Sept. 13, 1938. G. J. SIBLEY 2,130,330

AUTOMATIC TRAFFIC CONTROL FOR CONVEYERS

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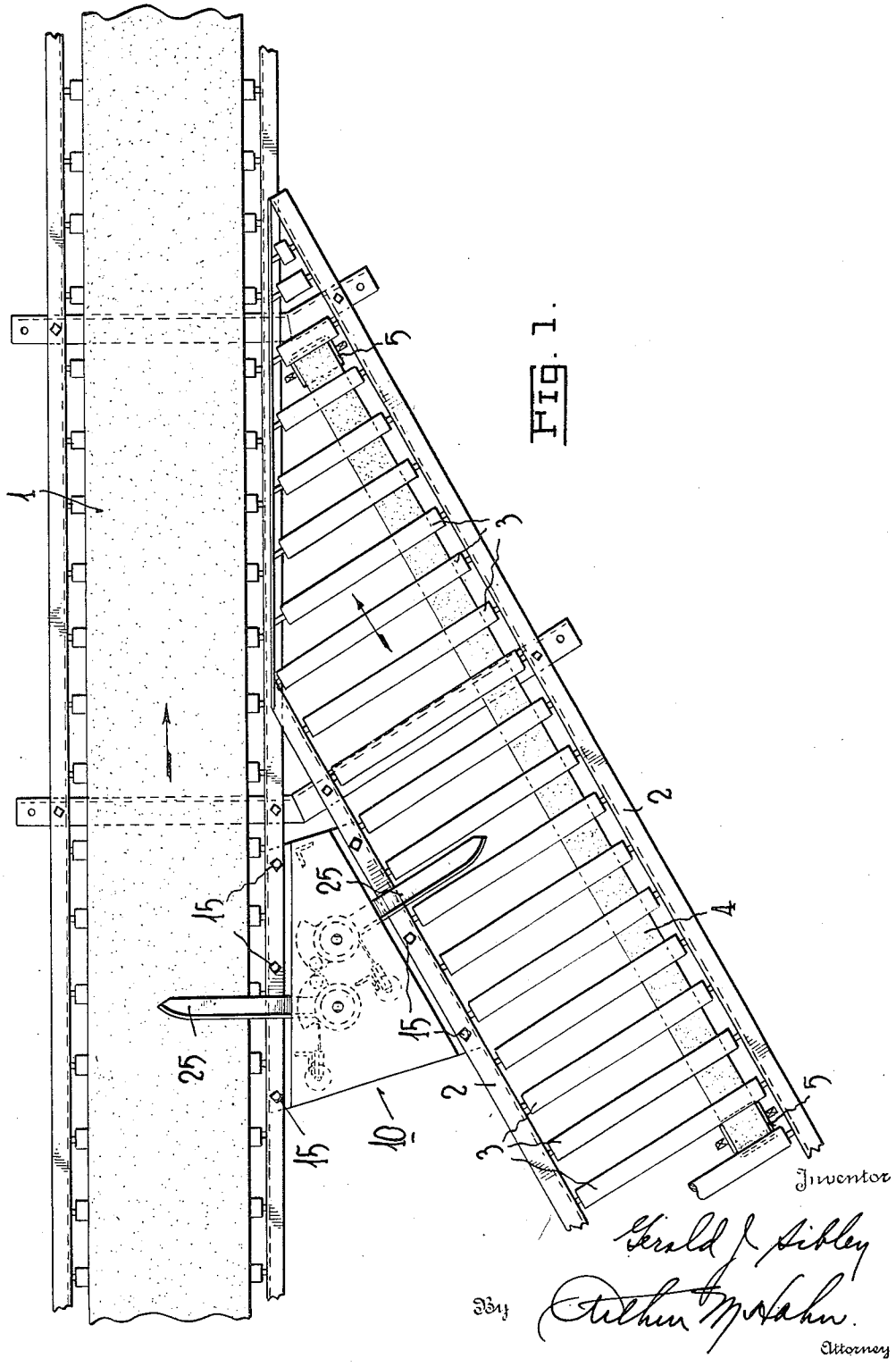


Fig. 1.

