

Nov. 24, 1942.

M. L. HASELTON ET AL

2,302,769

INDICATING DEVICE

Filed March 2, 1940

2 Sheets-Sheet 1

FIG. 1

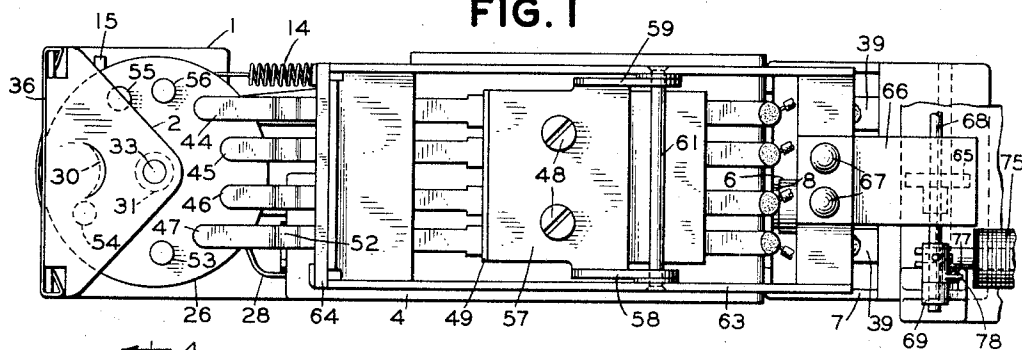


FIG. 2

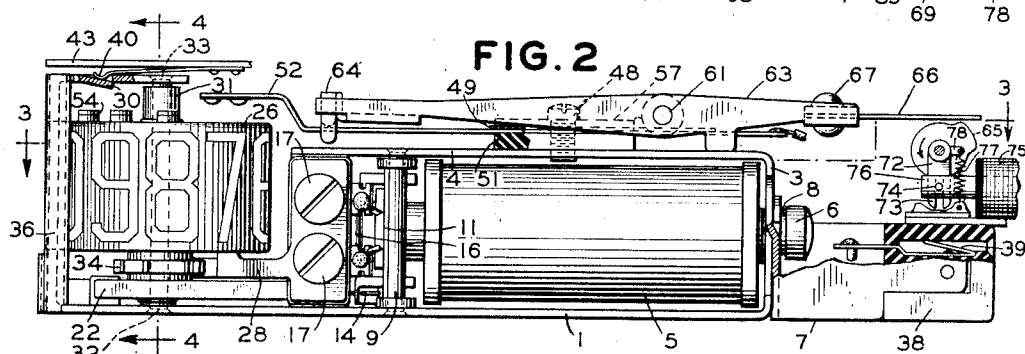


FIG. 3

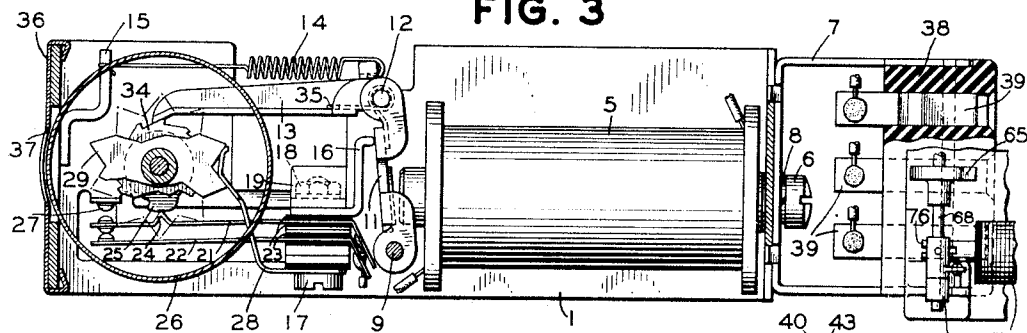
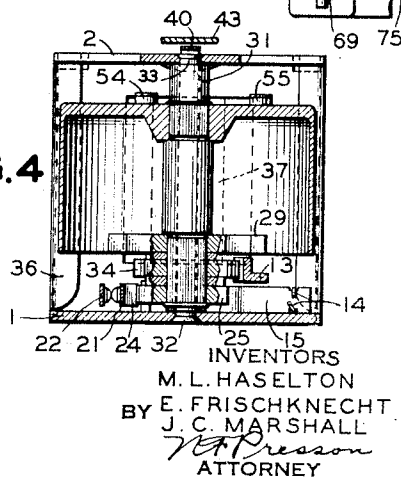


FIG. 5

CONTACT CODE					
DIGIT	SPRING NUMBER				CODE UNITS
	1	2	3	4	
1	x				1
2		x			2
3	x		x		1-3
4		x		x	2-4
5			x		3
6	x			x	1-4
7	x	x			1-2
8		x	x		2-3
9			x	x	3-4
0				x	4
BLANK					

