Jan. 13, 1931. G. MAURER 1,788,727

SYSTEM FOR CONTROLLING THE ENERGIZING OF LAMPS ON ELECTRIC SIGNS

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Fig. 1

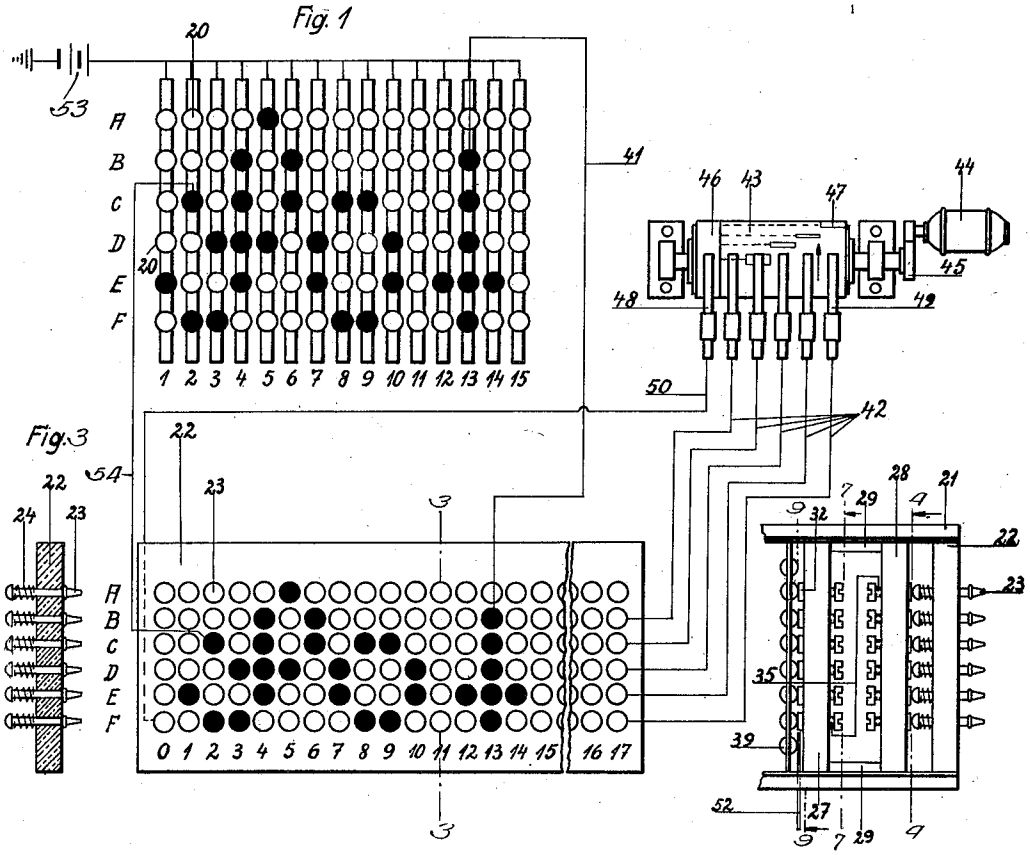


Fig. 10

S	C2	D3	D4	D5	C6	B6	A5		from Fig.	5
	F1	F2	F3	F4	F5	F6	F7		to Fig.	8
	B4	C4	E4	F3	F2	E1			from Fig.	5
	E1	E2	E3	E4	E5	E6			to Fig.	8

O	C8	C9	D10	E10					from Fig.	5
	F8	F9	F10	F11					to Fig.	8
	F9	F8	E7	D7					from Fig.	5
	F12	F13	F14	F15					to Fig.	8

↓	B13	C13	D13	E12					from fig.	5
	B17	C17	D17	E17					to Fig.	5
	E13	E14	F13						from Fig	5
	E17	E17	F17						to Fig.	5
	F0								from fig.	5
	F0								to Fig.	8

Fig. 2.

