United States Patent

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[54] **TOY VEHICLE ACCELERATOR**
12 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **46/243,** 46/202, 104/168, 198/127
[51] **Int. Cl.** **A63h 33/26**
[50] **Field of Search** 46/202, 243; 104/168; 198/127

[56] **References Cited**

UNITED STATES PATENTS

2,575,914	11/1951	Griffin et al.	104/168
2,947,263	8/1960	Vidmar	104/168
3,039,402	6/1962	Richardson	104/168
3,040,866	6/1962	Rehm	198/30
3,132,736	5/1964	May et al.	198/127

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ABSTRACT: An accelerator for unpowered toy vehicles traveling along a roadway wherein a pair of oppositely turning motor-driven vehicle-engaging rollers are each rotatably mounted on pivoted levers, the levers being biased to swing toward each other and mounted opposite each other adjacent opposite sides of the roadway in order that the rollers temporarily but equally engage opposite sides of the vehicles an thereby stably accelerate the vehicles in a predetermined direction.

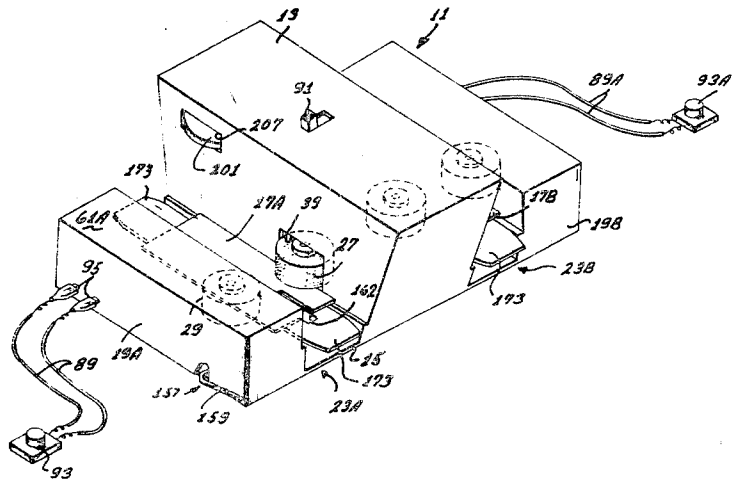


FIG. 1

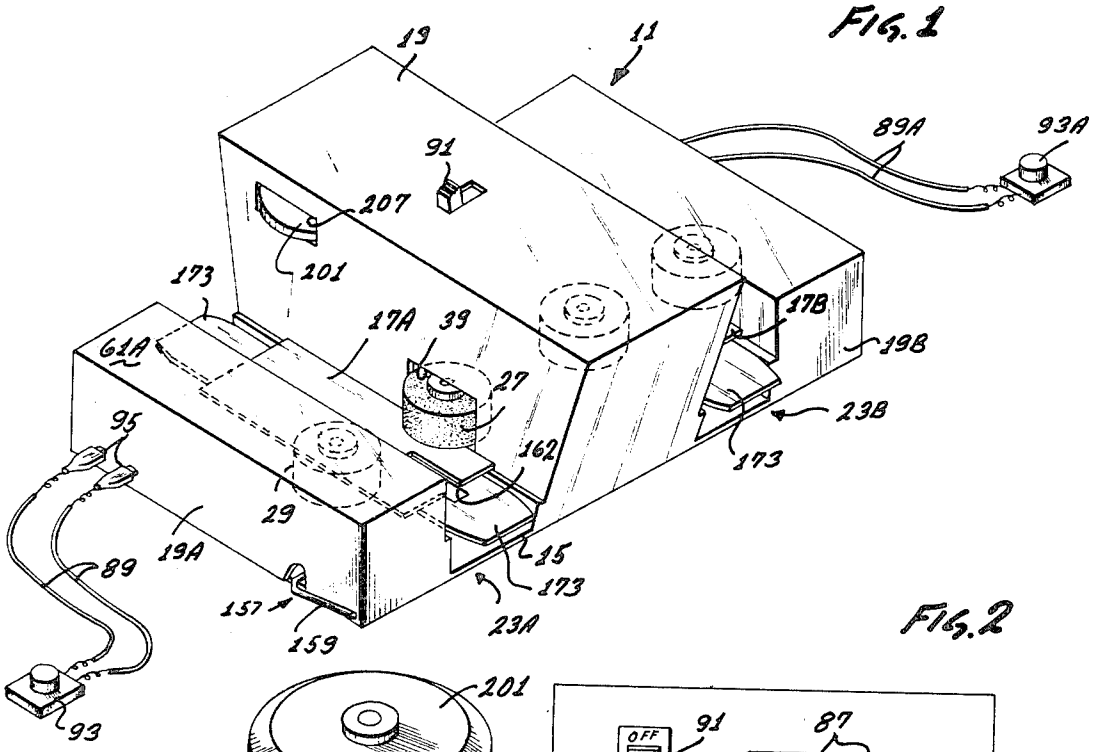
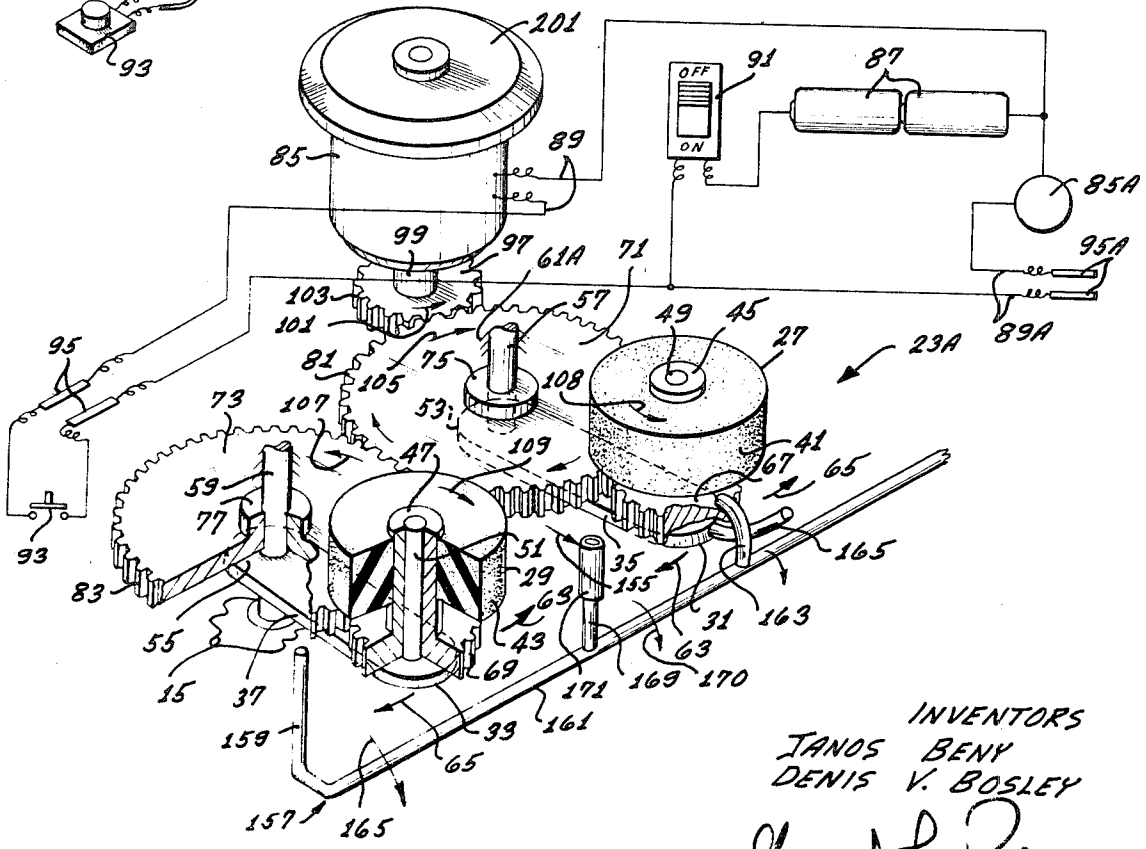


