

Filed April 6, 1956

RECORD PERFORATION ANALYZING MECHANISM

3 Sheets-Sheet 1

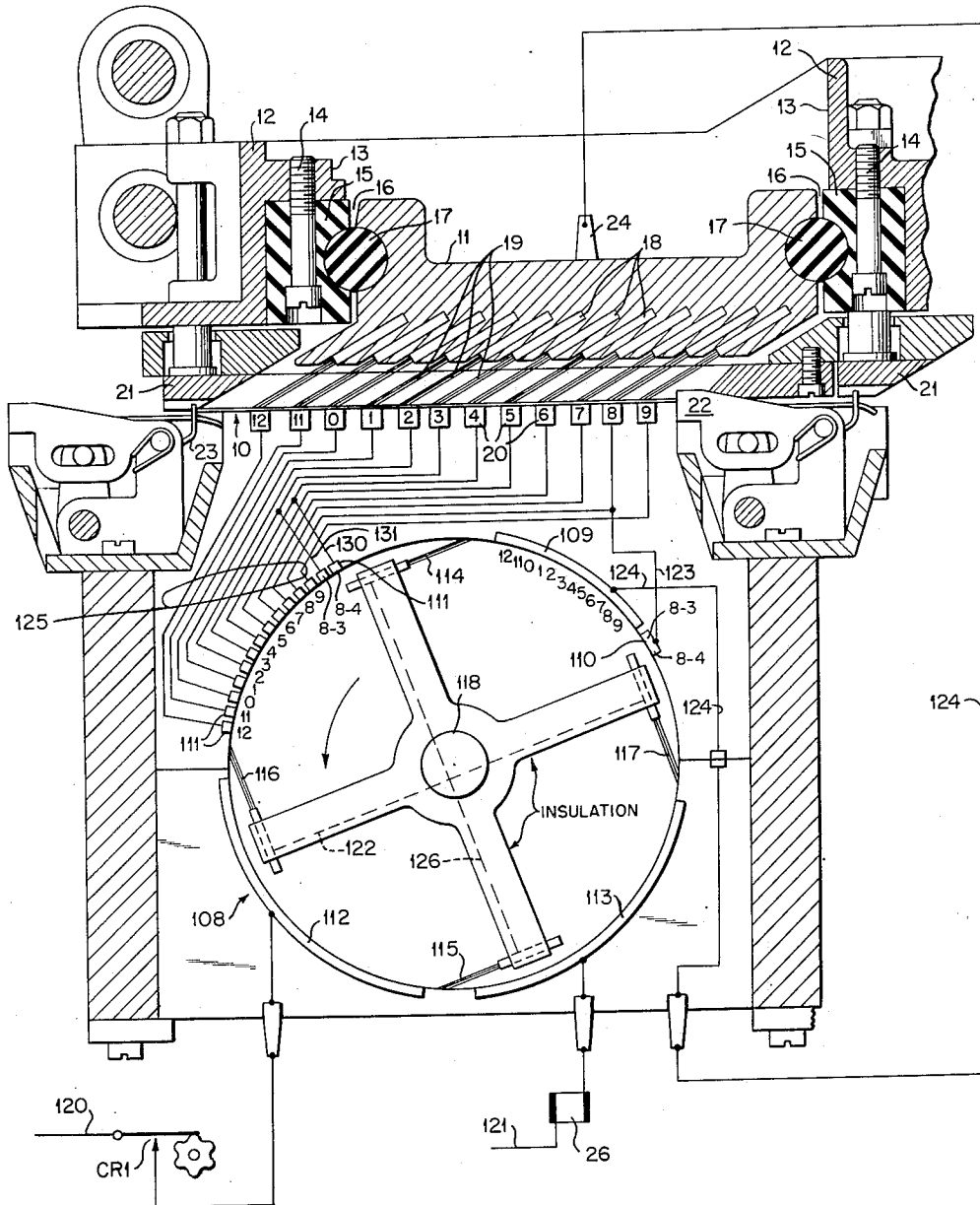


FIG. 1

INVENTOR.
ROBERT I. ROTH

BY

J. W. Lowmiller

ATTORNEY

Feb. 11, 1958

R. I. ROTH

2,822,980

