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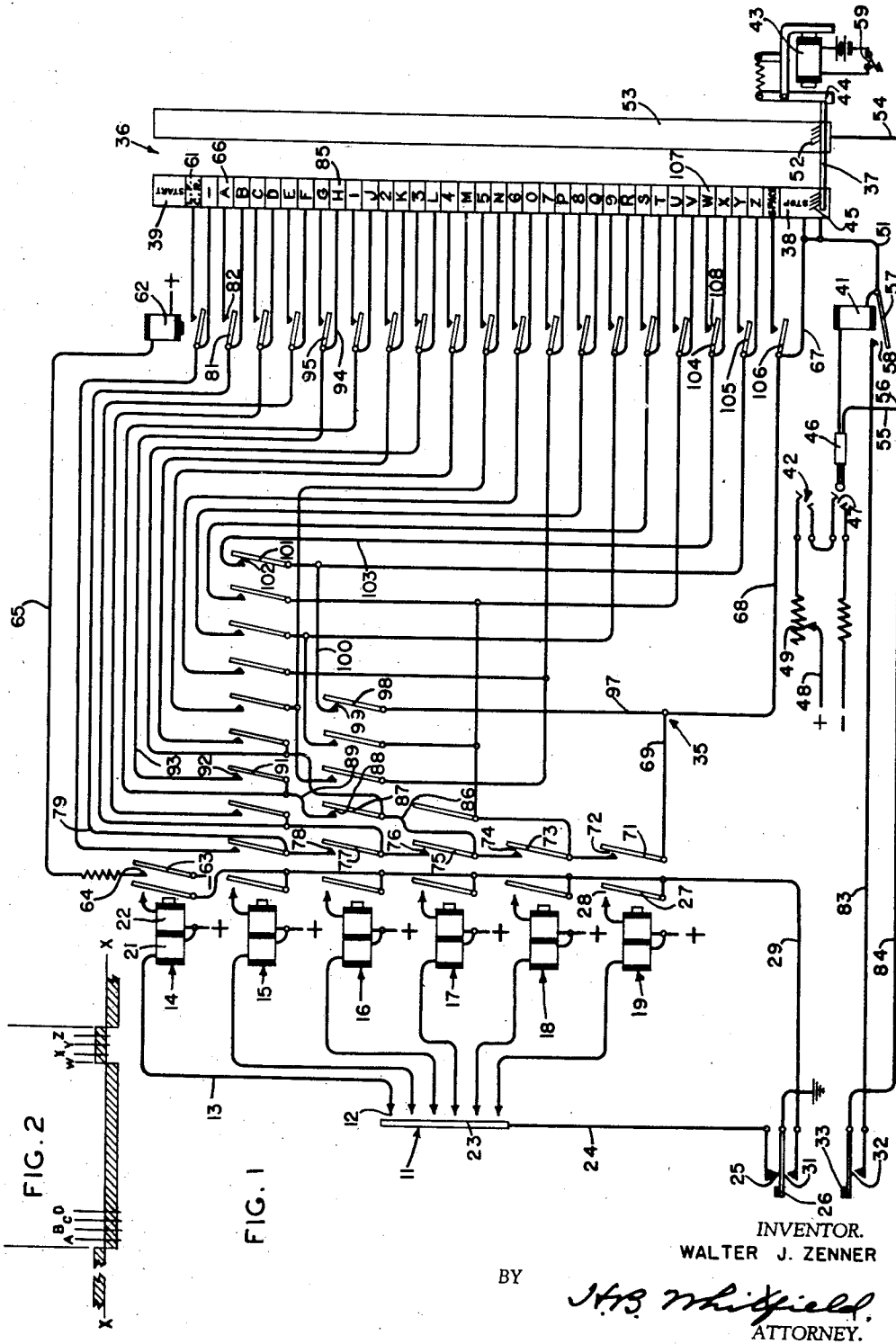
W. J. ZENNER

