Dec. 3, 1957 F. H. MITTAG ET AL 2,815,182

DISPATCH TUBE SYSTEM

Filed Sept. 27, 1955 3 Sheets-Sheet 1

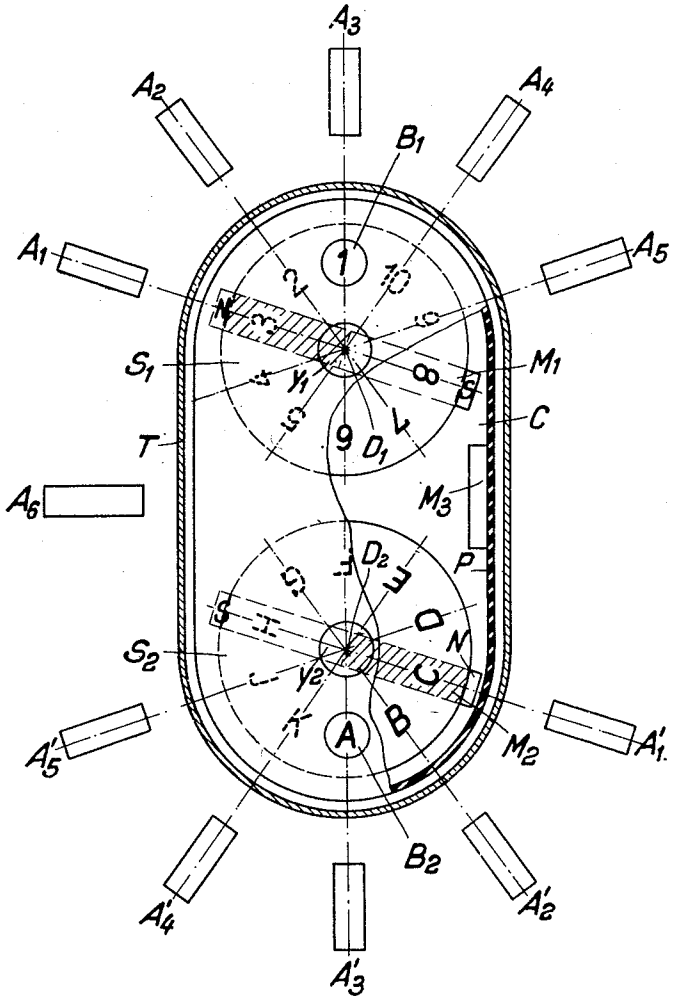


Fig. 1

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DISPATCH TUBE SYSTEM

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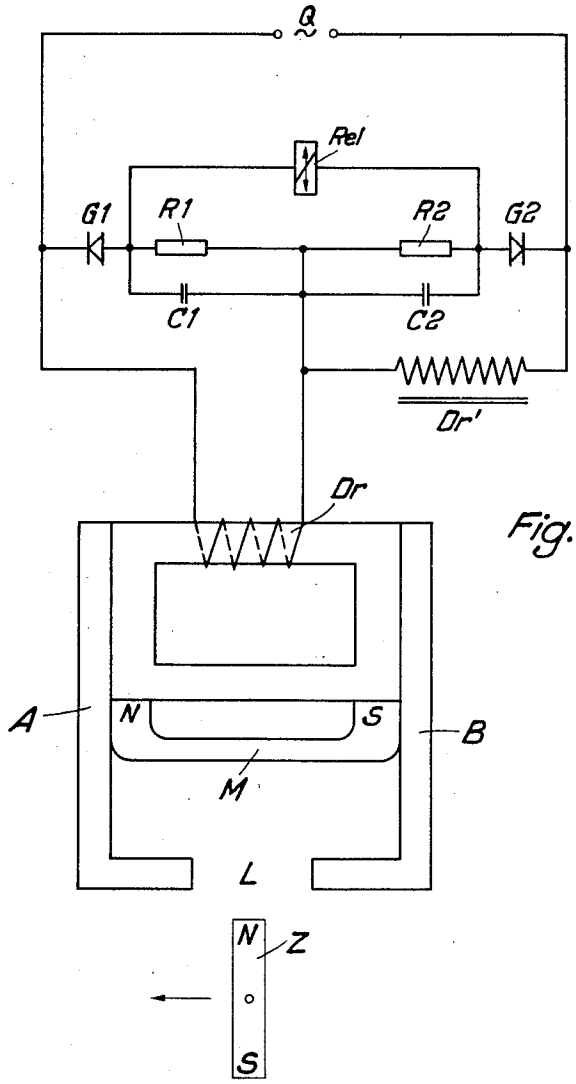