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Fig. 2.

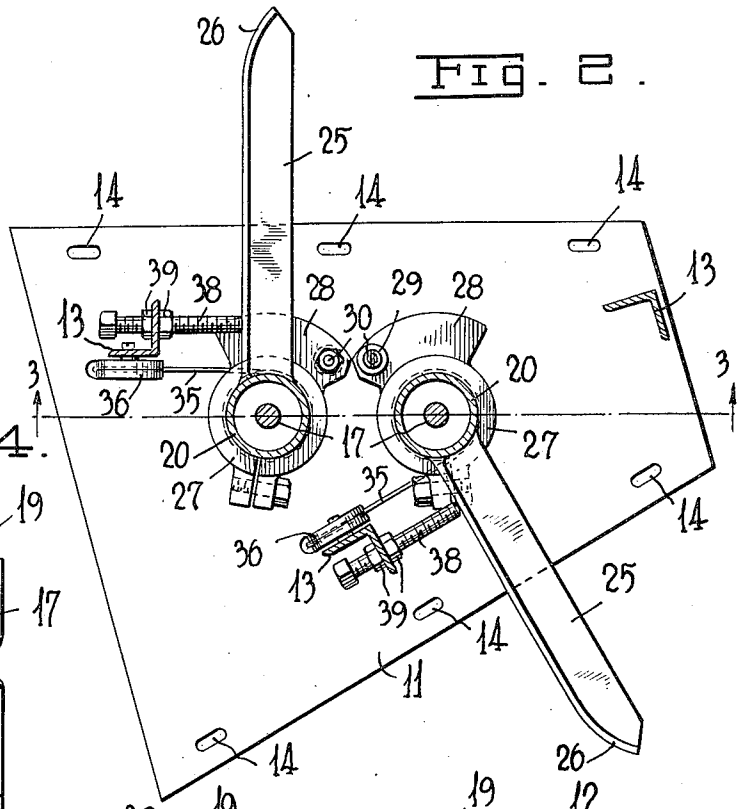


Fig. 4.

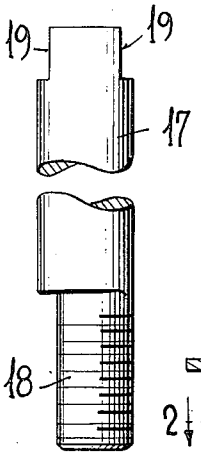
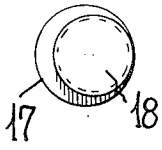


Fig. 5.



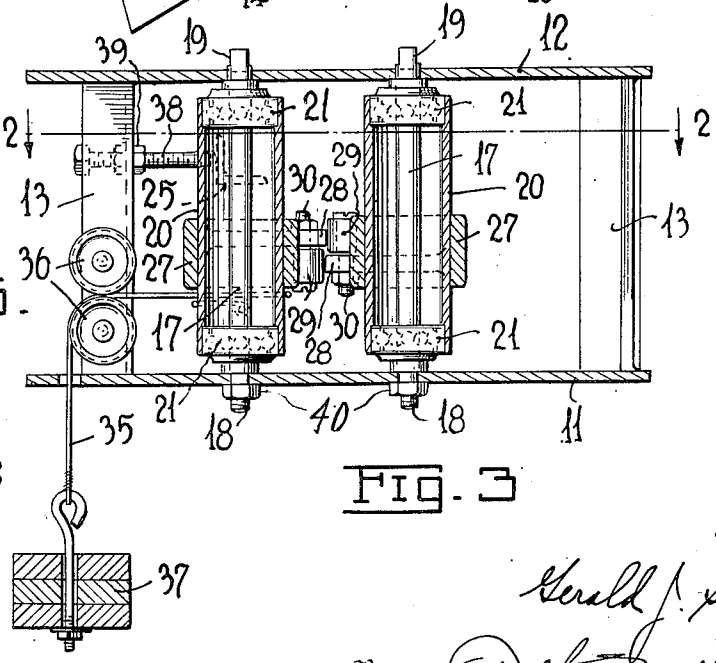


Fig. 3

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AUTOMATIC TRAFFIC CONTROL FOR CONVEYERS

