Feb. 7, 1933. E. G. GRIFFITH 1,896,402

CONVEYER TAKE-OFF

Filed Oct. 24, 1930

Fig. 1.

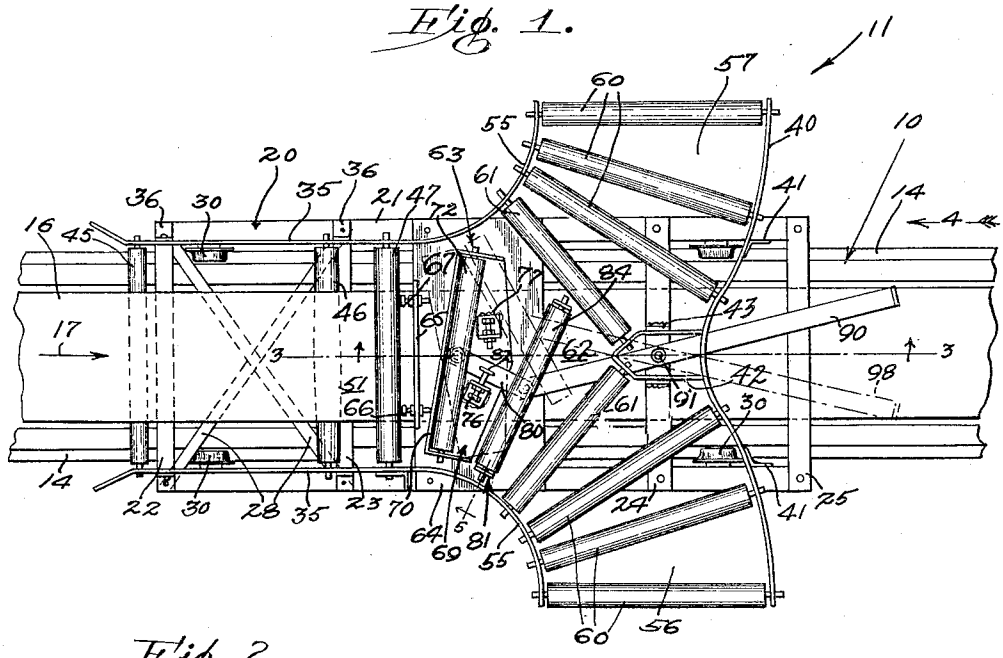


Fig. 2.

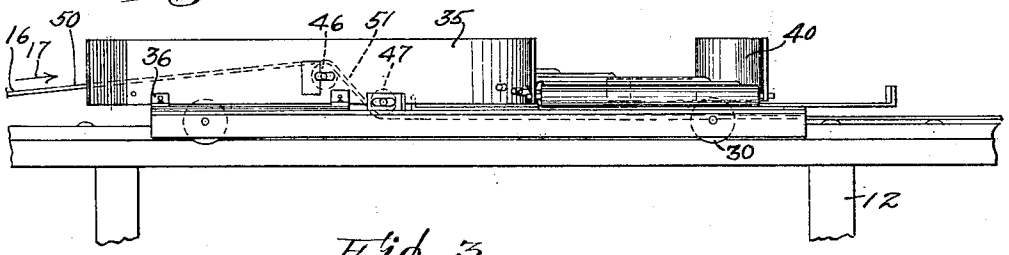


Fig. 3.

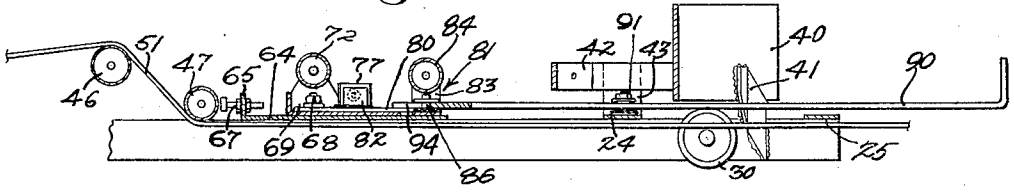


Fig. 4.

