Dec. 9, 1969 D. K. PAUL 3,482,529

TRANSPORTATION SYSTEM

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FIG. 1

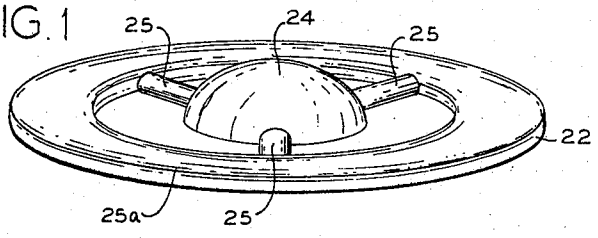


FIG. 2

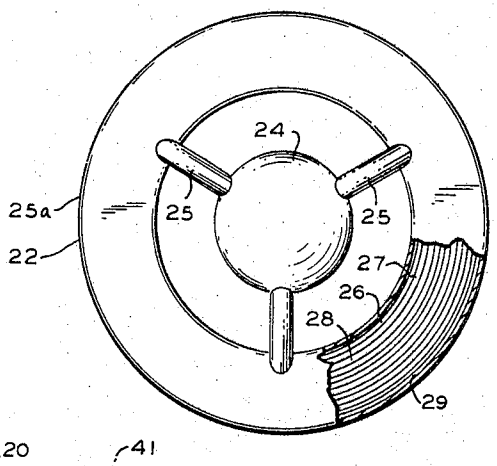
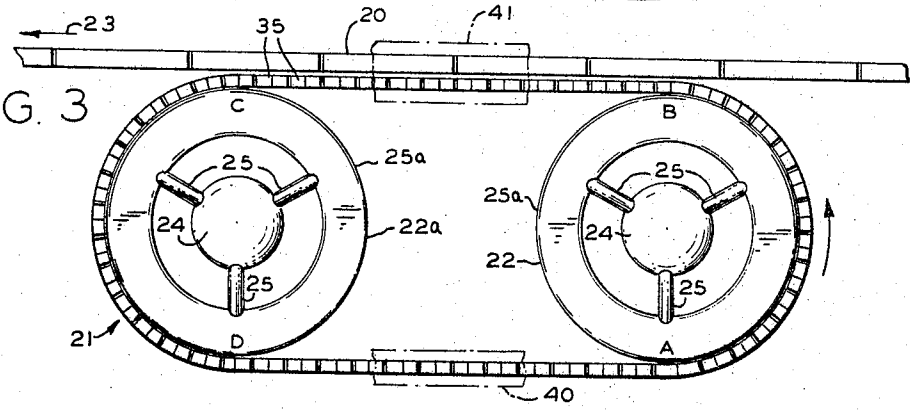


FIG. 3



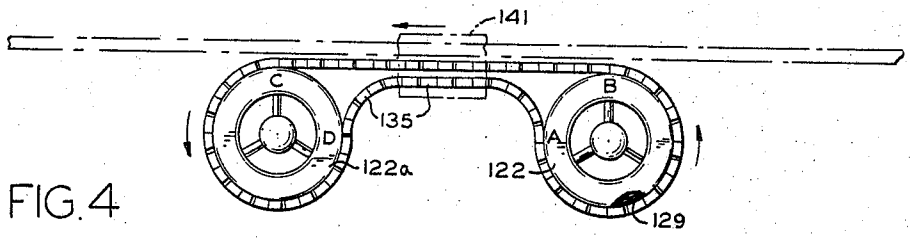


FIG. 4

DONALD K. PAUL
INVENTOR

BY
BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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FIG. 5

