July 20, 1954 D. M. KING 2,684,039

CONVEYER SYSTEM

Filed May 26, 1950 2 Sheets-Sheet 1

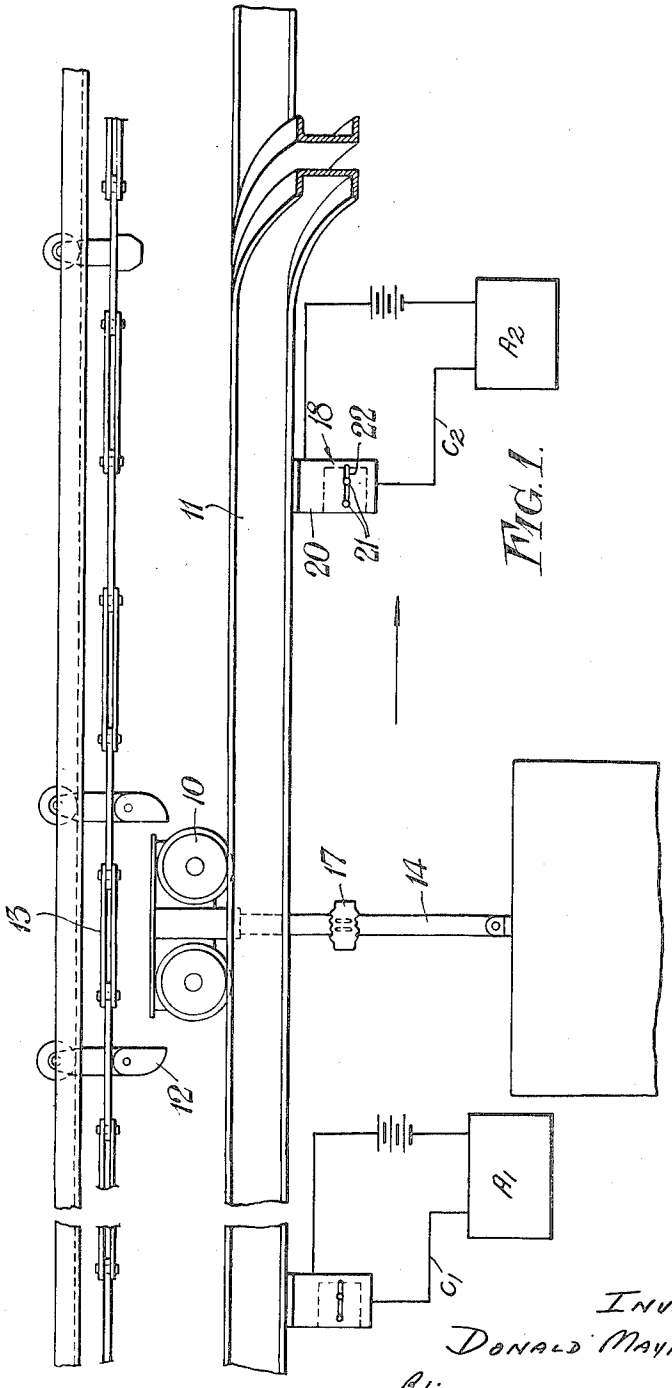


FIG. 1.

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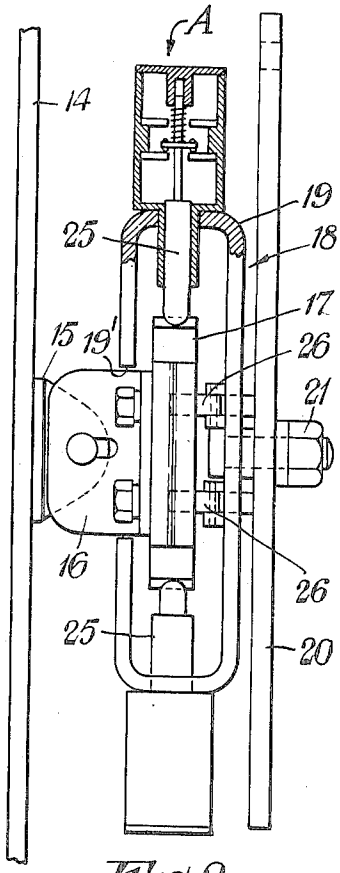


FIG. 2.

