March 17, 1953 R. T. BARBEE ET AL 2,631,711

MACHINE FOR PRODUCING TRANSPOSITION CHARTS

Filed Jan. 3, 1949 2 SHEETS--SHEET 1

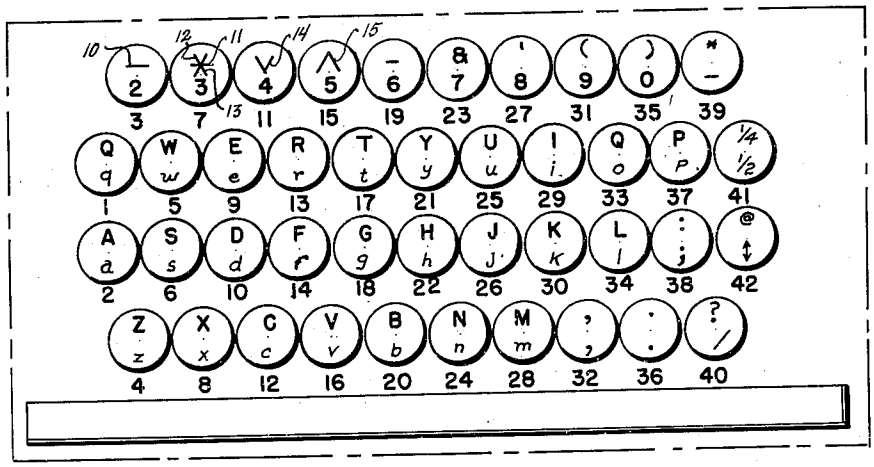


Fig. 1.

Fig. 3.

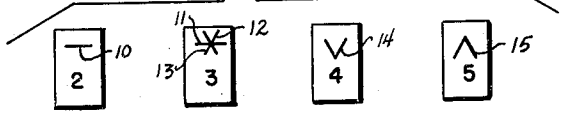
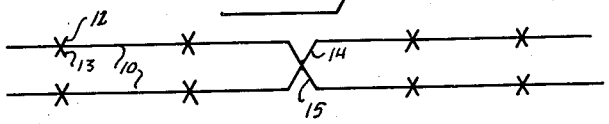


Fig. 4.



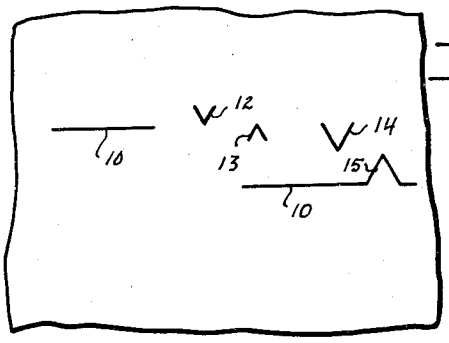


Fig. 5.

INVENTORS
ROY T. BARBEE
MASON B. WILEY

BY

Agent.

