C. D. SEEBERGER.

CONVEYER.

APPLICATION FILED JAN. 4, 1905. RENEWED MAR. 9, 1910.

972,475. **Patented Oct. 11, 1910.**

2 SHEETS—SHEET 1.

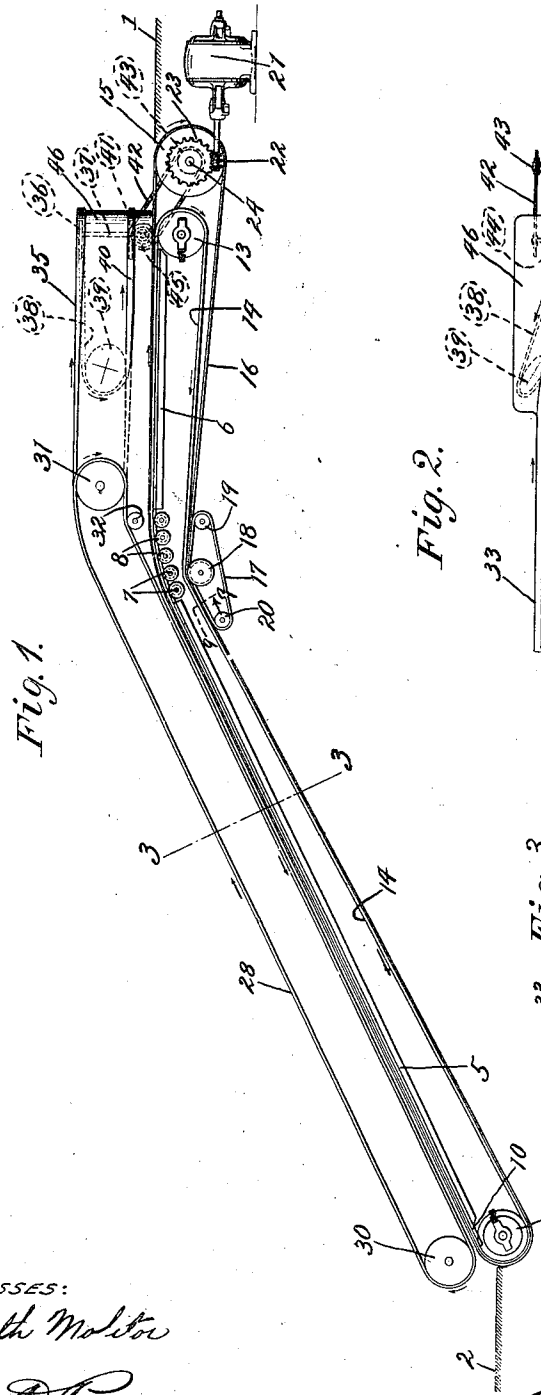

Fig. 1.

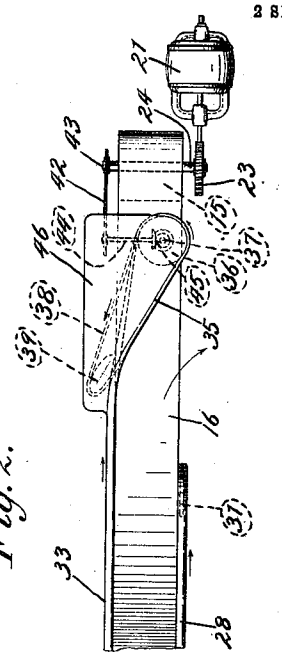

Fig. 2.

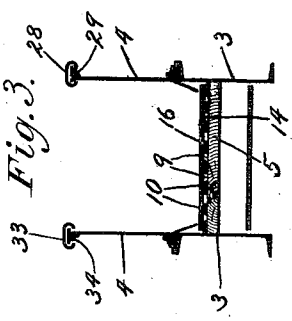

Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

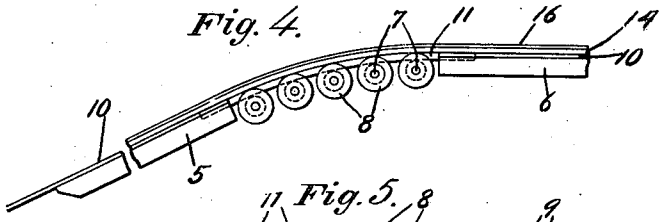


Fig. 5.

