W. K. QUEEN & T. F. PICKETT.

ELECTRIC SIGN.

APPLICATION FILED MAY 2, 1912.

1,120,971.

Patented Dec. 15, 1914.

4 SHEETS—SHEET 1.

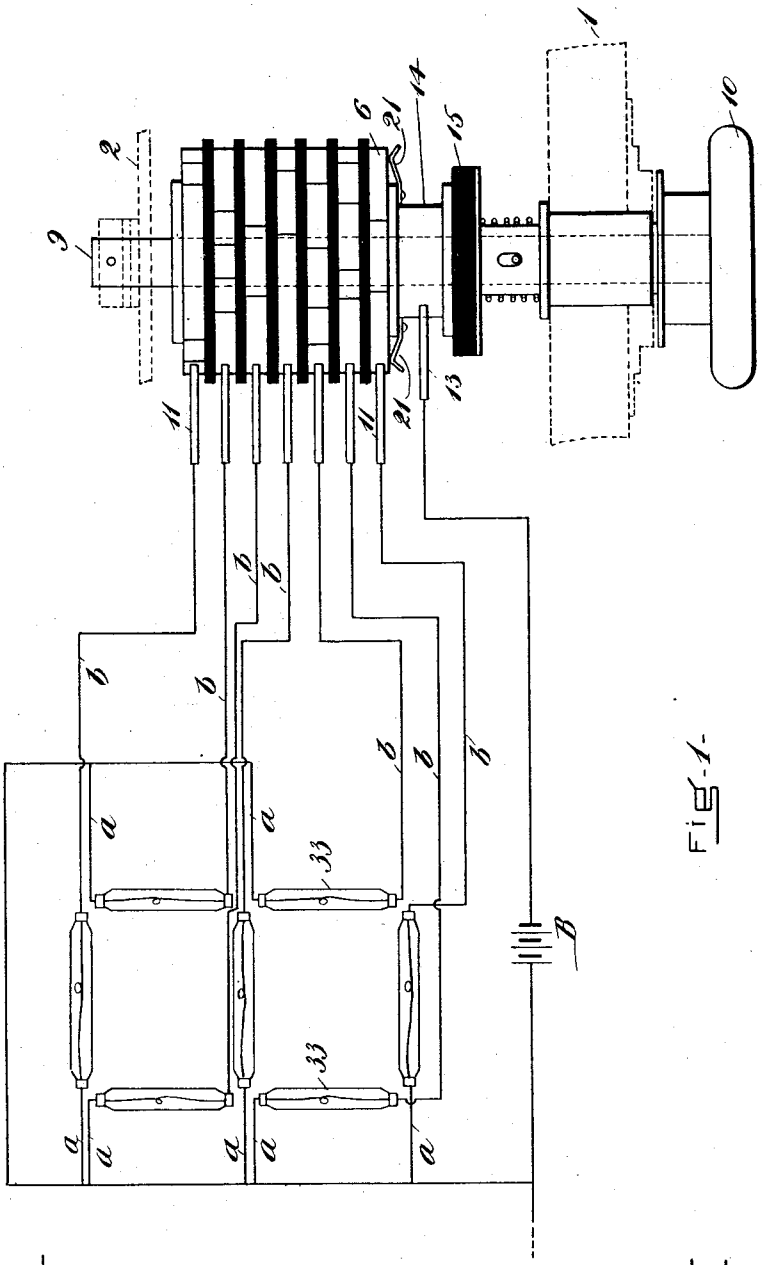


FIG. 1.

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4 SHEETS-SHEET 2.

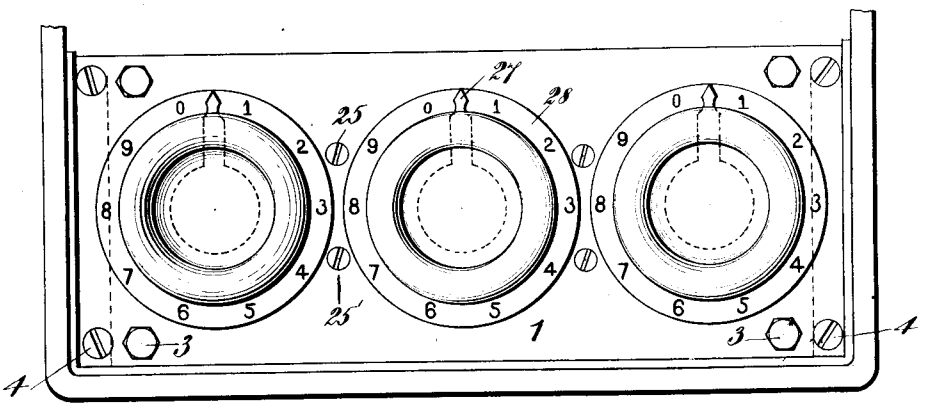


Fig. 2.