2,336,910

TELEGRAPH TRANSMITTER

Filed Aug. 15, 1942

2 Sheets-Sheet 1



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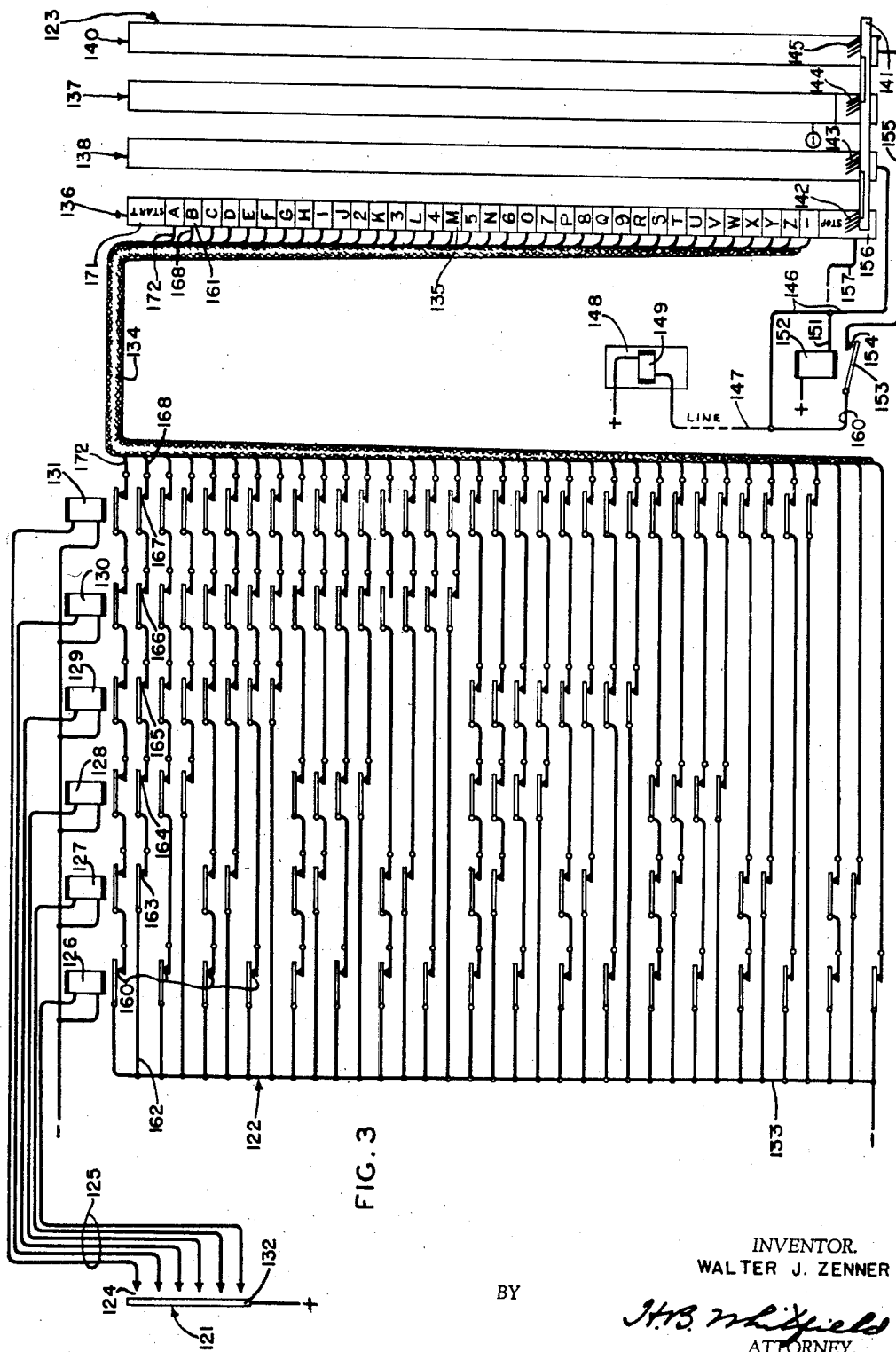
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UNITED STATES PATENT OFFICE

2,336,910

TELEGRAPH TRANSMITTER

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5 Claims. (Cl. 173-26)

The present invention relates to printing telegraph systems and apparatus and more particularly to apparatus for transmitting monopulse isochronous code signals.

The principal object of the invention is to provide apparatus including circuits for translating permutation code signals into monopulse isochronous code signals.

In accordance with the present invention, permutation code signals are transmitted under the control of tape transmitters, and are received by a plurality of receiving relays equal in number to the elements comprising the code being translated. The receiving relays control contacts arranged according to a fan circuit, whereby circuits are prepared to segments of a rotary brush-type distributor of a monopulse transmitter. Upon the operation of the distributor, translation into the desired signal conditions is effected.