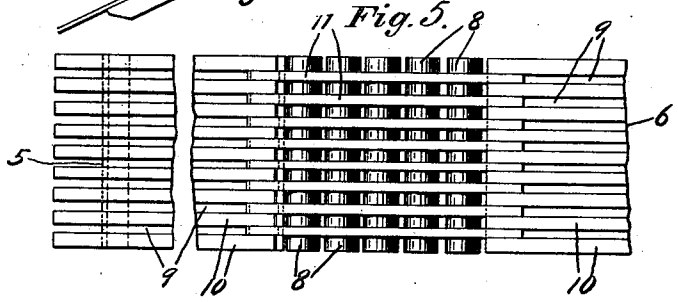


Fig. 6.

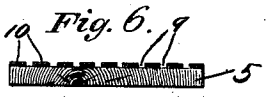


Fig. 7.

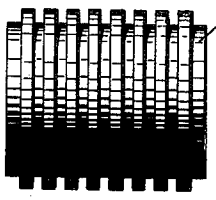


Fig. 8.

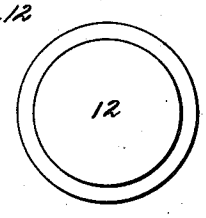


Fig. 9.

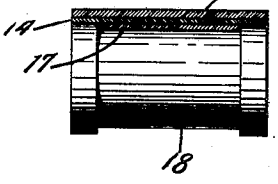


Fig. 10.

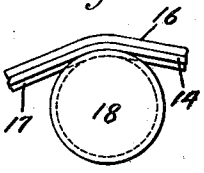


Fig. 11.

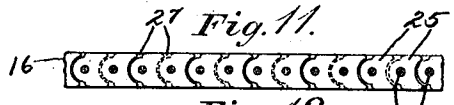
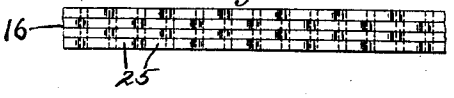


Fig. 12.



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UNITED STATES PATENT OFFICE.

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CONVEYER.

972,475. Specification of Letters Patent. Patented Oct. 11, 1910.

Application filed January 4, 1905, Serial No. 239,592. Renewed March 9, 1910. Serial No. 548,284.

To all whom it may concern:

Be it known that I, CHARLES D. SEEBERGER, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Conveyers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an endless conveyer or carrier designed to transport passengers or freight from one point to another, and in the form shown from one level to another.

The objects and advantages of the invention will be clearly understood from the accompanying specification in which the construction and arrangement are fully set forth.

The invention consists of the combinations, arrangements, and organizations of parts hereinafter particularly described and then pointed out in the appended claims.

Referring to the drawings—Figure 1 is a side elevation, diagrammatic in character, illustrating an embodiment of the present invention; Fig. 2 is a plan view of the upper portion of Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a side elevation on an enlarged scale showing the inclined and horizontal platforms at the upper end and the rollers for supporting the conveyer at the point where it is deflected from the inclined to the horizontal platform, portions of the platforms being broken away to facilitate illustration; Fig. 5 is a plan view of the construction shown in Fig. 4; Fig. 6 is a transverse section of the platform; Fig. 7 is a detail side view of the grooved pulley carrying the conveyer at the lower end of the incline; Fig. 8 is an end elevation of such pulley; Fig. 9 is a section on the line 9—9 of Fig. 1; Fig. 10 is a side elevation of the parts illustrated in Fig. 9; Fig. 11 is a detail side elevation of the carrying surface of the conveyer; and Fig. 12 is a fragmentary plan view thereof.