FIG. 2



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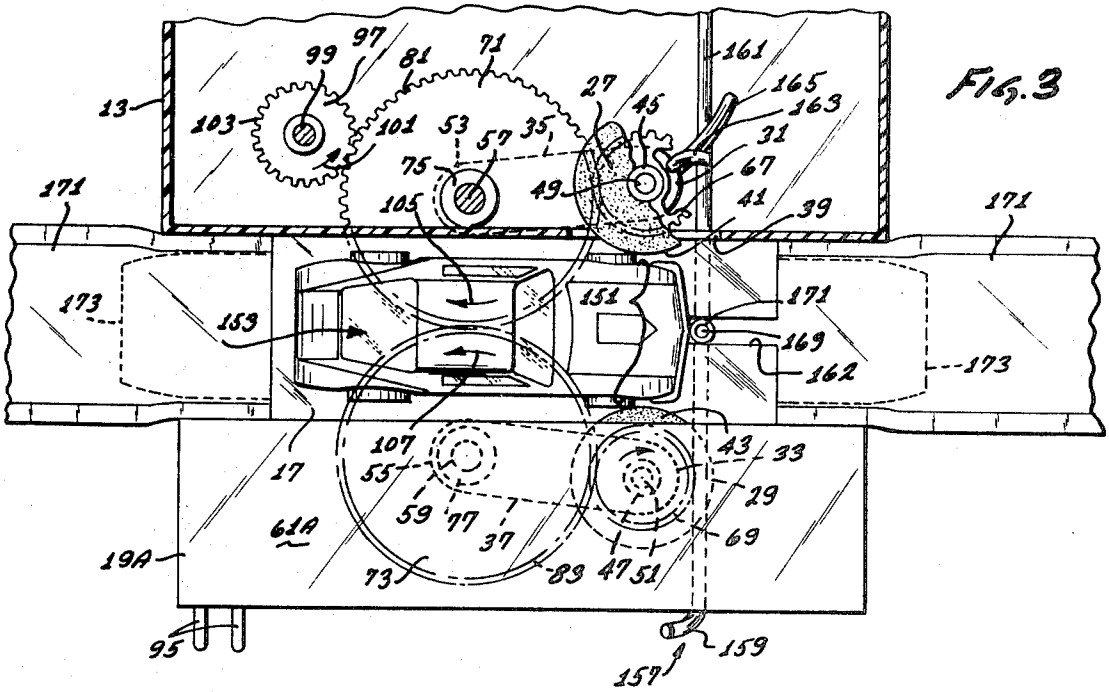


