Oct. 20, 1931. B. K. GILLESPIE 1,827,886

APPARATUS FOR CLEANING AND POLISHING AUTOMOBILES

Filed Dec. 16, 1927 5 Sheets-Sheet 1

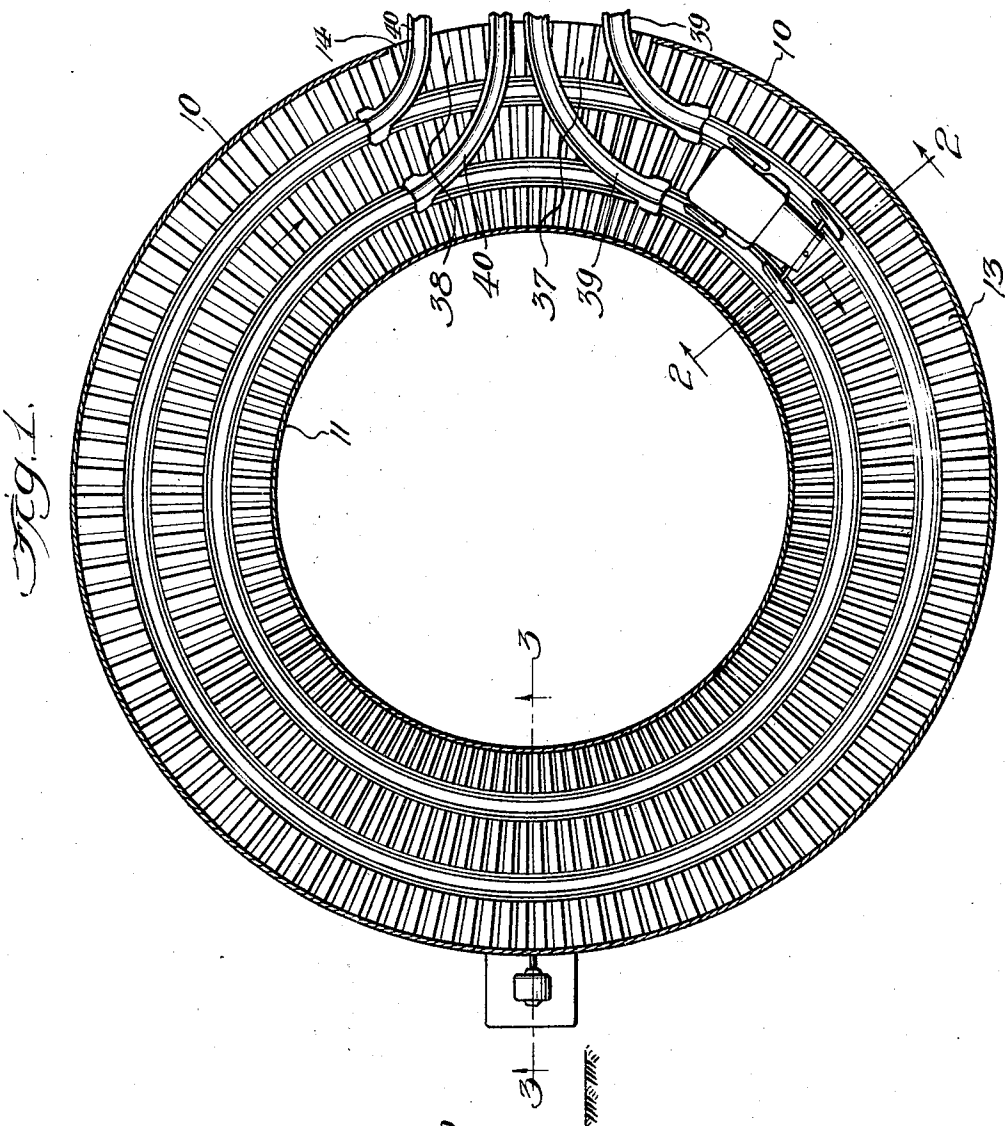


Fig. 1.

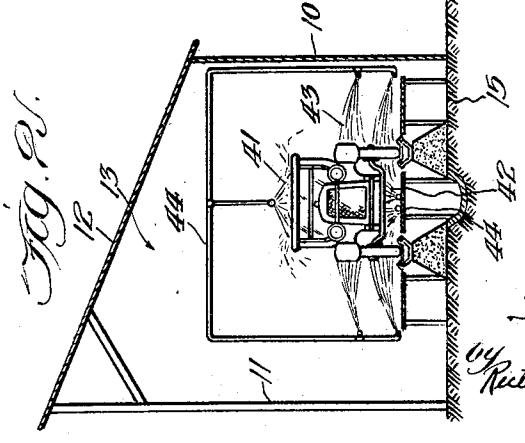


Fig. 2.