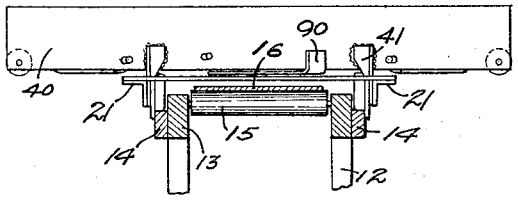
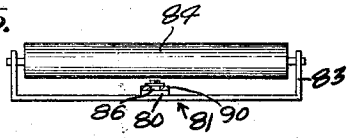


Fig. 5.



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# UNITED STATES PATENT OFFICE

EARL G. GRIFFITH, OF LOS ANGELES, CALIFORNIA

## CONVEYER TAKE-OFF

Application filed October 24, 1930. Serial No. 490,931.

My invention relates to conveyers and particularly to belt conveyer take-offs.

In certain situations requiring the services of conveyers, relatively compact objects, such as filled shipping cases, must be conveyed to various points in a large storage room or to one or the other of several storage rooms opening on a common hallway. This is often accomplished by a power driven horizontal belt conveyer extending along one side of the large storage room or along the hallway connecting the several smaller ones. This power belt conveyer may be equipped with a take-off for diverting cases laterally from any point along the entire conveyer. From the take-off, the cases may pass directly onto a gravity conveyer temporarily set up to carry them to the location where it is desired they be delivered.

Take-offs of this nature generally include a frame shiftable longitudinally on the conveyer frame and carrying rollers for forming a step in the conveyer belt whereby cases carried thereon are lifted slightly and pass from this step onto a series of rollers disposed similar to an ordinary "gravity curve" and which direct the cases laterally from the conveyer.

Owing to the impracticability of giving the step in the conveyer belt more than a relatively slight depth, the gravity rolls in take-offs have hitherto been adapted for removing cases from a single side of the conveyer only. In many situations, however, and particularly where the conveyer extends down the middle of a large room, it is desirable to be able to automatically take cases off the conveyer on either side thereof.

It is accordingly an object of my invention to provide a conveyer take-off by which cases may be diverted from a belt conveyer towards either side thereof at pleasure.

The manner of accomplishing the foregoing objects, as well as further objects and advantages, will be made manifest in the following description and in the accompanying drawing, in which:

Fig. 1 is a plan view of a preferred embodiment of my invention.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is a fragmentary longitudinal sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a front elevational view taken in the direction of the arrow 4 in Fig. 1.

Fig. 5 is a detail cross sectional view taken on the line 5—5 of Fig. 1.

Referring specifically to the drawing, Fig. 1 shows a conveyor 10 on which is mounted a take-off 11 which constitutes the preferred embodiment of my invention.

The conveyor 10 includes a frame 12 having longitudinal members 13, outer faces of which are provided with tracks 14. Rotatably supported by the frame members 13 are rollers 15 on which a belt 16 is power driven in the direction of the arrow 17 in Fig. 1.

The take-off 11 includes a rectangular base frame 20 having longitudinal frame members 21 and cross bars 22, 23, 24 and 25. The rectangle between the longitudinal frame members 21 and cross bars 22 and 23 is braced as by straps 28. Rotatably mounted on the longitudinal members 21 are small car wheels 30 which are adapted to run on the tracks 14, as clearly shown in Figs. 1 and 4, to shiftably support the take-off 11 on the conveyer 10. Erected upon the frame 20 are side walls 35 which are fixed to the frame by brackets 36, and a front or end wall 40 which is supported on the frame by lateral brackets 41, and a central bracket 42, the latter having legs 43 which are secured to the cross bar 24. Rotatably mounted between the side walls 35 are rollers 45, 46 and 47. The conveyer belt 16 passes over the rollers 45 and 46 and under the roller 47 so that traveling in the direction of the arrow 17 an upward inclination is formed in the portion 50 of the belt 16 terminating in a downward step portion 51 disposed between the rollers 46 and 47 which returns the

belt substantially to its normal level in which it rides upon the conveyer rollers 15.

For purposes of adjustment, one end of each of the rollers 46 and 47 is mounted in a slot provided in one of the side walls 35 to permit adjustment of this roller.

