

B. C. BATCHELLER.
CARRIER SYSTEM.

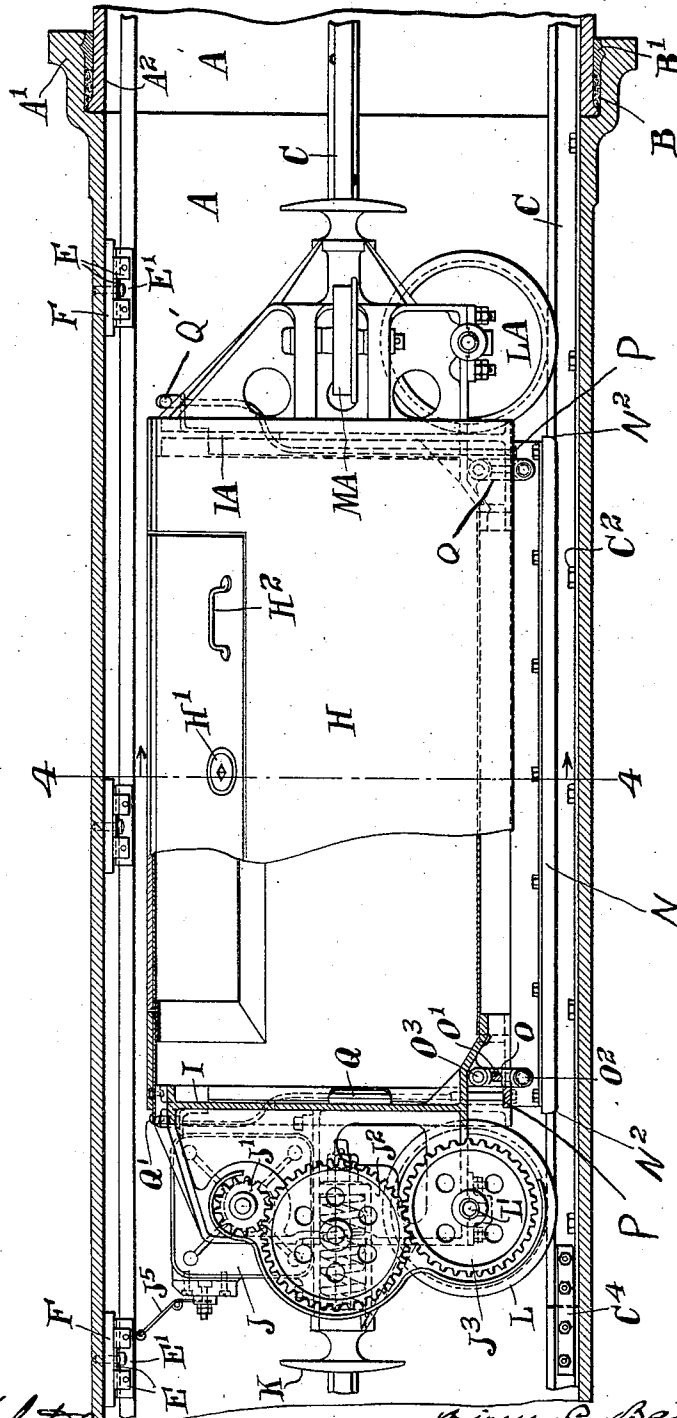
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1,061,036.

Patented May 6, 1913.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES
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3 SHEETS—SHEET 2.

FIG. 2.

