

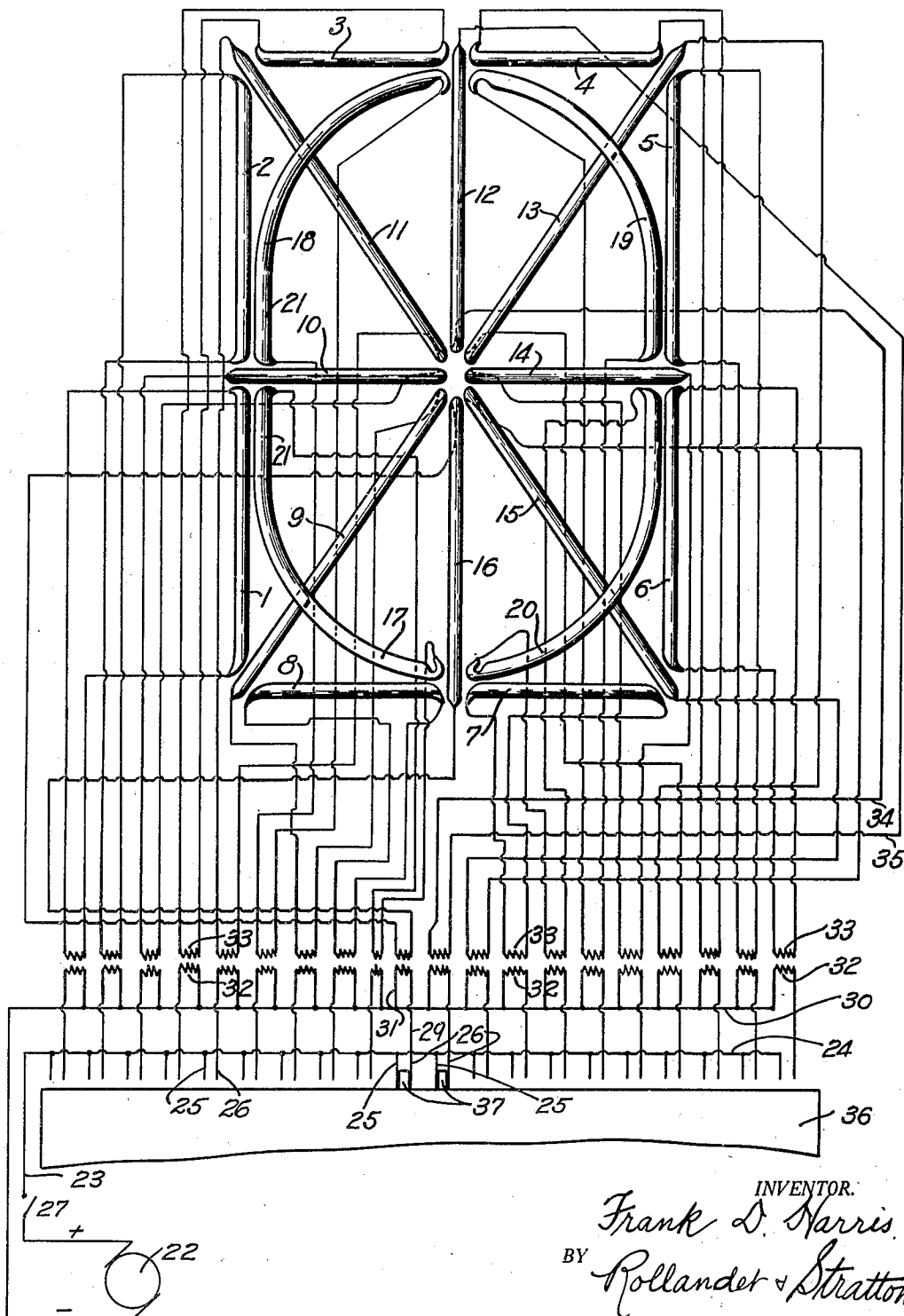
May 2, 1933.

F. D. HARRIS

1,906,960

SIGN

Filed May 12, 1930



UNITED STATES PATENT OFFICE

FRANK D. HARRIS, OF DENVER, COLORADO, ASSIGNOR TO FLEXO AUTOMATIC SIGN
COMPANY, OF DENVER, COLORADO

SIGN

Application filed May 12, 1930. Serial No. 451,705.

