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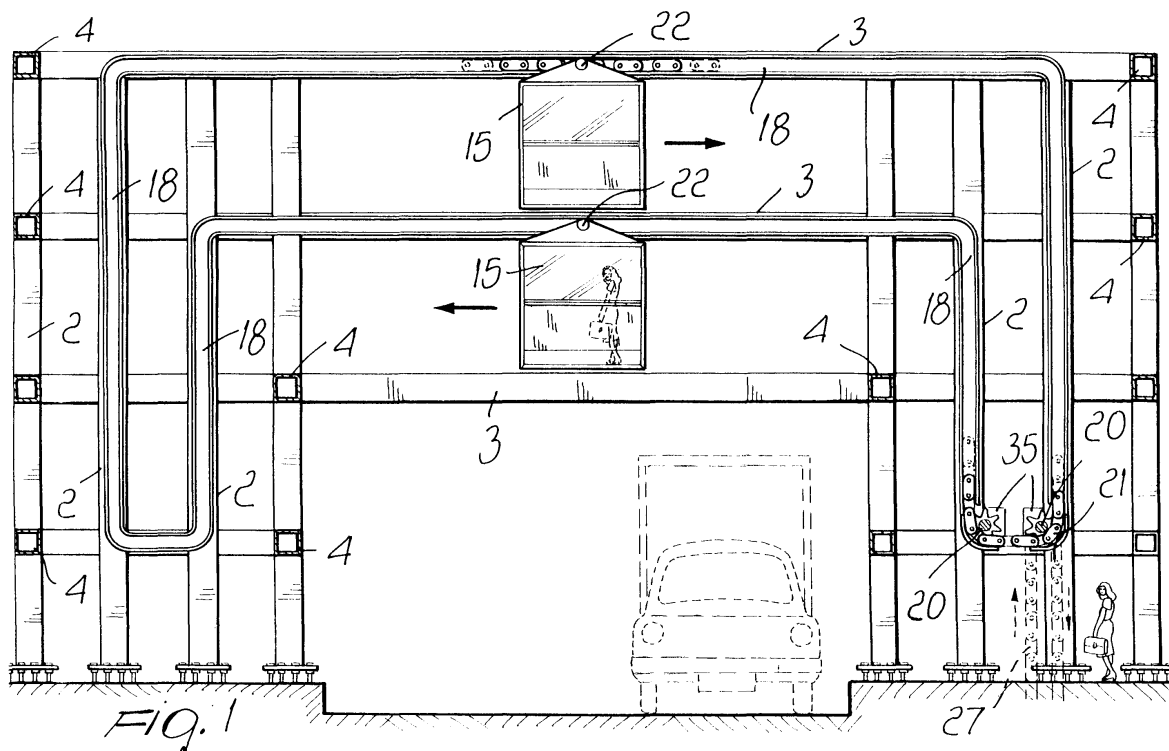
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(54) **Bridge-type conveyance system for crossing roads and the like**

(57) A bridge-type conveyance system for crossing roads and the like, comprising a box-like structure which is meant to be arranged transversely to a road and to support a plurality of pedestrian-carrying cars (15)

traveling along a closed path; the cars (15) are actuated by actuation means which are connected to kinematic means for the movement of the cars (15) in a continuous cycle along the structure of the bridge-type system from one side of the road to the other.



Description

[0001] The present invention relates to a bridge-type conveyance system for crossing roads and the like. More particularly, the invention relates to a pedestrian bridge-type system for crossing city streets with high traffic levels, suitable to improve road conditions.

[0002] It is known that crossing roads is becoming increasingly difficult for pedestrians owing to the growing amount of vehicle traffic.

[0003] Crossing at traffic lights forces pedestrians to wait for the green light in order to cross the road.

[0004] Crossing a road at locations which are not served by traffic lights is particularly dangerous, besides being forbidden by the law; accordingly, vehicle traffic heavily affects the movement of pedestrians in city streets.

[0005] Although the provision of underpasses is functional from the point of view of safety and speed in crossing, it forces pedestrians to walk down and then up stairways, with consequent problems for the disabled and for senior citizens and children.

[0006] The aim of the present invention is to provide a bridge-type conveyance system, particularly for roads and the like, which allows pedestrians to cross automatically and without waiting times and allows to reduce the amount of vehicle emissions inhaled at the roadside.