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SYSTEM FOR CONTROLLING THE ENERGIZING OF LAMPS ON ELECTRIC SIGNS

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Fig. 5



Fig. 4

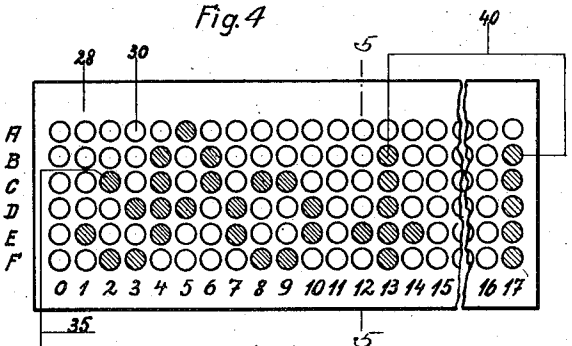


Fig. 8

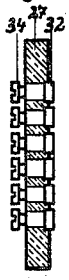


Fig. 7.

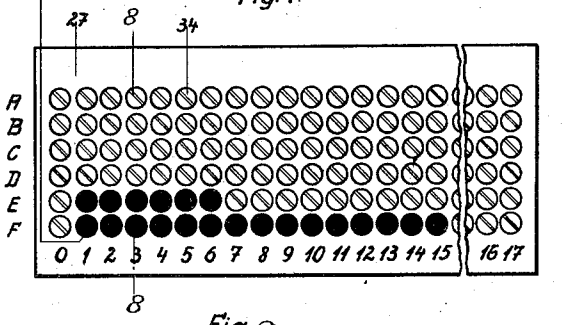


Fig. 9.

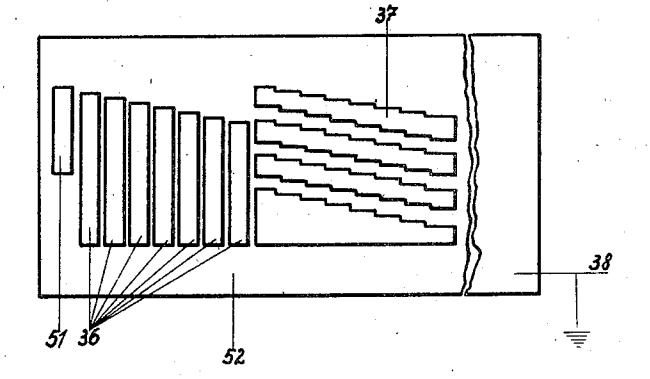
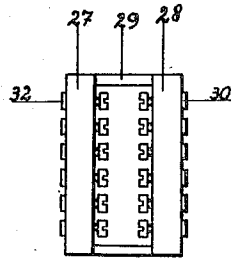


Fig. 6



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UNITED STATES PATENT OFFICE

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SYSTEM FOR CONTROLLING THE ENERGIZING OF LAMPS ON ELECTRIC SIGNS

Application filed January 25, 1928, Serial No. 249,390, and in Germany January 27, 1927.

My invention relates to improvements in systems for controlling the energizing of lamps on electric signs, and the object of the improvements is to provide a system of this class in which the lamps composing the lines of symbols or letters are successively energized so that the symbols or letters are made to appear in the manner of writing corresponding symbols or letters. With this object in view my invention consists in connecting the lamps composing the individual letters or symbols with contact making members cooperating with switch members movable relatively thereto and disposed so that when operating the switch members relatively to the contact members the said contact members are successively connected to the supply of electric current.

In systems of this class it is desirable that the same sign can be used for successively displaying different letters or symbols, and for this purpose it is necessary to connect varying groups of lamps with the net. Now another object of the improvements is to construct the switching apparatus so that the said change from one symbol or letter to another one can be readily made. With this object in view my invention consists in providing exchangeable connecting members for the switching apparatus, the said connecting members containing the electrical connections corresponding to the desired letters or symbols and being adapted to be selectively put into the switching apparatus. Thus by removing the said exchangeable set of contacts and putting into the apparatus another set the switching apparatus is readily re-arranged for causing different symbols to be displayed.

