

(No Model.)

2 Sheets—Sheet 1.

L. S. CRANDALL.
SIGNALING APPARATUS.

No. 542,928.

Patented July 16, 1895.

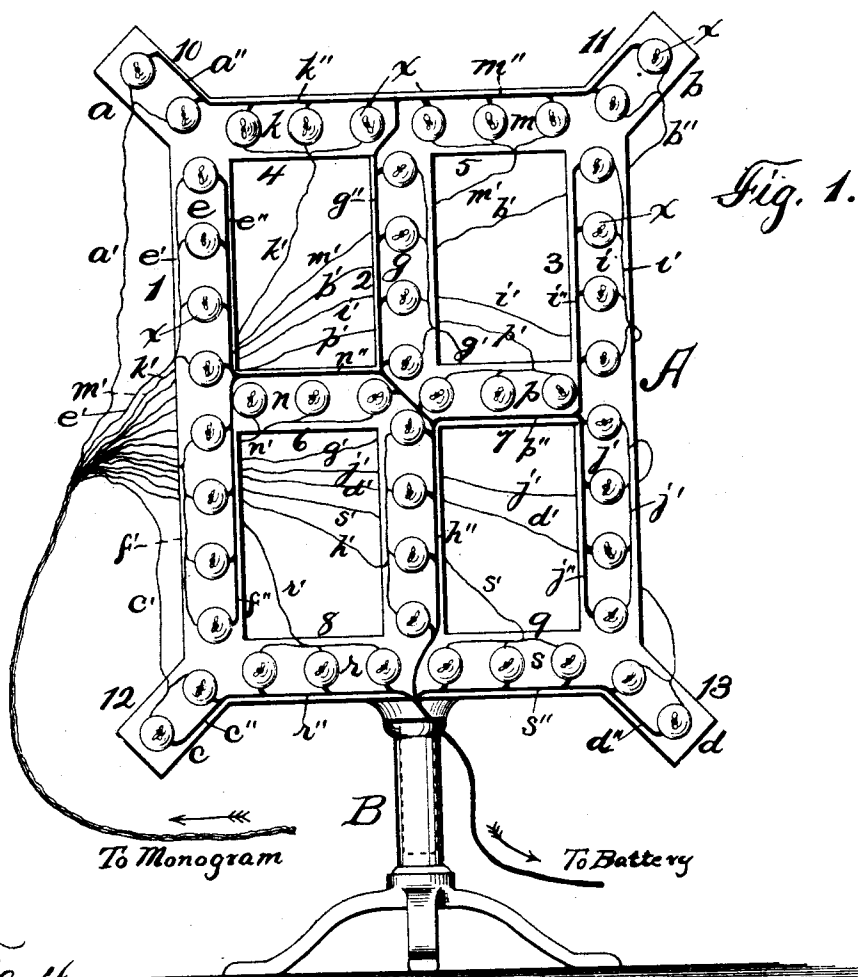
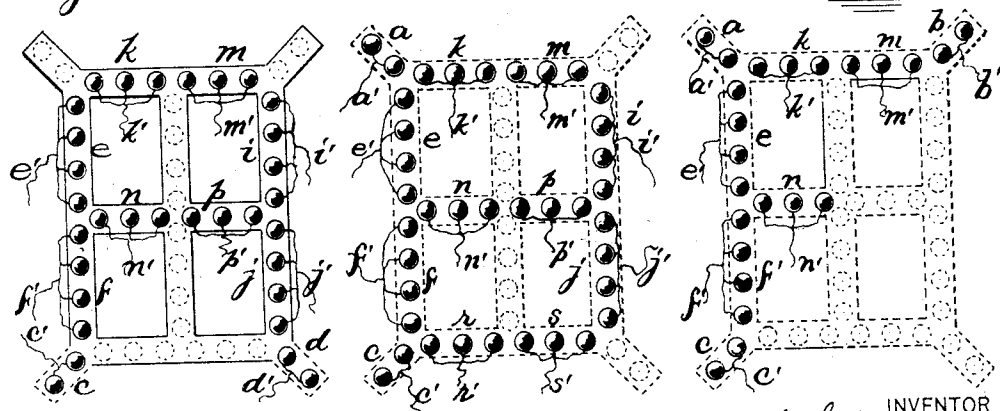


Fig. 4.



WITNESSES:

D. May Woodrich.
C. B. Hume.

INVENTOR

Lucius S. Crandall

By

Smith & Benson
ATTORNEYS.