FIG. 4



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2 Sheets-Sheet 2

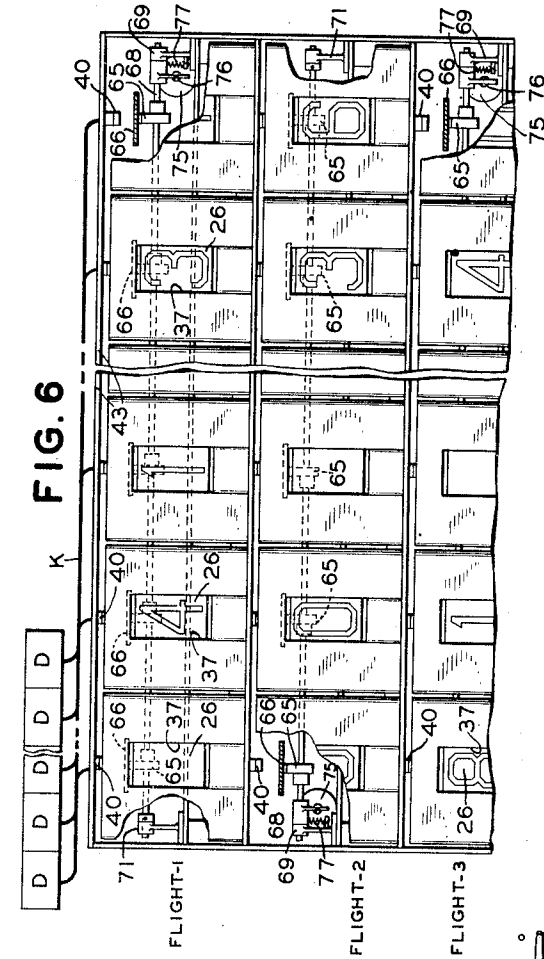


FIG. 6

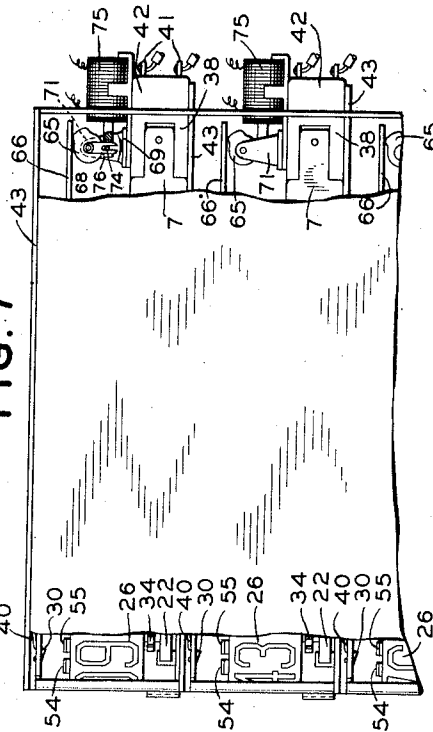


FIG. 7

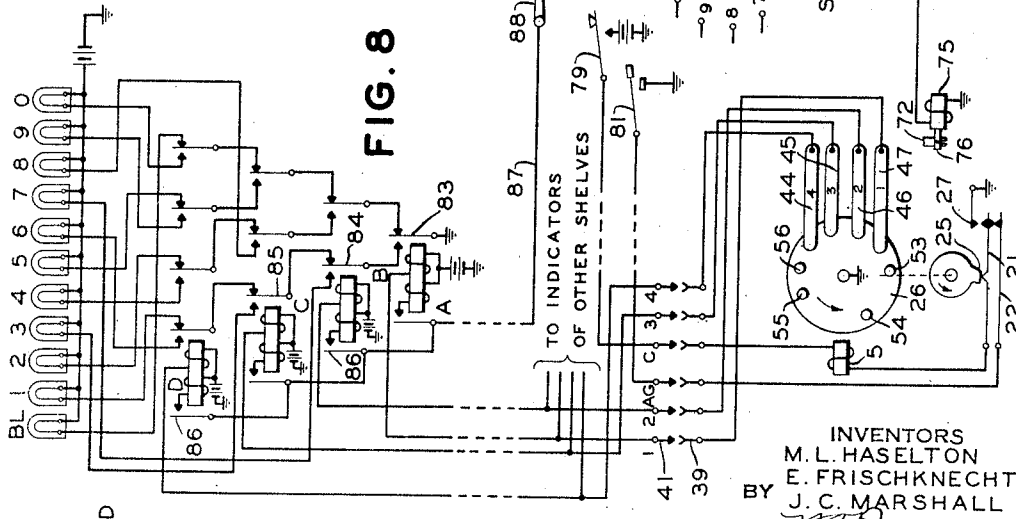


FIG. 8

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2,302,769

INDICATING DEVICE

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Application March 2, 1940, Serial No. 321,846