Other objects of the improvements will appear from the following description of the invention.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawings,

Fig. 1, is a diagrammatical elevation showing the improved system comprising a part of the electric sign having three letters or symbols produced thereon, the contacts connected with the lamps shown on said sign and a rotary switch apparatus, controlling said contacts,

Fig. 2, is an elevation showing a part of the switching apparatus,

Fig. 3, is a sectional elevation taken on the line 3—3 of Fig. 1,

Fig. 4, is a diagrammatical elevation showing one set of intermediate contacts cooperating with the contacts shown in Fig. 1, and looking in the direction of the arrows 4—4 shown in Fig. 2,

Fig. 5, is a sectional elevation taken on the line 5—5 of Fig. 4,

Fig. 6, is an elevation showing one of the exchangeable connecting members,

Fig. 7, is a diagrammatical elevation showing the second set of contact members of the intermediate connecting member, looking in the direction of the arrows 7—7 of Fig. 1,

Fig. 8, is a sectional elevation taken on the line 8—8 of Fig. 7,

Fig. 9, is an elevation looking in the direction of the arrow 10 of Fig. 1 and showing the switch member controlling the energizing of the lamps, and

Fig. 10, is a table showing the electrical connections of an intermediate connecting member.

In Fig. 1 I have shown the electric sign composed of series of electric lamps 20 and constructed so that the lateral rays of the lamps are intercepted, and only the rays emanating from the rays perpendicularly to the sign are visible, as is known in the art. The said lamps are connected with one of their terminals with one pole of the source of electric energy 53, and with the other terminals they are connected each with one contact of the switching apparatus, as is known in the art. Fig. 1 shows one of the said leads 54. The construction of the sign and its lamps is known in the art and I deem it not necessary to describe the same in detail. In Fig. 1 the horizontal rows of the lamps have been indicated by the letters A to F, and the vertical rows have been indicated by the Figures 1 to 15. The same charac-

ters have been used for indicating the contacts of the switching apparatus, so that corresponding contacts can be readily traced. In the sign the letters S and O and a symobl representing an arrow have been illuminated, and the same letters and symbol appear in the switching apparatus.

The switching apparatus consists of a frame 21, Fig. 1, having an insulating plate 22 fixed thereto, the said insulating plate being shown in detail in Figs. 1 and 3. In bores of the insulating plate 22 contact pins 23 are mounted, which are acted upon by springs 24 tending to push the same inwardly, and each of which is connected with a terminal of one of the lamps shown in Fig. 1. Thus for example the contact pin 23 having the position C2 is connected with the lamp C2 by a lead 54. In addition to the said rows of contacts 1 to 15 corresponding to the rows of lamps 1 to 15 shown in Fig. 1 the insulating plate 22 carries additional rows of contacts 0 and 16, 17. For clearness sake in Fig. 1 only one of the contacts 23 is shown to be connected with the corresponding lamp 20.

In suitable guide ways of the frame 21 an intermediate connecting member is removably mounted which consists of two parallel insulating plates 27 and 28 connected with each other by bars 29. In bores of the insulating plate 28 shown in detail in Figs. 4 and 5 contact pins 30 are mounted which correspond in position to the contact pins 23, and which are disposed in horizontal and vertical rows represented by the characters A to F and 0 to 17. The insulating plate 27 shown in detail in Figs. 7 and 8 is provided with similar contact pins 32, which are likewise arranged in horizintal and vertical rows A to F and 0 to 17. At their inner ends the contact pins 30 and 32 carry screws 33 and 34 respectively by means of which leads 35 can be fixed thereto. The contact pins 30 are not connected with the contact pins 32 corresponding thereto in position, but only such contacts 30 are connected to contacts 32 which are necessary for energizing the desired lamps. In Figs. 4 and 7 I have indicated the contacts 30 and 32 which have thus been connected respectively by cross-hatching and in solid black.