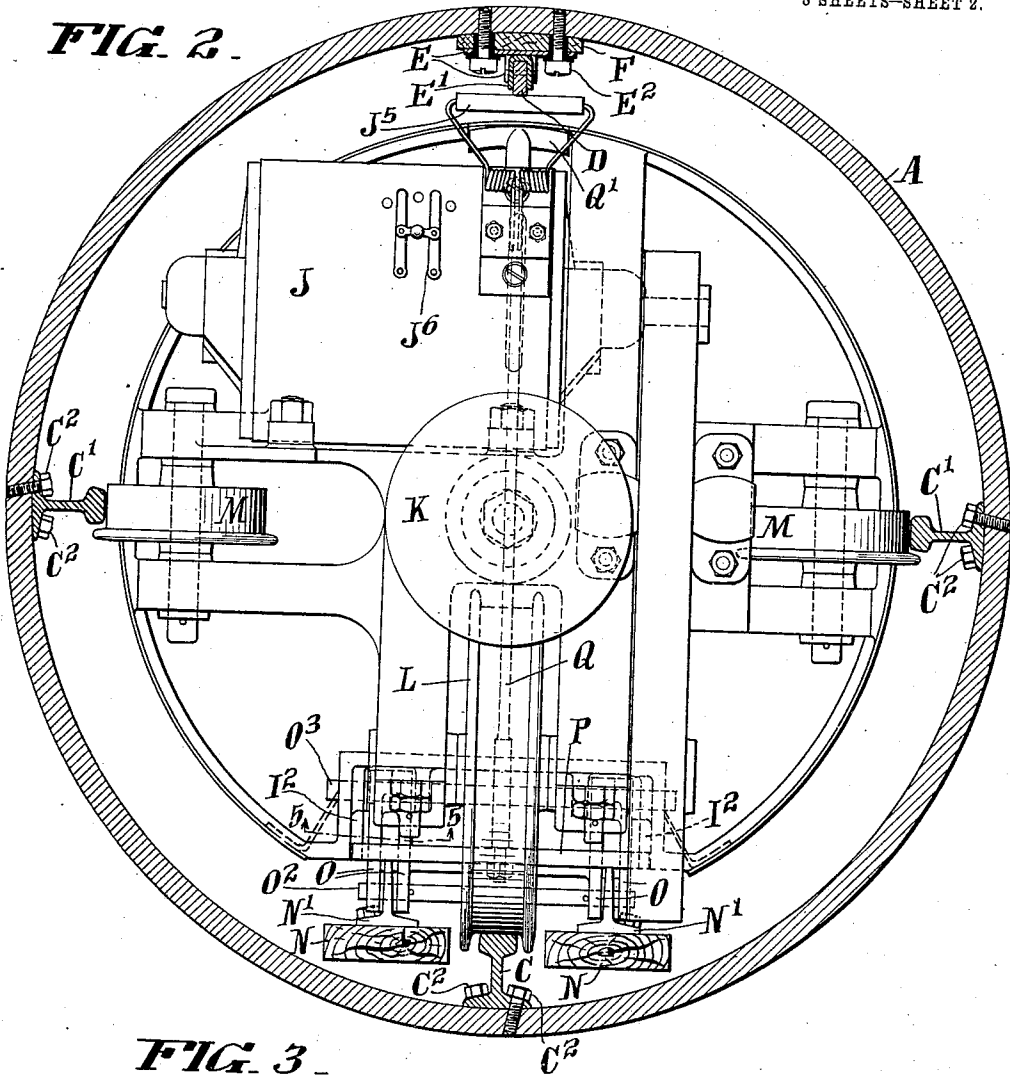
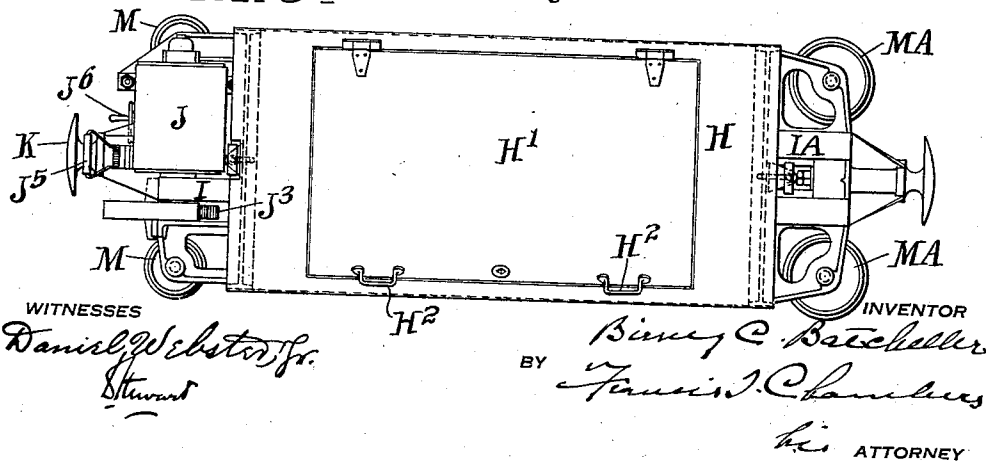


FIG. 3.