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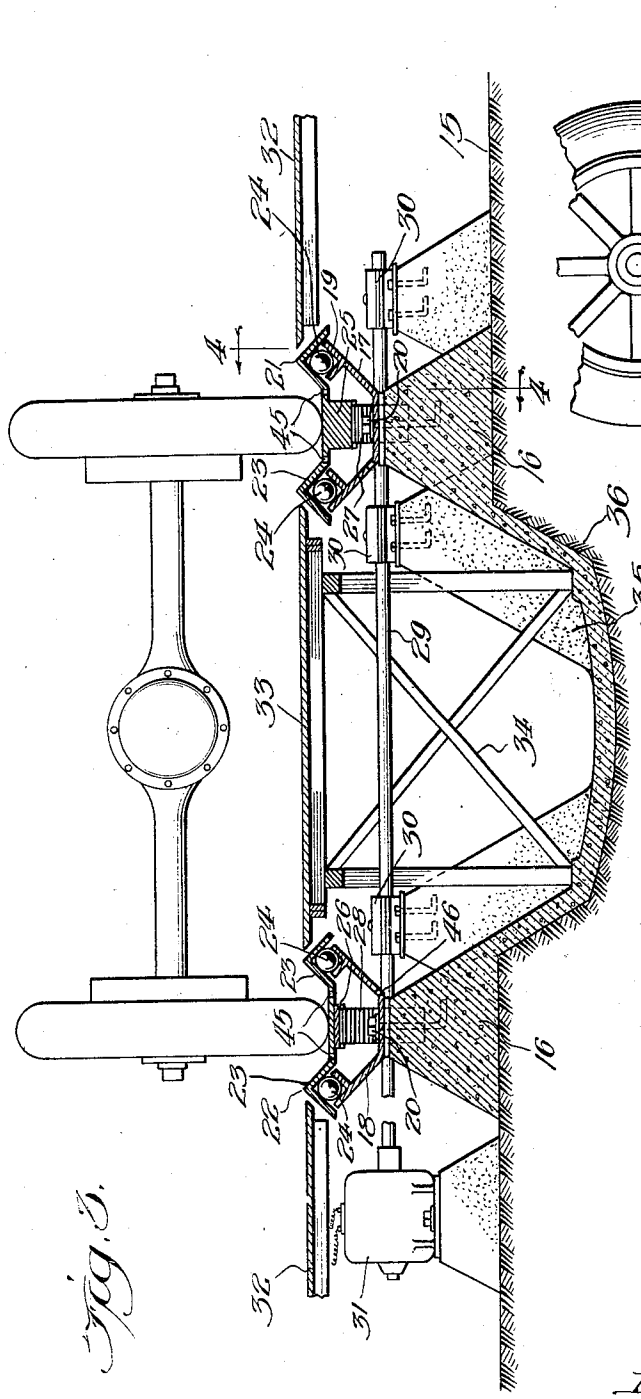


Fig. 5.

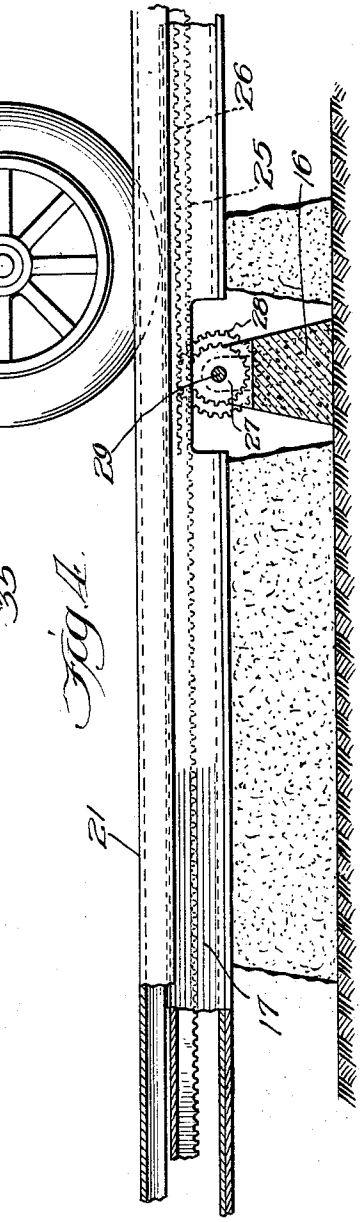


Fig. 4.