More specifically, the principle involved in the adaptation of a brush-type distributor to monopulse isochronous code signal transmission is that when the brush arm leaves the stop segment, the line current becomes zero, thus initiating the no-current or spacing portion of the monopulse code signal. Then, when the brush reaches the conditioned or energized segment corresponding to the character to be printed, an impulse is generated which energizes a magnet which locks up, and in locking up, it applies continuous current to the signal line for the remainder of the revolution of the brush, thus providing the marking current portion of the monopulse code signal, irrespective of the condition of the remaining segments on the distributor.

A more complete understanding of the foregoing objects and features of the invention may be had from the following description, when taken in conjunction with the accompanying drawings, wherein,

Fig. 1 represents a schematic circuit having embodied therein the principles of the present invention;

Fig. 2 is a graphical representation of a signal of the monopulse type employed in operating printers of the class disclosed in U. S. Patent No. 2,147,075, issued February 14, 1939, to W. J. Zenner; and

Fig. 3 is a schematic circuit of another form of the present invention.

Monopulse signals may be composed of current and no-current signal conditions, and as may be understood by referring to Fig. 2, the transmission of monopulse signals of the type contemplated herein involves the interruption of a normal line

condition for a measured interval which is initiated at a point definite with respect to each transmission cycle and is continued until the rotating brush arm of a transmitting distributor has attained a position in the cycle which corresponds to and is identified with the particular character transmitted. At the termination of this impulse, a line current condition is restored as indicated at the character W in Fig. 2. Normal line current is maintained thereafter until the arrival of the succeeding start instant, when, if a succeeding character is in readiness for transmission, another line interruption is thereat repeated. The alternative (normal and character impulses) line conditions may, if preferred, be comprised of positive and negative signals, or they may be comprised of either polarity of current as one line condition with no-current as the alternative line condition. Variations of signaling practice along these lines are not inconsistent with the structural principles disclosed in the present invention.

Having reference to Fig. 1, the transmitting arrangement involves a tape transmitter 11, indicated schematically in the drawing. Tape transmitter 11 comprises a plurality of transmitting contacts 12 (six in the present embodiment), which are connected by conductors 13 to a corresponding plurality of storing relays 14, 15, 16, 17, 18, and 19. Each storing relay 14 to 19 is provided with an operating winding 21 and a holding winding 22. When the transmitting contacts 12 are closed in response to the sensing of perforations in the tape, circuits for the operating winding of the storing relays 14 to 19 are completed from positive battery, through the operating windings 21 of the respective storing relays to be operated, thence over conductors 13 associated with said relays, through the respective contacts 12, thence over the bus bar 23 and conductor 24, through contact 25 associated with a cam operated contact controller 26, to ground. Upon operation of the storing relays 14 to 19, their armatures will be attracted to close their associated contacts. Among these armatures, there is associated with each storing relay, an armature 27, which, when attracted, closes its associated contact 28. Locking circuits for the operated storing relays 14 to 19 are completed from positive battery, through the locking windings 22 of the operated storing relays 14 to 19, through contact 28 (now closed), over armature 27, over conductor 29, through contact 31 (now closed) to ground. Contacts 25 and 31 are cam controlled through the instrumentality of con-

troller 26 located in the tape transmitter 11. The timing of the operation of contacts 25 and 31 is such that contact 25 is normally closed while the tape transmitter is idle (or in the stop position), when shortly after the initiation of operation the energizing circuits for the operating windings of the selected or operated storing relays 14 to 19 have been established, and when the relays 14 to 19 have been operated, the cam (not shown) in the tape transmitter operates the controller 26 to close the contact 31 and then open the contact 25 so that when the locking contact 23 has been closed, the circuit will be completed through contact 31. Also located in the tape transmitter 11 is another cam controlled contact 32, which is operated by a cam controlled arm 33. The function of this contact will be described hereinafter.

The tape transmitter 11 through the instrumentality of its storing relays 14 to 19 controls through a fan circuit, indicated generally as 35, the conditioning of a plurality of segments on a rotary brush-type distributor, indicated generally as 36. The principle involved in the adaptation of a brush-type distributor 36 to monopulse isochronous code signal transmission as already indicated is that when the brush arm 37 leaves the stop segment 38 and traverses the start segment 39, the line current becomes zero, thus initiating the no-current or spacing portion of the monopulse signal. Then, when the brush reaches the conditioned or energized segment corresponding to the character to be transmitted, as determined by the setting of the tape transmitter 11, through the fan circuit 35, an impulse is generated which energizes a magnet 41 (as will presently appear), which locks up and controls continuous current on a signal line connected to the transmitter through jack 42 for the remainder of the revolution of the brush arm, thus providing the marking current portion of the monopulse code signal irrespective of the condition of the succeeding segments on the distributor 36.