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3 SHEETS—SHEET 3.

FIG. 4.

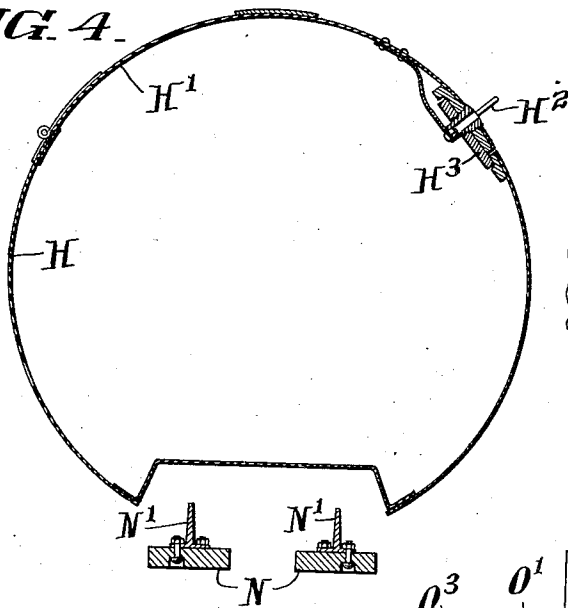


FIG. 5.

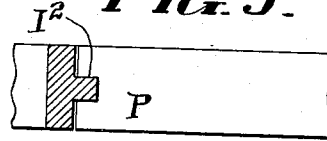


FIG. 6.

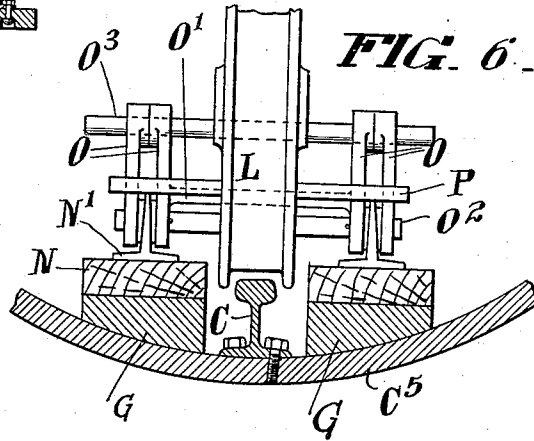
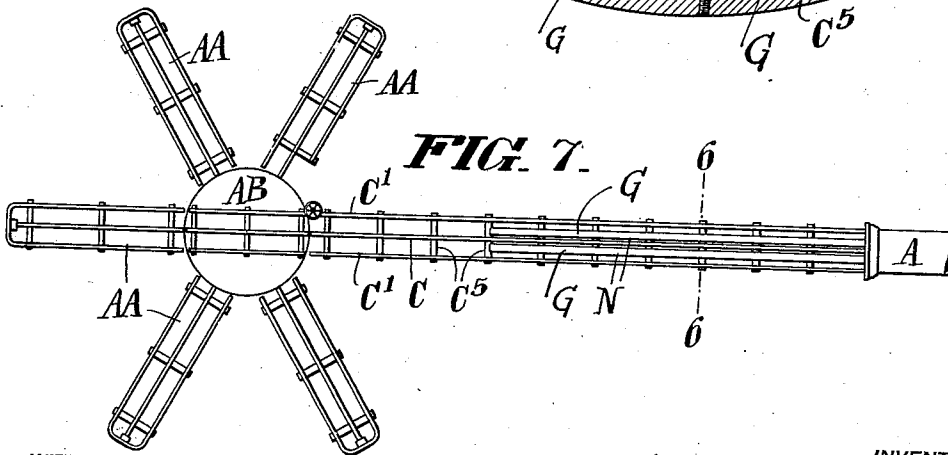


FIG. 7.