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APPARATUS FOR CLEANING AND POLISHING AUTOMOBILES

Filed Dec. 16, 1927 5 Sheets-Sheet 3

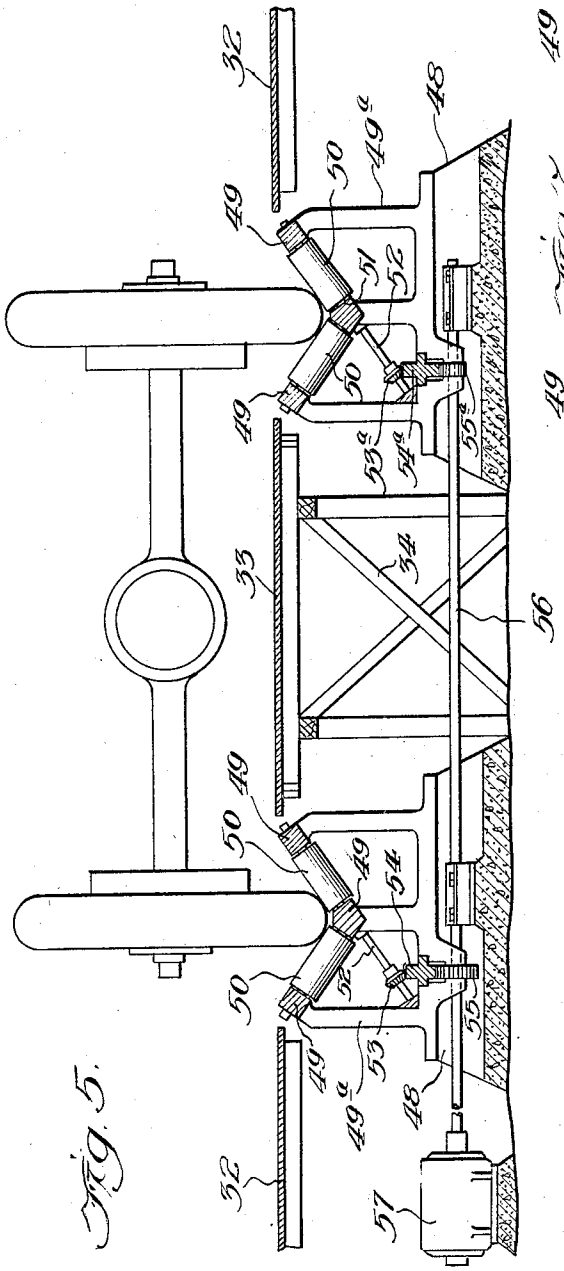


Fig. 5.

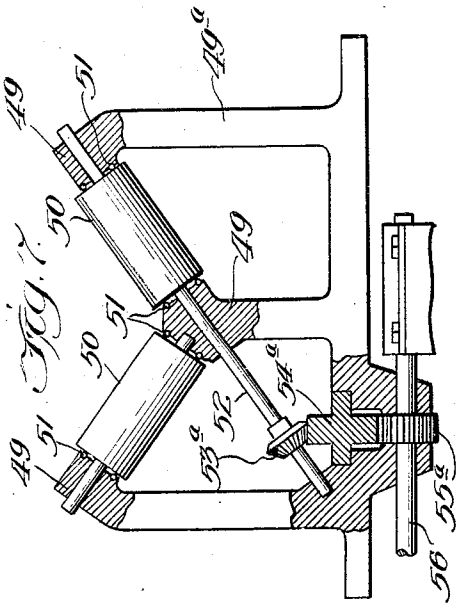


Fig. 7.

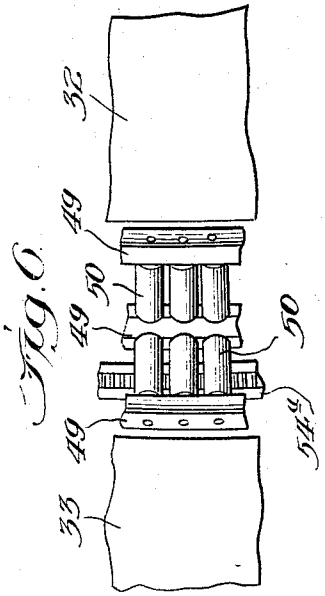


Fig. 6.

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APPARATUS FOR CLEANING AND POLISHING AUTOMOBILES

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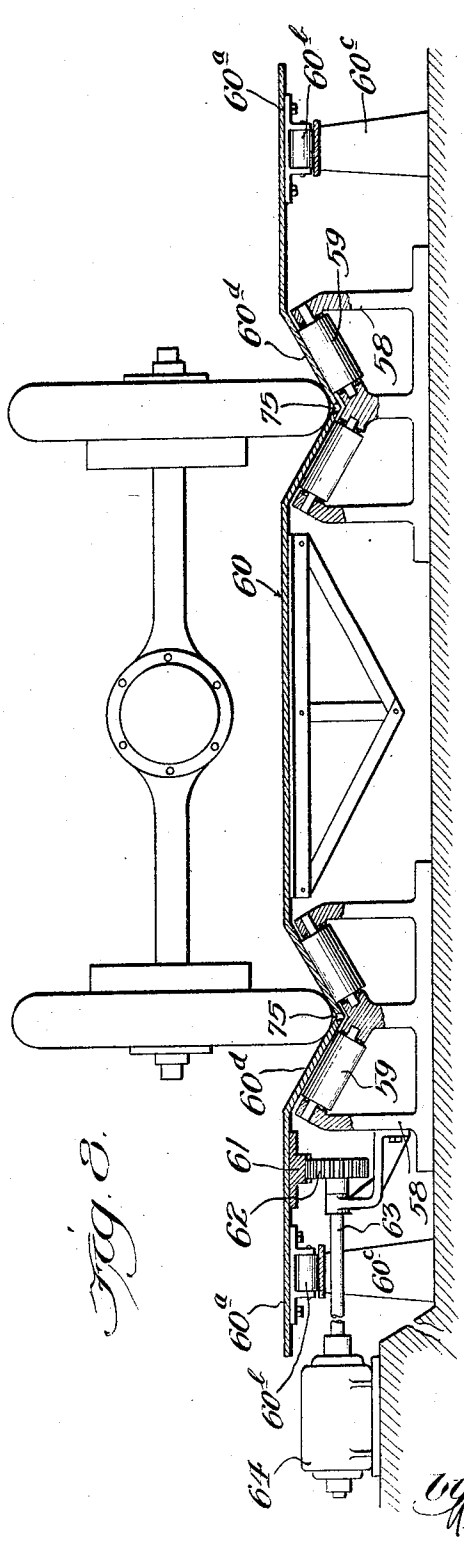


Fig. 8.