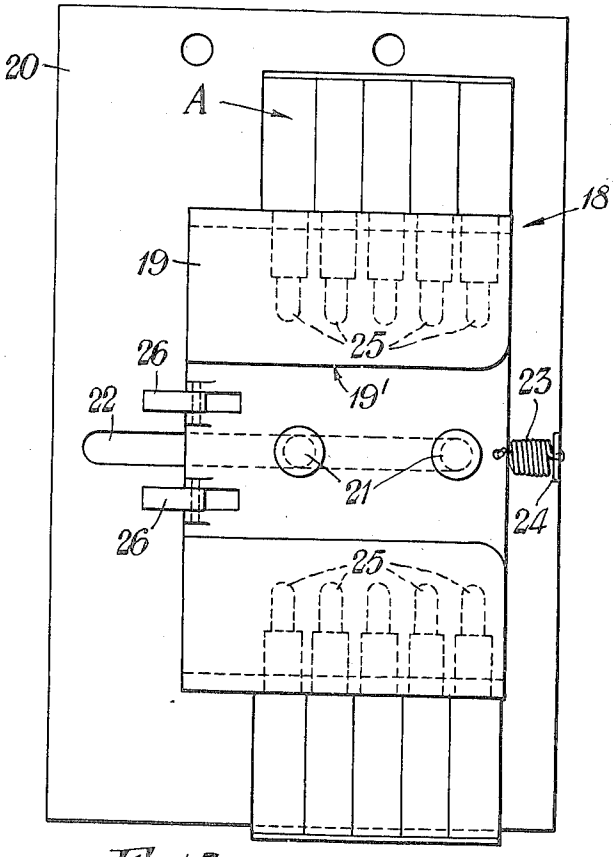


FIG. 3.

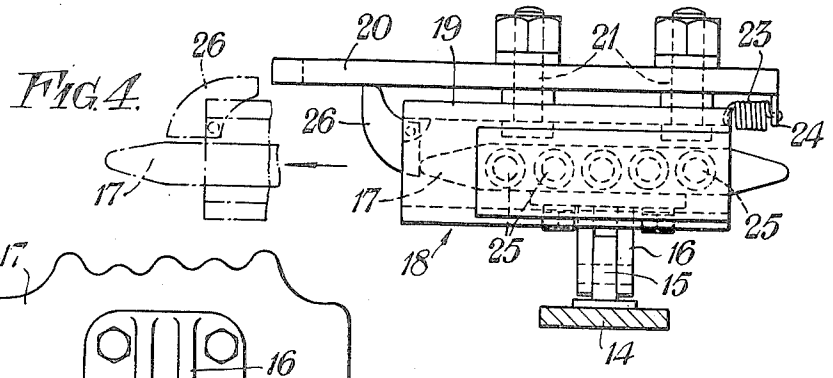


FIG. 4.

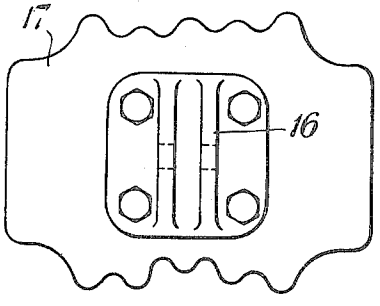


FIG. 5.

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CONVEYER SYSTEM

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6 Claims. (Cl. 104—88)

1

This invention relates to conveyor systems and more particularly to such systems of the kind wherein load carrying trolleys or the like are caused to travel along a predetermined path or track.

