No. 723,240. PATENTED MAR. 24, 1903.

D. A. CASALONGA.

PASSENGER CONVEYER.

APPLICATION FILED OCT. 10, 1902.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

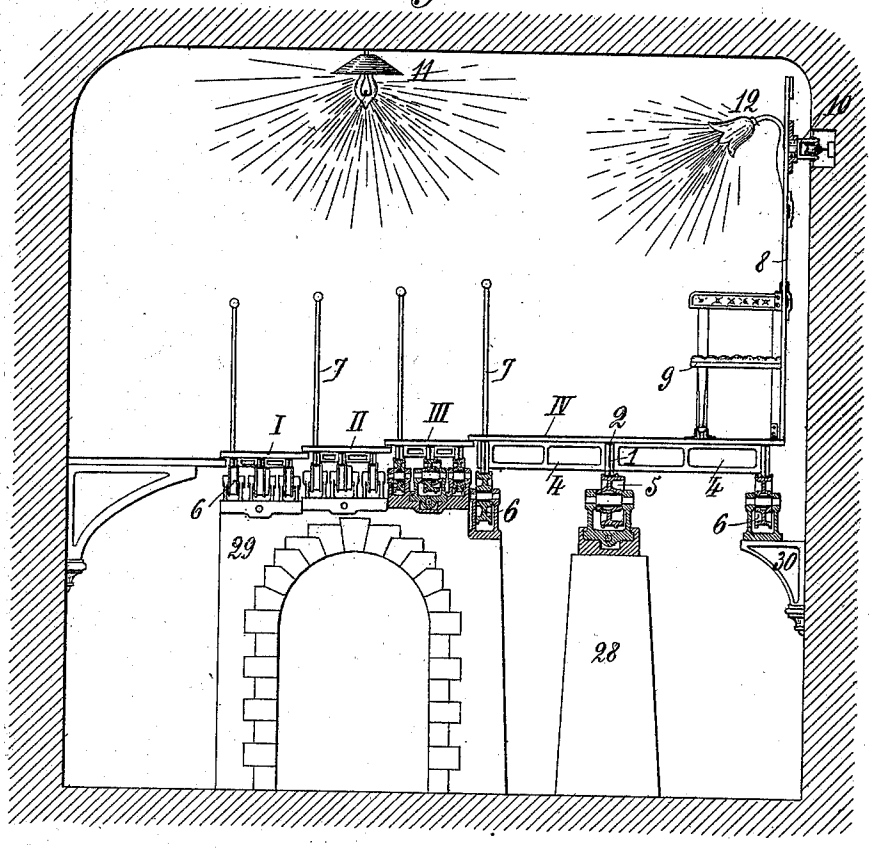
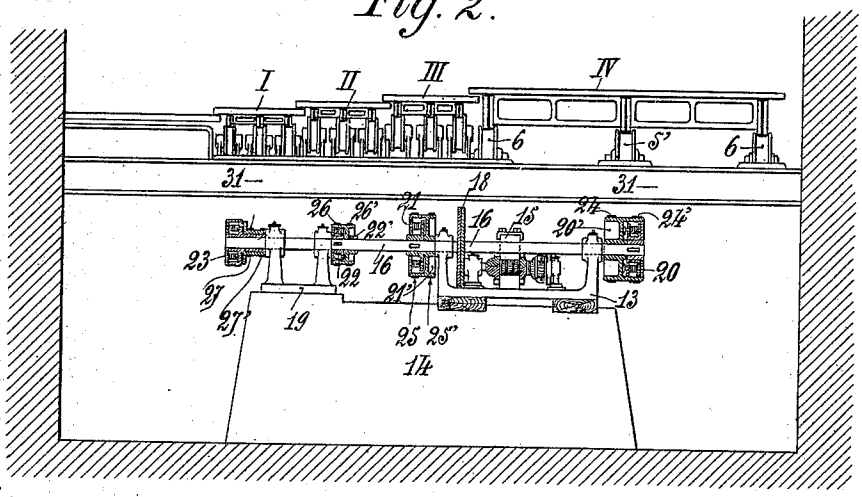


Fig. 2.



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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 3.

