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T. P. MILLER

2,183,653

CONTROL SWITCH

Filed Oct. 18, 1937

FIG. 2

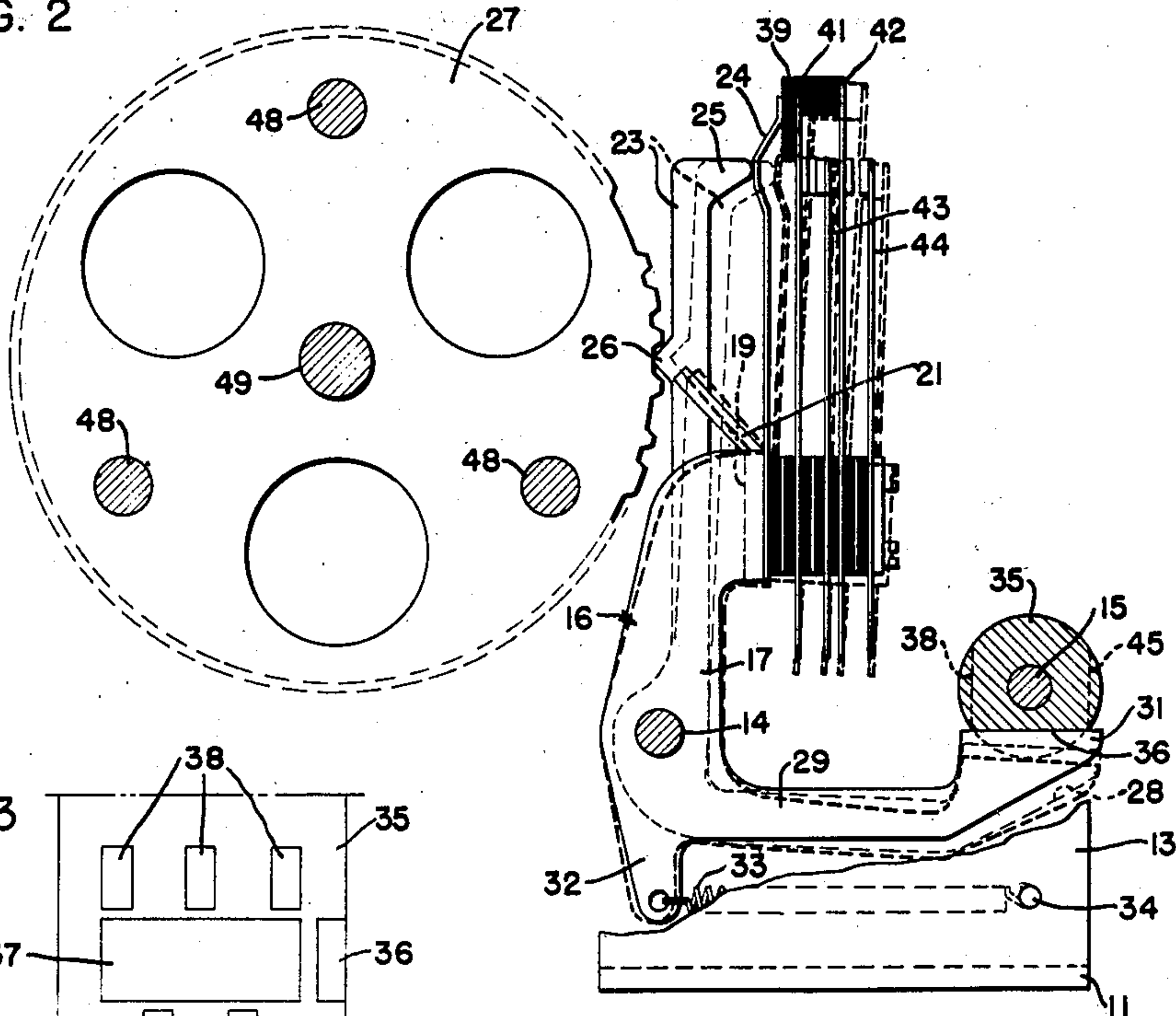


FIG. 3

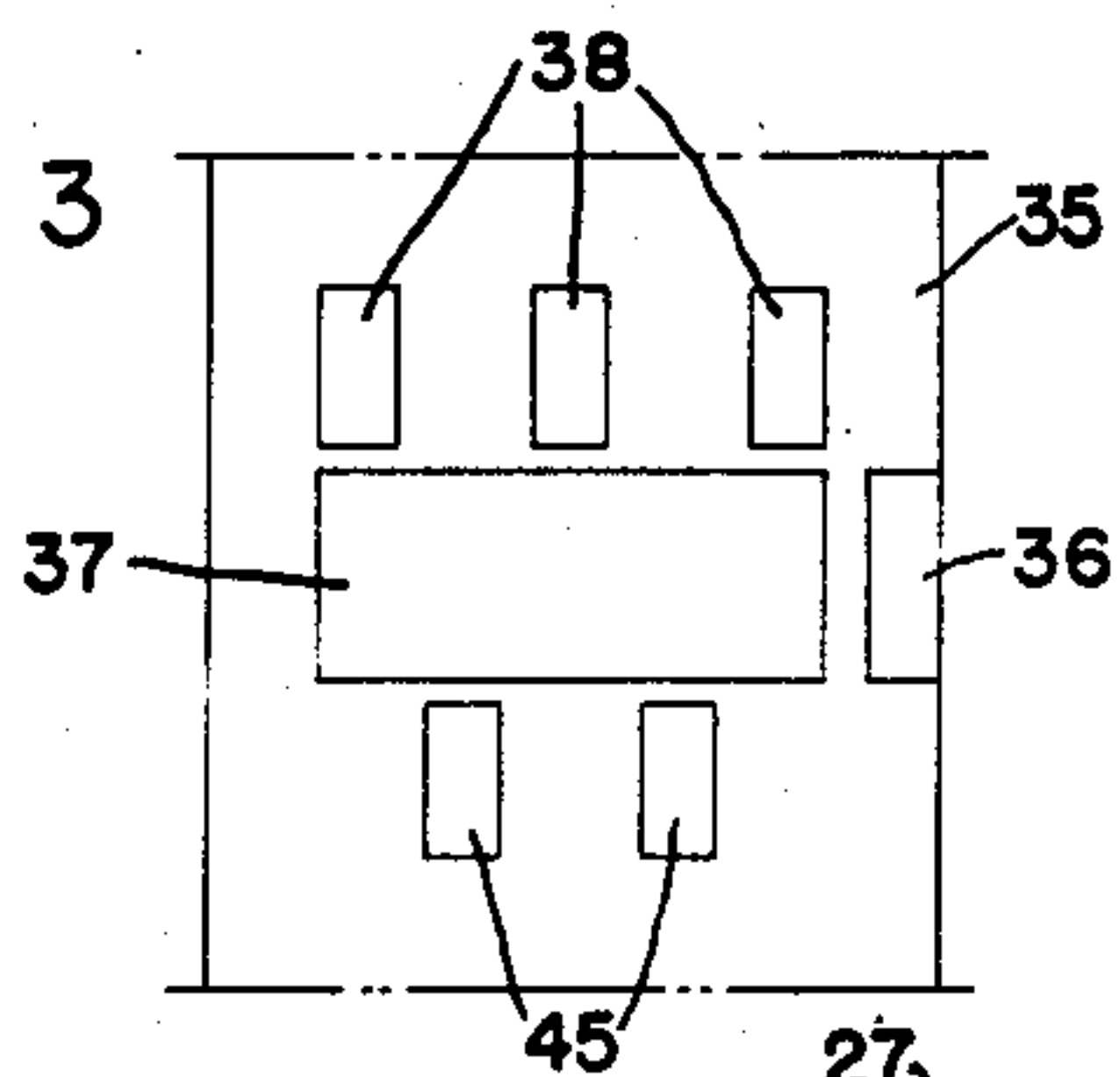