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Application March 9, 1938, Serial No. 194,964

10 Claims. (Cl. 198—21)

This invention relates to an automatic traffic control for conveyer systems and is directed more particularly to an automatic control mechanism for conveyer systems wherein one or more branch conveyers feed into a main conveyer.

In systems of this character, it often happens that an article from a branch conveyer will arrive at the junction with the main conveyer at the same time that one or more articles are passing this junction on the main conveyer. It is obvious that a collision will occur, and it is the primary object of the present invention to provide a relatively simple and inexpensive automatic control mechanism which will prevent such collisions by effectively blocking the approach of an article on one conveyer line if one or more articles are passing the junction on the other conveyer line.

Another object is to provide a control mechanism which may be easily and quickly attached to existing conveyer systems without in any manner altering the construction of the branch or main line conveyers.

Another object is to provide an automatic control mechanism including a pair of arms, one adapted to normally project laterally across the main line conveyer, and the other adapted to normally project laterally across the branch line conveyer, and also including means interlocking said arms whereby swinging movement of one arm by an article, will automatically lock the other arm in laterally extending position to prevent transit of articles on its conveyer line until the first mentioned arm is restored to normal position by passage of the article.

A further object is to provide an automatic control mechanism which may be manufactured as a unit structure and which may be readily adapted to any conveyer system that includes two conveyers intersecting at a junction, irrespective of the particular types of conveyers used so long as there is some provision for permitting articles on either conveyer being temporarily arrested in transit. In other words, one or both conveyers may be of the power driven type or gravity type, as the operation of the device is dependent entirely upon the passage of articles and not on the type of conveyer lines used.

A still further object is to provide an automatic control mechanism of the aforesaid character which shall consist of few parts that are exceedingly simple in construction, inexpensive to manufacture and which may be easily assembled.

With the foregoing and other objects in view, the invention may be stated to consist in the various novel features of construction and arrangement or combination, all of which will be fully described hereinafter and pointed out in the appended claims.

In the drawings accompanying and forming a part of this application,

Figure 1 is a fragmentary top plan view of the junction of a main line conveyer and a branch line conveyer, and showing my automatic control device applied thereto;

Figure 2 is a horizontal sectional view through the control device corresponding to the line 2—2 of Figure 3;

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 2;

Figure 4 is an elevation of one of the roller axles used in the control device; and

Figure 5 is an end elevation thereof.

Referring to Figure 1, 1 denotes a fragmentary portion of a main line conveyer, and 2 a fragmentary portion of a branch line conveyer arranged at an acute angle thereto for feeding articles to the main line conveyer. In the present instance, I have illustrated the main line conveyer as a power driven endless belt type of conveyer and the branch conveyer as a roller conveyer having the rollers 3 of its discharge end portion driven by a belt 4 that is frictionally engaged therewith. This belt is engaged over suitable pulleys 5, one of which may be driven in any suitable manner, not illustrated. It will be understood, that either or both of the conveyers 1 and 2 may be gravity type conveyers if so desired, as the control mechanism to be described hereinafter is actuated by the movement of articles passing along the conveyers irrespective of how such movement is accomplished.

As shown in Figure 1, the control mechanism denoted generally at 10, is located in the acute angle defined by the conveyers 1 and 2.

Referring now to Figures 2–5 inclusive, the control mechanism comprises a base plate 11 and a top plate 12 which are maintained in vertically spaced and substantially parallel relation by vertically disposed angle irons 13, three such members being illustrated. Each of the plates 11 and 12 is substantially trapezoidal or quadrilateral in shape to fit in the angle defined by conveyers 1 and 2, and as shown particularly in Figure 1, the side edges of the base plate preferably extend beyond the corresponding edges of the top plate. These side edge portions of the base plate are provided with elongated slots 14 to permit fastening the control unit structure to the conveyer side

rails by bolts 15 or other suitable fastening means.