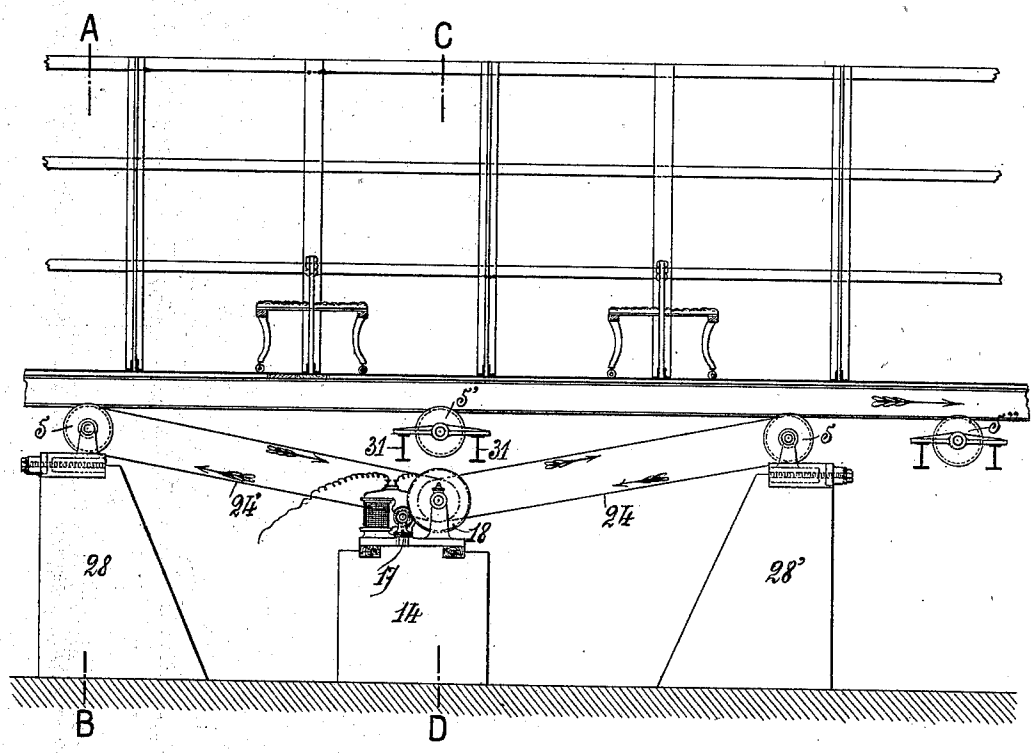


Fig. 7.

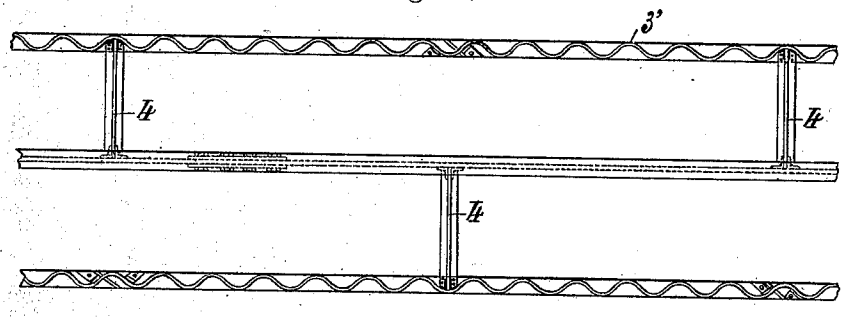
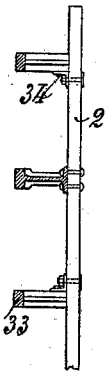


Fig. 8.



