

April 14, 1931.

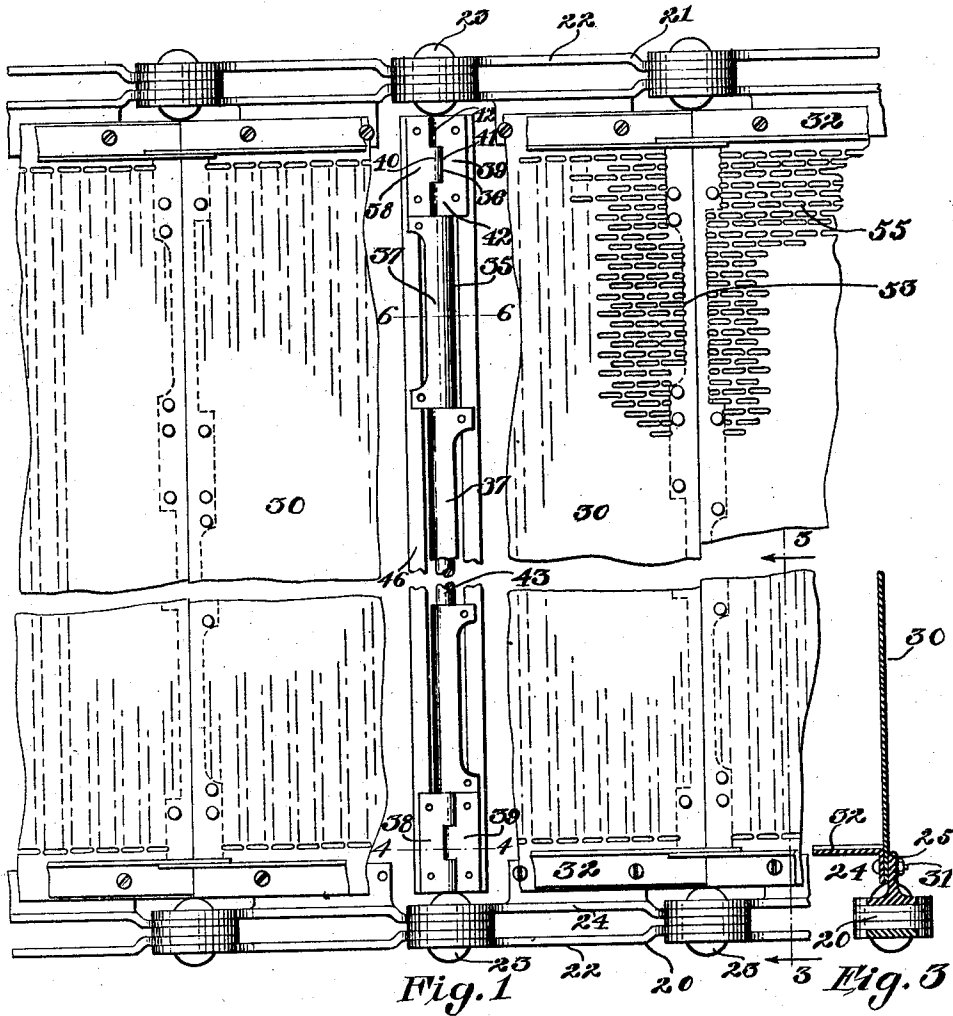
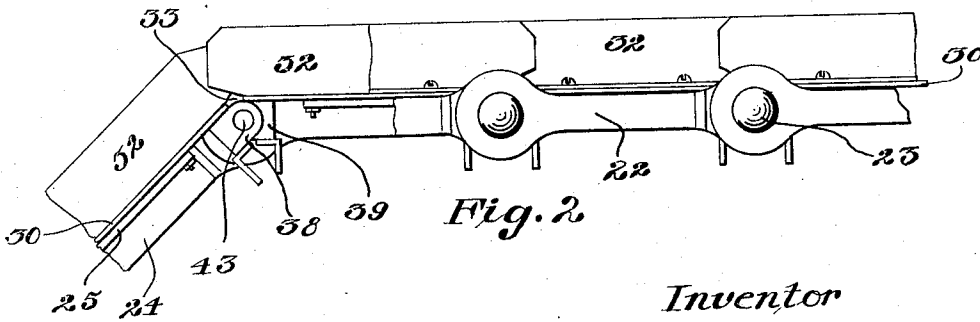
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1,800,432

CONVEYER

Filed Jan. 26, 1929

3 Sheets-Sheet 1



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April 14, 1931.