In connection with conveyor systems of the kind set forth, it has previously been proposed to provide a selector mechanism which includes means adapted to be associated with all or certain of the trolleys and to be set to actuate any one of a number of switches, contacts or other devices disposed at different points along the path of the conveyor in order to effect automatically the switching of the associated trolley to a branch line, stoppage of the trolley for loading or unloading purposes or to perform some other required function concerned with the subsequent travel, loading or unloading of the trolley at a predetermined point in the course of its travel.

It is the chief object of the present invention to provide an improved selector mechanism by means of which it will be possible automatically to control the load carrying trolleys present in a conveyor system of the kind referred to, and in accordance therewith a selector mechanism is provided which comprises a plurality of keys or like elements each of which is capable of attachment to and detachment from a trolley or a member associated with the latter, and is formed with a series of notches, indentations or the like, the number, configuration or disposition of which is particular thereto, and a plurality of switch units disposed at spaced points along the length of the conveyor and in the path of said keys or like elements when attached to the trolleys or members associated therewith, each of said switch units including one or more depressible contact elements which is or are so constructed and arranged as to be actuated by a key or like element having an appropriate arrangement of notches, indentations or the like to effect closure of a circuit or circuits controlling the operation of a track switch, lift or drop section or other movable control device incorporated in the conveyor system.

In order that the said invention may be clearly understood and readily carried into effect the same will be hereinafter more fully described with reference to the accompanying drawings which show one embodiment by way of example and in which:

Figure 1 illustrates a portion of a conveyor system to which selector mechanism according to the invention is applied.

Figure 2 is an end elevational view showing a

2

selector key mounted on the load bar of a conveyor trolley and cooperating with a switch unit forming part of the selector mechanism.

Figure 3 is a front elevational view of the switch unit shown in Figure 2, the selector key shown in Figure 2 having been removed.

Figure 4 is a plan view of the arrangement shown in Figure 2.

Figure 5 shows a selector key in elevation.

Referring to the drawings it will be seen that in the embodiment illustrated the mechanism is applied to a conveyor system wherein load-carrying trolleys, one of which is indicated at 10, are propelled along a fixed overhead track 11 by means of driving abutments or pusher dogs 12 associated with an endless driving chain 13 disposed above such track. In systems of this type each load carrying trolley 10 is generally provided with a depending load bar 14 to which the load may be attached and it is to such load bars that a portion of the selector mechanism according to the invention may conveniently be applied. In the embodiment illustrated the mechanism includes an arm, bracket or the like 15, (Figures 2 and 4) which is so mounted on the load bar 14 as to project laterally therefrom. Pivotally mounted on the arm, bracket or the like 15 is a carrier member 16 which is adapted to support a selector key 17 the latter being in the form of a plate the leading and the trailing edges of which are preferably beveled or otherwise so formed, as will be seen from Figure 4, as to facilitate its passage into and through a series of switch units which are disposed at spaced points along the path of the conveyor. As will be seen from Figure 2 the clearance between the rear edge of the carrier member 16 and the base of the bracket 15 is limited so that the degree of pivotal movement allowed to said carrier member will be very small. Thus while being capable of limited movement the key 17 will be prevented from dropping and will be maintained at all times in a vertical or substantially vertical plane. The selector key 17 is so mounted on the carrier 16 as to be readily removable and replaceable, being supported for example on one or more studs, pins or the like mounted on the outer face of such carrier member. In accordance with the invention a plurality of selector keys or the like are provided each being in the form of a plate of metal or other suitable material and having a series of notches, indentations or the like in the upper and/or lower edges thereof, as indicated more clearly in Figure 5, the number and/or disposition and/or dimensions of such notches, in-

dentations or the like being varied in each key or the like.