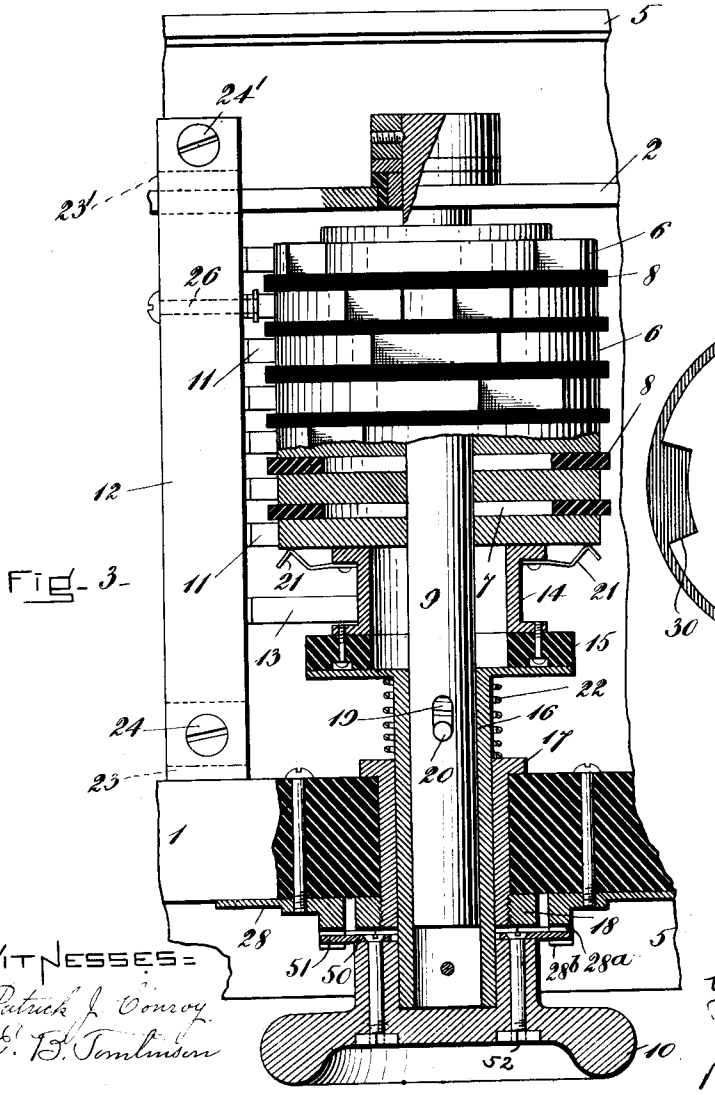


Fig. 3.

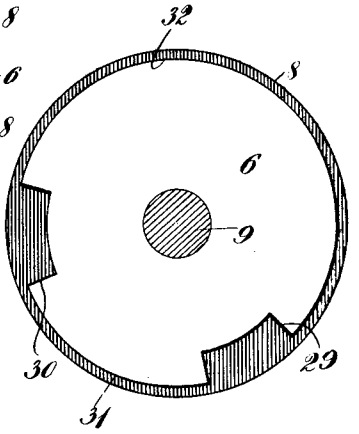


Fig. 4.

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4 SHEETS—SHEET 3.

