No. 618,591. Patented Jan. 31, 1899.

A. VIETOR.

MEANS FOR LOCOMOTION.

(Application filed Dec. 22, 1897.)

(No Model.) 4 Sheets—Sheet 1.

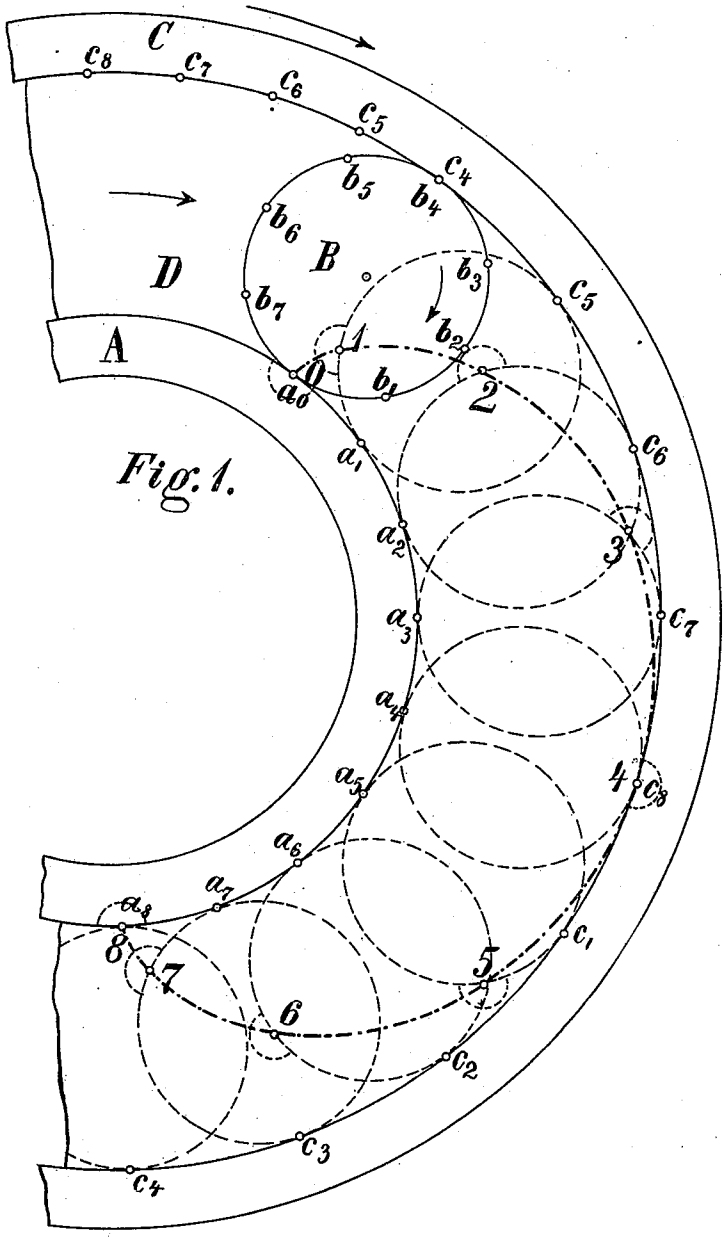

Fig. 1.