11 Claims. (Cl. 177—353)

This invention relates to an indicating system and apparatus adapted for use in, or to be appurtenant to, market quotation boards and boards adapted to any announcement or bulletin service other than market quotation services, such, for example, as announcement or bulletin boards employed for the control of airway traffic and the like, wherein an electro-responsive device selectively actuates a member to different positions as determined by electrical impulses transmitted to the device, and particularly to an electromagnetic indicator for selectively displaying different digits or other devices or indicia in accordance with the number of electrical impulses of predetermined character caused to flow through the actuating winding of the electromagnet, the device comprising actuatable members for transmitting electrical impulses in permutation code combination in accordance with the digit or indicia displayed by the device.

In systems now in general use for posting information and data relative to the control of aircraft in flight, hereinafter referred to as airway traffic control systems, it is the general practice to post this information upon bulletin or announcement boards manually by the use of chalk or crayon, one or more attendants being required at the bulletin or announcement boards for this purpose. As is well known, manual methods of posting such a board possess the disadvantage of errors introduced by the posting attendant, non-uniformity of the characters posted and, furthermore, the obscurement of the board by the attendant in posting the same.

One object of the present invention is to obviate the foregoing disadvantages and provide an improved indicator which is rapid in operation and possesses the advantage of reliability in operation and which may be controlled from a distant point.

Another of the advantages resides in a novel and improved structure wherein a relatively small operating current is required to actuate the indicating device.

A further object of the invention is the provision of an indicator unit having embodied therein a settable drum bearing indicia and having contact members for transmitting signals representative of the various indicia displayed by the indicator in any of its moved positions, the actuating members for the indicator and the transmitting contact members being so constructed and arranged that the indicator is especially adapted for use in a system, such as shown in the Marshall and Haselton Patent No. 55

2,246,449, issued June 17, 1941, for the control of airway traffic, in which a considerable number of items of information in regard to a plurality of flights are required to be posted concurrently on a bulletin or indicator board and in which a considerable number of indicators are required for posting each of such items, the space available for such an indicator board being quite limited, and the indicia representing the information posted necessarily being legible to a group of observers at substantial distances from the bulletin board; which indicator unit notwithstanding its small overall dimensions is nevertheless rugged, rapid and accurate in operation, and is adapted to transmit signals to a distant point for actuating other devices for posting at such point the information displayed by the indicator.

A still further object resides in the provision of improved means for enabling the settings of a plurality of adjacent indicating devices to be transmitted simultaneously over a plurality of communication channels for simultaneous display of said settings on other indicating devices.

Another object is to provide a device of the character disclosed which may readily be inserted and removed from a bank of such units for inspection, adjustment, replacement or repair, without disturbing the other units of the bank or the electrical connections thereto.

Still another object of the invention resides in the provision of a system for transmitting electrical signals from a selected device in accordance with the setting of the device, said device having signal transmitting elements arranged to be in operative position in succession with respect to other coacting transmitting elements of the device in successive positions of said device.

An additional object is an indicating and retransmitting device having a plurality of contacts settable to different positions and coacting brushes in which there is no frictional load imposed by the brushes while the device is being actuated to a new setting; more specifically, the arrangement disclosed permits the angular setting of the indicator drum to take place with the brushes disengaged from their associated contacts and separate means are employed to move the brushes into engagement with their associated contacts whenever the setting or stored digit is required to be taken off for comparison, check, or retransmission to actuate another posting device.

Other objects of the invention will appear from the following description taken from the accompanying drawings in which:

Fig. 1 is a plan view of the device.

Fig. 2 is a view in elevation, partly in section, of the device of Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a view, partly in section, taken along the line 4—4 of Fig. 2.

Fig. 5 is a code suitable for use with the device.

Fig. 6 is a partial front view in elevation, of a bank of storage indicators comprising a display or bulletin board.

Fig. 7 is an end view, partly broken away, of the display or bulletin board of Fig. 6, and

Fig. 8 is a circuit diagram of one embodiment of the invention.

Referring now to the drawings specifically, in which like numerals of reference are employed to designate like parts throughout several views, the numeral 1 is employed to designate the lower portion of the frame of the storage device and the numeral 2 the upper portion of the frame. Referring to Figs. 1, 2 and 3 of the drawings, the frame comprises a rear portion 3 thereof and a portion 4 extending, preferably, above and along the electromagnet 5 which is affixed to the rear of the frame 3 by the screw 6 which passes through a member 7 thereby holding the member 7 in rigid alignment with the rear of the frame 3. This rigidity is maintained by the split washer 8 interposed between the head of the screw 6 and the member 7.

