L. B. LARSEN.

CARRIER.

APPLICATION FILED OCT. 26, 1908.

926,264. Patented June 29, 1909.

3 SHEETS—SHEET 1.

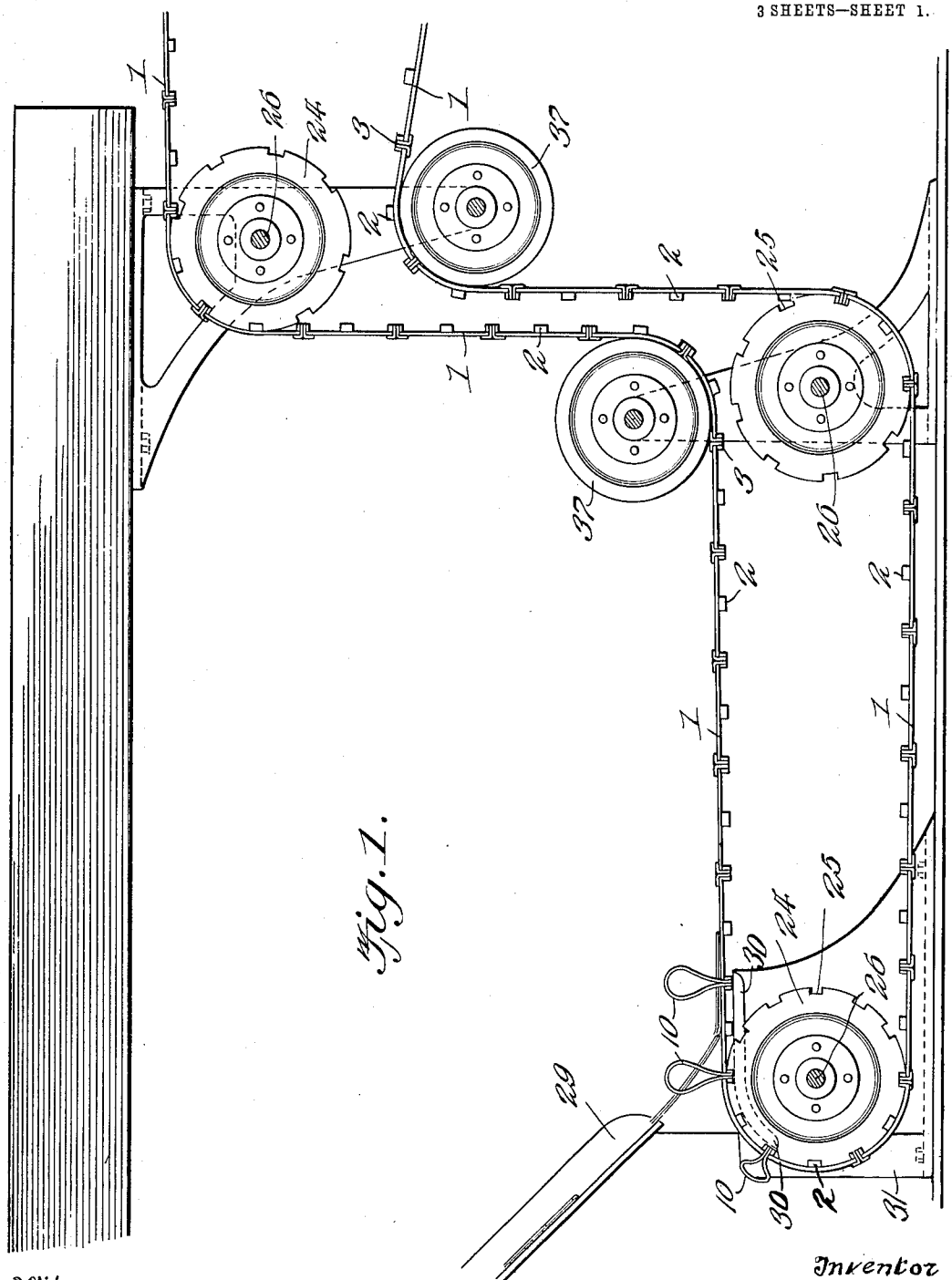