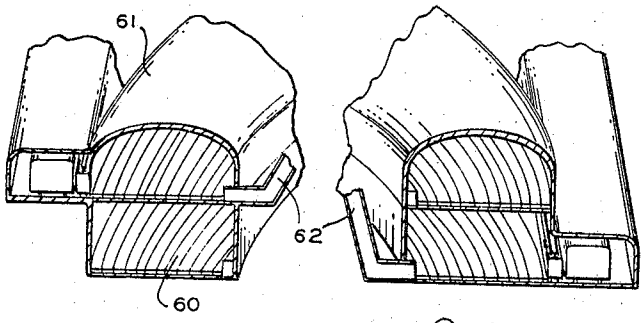


FIG. 6

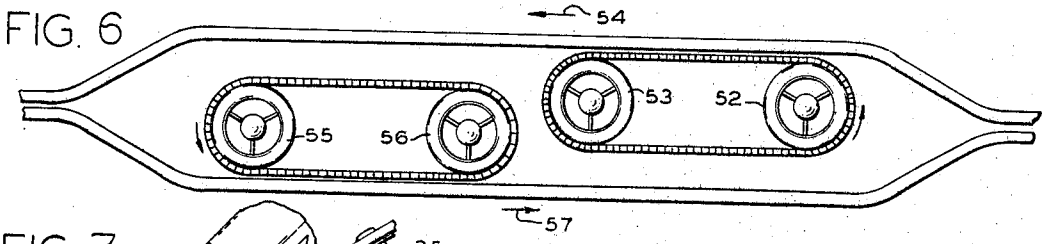


FIG. 7

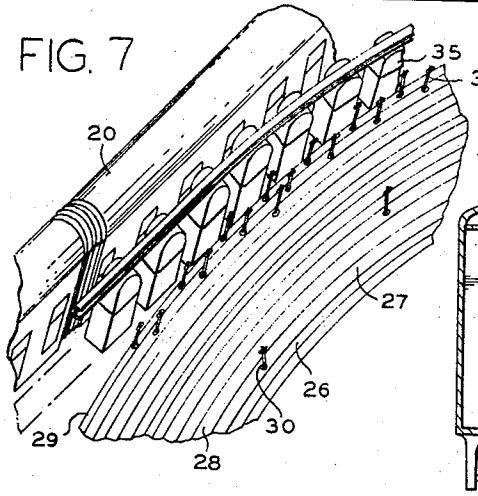


FIG. 8

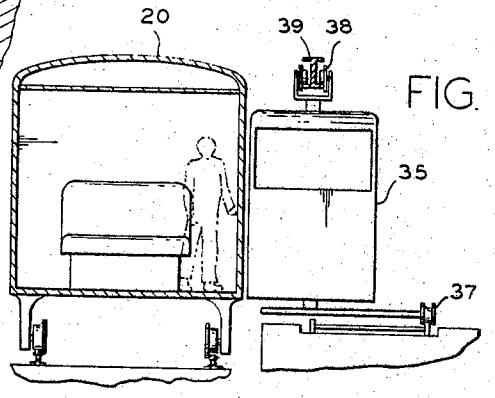
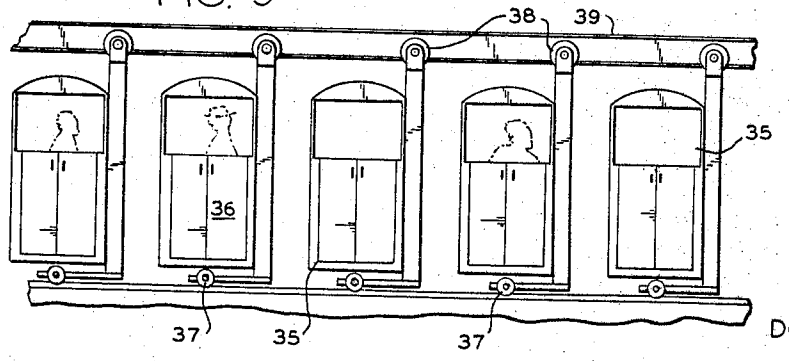


FIG. 9



DONALD K. PAUL
INVENTOR

BY

BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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FIG. 10