Mounted at a plurality of points along the conveyor path, e. g. at or adjacent each loading or unloading station, switch point or the like is a number of switch units, two of which are indicated generally at 18 in Figure 1, which are so disposed that as each trolley passes along the track the selector key 17 associated therewith will enter and pass through the same. Briefly, each switch unit 18 includes a channelled body portion in which one or more spring loaded plungers or other suitable devices are mounted, such plungers or the like being so arranged as to lie in the path of movement of the selector key 17 carried by each trolley and being adapted on actuation thereof to close one or more contacts controlling the operation of an electrical circuit or circuits, for example, the electric circuits C, and C_2, in turn adapted to control the operation of the trolley diverting means, the loading or unloading means, stops or other devices, schematically represented at A_1 and A_2 on Fig. 1. The arrangement is preferably such that the plunger or plungers or the like at each station require to be depressed or actuated to a different extent or to different extents and/or in different combinations to produce closure of the associated electrical circuit so that the plunger or plungers at any one station can only be actuated to close such circuit and to effect the required operation on the trolley by the selector key appropriate to that particular station.

In the embodiment illustrated in the Figures 2–4 the switch unit 18 comprises a channelled body portion 19 which is so mounted on a supporting plate or bracket 20 as to be capable of limited movement in a path parallel to the direction of travel of the conveyor. The plate 20 is fixedly mounted in position for example on the underside of the track 11. In the embodiment illustrated the body portion 19, which is formed with a slot or passage 19' to accommodate the carrier members 16, carries a pair of studs 21 which are adapted to project through a slot 22 in the plate 20. Attached to the body portion 19 is a spring 23 which is anchored at its other end to a lug or projection 24 on the plate 20 and is adapted normally to urge said body portion 19 into a position wherein the right hand stud 21, as shown in Figure 3, is at the right hand end of the slot 22. Mounted on the body 19 are two sets of plungers, indicated at 25, which are adapted to function in the manner above described. The limited travel permitted to the body portion 19 is necessary in order to allow the latter to travel a short distance with each selector key 17 and thus to allow sufficient time for contact between the selector key and the appropriate plungers 25 to produce the required closure of the electrical circuit. To ensure that the body portion 19 will be caused to travel along with each key 17 it is provided with a pair of retaining latches 26 which are adapted, on entry of a selector key 17 into said body portion, to engage said key and thereby to couple the same to said body. The arrangement is such that the coupling between the key 17 and the body 19 will be broken automatically when the latter reaches a position wherein the latches 26 pass out of contact with the plate 20 and are thereafter free to pivot. On pivoting of the latches, as indicated in dotted lines in Figure 4, the coupling between the key 17 and the body 19 will be broken and the latter will be returned to its initial position under action of the spring 23.

Any desired or suitable number of plungers or other similar movable devices may be associated with each switch unit while the number and configuration of the selector keys may be similarly varied provided that the combination or arrangement of notches, indentations or the like therein is sufficient to provide for actuation of any required plunger or set of plungers or the like. By suitable disposition of the plungers or the like and of the notches, indentations or the like in the selector keys, it will be possible, with a limited number of keys, to arrange for actuation of means at any one of a comparatively large number of stations.

It will be appreciated that when it is required to actuate means at a selected point along the conveyor path it will only be necessary to position on the carrier member 16 associated with the particular trolley concerned that selector key which will be effective to operate the plunger or plungers in the switch unit at the required station. A the trolley passes along the conveyor the carrier member will be caused to enter and to pass through any switch unit present along the conveyor path but the selector key carried thereby will only be effective properly to operate the plunger or plungers at the selected station.

It will be appreciated that the selector mechanism according to the invention may be readily applied to any part of a load carrying trolley or to any type of such trolley or load carrier, other than that specifically referred to, which is adapted to be propelled along a predetermined path or track.