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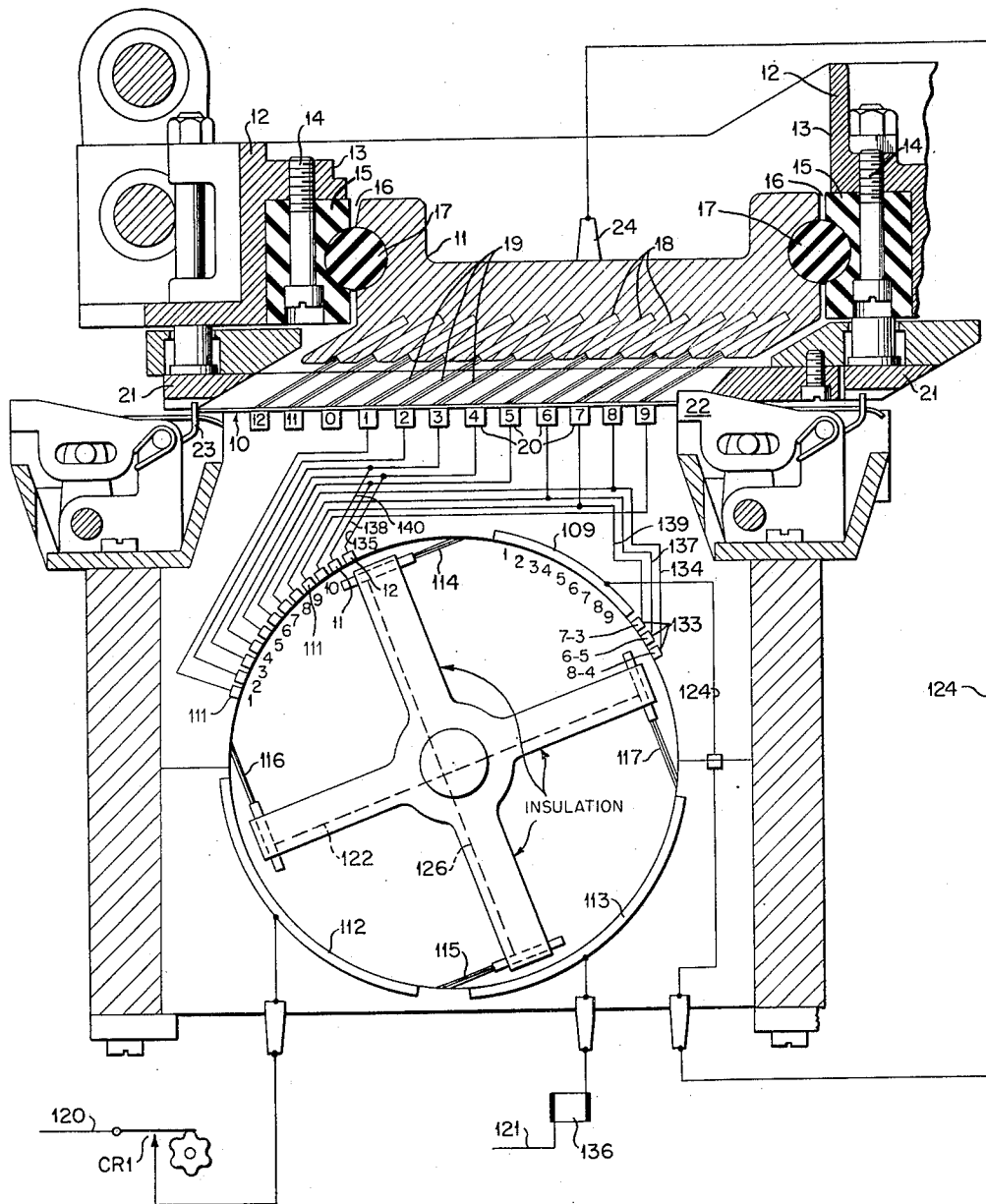


FIG. 2

INVENTOR.
ROBERT I. ROTH

BY *J. W. Lounitzer*

ATTORNEY

2,822,980

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CR1 & READOUT PULSES
OF FIG. 3

