Nov. 20, 1951 T. S. SKILLMAN 2,575,847

STORAGE SYSTEM

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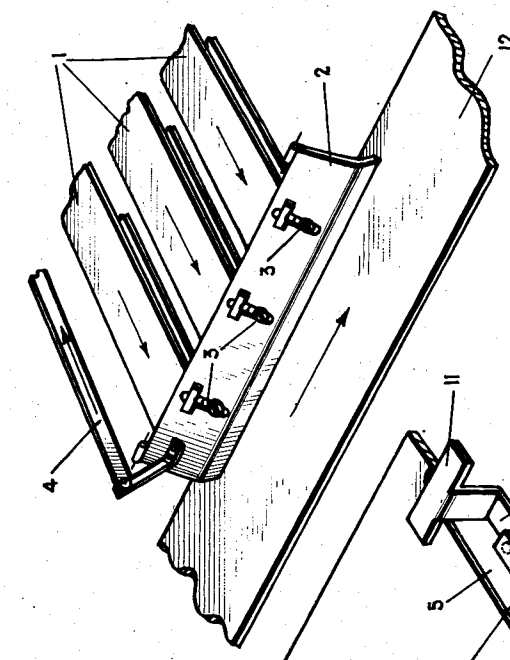


FIG. 1

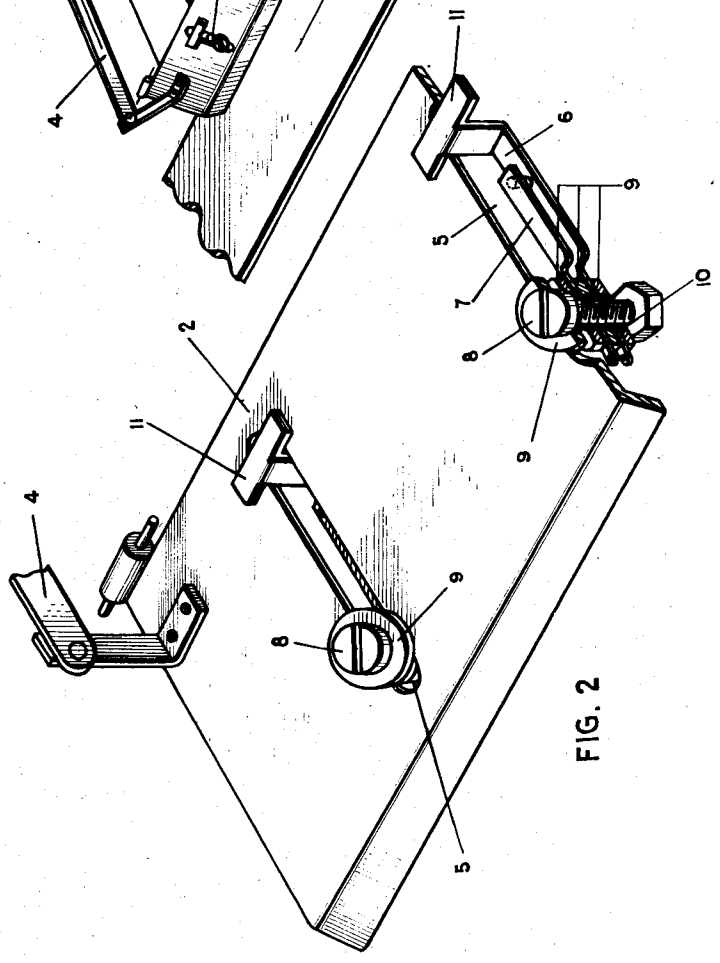


FIG. 2

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STORAGE SYSTEM

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The invention relates to electrical contact devices and particularly to contact devices which have to be operated by articles passing along a surface, for example, a chute.

Hitherto electrical contact devices have been used which consist of a pair of contacts so arranged that one contact spring protrudes through an opening in the surface on which articles pass along. This opening must be wide enough to enable free movement of the contact spring, but must be kept rather small to avoid jamming of articles thus restricting the width of the contact spring operated by the articles passing over it. Difficulties arise when articles of various shapes have to operate the same contact spring and special arrangements, for example, additional guides for the articles have to be provided to avoid failure in the operation of the contacts.

It is an object of the invention to overcome these difficulties and to devise an electrical contact device which is safely operated by articles of various shapes passing along a surface without additional guidance.

According to the invention a set of simultaneously operable electrical contacts is fixed to a base plate with an orifice therein. The actuated member of the contact set protrudes through the orifice to the other side of the base plate and there has a portion which is parallel to the plane of the base plate and overlaps the orifice.

According to a further feature of the invention, the distance between the overlapping portion and the base plate in the unoperated position of the contact set is determined by the movement necessary and sufficient to operate the contact set.

Contact devices, according to the invention, are especially useful in systems having movable belts for the storage of articles, and common to a plurality of belts, conveyor means to receive articles released from the movable belts. These contact devices can be used to control counting arrangements or driving means for the belts or both and it is another feature of the invention to position the contact devices between the movable belts and the conveyor means, so that they are operated whenever articles part from the corresponding belts to the conveyor means. The base plate of the contact device can, for example, take the form of a flap hinged across the movable belts and sloping down to the conveyor means.

These and other features of the invention will be apparent from the following description which refers to an embodiment of the invention illustrated by way of example in the accompanying drawings in which—

Fig. 1 shows one application of the contact device according to the invention,

Fig. 2 shows details of a contact device according to the invention.