Fig. 2

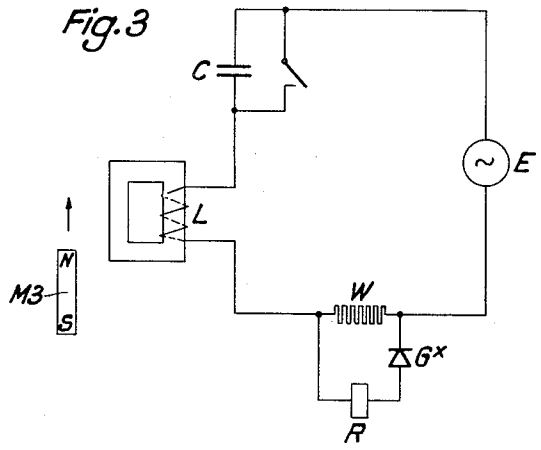
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DISPATCH TUBE SYSTEM

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Fig. 3



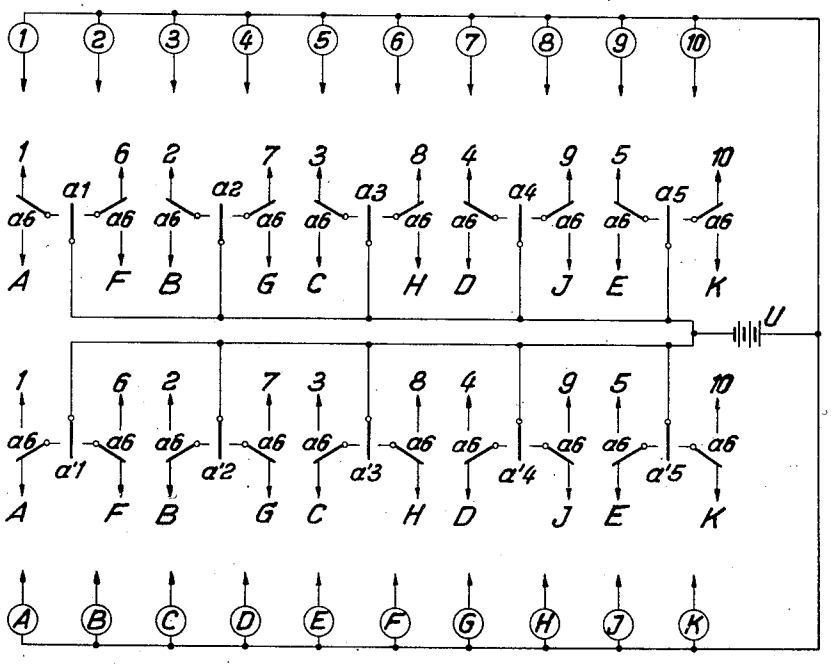


Fig. 4

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2,815,182

Patented Dec. 3, 1957

2,815,182

DISPATCH TUBE SYSTEM

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Application September 27, 1955, Serial No. 536,947

Claims priority, application Germany October 1, 1954

7 Claims. (Cl. 243—16)

The invention relates to arrangements for the destination-marking of the containers or carriers employed in dispatch-tube systems whose routing switches are controlled magnetically. In the arrangements here concerned the carriers and the transmission tube are so constructed that the carriers when in this tube shall be unable to turn.

In general these carriers are different in form from the cylindrical one. In most cases their cross-sectional shape is oblong or oval. Carriers so constructed permit the well-known magnetic destination-control equipment to be arranged in a plane normal to the axes of the carriers, that is, the transmission tube has test or scanning members located in that plane and positioned near or around the tube. Every control action is initiated by one or more of these members becoming affected by a magnet fitted to the carrier. The test members so affected initiate the setting of a routing switch for the respective carrier. The carrier itself has as many magnetizable bodies as there are test members adapted to be selectively affected by it. For every control action the requisite ones of these bodies have to be magnetized in a certain sense by means of a separate appliance. It is, however, also possible for the carrier to have magnetic bodies fixed to its circumferential surface and so positioned as to be expressive of a certain destination. In the latter case the expenditure in magnetic bodies is less than in the other. Hence the weight of the carrier is correspondingly smaller. However, the bar-magnets in carriers of the latter construction must be held in position by devices that should be extremely reliable in action since otherwise with the carrier traveling the bar-magnets may get lost or change their position.