A bearing 9 is supported by the frame portions 1 and 4 and has pivotally mounted thereon the armature 11, the other end of the armature 11 being provided with a bearing 12 upon which is pivoted the driving pawl 13. The armature is also provided with a retractile spring 14 attached to the member 15 which, in turn, is secured to the frame of the unit and which may be bent to vary the tension of the spring 14 as desired. The armature 11 is normally urged by the spring 14 against the backstop 16 which is included in the pileup held by the screws 17 and nuts 18 to the member 19 which is affixed to the portions 1 and 4 of the frame in any well known manner; as for example, by welding or brazing. The pileup includes the contact springs 21 and 22 electrically insulated from each other and from the frame by the insulating strips 23. The spring 21 is provided with a bent portion 24, adapted to be engaged by the cam surface 25 when the indicia bearing drum 26 is in the blank position. The cam 25 is made, preferably, of insulating material and causes the contact spring 21 to be moved into engagement with the contact spring 22 when the cam 25 is in the position shown on the drawings. As the cam 25 is moved out of engagement with spring 21, the contacts of spring 21 are disengaged from the contacts of spring 22 and brought into engagement with the ground contact 27, which is in electrical circuit with the frame of the unit. The pileup also includes a jockey spring 28 for engaging the jockey wheel 29.

The drum 26 is provided with the indicia 1 to 9 and 0, and a blank space and is pivotally mounted upon the bearing 31 which is secured to the frame portions 1 and 2 at the bearing points 32 and 33 respectively. The drum is provided with a ratchet wheel 34 having eleven teeth thereon and adapted to be engaged by the driving pawl 13 as the electromagnet armature 11 is operated. The jockey wheel 29, hereinbefore referred to, is likewise provided with eleven teeth adapted to be engaged by the jockey spring 28. The drum is also in rigid engagement with the cam 25 for

controlling the movement of contact spring 21 in accordance with the position of the drum.

The pawl 13 is urged against the ratchet wheel 34 by the spring 35. A mask 36 is detachably mounted on the front portion of the frame of the unit in the manner indicated on the drawings and is provided with an aperture 37 through which the various indicia of the drum are exposed to view.

The arrangement of parts thus far described provides a structure wherein the airgap between the armature and core of the electromagnet is small, thus producing a high degree of efficiency in the operation of the unit. This small airgap is obtained by adjustment of the backstop 16 such that the movement of the driving pawl 13 during the period of decay of the flux in the electromagnet 5 is substantially one-half of the pitch of the ratchet wheel 34, the pitch being defined herein as the distance between corresponding points on adjacent teeth of the ratchet wheel. When the armature 11 comes into engagement with the backstop 16 the jockey wheel 29 will be stepped a distance substantially equal to one-half the pitch of the wheel, and is stepped the remainder of the distance traveled during each stepping operation, by the action of the jockey spring 28 against the opposite side of the tooth of the jockey wheel. The jockey arrangement herein disclosed also causes the drum to be centered at the end of each step thereof, such that the selected indicium is in alignment with the aperture 37 of the mask and, as above stated, causes the drum to complete its movement from one position to the next after the driving pawl 36 has been arrested by the engagement of armature 11 with the backstop 16. The unoperated airgap between the armature and core of the electromagnet is thus maintained small and the efficiency and quickness of operation of the unit is increased accordingly.

As is well known, the force exerted by an electromagnet upon an armature varies inversely with the square of the distance between the electromagnet and the armature. With the backstop 16 adjusted such that the movement of the armature 11 is arrested by the backstop when the driving pawl 13 has moved a distance substantially equal to one-half of the pitch of the ratchet wheel 34, the unoperated airgap between the armature and the core of the electromagnet is substantially one-half of the airgap which would be required if the driving pawl moved a distance equal to the pitch of the ratchet wheel. In applicant's arrangement the initial pull exerted by the electromagnet upon the armature is, therefore, approximately four times that of stepping devices heretofore devised wherein the driving pawl is moved through a distance equal to the pitch of the ratchet wheel.