FIG. 3

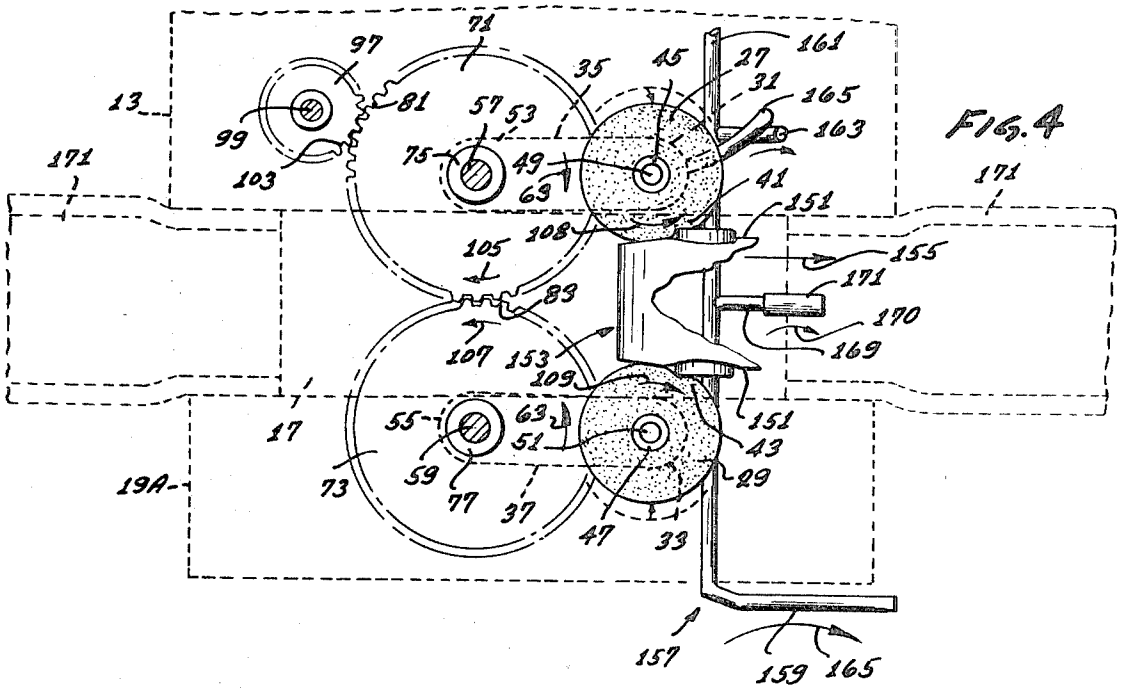


FIG. 4

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TOY VEHICLE ACCELERATOR

BACKGROUND OF THE INVENTION:

1. Field of the Invention

The present invention pertains generally to the filed of toy vehicles and trucks or roadways upon which they travel and more particularly to a novel technique for accelerating such unpowered toys along the roadway in a stable condition.

2. Description of the Prior Art

Toy vehicles such as miniature cars which are initially accelerated by the force of gravity are well known in the art. This requires the operator of the toy to continually replace the toy at the top of an elevated portion of the roadway and precludes sustained toy travel over a lengthy path.

In the past, several techniques have been developed which engage and accelerate these vehicles. Generally, these methods are rather complicated, bulky and expensive to manufacture. A toy vehicle accelerator which overcomes these disadvantages would therefore be a significant advancement in the art.

SUMMARY OF THE INVENTION:

In view of the foregoing factors and conditions characteristic of prior art acceleration boosters, it is a primary object of the present invention to provide a new and improved toy vehicle accelerator not subject to the disadvantages enumerated above and having an improved vehicle propulsion means mounted adjacent roadway along which unpowered toy vehicles travel.

It is another object of the invention to provide a toy vehicle accelerator that does not require that a portion of a roadway upon which toy vehicles travel be elevated and which provides an acceleration force independently of the force of gravity.

It is also an object of the present invention to provide an inexpensive to fabricate and simple to operate toy vehicle accelerator.

It is still another object of the present invention to provide a toy vehicle accelerator which readily adapts itself to vehicles having differing widths.

It is yet another object of this invention to provide a toy vehicle accelerator wherein all transverse forces are of equal magnitude and opposite in direction to cancel any unbalancing effects of the propulsion unit.

It is a further object of the present invention to provide a toy vehicle accelerator which may be caused to accelerator only selected toy vehicles.

It is still a further object of the present invention to provide a toy vehicle accelerator readily adaptable to a single track or roadway as well as adjacent parallel roadway configurations.

According to the present invention, a pair of levers are pivotally mounted opposite each other adjacent opposite sides of a toy vehicle roadway, the levers being biased toward each other. Also, vehicle propulsion means including a pair of driven vehicle engaging rollers are rotatably mounted opposite each other on the levers for temporarily but equally engaging opposite sides of the vehicles to stably accelerate the vehicles in a predetermined direction.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The invention and specific embodiments thereof will be described hereinafter by way of example and with reference to the accompanying drawings wherein like reference numerals refer to like elements or parts. BRIEF DESCRIPTION OF THE DRAWINGS:

FIG. 1 is a perspective view of a toy vehicle accelerator accommodating adjacent parallel tracks and constructed according to the present invention:

FIG. 2 is a schematic diagram of the electrical and mechanical elements used in the device of FIG. 1;

FIG. 3 is a plan view of the accelerator of FIG. 1, showing a toy vehicle just being engaged by the vehicle-engaging rollers; and

FIG. 4 is a plan view of the accelerator of FIG. 1, showing the vehicle-engaging rollers disengaging the toy vehicle after accelerating same. DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring again to the drawings and more particularly to FIG. 1, a dual-track toy vehicle accelerator 11 is shown having a centrally located motor and battery housing 13 situated on a base 15 and first and second track or roadway sections 17A and 17B disposed along opposite sides of the housing 13 and between the housing 13 and separate first and second outer gear housings 19A and 19B, respectively.