FIG. 1

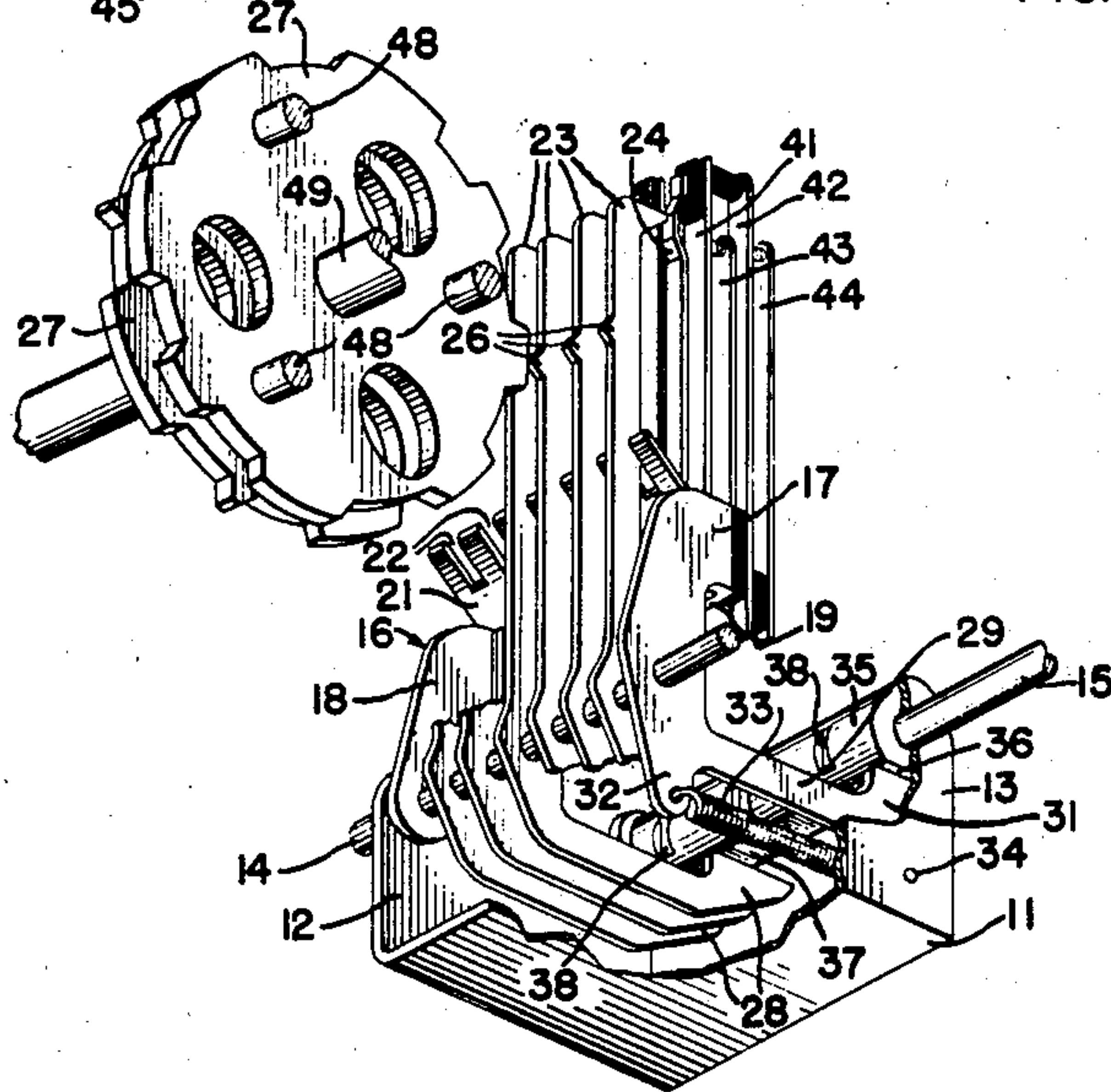
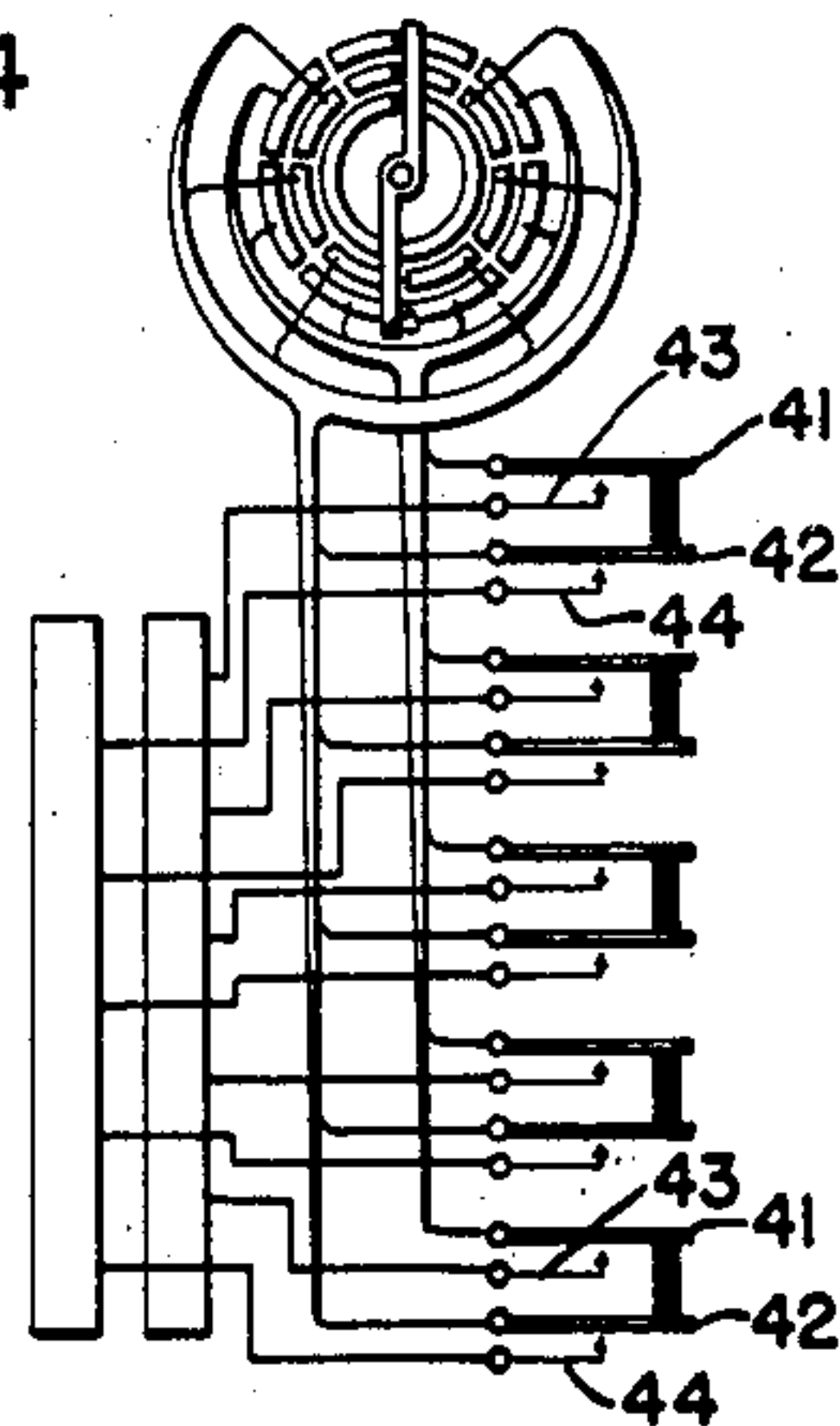