The use of the small airgap hereinbefore referred to enables a retractile spring of increased tension to be employed, thereby causing a greater force to be exerted by the driving pawl 13 against the ratchet wheel during the release stroke of the armature. The drum assembly is thus given a greater impetus thereby causing the drum to be stepped ahead to its next position more quickly. With this arrangement the drum assembly obtains a high angular velocity within a relatively short period of time and this velocity is increased by the action of the strong retractile spring 14 during the first part of each stepping movement of the drum assembly, and further accelerated by the action of the jockey

spring 28 against the jockey wheel 29 during the latter part of each stepping movement. This high angular velocity is arrested at the end of each stepping movement, not by the driving pawl as in the case of stepping mechanisms heretofore devised, but by the jockey spring coming into engagement with the next succeeding tooth of the jockey wheel thereby providing a yieldable mechanism for arresting the movement of the drum assembly and centering the same in its moved position.

This arrangement removes one of the causes of wear of the driving pawl and ratchet wheel of stepping mechanisms of the types heretofore devised, which results from the employment of the driving pawl and ratchet wheel as an abrupt stopping means for the rotating element.

Furthermore, with applicant's arrangement the electromagnet may receive an operating impulse while the drum is moving during the second part of its travel during each stepping operation under the influence of the jockey spring 28, or as soon as the armature 11 has come into contact with the backstop 16. An overlap condition is thus incorporated in the operation of the unit whereby the driving pawl may be moved to its operating position during the time that the drum is being propelled by the jockey spring during each stepping operation. The driving pawl, therefore, is in position to engage the next succeeding tooth of the ratchet wheel 34 as soon as the drum has been moved to its next position, and the drum is thus operated in a substantially continuous movement without waiting for the driving pawl to arrest the same and subsequently be withdrawn by the electromagnet to its operating position.

As a result of the small unoperated airgap employed, the armature may be fully retracted by the electromagnet with a current impulse of shorter duration flowing through the winding of the electromagnet than would otherwise be possible for the reason that the flux density is increased and for the additional reason that the travel of the armature is reduced. Furthermore, since the armature is required to travel only substantially one-half the distance of the pitch of the ratchet wheel during the open interval following a current impulse of the electromagnet, this open interval is also reduced. It will readily be understood, therefore, that the reduction in the length of the current impulse and the open interval between successive current impulses applied to the electromagnet will result in these impulses being received at a correspondingly higher rate of speed than has heretofore been possible, whereby the indicator receiving these impulses is operated at a very high rate of speed.

The jockey spring 28 engages two adjacent teeth of the jockey wheel 29 with the drum in its rest position and the drum is thereby accurately positioned in each of its rest positions such that each of the indicium is in exact alignment with the aperture of the mask whereby the indicium may be substantially as large as the aperture in the mask.

The frame is provided with a detent portion 30 for engagement with a ground spring 40, Fig. 7, secured to the shelf 43, thereby maintaining the unit in position within the display panel.

The member 7 extending to the rear of the unit is provided with an insulating jack 38 having a plurality of slip connections 39 for engagement with complementary plug portions 41 in a 75

plug assembly 42 affixed to the shelf 43, Fig. 7, of the display panels.

The unit is also provided with the contact springs 44, 45, 46 and 47 secured to the frame portion 4 of the unit by the screws 48 and insulated therefrom by the spacing plates 49 and 51. Each of the contact springs 44 to 47 inclusive is provided with a bent up portion 52 such that, when the drum 26 is being actuated to a new setting, the contact springs are normally out of engagement with the contacts 53, 54, 55 and 56 which are affixed to, and disposed in arcuate alignment on, the drum 26. This arrangement provides a structure wherein the movement of the drum is unretarded by the contact springs 44 to 47. The plate 57 is interposed between the insulating strip 49 and the heads of the screws 48 and is provided with a raised portion 58 and 59 which supports bearing shaft 61. This shaft extends through the member 63 whereby the member 63 is pivoted to the bearing 61. The member 63 is provided with an insulating strip 64 for engagement with the contact springs 44 to 47 as the member is actuated by the cam 65 which, when operated, presses against the spring 66 affixed to one end of the member 63; as for example, by rivets 67, thereby causing the member 63 to rotate about the bearing shaft 61 and bring the insulated strip 64 into engagement with the contact springs 44 to 47, thereby deflecting the same and causing them to be brought into engagement selectively with the contacts 53 to 56 in accordance with the position of the drum 26.

Since the contacts 53 to 56 move into operative relationship progressively with the contact springs 44 to 47 as the drum 26 is stepped to successive display positions, this arrangement provides means for producing progressively varying permutation code signals.

Cam 65 is mounted on a shaft 68 supported by the bearings 69 and 71, Fig. 6. The shaft 68 is provided with an arm 72 having a slot 73 therein adapted to be engaged by the pin 74. A solenoid 75, when energized, causes the plunger 76 to be withdrawn and the pin 74 affixed thereto to cause the arm 72 to rock the shaft 68 and bring the cam 65 into operative engagement with the spring 66 thus rotating the member 63 and bringing the contact springs 44 to 47 into electrical contact with the contacts 53 to 56 in accordance with the angular setting of the drum 26 thereby applying ground to certain of the contact springs 44 to 47 and causing certain of the decoding relays A to D, Fig. 8, to operate and select one of the lamps for operation. When the solenoid 75 is deenergized the shaft 68 is returned to its original position by the retractile spring 77 acting on the arm 78 affixed to the shaft.