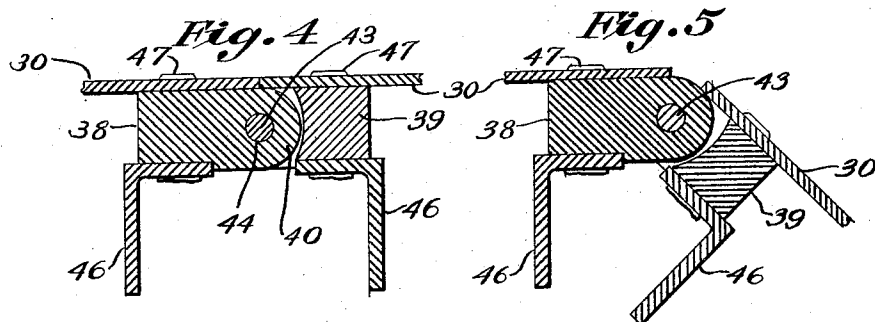
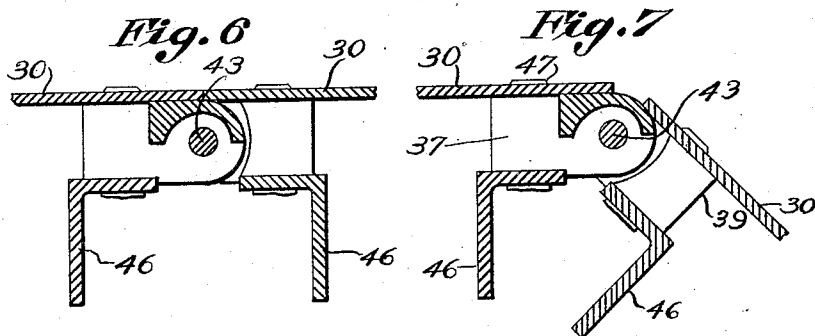
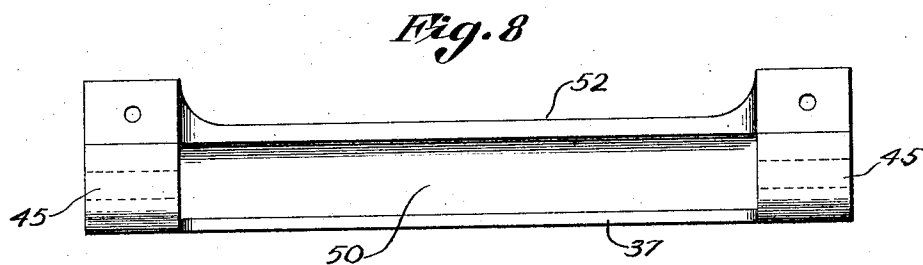
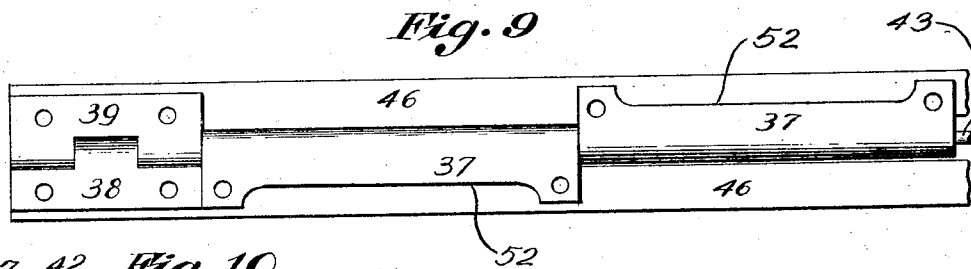
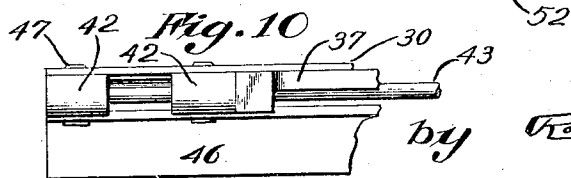
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1,800,432