[0007] Within the scope of this aim, an object of the present invention is to provide a bridge-type conveyance system for crossing roads and the like which does not entail performing an excavation beneath the roadbed, as occurs in the case of the provision of underpasses.

[0008] Another object of the present invention is to provide a bridge-type conveyance system for crossing roads and the like which allows a substantially continuous crossing of the road involved.

[0009] Another object of the present invention is to provide a bridge-type conveyance system for crossing roads and the like which can also be used as a support for advertising billboards and the like.

[0010] Another object of the present invention is to provide a bridge-type conveyance system for crossing roads and the like which is highly reliable, relatively easy to provide and at competitive costs.

[0011] This aim, these objects and others which will become apparent hereinafter are achieved by a bridge-type conveyance system for crossing roads and the like, characterized in that it comprises a box-like structure which is meant to be arranged transversely to a road and to support a plurality of pedestrian-carrying cars traveling along a closed path, said cars being actuated by actuation means which are connected to kinematic means, for the movement of said cars in a continuous cycle along the structure of said bridge-type system from one side of the road to the other.

[0012] Further characteristics and advantages of the invention will become apparent from the description of

a preferred but not exclusive embodiment of the bridge-type system according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a sectional front elevation view of the bridge-type system according to the present invention;

Figure 2 is a side elevation view of the bridge-type system according to the present invention;

Figure 3 is a detail view of the bridge-type system according to the present invention;

Figure 4 is a sectional view of one of the rails for guiding the car that can move along the bridge-type system according to the invention;

Figure 5 is another detail view of the bridge-type system according to the invention;

Figures 6 and 7 are sectional views of safety means used in the bridge-type conveyance system according to the invention, illustrated respectively in two operating conditions.

[0013] With reference to the above figures, the bridge-type system according to the present invention, generally designated by the reference numeral 1, comprises a supporting frame which is constituted by a plurality of mutually parallel vertical uprights 2, arranged at each side of the road on which the bridge-type system is arranged, and by a plurality of transverse connecting elements 3, which are suitable to connect the vertical uprights 2.

[0014] Figure 1 is a sectional view of the bridge-type system according to the present invention, illustrating four vertical uprights 2 and three transverse connecting elements 3 which are meant to interconnect the four vertical uprights 2 arranged on one side of the road to the four vertical uprights 2 arranged on the opposite side.

[0015] The supporting frame has a second plurality of vertical uprights 2 which are arranged so as to face the first plurality of vertical uprights 2, at each side of the road, and has a similar plurality of connecting elements 3 which are arranged so as to face the first plurality of connecting elements 3.

[0016] In this manner, a substantially box-like structure is provided, also by way of the presence of connecting cross-members 4 which interconnect the first and second pluralities of vertical uprights 2 and the first and second pluralities of connecting elements 3.

[0017] The bridge-type system thus formed is anchored, for example by bolting or the like, to a box-like structure 5 which is buried at each side of the road and is internally hollow.

[0018] The box-like structure has anchoring elements 6 which are arranged vertically and correspond to the plurality of vertical uprights 2.

[0019] Connection of the bridge-type system according to the invention therefore occurs by connecting the uprights 2 to the anchoring elements 6.

[0020] At least one of the box-like structures 5 buried at the sides of the road over which the bridge-type system is to be installed is furthermore used to accommodate movement means 10, conveniently constituted by an electric motor, for actuating a plurality of cars 15 which are meant to follow the profile of the bridge-type system so as to allow pedestrians to cross from one side of the road to the other by using the car.

[0021] Guide rails 18 are provided at two of the vertical uprights 2 and run along two of the connecting elements 3, so as to constitute a closed path between the first plurality of vertical uprights 2, the second plurality of vertical uprights 2 on one side of the road, up to the first and second pluralities of vertical uprights at the opposite side of the road.

[0022] The plurality of cars move so as to be spaced from each other along said closed path formed by the guide rails 18. The guide rails 18 accordingly form a circuit for the cars.

[0023] In this manner a sort of closed circuit for the cars 15 is obtained, which are actuated by the motor 10 by way of kinematic means which are conveniently described hereinafter.

[0024] The continuous actuation of the cars 15 allows pedestrians to cross the road by using said cars, in practice without having to wait, since the passage of the car at the ground and the arrival of a subsequent car are mutually separated by a time interval.