	15	45	75	105	135	165	195	225	255	285	315	345						
0	30	60	90	120	150	180	210	240	270	300	330	360						
BRUSHES 19 DOWN																		
				DIGITS	8-4	8-3	9	8	7	6	5	4	3	2	1	0	11	12
				CODE	8-4	8-3	9	8	7	6	5	4	3	2	1	0	11	12
				DIGIT	12	11	10	9	8	7	6	5	4	3	2	1		
				DIGITS	9	8	7	6	5	4	3	2	1	0	11	12		
				CODE	7-2	7-1	7	4-2	4-1	4	2-1	2	1	11-12	11	12		

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2,822,980

RECORD PERFORATION ANALYZING MECHANISM

Robert I. Roth, Briarcliff Manor, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

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8 Claims. (Cl. 235—61.11)

This invention relates to perforation analyzing means and more particularly to the type which analyzes the perforated record for the purpose of deriving differentially timed work impulses.

It is well known in the patent to R. E. Page et al. No. 2,484,114 to analyze perforations in the IBM form of card by brushes which are retained at rest during the analyzing period and in accordance with the brushes which pass through holes emit differentially timed impulses under control of a coordinated emitter. However, when a record column contains holes arranged in combination, such as 8-4, 8-3, or other desirable coded combinations, it was necessary to emit two impulses and utilize translating and converting devices exterior of such perforation analyzing means and emitter to secure useful differentially timed impulses from the combination holes.

It is then the principal object of the present invention to associate with the plurality of brushes of an electrical analyzing device an emitter which emits differentially timed impulses when holes appear singly, and differentially timed impulses when holes appear in coded combination.

According to the present invention the emitter readout points have individual wire connections to the respective analyzing brushes to complete a work circuit as a readout brush passes over an effective emitter readout point which is rendered "alive" or "marked" by the respective analyzing brush passing through a hole in a column of the record.

Said emitter herein is provided with supplemental readout contacts for each coded combination, and each is rendered alive when an impulse circuit is serially completed through a pair of brushes for the holes in combination.

For example, if the card has the coded combination 8-4, or 8-3, as is useful to control alphabet printing mechanisms of a certain type, a test pulse applied to one brush ascertains whether a hole appears in one of these positions and if so whether the circuit network may be continued through the brush at the other position, to the related emitter point.

Therefore, it is a further object of the present invention to provide a circuit network intermediate analyzing elements and an emitter which translates coded combination holes to single differentially timed impulses, said circuit network being completed serially through a pair of analyzing brushes for the coded holes.

For the purpose of showing the various uses of the improved record perforation analyzing means, it is shown herein, by way of one example, for converting 8-4, 8-3 coded combinations useful in controlling alphabet printing mechanisms of the type shown in the patent to R. E. Page et al., No. 2,438,071.

Another embodiment shown herein employs the same novel principle for an emitter of the type which emits twelve differentially timed impulses for entering duodecimal amounts, which are digits 1-9, 10, 11 and 12 for

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the English monetary system, or for entering fractions, etc.

Another embodiment discloses a combined record perforation analyzing means and emitter which is adapted for analyzing and converting a coded card having the 0, 1, 2, 4, 7 coded combination. In such coded card 1, 2, 4, 7 are utilized for emitting digit impulses 1, 2, 4 and 7 by single holes, whereas for digits 3, 5, 6, 8 and 9 different coded combinations, i. e. 2-1; 4-1; 4-2; 7-1; 7-2 respectively are utilized. This points out the possibility of using the present translating circuit network for more than two or three coded combinations as were used in the preceding two modifications.

It is apparent then that the present invention is not restricted to the form of embodiments shown, and may be utilized in a variety of ways. The novel concept of emitting a differentially timed impulse by a circuit completed serially through at least a pair of analyzing brushes for coded combinations has obviously the advantage of simplicity in code conversion and translation.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a transverse sectional view and represents the form of record perforation analyzing means and coordinated emitter for emitting differentially timed impulses 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 and two extra impulses for 8-4 and 8-3 combinations.

Fig. 2 is a transverse sectional view of the same form of record perforation analyzing means as Fig. 1, but having a different circuit network so arranged that 1-9 digit impulses are transmitted from single holes, and digits 10, 11 and 12 for duo-decimal or fractional amounts when three different coded combinations are utilized.