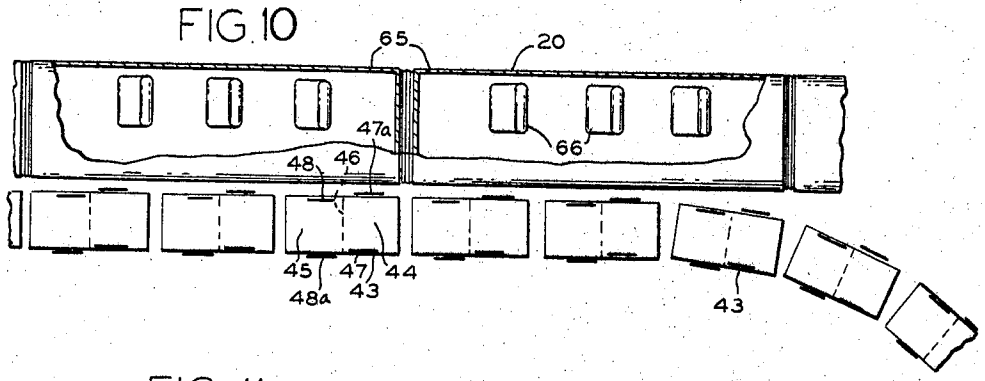


FIG. 11

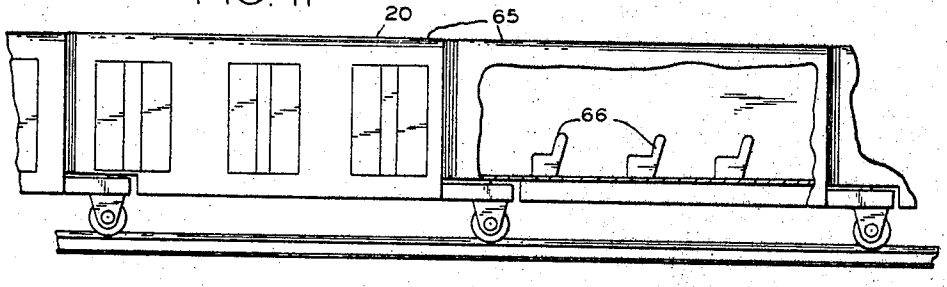


FIG. 12

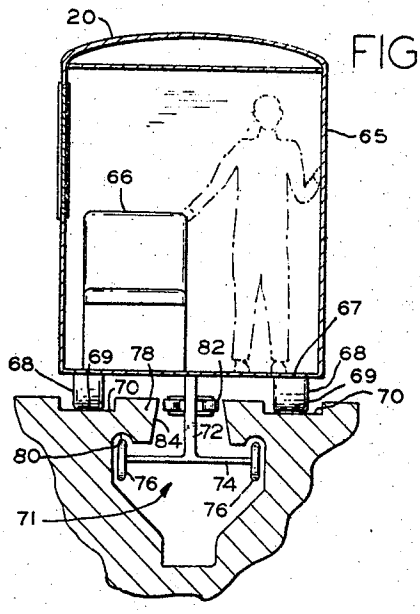
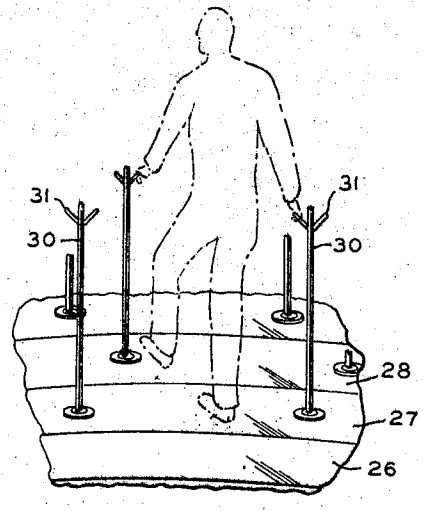


FIG. 13



DONALD K. PAUL
INVENTOR

BY
BUCKHORN, BLORE, KLARQUIST & SPARKMAN
ATTORNEYS

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Patented Dec. 9, 1969

3,482,529

TRANSPORTATION SYSTEM

Donald K. Paul, 1033 Westwood Drive,
Stayton, Oreg. 97383

Filed Feb. 5, 1968, Ser. No. 702,948
Int. Cl. A63g 1/00
U.S. Cl. 104—25 8 Claims

ABSTRACT OF THE DISCLOSURE

A mass transportation system adapted to entrain and detrain passengers from a continuously moving passenger train, having stations each comprising two rotundas, one of the rotundas being used by entraining passengers and the other of the rotundas being used by detraining passengers. Each of the rotundas has a platform at the center and a plurality of constant-speed annular conveyors rotating at incrementally increasing speeds therearound, the innermost of the conveyors traveling at a low speed to permit passengers to step onto or off from said platform, the outermost of the conveyors having a speed approximately equal to that of the train. A plurality of booths travel around the two rotundas approximately at the speed of the train. Passengers step from the outermost conveyor to the booths as the booths travel adjacent one of the rotundas; passengers transfer from the booths to the train as a booth travels intermediate the two rotundas and adjacent the path of the train.

BACKGROUND OF THE INVENTION

This invention relates to a mass transportation system and, more particularly, to such a system adapted for use in metropolitan communities where continuous, safe and efficient transportation must be provided for vast numbers of people each day.

The problem of providing safe, efficient and dependable public transportation for our metropolitan communities is one of the most important problems that has yet to be solved in the Twentieth Century. Those systems which are presently available are not suited for the job that has to be done.

The subway systems which presently exist in certain cities have done a remarkably good job in transporting large numbers of people from place to place quickly and economically, but constructing new subway systems for cities that do not have them has become prohibitive because of the large cost entailed in underground tunneling. The Bay Area rapid transit system in San Francisco is an example where construction estimates are being greatly exceeded due to the rapidly spiraling and unforeseen costs of the large underground excavation which has been found necessary.