General operation

In its stop or unoperated position, the stop magnet 43 of the brush-type distributor 36 is de-energized and hence the stop arm 44 is spring held in its clockwise position to block the movement of brush arm 37, and to hold the brush 45 in contactual engagement with stop segment 38. Preparatory to transmission of signals the plug 46 is inserted in the jack 47 to connect the transmitter to battery or source of current and to the signal line. The line is indicated by the self closing jack 42, and the receiving instrument may be connected to this jack 42. In this position of brush arm 37, current is applied to the signal line through jack 42 from battery, over conductor 48, through variable resistor 49, through the upper terminal of jack 42, through the selector magnet if a receiving device (not shown), back through the lower terminal of jack 42, then through the upper terminal of jack 47, through the plug 46, thence through the winding of relay 41, over conductor 51, through stop segment 38 and brush 45, over brush arm 37 and through brush 52, through ring 53, over conductors 54 and 55, thence through plug 46, the lower terminal of jack 47 to negative battery. The receiving printer associated with the line jack 42 may be of the type shown in U. S. Patent No. 2,147,075. Such a condition of the signaling line is the normal,

idling condition of the telegraph line wherein the condition is said to be marking; that is, with current on the line. In this condition, the relay 41 remains energized over the afore-described circuit which divides at the juncture 56 and extends through contact 32, the purpose of which will be presently described. Moreover, under the conditions of the apparatus just described, the armature 57 of relay 41 is attracted and remains in this position to close the contact 58, which at this time, however, has no effect, but the purpose of which will later appear.

To begin transmission of monopulse isochronous code signals under the control of tape perforated according to a permutation code, the perforated tape is inserted in the transmitter 11 in well-known manner, and a manually controlled switch 59 is operated to close the circuit of the start magnet 43 to cause the armature 44 to remain attracted, thus disengaging the armature 44 from the brush arm 37. The brush arm 37 is driven by the operating shaft of the brush-type distributor 36 through the instrumentality of a friction clutch in well-known manner, and at the same time a stepping action is imparted to the tape transmitter 11. Also, contact controlling arms 26 and 33 are cyclically operated, and the timing of the closure of their associated contacts 25, 31, and 32 is such as to effect the appropriate operation of the transmitting system.

For the purpose of illustration it will be assumed that it is desired to transmit the character A. In accordance with the system disclosed in Fig. 1, the tape sensing pins (not shown) will encounter permuted arrangements of perforations in the tape, which will cause the closure of contacts 12 (corresponding to the code combination for the character A) associated with storing relays 14, 16, 17, 18, and 19, which will become energized over the previously described circuit including cam controlled contact 25, and as soon as the storing relays become energized, a cam will swing the arm 26 so as to close contact 31 and then open contact 25, whereupon locking circuits for the respective storing relays will be completed by the closure of their contacts 23. In timed relation with the foregoing operation, the brush arm 37 is rotated so as to move the brush 45 off of the stop segment 38 and on to the start segment 39. Since the segment 39 is a "dead" segment, the line circuit condition will be changed from a marking to a spacing or no-current condition, and this latter condition will exist until the brush 45 contacts a charged or energized segment, as will presently appear. Also, before the brush 45 has reached the first segment 41, the contact 32 will be controlled by a cam (not shown) acting upon the arm 33, thus closing the contact 32 and that portion of a locking circuit for relay 41 which will be presently traced. By the energization of the storing relays 14, 16, 17, 18, and 19, the armatures associated therewith will be operated to close their associated contacts, thus preparing the fan circuit 35 for the transmission of the monopulse code signal for the character A.