Fig. 3 is a transverse sectional view of the same form of record perforation analyzing means and coordinated emitter as in Fig. 1, but having the emitter and translator circuit network modified to be controlled by a card having the 1, 2, 4, 7 coded combination. In this arrangement five different coded combinations are translated by the circuit network.

Fig. 4 is a timing diagram.

Analyzing mechanism

The analyzing mechanism for the perforated records, and the coordinated emitter which is constructed in the novel manner to be subsequently described, is preferably of the type which analyzes the records while they are at rest, and conveniently may be the type shown in the patent to R. E. Page et al., No. 2,484,114; Figs. 1, 2, and 3 herein showing suitable modifications of such analyzer for carrying out the present invention.

Such analyzer is adapted in Figs. 1 and 2 to analyze the type of perforated record shown in the patent to C. D. Lake, No. 1,772,492, granted August 12, 1930. In general, the card 10 has perforations which are rectangular in shape and arranged in eighty vertical columns, and in twelve horizontal rows through which perforations electrical circuits are closed to control operations of the machine. The index points in each column are designated 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, 11, (X) and 12 (R).

In more detail, the analyzing means shown in the aforementioned patent to R. E. Page et al., No. 2,484,114 is provided as shown in Figs. 1 and 2 with an analyzing unit 11 for each vertical card column, which analyzing units 11 are carried by a reciprocable frame member 12 consisting of a single metallic casting. The frame member 12 is formed so as to be capable of holding 80 analyzing units 11 for a corresponding number of vertical card col-

umns. Each analyzing or brush carrying unit comprises a metal plate which in thickness is less than the width of a card column and the plurality of brush carrying units 11 are mounted on the frame member 12 insulated from each other. The 80 analyzing units 11 are mounted so as to fit or pass through a rectangular opening 13 formed in the frame member 12. By means of mounting screws 14 transverse bars 15 of insulating material are carried by the frame member 12 and said bars 15 are formed with slots 16 which receive the metal analyzing units 11 in such manner that they are insulatably spaced from each other but correlate the brushes 19 with the index point positions. The analyzing units are locked in position on the frame member 12 by rods 17 of insulating material which fit in semi-circular cutout portions formed at the ends of the analyzing units 11 and along the edge of each insulating bar 15.

Each analyzing unit is provided with inclined slots adapted to receive ferrules 18, each of which carries the analyzing brushes 19 which are preferably inclined in the direction of card feed and are normally elevated while the cards are being fed to analyzing position. The terminal ends of the analyzing brushes 19 are ground flush with a straight edge to enable an efficient electrical contact with a related individual contact member 20, there being 12 of these for contact with the analyzing brushes for each card column.

The means for depressing the frame member 12 in a timed operation of the machine may consist of any suitable means, it only being essential that the frame member is in lowered position between 105° and 315° (see Fig. 4) of the machine cycle during which time electrical impulses from an emitter are being transmitted. Furthermore, any suitable means may be provided for feeding the cards in a successive manner to the analyzing means and since it forms no part of the present invention such feeding means are not shown. Such feeding means should feed a card to the analyzing means so that the latter retains contact with the card during the time the electrical impulses are transmitted and thereafter feed said card out of the analyzing means in order to receive a successive card.

It is desirable to hold the cards stationary during an analyzing operation and to this end the patent to R. E. Page et al., No. 2,484,114 also shows clamping plates 21 which press the card 10 against the surface of the card feeding bed. Incidentally, other expedients to hold the card in proper analyzing position consist of a depressible card stop 22 which is depressed as the card is fed to the left in Figs. 1, 2 and 3 to analyzing position against shiftable aligning stops 23 which are actuated to the right slightly to move any disaligned card against the fixed card stops 22 at the right.

When a record card is in analyzing position the card perforations are then read out through an emitter which has wiring connections to the contact points 20 engageable with the brushes 19 through the holes which are present in a card column.

Each analyzing plate 11 also has an upwardly extending wire terminal 24 (Fig. 1) to which a wire may be connected to extend the impulse circuit by the metal plate 11 and through the brushes 19 and card holes to the associated contact points 20.