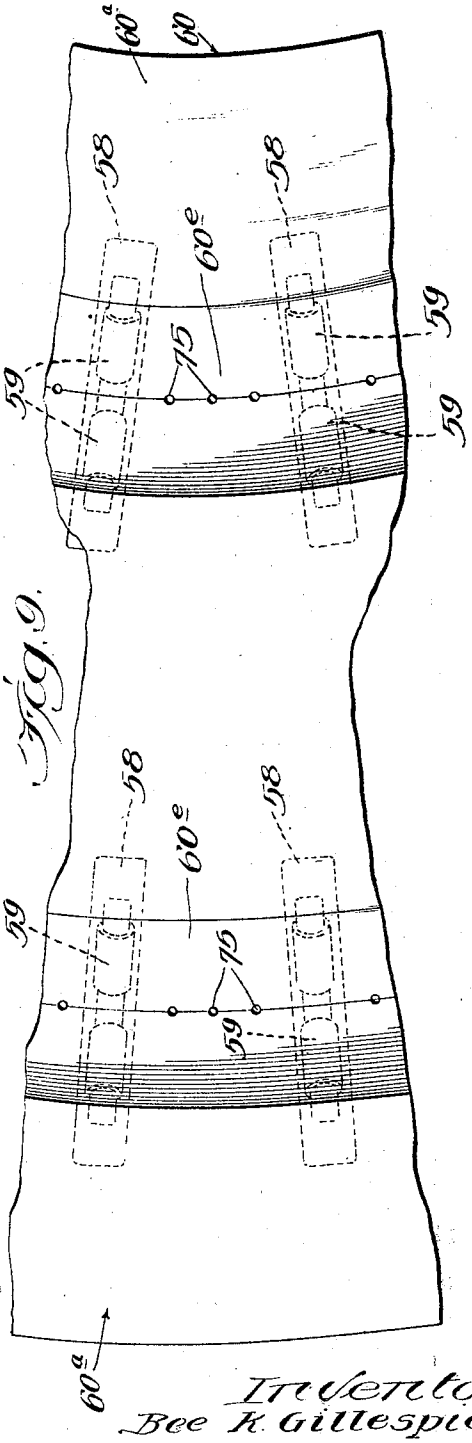


Fig. 9.

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APPARATUS FOR CLEANING AND POLISHING AUTOMOBILES

Filed Dec. 16, 1927 5 Sheets-Sheet 5

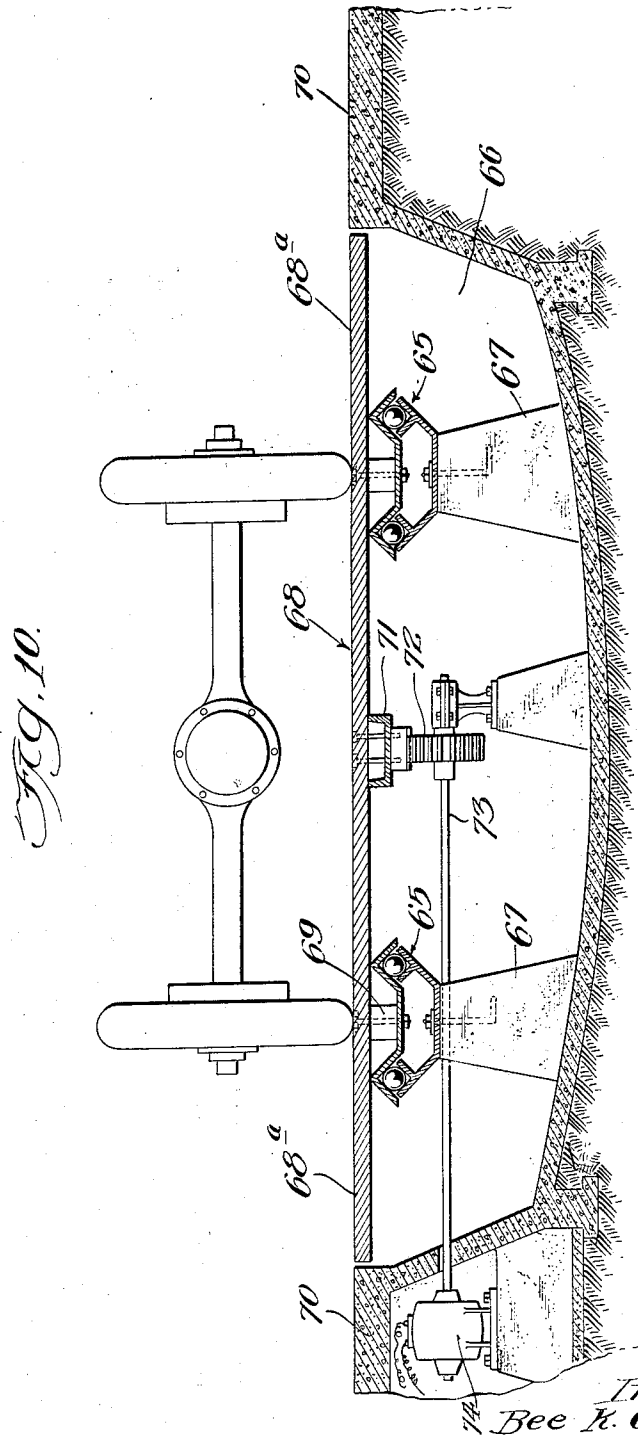


FIG. 10.

