

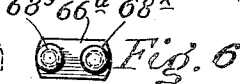
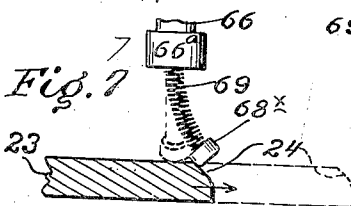
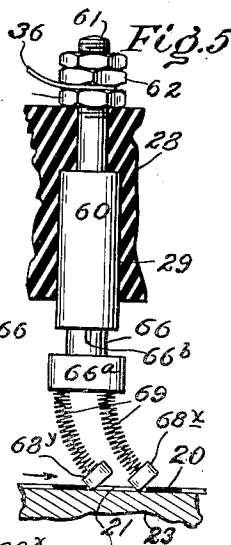
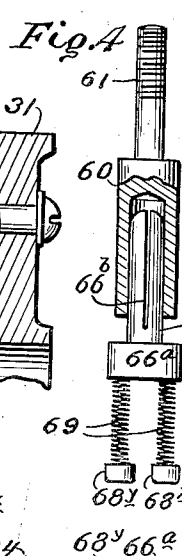
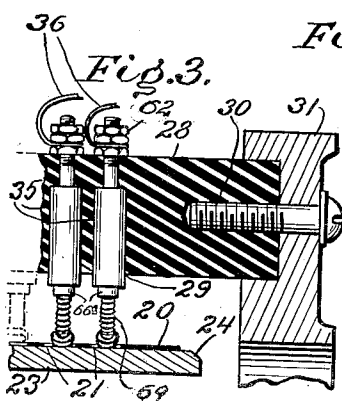
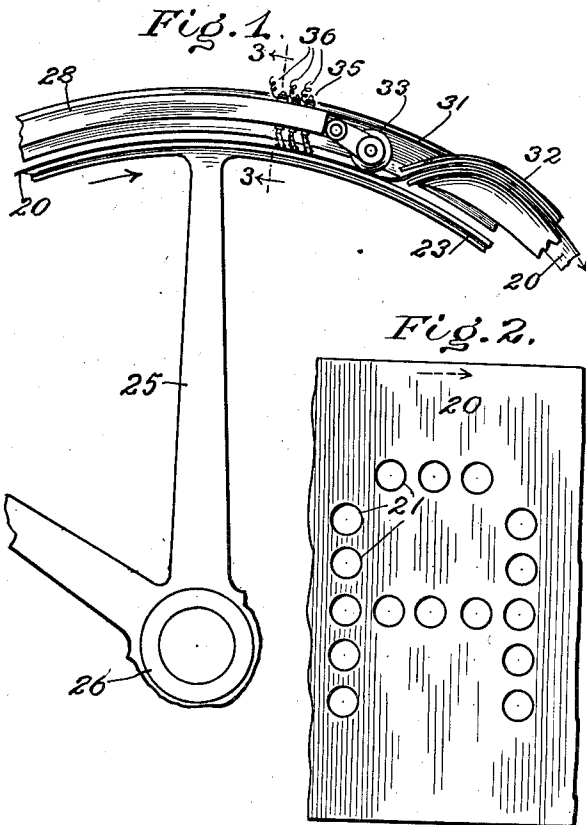
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CIRCUIT CONTROL MEANS

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CIRCUIT CONTROL MEANS

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1 Claim. (Cl. 200—46)

This invention relates to circuit control means of the kind embodying electric contact devices in combination with a traveling control element, band or strip. The invention relates particularly to circuit control means embodying a great number of circuits, extending for example to electric lamps, and operated by a corresponding number of contact devices under the control of the traveling band or other element.

An important commercial use of circuit control means of the class referred to is the operation of so-called traveling message signs wherein a bank of fixed lamps, arranged in a field of columns and rows, is operated by a corresponding bank of contact devices, each in circuit with one or more lamps, said devices being methodically and automatically controlled by the specially prepared traveling element or band in a manner to produce upon the lamp bank a prearranged display of letters, pictures or symbols apparently traveling across the field, in the case of letters and words from right to left. An instance of a traveling sign apparatus to which the present invention is applicable is disclosed in prior patent of Jimenez 1,844,770 of February 9, 1932, to which type of apparatus the present invention has been adapted, for purposes of illustration, it being understood that the invention is useful in or with various other traveling sign apparatuses, or other classes of circuit control means.