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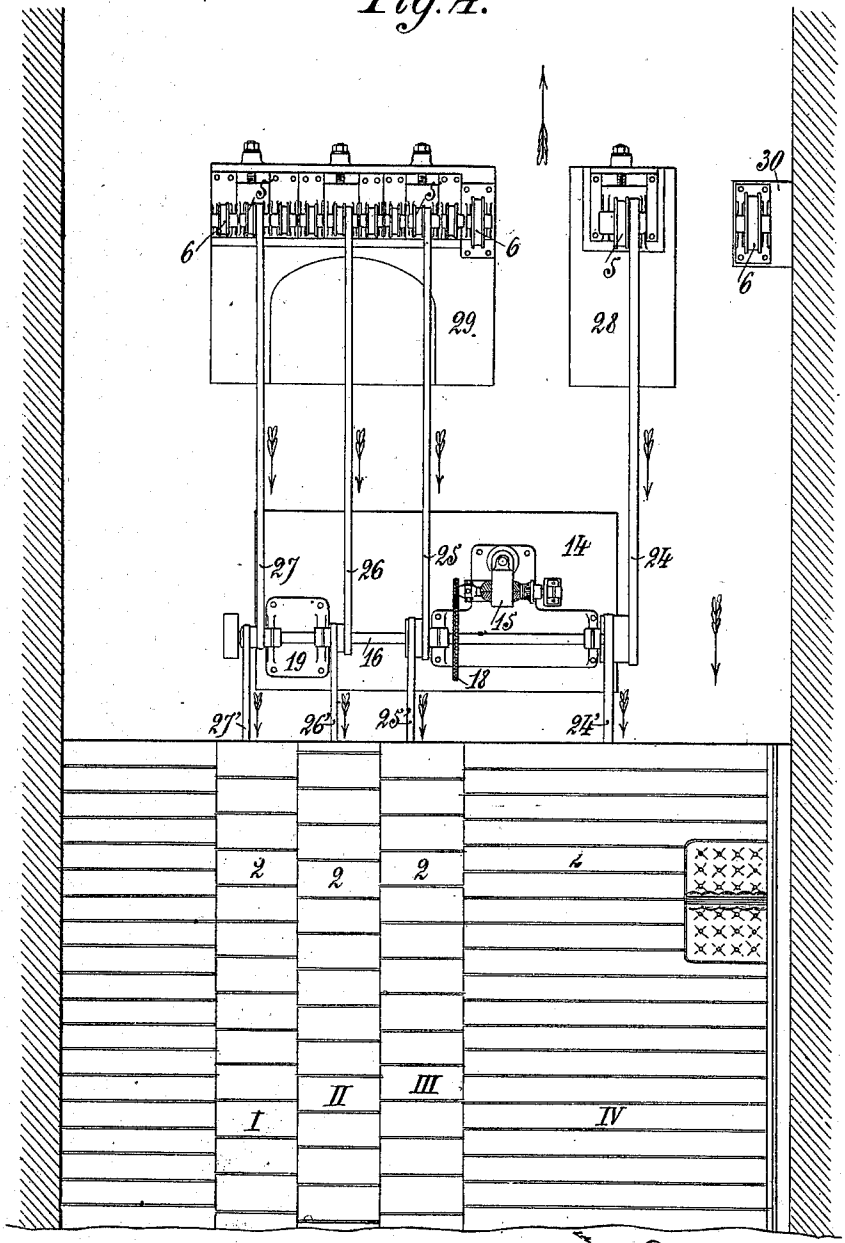
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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 4.



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PASSENGER CONVEYER.

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NO MODEL. 4 SHEETS—SHEET 4.