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Patented Oct. 20, 1931 1,827,886

UNITED STATES PATENT OFFICE

BEE K. GILLESPIE, OF CHICAGO, ILLINOIS, ASSIGNOR TO GILLESPIE AUTO LAUNDRY SYSTEM, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

APPARATUS FOR CLEANING AND POLISHING AUTOMOBILES

Application filed December 16, 1927. Serial No. 240,487.

My invention relates generally to apparatus for cleaning and polishing automobiles which is adapted to take care of any number of automobiles successively and in rapid order, and it has to do more especially with novel structure for supporting and handling the automobiles in succession through a washing and polishing compartment.

One of the objects of my invention is to provide simple, inexpensive and highly efficient means for bodily receiving and continuously transporting the automobiles through a treating compartment where the several cleaning and polishing operations are successively carried out, the movement being so timed that each operation may be completely carried out and the automobiles delivered from the compartments completely cleaned and polished.

Another object is to provide the treating compartment with means for bodily conveying the automobile therethrough which is of such character as to greatly facilitate the work of the operators and whereby the various operations may be carried out more quickly and more efficiently.

A further object is to provide an anti-friction conveyor structure for bodily carrying the automobile through the treating compartment.

Still another object is to provide stationary track sections cooperating with the movable conveyor structure in such a manner as to deliver the automobiles thereto and receive them therefrom, such stationary track sections being so shaped as to act as positive guides for directing the automobiles to and from the cleaning compartments without human aid.

Other objects and advantages will become apparent as this description progresses and by reference to the drawings, wherein,—

Figure 1 is a plan sectional view of one form of apparatus embodying my invention;

Figure 2 is a vertical section taken substantially on line 2—2 of Fig. 1;

Figure 3 is an enlarged fragmentary vertical section through the floor and track structure and taken substantially on line 3—3 of Fig. 1;

Figure 4 is a side elevation, partially in section, taken substantially at the position indicated by line 4—4 of Fig. 3;

Figure 5 is a transverse vertical section (similar to Figure 3) through another form of track structure;

Figure 6 is a top plan view of a portion of the track structure shown in Fig. 5;

Figure 7 is an enlarged elevated view, partially in section, of the right hand track part shown in Fig. 5;

Figure 8 is a transverse vertical section (similar to Figure 3) through still another form of track structure;

Figure 9 is a top plan view of a portion of the track structure of Fig. 8; and

Figure 10 is a transverse vertical section (similar to Fig. 3) through an additional form of track structure.

Referring to the drawings, and particularly to Figs. 1 and 2, one form of structure which I have chosen to illustrate my invention comprises a circular enclosure or building having an outer wall 10, concentric inner wall 11 and roof 12. The concentric inner and outer walls form a circular washing and cleaning compartment 13, access to which is had through a common entrance-exit 14 in the outer wall 10. The compartment 13 is sufficiently wide to readily receive the circular automobile-supporting and handling conveyor and suitable platforms along the opposite sides thereof upon which apparatus may be located and the operators may stand.

The automobiles are bodily carried through the compartment 13 and an important phase of my invention is the provision of highly efficient means for so carrying the automobiles, one form of which (Figs. 1 to 4, inclusive) will now be described. A pair of suitably spaced foundation blocks 16 which extend continuously around the compartment 13 in concentric relation, are mounted upon the floor or ground 15. These blocks are preferably formed of stone, cement or some other rigid and durable material (Fig. 3). Or, if desired, this foundation may consist of circular rows made up of a plurality of separate and conveniently spaced blocks. Circular channeled supports

17 and 18 are mounted upon these foundation blocks and their side flanges are Y-shaped in cross-section to provide, in each instance, at opposite sides, upwardly opening ball grooves 19. These channeled supports are secured to the blocks 16 in any desired manner and, preferably, by the studs and nuts 20. To receive, support and convey the automobiles, I provide continuous, circular and concentrically located track sections 21 (inner) and 22 (outer) which are formed to provide a central automobile wheel-receiving channel having outwardly slanting side walls. The edges of these side walls are turned downwardly and outwardly to form an inverted V-shaped section to provide a pair of opposite and downwardly opening ball grooves 23 for each track section. The track sections are mounted directly above the channeled supports 17 and 18 with their respective ball grooves aligned to provide closed ball races which receive a plurality of balls 24 providing a ball bearing support for the respective sections (Fig. 3).

The ball bearing structure (Fig. 3) provides a continuous support throughout the circular track sections at their opposite sides and renders movement of the platform exceedingly easy and uniform, as well as reducing wear to a minimum.

It is desirable that these two track sections, although separate and distinct, be driven in their circular path as a single-moving unit. To this end, the under sides of these track sections are provided with integral, or otherwise, depending racks 25 and 26 which are engaged by pinion gears 27 and 28 mounted upon shaft 29 which is journaled in bearings 30 and driven by a motor 31. The motor may be located at any desirable place and sufficiently remote as to not be harmed by the water used in cleaning. Also, while I show and describe a motor as the power means, any other desirable motive force may be employed. Since the separated track sections are to travel in their circular path as a single moving unit, it is necessary that means be provided to regulate the relative speeds of these separate sections so that they complete one revolution in the same given time; and this is accomplished by using a large outer pinion gear 28 with a proportionately smaller inner gear 27 whereby the outer section is driven at faster speed to compensate for the greater distance it must travel and the inner section at such a relatively slower speed that both sections traverse the entire circular compartment in the same length of time. The respective racks 25 and 26 have different length teeth to compensate for the different size gears.