Referring to Fig. 1, the numerals 1 and 2 indicate respectively the upper and lower levels between which the goods or passengers are to be transported by the conveyer. A suitable frame work 3 is mounted between the levels to support the conveyer and is provided on each side with a balustrade 4 of any suitable construction. A platform 5 is secured in any suitable manner to the frame work 3, being arranged at an incline and extending from near the lower level and terminating at its upper end slightly below the plane of the upper level, as shown in Fig. 1. At the upper end of the conveyer, a suitable distance below the plane of the upper level 1, is a horizontal platform 6. A series of transverse shafts 7 is located between the adjacent ends of the platforms 5 and 6 in the angle between such platforms, and rollers 8 are mounted on these shafts. As shown in Figs. 1 and 4, the shafts 7 are so disposed that the upper faces of the rollers 8 are in a curved line gradually deflecting the line of the upper surface of one platform into that of the other platform, thereby avoiding an angle at this point. It is obvious that instead of employing the rollers 8 either platform may be continued and gradually curved or deflected to the other.

The platforms 5 and 6 have their upper surfaces grooved longitudinally, as at 9, as shown in Figs. 3 and 6, such grooves being provided by strips 10. While I have shown the strips 10 as being separate pieces attached to the platforms it is obvious that the same result may be secured by making such platforms and strips integral. The strips 10 are preferably made of metal so as to reduce friction and wear. The grooves 9 are designed to contain a suitable lubricant for a purpose hereinafter mentioned. As shown in Figs. 4 and 5, the rollers 8 are provided with circumferential grooves which are in alinement with the grooves 9. Filler strips 11 are located in the grooves of the rollers 8 and the ends thereof break joints with the strips 10 of the platforms 5 and 6, and have their upper faces flush with the strips. The upper faces of the rollers 8 are also flush with the upper faces of the filler strips 11, so that the filler strips and rollers form a curved bridge for the space between the platforms 5 and 6. By means of the construction described, the platforms 5 and 6 with the rollers 8 and filler strips 11 form a continuous support or base practically conforming to the planes of travel of the conveyer throughout its transporting run or portion.

At the lower end of the inclined platform 5 is located a transverse pulley 12 while at the remote end of the horizontal platform 6 is located another pulley 13. These pulleys may be supported in any suitable manner,

and preferably are spring-controlled, as shown in Fig. 1, whereby the belt traveling over the pulleys is automatically tightened. The pulley 12 is grooved circumferentially, as shown in Figs. 1, 7 and 8, and so positioned that the ends of the strips 10 extending beyond the lower end of the platform 5, as shown in Fig. 4, enter the grooves as shown in Fig. 1 and bridge the space between the adjacent end of the platform 5 and the pulley 12. An endless belt 14, which may be of any suitable character, is adapted to the pulleys 12 and 13 and travels at its upper stretch along the support or base. A driving pulley 15 is located beyond the end of the belt 14, as at the upper end of the conveyer, and passing around the pulleys 12 and 15 and inclosing the belt 14 is a second endless belt 16. As shown in Fig. 1, the belt 14 at its upper stretch is interposed between the upper stretch of the belt 16 and the support or base. The belt 16 constitutes the carrying surface of the conveyer and its transporting run or portion rests on the belt 14, which is supplemental thereto and serves to reduce to a minimum the friction between the carrying belt and the support or base. Inasmuch as the supplemental belt 14 is driven by the belt 16, it is obvious that these belts travel at the same speed.