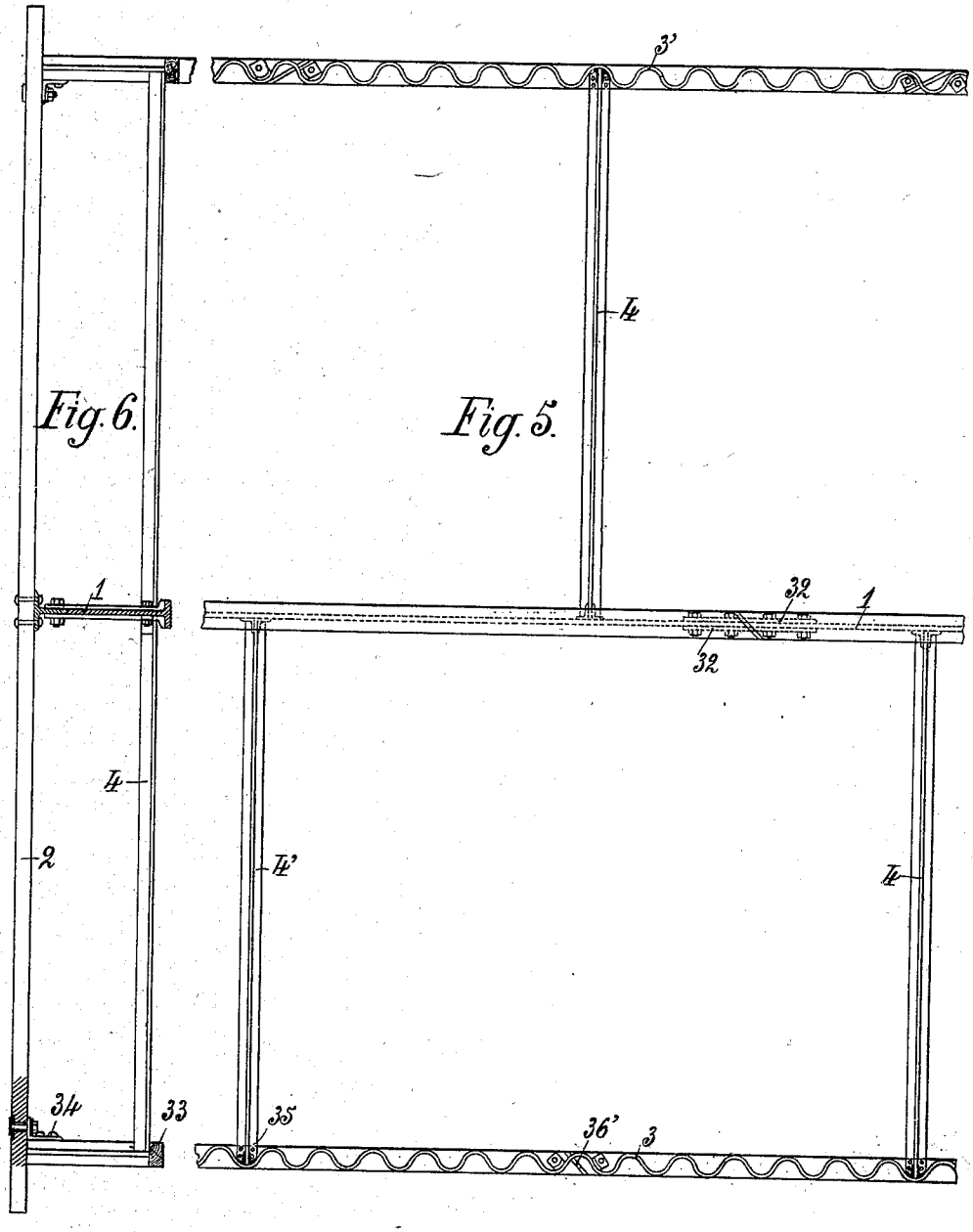


Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

DOMINIQUE ANTOINE CASALONGA, OF PARIS, FRANCE.

PASSENGER-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 723,240, dated March 24, 1903.

Application filed October 10, 1902. Serial No. 126,759. (No model.)

To all whom it may concern:

Be it known that I, DOMINIQUE ANTOINE CASALONGA, a citizen of the Republic of France, residing at Paris, France, have invented Improvements in or Relating to Passenger-Conveyers, of which the following is a specification.

This invention consists of improvements in electromechanical apparatus for operating the stages of passenger-conveyers, which I will describe with the aid of the accompanying drawings, which illustrate an example of apparatus in accordance therewith.

In the said drawings, Figure 1 shows in transverse sectional elevation corresponding to the line A B of Fig. 3 a conveyer comprising four stages, which are respectively indicated by the reference-numerals I II III IV and are mounted on rollers in a tunnel. Fig. 2 is a transverse sectional elevation corresponding to the line C D of Fig. 3 and to the main shaft to which the motion is imparted by a dynamo-electric motor. Fig. 3 is a longitudinal sectional elevation of a transmission-station. Fig. 4 is a plan of a portion of the conveyer and of a little more than half of a transmission-station. Fig. 5 is a plan of a portion of the main stage IV, wherein the floor-plating has been removed in order the better to show the arrangement and joining of the beams. Fig. 6 is a cross-sectional elevation corresponding to Fig. 5. Fig. 7 is a plan of a portion of one of the smaller stages I II III, resembling in its general features the plan of the main strip IV shown in Fig. 5. Fig. 8 is a cross-section corresponding to Fig. 7.