Fig. 1.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

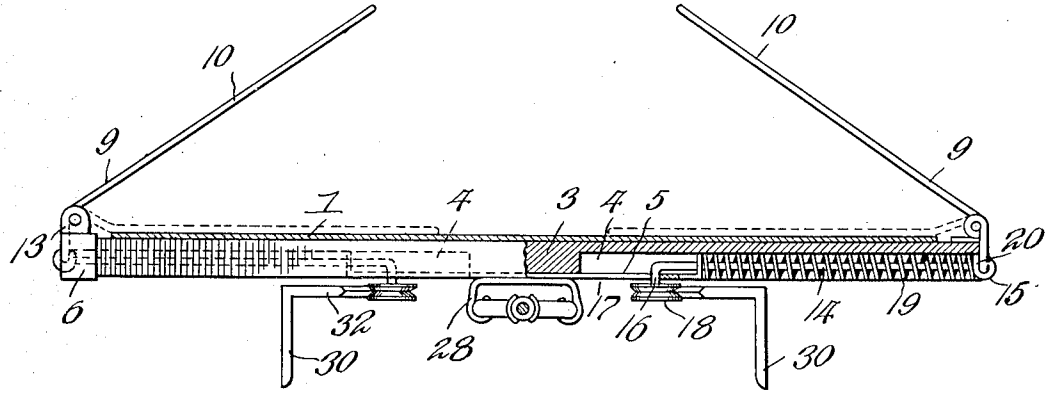


Fig. 3.

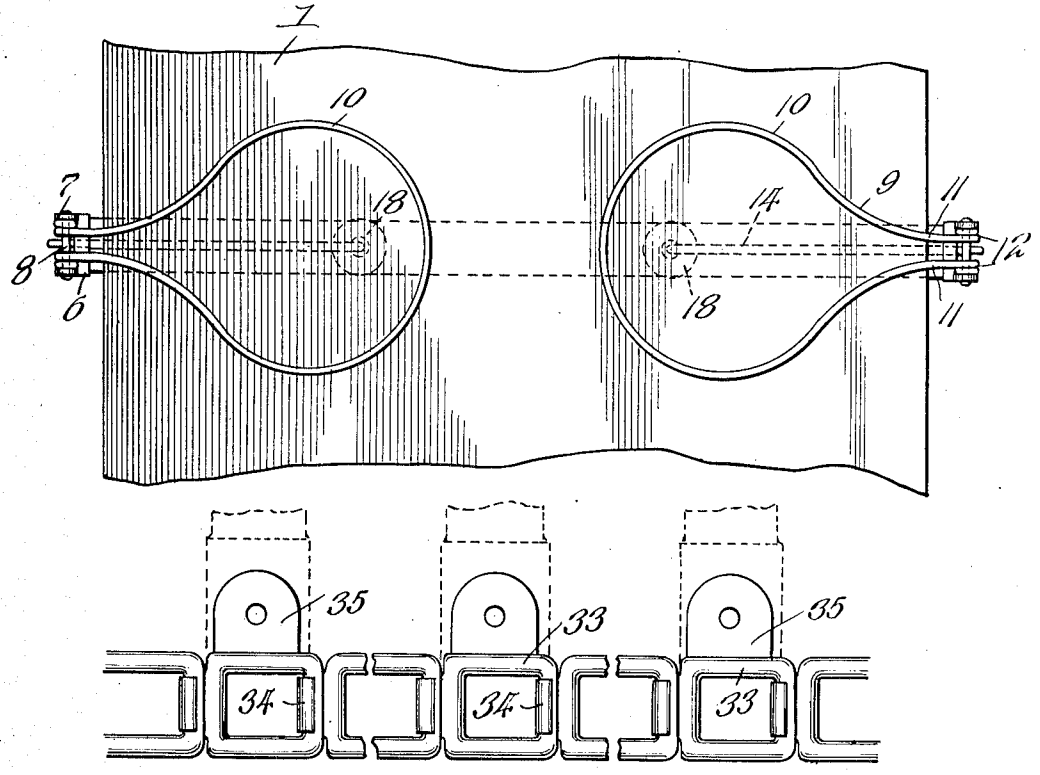


Fig. 6.