CONVEYER

Filed Jan. 26, 1929

3 Sheets-Sheet 2



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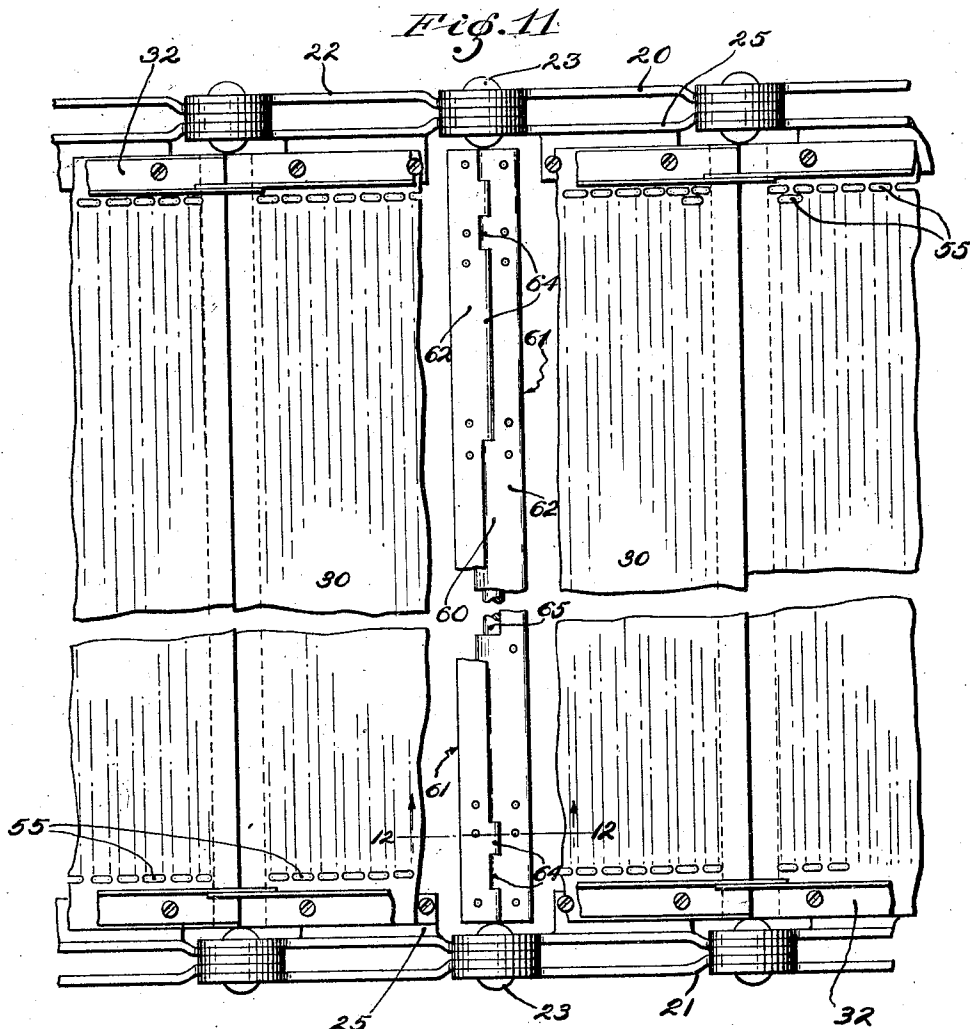
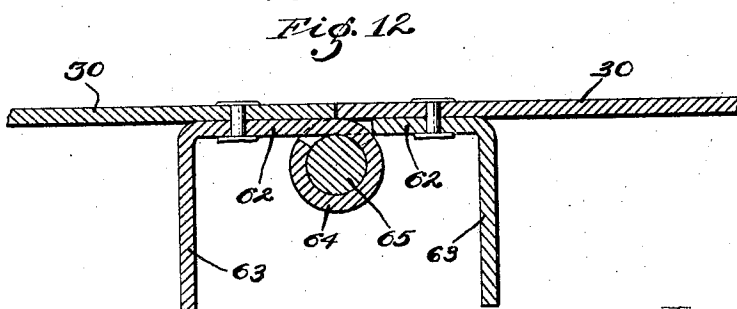
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1,800,432