Each stage, whether of greater or of less width, is mounted on a flexible longitudinal metal beam 1, formed, as shown in Figs. 5 and 6, by joining together iron sections having their ends at forty-five degrees to their axes and secured together by means of fish-plates, so that the beam can be bent both in a vertical and in a horizontal plane. Small flooring boards or panels 2, of wood or of thin sheet metal, are secured centrally to the upper flanges of the beams 1. The edges of these panels bear on the outer beams 3 3', of corrugated sheet-iron, upon the surfaces of which they can lightly slide when the stages pass over curved portions. Light supports or arms 4, secured at regular intervals to the beam 1 beneath the panels 2, sustain certain of the panels 2 and by forming cross-tie bracing serve to maintain the form of and distance between the beams, while in no way impairing the flexibility of the stage in a horizontal direction.

The longitudinal beam 1 of each stage bears successively by means of its lower flanges upon the flat bottom of a groove in a roller 5, which is or may be a driving-roller with a pulley and against the flat bottom of a groove in a similar roller 5', which is merely a supporting-roller. These rollers are separated by a distance of about five meters. Supporting-rollers 6, similar to the rollers 5', are arranged under the outer beams of each stage and also at a distance of about five meters apart. Posts 7, serving as supports, are arranged and secured at regular intervals upon and along the edge of each stage. The supports of each stage can be connected by or have substituted for them hanging straps.

Along the back edge of the stage IV is a movable back 8, formed of open-work and having the same mobility and flexibility as the stage of which it forms a part, and along and against this back are arranged at intervals seats 9, which may either be fixed or made to turn down. The back 8 may be covered to a suitable height by a metallic trellis. A contact-conductor may be located at 10, so that besides the stationary lamps 11 in the tunnel there may be lamps 12, which travel with the large strip IV.

At intervals of about fifteen meters there is located upon a frame 13, carried by a masonry support 14, a dynamo-electric motor 15 whose rotary movement is reduced and transmitted to a shaft 16, as by a small pinion 17, Fig. 3, engaging with a large wheel 18, keyed on the shaft 16. A worm and worm-wheel might be substituted. This transmitting and reducing gear may be immersed in an oil-bath. The shaft 16 extends to a standard 19, which supports its end, and upon this shaft there are keyed electromagnetic friction-clutches 20 21 22 23, which when energized are adapted to engage pulleys 20' 21' 22' 23', and thus to drive the stages either directly or through belts or cables. Each of the pulleys 20' 21' 22' 23' is in the example adapted to receive a pair of belts. Each of these belts, which are

respectively numbered 24 24′, 25 25′, 26 26′, and 27 27′, actuates a pulley formed in one piece with one of the rollers 5, by which the longitudinal beam of a stage is moved and supported.

The rollers 5 belonging to the large stage IV are carried by supports 28 28′, Fig. 3. Means are provided for enabling the tension of the belts or cables to be regulated as desired. The rollers 5, by which the small stages I II III are moved, and the rollers 6, by which they are supported, are carried by supports 29, located at one side of the supports 28 28′, and each of these rollers may be furnished with a device, as one or more regulating-screws, on yielding supports, whereby its height may be regulated. The supporting-rollers 6 of the outside beam on the right-hand side of the stage IV are provided with suitable supports 30, which may be simply brackets arranged against the wall of the tunnel. The other supports are arranged in such a way that it is easy to walk around them. They may be constructed of masonry or armored cement, and their upper part may be of asphalt.

The series of supporting-rollers 5′, whose axes are located in the vertical plane containing the axis of the shaft 16, is carried by two transverse girders 31, which may, if necessary, be raised so as not to extend below the rollers and be stayed to other girders, so as to form a strong support of the least possible height.

The tunnel within which the conveyer is arranged is generally of approximately rectangular cross-section with a flat or slightly-arched roof. When in the lower part of this tunnel there occurs a transverse obstruction—as, for example, a sewer or another tunnel or channel—over which it is necessary to pass, the series of supports may be interrupted and the beams supported by simple carrying-wheels of sufficient number and diameter.

An explanation has already been given of the construction of the stages, which, while differing in breadth and speed, are all of similar construction. Figs. 5, 6, 7, and 8 enable the constructional details to be readily understood.