In order to prevent sagging of the under stretch of the belts 14 and 16 and to maintain their under or return stretches in frictional engagement, an auxiliary supporting belt 17 carried by suitable transverse idle pulleys 18, 19 and 20 is located at a suitable point, preferably at the head of the incline. The idler 18 is mounted preferably under and close to the rollers 8 while the idlers 19 and 20 are spaced from and carry the belt 17 at opposite sides of the idler 18 and in angular relation to the return stretch of the conveyer. By disposing the auxiliary belt 17 close to the rollers 8 space is economized and at the same time the carrying belt 16, which is also the driving belt, is held closely in contact with the supplemental belt 14 practically throughout its length so as to increase the area of contact of the belts. As shown in Figs. 9 and 10, the idle pulley 18 is provided with a circumferential groove substantially the width of the auxiliary belt 17 which is seated in such groove to prevent lateral slippage thereof. The idle pulleys 19 and 20 may be similarly grooved.

Motion may be communicated to the conveyer in any suitable manner, as by means of a motor 21 whose shaft is provided with a worm 22 meshing with a worm-wheel 23 fixed on the shaft 24 of the driving pulley 15, as shown in Figs. 1 and 2.

By reason of the construction described the supplemental belt is kept thoroughly lubricated by the lubricant in the grooves of the platforms, being therefore practically frictionless and minimizing the friction between the carrying belt and the support or base. By extending the lower ends of the strips 10 on the inclined platform 5 into the grooves of the pulley 12 and providing the filler strips 11 connecting the adjacent ends of the platforms 5 and 6, the carrying surface is prevented from sagging at any point of its transporting portion or run. The arrangement is such that the upper surface of the carrying belt 16 while moving over the platform 6 forms a landing flush with the upper level 1.

While the carrying belt 16 may be of any suitable character, a belt composed of sections is preferably employed, such as that illustrated in Figs. 11 and 12. As there shown the belt consists of similarly shaped sections 25, preferably made of leather and connected in staggered arrangement transversely by pivot pins 26. The shape of the sections as shown reduces the openings 27 between them to a minimum so as not to offer lodgment to umbrellas, etc. The sectional arrangement of belt shown provides a carrying surface capable of carrying heavy loads, and as the sections 25 are arranged on end and pivotally connected the belt is readily deflected at the proper points and passes around the pulleys without danger of disintegrating or breaking as would be the result were an integral belt made of leather or similar material of the necessary thickness employed. These sections may be roughened or corrugated on their upper surface.

At each side of the conveyer a traveling hand rail may be employed. On one side of the conveyer a hand rail in the form of an endless belt 28 is adapted to a guide 29 carried by the balustrade at that side of the conveyer and passes over the pulleys 30 and 31 located near the top and bottom of the incline, an idler 32 located near the top of the incline serving to properly deflect the return stretch. Either of the pulleys 30 and 31 or both of them may be driven by any suitable driving connections so that the upper stretch travels in the same direction as the conveyer and of course preferably at the same speed. The hand rail 33 at the opposite side of the conveyer moves along the incline on the guide 34 and at the upper end of the incline runs over a curved surface to change its direction to horizontal and is arranged at its upper end to provide a shunt or barrier. For this purpose at the upper end the rail 33 is carried as at 35 across the conveyer, as at the landing portion thereof, and makes a loop around a horizontal pulley 36 fixed on the upper end of a vertical shaft 37 at the opposite side of the conveyer. It then passes in a stretch as at 38 to and around an idle pulley 39 which is set at an angle as shown diagrammatically in Figs. 1 and 2

at a point adjacent to where the upper stretch 35 of the hand rail is deflected across the conveyer and in such position that it delivers the rail in substantially the vertical plane of the stretch 35. The rail passes from the idler 39 in a lower stretch 40 across the conveyer to a pulley 41 fixed on the shaft 37 below the pulley 36, and thence making a half loop around said pulley passes to a pulley (not shown) associated therewith and which may be suitably located, as at the lower end of the incline. By this arrangement the hand rail provides a shunt or barrier at the upper end of the conveyer, the upper and lower stretches 35 and 40, respectively, traveling in the same direction across the line of movement of the conveyer and in the same vertical plane, so that the load will be delivered upon a side landing portion of the upper level. The hand rail 33 may be driven from the driving pulley of the conveyer as by means of a sprocket chain 42 connecting a sprocket wheel 43 on the shaft of the driving pulley and one end of a horizontal shaft 44 the other end of which communicates motion to the vertical shaft 37 by means of bevel gearing 45.