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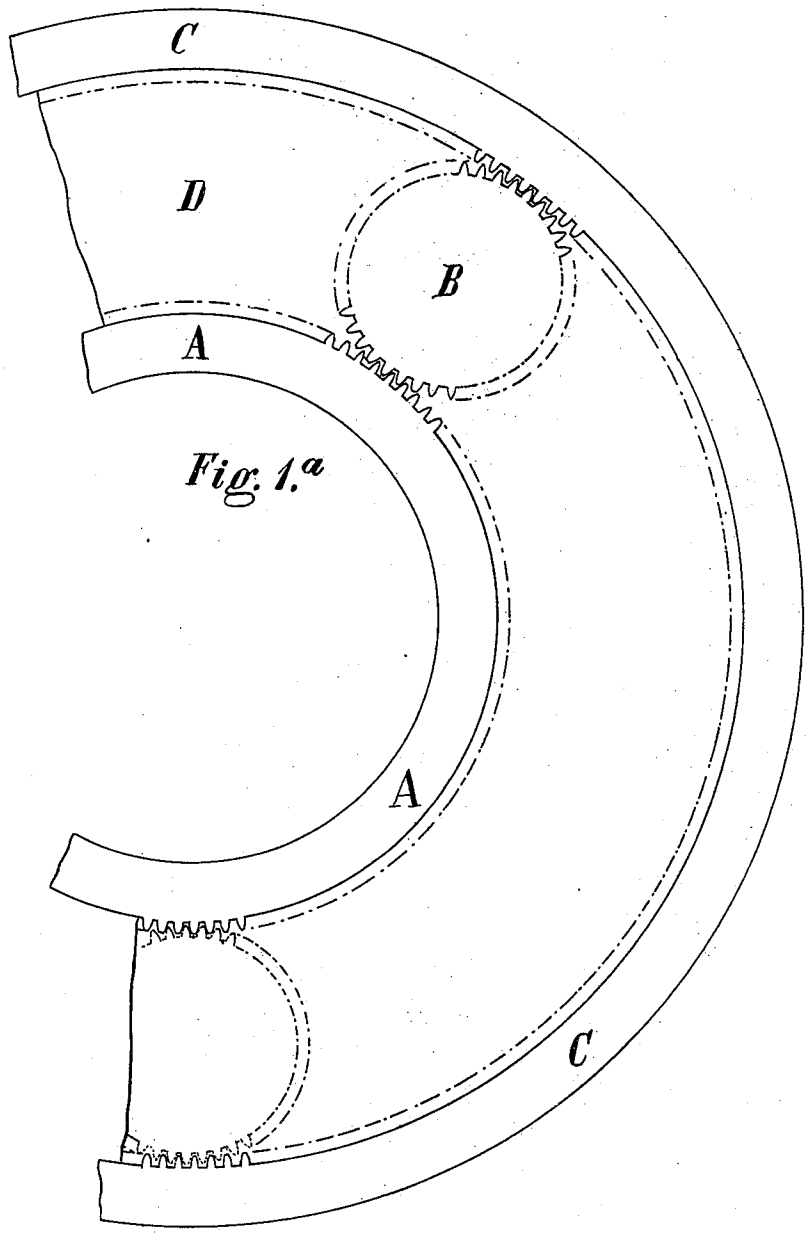

Fig. 1.a

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Fig. 2.

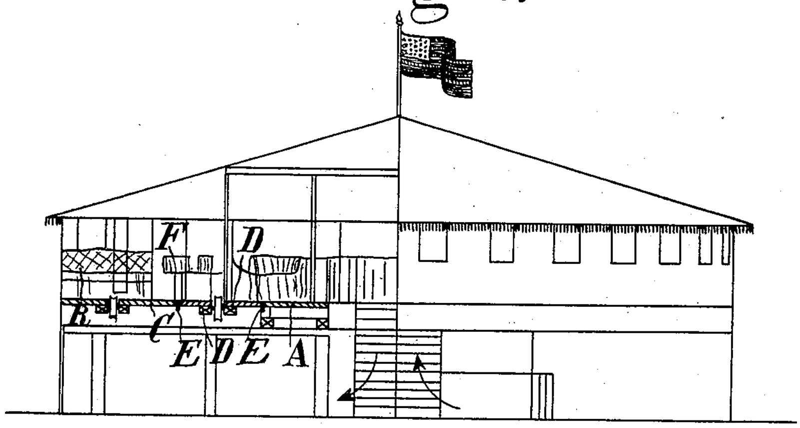
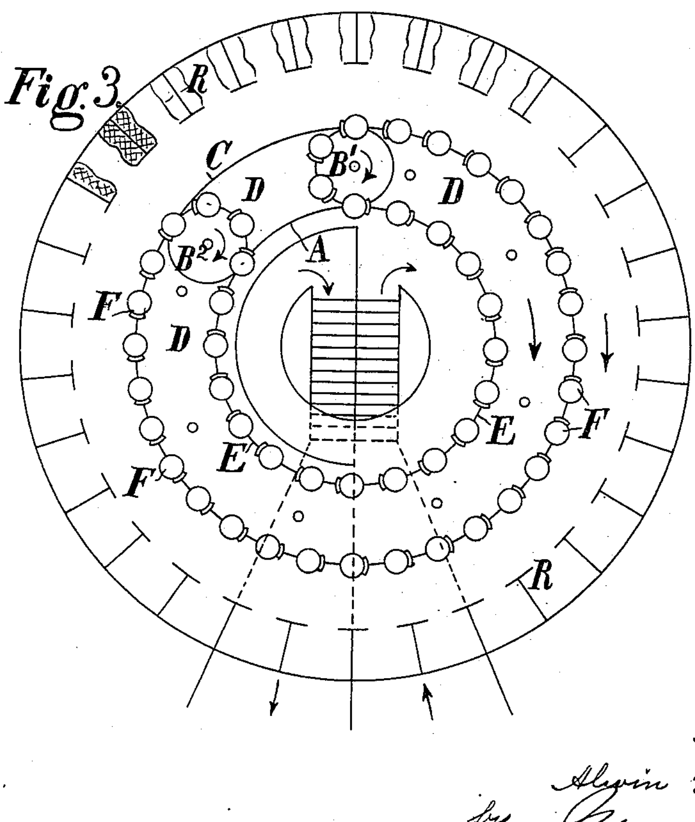


