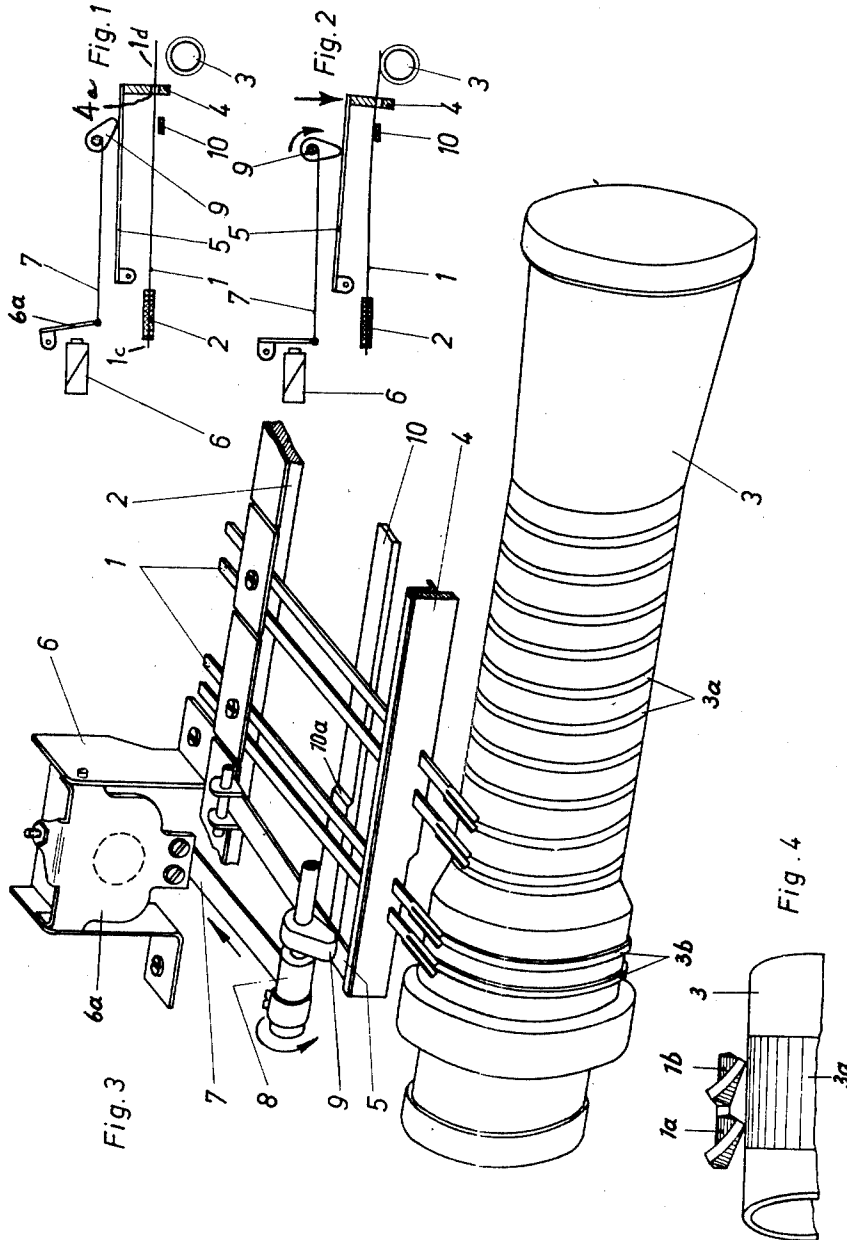


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CONTACT SPRING ASSEMBLY FOR AUTOMATIC SWITCHING
OF MESSAGE CARRIERS IN PNEUMATIC TUBE SYSTEMS
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CONTACT SPRING ASSEMBLY FOR AUTOMATIC SWITCHING OF MESSAGE CARRIERS IN PNEUMATIC TUBE SYSTEMS

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The present invention relates to automatic switching means for message carriers in pneumatic tube systems, wherein the carriers are provided with characteristic directive markings whose setting is detected by corresponding spring contacts to guide the carrier in the desired direction where two or more tube routes branch off or intersect. More particularly, this invention relates to an improved contact spring assembly in such switching means.

It is known to provide cylindrical message carriers used in pneumatic tube systems with marking rings which can be set in a predetermined manner and to provide suitable detecting means at junction points between tube branches or intersections to switch the carrier automatically into the desired tube branch, as determined by the setting of the marking rings on the carrier. The detecting means usually comprise leaf springs which contact the markings upon being actuated by an electromagnet.

It is the principal object of the present invention to provide contact spring assemblies of the above-described type, which assure dependable contact with the marking rings without requiring adjustments after installation. Since the springs of the assemblies according to this invention also need no prior loading, considerable manufacturing and operating economies may be achieved thereby.

The above and other objects and advantages are accomplished in accordance with the invention by providing a contact spring assembly comprising a set of contact springs lying adjacent one another in one plane, an insulating support means upon which the contact springs are mounted at one end thereof, a common actuating member attached to all contact springs and being arranged substantially transversely thereto near their other ends, and one or more loaded leaf springs supporting the actuating member, the leaf spring or springs together with the actuating member being set in motion in response to an electromagnet. Thus the actuation of the electromagnet will cause the contact springs to make contact with the set marking rings of a passing message carrier and direct the same into the selected tube branch.

The invention will be more fully explained in conjunction with the detailed description of the accompanying drawing showing a preferred embodiment, and wherein: Figs. 1 and 2 show a schematic side view of the contact spring assembly in rest and operational positions, respectively;

Fig. 3 is a perspective view of the contact spring assembly and a message carrier passing thereunder; and Fig. 4 shows a front view of the contact spring ends.