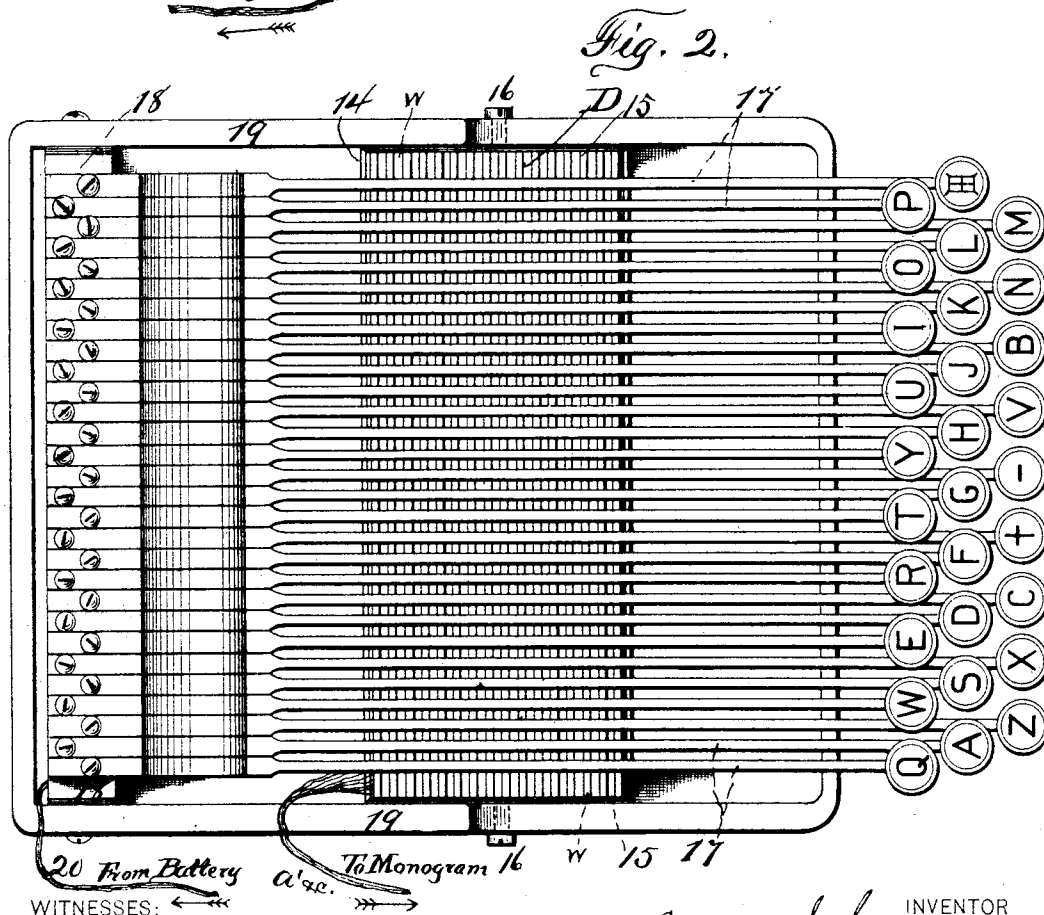
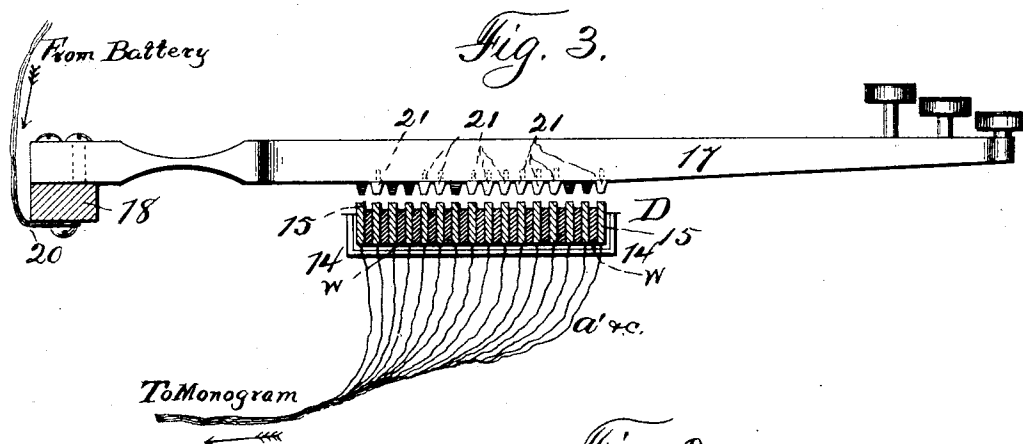
(No Model.)

2 Sheets—Sheet 2.

L. S. CRANDALL.
SIGNALING APPARATUS.

No. 542,928.

Patented July 16, 1895.



WITNESSES:

S. May Goodrich.
C. B. Moore.

INVENTOR
Lucien S. Crandall
By *Smith & Arnisow*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

LUCIEN S. CRANDALL, OF PARISH, NEW YORK.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 542,928, dated July 16, 1895.

Application filed February 17, 1893. Serial No. 462,674. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN S. CRANDALL, of Parish, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Signaling Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to signaling apparatus
10 and to that class embodying a compound monogram embodying all of the elements of all of the letters of the alphabet, and means to define and outline each element and each group of elements which together create any
15 letter of the alphabet, either by illuminating each element or group or series of elements to display any letter desired or any sequence of letters necessary to spell a word, or by any other means adapted to the purpose of rendering prominent any single element or any
20 group or series of elements.