CONVEYER

Filed Jan. 26, 1929

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CONVEYER

Application filed January 26, 1929. Serial No. 335,155.

The primary object of this invention is to provide a conveyer having an apron made up of a plurality of plates, which, when in alignment, abut at their edges and including means to prevent material from falling between the edges of the adjacent plates when not in alignment; more specifically to provide in a conveyer of the type mentioned a hinge assembly carried by the plates, independent of the chains on which the plates are supported, portions of the hinge units projecting beyond the edges of the plates and being curved in order that the plate edges shall be in contact with the hinge assembly under all conditions.

A further object of this invention is to provide a conveyer having a continuous sectional metal apron having a smooth upper or carrying surface adapted to convey loose material and from which any material having a tendency to stick can be quickly and easily removed by scraping.

Other objects of the invention reside in specific details of the invention pointed out in the specification and claims and shown in the accompanying drawings in which:

Fig. 1 is a plan view of a portion of a conveyer embodying one form of this invention, certain parts being broken away;

Fig. 2 is a side elevation of such a conveyer, parts being broken away in order to show the contact between an apron-plate and a hinge assembly when that plate is out of alignment with an adjacent plate;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1 and showing the jointer of one end of an apron-plate to the link of one of the conveyer chains;

Fig. 4 is an enlarged sectional view of an end hinge unit taken along the line 4—4 of Fig. 1 with the apron-plates in alignment;

Fig. 5 is a view similar to Fig. 4 with the apron-plates out of alignment when rounding a chain sprocket;

Fig. 6 is an enlarged sectional view of an intermediate hinge unit taken along the line 6—6 of Fig. 1 with the apron-plates in alignment;

Fig. 7 is a view similar to Fig. 6 with the apron-plates out of alignment when rounding a chain sprocket;

Fig. 8 is a front elevation of an intermediate hinge unit;

Fig. 9 is an enlarged plan view of one of the end hinge units and a portion of the adjacent intermediate hinge unit;

Fig. 10 is a front elevation of one lug of an end hinge unit and a portion of an adjacent intermediate hinge unit;

Fig. 11 is a plan view of a portion of a conveyer embodying another form of this invention, certain parts being broken away; and

Fig. 12 is a sectional view taken along the line 12—12 on Fig. 11.

The conveyer selected for illustration in the drawings comprises a work-carrying apron on a pair of parallel longitudinally extending chains 20, 21, each chain being made up of a plurality of links 22 connected by pins 23. The inner bar 24 of each link is provided with a bracket 25 which may be integral therewith as shown in the drawings. Apron-plates 30, which form the work-carrying apron, are supported by the brackets 25 and are secured thereto in any suitable manner, as for instance by bolts 31 (see Fig. 3). The length of each apron-plate 30 is coextensive with the distance between the centers of the pins 23, thus when the apron-plates are in alignment the edges of the adjacent plates abut (see Figs. 1, 4 and 6). Mounted upon each plate 30 at the sides thereof is a flanged guard 32 which may be secured in place by bolts 31.