My invention relates to electric signs. The principal object is to provide an arrangement of neon gas electric tubes that will make any letter of the alphabet by lighting certain of
5 the tubes.

Another object is to provide conveniently arranged circuits for the tubes that may be closed mechanically or manually as desired.

A further object is to provide an arrangement of tubes, in which some of them are curved and some straight, to better form the letters containing curves.

Still another object is to provide a novel arrangement or system of wiring for said tubes. Other objects will appear in the course of the following description. While the invention resides in novel construction, arrangements and combinations of parts, changes may be made in same without departing from the spirit of the invention.
20

Although it is not essential, the switch shown in my co-pending application Serial No. 458,559 may be conveniently used to close the circuits of the present sign.

The drawing is a diagrammatic representation of neon tubes comprised in the invention, circuits therefor, and circuit closing means for the circuits.
25

While neon gas is preferable, other gases that are adapted to be illuminated by electric current may be used and are considered equivalents. Moreover, the drawing only shows a single system. It is to be understood that a battery of such systems may be arranged side by side to simultaneously outline all the letters of a word or phrase. A single switch would be suitable, if not advisable, for such a battery.
30

Referring more in detail to the drawing, the reference numerals 1 to 20 designate gas tubes that are arranged whereby any letter of the alphabet may be formed. The tubes 1 to 8 form a rectangle. The ends of these tubes are spaced from each other for a purpose to be more fully explained hereinafter.
35

Tubes 9, 11, 13 and 15 are diagonally arranged in the rectangle and respectively project into the spaces between the ends of tubes 8 and 1, 2 and 3, 4 and 5, and 6 and 7. Tubes
40 12 and 16, and 10 and 14 are respectively ar-

ranged to bisect the rectangle longitudinally and transversely. These tubes respectively project into the spaces between the ends of tubes 3 and 4, 7 and 8, 1 and 2, and 5 and 6. The inner tips of tubes 9 to 16 are arranged
55 around the center of the rectangle in the form of an ellipse or oval.

Within the rectangle and crossing over the diagonally arranged tubes are curved tubes 17 to 20. These tubes are parallel with the
60 sides of the rectangle for a short distance, as illustrated at 21. The curved tubes terminate within the quarters of the rectangle, adjacent to the outer ends of the tubes that bisect the sides and ends of the rectangle.
65 The latter tubes also separate the ends of the curved tubes.

Electrodes have not been shown at the ends of the tubes since the drawing is only schematic. Moreover, it is within the skill
70 of an ordinary mechanic to place suitable electrodes within the ends of the tubes and connect same in the circuits illustrated.

The circuit for the tube 12 will be traced. Beginning at a source 22, the current travels
75 through a main switch 27 (closed during operation) and through wire 23 to a bus bar 24. Contact 25 is connected with the bus bar 24. Contact 26 spaced from the contact 25, connects with one end of the primary side
80 of a transformer by a wire 29. The other end of the primary side of the transformer connects with another bus bar 30 by a wire 31 and then back to the power. The secondary side 33 of the transformer is connected with
85 the ends of the tube 12 by wires 34 and 35. The circuits of the other tubes are similar and are thought clear from the drawing. A more detailed explanation of the wiring appears unnecessary.
90

There is a transformer for every tube, but only one source of electric energy. Each transformer is connected with spaced contacts similar to contacts 25 and 26. Thus to light any tube, its respective contacts are connected, either by bridging same, or by other suitable means.
95

A rotary switch, such as shown in my said co-pending application, is indicated in part and diagrammatically at 36. Of course it is
100

clear without illustration that the desired contacts may be electrically connected by manual switches, although it is desired to use suitable automatic means for illuminating selective tubes in predetermined arrangements and series, such as said rotary switch.

It is of advantage to have the switch on the power side of the transformer for this avoids arcing or a complicated make-and-break switch.

In the operation of the invention, the switch is rotated. Conductive members 37 are shown closing the circuits of tubes 12 and 16 to form the letter "I".