The separate accelerating mechanism, here designated by reference numerals 23A and 23B, are identical and may be used individually with a single track layout or simultaneously but independently with a dual track setup as shown. Accordingly, it should be understood that the principles of the invention apply equally to single and multiple track systems. In view of this fact, henceforth the invention will be described with reference to only one accelerating mechaniam.

Referring now to FIGS. 1 and 2, the accelerating mechanism 23A includes an inner vehicle engaging roller 27, and an outer vehicle engaging roller 29, each mounted on first ends 31 and 33 of flat levers 35 and 37, respectively. The rollers 27 and 29 protrude through appropriate apertures in their respective housings, such as aperture 39 in the motor-battery housing 13.

The rollers 27 and 29 are comprised of outer annular resilient members 41 and 43 and respective tubular shafts 45 and 47. The resilient members may be fabricated from a soft rubber or similar natural or synthetic material and the shafts from such materials as aluminum, iron, steel or a hard plastic. These last-mentioned members are rotatably held by individual spindles 49 and 51, the first being mounted on the lever 35 and the other on the lever 37.

Adjacent opposite ends 53 and 55 from the ends 31 and 33 the respective levers 35 and 37 are pivotally mounted on respective posts 57 and 59 extending upwardly from the base 15 and preferably held at their other ends by upper wall 61A of the outer gear housing 19A. In this manner, the rollers 27 and 29 may swing toward and away from each other as indicated by arrows 63 and 65, respectively.

Each of the tubular shafts 45 and 47 are attached to or made integrally with relatively small drive gears 67 and 69 which in turn are meshed with relatively larger idler gears 71 and 73, respectively, the latter gears being rotatably mounted on respective ones of the posts 57 and 59 and held adjacent the levers 35 and 37 by fixed collars 75 and 77. Idler gear 71 includes peripheral gear teeth 81 which at all times mesh with gear teeth 83 of the idler gear 73 at a point between the posts 57 and 59.

Coupled to the gearing system just described is an electric motor 85 which is energized by batteries 87 through conductors 89 and through a battery supply on-off switch 91. Also inserted in series with one of the electrical conductors 89 may be disposed an external temporary contacting operator switch 93 which is connected to the circuit by means of connectors 95. A parallel connected second motor 85A and second connectors 95A will also be used where a dual accelerator is provided.

When the motor 85 is energized by the closing of the electrical circuit by means of switches 91 and 93, drive pinion 97, (mounted on the motor shaft 99) is caused to rotate in the direction indicated by arrow 101. The pinion's gear teeth 103, being meshed with the gear teeth 81 of the idler gear 71, in turn causes this idler gear to rotate in the opposite direction as shown by arrows 105, and the other idler gear 73 is also rotated in the direction shown by arrow 107. As a consequence of the above-described motor driven gearing arrangement, the vehicle-engaging rollers 27 and 29 rotate in opposite directions, illustrated by arrows 108 and 109, at equal speeds.

It should particularly be noted that the lever supported drive gears 67 and 69 are meshed with the contrarotating

larger idler gears 71 and 73 in such a manner that causes, due to frictional forces, the end 31 and 33 of the levers 35 and 37 to swing toward each other, unless constrained. In this manner a self-biasing arrangement is provided so that the rollers are in position to make a balanced contact with the sides 151 of a toy vehicle 153 as seen in FIG. 3. As the rollers engage the vehicle 153, the levers 35 and 37 are forced outward against the biasing force while the rollers force the toy to accelerate out of the accelerator 11 in the direction of the arrow 155 seen in FIG. 4. Thus, the vehicle-engaging rollers 27 and 29 will generally conform to any vehicle side configuration and to varied widths of toys passing therebetween.

The accelerator 11 may also be used as a starter by the use of a starter arrangement 157 comprising a starting handle 159 (only one shown) at each end of a transverse bar 161 rotatably held below the roadway sections 17 by simple conventional means (not shown). The bar 161 also carries a roller disengaging arm 163 extending transversely of the bar at positions to contact and force aside a corresponding lever extension 165 when the handles 159 are upright.