When the conveyer is employed for passenger transportation the shunt or barrier preferably is formed by the traveling hand rail in the manner described; however it is obvious that when the conveyer is employed for freight no hand rail is necessary, and in such case the shunt or barrier is formed by an endless belt which does not of necessity extend in any direction other than across the conveyer. The lower stretch of the shunt may be arranged as close to the conveyer as circumstances require so as to insure the discharge of small pieces of freight. Of course, in any case the shunt may extend more or less across the conveyer, and at any suitable angle.

It is obvious that while the pulley 13 is shown idle it may be driven from the drive pulley 15 or other suitable source of power.

A suitable housing, such as 46, may be provided for inclosing the portions of the hand rail 33 and the mechanism driving the same located beyond the shunt or barrier.

While the conveyer has been described as having its transporting portion or run moving upwardly or ascending, it is obvious that it may be driven in the opposite direction so as to carry passengers or freight in the opposite direction or from an upper to a lower level. It is further obvious that the conveyer may be employed to transport in either direction between points on the same level.

While the grooves are described as longitudinal of the supports it is obvious that their direction and shape may be altered; for example, they may be made sinuous whereby they would subserve the added function of supporting the belt under the foot of the passenger at practically all points.

Having described my invention, I claim:

1. In a conveyer, a support or base composed of angularly disposed platforms and an intermediate curved bridge, and a carrier traveling over the support and bridge.

2. In a conveyer, a support composed of an inclined platform, a horizontal platform, and intermediate rotary and stationary members, and a carrier moving over the support.

3. In a conveyer, a support or base composed of an inclined and a horizontal platform spaced apart and rollers bridging the space, and an endless carrying surface traveling over the support.

4. A conveyer consisting of an endless belt, and a support therefor comprising angularly disposed platforms and rollers bridging the angle and gradually deflecting the line of one platform into that of the other.

5. A conveyer consisting of an endless belt, and a support therefor comprising angularly disposed platforms, and rollers bridging the angle and gradually deflecting the belt from one platform to the other.

6. A conveyer consisting of an endless belt, and a support therefor comprising angularly disposed platforms, grooved rollers bridging the angle and gradually deflecting the belt from one platform to the other, and filler strips connecting the platforms and located in the grooves.

7. A conveyer consisting of an endless belt, and a support therefor comprising an inclined and a horizontal platform having grooves on the upper surfaces thereof, grooved rollers bridging the angles between the platforms and gradually deflecting the line of one platform into that of the other, and filler strips connecting the platforms and located in the grooves of the pulleys and breaking joints with the strips of the platforms.

8. A conveyer consisting of an endless belt, and a support therefor comprising an inclined and a horizontal platform, grooved rollers bridging the angle between the platforms and so curved as to gradually continue the line of the surface of one platform into that of the other, and filler strips connecting the platforms and located in the grooves with the faces thereof flush with the faces of the rollers.

9. A conveyer consisting of an endless belt, and a support therefor comprising an inclined and a horizontal platform having longitudinal strips providing grooves on the upper surfaces thereof, grooved rollers bridging the angle between the platforms and gradually deflecting the line of one platform into that of the other, and filler strips connecting the platforms and located

in the grooves of the pulleys and breaking joints with the strips of the platforms.

10. In a device of the class described, a stationary support having a straight frictionless bearing surface, an endless carrying surface moving over the bearing surface, and means to drive the carrying surface.

11. In a conveyer, a stationary support, an endless carrier, and a friction reducing surface interposed between the carrier and support.

12. In a conveyer, a platform, a continuous carrying surface, and an interposed friction reducing surface.

13. In a conveyer, a platform, a continuous carrying surface, and an interposed surface in frictionless contact with said platform.