In this form, at the opposite sides of the track sections, I provide elevated stationary platforms 32 which are substantially on the same level as the track. The washing and polishing apparatus may, in part, be located on these platforms and the operators may also stand on them. This floor surface is preferably formed of spaced strips or slats which readily permit the water and other fluid and waste to pass therebetween and upon the floor or a pit therebeneath. These side platforms instead of being elevated, as shown, may be a part of the main floor surface with the intermediate track mounted in a pit on a level therewith.

I also employ another continuous and circular stationary platform 33 (Figs. 1 and 3) between the track sections 21 and 22 and substantially on a level therewith. This platform is also formed of spaced strips or slats supported (Fig. 3) by truss construction 34 seated in the central waste-receiving pit 35. The walls of this pit are formed of concrete, or stone, or some leak-proof material and they taper upwardly and outwardly to provide a fairly large circular trough throughout the circumference of the compartment. The blocks 16 are preferably located to serve as the upper parts of the opposite trough walls (Fig. 3).

The automobiles may enter the treating compartment at 37 and emerge as at 38; but this direction of travel of the automobile may be reversed if desired without departing from my invention. To guide the cars through the entrance-exit 14 to and from the movable track, I provide (Fig. 1) stationary track sections 39 (entrance) and 40 (exit) which are curved and formed of channeled pieces shaped similarly to the wheel receiving portion of the track sections 21 and 22, and which are immovably supported in any desired manner above the movable track. The ends of these stationary track sections are flared and turned downwardly with the adjacent channeled sides turned outwardly toward and over the movable track sections in such a way that the automobiles may be readily deposited on and received from the movable sections therebeneath without danger of harm to the same. These stationary sections may lead to a common platform (not shown) which may be located either within, or in an extension of, or on the outside of, the enclosure structure.

In the operation of the structure so far described, any number of automobiles, one immediately after the other, may be driven or moved along the stationary track sections 39 and onto the continuously moving track sections 21 and 22 therebeneath and they will be carried continuously along throughout the compartment until they are again deposited upon the stationary exit track sections 40. Upon entering the compartment 13, the automobiles may first be, each in its turn, subjected to a cleaning action or preliminary soaking action by a plurality of top, bottom and side sprays 41, 42 and 43 in a manner

illustrated in Fig. 2. The apparatus for so spraying the automobiles may be of any desired form, for example (Fig. 2) it may comprise a plurality of pipes 44 connected to a water source (not shown) and controlled manually by valve devices (not shown), or automatically, or otherwise. As the car advances from the position shown in Fig. 2, it moves clear of that spraying apparatus and it is then subjected to successive treatments by operators, including further soaking, washing and polishing of all parts of the automobile so that by the time it reaches the platform or stationary track section 40 it is completely cleaned and polished and has passed inspection.

The water or other liquid which is applied to the automobiles during their movement through the chamber, together with the waste, finds its way, in part, through the central stationary slatted platform 33 into the pit 35 and through the side platforms 32 to the surface beneath, from which it may find its way by suitably provided conduits (not shown), or otherwise, into the trough pit 35 or to some other and desirable location. Some of the water will enter the channel of the track sections 21 and 22 and to permit immediate drainage of the same, I provide a plurality of openings 45 (Fig. 3) located at frequent intervals in the bases of such sections and which drain into the channels of the supports 17 and 18. These supports are drained into the pit trough 35 by way of a plurality of drain openings 46 located at frequent intervals therein. The inverted V-shaped sides of the channel track sections 21 and 22 extend down over the upwardly projecting arms of the supports 17 and 18 so as to prevent water from entering the ball races and interfering with the functioning of the balls 24. The side flanges of the track sections are also so associated with the side flanges of the lower supports 17 and 18 that the former are positively positioned upon the latter and held against lateral displacement, but may be readily lifted upwardly for cleaning, repair, etc., purposes.

In Figs. 5, 6, and 7 I show another form of apparatus embodying my invention, and which is substantially the same as that shown in Figs. 1 to 4, inclusive, except as to the track structure. In this instance, I employ spaced circular foundation supports 48, each carrying a separate, continuous and circular track section. Each track section consists of circular and continuous frames 49 supported at intervals by frame pieces 49^a and adapted to carry two circular rows of rollers 50 having their inner ends projecting downwardly and inwardly to provide a V-shaped wheel-receiving space for positively positioning and carrying the automobiles throughout the compartment 13. The rollers in each row are located side by side rather closely, as indicated in Fig. 6, and are, preferably, supported upon the frames 49 by roller bearings indicated generally at 51 (Fig. 7). In this form, the automobile is bodily conveyed by positively rotating certain of the supporting rollers 50 as follows: One roller in each group has its supporting shaft 52 extended and supported to receive a beveled gear 53 (outer) and 53^a (inner) adapted to mesh with and be driven by, respectively, floating circular, continuous and concentric rings 54 and 54^a. These rings are each provided with an upper toothed surface adapted to cooperate with the beveled gears 53 and 53^a; and a lower or under toothed surface adapted to be engaged by gears 55 and 55^a, respectively, carried by a common drive shaft 56 driven by a motor 57, or other suitable means, located at any desirable position. In this instance, as with the structure shown in Fig. 3, the inner gear 55^a is of smaller diameter than the outer gear 55 with the toothed surfaces of the rings 54^a and 54 of a corresponding length so that the driven rollers of the inner track section are rotated at a slower rate of speed than the driven rollers of the outer section to cause the automobile to travel in a uniform manner from one end of the compartment to the other as will be well understood. The automobile is driven upon the stationary track sections 39 at the entrance and onto the rollers beneath, and the automobile brakes are applied in such a manner as to lock the rear wheels against rotation as the rollers 50 rotate. As these rollers 50 move, the friction between the automobile wheel and the same is such that the automobile is carried along slowly by and upon the rollers. Other details and operation are substantially the same as described in connection with the forms of Figs. 1 to 4 inclusive.