During the travel of the conveyer around the chain sprockets the apron-plates shift out of alignment leaving spaces 33 between the edges of adjacent plates. When employed for carrying loose material, some of the material will fall through the spaces 33; and one object of this invention is to prevent such loss of material by providing a continuous apron. The apron-plates 30 are connected by a hinge assembly 35 which comprises a pair of end hinge units 36 and a plurality of intermediate hinge units 37 which extend between the end hinge units. Each end hinge unit includes a pair of interlocking lugs 38, 39, the lug 38 being here shown as provided with a tongue 40 which

extends into a recess 41 formed in the lug 39 by a pair of projections 42. A hinge pin 43 extends the length of the distance between the chains 20 and 21 passing through suitably formed bearing apertures 44, 45 in the end and intermediate hinge units respectively. The center line of the pin 43 coincides with the center line of the pins 23 so that the chains 20, 21 will maintain the same relation to the apron-plates 30 and hinge assemblies 35 throughout the travel of the conveyer.

One lug of each end hinge unit is secured to the under side of one apron-plate 30 while the other lug is secured to the under side of the adjacent apron-plate 30. The intermediate hinge units are secured alternately to the adjacent apron-plates 30 as shown in Fig. 1. In order to strengthen this hinge assembly there are provided a pair of iron angle bars 46 which are coextensive in width with the apron-plates 30. The hinge units are clamped between the bars 46 and the plates 30 by any suitable means, rivets 47 being shown in the drawings. The units 37 are preferably hollowed out on the under side to provide a recess 50 through which the hinge pin 43 passes without engagement, the bearing apertures 45 being provided in each end of the intermediate unit.

Conveyers of the type here shown have been used for carrying macerated reclaimed rubber through a dryer and are provided with a series of perforations through which the air can be forced through the mass during the travel of the apron through the dryer. In the present instance the plates 30 are shown provided with a series of perforations 55 which are provided over substantially the entire surface of the plate between the guards 32. The securing of the hinge assemblies to the plates, of course, prevents the extension of the perforations to the very edge of the plates. However, in order to make the perforations as extensive as possible, over the bed of the conveyer, each intermediate unit 37 is provided with a recess 52 at the edge which is secured to the plate. Thus, as shown particularly at 53 in Fig. 1, the perforations 55 can be extended almost to the edge of the plate.

The portions of the end lugs 40 and 42 and the unit 37 which extend beyond the edges of the plates are curved, being here shown as struck on an arc with a radius equal to the distance from the center of the hinge pin 54 to the under side of the apron-plate 30, so that when the conveyer is flexed as in passing around a sprocket and the apron-plates are thrown out of alignment, the under edges of the apron-plates remain in contact with the curved surfaces of the hinge units. The spaces 33 are thus closed by the hinge assemblies 35 so that the material can not escape between the edges of the plates.

Figs. 11 and 12 illustrate another form of conveyer which differs from that previously described in the construction of the hinged means by which the apron plates are joined. The parts common to both embodiments are designated by like reference characters and obviously need not be described in detail.

The apron-plates 30 are here shown connected by a hinge assembly 60 which comprises a pair of interlocking units 61. Each unit 61 is here shown as consisting of an elongated strip 62 provided with a flange 63 along one edge and a series of spaced projecting loops 64 along the other edge. The loops 64 of each unit are so arranged that when assembled with another unit the loops 64 of each unit will enter and fill the spaces between the loops 64 of any other unit. The loops 64, when a pair of units 61 are assembled, form a continuous pocket extending across the conveyer from one side to the other which receives a hinge pin 65. The center line of each hinge pin 65 should coincide with the center lines of the pins 23 at each end thereof, so that the relation of the chains to the apron-plates will not change during the travel of the conveyer.