Operation of machine in connection with Fig. 1

In Fig. 1 the perforation analyzing means is shown interconnected with an emitter which is wired to the brushes to transmit impulses 8-4, 8-3, 9-1, 0, 11, and 12 to a print control magnet 26.

As is well known in Patent No. 2,438,071 to Ralph E. Page et al., the transmission of such impulses to magnet 61 therein, which corresponds to magnet 26 herein, is for the purpose of selecting groups of type, and type in each selected group. Especially important are the 8-4 or 8-3

impulses which are for the purpose of selecting two extra groups of punctuation type. The Fig. 1 construction is arranged according to the present invention to translate such coded combinations to derive a single impulse from the emitter.

An impulse emitter generally designated by numeral 108 is operatively associated with each column of analyzing brushes 19. In more detail each emitter or commutator has at its periphery a segment 109 for testing the presence of holes at index points 9-0, 11 and 12 and a segment 110 for testing the presence of 8-4, 8-3 combination holes in a controlling column. In the other quadrant of the emitter there is disposed readout contact points 111 for reading out impulses 8-4, 8-3, 9-0, 11, and 12.

In the other two quadrants of the emitter below the contact points 109, 110, 111 are current supply segments 112 and 113. There are two oppositely disposed brushes 114 and 115 and two oppositely disposed brushes 116 and 117. The four brushes are carried by an insulating member and rotated by a shaft 118 which makes a quarter revolution per machine cycle. The four brushes are shown in a position which corresponds to the position necessary at the start of each machine cycle.

Current is supplied to the electrical circuits by supply lines 120 and 121. Test circuits are completed from the line side 120, through circuit breaker cam contacts CR1, and when a brush, such as 116 makes contact with the segment 112, the test impulse is extended to brush 117 since brushes 116 and 117 are interconnected by a wire 122. The circuit breaker impulses are transmitted at a time which are coincident with the readout pulses for the emitter 108 from readout contact points 111 (see Fig. 4). During 8-4 and 8-3 impulse times the brush 117 tests for the presence of 8-4 or 8-3 holes in combination, the circuit being extended from the segment 110 and a wire 123 to a translating circuit network to be later described. Thereafter, as the brush 117 makes contact with the segment 109 designated 9-0, 11 and 12, a second test impulse passes to a wire 124 which is connected to the wire terminal 24. It will be seen from Fig. 1 that the contact points 20 which are engaged by the respective brushes 19 through the card holes have individual wire connections 125 to the related contact points 111 and when a brush 19 passes through a hole a respective wire 125 extends the test circuit impulse to the related contact point 111. Alternatively, the brushes 19 could be wired individually to contact points 111 if the contact points 20 were common. During the impulse times 9-0, 11 and 12 the circuit is completed from the "live" contact point 111, brush 114, wire 126, brush 115, segment 113, print control magnet 26 to the line side 121.

There will now be explained the operation of the machine in connection with the circuit diagram when either combination of holes 8-3 or 8-4 are in a controlling column.

In Fig. 1 it will be seen that the segment 110 is for the purpose of testing the presence of the 8-3 and 8-4 holes so that the impulse circuit will extend via wire 123 to the contact point 20 designated 8. Thus, there is first a test for the determination of the presence of an 8 hole in a controlling column and upon the presence of such 8 hole the circuit will then be extended up through the brush 19 passing through the 8 hole in contact with the "8" contact point 20, to the metal plate 11. The test circuit will then branch down through either the brush 19 passing through the 4 hole or the 3 hole in the same controlling column and for a 4 hole by a wire 130 to the contact point 111 designated 8-4, or upon the presence of a 3 hole through a wire 131 to contact point 111 designated 8-3. Accordingly, a timed impulse 8-4 or 8-3 will be read out when the brush 114 encounters either of such contact points 111. A circuit will then extend, as described by wire 126, brush 115, segment 113, print control magnet 26, to the line side 121.

It is obvious that, in the absence of a 3 or 4 hole, the

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above test circuit will be ineffective and an 8-4 or 8-3 impulse will not occur, since neither of the contact points 111 designated 8-4 or 8-3 is "live."