Fig. 3.



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No. 618,591. Patented Jan. 31, 1899.

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MEANS FOR LOCOMOTION.

(Application filed Dec. 22, 1897.)

(No Model.) 4 Sheets—Sheet 4.

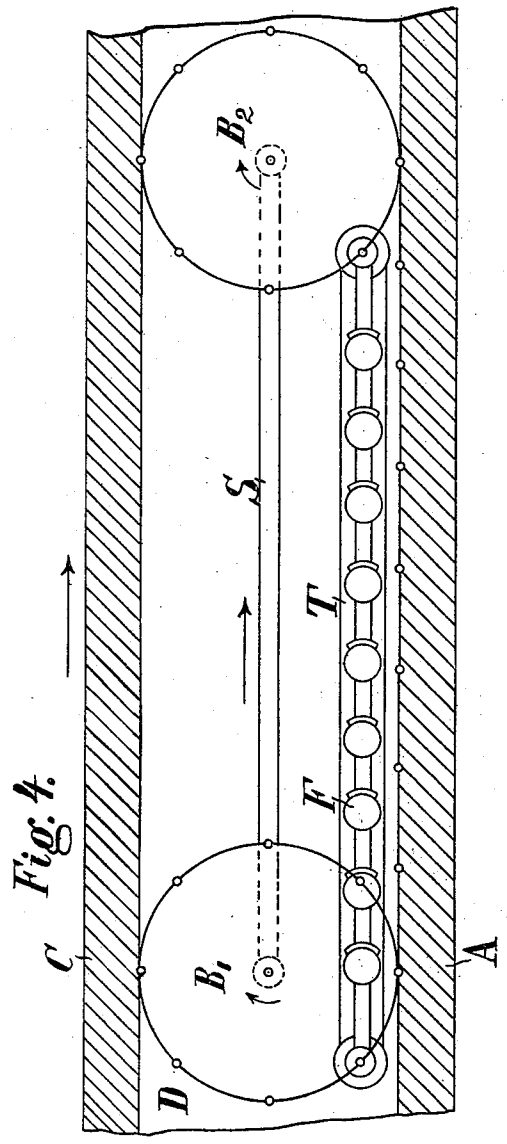

Fig. 4.