In Figs. 8 and 9 I show still another form of track structure embodying my invention which comprises inner and outer spaced track supporting frames 58 carrying rollers 59 arranged similarly to those of the form of Fig. 5 to provide V-shaped roller supports (Fig. 8). Upon these rollers I mount a circular, continuous and one-piece track 60 having spaced and depending V-shaped portions 60^d which fit over and ride upon the rollers 59. Although I preferably employ in this instance a single track piece, the V-shaped parts thereof may be separate pieces arranged in concentric relation but rigidly connected together as a single unit by lateral cross-pieces secured at intervals throughout their circumference. The edges of the track plate 60 are extended to provide side platforms 60^a movable along with the automobile. The operators, or some of them, may stand on these side platforms and ride along with the automobile in carrying out the various operations. The outer edges of these movable side platforms are supported by rollers 60^b

carried thereby and which roll along upon the continuous circular track support 60e. One of the side platforms carries a circular rack 61 adapted to be engaged by a pinion 62 carried by drive shaft 63 which is driven in any suitable manner as by the motor 64. The bottoms of the channels 60d are provided with frequent openings 75 to drain the water and waste, etc., that may be deposited in the channels. In operation, the automobile is driven upon the track 60 in the manner indicated in Fig. 8 and the track is moved over the rollers as a single unit by the rack and pinion construction described. Further details and operation are as described in connection with the form of Figs. 1 to 4 inclusive.

An additional form of track structure is shown in Fig. 10. In this form, I employ spaced circular track sections 65 which are similar to those described in connection with the form of Figs. 1 to 4, inclusive. These track sections are mounted in a pit 66 upon suitable supports 67. A circular conveyor platform 68 made of wood, or other suitable material, is rigidly secured to the upper movable channels of the track sections for movement therewith by a plurality of bolt and block devices 69 located, at frequent intervals, therearound. The conveyor platform may be a continuous piece or a plurality of slightly spaced slats, as desired. The platform is sufficiently wide to receive the automobile thereon and to provide at the sides thereof platforms 68a upon which the operators, or some of them, may stand and ride along with the automobile. This platform is preferably mounted on the level of the floor 70, and the pit 66 extends throughout the width of the platform so that all of the water and waste will pass directly thereinto.

Motion is transmitted to the platform by a rack 71 engaged by a pinion 72 on drive shaft 73. This shaft is driven by a motor 74 or other suitable means.

In the operation of this latter structure, the automobile is driven upon the stationary track 39 (Fig. 1) and moved therealong onto the movable conveyor 68 therebeneath and is carried along and treated so as to emerge upon the stationary track sections 40 completely cleaned and polished. Further details and operation are substantially as described in connection with the form of Figs. 1 to 4.

Although I have shown and described several forms of apparatus for carrying out my invention, it will be understood that various other changes in details and arrangement of parts may be made therein without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. In apparatus of the character described, disconnected and continuous inner and outer circular and concentric track sections, and a single driving means connected to both said sections in such a manner that both, although traveling relatively different distances, make a complete revolution in the same time.

2. In apparatus of the character described, disconnected and continuous inner and outer circular and concentric track sections, and a single driving means connected to both said sections in such a manner that both, although traveling relatively different distances, make a complete revolution in the same time, said means comprising racks carried by said track sections, different sized pinion gears engaging said racks, and a single drive shaft carrying both said gears.

3. In apparatus of the character described, disconnected and continuous inner and outer circular and concentric track sections, means for moving said outer section at one speed, means for moving said inner section at a relatively slower speed, and a common actuator for both said moving means.

4. In apparatus of the character described, an automobile support and conveyor comprising separated track sections including anti-friction supports for the same.

5. In apparatus of the character described, a vehicle support and conveyor comprising separated track sections, a separate support for each such section, and anti-friction bearings between each section and support.

6. In apparatus of the character described, a channeled track section for receiving wheels of the automobile, a support for said track section having upstanding arms associated with the sides of said track section so as to form enclosed pockets therebetween, and anti-friction devices in said pockets for carrying said section upon said support.

7. In apparatus of the character described, a track section having an upwardly opening channel for receiving wheels of the automobile, the sides of said section being turned downwardly at their edges to provide downwardly opening ball grooves, a support beneath said section having upstanding arms Y-shaped in cross-section to provide upwardly opening ball grooves which cooperate with said downwardly opening grooves to form ball retainers, and a plurality of balls in said retainer spaces upon which said track section rides.