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CARRIER SYSTEM.

1,061,036.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed February 20, 1912. Serial No. 678,893.

To all whom it may concern:

Be it known that I, BIRNEY C. BATCHELLER, a citizen of the United States of America, residing in the city of New York, borough of Brooklyn, in the State of New York, have invented a certain new and useful Improvement in Carrier Systems, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention relates to carrier systems of the kind in which motor driven carriers unattended by operators are employed to transmit mail, parcels and the like between the various stations of the system.

The main object of the invention is to provide a simple, reliable, and effective carrier construction having supporting and guiding wheels so disposed with respect to the cooperating track rails that the carriers can be operated, and in particular can turn sharp corners at high speed.

Carrier systems of the kind to which the invention relates are ordinarily installed underground and the motors on the carriers are ordinarily electric motors receiving current from storage batteries on the carriers or through a traveling contact with a stationary conductor.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described a preferred form in which my invention may be embodied.

Of the drawings, Figure 1 is a sectional elevation of a section of transit tubing with a carrier in place therein, said carrier being partly broken away and in section. Fig. 2 is a transverse section of the transit tubing of Fig. 1 with the carrier shown in end elevation. Fig. 3 is a plan view of the carrier shown in Figs. 1 and 2. Fig. 4 is a sectional elevation on the line 4—4 of Fig. 1. Fig. 5 is a partial section on the line 5—5 of Fig. 2. Fig. 6 is a view partly in section on the line 6—6 of Fig. 7, illustrating the operation of the means for checking the carrier as it approaches a station, and Fig. 7 is a somewhat diagrammatic representation of the transit

tubing and terminal station of a single track carrier system.

In the form shown in the drawings the body of the guide way for the carriers is a transit tube formed of pipe sections A, which may be, and are shown as being identical with the cast iron water and sewer pipes in common use. As shown each section A is formed at one end with a bell A' and at the other end with a spigot A² adapted to be entered in the bell end of an adjacent section, and as shown, the joints between the adjacent sections are made water-tight by the usual yarn and lead caulking material B and B' respectively. Within the transit tube and at the bottom of the latter, there is secured a carrier supporting and guiding track rail C. As shown, this rail is of T-section with the underside of the base flange rounded to the curvature of the transit tubing. The rail is secured in place by bolts C² passing through the base flange of the rail and tapped into the pipe sections A. Guide rails C', C' are secured to the opposite sides of the transit tubing at about the level of the axis of the tubing. These rails may be identical in shape with the rails C and are shown as secured in place in a similar manner by bolts C². The track rails C and C' may be formed in sections of any desired length and connected together by fishplates C⁴ of usual form, and ordinary securing bolts. Preferably the rail sections are so disposed that the joints in the rails do not coincide with the joints between the pipe sections A.

In the particular arrangement of transit tubing and terminal stations shown in Fig. 7 a turn-table AB is provided at some distance from the mouth of the tube formed by the pipe sections A proper. The rails C and C' extend, however, directly to the turn-table AB, being supported by brackets C⁵ so that this portion of the carrier guideway is open. Radially disposed with respect to the turn-table AB are storage receptacles or cages AA which have rail sections C and C' supported by brackets C⁵ and the turn-table AB is provided also with rail sections C and C' supported by brackets C⁵. The track rails C and C' of the turn-table are brought into register with the main track rails C and C' and with the track rails C and C' of the storage cages AA, as conditions make desirable. To the bottoms of the supports C⁵ adjacent the end of the transit tube proper are

secured stationary skids G, G, arranged at each side of the rail C, as shown best in Fig. 6. These skids are employed for purposes hereinafter described.