Referring now to Fig. 8 of the drawings there is shown thereon an impulse transmitter represented generally by the telegraph key 79, which when operated, applies battery by way of conductor C and contact elements 41 and 39 to one end of the winding of the electromagnet 5 of the storage unit. If it be assumed that the drum of this unit is in the position to display a blank, the circuit from the other end of the winding of the magnet 5 is continued by way of the contact spring 21, contact spring 22, contact elements 30 and 41, conductor AG and thence to the key 81 which will be in the closed position, thereby applying ground to conductor AG. The electromagnet 5 is energized over the circuit just described and attracts the armature 11 and the

driving pawl 13 affixed thereto so that the end of the driving pawl engages the ratchet wheel 34. When the transmitter 79 removes battery from conductor C, magnet 5 deenergizes and the drum 26 is stepped ahead by the combined action of the retractile spring 14 and the jockey spring 28 to the next position, thereby causing cam 25 to rotate and disconnect spring 22 from spring 21, spring 21 at this time being in engagement with grounded contact 27. The next succeeding impulse from the transmitter 79 applies battery by way of conductor C, contact elements 41 and 39 to the electromagnet 5, the circuit being continued by way of contact spring 21 to the grounded contact 27. Impulses are thus received from the transmitter 79 until the drum 26 has taken the desired setting.

If the indicator has been setting on any position other than the blank setting, the transmitter 79 would apply restoration impulses to the magnet 5 with the key 81 unoperated, thereby causing the drum 26 to be stepped ahead to its blank position on a circuit including grounded contact 27. As the drum moves into its blank position, contact spring 21 is disengaged from contact 27 and brought into engagement with contact 22, thereby rendering the electromagnet 5 unresponsive to additional impulses from the transmitter 79 until the key 81 is moved to its closed position.

Associated with the posting or bulletin board is a selector mechanism adapted to select any of the storage indicator devices for operation. In the specific embodiment of the invention disclosed on Fig. 8 of the drawings, this selector mechanism is diagrammatically represented by a selection switch SEL adapted to select any of the solenoids 75 for operation. When the wiper arm 82 thereof is brought into engagement with terminal 2 of the switch SEL, battery is applied to the winding of solenoid 75 causing the solenoid to operate and withdraw the plunger 76 thereby bringing the contact springs 44, 45, 46 and 47 into engagement with certain of the contacts 53, 54, 55 and 56 in accordance with the position of the drum 26.

Assume, by way of example, that the drum 26 is in position to display the digit 3 and the solenoid 75 is energized. Ground will, therefore, be applied to conductors 1 and 3 thereby operating relays A and C respectively. Ground at armature 83 of relay A is extended by way of its front contact to armature 84 and break contact of relay B, armature 85 and make contact of relay C and thence to lamp 3, thereby causing lamp 3 to light as an indication that the drum is resting on its position 3. Reference to the contact code of Fig. 5 will clearly indicate the grounded condition of each of the contact springs of the storage unit for each of the remaining digits to be displayed, the circuit for each of these digits being completed over obvious paths including contacts of relays A, B, C and D.

The operation of the relays A, B, C and D causes the associated armature 86 of these relays to be moved into engagement with the make contact thereof, thereby completing a circuit from battery through the locking winding of the operated relay, make contact and armature 86, conductor 87 to ground at switch key 88. The permutation code signal is thus stored in the decoding relays, causing the selected lamp to remain lighted until the relays are released by the operation of key 88.

From the foregoing it is clear that relays A, B, C and D will assume a setting in accordance with

the position of the drum 26 when the solenoid 75 is operated, the relays A, B, C and D acting to store and decode the signals transmitted by the contact springs 44, 45, 46 and 47. It will be noted that the arrangement of Fig. 8 provides an indicating storage device including distributor contacts for transmitting a permutation code signal over a plurality of conductors, less in number than the settings of the distributor to a group of decoding relays which may be remotely situated with respect to the storage device, and the system includes means for storing the signal within the decoding relays and actuating a plurality of signal devices by the decoding relays either momentarily or for a considerable period of time in accordance with the operated condition of the release key 88. For example, the selector switch SEL may have the wiper 82 thereof brought into momentary engagement with a selected contact thereby causing the momentary operation of the solenoid 75 and contact springs 44 to 47 whereby the setting of the storage indicator is transferred to the storage and decoding relays A, B, C and D, the relays A, B, C and D retaining their settings after the contact springs 44 to 47 have released and, if desired, during the time that the drum 26 is taking a new setting.