FIG. 4



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CONTROL SWITCH

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Application October 18, 1937, Serial No. 169,625

10 Claims. (Cl. 178—69)

The present invention relates to mechanical switch controlling apparatus and particularly to code-control switching apparatus adaptable to printing telegraph systems.

5 In transmitting apparatus adaptable to the transmission of code signals singly or code signal messages, it has been found advantageous to employ means for switching a common transmitting distributor among a plurality of different types
10 of test signaling or transmitter equipment. In certain types of test signaling transmitter equipment, there are employed a set of coded elements predeterminedly set and arranged for the transmission of familiar test messages. The fidelity
15 of the receiving device may be determined by contrasting the reproduced message record with the known test message. In arrangements of this class, the test message may be impressed upon the periphery of a set of notched code discs, which
20 rotate in timed relation with the transmitting distributor, conditioning as they do so a set of transmitting contacts. At the conclusion of one test message, a succeeding one is started, the continuity being interrupted only upon the cessation of transmission.

25 Another form of test signal transmission entails the use of a device for conditioning a set of contact elements to cause to be transmitted continuously a single character or several single characters alternatively. Certain utilities are
30 obtained from the use of single test characters which are not obtainable for universal test purposes from miscellaneous message matter such as is transmitted by a message coding apparatus as will be described later. One of the utilities
35 thereby obtained is in conjunction with a stroboscopic receiving apparatus where, by using similar repeated characters, there is afforded an opportunity of reproducing a visual index from which variations of consecutive character signals
40 may be visibly ascertained, so that in the event of certain classes of disorder manifest more easily by variations or discrepancies in similar character signal transmission, the visual index produced at the receiving equipment affords a means
45 for studying specifically the certain types of disorder among which are signal bias and end distortion.