5 In the particular form of apparatus disclosed the carriers are provided with and driven by suitable electric motors receiving current from an overhead conductor D which is secured at intervals to the top of
10 the transit tube sections A by means of metal clips E which are secured to the overhead conductor but are insulated therefrom by the insulation E', and are secured to the transit tubing by bolts E² which are insulated from the clips E. The latter are
15 spaced away from the metallic tube sections A by interposed blocks of wood F, or other insulating material. This overhead conductor preferably terminates adjacent each terminal at the end of the tube proper.
20 The carrier shown in Figs. 2, 3 and 4 comprises a tubular body H advantageously formed of sheet metal and provided with a hinged door H' at the top adapted to be
25 locked in place by an internal button H³. H², H², represent handles for opening and closing the door. The ends of the tubular body H are secured to end members I and IA which are similar in construction except
30 for the features hereinafter referred to. The end member I is formed of cast metal and is provided with flanges and ribs to give it the desired strength and shape and at the same time minimize the weight of
35 the carrier. Secured to the end member I is an electric motor J the shaft of which carries a gear J' which meshes in turn with an idle gear J². The idle gear J² meshes in turn with a gear J³ carried by the shaft
40 L' of a main carrier supporting wheel L which runs on the central rail C and is provided with flanges at each side of the rail. The motor receives current from the overhead conductor D through a bow trolley J⁵ of familiar type. J⁶ represents a
45 reversing switch mechanism by which the carrier may be adjusted to run in either direction. Axially mounted on the end member I is a spring buffer K. Journaled to
50 the end member I on opposite sides are horizontal wheels M, M, engaging the side rails C', C', and formed each with a flange at its underside. The end member IA with attached parts differs from the end member I primarily in the omission of the motor J
55 and of any driving connections for the shaft L' of the wheel LA which may be identical with the wheel L. The side wheels MA journaled in the member I may be identical
60 in construction and arrangement with the wheels M connected to the head I, though as shown, the wheels MA are made larger in diameter than it is convenient to make the wheels M.

65 Beneath the carrier body are mounted two

skids N, N, adapted to cooperate with the stationary skids G, G, heretofore described, in arresting the motion of the carrier. As shown the skids N, N, are of wood with their ends rounded off as indicated at N². To the upper side of each skid N is secured a flanged metal stiffening bar N' running longitudinally of the skid. The skids N are connected to the carrier proper by swinging link structures, one at each end of the carrier, and each comprising link members O arranged in pairs which straddle the vertical flanges of the stiffening bars N' attached to the skids N. As shown each pair of link members O are connected by integral hub portions and the inner links for the two
70 skids at each end of the carrier are connected by a stiffening bar O'. The lower ends of the links O at each end of the carrier are pivotally connected to the two skids N by
75 the pin or shaft O² passing through the vertical flanges of the two stiffening bars N', and each link structure is pivotally connected to the corresponding end member I or IA by a pin of shaft O³ passing through
80 suitably disposed lugs formed on the end member. Normally the links and skids are held rigidly in the position relative to the carrier shown in Figs. 2 and 3 by locking
85 bars P, P, which are formed with notched ends receiving the vertical guide ribs I², I² carried by the corresponding end members I and IA, as shown best in Fig. 5. Each of these locking bars P may be lifted into position to allow the corresponding link structure and the adjacent ends of the skids N to
90 swing toward the lifted locking bar, by means of a rod Q which passes up through the carrier body at the inner side of the corresponding end member to a point adjacent the upper end of the carrier where the
95 rod is bent and passes through a slot formed for the purpose in the portion of the end member closing the end of the carrier body proper. At its upper end each
100 rod Q is provided with a handle Q' which in the normal position of the apparatus is slightly below the top of the car. The rods Q with their handles Q' insure the locking
105 of the skids N in their normal position when the carrier is passing through the transit tubing, for when the skids are unlocked the handles Q' project above the body of the car a distance sufficient to prevent the carrier from passing into the transit tube.
110 In what may be called the normal position of the skids N the links O are vertical, as shown in Fig. 1, and the transverse locking bar P at one end of the carrier engages the corresponding links and prevents the
115 skids N from swinging in one direction, while the locking bar P at the other end of the carrier engages the adjacent links and prevents the skids from swinging in the opposite direction. When either locking bar
120 125 130

P is lifted the links O may swing forward or backward depending on which bar P is lifted to correspondingly raise the skids N from their normal position in which they are adapted to engage the stationary skids G when the carrier moves over the latter.