In the embodiment of the invention shown in Fig. 1, the storing relay 14 is associated with an auxiliary relay 62 for the purpose of taking the load of operating a great number of armatures off the relay 14. It is, therefore, understood that the armatures associated with the magnet or relay 62 can be associated directly with relay 14. Therefore, to

effect the operation of the armatures associated with the auxiliary relay 62 the armature 63 is associated with relay 14, so that upon the energization or operation of relay 14, the armature 53 will be operated to close its contact 54 to complete a circuit for the energization of magnet 62 from negative battery through armature 62, contact 64, over conductor 55, thence through the winding of relay 62 to positive battery. Accordingly, all of the armatures associated with the relay 62 are operated to close their respective contacts. Likewise, the armatures of relays 16, 17, 18, and 19 are also operated to close their respective contacts.

Thus, when the brush 45 of the transmitter brush arm 37 engages the segment 63 identified with the character A, the following circuit is completed: From positive battery, over conductor 48, through variable resistor 49, through upper member of jack 42, thence through the line and recording machines thereat, and through the lower contact spring of jack 42, through the upper contact spring of jack 47, through plug 46, thence through the winding of relay 41, over conductor 51, over conductors 57, 63, and 69, through armature 71, contact 72 (now closed), over armature 73, through contact 74 (now closed), over armature 75, through contact 76 (now closed), over armature 77, through contact 78 (now closed), over conductor 79, through armature 81, through contact 82 (now closed), through segment 63, brush 45 (now arrived thereat), over brush arm 37, through brush 52, ring 53, then over conductors 54 and 55, through plug 46 and jack 47 to negative battery.

At the instant of traversal of brush 45 over segment 63, and upon the consequent completion of the aforescribed circuit, relay 41 will become energized and attract its armature 57 to close contact 53, whereupon a locking circuit for relay 41 will be completed from positive battery over conductor 48, through resistor 49, through jack 42, including the line circuit and interconnected receiving apparatus, and returning through jack 42 and continuing through jack 47 and plug 46 through winding of the relay 41, through armature 57 and contact 53, then over conductor 53, through contact 32, over contact arm 33, over conductor 34, over conductor 55, through plug 46 and jack 47 to negative battery. Through the instrumentality of relay 41 and its locking circuit, which becomes effectively operated as the selected segment 63 is traversed, the signaling line will remain in an energized or marking condition to produce the definitive impulse of the monopulse isochronous code signal as the brush arm 37 continues its rotation back to the stop segment 23 in readiness to initiate another rotation for the transmission of a succeeding character.

It will now be assumed that it is desired to transmit the character H. When the H combination is to be transmitted, the tape transmitter will sense the coded perforations in the tape corresponding to the character H, and corresponding contacts 12 will be closed, which, according to the present embodiment, will effect the operation of the storing relays 15, 16, 18, and 19. As the distributor brush arm again begins its rotation in the new cycle for the transmission of the character H, the brush 45 will pass off the stop segment 23 and onto the start segment 29, thus breaking the energizing circuit for the relay 41 and releasing armature 57 therefrom. At any time during the traversal of brush 45 over the

stop segment 23, the contact 32 will be opened by its control cam to break the locking circuit for the relay 41 thus rendering the locking circuit ineffective. During the traversal of brush 45 over the latter portion of start segment 29, contact 32 will again be closed, thus preparing the locking circuit for magnet 41. Relay 41 will remain de-energized until the brush 45 engages the segment identified with the character H. Thus, a spacing or no-current condition is established on the signaling line representative of the starting or no-current portion of the monopulse isochronous code signal for the character H. Upon the operation of storing relays 15, 16, 18, and 19, and their consequent locking up, their armatures will be attracted to prepare through fan circuit 35 a path to the segment 65 representative of the character H, as follows: From positive battery, over conductor 48, through potentiometer 49, through jack 42 and over the line through the interconnected receiving apparatus and back through jack 42, over jack 47, through plug 46, through the winding of relay 41, thence over conductors 51, 57, 63, 69, over armature 71, through contact 72 (now closed), over armature 73, through contact 74 (now closed), over conductor 86 (which by-passes armature 75 which was not attracted due to the fact that storing relay 17 is not operated), thence over armature 87, through contact 88 (now closed), thence over conductors 33, over armature 91, through contact 92 (now closed), then over conductor 93, over conductor 94 (the armature 95 of relay 62 being by-passed at this time), thence through the segment 65 representing character H, through the brush 45 (now in contact or engagement with segment 65), over brush arm 37, through brush 52, through ring 53, then over conductors 54 and 55, and through plug 46 and jack 47, to negative battery. As previously indicated in connection with transmission of the character A, the relay 41 will become energized at the instant of traversal of brush 33 over segment 65 to pull up its armature 57 and close its contact 53, thus completing the locking circuit for relay 41, as previously described, over conductors 33 and 64 and through contact 32, so long as contact 32 remains closed, which is during substantially the entire rotation of the brush arm 37, except for that period when the brush 45 traverses the start segment 29, at which time the contact 32 will be opened momentarily to break the locking circuit for the relay 41 preparatory to the transmission of a succeeding monopulse code signal.