Existing surface transportation systems clog our streets and pollute the atmosphere, yet achieve a relatively low net origin-to-destination speed. Commuter railway systems are likewise inefficient due to the vast number of stops that must be made, reducing the net speed that can be obtained. It is estimated that the average city bus transportation system achieves a net origin-to-destination speed of only 6 miles per hour; rapid transit systems, only 8 miles per hour; commuter trips by automobile, only 11 miles per hour; and commuter railway systems, only 14 miles per hour, despite the higher speeds at which the particular vehicles concerned actually travel between stops. The transportation system of my invention will be able to achieve a greatly improved net transportation speed at a cost that communities can afford.

SUMMARY OF THE INVENTION

The present invention seeks to take advantage of the principle that efficient transportation is most readily achieved using continuously moving equipment. When a large quantity of material has to be moved, engineers frequently employ an endless-belt, continuously moving conveyor system. This invention seeks to use this method to solve the mass transportation problem in modern cities.

The system of the present invention contemplates a continuously moving passenger train having means to permit passengers easily and safely to get on and get off the train while it is moving. Such will avoid the waste inherent in starting and stopping a large vehicle many times during a journey. The entraining and detraining means referred to comprise a plurality of stations, each of which comprises at least one rotunda to assist passengers to get on and off the continuously moving train.

Each rotunda in turn comprises a stationary loading or unloading platform at its center around which rotate a plurality of constant speed annular conveyors. The innermost of these conveyors has a low speed to permit passengers safetly to step onto or off from the center platform. The outermost of these conveyors has a speed approximately that of the constantly moving passenger train. The intermediate conveyors each has a speed which incrementally increases from the innermost to the outer most of the conveyors so that passengers can step easily and safely from one conveyor to another.

A typical station will have two such rotundas spaced apart at approximately the same elevation. A plurality of booths revolves around the two rotundas. The booths travel at a speed also approximating that of the continuously moving train. The booths are relatively small, for example large enough to hold one or two passangers, or two passengers in each of two compartments. In the latter form, one compartment would be for passengers getting on the continuously moving train via the outermost of the annular conveyors in an entraining rotunda; the other compartment would be for passengers getting off the train, who transfer from the booth to the outer conveyor on a detraining rotunda. Since the booths travel around the two rotundas, each travels adjacent one of the outermost conveyors during a portion of its travel, which portion will vary depending on the particular design desired for the station. The portion of adjacent travel permits passengers to enter the booth from the conveyor or vice versa. While the booths are intermediate the two rotundas, they travel adjacent the path of the train to permit passengers to step from the booth and enter the train or vice versa.

The overriding advantage inherent in the transportation system of my invention is the economy that will be achieved through use of continuously moving equipment. It is universally recognized that nearly all machines perform best when they are run at a constant speed. Lubrication problems are minimized, wear and tear are reduced, and all bearing and moving parts are subjected to much less stress when run at a steady speed than when subjected to constant starting and stopping.

Since the power requirements for any machine are also reduced when it is run at a constant speed as against being continuously started and stopped, the transportation system of my invention will achieve further economies by minimizing power demands. Still further economies will be effected through the use of rolling equipment that can be constructed much more lightly than in present equipment. Present day railway coaches have to be built of very strong and heavy material to withstand the stresses caused by frequent starting and stopping. Furthermore, the braking systems for such coaches, of necessity, have to be extremely sturdy. The cost of replacing brake shoes

alone is an expensive item in operating a train. The lighter construction required for the continuously moving coaches in the system of my invention will thus result in sizeable construction and maintenance economies.

A still further advantage inherent in my transportation system is that it will achieve a higher net origin-to-destination speed than is presently possible. With approximately a dozen annular conveyors rotating around each of the platforms at incremental speeds of approximately 180 feet per minute, the system of my invention will permit passengers to entrain and detrain from a continuously moving train traveling at approximately 2160 feet per minute or 24 miles per hour. This will achieve a net portal-to-portal transit speed considerably in excess of that presently obtainable.

Since the transportation system of my invention contemplates a passenger train which is continuously moving, the train can be considerably longer and thus narrower than presently available trains. Thus the trains themselves can be comprised of long narrow coaches, and this will permit subway systems to be constructed having tunneling of relatively small diameter. Since the cost of tunneling is approximately proportional to the cross-sectional area of the tunnels required and the cross-sectional area is proportional to the square of the diameter, a narrow tunnel will cost only a fraction as much as a wider one when the cost of excavation and overhead support is considered.

A still further advantage of the transportation system of the present invention lies in the fact that the narrow passenger trains contemplated will have low wind resistance, thus further reducing the cost of operation. The fact that trains will travel continuously at approximately 24 miles per hour speed, rather than at the much higher speeds presently used in between stations, will also reduce the cost of operation. Furthermore, the comparatively low speed of operation will permit the continuously moving train to negotiate sharp corners with ease, thereby to permit the train to avoid buildings, underground obstacles, etc.