By the invention these shortcomings are avoided but the advantage of a less expenditure in bar-magnets is retained.

According to the invention the carriers have one or more bar-magnets rotatable in one or both of their end walls and in close adjacency to these, so that the bar-magnets shall be able to affect predetermined test or scanning members associated with the transmission tube.

The invention will be described hereafter, reference being had to the accompanying drawings, in which:

Fig. 1 is a partially diagrammatic cross-sectional view of a transmission tube and a carrier in it, the two being provided with one form of the inventive control equipment;

Fig. 2 shows a circuit arrangement suitable for the arrangement of the test members, and also shows a magnet similar to magnets forming part of the control equipment of the carrier;

Fig. 3 illustrates a circuit arrangement suitable for the arrangement of an additional test member which serves as a change-over device.

Fig. 4 represents a circuit arrangement suitable for the test members indicated schematically in Fig. 1 as surrounding the transmission tube.

An end wall of a carrier C which, as shown in Fig. 1, is oblong or oval in cross-section, has two bar-magnets M1, M2, mounted rotatably in the centers D1, D2 of the

semi-cylindrical side parts of the carrier. The magnets M1, M2 can each be set to any one of ten positions which are determined by five test members A1—A5 and A'1—A'5, respectively. Each magnet M1, M2 can thus be set to produce any one of ten control actions. Any effective position of M1 may be combined with any effective position of M2, so there are $10\times10=100$ possibilities of adjusting the carrier as to its destination. This number will suffice in most cases, but it is within the scope of the invention to provide still more possibilities of adjustment if the carrier is of an adequate cross-sectional area or shape.

In order to facilitate the adjusting of the destination marking, the magnets M1, M2 may be fixedly united with discs S1, S2 that have the destination characteristics marked on them. For example, disc S1 may have numerals 1–10 while disc S2 is provided with letters A–K. Preferably the magnets M1, M2 and discs S1, S2 are fixed to the inside of the respective end wall of the carrier, this wall having apertures B1, B2 to display the said numerals and letters. Fixed to the discs S1, S2 and magnets M1, M2 are handles Y1, Y2 by means of which the discs and magnets can be turned from without. These handles may be constituted by thumb wheels, that may be milled or serrated. The carrier when being inserted into the transmission tube can happen to be in a position different from the correct one by 180°. In order to preclude faults brought about by such wrong insertion, another feature of the invention consists in the provision of an additional test member A6 which with the carrier in the wrong position will be controlled by an additional magnet M3 on the carrier in order to act as a change-over device causing the desired routing switch to be set instead of a wrong one.

As here shown by way of example, the magnet M1, rigid with disc S1, is so positioned with respect to it as to coincide with the numerals 3, 8 thereof and to point to the test member A1. Accordingly, the numeral 1 is seen in the aperture B1. Equally, with magnet M2 in the position shown, the letter A of disc S2, rigid with M2, is seen in the aperture B2.

According to another feature of the invention the magnets M1, M2 are mounted in the cap P of the carrier, whereby the work of mounting will be easy to carry out and the setting mechanism easy to inspect. The magnets M1, M2 when in any one of their effective positions are held in it by an arresting device. Appropriately this is likewise of magnetic nature. For instance, small bodies of ferromagnetic material, preferably iron, may be arranged on the circumference of a circle swept over by the magnets M1, M2.

The test members A1—A5 and A'1—A'5 may be constructed as in the arrangement represented in Fig. 2.

This arrangement comprises a magnetic circuit constituted by the iron core of a choke Dr and by two limbs A, B whose free ends have an air gap L between them. Such magnetic circuit has a magnet M included in it, preferably so as to be fitted to the iron core of choke Dr. Magnet M may be a permanent magnet or may be excited by a direct-current field. The electric circuit of choke Dr is a sort of measuring circuit or bridge connection that further comprises a second choke Dr', resistors R1, R2 connected in parallel with condensers C1, C2 and in series with rectifiers G1, G2, an alternating-current source Q, and a polarized relay Rel. Z denotes a magnet identical to either one or the other of the magnets M1, M2 shown in Fig. 1.

The additional test member A6, Fig. 1, may be constructed as shown in Fig. 3. Here an iron-core choke L is included in an electric oscillatory circuit whose capacity is designated C, and which also contains a resistance W that has a relay R shunted to it over a rectifier G×. E de-

notes an alternating voltage source in this circuit. A magnet M3 approaching the choke L or passing by it acts to change the inductance of L and thereby to change the potential across relay W in a manner to excite relay R. This relay is not polarized and has changeover contacts *a6* represented in Fig. 4. The magnet M3 shown in Fig. 3 is identical to the magnet M3 represented in Fig. 1.