In operation the carrier after being loaded and after having the skids locked in their normal position is started with a push into the transit tube proper whereupon the motor receiving current from the overhead conductor D through the trolley J^s quickly brings the carrier up to speed, and it is one of the main advantages of the invention that a carrier constructed as described, and running along track supporting and guide rails arranged as described, can be operated at high speeds and can turn the sharp curves which in the practical use of this apparatus it is frequently found necessary to give the transit tubing without slowing down the car, and without requiring any adjustment of the current supply to the motor. When the carrier traveling at high speed reaches a sharp curve the centrifugal force acting on the carrier tends of course to throw the carrier outward, but this tendency is effectually resisted by the engagement of the proper lateral guide wheels M and MA with the corresponding guide rails C', which are arranged at about the level of the center of gravity of the carrier. This arrangement obviates all necessity for the superelevation of the outer rail necessary at curves in guideways in which the carriers run on weight supporting rails. The flanges on the two sides of the wheels L and LA and the bottom flanges of the wheels M and MA prevent the carrier from jumping off the rails at any time.

Preferably as shown the axes of the supporting and two lateral guide wheels at each end of the car lie in the same vertical plane, transverse to the length of the carrier as this gives a marked advantage when it is desired to have the carrier turn sharp angles at high speeds. It will be understood the carrier driving motor should be of such a character or the carrier should have such controlling devices that a desired maximum will not be exceeded. For instance the carrier motor may well be an electric motor having its field energized in normal running by a shunt winding.

The carrier construction illustrated embodies novel features of construction and arrangement which are claimed in application Serial No. 728,775, filed October 31, 1912, as a division of this application.

The transit tube formed of pipe sections A, described may be installed rapidly and easily, and this form of transit tube is highly advantageous on this account and because of its durability and the ease with which it may be made watertight. No claim is made

herein, however, to the specific construction of the transit tubing proper, as that forms the subject-matter of my co-pending application, Serial Number 678,892 filed of even date herewith.

When the carrier approaches a point at which it is to be stopped, as for instance, such a station as is shown in Fig. 7, the skids N of the carrier engage the stationary skids G, G, located at that point. The two sets of skids are so relatively arranged that when they are in engagement the carrier is lifted to more or less completely raise the wheels L and LA clear of the rail C so that all or a substantial part of the weight of the carrier is made use of in creating frictional resistance between the movable and stationary skids N and G, respectively, which quickly rings the carrier to rest. After the carrier is brought to rest in this manner one of the locking bars P, ordinarily the rear one, is lifted to unlock the skids, whereupon the carrier proper may swing forward on the links O until the weight of the carrier is again transferred to the rail C through the wheels L and LA. The carrier may then be readily moved by hand on to the turntable AB, or may otherwise be manipulated as conditions may require. The carrier system disclosed is primarily intended for underground installation and to be used in large cities for transmitting mails or parcels through considerable distances. The particular apparatus disclosed was primarily designed for use in a system in which the pipe sections A are about thirty inches in diameter and the overall length of the carrier is about seven feet. It will be understood, however that the dimensions given are merely illustrative and that the diameter of the pipe sections and the length of the carrier may be made larger or smaller as conditions require. The provisions of the buffers K, K, limit the liability to injury in case of collision of one carrier with another carrier or with other objects.

While in accordance with the provisions of the statutes I have illustrated and described the best form of my invention, now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention, and that under some conditions certain features of my invention may be used with advantage without a corresponding use of other features.

Having now described by invention what I claim as new and desire to secure by Letters Patent, is:

1. In an automatic carrier system, the combination with the carrier supporting track and a carrier having wheels running on said track, of means for automatically arresting the motion of the carrier at a de-

terminated point along the track comprising a stationary element located at said point, a cooperating element mounted on said carrier and movable relative to the carrier into and out of a position in which it will engage said stationary element and thereby frictionally retard said carrier when the latter reaches said point in moving along said track and means mounted on the carrier for releasably locking said cooperating element in said position.