The longer length of the passenger train which is possible with the system of my invention will also achieve high levels of operational safety. With the greater length of the train and its relatively low constant speed, one part of the train climbs a hill while the other part descends. Suitable automatically operating generating equipment will make it possible to use the power that can be generated while the train is descending the hill, thereby further to achieve operational economies.

With the light construction contemplated for the passenger train of the present invention, it will be possible to have each railway car self-powered, thereby to avoid the heavy coupling devices required in present passenger trains using locomotives to pull long lengths of cars. This will also permit the whole train to start as a unit, further achieving very light and therefore economical construction.

A still further advantage of the transportation system of the present invention resides in the fact that it can operate either below the ground or above the ground as local conditions dictate. In certain cities or in certain locations within a given city, the rotundas could be erected above the ground with the continuously moving passenger train traveling on a mall between buildings or on an elevated track above the buildings or above presently existing sidewalks or streets. The elevated track in effect would provide a covered sidewalk between existing buildings, with the train actually traveling approximately 10 or 12 feet above the street level. Where tracks cross, one could move up the equivalent of one floor. The light weight, flexibility, and low but constant speed inherent in the transportation system of my invention will make it possible for tracks to be suspended from existing bridges or to pass through existing buildings.

From the above, it can be seen that the transportation system of my invention will achieve its primary object of providing an economical transportation system for metropolitan communities with significantly greater net origin-to-destination transportation speeds than have been heretofore possible.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings,

FIG. 1 is a schematic perspective view of an underground rotunda adapted for use with the transportation system of the present invention;

FIG. 2 is a plan view with parts broken away of the rotunda of FIG. 1;

FIG. 3 is a plan view of a station comprising entraining and detraining rotundas designed to serve a passenger train continuously moving in one direction;

FIG. 4 is a plan view of a station incorporating a different embodiment of my invention;

FIG. 5 is a vertical sectional view through a station serving passenger trains continuously moving in opposed directions, the rotunda serving a train going in one direction being above the rotunda serving the train going in the opposite direction;

FIG. 6 is a plan view of a station serving passenger trains moving in opposed directions in which two sets of two rotundas are built side by side;

FIG. 7 is perspective view of the conveyors, booths and pasesenger train comprising the transportation system of the present invention;

FIG. 8 is a cross section through a passenger train and an adjacent booth showing a passenger about to enter or depart therefrom;

FIG. 9 is a side elevational view of one embodiment of booths contemplated for use with the present invention;

FIG. 10 is a plan view of another embodiment of the booths of the present invention shown in a position adjacent to a passenger train;

FIG. 11 is a side view with parts broken away of a passenger train suitable for use with the present invention;

FIG. 12 is a transverse section through an embodiment of a passenger train suitable for use with the present invention; and

FIG. 13 is a perspective view of a passenger stepping from conveyor to conveyor in a rotunda of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings and in particular to FIGS. 1–3, the transportation system of the present invention comprises a continuously moving, constant speed passenger train **20** and a plurality of stations **21** from which passengers can get on and get off the constantly moving train. Each of the stations **21** in turn comprises at least one and preferably either two or four rotundas **22**. In the embodiment shown in FIG. 3, two such rotundas **22**, **22***a*, are provided to assist passengers in getting on and getting off the train **20**, which is, by way of example, depicted as continuously moving in the direction of the arrow **23**.

The rotunda **22** is shown in FIGS. 1 and 2 in a form suitable for use with an underground transportation system or subway. A central domed portion **24** is provided to which access from the street may be provided, as by stairs or escalators. Radiating from the domed portion **24** are any suitable number of tunnels **25** through which passengers travel to a toroidally-shaped enclosure **25***a* in which is located an annular stationary loading platform **26**. The platform **26** is preferably made of concrete and is about 5 feet wide and 230 feet in diameter.

Also located within the enclosure **25***a* and encircling the platform **26** is a first or innermost annular conveyor **27**

approximately 2 feet wide, made of rubber, plastic, aluminum, or steel, and traveling in a counter-clockwise direction at a speed of approximately 180 feet per minute. The conveyor **27** is powered by a mechanism concealed therebeneath in the manner of the usual moving walkway.

Concentric with the first conveyor **27** is a second, radially larger conveyor **28** similarly powered by mechanism concealed underneath. The innermost edge of the second conveyor **28** is spaced no more than one inch away from the outermost edge of the first conveyor **27**. The second conveyor **28** rotates at a speed of approximately 360 feet per minute, thereby to provide a difference in speed between the first and second conveyors of 180 feet per minute, which is exactly equal to the difference between the speed of the first conveyor and the stationary platform **26**.