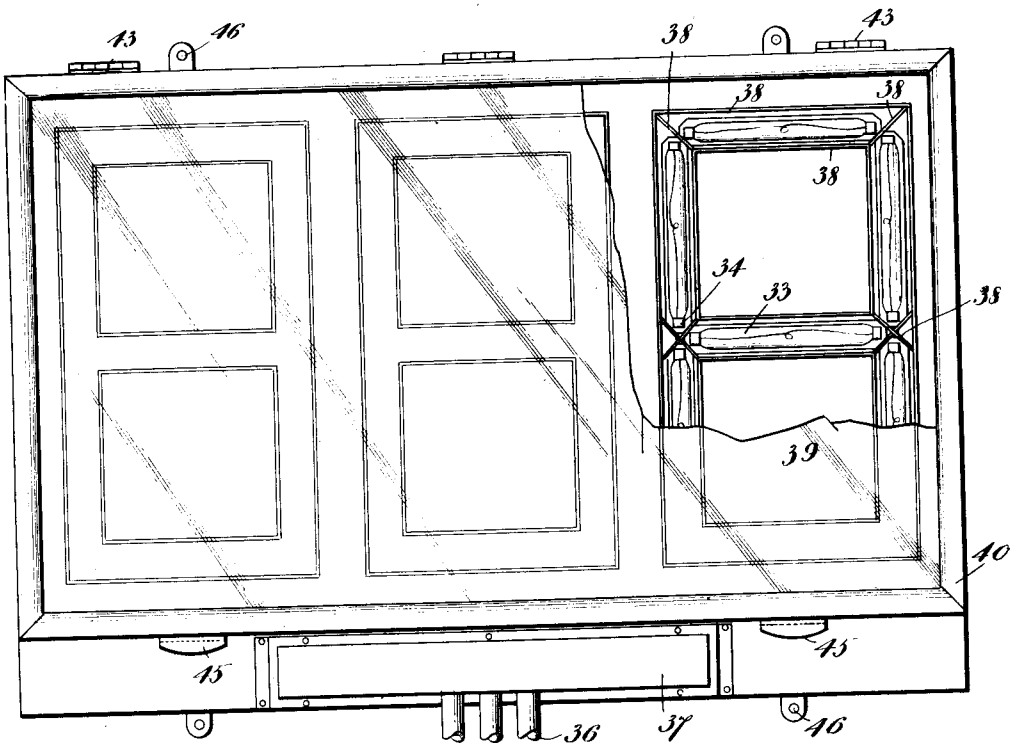


Fig. 7.

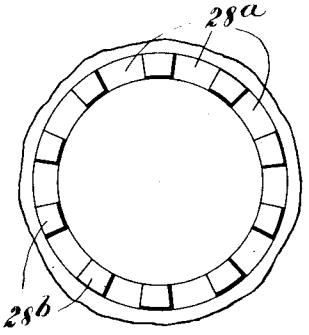


Fig. 3a.

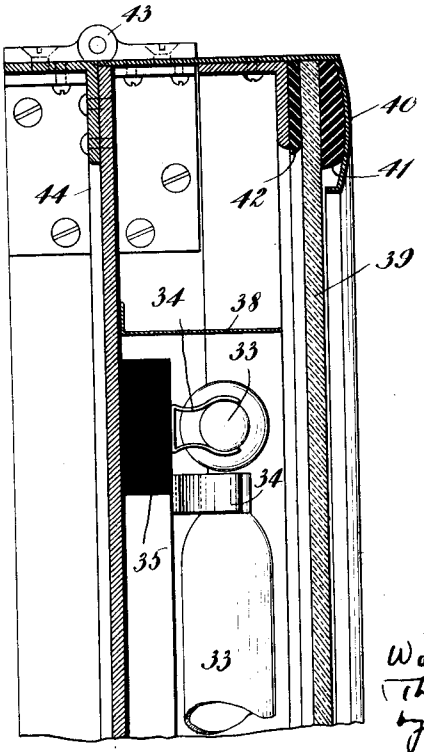


Fig. 8.

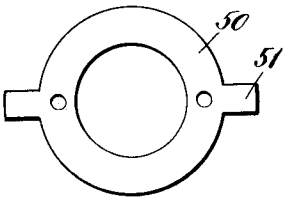


Fig. 3b.

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4 SHEETS—SHEET 4.