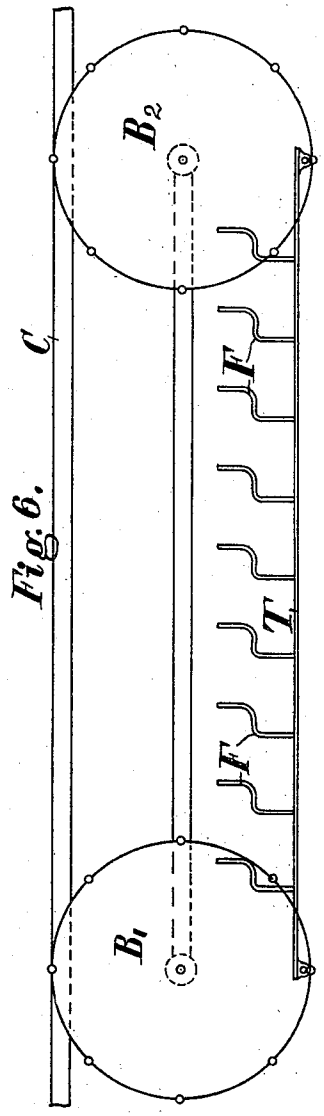

Fig. 6.

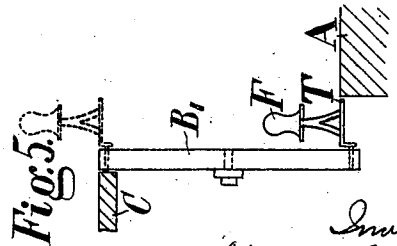

Fig. 5.

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UNITED STATES PATENT OFFICE.

ALWIN VIETOR, OF WIESBADEN, GERMANY.

MEANS FOR LOCOMOTION.

SPECIFICATION forming part of Letters Patent No. 618,591, dated January 31, 1899.

Application filed December 22, 1897. Serial No. 663,037. (No model.)

To all whom it may concern:

Be it known that I, ALWIN VIETOR, a subject of the German Emperor, and a resident of Wiesbaden, Germany, have invented certain new and useful Improvements in Means for Locomotion; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention renders it possible to mechanically transfer persons between a stationary fixed platform on the one hand and a second continuously-moving platform or to a gangway which can be applied to a railway-carriage or other vehicle in motion on the other hand. The arriving and departing persons for this purpose only need to step from their standpoint onto a stand or seat which is at the same height directly in front of or near them and is for the time being in a relative stationary condition, which stand or seat is mechanically moved to and fro with a gradual and continuous alternation of velocity from one to the other of the two platforms and is arranged on a rolling disk or wheel which describes a cycloidal curve. If the disk is circular and the track on which it rolls is a circle or a straight line, all points on the circumference of the disk describe cycloidal curves. If the track on which it rolls is a curve built up of circular arcs of different radius or a curve of other kind, cycloidal forms or curves of a complicated nature are described. Each time a generating-point coincides with the point of contact of the wheel or disk with the track a reversing-point occurs in the course or locus of the cycloid. The velocity of the point is here equal to zero. From one reversing-point to the next, corresponding to a complete circumference of a rolling disk or wheel, the velocity of the point on the periphery of the disk describing a cycloid varies continuously with a uniform rolling of the disk or wheel, since it increases gradually in the first half of the track up to double the velocity of the motion of translation of the center of the disk and then gradually decreases again to zero in the second half of the track. The envelop curve contains the points of the cycloid of greatest velocity, together with those of the cycloids described by the peripheral points of the rolling disk. If the track on which the disk rolls is a circle, the envelop is a circle concentric therewith. If the track is a straight line, the envelop is a straight line parallel thereto. These two simplest cases are the most suitable in practice for the purpose in view.

In the accompanying drawings, which illustrate the invention, Figure 1 is a plan of part of a stationary platform, of part of a rotating platform concentrically surrounding the same, and a circular disk or wheel arranged between the two platforms; Fig. 1^a, a part of a modification of the arrangement. Fig. 2 shows, half in vertical section and half in side elevation, a roundabout with my cycloidal platform applied thereto. Fig. 3 is partly a plan, and partly a horizontal section of Fig. 2. Fig. 4 is a plan showing a modification in which the stationary and the moving platforms are straight and parallel to each other, while between the two platforms are arranged two horizontal disks or wheels connected together into one moving system by means of rods. Fig. 5, finally, is an end elevation, partly in vertical section; and Fig. 6, a side elevation showing a modification in which two disks or wheels connected together into a moving system are arranged perpendicularly and the stationary platform lies lower than the moving platform.