[0025] The number of cars 15 is of course constrained by the length of the bridge-type structure, i.e., by the length of the connecting elements 3, and the purpose is to convey the pedestrians from one side of the road to the other by continuous rotation.

[0026] At the corners of the guide rails 18 there are provided sprockets 20 which allow the passage and travel of a chain 21 which supports a shaft 22 so that it is rigidly coupled thereto; said shaft acts as a support for the car 15.

[0027] As shown in detail in Figure 3, the shaft 22 is rigidly connected to one of the links of the chain 21 on one side and to a link of a chain 21, similar to the preceding chain, at the other side. The latter side slides in a similar guide rail 18 of the box-like structure of the bridge-type system formed by the facing plurality of uprights 2, which are connected by cross-members 4.

[0028] The shaft 22 that supports the car 15 further has, on the outside of the connection to the chain 21, at least one wheel 23 for each end of the shaft 22, allowing said car to travel within the guide rail 18, keeping the chain raised and free to slide within the guide rail.

[0029] Figure 4 is a sectional view of the substantially C-shaped guide rail 18 which has a suitable step 24 for the movement of the wheels 23.

[0030] A tooth 45 is provided at the shorter sides of the C-like shape of the guide rail 18 and allows the guided passage of the chain 21.

[0031] The motor 10 is connected, by means of its driving shaft 25, to a sprocket 26 which is accommodat-

ed in the box-like structure 5 that is buried at the sides of the road; said sprocket 26 is in turn connected, by means of a chain 27, to a second sprocket 28 which is in turn pivoted, by means of a pivot 29, to the sprocket 20 which allows to drive the chain 21.

[0032] Covering housings 35, shaped substantially like a circular sector, are provided at the corners of the guide rails 18.

[0033] The cars 15 stop and start, in order to allow pedestrians to access them, preferably in an intermediate position between one vertical upright 2 and the upright that is adjacent thereto, so as to allow easy passage of the pedestrians into and out of the cars 15.

[0034] The box-like structures 5 buried at the sides of the road act as foundations for the bridge-type system and ensure its necessary stability.

[0035] Said box-like structures 5 are furthermore conveniently covered by a covering element so as to be perfectly flush with the roadside paving.

[0036] Figures 6 and 7 illustrate safety means for preventing a sudden breakage of the driving chain 21 from having dangerous consequences. Said safety means conveniently comprise a hook-like element 40 which is pivoted below the guide rail 18 in which the driving chain 21 runs; said element is provided with elastic means 41 which are suitable to connect its lower end to the edge of said guide rail, whereas its upper hook-shaped end protrudes partially into the guide rail 21.

[0037] When the chain 21 moves, as shown in Figure 6, the links of the chain 21, in their uniform movement (for example toward the left, as indicated by the arrow in Figure 6), press down the head of the hook-like element 40 and can therefore run freely within the guide rail 18.

[0038] If the chain 21 breaks, the hook-like element 40 moves into the position shown in Figure 7 so as to contrast the reverse movement (to the right in the example of Figure 7) of the chain 21, since the elastic means are no longer kept elongated by the lowering of the head of the hook-like element due to the passage of the chain and therefore allow the engagement of said hook-like element with the portion of the chain 21 that moves, in this exemplifying case, to the right.

[0039] The bridge-type system structure thus conceived is further covered with a plurality of cladding elements which are suitable to conceal the uprights 2 and the connecting elements 3 as well as the cross-members 4, allowing only access to the cars 15.

[0040] The cladding elements of the bridge-type system according to the invention can be used to apply thereto advertising billboards and the like.

[0041] In practice it has been observed that the bridge-type conveyance system according to the invention fully achieves the intended aim and objects, since it allows easier crossing of the road by pedestrians without having to wait for the idle times inevitably entailed by a traffic light and at the same time it avoids the use of stairways as normally occurs when underpasses are

built.

[0042] The bridge-type system thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0043] Thus, for example, it is possible to provide for the presence of two actuation motors, one of which is meant to be used in emergency situations which involve a failure of the motor normally used to drive the cars along the structure of the bridge-like system.

[0044] All the details may also be replaced with other technically equivalent elements.

[0045] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0046] The disclosures in Italian Patent Application No. MI98A002869 from which this application claims priority are incorporated herein by reference.