Forward end portions 55 of the side walls 35 are curved outwardly as shown in Fig. 1 and outer portions of the front wall 40 are bent about concentric axes with the side wall portions 55 to form right and left runways 56 and 57. Supported at opposite points in the walls forming these runways are gravity rollers 60 as well as shorter gravity rollers 61 mounted between side wall front portions 55 and the bracket 42. The rollers 61 and 60 of each of the runways 56 and 57 have fixed positions and unite to form a gravity roller curve with the rollers thereof disposed successively at lower levels.

Between the step 51 and the rollers 61 is a space 62 in which is disposed a switch 63. The switch 63 has a base plate 64 which extends through the space 62 and is secured upon side frame members 21. Provided on the rear of the plate 64 is an upturned flange 65 having adjustable stops 66 and 67 mounted thereon. Resting on the plate 64 and swingably mounted about a bolt 68 extending upwardly therefrom is a switch roller bracket 69. This bracket comprises a flat plate having an upturned flange 70 provided along its rear edge and ears 71 at its ends between which ears is rotatably mounted a switch roller 72. The flange 70 is of sufficient height to abut against the adjustable stops 66 or 67 when the bracket 69 is swung about the bolt 68. Fixed upon the bracket 69 in diametrically opposite positions are adjustable stops 76 and 77.

Also swingable on the pivot bolt 68 of the bracket 69 is an arm 80 of a second switch roller bracket 81 upon which this arm is secured centrally. The arm 80 has an upstanding abutment wall 82 which is adapted to engage against either of the stops 66 or 67 when the bracket 81 is rotated relative to the bracket 69. The body of the bracket 81 comprises a flat strap of metal 83 with the ends bent up to rotatably support a roller 84 as shown in Fig. 5. Extending upwardly from the juncture between the strap 83 and the arm 80 is a switch actuating pin 86.

Extending above the cross bars 24 and 25 and beneath the front wall 40 is a switch control lever 90 which is pivoted on a bolt 91 extending upwardly from the middle of the cross bar 24. Formed in the inner end of the control lever 90 is a slot 94 which slideably receives the switch control pin 86. In Fig. 1 the lever 90 is positioned to bring the rollers 72 and 84 into such relation with the rollers 60 and 61 in the runway 56 that articles discharged over the step 51 of the conveyer belt 16 will be directed into and along the runway 56 onto any means provided opposite this runway for receiving these. In the use of the take-off 11 it is preferable that the extending ends of the walls 35 and 40 opposite the end of each runway 56 and 57 will connect with a gravity conveyer and will be supported by the frame-work of that conveyer when articles pass along this runway. In case there were no conveying device for receiving articles discharged from either of the runways 56 or 57 it would be necessary to have a man stand at the discharge end of the runway to receive articles therefrom.

When the lever 90 is swung from the position in which it is shown in Fig. 1 so as to swing the bracket 81 toward the runway 57, the abutment wall 82 will engage the stop 77 of the bracket 69 and the bracket 69 will thereafter be swung with the bracket 81 until the wall 70 on the bracket 69 engages the stop 67. This determines the proper position of the rollers 72 and 84 for directing articles from the conveyer 16 along the runway 57 which position is indicated in Fig. 1 by broken lines 98.

It is thus seen that by simply swinging the lever 90 back and forth articles may be directed along either of the runways 56 or 57 at pleasure.

While I have shown and described but a single embodiment of my invention, it is to be understood that various changes and modifications may be made in this without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame shiftably mounted on said conveyer frame; means on said take-off frame for forming a relatively shallow step in said belt; gravity rolls mounted on said take-off frame below the level of the top of said step and adapted to discharge objects from either side of said conveyer; and selective means for causing objects such as boxes and the like discharged over said step in said conveyer to pass onto said rolls and to be directed to the right or to the left as desired.

2. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame shiftably mounted on said conveyer frame; means on said take-off frame for forming an upward inclination in said belt terminating in a downward step to approximately the normal level of said belt; means forming substantially horizontal box runways extending to the right and to the left from the space immediately in front of said step; and means in said space for selectively directing objects, such as boxes and the like, discharged over said step, along one or the other of said runways.