Since the shaft 118 receives only a quarter revolution in each machine cycle, it will be noted that in the following machine cycle the four brushes will have received a rotation of 90° and brush 114 will then wipe over the segment 112 as the brush 115 wipes over the contact points 109-110, and brush 117 will wipe over the read-out contact points 111 as its oppositely disposed brush 116 wipes over the segment 113. However, the circuit operation is precisely the same as above so that beyond this change in position of the emitter brushes the principle of operation is precisely as has been described.

Operation of machine in connection with Fig. 2

Fig. 2 represents a modification of the emitter for transmitting twelve differentially timed impulses 12, 11, 10, 9-1 for entering duo-decimal amounts in an accumulator under control of a column of the card. Digits 9-1 are entered under control of correspondingly designated single holes in the column of the card, whereas the entry of 10 is initiated by holes 7-3, the entry of the 11 upon presence of holes 6-5 and the entry of 12 upon the presence of the holes 8-4.

The emitter has three read-in contact points designated 133 which are successively engaged by the brush 117 to determine the presence of the combinational holes 8-4, 6-5 or 7-3, in this order. When the brush 117 makes contact with the first contact point 133 the circuit is extended from the 8-4 contact point 133 and wire 134 to the contact point 20 designated 8, thence through the associated brush 19, metal contact plate 11, through the 4 brush 19, wire 135 to the 12 contact point 111. When brush 114 makes contact with such contact point an impulse will be transmitted at the 12 impulse point time (see Fig. 4) to a magnet 136. Said magnet is an accumulator clutch control magnet well known in the art and when energized engages a clutch to rotate an accumulator wheel twelve units to enter 12 therein. The 11 and 10 units are also entered in the accumulator wheel upon the presence of other combinational holes. When the second contact point 133 is engaged by the brush 117 and if the holes 6-5 are present a circuit will be extended by wire 137 and serially through the 6 and 5 brushes 19 to a wire 138 to contact point 111 designated 11. This later differentially timed impulse (see Fig. 4) will effect the entry of 11.

It need only now be described that when the contact point 133 designated 7-3 is engaged by the brush 117 a circuit will be extended by wire 139 and serially through the 7 and 3 brushes 19 to a wire 140 to contact point 111 designated 10. When engaged by the brush 114 a differentially timed impulse will be transmitted to enter ten units in the accumulator wheel.

The Fig. 2 arrangement is especially useful in entering duo-decimal amounts as in the English monetary system but may also represent fractions. The Fig. 2 arrangement likewise shows the translation of combinational holes through a translating circuit network intermediate perforation analyzing brushes and the emitter. It is obvious that a further extension of the system may be devised for entering other fractional amounts less or greater than 12ths. For example, 16ths, in which case more combinational holes will be required to enter the additional numbers.

Operation of the machine in connection with Fig. 3

Fig. 3 represents the construction of perforation analyzing means and emitter, specially adapted for the analysis of double deck perforated cards. By selection of a suitable code, preferably the 1, 2, 4, 7 code herein, all of the digits and the X and Y or 11 and 12 designations may be designated in half a controlling column.

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Six index points in the upper half of the card may represent one designation and the other lower six index point positions in the lower half of the controlling column may represent another designation. In this manner, as is well known, the character representing capacity of a card may be doubled.

The emitter, therefore, is of a dual construction to take care of the upper and lower designations in each controlling column and since the construction and operation are alike for both sections, it will be described only in connection with one. The code and the designations represented are as follows:

Digit or designation	Code
9-----	7-2
8-----	7-1
7-----	7
6-----	4-2
5-----	4-1
4-----	4
3-----	2-1
2-----	2
1-----	1
0-----	11-12
11-----	11
12-----	12

With respect to the emitter construction, a rotating tube 150 is substituted for shaft 118 in Figs. 1 and 2 and said shaft for each half of the emitter carries two brushes formed of spring contact blades or brushes, the latter being preferable. Brushes 114 and 115 comprise one pair and 116 and 117 the other pair. As brush 116 makes contact with the segment 112, it will be seen that the line side 120 is connected thereto through CR1 cam contacts, and as said brush 116 makes contact with segment 112 the other integral brush 117 passes over a series of contacts 109 to determine the presence of holes, either singly or in combination.