[0047] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A bridge-type conveyance system for crossing roads and the like, characterized in that it comprises a box-like structure which is meant to be arranged transversely to a road and to support a plurality of pedestrian-carrying cars traveling along a closed path, said cars being actuated by actuation means which are connected to kinematic means, for the movement of said cars in a continuous cycle along the structure of said bridge-type system from one side of the road to the other.
2. The bridge-type system according to claim 1, characterized in that said supporting structure comprises a plurality of vertical uprights which are arranged so as to face each other at each side of the road, and a plurality of connecting elements which are likewise arranged so as to face each other and interconnect said plurality of vertical uprights, connecting cross-members being further provided for connecting mutually facing vertical uprights and mutually facing connecting elements.
3. The bridge-type system according to claim 1 or 2, characterized in that it is provided with box-like structures which are buried at the sides of said road and are suitable to support said plurality of vertical uprights.
4. The bridge-type system according to one or more

of the preceding claims, characterized in that at least one of said box-like structures internally accommodates said actuation means.

5. The bridge-type system according to one or more of the preceding claims, characterized in that said actuation means comprise at least one electric motor.
6. The bridge-type system according to one or more of the preceding claims, characterized in that it comprises guide rails which are arranged in a closed loop at two facing pairs of said vertical uprights and at two facing pairs of said connecting elements, said guide rails allowing the movement of said cars.
7. The bridge-type system according to one or more of the preceding claims, characterized in that each car of said plurality of cars is supported by a shaft whose ends are suitable to run within said guide rails.
8. The bridge-type system according to one or more of the preceding claims, characterized in that said supporting shaft of each one of said cars is rigidly fixed, at its ends, to a pair of chains and is further provided, on the outside with respect to said chains, with at least one pair of wheels for running within said guide rails.
9. The bridge-type system according to one or more of the preceding claims, characterized in that said actuation means are connected, by means of a driving shaft, to a first sprocket which is connected, by means of a chain, to a second sprocket which is in turn connected to a third sprocket which is arranged at the passage of said chain for driving said cars.
10. The bridge-type system according to one or more of the preceding claims, characterized in that each one of said guide rails has a substantially C-shaped cross-section.
11. The bridge-type system according to one or more of the preceding claims, characterized in that it comprises cladding elements which are arranged on said supporting structure.
12. The bridge-type system according to one or more of the preceding claims, characterized in that it comprises safety means which are suitable to prevent the movement of said chain in reverse with respect to the movement to which said chain is subjected in normal operating conditions, said safety means comprising a hook-like element which is suitable to pass from a position for enabling the passage of said chain to a position for engaging said chain in case of breakage of said chain, said hook-like ele-

ment comprising elastic means which connect one of its ends, arranged opposite an end for engaging said chain, to the lower edge of said guide rail within which said chain runs.