The units are secured to the apron-plates 30 by rivets or similar means, and the perforations in the plates extend to the edges of the units. The surfaces of the loops 64 are curved preferably upon the arc of a circle having its center at the center of the hinge pin 65. As a result, when the conveyer is flexed the under edge of each apron plate remains in contact with the surfaces of the loops carried by the adjoining plate. Moreover, the loops 64 of each unit are so formed that they fill the spaces between the loops 64 of the unit with which it is interlocked. Hence the spaces 33 between the edges of the adjacent plates are closed by the assemblies 60 so that no material can escape from between the plates during the travel of the conveyer.

It will be noted that in both embodiments the hinge assemblies which connect the abutting edges of the plates extend entirely across them and support and stiffen the edges thereof. Thus any tendency of the edges to leave their normal position is prevented so that after flexing they will return to exact alignment and hence will form a continuous metal apron as distinguished from the usual type of metal apron in which the plates are spaced an appreciable distance apart and hence are not applicable for conveying granular or fluid material as is a conveyer embodying this invention.

Moreover, reclaimed rubber has a tendency to stick to the plates of a conveyer and can only be removed by vigorous scraping. A conveyer embodying this invention presents a smooth carrying surface and thus permits

such treatment, there being no pockets or recesses on the surface in which the rubber can collect and from which it can be removed only with great difficulty.

5 The conveyer particularly set forth herein has many uses other than that mentioned above. The perforations 55 in the apron adapt the conveyer for carrying moist material not only through a dryer but other-
10 wise, the moisture being free to escape. Furthermore, since the apron is of steel plates the conveyer can be used for any heavy material such as rocks, ore and the like or for any purpose in which fabric or continuous aprons
15 can not be used, due to the fact that the apron might be injured by the work. Furthermore this conveyer provides a continuous surface and can be used not only where a continuous fabric or rubber conveyer has
20 previously been used, but also in many installations wherein, due to the character of the material carried, these other conveyers are not applicable.

While two embodiments of this invention
25 have been shown and described, such disclosures are merely illustrative and not limitative, the spirit and scope of the invention being set forth in the following claims.

I claim:

30 1. A conveyer comprising a pair of parallel longitudinally extending linked chains and plates carried by said chains, each plate being removably secured at the ends to a link of
35 one chain and a corresponding link of the other chain, and being longitudinally coextensive with the links to which it is secured so that when an adjoining pair of plates are in alignment their adjacent edges abut, and a hinge assembly carried jointly by each ad-
40 jacent pair of plates and having arcuately formed portions which close the spaces formed between the edges of the plates when not in alignment.

2. A conveyer comprising a pair of parallel
45 longitudinally extending linked chains, brackets on the inner side bar of each link of each chain, plates extending between said chains, the ends of each plate resting upon and being secured to brackets carried by an
50 opposing pair of links, and a hinge assembly extending transversely substantially the entire width of the plates, said assembly having arcuately formed portions which close the spaces formed between the edges of ad-
55 jacent plates, said hinge assembly being carried by the plates independently of said chains.

3. A conveyer comprising a pair of parallel
60 longitudinally extending linked chains, plates carried between said chains and attached to the links thereof, said plates, when in alignment having their adjacent edges abutting, and a hinge assembly carried jointly
65 by each adjacent pair of plates, to connect the plates and having portions formed to engage

the inner side of the plates to close the spaces formed between the edges of the plates when said plates are not in alignment, the surface of said plates being provided with perfora-
70 tions through which moisture from the material carried by the conveyer may escape.

4. A conveyer comprising a pair of parallel
75 longitudinally extending linked chains, plates carried between said chains and attached to the links thereof, and a hinge assembly carried jointly by each adjacent pair of plates
80 having portions formed, to connect the plates and close the spaces formed therebetween when the edges of the plates are not in alignment to maintain a substantially continuous surface, the hinge assembly compris-
85 ing units each secured to a plate and a hinge pin carried by said units, the surface of said plates being provided with perforations which extend to the units of the hinge as-
semblies carried by the plates.