A total of 12 such annular conveyors are shown in FIG. 2, each rotating at an incremental speed of 180 feet per minute with respect to the adjacent conveyor so that the outermost conveyor **29** is rotating at approximately 2160 feet per minute, or slightly more than 24 miles per hour. Of course, more or less conveyors may be used with different incremental speeds as may be found practical or more economical.

Each conveyor is equipped at intervals of about 3 feet with upright stanchions **30** approximately 30 inches high. Each stanchion is provided at its top with two handles **31**. (See FIG. 13.) After a passenger gains access to the stationary loading platform **26**, he remains there until a stanchion **30** on the first or innermost conveyor **27** glides slowly past him. Reaching out and grasping the handle **31** on the top of the stanchion **30** at the same time that he steps forward, the passenger is able to step onto the first conveyor **27**. The passenger then waits on the first conveyor **27** until a stanchion on the second conveyor **28** moves past him. He then reaches out and steps onto the second conveyor **28** in the same manner as he stepped onto the first one. The passenger continues transferring in this manner from conveyor to conveyor until he arrives at the outermost one **29**. The incremental speed of 180 feet per second, which is approximately 2 miles per hour, will make it possible for a passenger safely to step from the loading platform **26** to the first conveyor **27** and thence from conveyor to conveyor.

Another rotunda **22***a* similar to the first is situated approximately 500 feet away. Revolving about the two rotundas **22**, **22***a* in the same manner as a chain goes around two sprocket wheels are a plurality of small booths **35** made of plastic or metal. In the embodiment of the invention shown in FIG. 3, the path of the booths **35** is tangential to the outer half perimeter of each of the two rotundas **22**, **22***a*. In between the rotundas, the path of the booths **35** is adjacent the track on which the continuously moving passenger train **20** runs.

The individual booths **35** may be large enough to hold one or two passengers (see FIG. 9) or they may be divided into two compartments (see FIG. 10) one designed for two entraining passengers and the other designed for two detraining passengers. As shown in FIGS. 8 and 9, a plurality of booths **35** having swinging doors **36** and supported by ground contacting wheels **37** are aligned by overhead wheels **38** traveling in an overhead track **39** encircling the two rotundas. The overhead wheels **38** and track **39** can hold the booth at an angle to the vertical when it is desired to have the conveyors banked to compensate for their incrementally increasing rotational speed.

It is desirable for an entraining passenger to reach the outermost conveyor **29** at the point A in FIG. 3. When he does this he will find a booth **35** emerging from a tunnel **40** connecting the two rotundas and traveling in a path adjacent to and at the same speed as the outermost conveyor **29** on which he is standing. The booth **35** and the outermost conveyor **29** will maintain their adjacent paths as they travel around the periphery of the rotunda **22** until they reach point B. This will furnish adequate time for the passenger to open the door **36** of the booth **35** and to step into it. The booth is provided with a door on its opposite side (not shown) for access to the train. An automatically controlled mechanism will maintain this latter door shut until the booth passes point B.

When the booth **35** with the entraining passenger therein passes point B, it continues in a straight line toward point C, having left the first rotunda **22** and traveling in another tunnel **41** connecting the two rotundas through which the train also travels. This straight line journey will take about 10 or 15 seconds, depending on the distance between the centers of the two rotundas **22** and **22***a*. During the straightline portion of its path, the booth **35** is aligned with the coaches of the continuously moving train **20**. Automatic mechanisms now either open the door on the train or allow such to be opened when the outer door on the booth is opened by the passenger. This will permit easy access from the booth into the train, thereby to complete the entraining procedure.

In order to insure that the passenger reaches the outermost conveyor at point A and not at point B where the paths of the booth **35** and the outermost conveyor **29** are diverging, each stanchion **30** has a number prominently displayed on its side and on its top. When getting on the first conveyor **27**, the passenger notes this number, then waits until the stanchion on the second conveyor **28** bearing the same number moves past him. This will be the correct moment for him to make the transfer from the first conveyor to the second, whereupon he will grasp the correctly numbered stanchion. This progression is followed by the passenger as he steps from conveyor to conveyor, always waiting for the identically numbered stanchion to come abreast of him before he steps from one conveyor to the next outermost one. Following this procedure will insure that the passenger reaches the outermost conveyor just as he is approaching point A, thereby giving him the maximum amount of time to effect transfer from the conveyor **29** to the adjacent booth **35**.

An alternative method for insuring that the passenger reaches the outermost conveyor at point A would be to paint segments of the conveyors with different colors. Stanchions **30** in each segment would be provided with colored lights on their uprights, the color of the light matching the color of the segment on which the stanchion is mounted. Instructions to passengers would be to wait for the same color on an adjacent conveyor before transferring. Transferring to segments of adjacent conveyors having the same color enables the passenger to reach the outermost conveyor approximately at point A. He is then correctly placed to be able to step into a booth **35** without having to hurry unduly.