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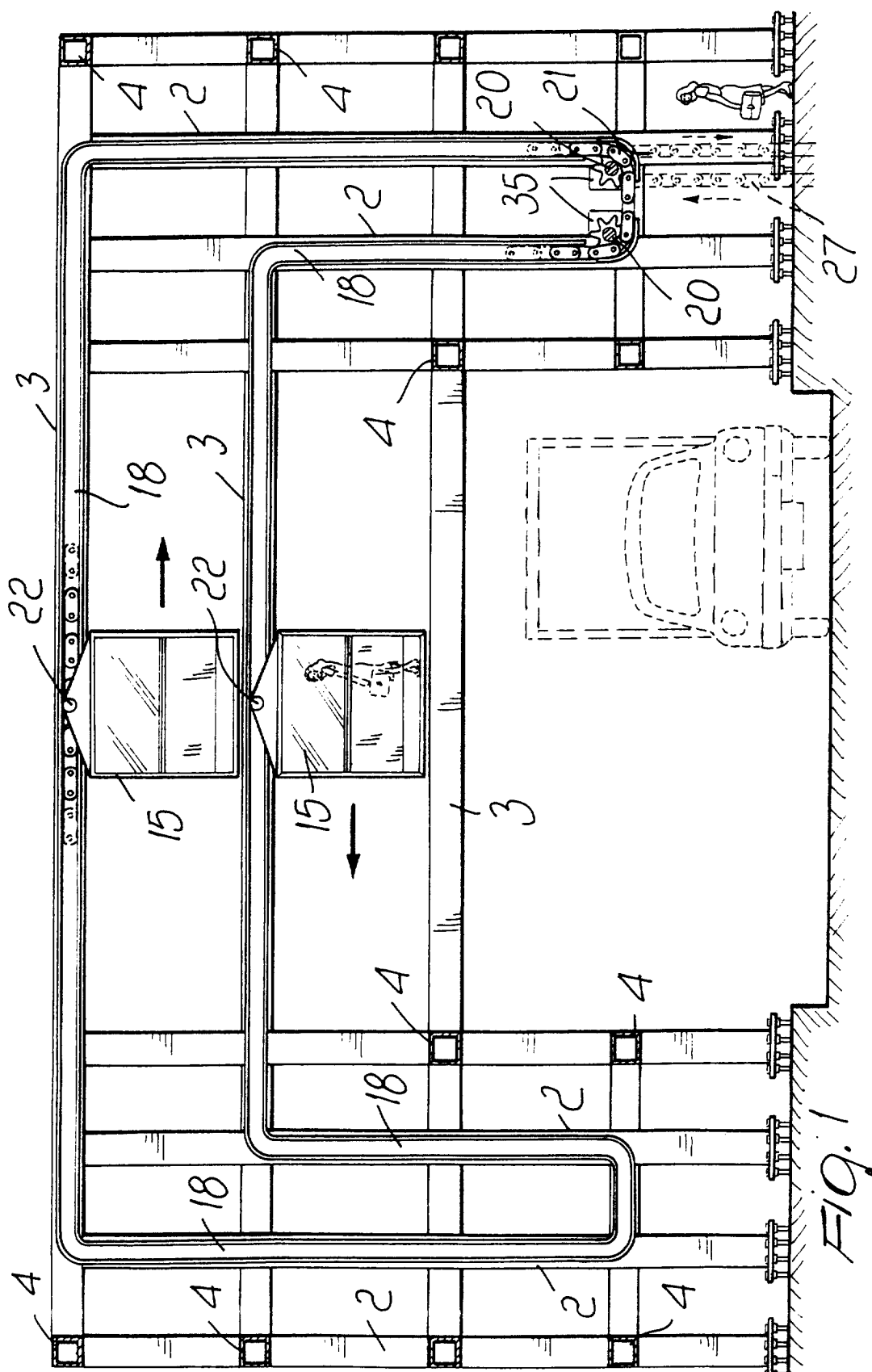
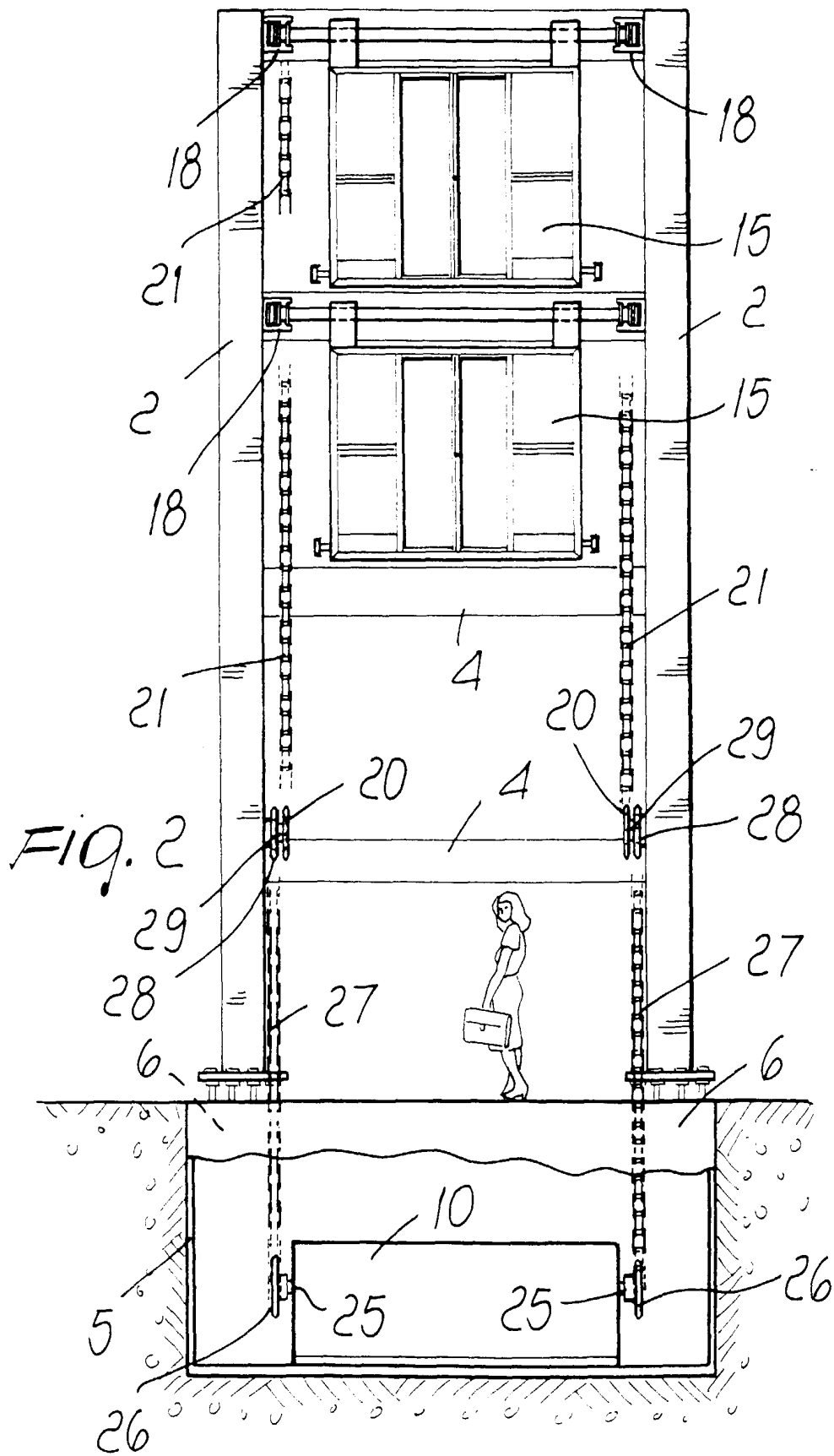