As indicated in Fig. 6, a plurality of decoding and display devices, D, which may be identical with the device D shown in Fig. 8, are connected by the cable K to the various vertical rows of indicator units shown in Figs. 6 and 7, the number of the units D corresponding to the number of indicators in each of the horizontal rows or shelves selectable by the switch SEL.

While the invention has been described in detail with respect to a certain referred example thereof which gives satisfactory results, it will be understood by those skilled in the art to which the invention pertains, or with which it is most nearly connected, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a device of the character disclosed, the combination of a member having a plurality of characters thereon and settable to different settings, a frame having an opening therein through which the characters are selectively displayed, means for actuating said member to different settings selectively to display said characters, a plurality of coacting contact making elements operatively mounted in a single row on said member, a plurality of electrical contacts disposed in a single row and in alignment with said contact making elements, said contact making elements on said member being arranged in order and spacing so that adjacent ones of said contact making elements move into operative relationship successively and progressively with said electrical contacts as said member is actuated to different settings by said actuating means thereby to set up progressively varying groups of permutation code signals, said varying groups of signals respectively representing the different settings of said members.

2. In a device of the character disclosed, the combination of a rotatable member having a plurality of characters thereon and settable to different settings, a frame having an opening therein through which the characters are selectively displayed, means for actuating said mem-

ber to said different settings, a single row of coaxing electrical contacts less in number than the settings of said member disposed in permutational arrangement in circular alignment on said member, a plurality of contact elements normally disengaged from said contacts, said electrical contacts being arranged in order and spacing so that adjacent ones of said contacts are movable into operative relationship successively and progressively with each of said contact elements, and electromagnetic means for causing said contact elements to engage said contacts in accordance with the settings of said member and set up different groups of permutation code signals on said contact elements representative respectively of the characters displayed by the device, said contact elements being equal in number to the number of code units comprising said signals.

3. In a system of the character disclosed, an electromagnetic device comprising a rotatable indicator drum having a plurality of characters thereon, an indicator frame having an aperture in one end thereof through which the characters are selectively displayed, a plurality of electrical contacts arcuately disposed on said drum, a plurality of contact springs adapted to engage said contacts in accordance with the position of said drum, a source of selection signals, means controlled by said signals for selecting and actuating said contact springs to engage said contacts and cause a permutation code signal to be set up on said contact springs in accordance with the character displayed by said drum, means for decoding said permutation code signal, an indicator operatively connected to said decoding means for displaying a signal representative of the character displayed by said drum, and means for storing the signal received from said contact springs when the contact springs are disengaged from their associated contacts.

4. In a system for posting information regarding the control of airway traffic and the like, the combination of a plurality of groups of devices settable in accordance with the information to be posted, means for setting said devices, a plurality of transmitting elements mounted on and individual to each device for setting up a signal in permutation code representative of the setting of the device, said transmitting elements being equal in number to the number of code units comprising said signal, said transmitting elements being normally in an unoperated position, a plurality of outgoing conductors connected to said transmitting elements, a plurality of relays connected to said outgoing conductors for decoding the signals transmitted by said transmitting elements, means for selecting the transmitting elements of a desired group of devices, electromagnetic means associated with the selected group of devices for operating the associated transmitting elements to cause them to transmit permutation code signals representative of the settings of said devices simultaneously over said outgoing conductors, means controlled by said decoding relays for posting the information displayed by the selected group of devices, and means including said decoding relays for storing the signals received from said transmitting elements of the selected group when said elements have returned to their normal unoperated positions.

5. In a device of the class described, an indicator frame, an indicator shaft supported by

said frame, a rotatable drum mounted upon said shaft and having an end face portion and a peripheral surface portion with a plurality of characters thereon, said indicator frame having an aperture in one end thereof through which the characters are selectively displayed, a plurality of coaxing circuit controlling members less in number than the number of operative positions of the drum, said circuit controlling members being arcuately disposed in permutational arrangement on said end face portion of the drum, means including a plurality of contact elements supported by said indicator frame and normally disengaged from said circuit controlling members, and electromagnetic means for causing said contact elements to engage and be selectively operated by said circuit controlling members to cause signal conditions to be set up in permutation code by said contact elements in accordance with the character displayed by said drum.

