle, even when the axle E and the wheels *e* are of very light construction.

When the wagons or vehicles employed are of the usual constructions, the bearings of their wheels upon the axles will in most cases be of the ordinary kind, without the presence of friction-relieving devices. On the other hand, when these wagons or vehicles are constructed expressly for use on the tracks it is preferred to provide their bearings with balls or rollers, whereby to reduce the friction to the minimum, and in Fig. 1 I have shown them so applied, in which a series of balls $d^2$ is shown interposed between the axle and the interior of the wheel-hub in the usual and customary manner of applying such devices.

While the form of the rails involving the thin narrow bars or strips is the most economical and is the one preferred in the construction of roads which are designed for use with wagons or vehicles that are provided with unflanged wheels, it is obvious that other forms may be adopted and that with a guiding device of the character described these wagons or vehicles may be operated upon the usual trolley and other street-car tracks and the latter thereby rendered available not only for street-cars, but also for wagons and other vehicles as well.

Although in the foregoing I have described the best means contemplated by me for carrying my invention into practice, I wish it distinctly understood that I do not limit myself thereto, as it is obvious that I may modify the same in various ways without departing from the spirit thereof.

Having now described my invention and specified certain of the ways in which it is or may be carried into effect, I claim and desire to secure by Letters Patent of the United States—

The combination with the thills or a pole of a vehicle, of means for guiding the latter along supporting-tracks, said means comprising an axle having flanged wheels on its outer ends, and attaching devices carried by the axle and removably applied to said thills or pole at sufficient distance from the front axle of the vehicle to turn said front axle and accurately guide the vehicle.

In testimony whereof I have hereunto set my hand this 4th day of April, 1901.

SYLVESTER N. STEWART.

Witnesses:

WM. H. APPLETON,

FRANK S. OBER.