Fig. 1



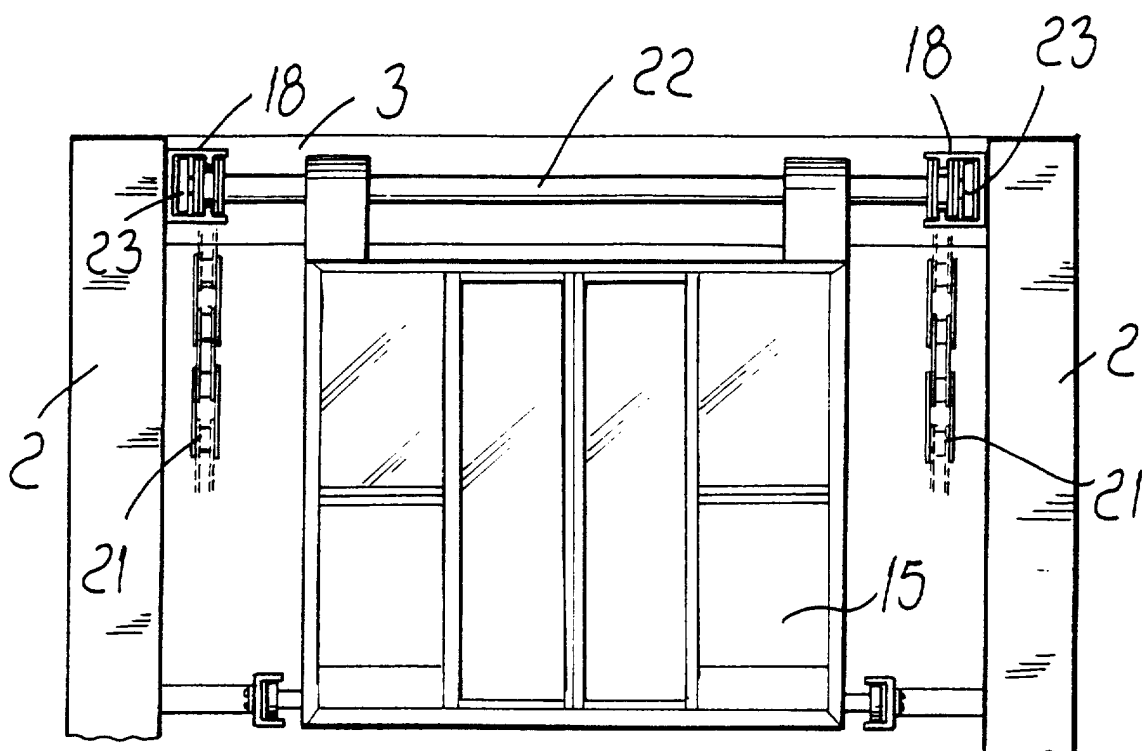


Fig. 3

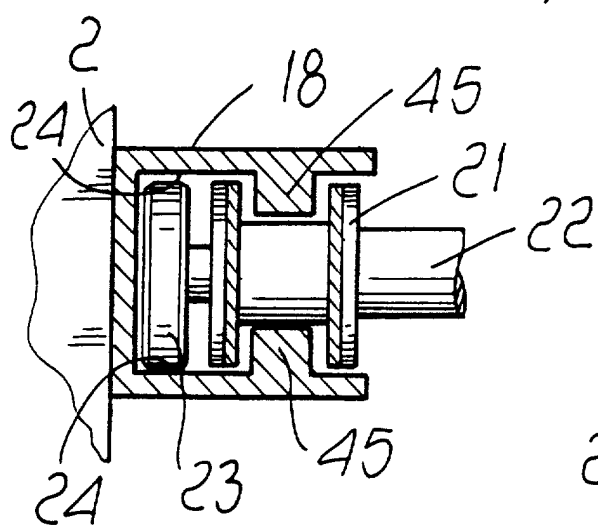


Fig. 4

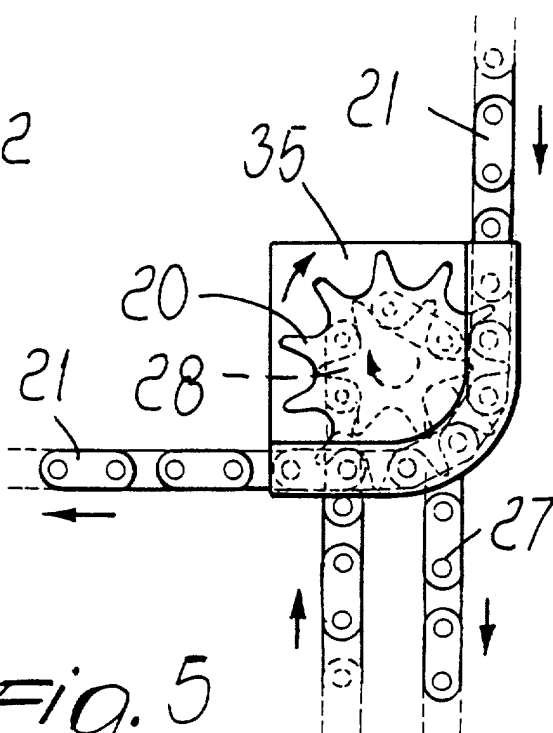
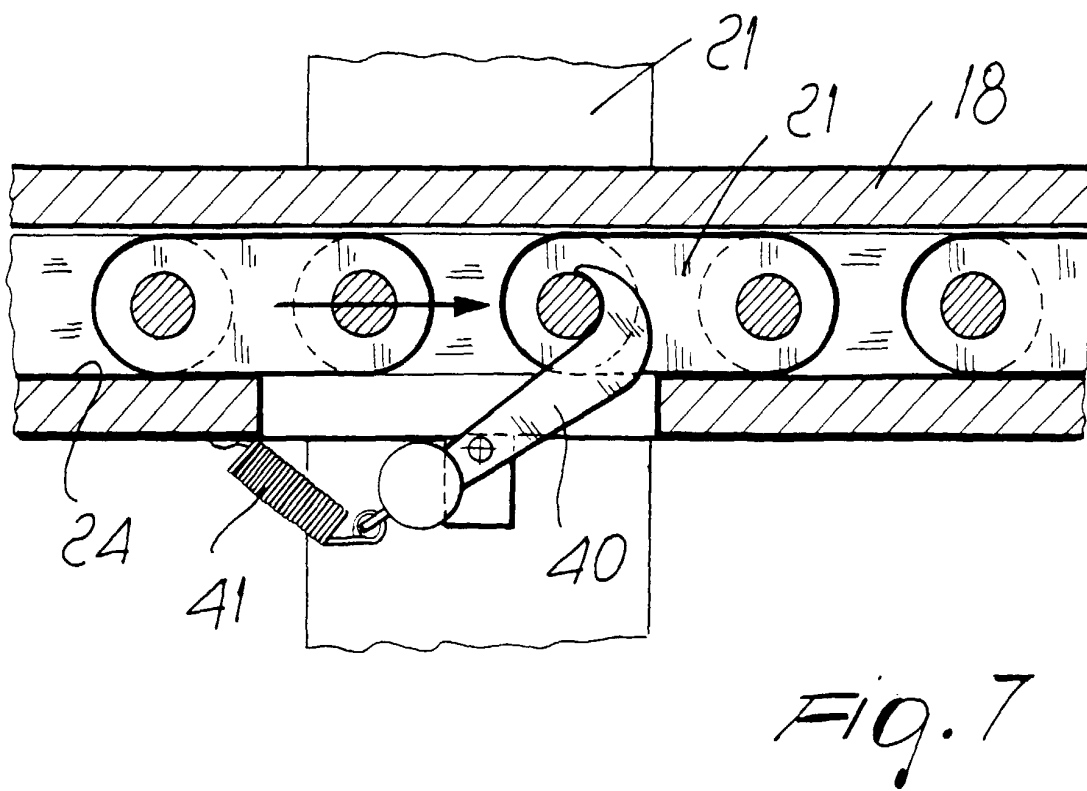
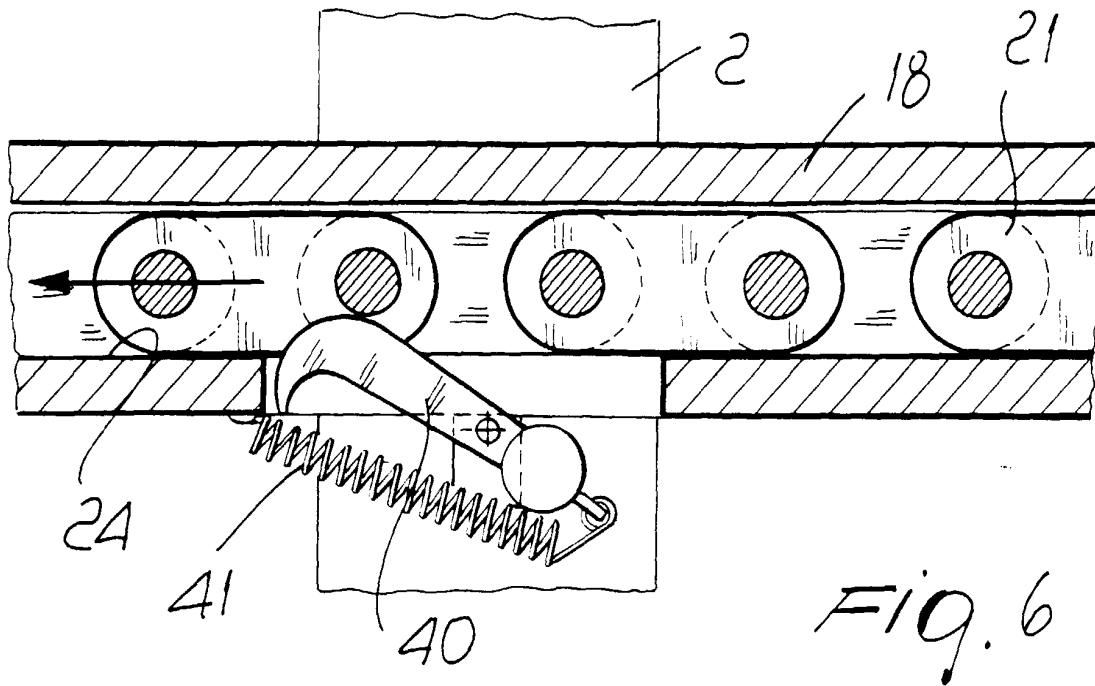


Fig. 5





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EUROPEAN SEARCH REPORT

Application Number
EP 99 12 3189

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 821 845 A (DEVIARIS GUY) 18 April 1989 (1989-04-18) * abstract; figures * -----	1	B66B9/00
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 April 2000	Examiner Salvador, D
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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