50 Transmitting equipment contemplating these features is disclosed and described in copending application Serial No. 162,328, filed September 3, 1937, by E. W. F. Hanke et al. In said copending application, means are provided for transmitting miscellaneous matter messages as well
55 as two types of single character signals; namely, R and Y. The present invention concerns itself with providing means to be associated with transmitting equipment such as that referred to, and has as its object instrumentalities for switching
60 a common distributor apparatus readily and con-

veniently from one to another of several different classes of signal transmission apparatus under the control of a simple manual device.

A comprehensive disclosure of one embodiment of the present invention is contained in the detailed specification following hereinafter, reference being had to the accompanying drawing in which like reference characters designate similar parts throughout, and in which,

Fig. 1 is a detailed perspective view of one embodiment of the present invention is applied to a mechanism resembling that illustrated in said copending application;

Fig. 2 is a transverse sectional view through the apparatus featured in Fig. 1 showing, by dotted outline, an intermediate condition of operation;

Fig. 3 is a pictorial development of the surface of the cylindrical control cam, a principal and fundamental element of the present invention, and

Fig. 4 is a diagrammatic representation illustrating a typical code bias signaling transmitter and indicating a manner of circuit arrangement whereby several contact assemblies are associated with a single plane rotary transmitting distributor 10.

Referring now more particularly to the accompanying drawing, the reference character 11 designates a supporting structure which itself is carried upon the base or frame of a test message transmitting unit. Two side walls 12 and 13 integrally formed with the structure 11 are bent upwardly, and these afford journals for shafts 14 and 15.

Shaft 14 constitutes an axis about which an assembly unit 16 of contacts and contact controlling levers is pivoted. The side walls 17 and 18 of unit 16 are connected together by means of a transverse portion 19, while a continuation breadthwise of said member 19 extending upwardly and leftwardly, as viewed in Fig. 2, is slotted so as to resemble a comb 21. Within slots 22 of comb 21 are confined against side play the contact controlling lever 23. They, too, are pivotally supported upon shaft 14, and each of them is maintained in its counterclockwise extreme position, Fig. 2, by an individual flat metallic spring 24.

All of the levers 23 are identical and their contour is best indicated in Figs. 1 and 2. Point engagement between levers 23 with their individual flat metallic springs 24 is maintained through a sidewardly extending projection 25 integrally formed with each of the levers 23, while just below the projections 25 and extending in an opposite direction from them are a corresponding series of projections 26 each of which, together with its lever, aligns horizontally with one of the miscellaneous message matter code discs 27 (see

Fig. 1). The body of each lever 23 below its journal at shaft 14 extends rightwardly (Fig. 2) for a short distance then upwardly, terminating with a cam follower section 28. A similar arm indicated 29 also extends rightwardly of the side wall 17 which forms a journal support of the assembly cradle 16. A similarly upturned extremity 31 thereof follows cam 35 seeking out the dwell 36. In the case of the frame 16, a downwardly extending lobe 32 is provided to which one end of a coil spring 33 is attached, whose other end is anchored at 34 to the side frame 13.

As will be noted from Fig. 2, follower sections 28 of the several levers 23, as well as follower section 31 of the cradle assembly 16, are arranged in transverse alignment and are spring urged upwardly beneath the surface of a cylindrical cam 35. Shaft 15 is a manual control shaft and at the foremost extremity thereof (not shown) there may be provided an indicator and handle, the former for denoting, with respect to a mounting panel, the relative angular position of said shaft. Cam cylinder 35 is secured to shaft 15, and, in accordance with the instant embodiment, is designed in contemplation of three alternative conditions of setting. Accordingly there are provided at 90° angular intervals on the surface of cylinder 35 as illustrated in the development, Fig. 3, various distributions of flat spot and arcuate contacting portions. Each distribution is arranged among individual elements of the cylinder as best indicated in the cross sectional view of Fig. 2. The cylinder 35 serves to engage said follower sections 31 and 28 in order to rock the cradle 16 and the levers 23 for the purpose of obtaining, as will be described later, a plurality of switching arrangements between miscellaneous message control cams 27 and the individual-character test signals, the code combinations of which are obtained by means of the cam flat spots 38 and 35 and the portions intervening them which together accordingly position said levers 23.