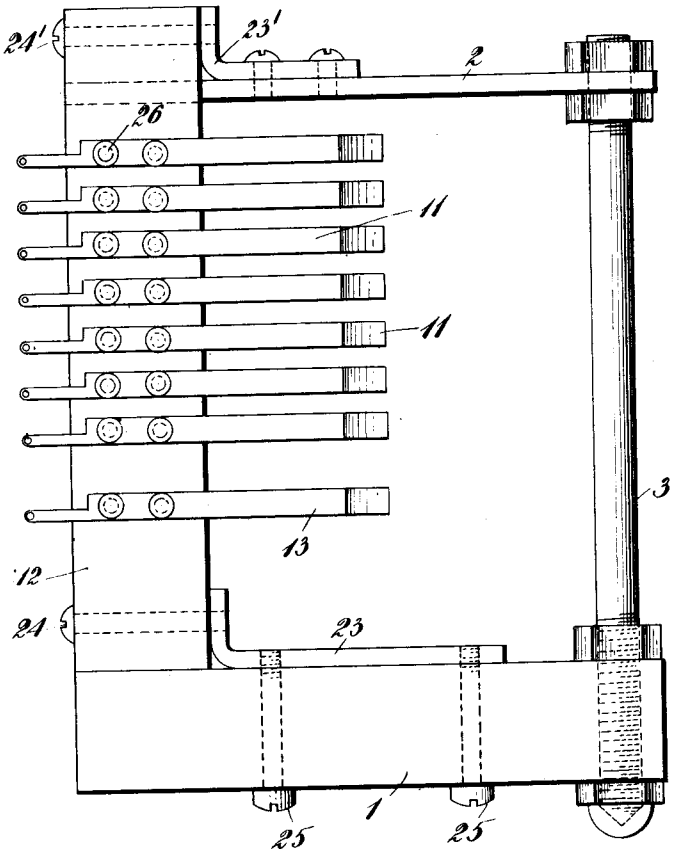


Fig. 5.

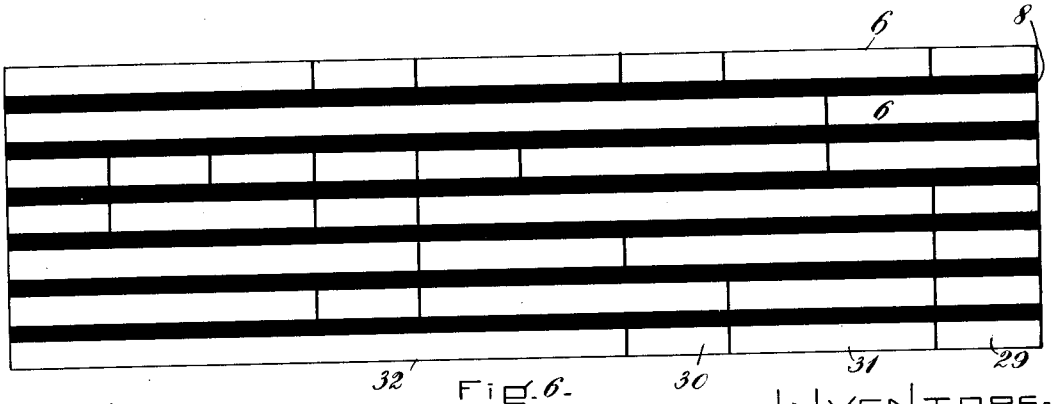


Fig. 6.

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UNITED STATES PATENT OFFICE.

WALTER K. QUEEN AND THORNTON F. PICKETT, OF NEEDHAM HEIGHTS, MASSACHUSETTS.

ELECTRIC SIGN.

1,120,971. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed May 2, 1912. Serial No. 694,632.

To all whom it may concern:

Be it known that we, WALTER K. QUEEN, a citizen of the United States, and THORNTON F. PICKETT, a subject of the King of Great Britain, and residents of Needham Heights, county of Norfolk, and State of Massachusetts, have invented a new and useful Improvement in Electric Signs, of which the following is a specification.

Our invention relates to electric signs and its object is to provide a simple device whereby numbers or letters may be exhibited at any desired point in the form of electric lamps by a distantly located commutating apparatus.

One of the various uses of the invention is to exhibit to the operatives in the boiler room of a power plant the various changes in the load on the engines, the engineer, for this purpose, so manipulating the commutating apparatus as to cause the illumination of certain combinations of lamps.

One embodiment of our invention is illustrated in the drawings which accompany and form a part of this specification, although it will be understood that the particular construction and system of circuits therein shown may be subjected to a wide range of variation without departing from the principle of our invention.

In the drawings, Figure 1 is a diagram showing one arrangement of circuits that may be employed to connect the commutating apparatus with the electric sign. Fig. 2 is an end view of the commutating apparatus. Fig. 3 is a longitudinal section of one of the commutators. Figs. 3^a and 3^b are details of the plates secured to the hand wheel hereinafter referred to. Fig. 4 is a transverse section showing the shape of one of the commutator disks. Fig. 5 is a side view showing the arrangement of the contact fingers. Fig. 6 shows a development of the circumference of the commutating apparatus. Fig. 7 is an elevation of the sign apparatus, and Fig. 8 is a vertical section of the same.