One of the important features of applicant's invention is the provision of a fan circuit 35 wherein each of the armatures of the relays control only one contact instead of two, as in prior fan circuits, which construction is made possible by applicant's novel method of transmitting monopulse code signals of the type diagrammatically shown in Fig. 2. According to applicant's arrangement, certain of the armature contacts are by-passed, and one or more of the segments corresponding to segments 61, 63, and 65, may be conditioned simultaneously upon the operation of the storing relays 15 to 19, but only the first segment encountered by the brush 45 in its rotation will be effective to complete the monopulse code signal, since due to the operation of the relay 41, the marking signal is impressed on the line independently of the further traversal of the brush 45 over succeeding segments in the cycle of rotation.

A further feature of the invention consists of superadding to a fan circuit according to a five-unit code, a portion of a fan circuit derived from a six-unit code thus increasing the selective possibilities of the system without necessitating the extensive wiring incident to a six-unit code fan circuit. In accordance with this arrangement, the armature 71 of storing relay 19 is connected by conductors 59 and 97 to armature 93. Consequently, armatures 93, 101, 104, 105, and 106 constitute an auxiliary group under the control of armature 71, wherein the six-unit code is employed.

Therefore, if the character W is to be transmitted to the line, the storing relays 14, 15, and 16 will become operated under the control of the perforated tape controlled contacts 12, to establish a circuit through the segment 187 identified with the character W, from positive battery over conductor 43, through resistor 43, through the jack 42, then over the line to return to jack 42, through jack 47 and plug 46, thence through the winding of relay 41, over conductors 51, 67, 68, and 97, then over armature 93, through contact 99 (now closed), over conductor 100, over armature 101, through contact 102 (now closed), over conductor 103, over armature 104, through contact 103 (now closed), then through segment 197, through brush 45, (in contact with the segment identified with the character W), then over brush arm 37, through brush 52, through ring 53, over conductors 54 and 55, through plug 46 and jack 47, to negative battery. Upon the establishment of this circuit, the relay 41 will become energized, and consequently locks up through its contact 59 and contact 32, as previously described. If the character X is selected for transmission, relay 52 will not be energized. Then the armature 104 will be released and contact 103 will be opened and the character X will be printed instead of the character W, because the circuit just described is by-passed around the contact 103.

Modification

A modified form of the present invention is shown in Fig. 3, and comprises essentially a tape transmitter, indicated generally as 121, a relay circuit indicated generally as 122, and a rotary distributor indicated generally as 123. The tape transmitter 121 comprises a plurality of transmitting contacts 124 (six in the instant embodiment), which are connected by conductors 125 to the windings of a corresponding plurality of storing relays 126 to 131. When the transmitting contacts 124 are closed in response to the sensing of a perforation in the tape, circuits for the windings of the storing relays 126 to 131 are completed from positive battery, over the bus bar 132 of the transmitter 121, through those contacts 124 which are closed due to the sensing or finding of a perforation in the tape, then over the conductors 125, through the windings of the operating or storing relays 126 to 131, to negative battery. As will presently appear, circuits will be closed in accordance with the operation of the storing relays 126 to 131, from negative battery, over conductor 133, through selected series of contacts associated with the storing relays 126 to 131, then through the cable 134 to a segment 135 on the brush type distributor 123 corresponding to the circuit completed upon the permuted operation of storing relays 126 to 131. The locking circuits for the storing relays 126 to 131 may, of course, be controlled in the manner shown in Fig. 1.

In this embodiment of the invention, the brush type distributor 123 is provided with segmented rings 136 and 137, and continuous rings 138 and 140. The brush arm 141 of the distributor 123 carries a plurality of brushes 142, 143, 144, and 145, of which brushes 142 and 143 are connected together, and 144 and 145 are connected together, the pairs being insulated from each other. Ring 138 of distributor 123 is connected by a conductor 146 to the signal line 147, to which, at the remote station, is connected a printing apparatus 148 having a receiving magnet 149. Such printing apparatus may be of the type shown in U. S. Patents Nos. 2,147,075 and 2,181,708. Also connected to the conductor 146, over conductor 151, is the winding of a relay 152. Relay 152 is provided with an armature 153 which is connected to the line wire 147. Associated with the armature 153 is a contact 154 which is connected over conductor 155 to ring 140 of the distributor 123.