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3 SHEETS—SHEET 3.

Fig. 4.

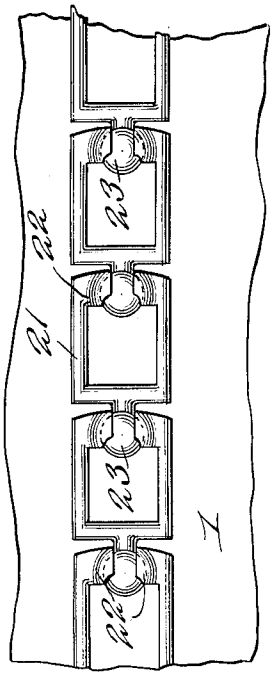
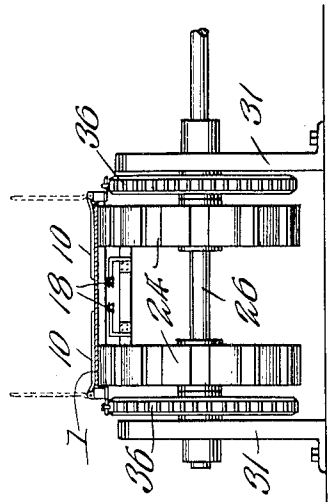


Fig. 5.



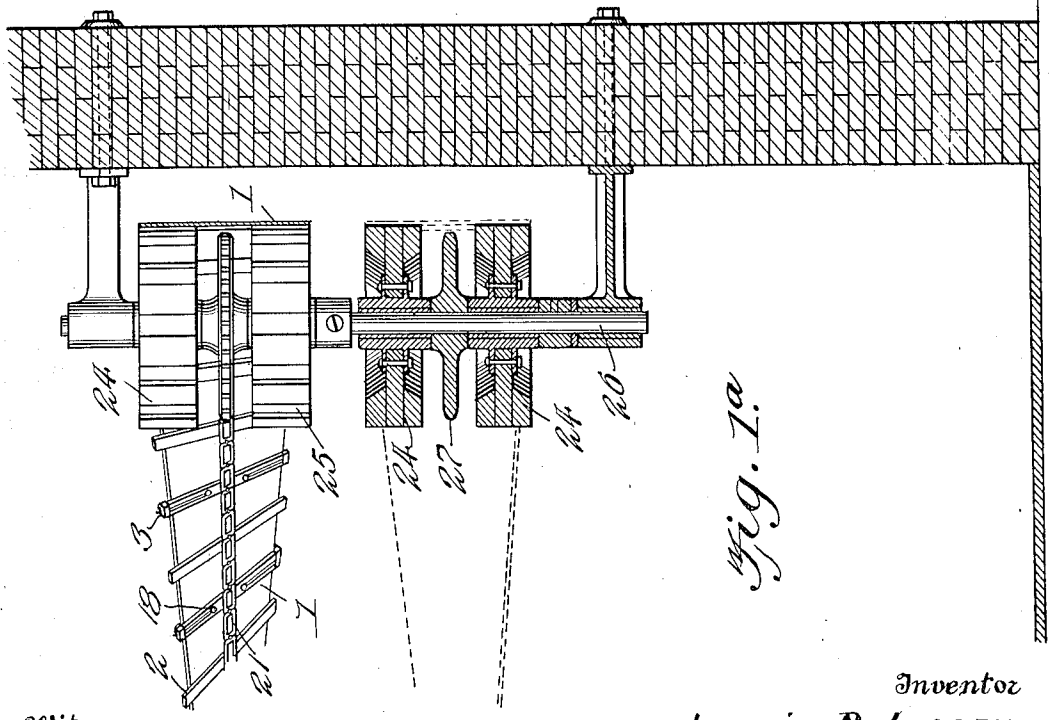


Fig. 1a.