8. In apparatus of the character described, conveyor mechanism including a track section having a channeled wheel receiving portion, a support for said track section having grooved parts, the sides of said track section being so formed and associated with said support grooves as to provide a pair of anti-friction bearing ways, and bearings in said roller-ways upon which said track section rides.

9. In apparatus of the character described,

a pair of separated continuous, circular and rotatably mounted track sections, a support for each said section, said sections and supports each having a pair of aligned grooves, and anti-friction devices in said grooves, and means for moving said sections over said devices.

10. In apparatus of the character described, means for bodily conveying the vehicle including a base, vehicle wheel-receiving elements upon said base and shaped to provide predetermined lateral alignment of the vehicle, and anti-friction means between said elements and support.

11. In apparatus of the character described, means for bodily conveying the vehicle including a base, vehicle wheel-receiving elements upon said base and shaped to provide predetermined lateral alignment of the vehicle, and anti-friction rollers between the wheel of the vehicle and said base.

12. In apparatus of the character described, spaced track sections for receiving the vehicle wheels, a separate support for each track section, each said track section having its edges overlapping said support in such a manner that the track may be moved vertically but will not be displaced laterally.

13. In apparatus of the character described, spaced track sections, a separate support for each track section having upstanding arms, said track sections having channeled portions the sides of which are turned downwardly to form pockets for receiving the upstanding arms of said support to prevent lateral displacement of the track sections.

14. In apparatus of the character described, a track support having an upwardly opening ball groove, a channeled track section movable relative to said support, ball bearing devices associated with said groove between said support and track section, the channel side of said track section being extended downwardly to provide a depending skirt along the side of said support to conceal said groove and ball bearing devices.

15. In apparatus of the character described, circular concentric movable track sections, means for moving said track sections at relative speeds, stationary platforms along the outer sides of said sections, a stationary platform between said sections, and stationary track sections adapted to deliver the vehicle to and receive it from the movable sections without human aid.

16. In apparatus of the character described, separated movable track sections having a channel for receiving the opposite vehicle wheels and for bodily conveying the vehicle, means for moving said track sections, stationary channeled track sections located above each said movable track section, and having their ends adjacent said movable sections turned downwardly theretoward and flared laterally so as to deliver the vehicle to and receive it from the movable track sections without human aid.

17. In apparatus for cleaning automobiles, movable conveyor means arranged to receive the wheels of the automobile to bodily carry it along, platforms along the sides of said conveyor and at the level thereof, a platform along the mid-part of said conveyor means, track devices supporting said conveyor, anti-friction elements between said track devices and conveyor, and means for moving said conveyor along said track devices.

18. In apparatus of the class described, a pair of separated, circular, concentric track sections each comprised of a series of pairs of rollers with the rollers of each pair mounted in V-formation, and means for driving at least one roller of each said pair.

19. In apparatus of the class described, a pair of separated, circular, concentric track sections each comprised of a series of pairs of rollers with the rollers of each pair mounted in V-formation, drive means, and connections between at least one roller of each said pair and said drive means for rotating said rollers, said connections being arranged to drive the rollers of the outer track section at a faster rate relatively to said inner section to accommodate rotation of said sections together as a unit.

20. In apparatus of the class described, a pair of separated, circular, concentric track sections each comprised of a series of pairs of rollers with the rollers of each pair mounted in V-formation, common drive means for both said track sections, and means connecting said drive means and rollers for movement of the rollers of the outer track section at a greater speed relative to the rollers of the inner track.

21. In apparatus of the class described, a pair of V-shaped, circular and concentric track sections, the side walls of which are formed by a plurality of successive rollers, a common drive member for both said sections, and drive connections between the rollers of each section and said drive member for driving certain of the rollers of the outer section at a greater speed relative to the speed of the inner section.

22. In apparatus of the class described, a pair of V-shaped, circular and concentric track sections, the side walls of which are formed by a plurality of successive rollers, a common drive member for both said sections, differential drive rings for said sections, and connections between certain of the rollers of the respective sections and said drive ring, and connections between said drive member and the respective rings for driving said certain rollers of one track section at a greater speed relative to the rollers of the other section.

23. In apparatus of the class described, a pair of V-shaped, circular and concentric track sections, the side walls of which are formed by a plurality of successive rollers, a main drive shaft, a driven shaft for each of the rollers forming one of the V-sides of each track section, a gear on each said roller shaft, a drive ring for each track section connected, respectively, with said roller gears, and differential gear connections between said drive shaft and said rings for driving said rings and the respective rollers at different rates of speed.

24. In apparatus of the class described, a pair of circular, concentric track sections, a support for each said section, a rack ring carried by each said section, a main drive shaft, and differential speed gears carried by said shaft and engaging said rings, respectively, for moving the inner and outer of said sections at different speeds.

25. In apparatus of the class described, a pair of circular, concentric track sections of channel-shape in cross-section, a support for each said section, a rack ring carried by the underside of each said section, a main drive shaft, a gear carried by said drive shaft and engaging the rack ring of the inner track section, a larger gear carried by said drive shaft and engaging the rack ring of the outer track section, and means for driving said shaft to cause movement of said gears and rings to rotate said track sections at different speeds in which each track section makes a complete revolution in the same length of time.

In testimony whereof, I have subscribed my name.

BEE K. GILLESPIE.