The relay R*el*, Fig. 2, of the test member A1, Fig. 1, has a contact *a1*, Fig. 4. This contact is thus representative in Fig. 4 of the member A1. Equally, contacts *a2*, *a3*, *a4* and *a'1*, *a'2*, *a'3*, *a'4*, *a'5* of the same design as *a1* are representative in Fig. 4 of the members A2—A5 and A'1—A'5, Fig. 1. These contacts are double-sided as shown, forming two make-contacts of which either one or the other will be closed depending upon whether either the north pole or the south pole of the magnets M1, M2, these being identical to magnet Z, comes to affect the test member selected from among A1—A5 and that selected from among A'1—A'5, such selection having been accomplished through setting the magnets M1, M2 correspondingly. To distinguish between the two make contacts of *a1—a5* and *a'1—a'5*, let them be spoken of as left-hand contacts and right-hand contacts, as viewed in the drawing. The circuit relationships in the case of Fig. 2 are so chosen that whenever the arrangement there shown is affected by the north pole of magnet Z (=M1 or =M2), the left-hand contact of *a1* shall be closed, whereas the south pole thereof shall close the right-hand contact of *a1*. This is also true of any one of the double-sided contacts *a2—a5* and *a'1—a'5*.

By 1–10 and A–K, Fig. 4, current-consumers which may comprise a suitable form of switching or signalling device are denoted. These are connected to a battery U to which the contacts *a1—a5* and *a'1—a'5* are joined as shown. The consumers may be of any suitable construction and are so connected with these contacts and over the contacts *a6* that they can be combined by them into pairs 1, A; 1, B; 1, C . . . 1, K; 2, A; 2, B; 2, C . . . 2, K; . . . 10, A; 10, B; 10, C . . . 10, K. In this way, with ten consumers 1–10 and ten consumers A–K as here shown by way of example, 10 times 10=100 such combinations are possible. These pairs of consumers served each to control the setting mechanism of a routing switch belonging to them alone. The arrangement here shown thus enables the control of 100 routing switches.

The consumers may be electromagnetic relays. Each such relay of a pair has a make-contact in the circuit of the setting mechanism for the routing switch belonging to this pair, these two contacts being connected in series.

With the circuitry at normal as shown, the left-hand make-contact of *a1* is in circuit connection with consumer 1 while the right-hand contact thereof, open like the former, is in circuit connection with consumer 6, as is indicated by arrows and the numerals 1 and 6, these arrows and numerals indicating that *a1* is connected over *a6* to consumer 1 on the one hand, and to consumer 6 on the other hand. Equally, the left-hand contact of *a'1* is in circuit connection with consumer A while the appertaining right-hand contact is in circuit connection with consumer F. Conversely, with the contacts *a6* switched over, *a1* will be in circuit connection with the consumers A and F, *a'1* with the consumers 1 and 6. In the same manner contact *a2* is in circuit connection either with consumer 2 or with consumer 7, or either with consumer B or G, contact *a'2* in circuit connection either with B or with G, or either with 2 or 7, and so on.

Let us now contemplate the destination marking of the carrier shown in Fig. 1. By means of the handles Y1, Y2 the magnets M1, M2 and the discs S1, S2, rigid with these, have been so turned that in the aperture B1, the numeral 1, and in the aperture B2, the letter A, are seen, respectively. The carrier is thus intended for a station 1A. In this case the position which magnet M1 has been given is such that, when the carrier is passing by the test equipment A1—A5 and A'1—A'5 of the transmission tube T, the north pole N of M1 acts on A1 while the north pole N of M2 acts on A'1. Accordingly, as will be understood from the foregoing, the contacts *a1*, *a'1*, Fig. 4, close their left-hand make contacts. Hence the consumers 1 and A are operated in the circuits U, 1, *a6*, *a1* (left-hand contact), U and U, A, *a6*, *a'1* (left-hand contact), U, respectively. 1 and A then cooperate as stated, to set the routing switch for station 1A.