Witnesses

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UNITED STATES PATENT OFFICE.

LUDWIG B. LARSEN, OF PORTLAND, OREGON, ASSIGNOR OF ONE-FOURTH TO L. W. CRONAN AND ONE-FOURTH TO J. D. O'DONNELL, OF PORTLAND, OREGON.

CARRIER.

No. 926,264. Specification of Letters Patent. Patented June 29, 1909.

Application filed October 26, 1908. Serial No. 459,616.

To all whom it may concern:

Be it known that I, LUDWIG B. LARSEN, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Carriers, of which the following is a specification.

The invention relates generally to an improvement in endless carriers, being more particularly directed to a carrier designed for the transportation of newspapers or the like from the press room to the delivery room or other remote point of deposit.

The main object of the present invention is the provision of a carrier designed to receive the newspapers directly from the press and constructed to automatically grip the papers as they are delivered to the carrier, whereby the papers remain fixed to the carrier during the travel of the latter from the receiving point to the delivery point.

Another object of the invention is the provision of gripping mechanism designed particularly for use with a flat flexible carrier, said mechanism being automatically actuated at the receiving point to provide for gripping the papers delivered to the carrier and similarly actuated at the delivery point to free the papers from connection with the carrier, the construction of the gripping mechanism permitting the travel of the carrier throughout any desired angular path, whereby the papers may be delivered from the press to any remote point, as for example to an upper floor or the like.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figures 1 and 1ª together constitute an elevation illustrating the construction and application of the improvement. Fig. 2 is an enlarged transverse sectional view through the carrier, taken at the receiving point to illustrate the position and operation of the tripping arms. Fig. 3 is a plan of the same. Fig. 4 is a bottom plan of a portion of the carrier showing the drive chains therefor. Fig. 5 is a sectional view, partly in elevation, showing a modified form of drive chains for the carrier. Fig. 6 is an enlarged plan showing the modified form of drive chains as applied to the carrier.

Referring particularly to the accompanying drawing, wherein is illustrated the preferred form of details, the improved carrier comprises an endless length of flexible material, preferably of textile fabric, as canvas or the like. This element, which will be hereinafter termed the conveying belt 1, is to be of an appropriate length and width for the purpose desired, and is braced in transverse extended or flat condition by cleats 2, which are secured across the belt at appropriate intervals on the normally lower surface. The cleats 2 tend to materially strengthen and stiffen the belt proper, and, as will presently appear, are designed to practically sustain the wear on the belt incident to its travel, thereby permitting the use of a comparatively light fabric for the belt.

Intermediate each of the adjacent cleats 2 is arranged what is termed the gripping mechanism, as illustrated more particularly in Figs. 2 and 3. This mechanism includes a strip 3 secured transverse the belt and corresponding in length and sectional dimensions to that of the cleats 2. Each strip is formed with a pair of longitudinally alined channels 4, which, at their outer ends, open through the ends of the strip and at their inner ends terminate adjacent the central point of the strip. These channels, which open through the lower or free surface of the strip are normally closed by a metallic plate 5, which, for convenience, may extend throughout the full length of the strip, whereby a housing is formed in each end of the strip.

Secured upon each end of the strip 3, immediately adjacent the side edge of the belt, is a socket member 6, which on the upper edge is provided with upwardly extending spaced ears 7, in which is mounted a pivot pin 8. Journaled upon each pivot pin is a gripping arm 9, preferably constructed of a single length of wire, bent intermediate its ends to form an approximately circular bearing portion 10 designed to overlie and bear upon the operative surface of the belt. Beyond the bearing portion the material of the arm is projected in approximately parallel lengths, as at 11, and bent to provide eyes 12 to encircle the pivot pin, beyond which eyes the material is extended down-

ward in loop form, as at 13, said loop being at approximately right angles to the plane of the remainder of the gripping arm and terminating in alinement with the open end of the housing 4.