The sections of I-iron of the flexible beam 1 are beveled at the ends to enable them to run on the bottom of the groove of each roller 5 or 5′ with the least possible amount of noise. These sections are connected together by fish-plates 32, whose bolts pass through them from one side without play and from the other side with a little play, caused by making the holes slightly oval. By this arrangement the flexibility of the beam in a vertical plane is increased. The movement of the beam in the horizontal plane is prevented by flanges cast on the rollers.

On curves the thrust resulting from the curvature of the beam is taken by a row of balls, against which the boss of the roller bears, thereby reducing the lateral friction.

On each side of the beam 1 and against it at intervals of about a meter there are secured by one end each the arms 4 already mentioned. The other ends of these arms are fixed to the corrugated wall of the outer beams 3 3′ to the right and left and to the wooden bars 33, above which the corrugations of these beams are supported.

To the upper part of each beam 3 3′ there are fixed angle-irons 34, which carry the ends of the boards 2, which are bolted to them with play, the bolt-hole being slightly oval to enable the ends of these boards to slide to a slight extent on the top of each lateral corrugated beam while passing around a curve.

Each bar 33 has a length of one meter and is fixed at its middle point 35 to the end of the arm 4, and at each end 36 it is cut at an angle. When the stage of the conveyer becomes curved the part 33 remains straight and normal to the arm 4, its ends moving slightly in relation to the corrugated wall. When the latter is developed on a curve and becomes curved itself, the bars 33 have the appearance of a number of lines forming a polygon approximately tangential to the curve. The oval form of the holes in the ends of each bar 33 enables the said ends to be slightly displaced.

Each motor, which is located at fifteen meters from those adjacent to it, drives fifteen meters of the conveyer; but, as has been seen, the stages of the conveyer are independent of one another, so that one stage can be stopped without stopping the others. When it is desired to stop one stage, it is necessary so to modify and regulate the speed of the stages that remain in motion as to enable a passenger to step from one stage to another without inconvenience. The independence of the stages enables them to be successively started and to be driven at different speeds.

Each motor is provided with a separate switchboard; but all the motors may be placed in circuit at one operation from a central station, and all the electromagnetic clutches of the same stage are arranged in series on the main wire, so that they may be simultaneously energized.

The motors, which, as already stated, are located at fifteen meters apart, develop a maximum motive power of about three horse-power. The armature is wound with thick wire, so that at starting each motor may develop four horse-power without sensibly heating its armature.

To effect the starting of the conveyer, after all the motors have been placed into circuit all the electromagnetic clutches of the stage I are energized. When this stage has attained its maximum speed, (about four kilometers per hour,) the clutches of the stage II are energized. When this stage has attained its maximum speed, (about eight kilometers per hour,) the clutches of the stage III are energized. Finally, when the speed of this stage has attained its maximum (about twelve

kilometers) all the clutches of the large stage IV are energized, the starting of this stage being facilitated by the movement of the adjacent stages. The starting or the restarting of the conveyer may, moreover, be commenced with any stage. It is obvious that the number and the width of the stages constituting a conveyer may be varied.

What I claim is—

1. In means for operating a passenger-conveyer comprising stages adapted to be propelled at different speeds, a device for propelling the stages comprising an electromotor 15; a main shaft 16; electromagnetic clutches 20, 21, 22, 23, pulleys 20′, 21′, 22′, 23′ in which the said clutches are located, and with which they are adapted when energized to engage; a driving-pulley and roller 5 formed in one piece or rigidly connected together and centrally arranged beneath each of said stages; belts or cables 24, 24′, 25, 25′, 26, 26′ 27, 27′ adapted to transmit the motion of the pulleys 20′ 21′ 22′ 23′ to the pulleys 5.

2. In means for operating a passenger-conveyer comprising stages adapted to be propelled at different speeds, a propelling device comprising an electromotor 15; a main shaft 16; electromagnetic clutches 20, 21, 22, 23; pulleys 20′ 21′ 22′ 23′ in which said clutches are located and with which they are adapted, when energized, to engage a driving pulley and roller 5 formed in one piece or rigidly connected together, and centrally arranged beneath each of said stages; belts 24, 24′, 25, 25′, 26, 26′ 27, 27′ adapted to transmit the motion of the pulleys 20′, 21′, 22′, 23′ to the pulleys 5; supporting-rollers 5′ interposed between the driving-rollers 5; transverse supports 31 for said supporting-rollers and adapted to serve as stays; lateral supporting-rollers 6; and isolated supports 28, 29, 30 on the floor of the tunnel.