The edge of the circular fixed platform A, Fig. 1, is the track or surface on which the disk rolls. The periphery of the circular disk or wheel B is the rolling surface or curve. The edge of the outer moving platform C is the envelop. The disk B transmits the persons or goods between A and C, while A is stationary and C moves. Between A and C beneath the disk B lies a cover-ring D.

Both between A and B, as well as between B and C, sliding or slipping of the rolling surfaces relatively to each other can be completely prevented by providing teeth thereon, as shown in Fig. 1^a. Then the points b^0 b' b^2 b^3 of the disk or wheel B successively coincide with the points a^0 a' a^2 a^3 of the platform A, while at the same time the diametrically opposite points b^4 b^5 b^6 b^7 on the periphery of the disk coincide with the points c^4 c^5 c^6 c^7 on

the moving platform C, which advance in the same direction as that in which the disk rolls. In this motion the point b^0 on the periphery of the disk describes, for example, the cycloid 0 1 2 3, in which 0 and 8 are reversing and consequently standstill points, while 4 is the point of greatest velocity.

While the point b^0 moves from 0 to 4 the arcs or sections $b^0 b'$, $b' b^2$, $b^2 b^3$, and $b^3 b^4$ of the disk B roll over the corresponding arcs $a^0 a'$, $a' a^2$, $a^2 a^3$, and $a^3 a^4$ on the track A. At the same time the arcs or sections $b^4 b^5$, $b^5 b^6$, $b^6 b^7$, and $b^7 b^0$ of the disk B roll on C, corresponding to the arcs $c^4 c^5$, $c^5 c^6$, $c^6 c^7$, and $c^7 c^8$ thereon. Consequently the point c^8 on C moves onto the point 4 of the cycloid, while the disk B rolls on A from a^0 to a^4. Consequently in order for any one to pass from a^0 to C during the rotary motion of the platform C one steps on b^0 from B at the moment when the rolling disk B touches the point a^0 of A and then remains on the stand or seat arranged somewhere thereon, and after the disk B has rolled through a distance equivalent to half its circumference will consequently be at the cycloid-point 4 opposite to the point a^4 and close to the point c^8 of the moving platform C, which has moved forward in the meantime. The person here has the same velocity as this point c^8 and can therefore step over from B to C as conveniently and securely as he stepped from A to B. Moreover, in order for any one to pass out at c^8 from the moving platform C at the moment when the rolling disk B (remaining stationary relatively to the platform C) touches the point c^8 of C, and consequently at the point 4 of the cycloid, one steps onto B and remains on a stand or seat provided thereon at b^0 during the rolling thereof through a half-circumference until at the cycloid-point 8 he will be momentarily stationary directly opposite the point a^8 of A. He can accordingly here step onto A. In this manner it is possible to pass over from all points of the edge of the stationary platform A to all corresponding points of the edge of the moving platform C, and inversely, the persons being carried through an arc of a cycloid while they are on the disk B.

The size of the disk B has to be made, generally speaking, so as to correspond with the velocity of the moving platform C.

If a single disk B is not sufficient at one arrival-and-departure platform of the kind described for effecting the transfer of passengers between the fixed platform and the moving platform, and consequently between the platform and a carriage, two disks can be united to form a pair by means of a chain-like band passing around both and carrying stands or seats. In this manner a pause or stay of the stands or seats at the edges of the platforms A and C is obtained in order to facilitate passing over. It can be adapted for rendering possible the mounting and dismounting from the ring R of a roundabout which runs uninterruptedly, Figs. 2 and 3. For this purpose a platform C is arranged on the inside of a ring R, provided with seats, so as to run therewith. Opposite to and concentric with this is arranged the fixed platform A at the same height around the center of the roundabout. Into the middle thereof the passengers enter and leave by a staircase. The cover-ring D, between A and B, carries at two places transfer-disks B′ and B², the rolling diameter of which is equal to the distance between A and C. Around the two disks is arranged an endless link-shaped band E, the remaining part of which lies over the edges of the platforms A and C, forming the roller-track. This band E, for which the necessary room is left, is provided throughout its whole length with seats F. At the same time care is taken in arranging the chain that only rolling of the disks B′ and B² on the edges of A and C can take place. The roundabout ring R, together with the platform C and the cover-ring D, can run on ring-shaped rails, while the disks B′ and B² turn about pins or stud-shafts secured to the ring D. The link, band, or chain E is geared to the disks B′ and B², said disks being constructed in the form of sprocket-wheels the teeth of which engage the band or chain links. The seats F are secured to said chain in any suitable or well-known manner, as by means of joint-bolts or the like. The platforms A C may be provided with edge recesses for the chain-links or a part thereof to move in. The rolling motion of the disks B′ B² may be imparted thereto from the platforms C and A, which for this purpose are provided with a toothed rim in gear with a toothed wheel on the spindle of the wheels B′ B² below said disks, as shown in Fig. 1ª, whereby a positive rotation or rolling motion is imparted to said disks.