The following table illustrates the tubes to be illuminated in order to form the respective letters:

	A	1-2-3-4-5-6-10-14
	B	1-2-3-4-5-6-7-8-10-14
20	C	4-7-17-18
	D	1-2-3-8-19-20
	E	1-2-3-4-7-8-10-14
	F	1-2-3-4-10
	G	4-14-17-18-20
25	H	1-2-5-6-10-14
	I	12-16
	J	5-17-20
	K	1-2-9-13-15
	L	1-2-7-8
30	M	1-2-5-6-11-13
	N	1-2-5-6-11-15
	O	17-18-19-20
	P	1-2-3-4-5-10-14
	Q	15-17-18-19-20
35	R	1-2-3-4-5-10-14-15
	S	2-3-4-6-7-8-10-14
	T	3-4-12-16
	U	2-5-17-20
	V	1-2-9-13
40	W	1-2-5-6-9-15
	X	9-11-13-15
	Y	11-13-16
	Z	3-4-7-8-9-13
	-	10-14

What I claim and desire to secure by Letters Patent is:

1. A sign comprising an arrangement of luminous gas tubes adapted to display any given ones to form letters or figures by selective energization and means for the selective energization of the tubes comprising a series of transformers, one for each tube, the primaries of which are separately connected in circuits with a common source of electricity and the secondaries of which are connected with opposite ends of the respective tubes, the primary circuits being broken by gaps corresponding in number with the transformers and the tubes, and a rotary element carrying devices to selectively bridge one or more of the gaps during its rotary motion, whereby to complete the respective circuits.

2. A sign comprising a suitable support, a series of luminous gas tubes on the support in a rectangular arrangement and having di-

agonal and curved tubes arranged therewith, and electrical circuits connected with the tubes to display in a luminescent condition certain ones of a given set of tubes, to form letters or figures, the ends of each tube being in spaced relation to adjacent other tubes, for their separate detachment and the ready attachment of their ends in the electric circuits, the tubes forming the rectangle having their ends in substantially the same plane.

3. A sign comprising a suitable support and a series of luminous gas tubes arranged on the support to display in a luminescent condition any one of a given set of letters or figures, the series including pairs of tubes forming the sides of a rectangle with their ends in spaced relation to each other, tubes radiating from the center of the rectangle with their inner ends spaced from each other and with their outer ends in the spaces between adjacent side tubes of the rectangle, and tubes subtending the angles of the rectangle with the ends spaced from adjacent other tubes of the same.

4. A sign comprising a suitable support and a series of luminous gas tubes arranged on the support to display in a luminescent condition any one of a given set of letters or figures, the series including pairs of tubes forming the sides of a rectangle with their ends in the same plane and in spaced relation to each other, tubes radiating from the center of the rectangle with their inner ends spaced from each other and with their outer ends spaced from adjacent side tubes of the rectangle and curvilinear tubes subtending the angles of the rectangle with the ends spaced from adjacent tubes of the rectangle.

5. A sign comprising a suitable support and a series of luminous gas tubes arranged on the support to display in a luminescent condition any one of a given set of letters or figures, the series including pairs of tubes forming the sides of a rectangle with their ends in spaced relation to each other, and tubes radiating from the center of the rectangle with their inner ends spaced from each other and with their outer ends in the spaces between adjacent side tubes of the rectangle.

6. A sign comprising a suitable support, a series of curved and straight, luminous gas tubes on the support, to display in a luminescent condition a given configuration, the tubes being separately detachable from the support and having their ends free and spaced from adjacent tubes for the ready connection of conductors of electricity, the ends of the straight tubes being in substantially the same plane.

7. An electric display sign comprising a series of luminous gas tubes in a rectangular arrangement, certain tubes at the sides of the rectangle being spaced apart, curved tubes subtending angles of the rectangle, to form

characters with parts thereof, the curved tubes being spaced apart, and tubes radiating from the center of the rectangle, having their outer ends in spaces between the spaced tubes
5 of the rectangle and being in spaces between the curved tubes.

8. An electric display sign comprising a series of luminous gas tubes in a rectangular arrangement, certain tubes at the sides of the
10 rectangle being spaced apart at their ends, curved tubes subtending angles of the rectangle, to form characters with parts thereof, ends of the curved tubes being spaced apart, and tubes radiating from the center of the
15 rectangle, having their outer ends in said spaces between the ends of said tubes in the rectangle and between spaced ends of the curved tubes.

In testimony whereof I hereunto affix my
20 signature.

FRANK D. HARRIS.

25

30

35

40

45

50

55

60