March 17, 1953 R. T. BARBEE ET AL 2,631,711

MACHINE FOR PRODUCING TRANSPOSITION CHARTS

Filed Jan. 3, 1949 2 SHEETS—SHEET 2

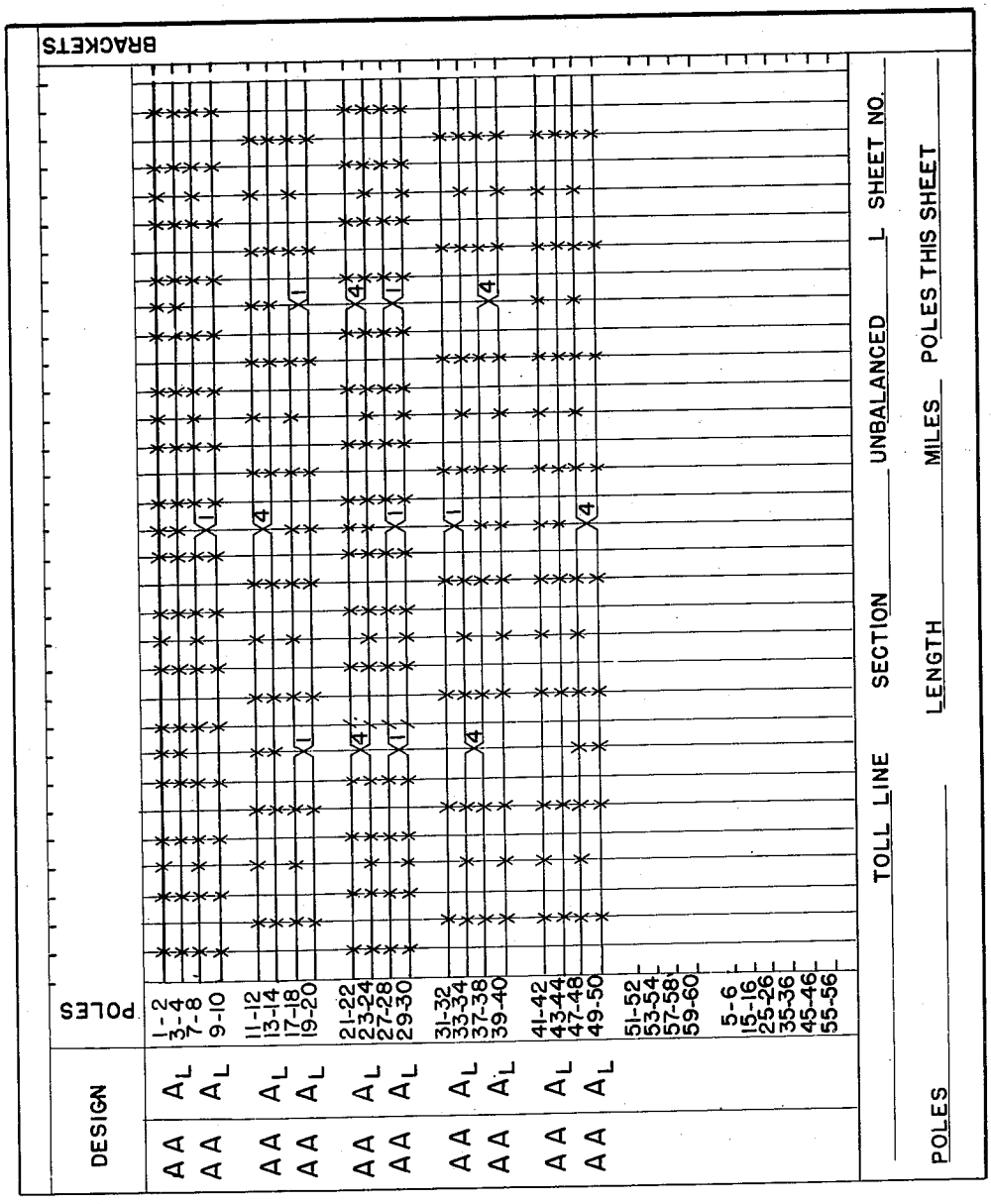


FIG. 2.

INVENTORS
ROY T. BARBEE
MASON B. WILEY

BY Jesmell & Paxton
Agent.

Patented Mar. 17, 1953 2,631,711

UNITED STATES PATENT OFFICE

2,631,711

MACHINE FOR PRODUCING TRANSPOSITION CHARTS

Roy T. Barbee and Mason B. Wiley, Charlotte, N. C., assignors to Frank W. Orr, trustee, Charlotte, N. C.

Application January 3, 1949, Serial No. 68,928

2 Claims. (Cl. 197—1)

1

The invention relates to a method and means of printing characters, and more especially is directed to a method and means of printing certain symbols or characters more commonly referred to in the communication field as "transposition designs" or "transposition charts."

The function of transpositions is to mitigate noise and cross talk on toll and exchange circuits assigned to open wire facilities. More particularly, an open wire is an uninsulated wire on a glass or other type insulator which is mounted on a wooden or steel pin secured to the cross arm of a supporting pole. A transposition has reference to the transposing or changing of wires from one pin position to another and a single transposition is the interchange of two wires on adjacent pins. A phantom transposition is the interchange of four wires associated in a group and supported by four pins in consecutive horizontal positions.

The processes currently used for producing these transpositions are not satisfactory, in that they require a considerable amount of time to prepare and are subject to many and costly errors. Generally, the end has been accomplished by the employment of electrotypes, photocopying and hand drawn charts. It can be seen, therefore, that highly skilled and high salaried personnel are required to produce the transpositions and even so, it is not possible to eliminate errors in the preparation of the transposition charts.

A salient object of the present invention is to provide a method and means of producing transposition charts which obviates the employment of highly skilled personnel and which will eliminate the disadvantages now present in the field.

Another object is to provide a method and means of modifying a conventional printing machine, such as the typewriter, to include certain symbols whereby any desired configuration in any and all groups of wires may be printed.

Another object of the present invention is to reproduce the desired symbols on a tape or the like, and the tape may then be employed with a machine for repeatedly and automatically reproducing the symbols.

In the drawings:

Figure 1 is a diagrammatic representation of a typewriter keyboard wherein the upper case of the type bars actuated by the keys at the left side of the upper row has been modified to employ the symbols necessary to produce the transpositions.

Figure 2 is a diagrammatic view of one of the charts prepared according to the invention.