3. A passenger-conveyer comprising stages adapted to be propelled at different speeds, a propelling device comprising an electromotor 15; a main shaft 16; electromagnetic clutches 20, 21, 22, 23; pulleys 20′, 21′, 22′, 23′ in which said clutches are located and with which they are adapted, when energized, to engage; a driving-pulley and a roller 5 formed in one piece or rigidly connected together, and centrally arranged beneath each of said stages; belts 24, 24′, 25, 25′, 26, 26′, 27, 27′ adapted to transmit the motion of the pulleys 20′, 21′, 22′, 23′ to the pulleys 5; a longitudinal beam 1 for each of said stages, jointed at an angle by means of fish-plates; corrugated side beams 3, 3′; bars 33 having free ends cut on the bevel; arms 4, 4′, connecting each central beam 1 with the corresponding beams 3, 3′; boards 2 centrally secured to the upper part of each beam 1 and angle-irons 34 by means of which each board 2 is attached near its ends to the side beams by means of bolts having a slight play to admit of lateral movement of the flooring relative to the side beams.

4. A passenger-conveyer comprising stages adapted to be propelled at different speeds, a propelling device comprising an electromotor 15; a main shaft 16; electromagnetic clutches 20, 21, 22, 23; pulleys 20′, 21′, 22′, 23′ in which said clutches are located and with which they are adapted, when energized to engage; a driving pulley and a roller 5 formed in one piece or rigidly connected together, and centrally arranged beneath each of said stages; belts 24, 24′, 25, 25′, 26, 26′, 27, 27′ adapted to transmit the motion of the pulleys 20′, 21′, 22′, 23′ to the pulleys 5; a longitudinal beam 1 for each of said stages, jointed at an angle by means of fish-plates; corrugated side beams 3, 3′; bars 33 having free ends cut on the bevel; arms 4, 4′ connecting each central beam 1 with the corresponding beams 3, 3′; boards 2 centrally secured to the upper part of each beam 1; angle-irons 34 by means of which each board 2 is attached near its ends to the side beams by bolts having a slight play to admit of lateral movement of the flooring relative to the side beams; a flexible wall 8 secured to the high-speed strip IV; seats 9 arranged longitudinally against and attached to said wall; and electric lamps 12 adapted to move with said wall; and a contact-conductor 10 adapted to supply said lamps with current.

5. In a passenger-conveyer comprising a plurality of stages adapted to be driven at different speeds, the combination of a motor, a main shaft, a series of pulleys arranged on said shaft, rollers adapted to support and move the various stages and driving connections between said main shaft and rollers.

6. In a passenger-conveyer comprising a plurality of stages adapted to be driven at different speeds, the combination of a motor, a main shaft, a series of pulleys arranged on said shaft, clutches for connecting the pulleys to the shaft, a longitudinal beam arranged on each stage, rollers adapted to engage said beam to support and move the stage and driving connections between said main shaft and rollers.

7. In a passenger-conveyer comprising a plurality of stages adapted to be driven at different speeds, the combination of a motor, a main shaft, a series of pulleys arranged on said shaft, clutches for connecting the pulleys to the shaft, driving-rollers adapted to move said stages, a series of rollers adapted to support said stages and a plurality of longitudinal beams arranged on each stage and adapted to engage with said rollers, and connections between said main shaft and rollers.

8. In a passenger-conveyer, a traveling stage having a flexible longitudinal central beam, and longitudinally expansible and contractible beams one at or near each edge thereof.

9. In a passenger-conveyer, a traveling stage having a longitudinally expansible and contractible beam made of corrugated metal.

10. In a passenger-conveyer, a stage having a flexible central longitudinal beam and

two longitudinally expansible and contractible side beams, and braces connecting the central and side beams at intervals.

11. In a passenger-conveyer, a traveling stage having a flexible central longitudinal beam, longitudinal supporting-beams having corrugated walls, braces connecting said central and supporting beams, and a flooring comprising a series of boards or panels securely connected to said central beam and having loose connection with the supporting-beams to permit a slight play relative thereto.

Signed at Marseilles, France, this 26th day of September, 1902.

DOMINIQUE ANTOINE CASALONGA.

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