3. In combination: a belt conveyer having a frame and a power driven belt traveling

thereon; a take-off frame shiftably mounted on said conveyer frame; means on said take-off frame for forming an upward inclination in said belt terminating in a relatively shallow downward step to approximately the normal level of said belt; walls forming box conveyer runways extending to the right and to the left from the space immediately in front of said step; gravity rolls mounted between said walls; and means in said space for directing objects discharged over said step onto the rolls in one or the other of said runways.

4. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame shiftably mounted on said conveyer frame; means on said take-off frame for forming an upward inclination in said belt terminating in a relatively shallow downward step to approximately the normal level of said belt; means forming box conveyer runways extending to the right and to the left from the space immediately in front of said step; and a shiftable supporting roller in said space for guiding objects discharged over said step into one or the other of said runways.

5. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame shiftably mounted on said conveyer frame; means on said take-off frame for forming an upward inclination in said belt terminating in a downward step to approximately the normal level of said belt; walls forming runways extending to the right and to the left from the space immediately in front of said step; gravity rolls mounted between said walls; a shiftable supporting roller in said space for guiding objects, discharged over said step, onto the rolls in one or the other of said runways; and a handle extending forwardly from the foremost of said walls to actuate said shiftable roller.

6. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a rectangular take-off frame shiftably supported on said conveyer frame; means on said take-off frame for forming a step in said belt; means forming a plurality of runways extending from a space disposed directly in front of said step; a roller bracket swingably mounted on said take-off frame in said space; a roller supported thereon; stops on said frame for limiting the swinging movement of said bracket; a second roller bracket swingable relative to said frame; a roller on said second roller bracket; stops for limiting the swinging movement of said second roller bracket to permit a degree of lost motion between the swinging of said second roller bracket and said first roller bracket; and means for swinging said roller brackets to selectively position said first and second rollers to direct objects discharged over said step along either of said runways at pleasure.

7. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a rectangular take-off frame shiftably supported on said conveyer frame; means on said take-off frame for forming a step in said belt; means forming a pair of runways extending from a space disposed directly in front of said step; a roller bracket swingably mounted on said take-off frame in said space; a roller rotatably mounted on said bracket supported thereon; adjustable stops for determining end positions of said swinging movement of said bracket on said take-off frame; a second roller bracket swingable relative to said first roller bracket; a roller rotatable on said second roller bracket; adjustable stop means limiting the swinging movement of said second bracket relative to said first bracket, said last mentioned stops being mounted on said first and second brackets; and means engaging said second bracket for swinging both said brackets between corresponding opposite positions to cause said rollers to direct objects discharged over said step along either of said runways as desired.

8. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a rectangular take-off frame shiftably supported on said conveyer frame; means on said take-off frame for forming a step in said belt; means forming a pair of runways extending from a space disposed directly in front of said step; a pair of switch roller brackets swingable about substantially the same vertical axes in said space and mounted in tandem relation; means for limiting the swinging movement of said brackets relative to said take-off frame and to each other; switch rollers on said brackets; and means for swinging said brackets so that said switch rollers may guide articles discharged thereon from said step along either one of said runways.

9. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a rectangular take-off frame shiftably supported on said conveyer frame; side walls and an end wall mounted on said take-off frame and extending upwardly therefrom; rollers mounted between said side walls for forming an upward inclination in said belt terminating in a downward step to approximately the normal level of said belt; fixed rollers between said end wall and forward ends of said side walls to form a pair of runways extending to the right and to the left from a space disposed directly in front of said step; and roller means disposed in said space and adapted to be shifted to combine with the fixed rollers in either of said runways to form a roller curve which will direct articles discharged over said step along said runway.