As soon as either the roundabout-ring R or the cover-ring D or one or both disks B are set in rotation, which can be effected by any external power, the other parts mentioned are caused to move therewith. The peripheral points of the two disks, and consequently also the parts of the chain E lying at the circumference thereof and the seats F, so far as these are not at rest directly at the edge of A or are moving in a circular path at the edge of the platform C at the same velocity, move together with the passengers thereon going from A or from C in cycloidal paths, according to Fig. 1. If the rotation takes place in the direction of the arrow, those on B′ are entering (going toward C) and those on B² are leaving, (going toward A.) Both over R and C, as also over the cover-ring D, as also over A, is provided a common roof running around with D.

If the fixed platform A and movable platform C are straight, Fig. 4, the two transfer-disks B′ and B² are connected to form a moving system by means of a rod S, which engages with pins at the centers of the disks, and are

so arranged that they roll with their periphery on the directly opposite edges of the platforms A and C. On a second rod or bar T can be mounted seats F, the said rod or bar engaging at its ends with pins arranged on the rolling circles of the disks. The arriving and departing passengers can enter or leave at any part of this rod or bar T, since all points thereof describe cycloidal curves. This arrangement is particularly suitable for elevated railways, as shown in Figs. 5 and 6. The transfer-disks B′ and B^2 are here in a perpendicular position, and the plane of the rod or bar T is arranged at right angles to the plane of the disks B′ B^2.

The transfer from A to B and from B to C, and inversely, has no difficulties in this case, also, if in the rolling motion the peripheral points B, and consequently also the stands or seats mounted on B, (or on the chain or band passing round the two disks B, as in the arrangement shown in Fig. 3,) move forward or backward toward A or C with a moderate velocity, remaining below one meter per second. Likewise, also, one can pass out from the moving platform C onto a vehicle moving along in immediate proximity to the outer edge thereof if the velocities of the two differ from one another by less than one meter per second. For safety and convenience in passing across from one to the other these differences in velocity must be reduced as much as possible.

If the open space between A and C on both sides of B be covered over to prevent persons from falling from the edges of A, B, or C to the ground at the bottom, the cover-ring D must move forward during the rolling of the disks B at the same rate. The upper surface of this ring can, if desired, be provided with stands or seats for the persons supervising the transfer of the passengers.

Instead of being employed for the arrival and departure of passengers the cycloidal platform can be made in a suitable form for use in an analogous manner in the loading and unloading of goods, more particularly for the delivery and receipt of express, postal packages, or the like to and from through-running railway-carriages.

Having now particularly described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a stationary and a movable platform, of one or more discoidal platforms for the transfer of passengers, and having a cycloidal motion between the aforesaid stationary and movable platforms, for the purpose set forth.

2. The combination with a stationary and a movable platform and a plurality of intergeared discoidal platforms for the transfer of passengers and having a cycloidal motion between the aforesaid stationary and movable platforms, for the purpose set forth.

3. The combination with a stationary and a movable platform equidistant from each other, and disks having a positive rolling motion between and along the proximate edges of said platforms; of a ring-cover between the proximate edges of said platforms, on which cover said disks are revolubly mounted, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALWIN VIETOR.

Witnesses:
MAX WESTMANN,
MAX C. STAEHLER.