As appears from the said figures, the contacts representing the letters and symbols shown in Fig. 4 are connected with contact members 32 which are located in the horizontal rows F and E, the table shown in Fig. 10 of the drawing indicating the contacts to be connected. Thus, the letter S produced by the contacts indicated in Fig. 4 is produced by means of the contacts C2, D3, etc., enumerated in the first line of the table shown in Fig. 10, and below the said contacts the second line of the table gives the contacts F1, F2, etc., of Fig. 7 which are connected with the contacts of Fig. 4. In a similar way the second part of the table indicates the contacts of Figs. 4 and 7 which are connected for producing the character O. The third part of the table shows the connection of the contacts producing the arrow. This part of the table will be referred to hereafter.

In Fig. 9 I have shown a metal plate 52 carrying elevated contact portions 36 and 37 and connected by a lead 38 to the source of electric energy. The said plate 35 is adapted to be pushed into the frame 21 with the elevated portions 36 in contact with the contact pins 32, the said plate being guided for this purpose between the said contact pins 32 and a set of rollers 39. As appears from Fig. 9 the elevated portions 36 are disposed transversely of the plate 35 and in the direction of the movement thereof, and their front ends which are first inserted into the frame 21 are in stepped relation. Thus, when inserting the plate 52 into the frame 21, at first the first one of the elevated portions 36 makes contact with the contact member F1 shown in Fig. 7, and thereafter the following portions 36 make successively contact with the contact members F2 to F7. Thereafter the first elevated portion 36 makes contact with the contact member E1, and thereafter the following contact members E2 to E6 are successively engaged by the elevated portions 36 corresponding thereto. Therefore, the contact members shown in Fig. 4 and representing the letter S are successively energized in the direction of writing the letter S, and the said letter appears in the same succession on the sign shown in Fig. 1.

The contact members representing the letter O in Fig. 4 are connected to the contact members F8 to F15 of plate 27, the contact member C8 in Fig. 4 being connected to F8 in Fig. 7 and the other contact members of Fig. 4 following one another in clockwise direction are successively connected to F8 to F15 in Fig. 7. The elevated portions 37 are disposed longitudinally of the plate 52, and the front and rear ends corresponding to the contact members F8 to F15 shown in Fig. 7 are in stepped relation. Therefore, when moving the plate 52 into the frame 21, the contact member F8 of Fig. 7 and the contact member C8 of Fig. 4 are first connected to the source of electric energy, and thereafter successively the following contact members representing the letter O. But before the last one of the contact members, that is the contact member D7 in Fig. 4 has been connected to the circuit, the first one C8 in Fig. 4 is disconnected from the circuit, until it is again connected thereto by the second one of the elevated portions 37 engaging the contact F8 in Fig. 7. Thus the illumination of the lamps of the sign shown in Fig. 1 travels

around the letter O, so that the said letter seems to rotate.

The circuits of the lamps representing the arrow shown in Fig. 1 are controlled in a different way, and the contacts thereof shown in Fig. 4 are not connected with contacts 32 of the plate 27 shown in Fig. 7, but with contacts B17 to F17 of Fig. 4, the said figure showing one of the leads 40. The contacts B13 to F13 and E12, E14 corresponding to the lamps representing the arrow and contained in the plate 22 shown in Fig. 1 are connected by leads such as 41 with the lamps representing the arrow. The contacts B17 to F17 of the plate 22 shown in Fig. 1 and cooperating with the contacts B17 to F17 of the plate 28 shown in Fig. 4 are not connected with lamps, but they are connected by leads 42 with a switching apparatus shown in Fig. 1. The said switching apparatus consists of a rotary drum 43 adapted to be rotated in a suitable way for example by means of an electromotor 44 and a gearing 45. The said drum carries a contact ring 46 and contact members 47 disposed laterally of the said ring and displaced with relation to one another in circumferential direction and electrically connected with the ring 46. The ring 46 and the said contact members 47 cooperate with switch arms 48 and 49, the switch arms 49 being connected to the leads 42, and the switch arm 48 being connected by a lead 50 to the contact F0 of the plate 22. The plate 52 is provided with an elevation 51 in position for acting on the contact F0 of the plate 27 shown in Fig. 7. The electrical connection of the contacts representing the arrow has been indicated in the third section of the table shown in Fig. 10.