In the particular drawings which we have selected for more fully disclosing the preferred embodiment of our invention, a plurality of commutators, herein shown as three in number, are arranged in a case comprising a front plate 1 of slate or other suitable insulating material, and a metallic back plate 2, which may be of steel. The bolts 3 connect the front and back plates, and the screws 4 secure the front plate to the outside frame 5. Each commutator consists in the present instance of seven rings, 6, separated by the conducting washers 7 of less diameter than the disks and by the insulating rings 8. The commutator is mounted on the shaft 9, suitably journaled in the front and back frames and a hand-wheel 10 is arranged for turning said shaft and commutator. Spring fingers 11 mounted on the plate 12 of slate or other suitable insulating material, coöperate respectively with the commutator disks. A spring finger 13, also mounted on said plate 12 makes electrical contact with the conducting ring 14, which by means of the insulating coupling 15 is secured to the sleeve 16 surrounding the shaft and passing through the bushing 17, which in turn passes through the front plate and is threaded to the lock-nut 18. By means of the slot 19 in the shaft and the pin 20 passing therethrough and affixed to the sleeve 16, the latter, which is secured to the hand-wheel 10, has a relative longitudinal movement with respect to the shaft, so that by pulling out the hand-wheel, the spring fingers 21 may be drawn out of contact with the disk against which the spiral spring 22 normally forces them. Also it will be apparent that by rotating the hand-wheel the shaft and commutator may be turned through the intermediary of the said pin and slot. The support 12 for the spring fingers is secured in the present instance to the front and back plates by the angle irons 23, 23′ and the screws 24, 24′ and 25, 25′. The spring fingers may be attached to the supporting plate in any suitable manner, as for example, by screws, one of which is shown at 26.

Each hand-wheel is provided with a pointer 27 arranged in front of the indicating plate 28, provided in the present instance with the numerals as indicated.

The plate 50, secured by the screws 52 to the hand-wheel, may be provided with the lugs 51 which fit into notches 28^a cut into the rim of the indicating plate 28 and thereby hold the commutator disks in their selected position. When it is desired to ex-

tinguish all the lamps the hand-wheel is pulled out and turned so that the lugs rest on the bosses 28^b, thereby maintaining the spring-fingers 21 out of contact with the disks and opening the return circuit.

Each commutating disk has one or more notches 29, 30 milled therein, as shown in Figs. 4 and 6, said notches being separated by conducting surfaces 31, 32 on which the upturned ends of the spring-fingers bear.

Referring more particularly to Fig. 1, it will be apparent that when the apparatus is in the position shown, there will be a circuit from the source of electrical energy B connected by the wires *a* to one terminal of each lamp 33 through such lamps as are connected by the conductors *b* with contact-fingers 11 which bear on conducting surfaces of the commutator disks. For example, if the outermost contact-fingers are in contact with such surfaces in the diagram shown in Fig. 1, the circuit may be traced from B through the wires *a* to the upper and lower horizontal lamps, thence by way of conductors *b* to the upper and lower disks and the interposed conducting washers 7 to the shaft-switch spring-fingers 21. the ring 14, and thence through the return circuit contact-finger 13 back to the battery.

By suitably manipulating the commutator, any desired combination of lamps 33 may be illuminated so as to produce the numerals 1 to 9 and 0.

By pulling out the hand-wheel 10 before rotating the same and therefore breaking contact between the spring-fingers 21 and their coöperating disk, the circuit will be broken and sparking at the contacts as the commutator is rotated will be prevented. It will be understood, however, that such shaft-switch spring-fingers need not be employed.

While it will be understood that the commutating apparatus above described may be employed with any suitable sign apparatus, we shall describe in connection with Figs. 7 and 8 one particular construction that has given good results in practice. In Figs. 7 and 8 the lamps 33, which preferably are of the type known as "Linolite" lamps, consisting of a glass tube about one foot in length having a filament extending throughout its length and connected to conducting caps at its ends, are held in place by the conducting clips 34, which are mounted on insulating blocks 35 and to which are connected the conductors designated as *a*, *b* in Fig. 1. The three sets of conductors enter the casing through the conduits 36 and are connected to terminals placed under the sheet iron cover 37 and said terminals are connected to the several spring clips 34. Light barriers 38, which may be formed of sheet iron are placed so as to inclose the several lamps and thereby restrict the light produced by any one lamp to a particular oblong space as shown. 39 is a glass plate held in the front cover frame 40 by a suitable packing 41, 42, and said cover may be hinged as shown at 43 to the back plate 44, handles 45 being provided for raising the cover.