As brush 117 makes contact with contact points 109 designated 1, 2, 4, 7, 11 and 12, it will be seen that the line side 120 is extended to each of the contact members 20 designated 1, 2, 4, 7, 11 and 12. In accordance with such holes singly the circuit will be extended through the corresponding brush 19, the metal brush carrying plate 11b for the lower half of the card and wire 141 to the contact points 111 designated 9-0, 11 and 12 and thence through the brush 114, brush 115, segment 113 and wire 142, magnet 143 to the line side 121. Thus, it is evident, upon the occurrence of holes singly, an individual circuit is completed through the related brush 19, thereby rendering the associated contact point 111 alive which is read out by the brush 114 to energize the accumulator magnet 143. Of course, said magnet will engage an accumulator wheel so as to effect the entry of the digits 1, 2, 4, 7 and 9. The 11 and 12 impulses created from the 11 and 12 index point positions correspond to the X and Y control positions of the customary tabulating card and are provided for control purposes. The manner in which this is effected forms no part of the present invention and, therefore, need not be explained in detail.

For the holes which occur in combination the same principles previously utilized in the Figures 1 and 2 embodiments are also incorporated in the Fig. 3 translating circuit network.

When brush 117 engages the 9 contact point 109, it will be seen that the circuit is extended by wire 144 to the brush 19 designated 7. If there is a hole at the 2 index point position circuit is then extended through the metal plate 11b, brush 19 designated 2 and wire 145 to the contact point 111 designated 9, thereby transmitting the 9 differentially timed impulse to accumulator control magnet 143, upon occurrence of combinational holes 7-2. If the holes were at 7 and 1 a circuit would have been completed through the brush 19 designated 1 and a wire 146 to contact point 111 designated 8, thereby transmit-

ting the 8 differentially timed impulse. As brush 117 makes successive contact with the contact points 109 designated 6 and 5 the circuit will be extended to the brush 19 designated 4 and upon the presence of holes 2 or 1 the circuit will be completed to the contacts 111 designated 6 and 5 in the same manner as previously explained, thereby transmitting a 6 or a 5 differentially timed impulse upon the occurrence of combinational holes 4-2 or 4-1.

When brush 117 makes contact with contact point 109 designated 3 a circuit will be extended through the brush 19 designated 2 and serially completed through the brush 19 designated 1 and by the wires 146 and 147 to the contact point 111 designated 3, thereby transmitting, as brush 114 makes contact with the 3 contact point, the transmission of a 3 differentially timed impulse to the magnet 143.

Summarizing, it is evident that five of the digits are transmitted upon the occurrence of five combinational holes in a controlling column, thus the translation of such holes is effected interiorly, that is, by the coordination of the perforation analyzing means and the emitter and no exterior translators or converters are necessary.

For a half revolution of the member 140, pairs of brushes 116-117 and 114-115 will then be in position to carry out the translation of combinational holes for the upper deck of the card. However, this translation is effected in substantially the same way and by a duplication of the devices just described. It will be noted that the brush carrying plates 11a and 11b are insulated from each other, thereby keeping the translating circuits independent of each other to prevent back circuits.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a plurality of modifications, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated and in their operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A record perforation analyzing means comprising an electrical conducting plate carrying a plurality of analyzing elements for a record column, contact members engageable by said elements through the record perforations, a frame carrying said plate and adapted to be moved relative to said record to cause said analyzing elements to electrically contact the respective contact members through the perforations, and means for applying a test electrical impulse to one of said contact members for determination of its continuity through the related analyzing element encountering a record perforation, said electrical conducting plate, and another record perforation analyzing element in contact with a related contact member through another record perforation in the same column.

2. A combined record perforation analyzing means and emitter comprising an electrical conducting plate carrying a plurality of analyzing elements, contact members engageable by said analyzing elements through the record perforations, a readout section of said emitter comprising a contactor successively engaging readout contacts electrically connected to each of said analyzing elements to transmit differentially timed impulses in accordance with the analyzing elements engaging the contact members through the perforations, said readout section having a supplemental readout contact engaged by said contactor, and means for applying a test impulse to one of said contact members for determination of its continuity through the related analyzing element encountering a record perforation, said electrical conducting plate, and another record perforation analyzing element engaging a related contact member through another perforation, and to said supplemental readout contact.