10. In combination: a belt conveyer having a frame and a power driven belt travel-

ing thereon; a rectangular take-off frame shiftably supported on said conveyer frame; side walls and an end wall mounted on said take-off frame and extending upwardly therefrom; rollers mounted between said side walls for forming an upward inclination in said belt terminating in a downward step to approximately the normal level of said belt; fixed rollers between said end wall and forward ends of said side walls to form a pair of runways extending to the right and to the left from a space disposed directly in front of said step; and a pair of shiftably mounted rollers disposed in said space and adapted to be shifted to combine with the fixed rollers in either of said runways to form a relatively continuous series of rollers adapted to direct along that runway objects discharged over said step onto said switch rollers.

11. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a rectangular take-off frame shiftably supported on said conveyer frame; side walls and an end wall mounted on said take-off frame and extending upwardly therefrom; rollers mounted between said side walls for forming an upward inclination in said belt terminating in a downward step to approximately the normal level of said belt; fixed rollers between said end wall and forward ends of said side walls to form a pair of runways extending to the right and to the left from a space disposed directly in front of said step; a pair of shiftably mounted rollers disposed in said space and adapted to be shifted to combine with the fixed rollers in either of said runways to form a relatively continuous series of rollers adapted to direct along that runway objects discharged over said step onto said switch rollers; and means extending outward beyond one of said walls for manually actuating one of said switch rollers.

12. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame mounted on said conveyer frame; means on said take-off frame for forming a step in said belt; gravity rolls mounted on said take-off frame below the level of the top of said step and adapted to discharge objects from either side of said conveyer; and selective means for causing objects discharged over said step in said conveyer to pass onto said rolls and be directed to the right or to the left as desired.

13. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame mounted on said conveyer frame; means on said take-off frame for forming a step in said belt; gravity rolls mounted on said take-off frame below the level of the top of said step and adapted to discharge boxes and the like from either side of the conveyer; and roller switch means shiftable bodily in a horizontal plane for selectively directing boxes discharged over said step in said conveyer to the right or to the left on said gravity rolls.

14. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame mounted on said conveyer frame; means on said take-off frame for forming a step in said belt; gravity rolls mounted on said take-off frame below the level of the top of said step and adapted to discharge boxes and the like from either side of the conveyer; and a roller extending substantially across the path of said belt and adapted to be swung horizontally for selectively directing boxes discharged over said step in said conveyer to the right or to the left on said gravity rolls.

15. In combination: a belt conveyer having a frame and a power driven belt traveling thereon; a take-off frame mounted on said conveyer frame; means on said take-off frame for forming a step in said belt; gravity rolls mounted on said take-off frame below the level of the top of said step and adapted to discharge boxes and the like from either side of the conveyer; and a pair of rollers extending substantially across the path of said belt and adapted to be coordinately swung horizontally for selectively directing boxes discharged over said step in said conveyer to the right or to the left on said gravity rolls.

16. In a flexible conveyer section, the combination of: a plurality of rollers extending substantially across the path of and adapted to support articles received by said section from a conveyer; means for mounting one of said rollers so that it is swingable in a horizontal plane about a vertical axis substantially at the center line of said conveyer; and means for mounting an adjacent one of said rollers so that it is also swingable about said axis to vary the angular relation of said swingable rollers.

17. A combination as in claim 16 including means for coordinately swinging said rollers as aforesaid.

18. In a flexible conveyer section, the combination of: a plurality of rollers extending substantially across the path of and adapted to support articles received by said section from a conveyer, said rollers being normal to a given curve so as to discharge the articles laterally of the conveyer; and means for mounting said rollers so that a plurality thereof are swingable in a plane substantially parallel with the plane of said conveyer and at least one of said rollers is bodily shiftable relative to the balance of said rollers to render said rollers normal to a different curve.

19. In a flexible conveyer section, the combination of: a plurality of rollers extending substantially across the path of and adapted to support articles received by said section

from a conveyer, said rollers being normal to a given curve which intersects said rollers close to their mid-point so as to discharge said articles laterally of said conveyer; and means for supporting said rollers and varying their angular relation to each other by a swinging movement in a substantially horizontal plane to render said rollers normal to a substantially different curve which intersects said rollers close to their mid-points.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 17 day of October, 1930.

EARL G. GRIFFITH.