The objects of the present invention include the improvement of the construction, mounting and operation of electrical contact devices of the kind referred to, and to improve the combination and cooperation thereof with the traveling control element or band. Particular objects are to afford an electric contact device which will be simple and durable in construction and easy of adjustment, repair and replacement.

Other objects and advantages will be explained in the hereinafter following description of several embodiments of the invention or will be apparent to those conversant with the subject. To the attainment of such objects and advantages the present invention consists in the disclosed novel electric contact device and the novel cooperation of the contact device and the traveling control element, as well as the novel features of combination, construction and arrangement herein disclosed.

In the accompanying drawing Figure 1 may be considered a front elevation of a part of a circuit control means embodying the present invention, this figure in part corresponding with a part of

Fig. 2 is a top or face view of a traveling controller, sheet or band such as may be used in the apparatus of Fig. 1 cooperatively with the contact device hereof.

Fig. 3 is a partial transverse section on an enlarged scale taken on the line 3—3 of Fig. 1.

Fig. 4 in front elevation, partly in section, shows the detail construction of the contact device.

Fig. 5 is a view corresponding with Fig. 4, but showing the cooperation of the contact device with the traveling control element or band.

Fig. 6 is a bottom view of the device shown in Fig. 4.

Fig. 7 is a right elevation view of a contact device like Figs. 4 to 6, indicating especially the cooperation of the device with the support or plate on which the band travels when said plate is in the act of being shifted laterally into its operative position.

The traveling control element may be in various forms, such as articulated plates, rotary disks or cylinders, but for illustration is herein shown as a traveling band or strip 20, for example of heavy paper, the control of the contact device being effected by a system of selectively placed control points 21, which in this illustration consist of depressions or perforations. The traveling band is shown in Figs. 1, 3, 5, etc., as advancing longitudinally over a suitable table or support 23, which in the illustrative case is composed of metal so as to constitute a part of the lamp circuits, each contact device adapted to drop or extend into or through the depressions or perforations to close the circuit, namely by contact with the plate or table 23. The principles of action however may be employed with types of traveling control element not requiring a metallic supporting table beneath.

Preferably, and as shown in said prior patent, the table or support 23 is of the advancing or traveling type, moving along with the traveling band which it supports. As seen in Figs. 3 and 7 hereof the lateral edge of the table 23 is beveled at 24 so that when bodily removed to give access to the contact devices the table may readily be reinserted in proper relation to the bank of contacts, the several contacts riding up laterally over the bevel 24, as shown in Fig. 7, and upon the top surface of the table. Further, preferably the table or plate 23 is in the form of a rotary drum or cylinder, typically represented as the rim or flange of a wheel, the spokes 25 of which extend from a hub 26. The wheel may be rotated and the perforated band advanced in

unison in the manner disclosed in said prior patent or in any other advantageous manner.

The several contact devices to be described are shown as supported in a fixed support or plate 28 which may be of bakelite or other insulating material, and is shown curved to conform to the rim 23 of the wheel, and as having a system of radial recesses 29, each of two diameters and with an intermediate shoulder. By screws 30 the insulating plate 28 is attached to opposite vertical frame members 31.

In Fig. 1 the traveling band 20 is shown as advancing rightward above the traveling plate or wheel rim 23 and beneath the contact supporting block 28. Corresponding generally with said prior patent the perforated band, beyond the system of contact devices, is diverted from the wheel rim and passed through a curved guide 32, whence it may travel through a suitable circuit or path, and if desired may return and repeat, in the form of an endless band. Between the bent guide 32 and the plate 28 is shown a guide roll 33 which may be spring pressed upon the band to hold it snugly to the wheel rim at this point.

In Figs. 1 and 3 is indicated the bank or system of contact devices 35. Only three transverse rows are shown in Fig. 1, it being understood that a large series of rows may be mounted in the plate 28 according to the length of the sign. Only two columns of said devices are shown in Fig. 3, it being understood that the series may be extended as desired according to the height of the sign. Extending from each of the contact devices 35 is shown a contact wire 36, and it will be understood that the several wires 36 constitute parts of separate circuits, extending for example to separate lamps, and to a source of current for separate control of the lamps through the contact devices. Preferably the support 23 and the current source are common to all of the circuits.