In each housing there is mounted a pull rod 14, which at the outer or free end is formed into an eye 15 to loosely engage the loop end 13 of the bearing arm. The pull rod is of materially less length than the length of the housing 4 and at its relatively inner end is bent laterally or downwardly, as at 16, to provide a depending stud portion adapted to project through an elongated slot 17 formed in the closing plate 5. On the stud 16 beyond the plate 5 there is mounted an idler pulley 18 which, from the arrangement described operates in a plane parallel to that of the strip 3. The pulley 18 is preferably circumferentially grooved for more effective engagement with the tripper, as will presently appear. Within each housing and encircling the pull rod 14 there is arranged a coil spring 19, bearing at its respective ends against appropriate stops 20, said spring being tensioned to normally position the pull rod at its limit of outward movement and thereby hold the bearing portion of the gripping arm into close contact with the upper or operative surface of the belt.

From the arrangement described it is obvious that with the parts in normal position the gripping arms will lie in close contact with the upper surface of the belt, but that said arms may be elevated at any desired point in the travel of the belt by exerting relatively inward pressure on the rollers 18, the elevation of the gripping arms being by such operation against the tension of the springs 19.

In connection with the construction described there is to be provided a means for feeding or imparting travel to the belt, and while there is shown a preferred means for accomplishing this result, it is to be understood that such is illustrated and described to complete the structure only, and that such particular means is not in the detail described an essential part of the present invention. Referring then to Fig. 4, it will be noted that the belt 1 is provided throughout its longitudinal center with the belt carrying element of the driving means, which means comprises a series of duplicate chain links 21 each of which is provided at one end with a ball extension 22 and at the opposite end with a ball socket 23, the extension of each link being fitted in the socket of the next adjacent link, thus connecting the links in endless chain formation with comparative free independent movement of each link.

The supporting and driving means for the belt include spaced rollers 24, preferably of wood or the like and peripherally formed with a series of transverse grooves 25 so arranged as to receive the bracing cleats 2 and strips 3 in the travel of the belt about the rollers. The pair of rollers are mounted upon a single shaft 26 and are so spaced as to engage the cleats and strips adjacent the side edges of the belt, and intermediate the rollers on the shaft there is fixed for simultaneous operation with the rollers an ordinary sprocket wheel 27, which wheel is so arranged that the teeth thereof will engage the respective links 21 and so impart a forward movement to the belt. To accommodate the teeth the chain element carried by the belt is secured in place by clip members 28 secured to the central portions of the cleats and strips and embracing the side bars of the particular links. By this means the links are supported in spaced relation to the proximate surface of the belt and the necessary space afforded for proper operation of the sprocket teeth.

The carrier described is primarily designed for the transportation of newspapers, and for this purpose one of the end supporting series of rollers will be located immediately adjacent the delivery chute 29 from the press. Coöperating with the supporting rollers at the receiving end of the carrier is arranged tripping arms 30, comprising metallic strips secured at one end upon a fixture, as 31, rising from a suitable support and carrying at their upper ends inwardly extending plates 32 projected in parallel relation to the plane of travel of the belt and in close proximity to the same beneath and in advance of the end of the delivery chute. The relatively inner edges of the plates 32 are preferably formed to fit snugly in the grooves of the pulleys 18, and said edges project at an angle to the normal plane of travel of said pulleys, that is the relatively rear end of the engaging edge is so spaced from the longitudinal center of the belt as to engage the outer portion of the coöperating pulley, from which point the engaging edge gradually approaches the longitudinal center of the belt until at the forward end it is at its maximum inward projection.