Referring now to the drawings, wherein like reference numbers in the several figures refer to like parts, there are shown contact springs 1 having one end 1c fixedly mounted on the insulating bar 2. The contact springs are so arranged that the message carrier 3 with its marking rings 3a and 3b may pass thereunder without impediment. Actuating member 4 is mounted over the outer ends of the springs, the member being provided with slits 4a to accommodate the springs 1 and to make it possible to slide the actuating member thereover to a desired distance from the free end 1d of the springs.

As shown for instance in Fig. 2, during operation of the device the actuating member 4 is depressed in the direction of the arrow in a manner to be explained below and the contact springs are flexed against insulating stop or rest 10 and are then further bent around stop 10

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toward message carrier 3. This arrangement increases the contact pressure between springs 1 and the marking rings of the carrier.

Since rings 3b of carrier 3 have a somewhat larger diameter than rings 3a, the slits 4b in actuating member 4, which accommodate the springs corresponding to rings 3b, are somewhat offset in height as compared to the slits accommodating the springs corresponding to rings 3a. Correspondingly, stop or rest 10 is provided with a shoulder 10a of a height which corresponds to the difference in diameter of rings 3a and 3b.

Actuating member 4 is connected to and held in position by loaded leaf spring 5 which also serves to keep the entire spring assembly in the rest position, as shown in Fig. 1. Although only one leaf spring is shown, it may be preferable for more perfect operation of the assembly and for fully satisfactory contact pressure between all springs and rings, to provide a leaf spring at each end of the assembly, the mounting thereof being substantially similar to the mounting of the leaf spring 5, as shown.

The contact spring assembly operates as follows: When electric current is supplied to electromagnet 6, it will cause a movement of steel band 7 in the direction of the arrow shown in Fig. 3. Steel band 7 is fixedly attached to armature 6a and is partly wound around axle 8. When the armature is attracted by the magnet, the steel band will partially unwind from the axle and rotate the same in the direction of the curved arrow in Fig. 3. This will cause cam 9, which is fixedly mounted on the axle, to turn, as shown in Fig. 2, and to depress leaf spring 5 and actuating member 4. If, as hereinabove described, a second leaf spring is provided at the other end of the spring assembly, the axle 8 will carry another cam in cooperation with the other spring. When the armature is released again, steel band 7 will automatically wind itself on the axle and cam 9 will return to its original position due to the action of the loaded leaf spring 5.

Fig. 4 shows a preferred embodiment of the contact spring ends. The message carriers are often covered by a layer of dirt and to assure a satisfactory contact between the contact springs and the marking rings, the contact-making ends of the springs are slit and each slit portion 1a and 1b is deformed to present edges to the marking rings. These edges are adapted to penetrate any dirt or other foreign matter accumulated on the marking rings and thus assure positive and firm contact therewith.

While the invention has been described with reference to certain specific embodiments, it should be understood that the same is capable of many modifications and adaptations within the skill of the expert without departing from its spirit and scope as defined in the appended claims.

What I claim is:

1. In a pneumatic tube system, automatic detecting means for message carriers with characteristically set marking rings, said detecting means comprising a set of spaced contact springs, each one adapted to cooperate with a different one of said rings insulating support means, means for mounting said contact springs fixedly and in one plane on said insulating supporting means, said springs normally out of contact with the marking rings of said carriers, a common actuating member attached to said contact springs and arranged substantially transversely thereto, at least one loaded leaf spring attached to and supporting said actuating member, and means co-operating with said loaded leaf spring for depressing said leaf spring said actuating member and said contact springs a predetermined distance into contact with said rings.

2. Detecting means as defined in claim 1, wherein there is further provided a transversely arranged insulating stop means located underneath said contact springs and between the insulating stop support means and the actuating member therefor, said insulating means lying in the path of the contact springs when the loaded leaf spring is depressed.

3. In a pneumatic tube system using message carriers with characteristically set marking rings: automatic

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detecting means comprising a set of spaced contact springs, each one adapted to cooperate with a different one of said rings, an insulating support bar, means for mounting said contact springs fixedly near one of their ends on said support bar, a common actuating member having a plurality of slits corresponding to the number of contact springs, said springs being mounted in said slits near the other ends thereof and adapted to be retained normally out of contact with said rings, at least one loaded leaf spring attached to and supporting said actuating member, a cam cooperating with each loaded leaf spring, and means for rotating said cam to depress said leaf spring, said actuating member and said contact springs a predetermined distance and into contact with said rings.

4. Detecting means as defined in claim 3, further comprising a transversely arranged insulating bar located between said support bar and said actuating member underneath said contact springs and in the path of said contact springs when said loaded leaf spring is depressed.

5. Detecting means as defined in claim 3, wherein said rotating means comprise an electro-magnet.

6. In a pneumatic tube system using message carriers with characteristically set marking rings: automatic electrical detecting means comprising a set of spaced contact springs located substantially in one plane, each one adapted to cooperate with a different one of said rings, an insulating support bar whereon said contact springs are mounted near one of their ends, a common actuating member arranged substantially transversely to said

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contact springs, fixedly engaging all contact springs near the other ends thereof and adapted to normally retain said contact springs out of contact with said rings, at least one loaded leaf spring attached to and supporting said actuating member, an electromagnet having an armature, a cam for each leaf spring, means for rotating each cam to depress the leaf spring engaged thereby, and means connecting each cam with said armature, whereby each cam will be rotated upon attraction of the armature by the electromagnet, thereby to urge said contact springs a predetermined distance into contact with said rings.

7. Detecting means as defined in claim 6, further comprising a common axle to carry said cams, a band being wound onto said axle and fixedly connected to said armature, whereby the attraction of the armature by said electromagnet will cause a pull on the band and thereby rotation of the axle.

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