The switching apparatus is capable of three conditions and in Figs. 1 and 2, the apparatus has been illustrated as it appears during its intermediate position, at which time follower 31 is seated within the dwell or flat spot 36 (see also Fig. 3). Flat spot 36 affords sufficient clearance to portion 31 to permit of the counterclockwise rotation of the entire assembly, including cradle 16, under the influence of spring 33 to an extent whereat the projections 26 come into contact engagement and rest against the peripheries of their respective code discs 27.

From the development, Fig. 3, it may be seen that flat spot or dwell 36 is in longitudinal alignment upon cam cylinder 35 with extensive flat area 37. Accordingly, at the time when flat spot 36 is presented to the feeler portion 31 of assembly 16, the extensive flat area 37 is presented to the feeler sections 28 of the several levers 23. At other times in the positioning of cylindrical cam 35, no flat area is presented to the feeler section 31 (see Fig. 3). For this reason, during such other positions of cylinder 35, the assembly including frame 16 is maintained in the clockwise extreme position indicated in dotted outline (Fig. 2).

In one of the other positions, 90° counterclockwise from the position indicated in Fig. 2, the flat spots 38 are presented so as to receive the feeler sections of certain ones only of the levers 23 which, in their ordinal sequence, are the first, third, and fifth levers permitting these levers to

be rotated by their springs 24 in a counterclockwise direction to a sufficient degree that they recede from contact closing position. The remaining levers; namely, the second and fourth, are meanwhile maintained in their clockwise extreme position whereat the pressure is communicated back through their individual springs 24, the individual insulation blocks 39 to the active blades 41 and 42, causing them to engage their contactors whose respective inert blades are indicated 43 and 44. The contactors 41—43 and 42—44 are instrumental in conditioning the transmitting elements of a transmitting distributor, as generally shown in Fig. 4, so that those of said pairs of contacts which are closed enable the transmitter to transmit current signal intervals over a line while those of them which are permitted to come ajar are caused to transmit no current signal intervals.

When the cylindrical cam 35 is rotated 90° in a clockwise direction from that illustrated in Fig. 2 which would be 180° from the last supposed position, reversal of the previous condition prevails, whereat flat spots 45 permit the first, third, and fourth levers 23 to assume an open contact condition while the second and fourth ones of said levers 23 are in the opposite or contact closing condition. The distribution of flat spots 38 and 45 is, in the instant case, an arbitrary one and is made in accordance with two predetermined code signals of a five unit code. The permutation established by the flat spots 38 and their intervening lever actuating portions corresponds to the alphabetical character R, while the flat spots 45, which are located at 180° therefrom together with their intervening portions, cause to be formed the alphabetical character Y. These two characters are chosen for test purposes because their component elements constitute an alternate reversal of current throughout their extent, while the corresponding elements of two signals are of opposite polarity.

The two settings, during which the code signals R and Y are transmittable in accordance with the instant embodiment, are referred to herein for convenience as the R and Y positions, while the intermediate one mentioned above is known hereinafter as the miscellaneous matter position. The coded discs 27, five in number, are transversely secured by means of bolts 48 and constitute an integral assembly which is secured upon the shaft 49, the latter being continuously driven from any suitable source of power, such as the principal drive apparatus utilized for operating the transmitting distributor. The peripheries of the several coded discs 27 are notched so that during each cycle of revolution, a complete message is communicated to the several contact controlling levers 23. Any standard test message may be employed for this purpose, such as the well known, "A quick brown fox, etc."

It is to be noted that the contact controlling levers are in engagement with the code discs 27 only during the intermediate position of cam 35 when the entire assembly is permitted, by flat spot 36, to rock counterclockwise, Fig. 2. During this condition, the inclined surface of each projection 26 rides up and down the projections and recesses of its corresponding code disc. The assembly of code discs 27 rotates at a considerably reduced speed compared to that of the transmitting apparatus. The several peripheries of the discs 27 engage their projections 26 urging them permutably, inwardly, and outwardly to effect accordingly the closure and opening of the contact

sets 41—44. In this way a stored code message is produced in terms of permutation code telegraph signals, which signals are then issued over the transmitting distributor apparatus in accordance with any of several well-known arrangements. The copending application referred to above indicates one such embodiment, to which the present apparatus is especially adapted.