As the belt travels over the rollers at the receiving point the pulleys 18 will engage the edges of the opposing tripping arms and by the travel along said edges will be forced inward toward the longitudinal center of the belt. The pull rods are thus operated to draw inwardly upon the loops 13 of the gripping arms with the effect to elevate the gripping portions of said arms from the surface of the belt. The tripping arms are so arranged that they will operate to elevate the gripping members while the latter are traveling beneath the free ends of the delivery chute 29, so that the papers pass-

ing down said chute are free to fall upon the surface of the belt while the gripping arms are in elevated position. As soon as the pulleys 18 ride off the tripping arms, the springs 19 operate to return the gripping members to clamping relation with the belt, thereby causing said members to close down upon the papers delivered upon the belt and for all purposes secure the papers against accidental displacement.

It is, of course, to be understood that at the delivery end of the carrier, wherever the same may be located a similar pair of tripping arms are to be arranged, whereby each of the gripping members, when reaching said delivery point will be operated to release the papers and permit the same to fall from the belt into a convenient chute or receptacle.

In Figs. 5 and 6 there is shown a slightly modified form of belt operating means in which, instead of a central guiding mechanism, the cleats and strips of the belt are each provided at their ends with chain elements 33, made up of links of approximately rectangular form each provided at one end with a lip 34 to engage the cross bar of the adjacent link. The chain elements in this form are secured to the socket pieces 6 of the strips 3 and to the cleats by providing the particular links adjacent such parts with laterally extending plates 35 to be secured by screws or other fastenings. By this means the chain elements project beyond the side edges of and in a plane below the belt. Coöperating with the chain elements in this form the shaft 26, carrying the guide rollers 24, is provided beyond each of said rollers with a sprocket wheel 36 to coöperate with the respective chain elements and positively drive the belt at both side edges.

Adjacent the receiving end of the belt I arrange a pressure roller 37 having a smooth periphery to bear upon the gripping members and compel an operative gripping action thereof.

The salient feature of the present invention resides in the entire flexibility of the belt and the automatic and positive gripping of the papers throughout the operative travel of the belt. By reason of this construction the belt may be given any desired angular position between the receiving and delivery points, so that it may be directed from the receiving point through a practically tortuous path of travel to the delivery point. With this carrier in use there is no necessity for locating the delivery and mailing rooms of the newspaper office close to the press room, though with devices as at present used these points must necessarily be located together and in nearly all instances on the same floor.

With the improvement described the belt after receiving the papers may be located over head and directed to any point for delivery.

Having thus described the invention what is claimed as new, is:—

1. A carrier comprising a flexible belt, brace strips arranged transverse the belt, means for operating the belt, and supporting rollers for the belt, said rollers being formed with peripheral grooves to receive the brace strips in the travel of the belt, the brace strips extending beyond the supporting rollers, and gripping means carried by the extended ends of the strips.

2. A carrier comprising a flexible belt, brace strips arranged transverse and beneath the belt, gripping means supported by said strips, and means carried within the strips for operating the gripping means.

3. A carrier comprising a flexible belt, a brace strip arranged transverse the belt, a gripper arm mounted on each end of the brace strip and overlying the belt, and means carried within said strip for operating the arms.

4. A carrier comprising a flexible belt, brace strips arranged transverse the belt, and a gripping means carried by each brace strip, said means comprising gripping arms pivotally supported on the strip, and a pull rod connected with each arm and mounted for movement in the strip.

5. A carrier comprising a flexible belt, brace strips arranged transverse the belt, and a gripping means carried by each brace strip, said means comprising duplicate gripping arms mounted respectively at the ends of the strip, and a pull rod connected with each arm and mounted for movement in the strip.

6. A carrier comprising a flexible belt, brace strips arranged transverse the belt, and a gripping means carried by each brace strip, said means comprising duplicate gripping arms mounted respectively at the ends of the strip, a pull rod connected with each arm and mounted for movement in the strip, and a spring engaging each pull rod to normally maintain the gripping arms in gripping relation to the belt.