To operate this mechanism, the handles 159 are moved to the position shown in FIGS. 2 and 3, and the toy 153 is moved along the roadway 17 up to a starting post 169 also extending from the transverse bar 161 and through an appropriate slot 162 in the roadway 17. The post 169 may be provided with a sleeve 171 of suitable material in order to prevent chafing of the front end of the vehicle 153. To release the vehicle, either one of the handles 159 (in a dual track arrangement) is moved or rotated clockwise as indicated by arrows 165. This movement rotates the post 169 (see arrow 170) and the disengaging arms 163 from the lever extension 165 to allow the vehicle 153 to pass and to allow the lever 35 to move in the direction 63 whereby the roller 27 engages the side 151 of the toy with an equal but opposite transverse force to the roller 29, and with an aiding accelerating force in the direction of vehicle travel 155.

The accelerator 11 may be placed at a track of a track or roadway system or in series with an elongated or continuous one. This may be accomplished by inserting suitable track sections 171 to coupling tabs 173 extending from each end of the accelerator roadway sections 17. For a more detailed description of such track and coupling tabs, reference may be made to a copending application S.N. 779,874 assigned to the assignee of the present invention.

A device constructed according to the invention may also include a flywheel 201 mounted on the motor shaft 99 as seen in FIGS. 1 (protruding through an aperture 207 in the housing 13) and in FIG. 2. This configuration provides much greater vehicle acceleration for the same current drawn by the motor 35 without the flywheel.

The material used in the fabrication of this toy are not critical and any material generally considered suitable for a particular use may be utilized.

From the foregoing, it will be evident that the invention provides a new and useful toy that may be used to stably propel miniature unpowered vehicles while moving or propel them from a standing start. The invention is specially adapted to accommodate vehicles of varying widths, weights and sizes.

Although a specific embodiment of the invention has been described in detail, other organizations of the embodiment shown may be made with the spirit and scope of the invention.

Accordingly, it is intended that the foregoing disclosure and drawings shall be considered only as illustrations of the principles of this invention and are not to be constructed in a limiting sense.

What I Claim is:

1. A toy for accelerating unpowered toy vehicles along a roadway, comprising: a base with a portion of the road way supported and extending thereabove,

a pair of levers pivotally mounted on said base opposite each other adjacent opposite sides of the roadway, the levers being biased toward each other; and

vehicle propulsion means including a pair of driven vehicle-engaging rollers rotatably mounted opposite each other on said levers for temporarily but equally engaging opposite sides of the vehicles to stably accelerate the vehicles in the portion of roadway above said base in a predetermined direction.

2. A toy according to claim 1, wherein said vehicle propulsion means includes motor means for providing rotational power, and mechanical means operatively coupled to said pair of rollers and to said motor means for utilizing said rotational power to rotate said rollers identical speeds in opposite directions.

3. A toy according to claim 2, wherein said levers are biased toward each other by said mechanical means.

4. A toy according to claim 2, wherein said motor means is an electric motor.

5. A toy according to claim 4, wherein said mechanical means includes a pair of drive gears each disposed on lever supported spindles coaxially with and attached to corresponding ones of said rollers. Said spindles being located adjacent the opposite end of said levers from where said levers are pivoted about respective fixed posts, said mechanical means also including a pair of relatively larger idler gears each rotatably mounted on different ones of said fixed posts and each meshed with corresponding ones of said drive gears and to each other, said drive pinion being meshed with at least one of said idler gears.

6. A toy according to claim 1, wherein said rollers include tubular shaft mounted annular resilient members.

7. A toy according to claim 1, also including starting means operatively coupled to one of said levers and a movable starting post for allowing the toy vehicles to be accelerated from a standing start.

8. A toy according to claim 7, wherein said starting means also includes a transverse rod on which a roller disengaging arm and said starting post are orthogally carried, said disengaging arm only contacting and holding aside said one of said levers when said starting means is in a prestart condition.

9. A toy according to claim 4, wherein a flywheel is carried by said rotating motor shaft.

10. A toy according to claim 4, wherein said motor means also includes an electric motor activated by a potential source through a series-connected power switch.

11. A toy according to claim 10, wherein an externally provided temporary-contacting operator's switch is connected in series with said electric motor and said power switch.

12. A toy according to claim 1, wherein a second pair of said levers and a corresponding second one of said vehicle propulsion means are disposed adjacent a second roadway positioned adjacent and parallel the first-mentioned roadway.

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