5. A conveyer comprising a pair of parallel
longitudinally extending linked chains, a plurality of plates having adjacent edges
90 abutting when adjoining plates are in alignment, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, said hinge assembly including coact-
95 ing hinge units, each unit being secured to a plate and consisting of a strip provided along one edge with a series of spaced projecting loops, the loops of one unit being so arranged
100 that when assembled with another unit the loops of each unit will enter and fill the spaces between the loops of the other unit.

6. A conveyer comprising a pair of parallel
longitudinally extending linked chains, a plurality of plates having adjacent edges
105 abutting when adjoining plates are in alignment, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, said hinge assembly including coact-
110 ing hinge units, each unit being secured to a plate and consisting of a strip provided along one edge with a series of spaced projecting loops, the loops of one unit being so arranged
115 that when assembled with another unit the loops of each unit will enter and fill the spaces between the loops of the other unit, and a hinge pin passed through said loops to secure the units in interlocked relation.

7. A conveyer comprising a pair of paral-
120 lel longitudinally extending linked chains, a plurality of plates, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, said hinge assembly including
125 coacting hinge units, each unit being secured to a plate and consisting of a strip provided along one edge with a series of spaced projecting loops, the loops of one unit being
130 arranged that when assembled with another unit the loops of each unit will enter and
135

fill the spaces between the loops of the other unit, and means engaging said loops to secure the units in interlocked relation.

8. A conveyer comprising a pair of parallel longitudinally extending linked chains, a plurality of plates, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, said hinge assembly including coacting hinge units, each unit being secured to a plate and consisting of a strip provided along one edge with a series of spaced projecting loops, the loops of one unit being so arranged that when assembled with another unit the loops of each unit will enter and fill the spaces between the loops of the other unit, and a hinge pin passed through said loops to secure the units in interlocked relation, the surfaces of the loops being curved so that the under edge of each plate will remain in contact with the surfaces of the loops of the unit carried by the adjoining plate.

9. A conveyer comprising a pair of parallel longitudinally extending linked chains, a plurality of plates, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, and providing a substantially smooth conveyer surface when the conveyer is flexed, said hinge assembly including coacting hinge units, each unit comprising a pair of lugs, one lug being secured to one plate and the other lug being secured to the other plate.

10. A conveyer comprising a pair of parallel longitudinally extending linked chains, a plurality of plates, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates and providing with the plates a substantially smooth conveyer surface when the conveyer is flexed, said hinge assembly including coacting end hinge units, and intermediate hinge units, each end unit comprising a pair of lugs, one lug being secured to one plate and the other lug being secured to the other plate, and each intermediate unit being secured to a plate.

11. A conveyer comprising a pair of parallel longitudinally extending linked chains, a plurality of plates, each plate being secured to and carried by a pair of opposite links, and a hinge assembly connecting each pair of adjacent plates, said hinge assembly including a hinge rod coacting and hinge units, and intermediate hinge units, each end unit comprising a pair of lugs, one lug being secured to one plate and the other lug being secured to the other plate and each intermediate unit being secured to plate portions of the units projecting beyond the edge of the plates to which they are secured and being curved upon their upper surfaces concentric with the hinge rod.

12. In a conveyer having plates the adjacent edges of which abut when the plates are in alignment, a hinge assembly carried by each pair of adjacent plates comprising end hinge units and intermediate hinge units, each unit including a pair of lugs, one lug being secured to one plate and the other lug being secured to the other plate, and said intermediate units being secured to either of said plates, and reinforcing angle bars secured to the lower surfaces of said units.

13. In a conveyer having plates the adjacent edges of which abut when the plates are in alignment, a hinge assembly carried by each pair of adjacent plates comprising end hinge units and intermediate hinge units, each end unit including a pair of lugs, one lug being secured to one plate and the other lug being secured to the other plate, and said intermediate units secured to either of said plates, the portions of each intermediate unit below the plate to which it is secured being recessed, and said plates being provided with perforations which extend up to the edge of such recessed portions.

Signed by me at North Adams, Mass., this twenty-fourth day of January, 1929.

LUCIEN BUCK.