7. A carrier comprising a flexible belt, brace strip arranged transverse the belt, a gripping arm pivotally mounted at one end of the brace strip, a pull rod connected with the arm and housed within the strip, a stud depending from the inner end of said rod, and a pulley carried by said stud.

8. A carrier comprising a flexible belt, brace strips arranged transverse the belt, gripping arms carried by each brace strip, operating means for said arm including pulleys arranged below the strip, supporting rolls for the belt, and means arranged

adjacent the supporting rolls to engage the pulleys for operating the gripping arms.

9. A carrier comprising a flexible belt, brace strips arranged transverse the belt, gripping arms carried by said strips, operating rods connected to the arms and adapted to hold said arms in operative relation to the belt, and means arranged at determinate points in the path of travel of the belt to engage and actuate the rods to move the arms to inoperative position.

10. A carrier comprising a flexible belt, brace strips arranged transverse the belt, a gripping arm pivotally mounted at one end of the brace strip, a pull rod connected with the arm and housed within the strip, a stud depending from the inner end of said rod, a pulley carried by said stud, and a drive chain carried by the brace strips wholly below the flexible belt.

11. A carrier comprising a flexible belt, brace strips secured to the under surface of the belt and projecting beyond the side edges thereof, and gripping means pivotally connected with the projecting ends of the brace strips, and means disposed longitudinally of and within the brace strips to normally maintain the gripping means in operative position.

12. A carrier comprising a flexible belt, brace strips arranged transversely of and projecting beyond the edges of the belt, gripping means carried by the projecting edges of the strips and coöperating with the upper surface of the belt, and means carried within the strips for maintaining the gripping means in gripping position relative to the belt.

13. A carrier comprising an endless belt, means for supporting the belt in travel, gripping arms carried by the belt and cooperating with the upper surface thereof, trips arranged adjacent the receiving end of the belt for operating the gripping arms to move them to inoperative position, and means arranged adjacent the receiving end of the belt to bear upon the gripping arms when the latter are in different positions.

14. A carrier comprising a flexible belt, gripping arms carried thereby, pull rods supported below the belt and connected with the gripping arms, means carried by the belt for moving the pull rods transversely of the belt in one direction, and trips fixed in the path of travel of the belt for actuating the pull rods in the opposite direction.

15. A carrier comprising a flexible belt, gripping arms carried thereby, a pull rod supported below the belt and connected with each gripping arm, means carried by the belt for moving the pull rods to force the gripping arms into gripping coöperation with the surface of the belt, and trips arranged in the path of travel of the belt for actuating the pull rods transversely of the belt and toward each other to force the gripping arms to inoperative position relative to the surface of the belt.

16. A carrier comprising a flexible belt, brace strips arranged transversely thereof, a gripping arm pivotally connected to each end of the brace strip, means mounted in the brace strip for operating each of said arms, said means projecting below the lower surface of the brace strip, and tripping means fixed in the path of the travel of the belt to engage the projected portions of the operating means.

17. A carrier comprising a flexible belt, means for operating the belt, brace strips arranged transverse the belt, gripping means carried by the strips, and means within the strips to maintain the gripping means in gripping position.

18. A carrier comprising a flexible belt, means for operating the belt, gripping arms carried by the belt, pull rods carried by the belt and connected with said arms, said rods being normally operative to hold the gripping arms in gripping relation to the belt, and means arranged in the path of travel of the belt for bearing directly upon the gripping arm to supplement the gripping action thereof.

19. A carrier comprising a flexible belt, means for operating the belt, gripping means carried by the belt, means beneath the belt for maintaining the gripping means in gripping position, and a pressure roller for supplementing the action of the gripping means.

In testimony whereof, I affix my signature in presence of two witnesses.

LUDWIG B. LARSEN.

Witnesses:
J. D. O'Donnell,
L. W. Cronan.