Now, when passing the plate 52 across the contacts 32, the circuits of the lamps representing the arrow is completed as follows: source of electric energy, lead 38, elevation 51, contact F0 of plate 27, contact F0 of plate 28, contact F0 of plate 22, lead 50, switch arm 48, ring 46, contacts 47, leads 42, contacts B17 to F17 of plate 22, contacts B17 to F17 of plate 28, leads 40, contacts B13 to F13 and E12, E14 of plate 28, corresponding contacts of plate 22, leads 41, lamps B13 to F13 and E12, E14 of sign, and back to the source of electric energy. By displacing the contacts 47 relatively to one another the said lamps are continuously switched in and out in regular succession. The circumferential length of the contacts 47 is such that always several lamps are simultaneously energized, so that the sign displays a portion of the arrow, and the light emanated from the said lamps appears to travel across the sign.

The operation of the system will be understood from the foregoing description.

As appears from Fig. 7, the table 27 is provided with a large number of contacts 32 only a small part of which has been used in the example described herein. But it will be understood that the other contacts may be used for connecting other lamps to the net, which are energized after the letters S, O and the arrow have been extinguished. The contact making plate 52 can be used with a plurality of contact making members 36, 37, the contacts 32 of the plate 27 being selected so as to produce the desired symbols.

In the practical construction of the apparatus the plate 52 will be made in insulated sections so that the current intensity supplied to the individual sections is reduced.

I claim:

1. A system for simulating various writings on a sign consisting of a field of lamps, comprising a sign provided with rows of lamps, connections between one of the terminals of each lamp and one side of a source of current, a switching apparatus comprising a support, a set of contacts permanently arranged on said support equal in number to the number of lamps and each connected to the other terminal of the corresponding lamp, a frame comprising two members, one of said members having a set of contacts mounted thereon equal in number to the permanent contacts and arranged in the same order and the other member having a plurality of contacts arranged in successive order, means on said support for removably mounting the frame on the support in a manner that corsponding contacts of the first member make contact with the permanently arranged contacts on the support, means in the frame for connecting selected contacts on the first member to successive contacts on the second member, and switch means connected to the other side of the source and having means for successively engaging the successive contacts of the second member.

2. A system for simulating various writings on a sign consisting of a field of lamps, comprising a sign provided with rows of lamps, connections between one of the terminals of each lamp and one side of a source of current, a switching apparatus comprising a support, a set of contacts permanently arranged on said support in a plane and equal in number to the number of lamps and each connected to the other terminal of the corresponding lamp, a frame comprising two plane members, one of said members having a set of contacts mounted thereon equal in number to the permanent contacts and arranged in the same order and the other member having a plurality of contacts arranged in successive order, means on said support for removably mounting the frame on the support in a manner that corresponding contacts of the first member make contact with the permanently arranged contacts on the support, means in the frame for connecting selected contacts on the first member to successive contacts on the second member, and

switch means connected to the other side of the source and having means for successively engaging the successive contacts of the second member.

3. A system for simulating various writings on a sign consisting of a field of lamps, comprising a sign provided with rows of lamps, connections between one of the terminals of each lamp and one side of a source of current, a switching apparatus comprising a support, a set of contacts permanently arranged on said support equal in number to the number of lamps and each connected to the other terminal of the corresponding lamp, a frame comprising two members, one of said members having a set of contacts mounted thereon equal in number to the permanent contacts and arranged in the same order and the other member having a plurality of contacts arranged in successive order, means on said support for removably mounting the frame on the support in a manner that corresponding contacts of the first member make contact with the permanently arranged contacts on the support, means in the frame for connecting selected contacts on the first member to successive contacts on the second member, and switch means connected to the other side of the source and having means for successively engaging the successive contacts of the second member, the contact making portions of said switch means being with their leading and rear ends in stepped relation, and being divided in the direction of the movement of the switch member into separate portions spaced from one another.

In testimony whereof I hereunto affix my signature.

GEORG MAURER.