If, further, the carrier is to be sent to a station 6F, for instance, then the magnets M1, M2 must be so turned that the apertures B1, B2 display the numeral 6 and the letter F, respectively. Thereby the magnets M1, M2 are given a position which is the reverse of that shown in Fig. 1, so their north poles N, when the carrier is passing by the test equipment A1–A5, A'1—A'5 of tube T, will not face anyone of these test members. But the south poles S come to affect the members A1, A'1. Therefore, as will be understood from the foregoing, the right-hand contact of *a1* will close the circuit U, 6, *a6*, *a1* (right-hand contact), U while the right-hand contact of *a'1* will close the circuit U, F, *a6*, *a'1* (right-hand contact), U. The consumers 6 and F are thus operated to set conjointly the routing switch for station 6F.

Let us contemplate still another destination marking, such as 5, D. In this case the carrier has been so adjusted, through turning the parts M1, S1, M2, S2, that its aperture B1 displays the numeral 5 while its aperture B2 displays the letter D. Consequently the north pole N of magnet M1 is now in such a position that, when the carrier is passing by the test equipment A1—A5, A'1—A'5 of tube T, the north pole of M1 comes to affect the member A5 while the north pole of M2 will affect the member A'4. None of the test members are facing the paths of the appertaining south poles. The north poles of M1, M2 thus act to close the left-hand contacts of *a5*, *a'4*, Fig. 4, in accordance with what has been stated, whereby the circuits U, 5, *a6*, *a5* (left-hand contact), U and U, D, *a6*, *a'4* (left-hand contact), U are completed to operate the consumers 5 and D. These then cooperate to set the routing switch for station 5D.

If the position of the carrier in tube T is the reverse of that shown in Fig. 1, so that magnet M3 will affect the test member or change-over device A6, the contacts *a6* thereof will be switched over as stated herebefore. Assume the destination marking to be again 5, D as in the case just contemplated, then with the carrier in that inverted position the north pole of M1 comes to affect not A5 but A'5 while the north pole of M2 will act on A4 instead of A'4. Accordingly, the left-hand contact of *a'5* and that of *a4* are closed in accordance with what has been described in this respect. As just stated, the contacts *a6* are likewise switched. The circuits thus completed are U, *a'5* (left-hand contact), *a6*, 5, U and U, *a4* (left-hand contact), *a6*, D, U, so in this case too the consumers operated are 5 and D, which then cooperate as stated to set the routing switch for station 5D.

Instead of the circuits represented in Figs. 2 and 3, any other suitable arrangements may be provided. The carrier as here shown is likewise susceptible of modification. For example, the handles Y1, Y2, shown as a sort of knobs, may be lever-type.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention.

What is claimed is:

1. In combination, a dispatch tube, a carrier, means for preventing rotation of said carrier about its longitudinal axis during its passage through said tube, a destination control station, a plurality of magnetic field test devices at said station located in a plane at right angles to the axis of said tube and respectively arranged at different angular positions with respect to said axis, a

bar magnet, and means for adjustably mounting said bar magnet on said carrier to permit it to be oriented in a plane at right angles to the longitudinal axis of said carrier, whereby said test devices are selectively influenced during the passage of said carrier through said tube.

2. An arrangement according to claim 1 in which said bar magnet is rotatably mounted on an end wall of said carrier.

3. An arrangement according to claim 1 in which said carrier comprises a closure cap and wherein said bar magnet is rotatably mounted on said cap.

4. An arrangement according to claim 3, wherein said bar magnet is rotatably mounted on the inside surface of said cap.

5. An arrangement according to claim 4, further comprising an indicating disc rigidly fixed to said bar magnet, an adjusting means fixed to said disc and projecting through an aperture in said cap, and a further aperture in said cap through which indications on said disc are displayed.

6. In combination, a dispatch tube, a carrier, means for preventing rotation of said carrier about its longitudinal axis during its passage through said tube, a destination control station, a plurality of magnetic field test devices at said station located in a plane at right angles to the axis of said tube and respectively arranged at different angular positions with respect to said axis, a plurality of bar magnets, and means for adjustably mounting said bar magnets on said carrier to permit them to be oriented in a plane at right angles to the longitudinal axis of said carrier, whereby combinations of said test devices are selectively influenced during the passage of said carrier through said tube.

7. An arrangement according to claim 6, wherein said test devices are arranged in groups, the number of said groups corresponding to the number of bar magnets and further comprising an additional test device associated with said dispatch tube, an additional magnet mounted on said carrier to cooperate with said additional test device, current consuming devices arranged in groups equal in number to said groups of test devices, change-over switch means for transferring the control by said test devices from one group of current consuming devices to another, and means for actuating said change-over switch means responsive to the influencing of said additional test device by said additional magnet.

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