Interposed between the plates 10 and 11 are a pair of vertically disposed and horizontally spaced axles 17. As shown in detail in Figures 4 and 5, each axle is formed with a threaded end portion 18 which is eccentrically disposed with respect to the longitudinal axis of the axle, for a purpose to be referred to hereinafter. The opposite end portion of each axle is formed with opposed flattened surfaces 19 to permit a wrench to be applied thereto. Mounted on each axle is a cylindrical roller 20 similar to an ordinary conveyer roller. Each roller is fitted with anti-friction bearings 21 at each end and the axle 17 extends through the inner races of the bearings.

Secured to each roller 20, as by welding, and extending at right angles thereto is an arm 25. Each arm is preferably made of angle iron to provide rigidity, and the outer end thereof is preferably slightly rounded as indicated at 26 for a purpose to be referred to hereinafter. Also secured to each roller 20, as by clamping, is a split collar 27 which is formed with a horizontally projecting arcuate shaped cam portion 28. As shown in Figure 3, the cam portions 28 of the two rollers are offset vertically. Each cam portion has mounted thereon adjacent an end, a roller 29 which is journalled on a stud 30 that is bolted to the cam. The rollers and studs are reversely mounted so that the roller on one cam portion will be in horizontal alignment and engage the edge of the other cam portion, when either of the arms 25 and rollers 20 are rotated.

Each roller and its associated parts is normally maintained in a predetermined position in any suitable manner. In the present instance, I have illustrated a flexible element 35, such as a wire rope, fastened at one end to its roller 20 and wrapped around the circumference of the roller, then passing between guide sheaves 36 which are rotatably mounted on angle iron members 13. The opposite end of the flexible element 35 is attached to a suitable weight 37. These weights tend normally to rotate the rollers 20 and in order to limit such rotation, I provide adjustable stop screws 38. These screws are each threaded through one of the angle iron members 13 and each screw is maintained in adjusted position by lock nuts 39. The ends of the screws are normally engaged with arms 25 to limit rotation of the arms so that each arm will project across its respective conveyer at substantially right angles to the longitudinally axis of the conveyer.

In use, the control device may be manufactured as a unit structure and may be easily and quickly installed by bolting the bottom plate 11 to the conveyer side rails as shown in Figure 1. The stop screws 38 are adjusted to limit the rotation of arms 25 in one direction so that each of said arms normally projects across its respective conveyer as previously described. An article passing along either conveyer will engage and deflect the arm 25 and its cylindrical roller 20 about its axis if the other arm 25 is in its normal position. The slightly rounded end 26 of each arm facilitates passage of the article past the arm as the portion 26 presents a broad smooth surface in contact with the article as it passes the arm. If, however, articles on both conveyers are approaching the junction point, the first article to engage its arm will swing the arm and its cylindrical roller 20. The cam 28 carried by said roller will also rotate and engage the small roller 29 on the other cam 28, thereby locking the other arm across its conveyer and preventing articles from being fed thereon to the junction. When the articles have passed and the first mentioned arm has returned to normal position, the other arm is then free to rotate and permit the articles on its conveyer to move to the junction. Meanwhile, rotation of this second arm locks the first arm in article stopping position in the same manner.

When wear occurs between the cams 28 and their respective rollers 29, the nuts 40 on the ends of the axles 17 may be loosened, and a wrench applied to the flattened faces 19 of the axles to rotate them. Due to the eccentric mounting of the axles, the wear is thus easily taken up, and the nuts 40 again tightened to hold the parts in adjusted position.

What I claim is:

1. In a conveyer system including two conveyers intersecting at a junction, a control mechanism positioned adjacent said junction for controlling articles on either of said conveyers approaching said junction, said control mechanism including two arms, one projecting laterally across each conveyer, said arms each being pivotally mounted to swing from article blocking position to a position to permit articles to pass, and interengaging means actuated by said arms whereby pivotal movement of one arm will lock the other arm in article blocking position.