2

Figure 3 is a diagrammatic representation of the type bars having the distinctive symbols thereon.

Figure 4 is a diagrammatic representation showing the manner in which the single transpositions and phantom transpositions are formed.

Figure 5 is a diagrammatic representation illustrating the location of the respective symbols relative to each other.

As shown in Figure 1, in the upper or topmost row of keys the upper case of the type bar on which appears normally the quotation mark has been modified to form a horizontal line 10. The upper case of the adjacent type bar is formed with a symbol including a horizontal line 11 which is in alinement with the line 10, and the apex of a V 12 rests at approximately the mid point of the line 11. The apex of an inverted V 13 also rests at the midpoint of the line 11 and this symbol is used to designate a single transposition in one pair of wires as illustrated in Figure 2.

The next adjacent type bar also has its upper case modified to form as V 14. The V 14 is located on the bar in such a manner that the upper end of each leg will be connected with the line formed by the horizontal line 10. The next adjacent bar is also altered in its upper case to form an inverted V 15, the apex of which is adapted to be connected with the apex of the V 14, while the free extremity of each leg will be attached to the line produced by the horizontal line 10, thus providing an X-shaped symbol employed to denote a phantom transposition.

For ideal operation, it has been ascertained that the line 10 should be ⅛ inch in length and that the diagonal line formed by the legs of the V 12 and inverted V 13 should be $\frac{1}{16}$ inch. The symbols 14 and 15 should each be ⅛ inch in height, thus providing a complete character ¼ inch in height or twice the height of the symbol employed to denote a single transposition.

The symbols or characters above mentioned are important and the location of these characters on the type bar is critical to the proper preparation of the transpositions. More specifically, the horizontal or straight line 10 must be located on the type bar so that it will connect with the horizontal line 11 and that the apices of the members 14 and 15 merge and that the free ends of each leg of these later members connect with the lines formed by the horizontal line 10.

In connection with the V 14 and the inverted V 15, it is possible to make this symbol by plac-

ing the character X upon the type bar adjacent to the symbol for forming the single transposition, but experience has shown that the forming of the phantom transposition in the manner above described is more desirable.

While I have shown the upper case of the four type bars for the upper row of keys being modified to provide the desired symbols, it is, of course, apparent that other bars could be utilized to accomplish the desired end. However, by locating the symbols as set forth does not modify the alphabet or numeral arrangement of conventional machines which, of course, is an important factor to be considered.

In operation, the symbols will be reproduced upon a tape, disk or other element and afterwards the tape may be used with an electric machine to reproduce the symbols repeatedly and automatically. Upon the selection of the desired prepared tapes and by joining these tapes in the proper sequence, a complete and accurate transposition design may be automatically reproduced, one of such designs being shown in Figure 2.

By the preparation of the master tape, it is possible for these tapes to be filed so as to be readily available to the individual preparing the charts and enable a complete chart to be reproduced in a fraction of the time necessary under current procedures. Moreover, upon checking the accuracy of the master tape, it can be seen that there is eliminated any possibility of errors which has always been troublesome in the past.

The invention is not to be confined to any strict conformity with the showing in the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

We claim:

1. A machine for producing symbols to be used for the preparation of a transposition chart for use in the communication field comprising a keyboard, type bars operated by the keyboard, one of said bars having a horizontal line thereon, another of said type bars having a complemental horizontal line thereon together with a v symbol, the apex of the v being disposed at approximately the mid point of said horizontal line, and an inverted v symbol, the apex of which is located at the mid point of said horizontal line thereby defining an x-shaped symbol denoting a single transposition with the horizontal lines of said bars producing the horizontal line on the chart, another of said type bars being provided with a V symbol extending below the said horizontal lines on said other bars with the upper end of each leg thereof connectable to the horizontal line produced by said other bars, and another of said type bars having an inverted V symbol thereon with the apex thereof joinable to the apex of the V symbol and the legs connectable to another horizontal line produced by said horizontal line bars below the first named horizontal line thus defining an X-shaped symbol denoting a phantom transposition.

2. A machine for producing symbols to be used for the preparation of a transposition chart for use in the communication field as defined in and claimed by claim 1, further characterized in that the height of the X-shaped symbol denoting the phantom transposition is twice that of the x-shaped symbol denoting the single transposition.

ROY T. BARBEE.
MASON B. WILEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
342,142	Smith	May 18, 1886
1,499,215	Griffin	June 24, 1924
2,177,539	Spielvogel	Oct. 24, 1939
2,209,586	Swift	July 30, 1940

FOREIGN PATENTS

Number	Country	Date
845	Great Britain	Mar. 27, 1862