In the circuit shown in Fig. 3, the brush arm 141 is shown with the brushes 142 resting on the stop segment 156. The brush arm 141 is adapted to be held in this position through the instrumentality of a stop magnet (not shown) similar to the arrangement shown in Fig. 1. With the brush arm 141 stopped in this position, current is normally supplied to the line 147 from negative battery, over conductor 157, through stop segment 156, through brushes 142 and 143, through ring 138, over conductors 146 and 151, through the winding of the receiving magnet 149 of the remote printing apparatus, to positive battery. A circuit is also completed from negative battery, over conductor 157, through stop segment 156, through brushes 142 and 143, ring 138, conductor 146 and 151, through winding of the relay 152 to positive battery. Relay 152 thus is energized and attracts its armature 153 to hold the contact 154 closed.

Assuming that it is desired to transmit the mono-pulse code signal for the character "B" the code combination of which is perforated in the tape, the tape transmitter upon sensing said code combination will close its contact 124 associated with the storing relay 126 only. Thus, the previously described energizing circuit for storing relay 126 will be completed, and upon energization, all of the contacts 160 of the relay 126 will be opened. Then, when the brush arm 141 rotates so that its brush 142 comes into contact with the segment 161 corresponding to the character B, a circuit will be completed from negative battery, over conductor 133, conductor 162, then through contacts 163, 164, 165, 166, 167, then over conductor 168 (which extends through the cable 134) to the segment 161 of the ring 136, through brushes 142 and 143, ring 138, conductors 146 and 151, through the winding of relay 152 to positive battery. Relay 152 was previously de-energized when the brush 142 passed off the stop segment 156 and on to the start segment 171 which is a dead segment; that is, it is not connected to any source of current. This broke the circuit for the relay 152, previously described, causing its armature 153 to be released and a contact 154 to be opened. Now, when the presently described circuit was completed, the relay 152 was re-energized. After the brush 142 leaves the stop segment 156, the circuit over the signal line 147 becomes broken and remains broken until the brush 142 reaches or contacts the first energized segment of the segmented ring 135, which in the present instance is the segment 161 identi-

fied with the character B. The relay 152 now becomes energized and remains so by virtue of its locking circuit extending from negative battery, over segment 137, brushes 144 and 145, ring 140, conductor 155, through contact 154, over armature 153, then over conductors 160, 146 and 151, and then through the winding of relay 152 to positive battery, thus putting marking current on the line 147 irrespective of the condition of the remaining segments 135 traversed.

When it is desired to transmit the character "A," none of the storing relays 126 to 131 will be energized. Thus, since all of the contacts 150 associated with relay 126 and similar contacts of relays 127 to 131 are all closed, a circuit will be completed from negative battery over conductor 133, through contacts 160 of all the storing relays 126 to 131, then over conductor 172, which extends through cable 134 and connects with the segment "A" of the ring 135.

The relay circuit 122 is arranged to operate in accordance with the following code wherein the storing relays 126 to 131 are identified as code elements 1 to 6, respectively:

Relays energized	Character
None.....	A
No. 1.....	B
No. 2.....	C
Nos. 1 and 2.....	D
No. 3.....	E
Nos. 1 and 3.....	F
Nos. 2 and 3.....	G
Nos. 1, 2, and 3.....	H
No. 4.....	I
Nos. 1 and 4.....	J
Nos. 2 and 4.....	2
Nos. 1, 2, and 4.....	K
Nos. 3 and 4.....	3
Nos. 1, 3, and 4.....	L
Nos. 2, 3, and 4.....	4
Nos. 1, 2, 3, and 4.....	M
No. 5.....	5
Nos. 1 and 5.....	N
Nos. 2 and 5.....	6
Nos. 1, 2, and 5.....	O
Nos. 3 and 5.....	7
Nos. 1, 3, and 5.....	P
Nos. 2, 3, and 5.....	8
Nos. 1, 2, 3, and 5.....	Q
Nos. 4 and 5.....	9
Nos. 1, 4, and 5.....	R
Nos. 2, 4, and 5.....	S
Nos. 1, 2, 4, and 5.....	T
Nos. 3, 4, and 5.....	U
Nos. 1, 3, 4, and 5.....	V
Nos. 2, 3, 4, and 5.....	W
Nos. 1, 2, 3, 4, and 5.....	X
No. 6.....	Y
Nos. 1 and 6.....	Z
Nos. 2 and 6.....	