2. In an automatic carrier system, the combination with the carrier supporting track and a carrier having wheels running on said track, of means for automatically arresting the motion of the carrier at a determined point along the track comprising a stationary element located at said point, a cooperating element mounted on the car and means mounted on the carrier for releasably locking said last mentioned element in a position in which it is adapted to engage the stationary element and thereby transfer a considerable portion of the weight of the carrier from the track to said stationary element when the carrier reaches said point in moving along said track.

3. In an automatic carrier system, the combination with the carrier supporting track and a carrier having wheels running on said track, of means for automatically arresting the motion of the carrier at a determined point along the track comprising a stationary element located at said point, a cooperating element, links by which said cooperating element is suspended from said carrier, said links being adapted to swing both forward and backward relative to the length of the carrier to swing said cooperating element upward from a normal position in which it is adapted to engage said stationary element and thereby transfer a considerable portion of the weight of the carrier from the track to said stationary element as the carrier reaches said point in moving along said track, means mounted on the carrier at one end for releasably locking said cooperating element against swinging upward in one direction and means mounted on the carrier at its opposite end for releasably locking said cooperating element from swinging upward in the opposite direction from said normal position.

4. In an automatic carrier system, the combination with the carrier supporting track and a carrier having wheels running on said track, of means for automatically arresting the motion of the carrier at a determined point along the track comprising a stationary element located at said point, a cooperating element extending longitudinally of the carrier, links by which said cooperating element is suspended from said carrier, said links being adapted to swing both forward and backward about axes

transverse to the length of the carrier to thereby lift the said cooperating element relative to the carrier upward from a position in which it is adapted to engage said stationary element as the carrier reaches said point, and a pair of locking bars mounted on said carrier and separately movable transversely to the carrier into and out of positions in which they engage said links and thereby hold said cooperating element in said position, one of said bars then serving to prevent the links from swinging in the opposite direction.

5. In a carrier system the combination with a carrier supporting track comprising a single main supporting track rail, of a carrier having a single wheel at each end adapted to engage said track rail, and means for checking the motion of the carrier comprising a pair of stationary skids located one at each side of said rail, a cooperating pair of skids, suspension links connecting the last mentioned skids to the carrier and adapted to swing to permit the suspended skids to move up out of a normal position in which they are adapted to engage the stationary skids and lift the weight of the carrier off of said rail, and releasable locking devices at each end of the carrier for locking said cooperating skids in said normal position.

6. In a carrier system the combination with a carrier supporting track comprising a single main supporting track rail, a carrier having a single wheel at each end adapted to engage said track rail, means for checking the motion of the carrier comprising a pair of stationary skids located one at each side of said rail, a cooperating pair of skids, connecting links by which the last mentioned skids are normally suspended from the carrier in position to engage the stationary skids and lift the weight of the carrier off of said rail and releasable locking devices at both ends of the carrier, those at one end being adapted to hold said links from swinging in one direction while those at the opposite end prevent the links from swinging in the opposite direction.

7. In a carrier system the combination with a carrier supporting track comprising a single main supporting track rail, a carrier having a single wheel at each end adapted to engage said track rail, and means for checking the motion of the carrier comprising a pair of stationary skids located one at each side of said rail, a cooperating pair of skids, links by which the last mentioned skids are normally suspended from the carrier in position to engage the stationary skids and thereby lift the weight of the carrier off of said rail and releasable locking devices at each end of the carrier for locking said cooperating skids in said normal position.

8. In a carrier system the combination
with a track and track supporting structure,
of a carrier running on said track, a station-
ary carrier arresting device located at a
5 point along said track at which it is desired
to stop the carrier, a coöperating carrier ar-
resting element mounted on the carrier and
movable from one position in which it is
adapted to engage said stationary element
10 and thereby arrest the motion of the carrier
into a second position in which it permits
the carrier to move along said stationary
element, and means mounted on the carrier
for releasably holding said element in said
one position, said means coacting with and 15
being prevented by said structure from per-
mitting the release of said element as the
carrier moves along said track toward said
stationary element.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."