As will be understood, correct operation of the system requires that the outermost conveyors **29**, the booths **35** and the constantly moving passenger train **20** all travel at the same speed. Such can be achieved by having the outermost conveyors **29** and the booths **35** engageable with a contact extending from the train. When the train **20** enters the station, the train contacts the booths and the outermost conveyors, actually driving them, thereby to synchronize their speeds as required.

An alternative embodiment for the booths of the present invention is illustrated in FIG. 10. The booths **43** therein shown are divided into two compartments **44** and **45** by a central partition **46**. Each of the compartments **44** and **45** is equipped with two sliding doors. In compartment **44**, the doors **47**, **47***a* may be opened only by a person moving radially outwardly, whereas in compartment **45** the doors **48**, **48***a* may be opened only by a person moving radially inwardly. The doors **47**, **47***a* are for use by entraining passengers; the doors **48**, **48***a* are for use by detraining passengers. Thus, a passenger on the outermost conveyor **29** can open the door **47** and step into the booth **43** and ride around the rotunda

22 until the path of the booth 43 becomes parallel to that of the train 20 at point B. At that instant, an automatic mechanism is activated whereupon the passenger is permitted to open the outer door 47*a* in front of him, thereby to step onto the continuously moving train.

While an entraining passenger is boarding the train, a detraining passenger who has arisen from his seat and stands waiting beside another door in the train, notifies the system of his presence by the pressure he exerts on a signaling plate mounted in the floor. After his presence has thus been noted, an automatic mechanism permits him to open the door of the train, open the door 48 and step into the compartment 45 in the booth 43. Closing the door 48 behind him, the passenger then waits until the booth 43 has diverged from the train 20 (past point C) and is traveling around the detraining rotunda 22*a*. The automatic mechanism then enables the passenger to open the inner door 48*a* and step onto the outermost conveyor 29 of the rotunda 22*a*. From there he can make his way, stepping inwardly from one conveyor to another, each time slowing his speed by approximately 180 feet per minute, until he reaches the stationary platform 26 from which he travels by stair or escalator to the street.

FIG. 6 is a plan view of a station serving passenger trains moving in opposite directions in which two sets of two rotundas are built side by side. Rotunda 52 is designed for persons getting on a train continuously moving in the direction of the arrow 54, while rotunda 53 is designed to serve persons getting off that train. Similarly, rotunda 55 is designed to assist persons getting on a train continuously moving in the direction of the arrow 57, while rotunda 56 is designed for passengers getting off that train.

Although only one rotunda might be possible under certain circumstances, two rotundas will more adequately service detraining and entraining passengers for a train moving in any given direction. The use of two rotundas will avoid the problems that would be caused by people stepping from conveyor to conveyor in opposite directions, which would cause congestion and confusion.

In order to conserve space, the two sets of two rotundas may be stacked one above the other as shown in FIG. 5. This will permit the lower set of rotundas 60 to serve a train going in one direction, while the upper set of rotundas 61 serves a train going in the opposite direction. Escalators 62 would be provided to move passengers quickly from both loading platforms to the street level.

FIG. 4 illustrates a different embodiment of the invention. There the booths 135 travel on a path around the rotundas 122, 122*a* such that the booths are adjacent the outermost conveyors 129 for approximately 270° of the periphery of the rotundas. Intermediate the two rotundas the booths share the same tunnel 141. This configuration has the advantage of allowing a passenger more time to make the transfer from a booth to the outermost conveyor. Such should increase the factor of safety of the system by a substantial margin. Other booth path configurations may also be employed as local conditions or economy dictate.

As has been mentioned previously, a principal advantage of the present invention is its ability to use long narrow trains, which in turn require narrow tunnels. Such a train is shown in cross section in FIG. 8 with the passenger shown in position to enter into an adjacent booth. The railway car shown in FIG. 8 is shown mounted on standard railway wheels on narrow gauge track.

A different embodiment of a passenger train suitable for use with the present invention is shown in FIGS. 10, 11 and 12. Each railway car 65 comprises three seats 66 in one line, leaving an aisle 67 for use by entraining and detraining passengers. Accommodations could be doubled with the use of two double seats side by side.

FIG. 12 is a cross-sectional view of the railway car. Instead of running on rails, the car's wheels 68 can run in concrete channels 69 floored with plastic 70. To eliminate the possibility of jumping the track, the car is provided with an anti-derailing device 71 as shown.