The details of one form of contact device 35 are shown in Figs. 4 to 7. It comprises a barrel 60 fitting within the shouldered recess 29, the barrel having a shank 61 extending outwardly and at its exterior end having a system of nuts 62 securing the device in place and serving for connection of the wire 36. In the form shown in Figs. 4 to 7 the hollow barrel 60 has within it a post 66 which has a lower head 66^a and its shank is slotted at 66^b to give compressibility and frictional engagement in the recess 29. The contacts 68^x and 68^y are metallic buttons provided at the lower ends of helical springs 69 secured in the post head 66^a. Preferably the springs 69 are open helices, giving a quite resilient longitudinal deflection as the control band travels under the contacts, as seen in Fig. 5, this arrangement also permitting lateral deflection as shown in Fig. 7 operative during the inserting of the wheel rim 23 in place. The contacts and supporting springs in this form are parallel and remain so when deflected.

One of the characteristic features of the present invention is that the contact device hereof comprises a plurality of contacts in tandem, that is, offset longitudinally, and mounted upon a common support, in this case the post 66. Thus a first contact 68^x is shown and a second contact 68^y, in the form of small metallic buttons carried on separate springs 69 attached or riveted to the head of post 66. The tandem contacts 68^x and 68^y, two in number, or three or more, if desired, are mechanically independent,

but are arranged cooperatively to operate a single circuit under control of the traveling band. As shown however the two contacts and their carrying springs are in permanent electric connection, and so arranged that either one or both of the contacts may effect the closing of the circuit corresponding to the contact device which includes them. Preferably the two contacts possess independent movement or resilience and therefore separate actuation. Thus the contact 68^y may yield with the advance of the traveling controller, by reason of its supporting spring 69; while the contact 68^x, being on a separate carrier spring 69, may independently rise and drop during control operations.

A particular cooperation is shown between the resilient twin contacts 68^x and 68^y and the perforated control band 20 as shown in Figs. 2 and 5. The control band 20 is perforated with relatively short perforations 21, circular, square or of other shape, and this invention obviates the need of elongated perforations or slots where a given circuit or lamp is to be operated over an extended period of time. The longitudinal spacing of the perforations has a relation to the spacing or distance apart of the twin contacts 68^x and 68^y. Thus taking the cross bar of the letter A illustrated on Fig. 2, this consists of a longitudinal row of perforations 21 separated by portions or bridges of paper, the perforations or depressions having longitudinally a greater dimension than the bridges. On an enlarged scale this is shown in Fig. 5. In relation to these perforations the twin contacts are spaced in tandem in a special way, namely, so close together that both of them simultaneously can engage a single perforation, affording double contact with the metal plate beneath, as shown in Fig. 5, but so far apart that the two can engage simultaneously in successive perforations, one at each side of the separating bridge.

By this arrangement and operation a substantially continuous contact is maintained, by one or the other or both contacts, throughout the extent of the longitudinal line of perforations effecting the control. The corresponding lamp is not intermittently extinguished but kept continuously energized, and therefore superior illumination is effected. The band is not weakened by the presence of elongated slots, and having only short perforations is relatively strong and durable; and is more easily and cheaply constructed and handled. The described spacing permits the first contact to enter each short perforation and close the circuit by making contact with the metal support beneath before the second contact rises from such perforation to the paper bridge beyond, and permits the second contact to drop into the next succeeding perforation before the first is lifted from the metal support.

There has thus been described a circuit control means containing the objects and embodying the principles of this invention; and since many matters of combination, construction and arrangement may be variously modified without departing from the principles the invention is not intended to be limited to such features except so far as set forth in the appended claim.

What is claimed is:

A multiple-circuit control mechanism of the kind having a system of electric contact devices arranged in a plurality of successive rows and adapted to be operated by a traveling control band formed with a number of longitudinal se-

ries of closely spaced control perforations, and having a rotatably mounted drum for supporting the traveling band and having a fixed support for supporting a system of contact devices; and characterized by comprising, for each contact position, a pair of contact devices in tandem carried by said fixed support in a removable and replaceable manner and terminating in tandem contacts in electrical connection with each other, so spaced apart longitudinally, less than the length of a single perforation, that the two contacts may engage in the same perforation at the same time, yet greater than the bridge between the perforations so that the two contacts may engage in successive perforations at the

same time, whereby to maintain continuously closed the circuit connected with said device during the passage of such series of perforations; and said contact devices each comprising a universally yieldable spring device mounted removably on said fixed support and having a contact at its free extremity, whereby the tandem contact devices so constructed and mounted may yield longitudinally during travel of the band and also may yield transversely, thereby permitting relative transverse movements of the drum for removing or replacing the drum and to afford access to said contact devices.

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