3. A record perforation analyzing means comprising a

plurality of analyzing elements, contact members engageable by said analyzing elements through the record perforations, means for applying a first test impulse to said analyzing elements to effect upon presence of a single perforation the continuity of said impulse through an analyzing element for the single perforation and the related contact member, means for applying a second test impulse to one of said contact members for causing upon presence of two combinational perforations its continuation through the related analyzing element for one perforation of a coded combination, through the record perforation analyzing element for the other perforation of the coded combination to the related contact member, and means for electrically connecting the record perforation analyzing elements for the coded combination.

4. A record perforation analyzing means comprising an electrical conducting plate carrying a plurality of analyzing elements, contact members engageable by said analyzing elements through the record perforations, means for applying a first test impulse to said analyzing elements to determine when single perforations occur its continuity through an analyzing element for the single perforation and related contact member, and means for applying a second test impulse to one of said contact members for causing its continuation when combinational perforations occur to the related analyzing element passing through one perforation of a coded combination, through said electrical conducting plate, and through a record perforation analyzing element for the other perforation of the coded combination to the related contact member.

5. A combined record perforation analyzing means and emitter comprising a plurality of analyzing elements, a readout section of said emitter having readout points and a contactor therefor, electrical connections between each analyzing element and related readout points, another section of said emitter comprising means for applying a test impulse to said analyzing elements to cause the transmission of a differentially timed impulse when said contactor engages a readout point connected to the analyzing element which analyzes a record perforation, a supplemental readout point of said readout section engaged by said contactor, and a translating circuit network comprising a circuit network completed serially through two analyzing elements upon presence of the corresponding two record perforations to said supplemental readout point, whereby said contactor as it engages said supplemental readout point transmits a single differentially timed impulse determined by a coded combination.

6. A combined record perforation analyzing means and emitter comprising analyzing elements, contact members engaged thereby through the record perforations, a readout section of said emitter comprising a supplemental readout point and a plurality of readout points having individual wire connections to said contact members, means for applying an impulse to said analyzing elements, and a contactor successively contacting said readout points to transmit said impulse as a differentially timed impulse in accordance with the single perforation analyzed, means for applying a second test impulse to the contact member for an analyzing element corresponding to one unit of a coded combination, said impulse being transmitted through said analyzing element and its corresponding contact member to another analyzing element and its contact member which correspond to the other unit of the coded combination, and a supplemental circuit connection between said last named contact member and said supplemental readout point, whereby said contactor transmits a single differentially timed impulse when it engages said supplemental readout point.

7. A record perforation analyzing means and combined emitter comprising a plurality of analyzing elements, a readout section of said emitter comprising readout contact points, each of which has a circuit connection to a related analyzing element and a contactor engaging said

readout contact points to transmit a differentially timed impulse during the time a first test impulse is being applied to said analyzing elements concurrently, further individual circuit connections between a plurality of analyzing elements selected according to coded combinations and related supplemental readout contact points also engaged by said contactor, and means for applying a second test impulse to another analyzing element selected according to the coded combinations to thereby extend the second test impulse through said other analyzing element and by said further individual circuit connections from either of the plurality of analyzing elements to related supplemental readout contact points in accordance with the combination of perforations analyzed by said plurality of analyzing elements.

8. A combined record perforation analyzing means and emitter comprising a plurality of analyzing elements, a readout section of said emitter having readout points and a contactor therefor, electrical connections between each analyzing element and related readout points, another

section of said emitter comprising means for applying a test impulse to said analyzing elements during the time said contactor engages said readout points to cause the transmission of a differentially timed impulse when said contactor engages a readout point connected to the analyzing element which analyzes a record perforation, a supplemental readout point of said readout section engaged by said contactor, a translating circuit network comprising a circuit network completed serially through two analyzing elements upon presence of the corresponding two record perforations to said supplemental readout point, and means for applying a second impulse to one of said two analyzing elements to cause as said contactor engages said supplemental readout point the transmission of a single differentially timed impulse determined by the coded combination of perforations.

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