I claim:

1. Selector mechanism for automatically controlling the path of travel of load carrying trolleys along a track system having track switches, lift or drop sections or other movable control devices, the selector mechanism comprising a carrier member mounted on each trolley, a plurality of key elements capable of selective attachment one at any time to and detachment from said carriers, said elements being in the form of plates having different series of notches therein and a plurality of electric switch units disposed at spaced points along the track system for interpositioning in electric control circuits controlling operation of the track switch, lift or drop section or other movable control device incorporated in the track system, each electrical switch unit comprising a body portion disposed adjacent the track system and a plurality of depressible contact members mounted on said body portion in such a manner as to be disposed in the path of the key elements associated with the trolleys, the contact members incorporated in each electric switch unit being adapted to be operated only by a related key element having a particular arrangement of notches therein to effect closure of the electric switch unit for completing the related electric control circuit.

2. Selector mechanism for automatically controlling the path of travel of load carrying trolleys along a track system having track switches, lift or drop sections or other movable control devices, the selector mechanism comprising a carrier member mounted on each trolley, a plurality of key elements capable of selective attachment one at any time to and detachment from said carriers, said elements being in the form of plates having different series of notches therein and a plurality of electric switch units disposed at spaced points along the track sys-

tem for interpositioning in electric control circuits controlling operation of the track switch, lift or drop section or other movable control device incorporated in the track system, each electric switch unit comprising a channelled body portion so formed as to allow of the passage of each key element therethrough, and a plurality of depressible contact members mounted on said body portion in such a manner as to be disposed in the path of said key elements, the contact members mounted in each of said body portions being adapted to be operated only by a related key element having a particular arrangement of notches therein to effect closure of the electric switch unit for completing the related electric control circuit.

3. Selector mechanism for automatically controlling the path of travel of load carrying trolleys along a track system having track switches, lift or drop sections or other movable control devices, the selector mechanism comprising a carrier member mounted on each trolley, a plurality of key elements capable of selective attachment one at any time to and detachment from said carriers, said elements being in the form of plates having different series of notches therein and a plurality of electric switch units disposed at spaced points along the track system for interpositioning in electric control circuits controlling operation of the track switch, lift or drop section or other movable control device incorporated in the track system, each electric switch unit comprising a rigid support, a channelled body portion so mounted on said support as to be capable of limited movement relatively thereto in a direction parallel to the direction of travel of the trolleys, a plurality of depressible contact members mounted in said body portion in such a manner as to be disposed in the path of said key elements when in position on the carriers, the contact members mounted in each body portion being adapted to be operated only by a key element having a particular arrangement of notches therein to effect closure of the electric switch unit for completing the related electric control circuit.

4. Selector mechanism as claimed in claim 3 including the provision of means adapted positively to couple the key element to the channelled body portion to effect movement of the latter through a predetermined distance relative to the rigid support, means also being provided to break the coupling and to return said body portion to its initial position on attainment of the limit of its travel.

5. Selector mechanism for automatically controlling the path of travel of load carrying trolleys along a track system having track switches, lift or drop sections or other movable control devices, the selector mechanism comprising a carrier member mounted on each trolley, a plurality of key elements capable of selective attachment one at any time to and detachment from said carriers, said elements being in the form of plates having different series of notches therein and a plurality of electric switch units disposed at spaced points along the track system for interpositioning in electric circuits controlling operation of the track switch, lift or drop section or other movable control device incorporated in the track system, each electric switch unit comprising a rigid support, a channelled body portion so mounted on said support as to be capable of limited movement relatively thereto in a direction parallel to the direction of travel of the trolleys, a plurality of depressible contact members mounted in said body portion in such a manner as to be disposed in the path of each key element when in position on the carrier, a pivoted latch associated with said body portion and adapted to engage each key element in such a manner as to maintain the latter in engagement with said contacts and at the same time to cause a movement to be imparted to said body through a predetermined distance, spring means adapted to return said body portion to its initial position following disengagement of the latch therefrom, the contact members mounted in each body portion being adapted to be operated only by a related key element having a particular arrangement of notches therein thereby to effect closure of the electric switch unit for completing the corresponding electric control circuit.

6. Selector mechanism as claimed in claim 5, wherein each key element is formed with notches in at least one edge portion thereof while at least one other edge is bevelled to facilitate entry thereof into the channelled body portion.

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