6. In a device of the class described, an indicator frame, an indicator shaft supported by said frame, a rotatable drum mounted upon said shaft and having an end face portion and a peripheral surface portion with a plurality of characters thereon, said indicator frame having an aperture in one end thereof through which the characters are selectively displayed, a plurality of coaxing electrical contacts less in number than the number of operative positions of the drum, said contacts being arcuately disposed in permutational arrangement on said end face portion of said drum, a plurality of contact springs supported by said indicator frame and normally disengaged from said contacts, and electromagnetic means for actuating said contact springs to engage said contacts and cause signal conditions to be set up in permutation code on said contact springs in accordance with the character displayed by said drum.

7. In a device of the class described, an indicator frame, an indicator shaft supported by said frame, a rotatable drum mounted upon said shaft and having an end face portion and a peripheral surface portion with a plurality of characters thereon, said indicator frame having an aperture in one end thereof through which the characters are selectively displayed, a plurality of coaxing electrical contacts less in number than the number of operative positions of the drum, said contacts being arcuately disposed in permutational arrangement on said end face portion of said drum, a plurality of contact springs supported by said indicator frame and normally disengaged from said contacts, electromagnetic means for actuating said contact springs to engage said contacts and set up a signal in permutation code on said contact springs in accordance with the character displayed by said drum, a plurality of outgoing conductors connected to said contact springs, means connected to said outgoing conductors for decoding the signal set up by said contact springs, and indicating means controlled by said decoding means for giving a signal representative of the character displayed by said drum.

8. In a system for the control of airway traffic and the like, a display board comprising a plurality of groups of indicating devices in closely spaced relationship to each other, each of said devices having a rotatable drum settable to different positions in accordance with the information to be posted by said board, a plurality of electrical contacts arcuately disposed on each of

said drums and less in number than the positions of said drums, a plurality of contact springs normally disengaged from said contacts, means individual to each group of contact springs for actuating the springs to engage their respective contacts in accordance with the position of the associated drum, said actuating means including a resilient operating member, a rotatable shaft individual to each group of indicators and having a plurality of cam elements thereon adapted to engage said resilient elements and operate said actuating means as the shaft is rotated, electro-responsive means for actuating each shaft whereby the contact springs of a desired group of indicating drums may be brought into operative engagement with the associated contacts and set up a permutation code signal representative of the information posted by the selected group of indicators, a plurality of conductors connected to said contact springs, means for decoding the signals received over said conductors, and signal means controlled by said decoding means for posting at a remote point the information displayed by said indicators of a selected group as the associated shaft is operated by said electro-responsive means.

9. In a device of the class described, an indicator frame, an indicator shaft supported by said frame, a rotatable drum mounted upon said shaft and having an end face portion and a peripheral surface portion with a plurality of characters thereon, said indicator frame having an aperture in one end thereof through which the characters are selectively displayed, a plurality of coating electrical contacts less in number than the number of positions of the drum, said contacts being arcuately disposed in permutational arrangement on said end face portion of said drum, a plurality of contact springs supported by said indicator frame and normally disengaged from said contacts, said contact springs being disposed longitudinally along and within the confines of said indicator frame, a bearing support positioned on said frame, means pivotally mounted on said bearing support for actuating said contact springs to engage said contacts and cause signal conditions to be set up in permutation code on said contact springs in accordance with the character displayed by said drum, and electromagnetic means selectively operative for actuating said pivotally mounted actuating means.

10. In a device of the character disclosed, an indicator frame, an indicator shaft supported by said frame, a rotatable drum mounted upon said shaft and having an end face portion and a peripheral surface portion with a plurality of characters thereon, said indicator frame having an opening in one end thereof through which the characters are selectively displayed, a plurality of coating electrical contacts less in number than the number of positions of the drum, said contacts being positioned in permutational arrangement on said end face portion of the drum, a plurality of contact elements supported by said indicator frame and normally disengaged from said contacts, a lever pivotally mounted on said frame and having an insulated portion thereof for engaging said contact elements as the lever is operated and causing said contact elements to be brought into operative engagement with said contacts in accordance with the position of said drum and set up a permutation code signal on said contact elements representative of the digit displayed by said drum, means including a resilient element for actuating said lever, and electromagnetic means selectively operative for actuating said resilient element.

11. In a device of the character disclosed, the combination of a rotatable member having an end face portion and a peripheral surface portion with a plurality of characters thereon and settable to different settings, a frame having an opening therein through which the characters are selectively displayed, means for actuating said member to said different settings, a row of coating electrical contacts less in number than the settings of said member disposed in alignment in permutational arrangement on said end face portion of the member, a plurality of contact springs less in number than the settings of said member, said contact springs each having a bent up portion such that the springs are normally out of engagement with said contacts, and electromagnetic means for causing said contact springs to engage said contacts in accordance with the settings of said member and set up permutation code signals on said contact springs representative of the characters displayed by the device.

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