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In Fig. 1 three storage belts 1 are shown on which articles can be stored and which move in the direction indicated by the arrows whenever these belts are driven by suitable driving means to release wanted articles stored thereon. A flap 2 is arranged across the ends of the belts 1 so that when the belts move forward the articles stored on them topple over on to flap 2 and slide down to a common conveyor belt 12 which conveys the articles to a suitable locality for delivery.

The flap 2 which can extend over a plurality of storage belts carries a plurality of contact devices 3, one being provided for each storage belt 1. When a storage belt 1 is moved to release articles stored thereon, the corresponding contact device 3 is operated by the articles toppling over from belt 1 to the common conveyor belt 12. Flap 2 is preferably hinged and can be pulled up by a control bar 4 to act as a stop when the storage belts are reloaded with articles.

The contact device itself is more clearly shown in Fig. 2. The base plate of the contact device is formed by flap 2 and is provided with slots 5, each slot being so arranged that it is opposite the middle of a corresponding storage belt as shown in Fig. 1.

The contact set itself is fixed to the lower side of the flap and in the example described consists of two contact springs 6 and 7 forming a break contact. One edge of flap 2 is bent to give enough clearance between the flap and the common conveyor belt to accommodate the contact set. It must be understood that any other type of contact set can be used whenever required, and the set may comprise a plurality of contact springs adapted to operate a plurality of circuits.

The contact springs 6 and 7 are secured in slot 5 by a screw 8 and fixed between insulating washers 9. The screw 8 is insulated by a sleeve 10 pushed through the washers 9 and the contact springs 6 and 7.

In the embodiment shown in Fig. 2 the contact spring 6 is used as an actuated member of the contact set and for this purpose has a portion protruding through slot 5 to the upper side of flap 2. This part may be an integral part of the actuated member, or may be made of different material and fixed thereto. This portion ends in a T-shaped part 11 which extends in a plane parallel to the plane of flap 2. The part 11 overlaps slot 5 wide enough to ensure a safe operation of the contacts by articles of various shapes released from the storage belts and toppling over flap 2 to the common conveyor belt. At the same time this overlapping portion acts as a stop for the travel of the actuated spring 6.

The distance between part 11 and flap 2 is determined by the amount of movement necessary for the safe operation of the contact set and

especially in cases where the actuated member is one of the contact springs, this distance is equal to the necessary travel of the contact springs.

The screw 8, securing the contact set to flap 2 permits a shifting of the contact set within slot 5 and thus enables adjustment of the contact device to the various shapes of articles released from the storage belts.

As mentioned before the contact device can be used to control directly the driving means for the corresponding storage belts or can operate counting arrangements to count the number of articles discharged from corresponding storage belts, or with a multiple contact set can be adapted to perform these or other operations simultaneously.

The foregoing description shows one embodiment of the invention only and it must be understood that modifications of the device described above are possible to meet special requirements without departing from the scope of the invention.

I claim:

1. In a system having movable belts for the storage of articles and, common to a plurality of said belts, conveyor means to receive articles released from said belts, electric contact devices operable by articles passing from the movable belts to said conveyor means, each said contact device comprising a base plate with an orifice therein, said base plate being slopingly positioned between a corresponding movable belt and said conveyor means, and a set of simultaneously operable electrical contact springs fixed beneath said base plate, the actuated member of said set of contact springs protruding through said orifice and having on the upper side of said base plate a portion overlapping said orifice across the path of said articles, said overlapping portion being disposed substantially parallel to the plane of said base plate and so positioned along the path of travel of said articles that articles released from a corresponding movable belt topple onto said overlapping portion before sliding down said base plate to said conveyor means.

2. In a system having movable belts for the storage of articles, and common to a plurality of said belts, conveyor means to receive articles released from said belts, electrical contact devices operable by articles passing from the movable belts to said conveyor means, each said contact device operable by articles passing from said belts to said conveyor means comprising a flap with an orifice therein, said flap being hinged across a corresponding belt and sloping down to said conveyor means, and a set of simultaneously operable electrical contact springs fixed beneath said flap, the actuated member of said set of contact springs protruding through said orifice and having on the upper side of said flap a portion overlapping said orifice across the path of said articles, said overlapping portion being disposed substantially parallel to the plane of said flap and so positioned along the path of travel of said articles that articles released from a corresponding belt topple onto said overlapping portion before sliding down said flap to said conveyor.

3. In a system having movable belts for the storage of articles and, common to a plurality of said belts, conveyor means to receive articles released therefrom, a flap hinged across a plurality of said belts and sloping down to said conveyor means, said flap having an orifice opposite each of said belts and, fixed to its lower side, a set of electrical contact springs corersponding to each of said belts, each set of contact springs having an actuated member protruding through the corresponding orifice with a portion on the other side of said flap overlapping said orifice across the path of articles released from the corresponding belt, said overlapping portion being disposed substantially parallel to the plane of said flap and so positioned along the path of travel of said articles that articles released from said belt topple onto said overlapping portion before sliding down said flap to said conveyor means.

4. An electrical contact device operable by articles passing from a higher to a lower level comprising a base plate with an orifice therein, said base plate being slopingly positioned between said higher and said lower level, said orifice being elongated along the path of travel of said articles; a set of simultaneously operable electrical contact springs fixed beneath said base plate, the actuated member of said set of contact springs protruding through said orifice and having on the upper side of said base plate a portion overlapping said orifice across the path of travel of said articles, said overlapping portion being disposed substantially parallel to the plane of said base plate at a distance therefrom determined by the amount of movement necessary and sufficient to operate said contact set, and on abutting against said base plate forming a stop for the travel of said actuated member; and means to adjust the mounting of said set of electrical contacts along said elongated orifice so that on release from said higher level articles of the type being handled topple onto said overlapping portion before sliding down said base plate to said lower level.

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