In the event that it is desired to employ the well-known Baudot code, the only change that would result would be a rearrangement of the characters allotted to the segments 135; for example, in the form of Baudot permutation code generally employed in the telegraphic art, the letter E would be substituted for B in the above table; D would become A; R would become B, etc. The arrangement adopted herein is predicated on the arrangement of keys in the keyboard transmitter shown in U. S. Patent No. 2,173,147 issued September 19, 1939 to W. J. Zenner.

Although it will be noted that with this arrangement of circuit more than one circuit will be prepared for each setting of the relays, nevertheless, in accordance with the theory of the monopulse code signal transmission, only the first prepared circuit which is encountered by the traversal of the brush 142 over the segment 135 included in that circuit will be completed to put current on the signal line, and such marking current will remain on the line due to

the energization of relay 152. Therefore, if the brush 142 should pass over other segments which are in the circuits of other prepared circuits, there would be no effect because of the fact that marking current is held on the line from and after the time the first charged segment is encountered.

Although the present invention has been described in connection with certain specific embodiments thereof, it is understood that other equivalent arrangements are contemplated, and that the present invention is limited only by the range and scope of the appended claims.

What is claimed is:

1. In a signal transmission system, a rotary distributor comprising a plurality of segments and an itinerant seeker operable thereover, a record sensing device, a plurality of circuits, each corresponding to one of said segments, means for preparing said circuits individually under the control of said sensing device, means for initiating the rotation of said seeker to produce the character selecting impulse of a monopulse isochronous code signal, and means effective upon the traversal of said seeker over the segment in a prepared circuit to establish the definitive impulse of said code signal irrespective of the condition of the segments further traversed.

2. In a signal transmission system, a rotary distributor comprising a plurality of segments and an itinerant seeker operable thereover, a record sensing device, a plurality of storing relays, contacts associated with said relays in a predetermined order of progression, a plurality of circuits, each corresponding to one of said segments and including predetermined ones of said contacts in series with its corresponding segment, means for preparing said circuits individually under the control of said sensing device, means for initiating rotation of said seeker to produce the character selecting impulse of a monopulse isochronous code signal, and means effective upon the traversal of said seeker over the segment in a prepared circuit to establish the definitive impulse of said code signal irrespective of the condition of the segments further traversed.

3. In a signal transmission system, a rotary distributor comprising a plurality of segments and an itinerant seeker operable thereover, a record sensing device, a plurality of storing relays, contacts associated with said relays in a predetermined order of progression, a plurality of circuits, each corresponding to one of said segments and including predetermined ones of said contacts in series with its corresponding segment, means for preparing said circuits individually under the control of said sensing device, means for initiating rotation of said seeker to produce the spacing portion of a monopulse isochronous code signal, and means effective upon the engagement of said seeker with the segment of the first prepared circuit encountered to establish and maintain the marking portion of said code signal irrespective of the condition of the segments further traversed.

4. In a signal transmission system, a rotary distributor comprising a plurality of segments and an itinerant seeker operable thereover, a record sensing device, a plurality of circuits, each corresponding to one of said segments, means for preparing said circuits individually under the control of said sensing device, means for initiating the rotation of said seeker to produce the

spacing portion of a monopulse isochronous code signal, and means effective upon the engagement of said seeker with the segment of the first prepared circuit encountered to establish and maintain the marking portion of said code signal irrespective of the condition of the segments further traversed.

5. In a signal translating system, a permutation code sensing device, a transmitter for sending isochronous monopulse code signals, said transmitter comprising a rotary distributor having a plurality of segments and an itinerant seeker operable thereover, a permutation code

sensing device, a plurality of circuits, each corresponding to one of said segments, means for preparing said circuits individually under control of said sensing device, means for initiating the rotation of said seeker to produce the character selecting impulse of a monopulse isochronous code signal, and means effective upon the traversal of said seeker over the segment in a prepared circuit to establish the definitive impulse of said monopulse code signal irrespective of the condition of the segments further traversed.

WALTER J. ZENNER.