2. In a conveyer system including two conveyers intersecting at a junction, a control mechanism positioned adjacent said junction for controlling articles on either of said conveyers approaching said junction, said control mechanism including two arms, one projecting laterally across each conveyer, said arms each being pivotally mounted to swing from article blocking position to a position to permit articles to pass, and interlocking elements associated with said arms for locking one arm in article blocking position when the other arm is swung about its pivot.

3. In a conveyer system including two conveyers intersecting at a junction, a control mechanism positioned adjacent said junction for controlling articles on either of said conveyers approaching said junction, said control mechanism including two arms, one projecting laterally across each conveyer, said arms each being pivotally mounted to swing from article blocking position to a position to permit articles to pass, and a projection associated with the pivotal mounting for each arm, said projections being interrelated in such manner that pivotal movement of one arm and its projection will prevent pivotal movement of the other arm and its projection.

4. A traffic control device for use with conveyers intersecting at a junction comprising a pair of arms pivoted to swing upon adjacent axes and each adapted to normally project into the path of articles passing over one of said conveyers, and controlling stop devices actuated by movement of the arms, each of said stop devices being movable into the path of movement of the other whereby when one has begun to move, the other and its arm is locked against movement.

5. A traffice control device for use with conveyers intersecting at a junction comprising a pair of arms pivoted to swing upon adjacent axes and each adapted to project over one of said conveyers in the path of articles traveling thereon, and controlling stop devices including segmental arcuate projections actuated by movement of the arms, each of said projections being movable into

the path of an element carried by the other projection whereby when one arm has begun to swing by an article on one of said conveyers contacting said arm, the other arm is locked against movement.

6. A traffic control device for use with conveyers intersecting at a junction comprising a pair of arms pivoted to swing upon adjacent axes, and controlling stop devices including segmental arcuate projections movable with said arms, said projections lying in different horizontal planes and each projection having an element extending into the plane of movement of the other projection whereby when one arm and its projection has begun to swing, the other arm is locked against movement.

7. A traffic control device for use with conveyers intersecting at a junction comprising two vertically spaced plates, a pair of arms journalled between said plates on adjacent axes, means limiting the swinging movement of said arms in one direction, means normally urging said arms against said limiting means, and controlling stop devices actuated by movement of said arms in an opposite direction, each of said stop devices being movable into the path of movement of the other whereby when one arm has begun to swing, the other arm is locked against movement.

8. A traffic control device for use with conveyers intersecting at a junction comprising two vertically spaced plates, a pair of arms journalled between said plates on adjacent axes, an adjustable stop for limiting the swinging movement of each of said arms in one direction, means normally urging said arms against said stops, and controlling stop devices including segmental arcuate projections movable with said arms, said projections lying in different horizontal planes and each projection having an element extending into the plane of movement of the other projection whereby when one arm and its projection has begun to swing, the other arm is locked against movement.

9. A traffic control device for controlling the passage of articles over two separate adjacent conveyer lines comprising a pair of arms, one adapted to normally project over one conveyer and the other arm over the other conveyer in the path of articles traveling along said conveyers, said arms each being pivotally mounted to swing from article blocking position to a position to permit articles to pass, and interengaging means actuated by movement of said arms whereby pivotal movement of one arm will lock the other arm in article blocking position.

10. A traffic control device for controlling the passage of articles over two separate adjacent conveyer lines and adapted to be positioned between said conveyer lines comprising a pair of arms, one adapted to normally project over one conveyer and the other arm over the other conveyer in the path of articles traveling along said conveyers, said arms each being pivotally mounted to swing from article blocking position to a position to permit articles to pass, and interengaging plates actuated by each arm and movable therewith whereby when one arm swings to permit passage of articles along its conveyer, the other arm will be locked in article blocking position across its conveyer.

GERALD J. SIBLEY.