From the foregoing, it is to be understood that by means of the instant embodiment of the present invention there is obtained a distributor switching arrangement for associating with a single bias adjustment transmitter to be used for issuing test signals any of several types of signal generating mediums, such as, the miscellaneous message matter set of code discs 27 or a single signal code setting apparatus. This is provided by the levers 23 themselves in conjunction with the flat spots 33 and 35 on the cam 27.

While the present invention has been explained and described in contemplation of a particular embodiment, it will be understood that numerous modifications and variations may be invoked without departure from the spirit of the present invention. For this reason it is intended not to be limited by any of the detailed description contained in the foregoing specification nor by the particular illustrations of the accompanying drawing, but to be afforded instead the margins of structural equivalency indicated by the hereunto appended claims.

What is claimed is:

1. In a transmitting apparatus, a set of transmitting contacts, a set of transmitting contact controlling members, a cylinder having control characteristics thereon for establishing a fixed setting of said controlling members, and a set of code discs having miscellaneous message matter stored therein for effecting a progressively changeable setting upon said controlling members.

2. In a telegraph transmitter, a set of transmitting contacts, contact controlling means, said contacts corresponding in number to the permutative elements of a code system, a set of coding discs each associated with one of said contact controlling means, and a device for withdrawing said contact controlling means from contactual engagement with said coding disc and for simultaneously establishing an arbitrary fixed code setting on said contact controlling means.

3. In an apparatus for switching between several automatic control devices of a telegraphmitter, the combination of a series of contact members, a corresponding series of contact controlling members each having a portion communicable with each of said automatic control devices, and means controlled by a single rotatable knob for alternatively bringing said contact controlling members into communication with each of said automatic control devices selectively.

4. A switch controlling mechanism including a pivotal shaft, a control shaft, an assembly bracket pivotally supported on said pivotal shaft, a set of contact elements carried by said bracket, a corresponding set of controlling levers supported on said pivotal shaft within said bracket, a manual control cylinder secured to said control shaft, portions on said controlling levers extending to and presented in close proximity to said cylinder, spring means individual to each of said controlling levers for urging them into contactual

engagement with said cylinder, and a plurality of longitudinal surface elements comprising said cylinder, each element having an individual disposition of elevations and depressions transversely in alignment with corresponding ones of said controlling levers.

5. A mechanical switch comprising in combination a set of contact closure members pivotally supported in parallel alignment, a cylinder pivoted on an axis parallel to the pivotal axis of said contact members, and individual spring means for urging said members rotationally into contactual engagement with said cylinder.

6. The combination set forth in claim 5 in which said members have integrally formed projecting arms which terminate with abutment portions for contacting the surface of said cylinder.

7. The combination set forth in claim 5 in which said cylinder is divided into a plurality of component longitudinal elements each of which is provided with an individual distribution of surface depressions in peripheral alignment transversely with certain of said members to vary accordingly the angular disposition thereof with respect to remaining ones of said members.

8. A mechanical switch comprising in combination a reciprocable supporting cradle, a set of contact closure members, a common shaft for pivotally supporting said contact closure members and said cradle, guide arms integrally associated with each of said contact closure members and with said cradle, a supervisory cylinder pivoted on an axis parallel to said common shaft of said contact members and cradle, and individual tensioning means for urging said guide arms of said cradle and said members rotationally into contactual engagement with said cylinder.

9. A supervisory control mechanism comprising in combination a pivot shaft, a manipulation shaft, a cylinder secured to said manipulation shaft having a plurality of longitudinal elements each with an individual distribution of prominent and recessive surfaces, a supporting bracket pivotally carried upon said pivot shaft having a guide portion extending in a direction of and spring urged into engagement with a peripheral surface of said cylinder, a plurality of contact controlling members also pivoted on said pivot shaft having portions individually associated with predetermined peripheral surfaces of said cylinder, and means for rotating said cylinder to present an individual one of said plurality of longitudinal elements into registration with said extending portions of said bracket and said members.

10. A telegraph transmitter including in combination a transmitting distributor, a plurality of transmitting contacts corresponding in number to distributive elements of said distributor, a set of contact controlling members each associated with one of said transmitting contacts, an apparatus for actuating said contact controlling members having thereon the permutative formation characteristic of a predetermined test message, and a manually controlled device for moving said set of contact controlling members out of range of engagement with said apparatus and also for simultaneously positioning said contact controlling members in accordance with a single permutative code signal.

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