14. In a conveyer, a lubricated platform, a carrying belt, a supplemental belt within the carrying belt and having its upper stretch interposed between the platform and the carrying belt.

15. In a conveyer, a platform, a carrying belt, a supplemental belt within and driven by the carrying belt and having its upper stretch interposed between the platform and the carrying belt, and means for driving the carrying belt.

16. In a conveyer, a platform having grooves adapted to contain lubricant, an endless carrying surface, a supplemental belt within the carrying surface and having its upper stretch between the carrying surface and the grooved platform.

17. In a conveyer, a platform having a longitudinally grooved surface, a driven carrying belt, and a supplemental belt within the carrying belt and having its upper stretch between the carrying belt and the grooved platform and driven by the carrying belt.

18. In a conveyer, a platform, a pair of belts one of which constitutes the carrying surface while the other is interposed at its upper stretch between the carrying surface and the platform, and means for keeping the return stretches of the belts in frictional contact.

19. In a conveyer, a support comprising angularly disposed platforms, a pair of belts one of which constitutes the carrying surface while the other is interposed at its upper stretch between the carrying surface and the platform, and means located under the platform for deflecting the return stretches of the belts and keeping the same in frictional contact.

20. In a conveyer, a support comprising angularly disposed platforms and rollers bridging the angle between the platforms, a pair of endless belts one of which constitutes the carrying belt while the other is located within the carrying belt and is interposed at its upper stretch between the carrying belt and the platform, and an auxiliary belt under the rollers and so disposed as to deflect the return stretches of the belts and maintain them in frictional contact.

21. In a conveyer, the combination of a carrying surface, a traveling hand rail and landing at the side.

22. In a conveyer, the combination of a carrying surface, and a traveling hand rail crossing the carrying surface.

23. In a conveyer, the combination of a carrying surface composed of a continuous flexible belt, a traveling hand rail and landing at the side.

24. In a conveyer, the combination of a carrying surface composed of a continuous flexible belt, and a traveling hand rail crossing the belt.

25. In a conveyer, the combination of a carrying surface moving in different planes, a bearing surface conforming to said planes of travel, a traveling hand rail and a side landing.

26. In a conveyer, the combination of a carrier moving in different planes, a bearing surface conforming to said planes of travel, and a traveling hand rail crossing said carrier.

27. In a conveyer, the combination of a carrier moving in different planes, a corrugated bearing surface conforming to said planes, a traveling hand rail and a side landing.

28. In a conveyer, the combination of a carrier moving in different planes, a corrugated bearing surface conforming to said planes, and a traveling hand rail crossing said carrier.

29. In a conveyer, a traveling carrier, and a hand rail moving with said carrier and forming a shunt.

30. In a conveyer, a carrying surface, and a shunt having a plurality of runs moving in the same direction.

31. In a conveyer, a carrying surface, and a shunt consisting of an endless belt having a plurality of runs moving in the same direction and in substantially the same plane.

32. In a conveyer, a carrying surface, and a moving hand rail having a plurality of runs moving across the carrying surface.

33. In a conveyer, a carrying surface, and an endless moving hand rail having a plurality of runs moving in the same direction across the conveyer.

34. In a conveyer, a carrying surface, an endless moving hand rail, and rollers around which the hand rail is deflected to provide a plurality of runs moving in a common direction across the carrying surface.

35. In a conveyer, a carrying surface, an endless moving hand rail, a pair of horizontal rollers associated with the upper and lower stretches of the hand rail, and an angularly disposed roller over which the hand

rail passes from one of such rollers to the other to provide a plurality of runs moving in the same direction and plane across the carrying surface.

36. A conveyer belt consisting of sections in staggered relation, and pins pivotally connecting the sections.

37. A conveyer belt consisting of leather sections pivotally connected together and of such shape as to reduce to a minimum the openings between the sections.

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

CHARLES D. SEEBERGER.

Witnesses:
W. H. BRADY,
H. R. MARSDEN.