The apparatus may be mounted on a wall or other support by the lugs 46. By means of this particular sign apparatus, numerals from 0 to 999 may be exhibited, although it will be obvious that by a mere duplication of parts, numbers containing more than three digits may be formed.

We claim:

1. In an electric sign, a plurality of electric lamps, a source of electric energy, means whereby any desired combination of lamps may be energized to produce a predetermined symbol, a switch operated by the last mentioned means for breaking the circuit of said source and spring means for maintaining said switch in circuit-closing position.

2. In an electric sign, a plurality of electric lamps, a source of electric energy, means whereby any desired combination of lamps may be energized to produce a predetermined symbol, a switch operated by the last mentioned means for breaking the circuit of said source, means for holding said switch in circuit-breaking position, and spring means for maintaining the same in circuit-closing position.

3. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps to produce a predetermined symbol, a switch operated by said commutator apparatus for breaking the circuit of said source and spring means for maintaining said switch in circuit-closing position.

4. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps to produce a predetermined symbol, a switch operated by said commutator apparatus for breaking the circuit of said source, means for holding said switch in circuit-breaking position, and spring means for maintaining the same in circuit-closing position.

5. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator comprising a plurality of disks, one for each said lamp, means connecting one terminal of each lamp with its commutator disk, a return circuit connecting all the other terminals of said lamps with each commutator disk, a switch operated by said commutator for breaking said return circuit and spring-means for maintaining said switch in circuit-closing position.

6. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator comprising a plurality of disks, one for each lamp, means connecting one terminal of each lamp with its commutator disk, a return circuit connecting all the terminals of said lamp with each commutator disk, a switch operated by said commutator for breaking said return circuit, means for holding said switch in circuit-breaking position, and spring means for maintaining the same in circuit-closing position.

7. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predetermined symbol, said commutator apparatus comprising a shaft, a plurality of disks mounted on said shaft, means for rotating said shaft, a switch operated by said means and having relative longitudinal movement with respect to said shaft for breaking the circuit of said source and spring means for maintaining said switch in circuit-closing position.

8. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predetermined symbol, said commutator apparatus comprising a shaft, a plurality of disks mounted on said shaft, means for rotating said shaft, a switch operated by said means and having relative longitudinal movement with respect to said shaft for breaking the circuit of said source, and means for holding said switch in circuit-breaking position.

9. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predetermined symbol, said commutator apparatus comprising a shaft, a plurality of disks mounted on said shaft, means for rotating said shaft, a switch operated by said means and having relative longitudinal movement with respect to said shaft for breaking the circuit of said source, means for holding said switch in circuit-breaking position, and spring means for maintaining the same in circuit-closing position.

10. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predtermined symbol, said commutator apparatus comprising a shaft, a plurality of disks mounted on said shaft, means for rotating said shaft, a contact ring mounted on said shaft, means electrically connecting said ring with said disks and means movable along said shaft for breaking said connection.

11. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predetermined symbol, said commutator apparatus comprising a shaft provided with a longitudinally-extending transverse slot, a plurality of disks mounted on said shaft, a sleeve slidable on said shaft, a pin affixed to said sleeve and passing through said slot, a contact-ring secured to, but insulated from said sleeve, and means electrically connecting said ring and disks.

12. In an electric sign, a plurality of electric lamps, a source of electric energy, a commutator apparatus for controlling the energization of any desired combination of lamps for producing a predetermined symbol, said commutator apparatus comprising a shaft provided with a longitudinally-extending transverse slot, a plurality of disks mounted on said shaft, a sleeve slidable on said shaft, a pin affixed to said sleeve and passing through said slot, a contact-ring secured to, but insulated from said sleeve, and a contact-member secured to said ring and arranged to make contact with the outer disk.

In testimony whereof, we have hereunto subscribed our names this 27th day of April, 1912.

WALTER K. QUEEN.
THORNTON F. PICKETT.

Witnesses:
GEO. K. WOODWORTH,
E. B. TOMLINSON.