The anti-derailing device 71 comprises a central shaft 72 depending from the chassis of the railway car 65 to the bottom of which is attached a secondary axle 74 at each end of which is mounted a free running wheel 76. The track comprises inwardly extending lips 78. If for any reason the car 65 rises upwardly, the wheels 76 contact a channel 80 on the underside of the projecting lips 78, thereby to keep the car on course. Also mounted on the shaft 72 opposite the lips 78 are two bumper wheels 82. If the car 65 sways excessively sidewardly, one of the wheels 82 will abut against the inward edge 84 of a lip 78, thereby to keep the railway car on its proper course.

The track pattern followed by the transportation system of the present invention would, naturally, depend on the layout of the city. Trains could run along concentric routes or could follow loops through more populous areas. It will also be possible to have an arrangement whereby smaller lengths of trains containing perhaps a dozen or so cars start their journeys at separate distant suburban points and converge and link up as they approach the city. As one train joins another, the length of the train increases until it virtually becomes an endless unit when the train reaches the city. The train then goes into the city, makes a loop around the heart of the downtown area, and then goes back to the suburbs with each section disconnecting and going off on a different track to a different area as required.

The invention has thus been described with reference to certain particular preferred embodiments, although it is to be understood that the specific details shown are merely illustrative and that the invention may be carried out in other ways without departing from the true spirit and scope of the following appended claims.

What is claimed is:

1. A mass transportation system comprising

a passenger train continuously moving at a constant speed; and

a plurality of stations adapted to permit passengers to get on and off said train while it is moving, each of said stations comprising

at least one rotunda to assist passengers to get on and to get off said train, said rotunda comprising

a stationary platform at the center thereof, and

a plurality of constant speed annular conveyors adapted to rotate around said platform,

the innermost of said conveyors having a low speed to permit passengers safely to step onto or off from said platform,

the outermost of said conveyors having a speed approximately equal to the speed of said train,

the conveyors intermediate said innermost and said outermost conveyors each having a speed incrementally increasing from said innermost to said outermost of said conveyors so that said passengers can step from one conveyor to another; and

a plurality of booths adapted to travel in a first path around said rotunda, at least one portion of said path being adjacent to said outermost of said conveyors,

another portion of said first path being adjacent to the path of said train, said booths traveling in said first path at approximately said speed of said train,

each of said booths being adapted, when on said one portion of said first path, to permit entraining passengers to step from said outermost conveyor and enter said booth and to permit detraining passengers to step from said booth and onto said conveyor,

each of said booths being further adapted, when on said other portion of said first path, to permit entraining passengers to step from said booth and enter said train and to permit detraining passengers to step from said train and enter said booth.

2. A transportation system as described in claim 1 in which each of said booths is comprised of two compartments, one compartment for use by entraining passengers, the other compartment for use by detraining passengers.

3. A transportation system as described in claim 1 further comprising a plurality of stanchions mounted on each of said conveyors to assist passengers stepping from one conveyor to another.

4. A transportation system as described in claim 1 in which said platform comprises an annular platform.

5. A transportation system as described in claim 4 in which said rotunda further comprises a passenger dome centrally located within said annular platform and a plurality of passageways radiating from said dome to said annular platform for passengers to gain access thereto.

6. A transportation system as described in claim 5 in which said annular platform and said annular conveyors are located in a toroidally-shaped enclosure.

7. A mass transportation system comprising

a passenger train continously moving at a constant speed; and

a plurality of stations adapted to permit passengers to get on and to get off said constantly moving train, each of said stations comprising

two rotundas,

one of said rotundas being adapted to assist passengers to get on said train,

the other of said rotundas being adapted to assist passengers to get off said train,

each of said rotundas comprising a stationary loading or unloading platform at the center thereof, and

a plurality of constant speed annular conveyors adapted to rotate around said platform,

the innermost of said conveyors having a low speed to permit passengers safely to step onto or off from said platform,

the outermost of said conveyors having a speed approximately equal to said speed of said train,

the conveyors intermediate said innermost and said outermost conveyors each having a speed incrementally increasing from said innermost to said outermost of said conveyors whereby passengers can step from one conveyor to another; and

a plurality of booths adapted to travel around said two rotundas approximately at said speed of said train,

each of said booths traveling adjacent one of said outermost conveyors as said booth passes around one of said rotundas whereby a passenger can step from said conveyor and enter said booth, or vice versa,

each of said booths being adjacent said train during at least part of the time that said booth is intermediate said two rotundas whereby a passenger can step from said booth and enter said train or vice versa.

8. A transportation system as described in claim 1 in which said booths are adjacent said outermost conveyor during approximately 270° of its periphery.

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ANDREW H. FARRELL, Primary Examiner