My object is to produce a compound monogram subdivided into a plurality of elements, each element representing a portion of a letter of the alphabet and all together embodying
25 all of the constructional elements necessary to construct or build any letter, and to provide means whereby each element or any group or series of elements can be illuminated
30 or otherwise rendered prominent over the remaining elements, whereby any letter can be produced in outline or configuration or any series of letters necessary or desired to spell any word, such illumination of elements, for
35 instance, being produced by the operation of the different keys of a keyboard, each key being adapted to make multiple electrical contacts and circuits, each circuit representing and illuminating an element of the monogram
40 and the number of the circuits made by each key equaling the number of monogrammic elements in each letter, and of which each letter is composed, and in which the monogram is illuminable in divisional parts, in elementary
45 parts, and in groups of elementary parts, and in which, when illumined, each element is designated and displayed by and, in fact, consists of a plurality of lamps or lights, electric or otherwise.

50 My invention consists in the several novel features of construction hereinafter described,

and which are specifically set forth in the claims hereunto annexed.

The apparatus is constructed and operated as follows, reference being had to the accom-
55 panying drawings, in which—

Figure 1 is a front elevation of the monogrammic or display frame pivotally mounted to rotate upon a standard. Fig. 2 is a top plan of a system of keys and the multiple contact-board under the keys. Fig. 3 is a sectional
60 side elevation of the keyboard and the contact-board and the wires connected to the contact-bars. Fig. 4 represents in front elevation the monogrammic or display frame when the
65 elements are illuminated which create the letters A, B, and F, respectively, the dormant elements being indicated by the dotted circles.

In this specification the name "signal apparatus" is used in a generic sense, inasmuch
70 as signaling is only one of the many uses to which the apparatus can be applied, and only one of the objects or objectives of the invention; and I will herein describe only the manner in which it is operated by and constructed
75 for the use of electric lights divided into a plurality of groups, each group representing an element of the monogram and one of the component parts of the members of the letters of the alphabet, and other characters, signs, or
80 symbols, and the word "battery" is also used as designating any source of generation of electricity.

A is the monogram frame, comprising the vertical rails 1 2 3, the horizontal rails 4 5 6
85 7 8 9, and the diagonal or branching rails 10 11 12 13, all of any suitable material and shown as pivotally mounted upon a standard B, though it may be mounted in many other ways; but for some purposes the pivotal
90 mounting is preferable whenever it is desired to change the direction of the presentation of the monogram according to the different points of vision. Upon these rails I show incandescent electric lights X, mounted in groups, each
95 group constituting a monogrammic element, and each element consisting of said lights, the number of which may be varied, as desired. These elements are here shown as sixteen in number, and are marked a, b, c, d, e, f, g, h, i,
100 j, k, m, n, p, r, and s, and a', b', c', d', e', f', g', h', i', j', k', m', n', p', r', and s' are the posi-

tive wires which connect these respective elements to the battery, (not shown,) and $a'', b'', c'', d'', e'', f'', g'', h'', i'', j'', k'', m'', n'', p'', r'',$ and s'' are the negative or return wires to the battery, each positive wire and each negative wire being connected to the lights in the usual manner.

Each positive wire and its negative wire constitute a separate circuit, and all of these circuits are normally broken at the contact-board D. This contact-board consists of a box or box-like frame 14, in which the metallic contact-bars 15 are placed, arranged in parallel lines and insulated from each other and from the box which contains them, the strips w being of insulating material, and each contact-bar represents an element in the monogram, and each of the positive wires a' to s' , inclusive, is connected to its contact-bar. This contact-board is shown as pivoted upon the trunnions 16, but it may be mounted in any other manner which will insure the simultaneous making of the respective multiple contacts hereinafter described.

Keys 17 are rearwardly mounted upon the rear bar 18 of the main frame 19, and each may be insulated from the others in any ordinary manner, or all may be electrically connected to said bar 18, which is connected to the battery by the wire 20; and in case the keys are insulated from each other then 20 indicates the bunch of wires, the separate wires thereof being connected to the separate keys.

Each key is provided with multiple contact-points 21, each contact-point representing an element of the monogram, and the points together representing the aggregate constituent elements of the letter indicated by the button upon the key.

Each key-bar has either a self-contained spring or is provided with or connected to a suitable spring which will act to normally hold, support, or carry the key out of contact with the contact-board; and inasmuch as the keys are rearwardly mounted and each key is adapted to make multiple contacts with the contact-board, and inasmuch as the contact-points, when a key is depressed, swing or move vertically in arcs of circles the center of which is adjacent to the rearward mounting of the key, and inasmuch as the front contact-point must travel a greater distance vertically than the rear one or the intermediate ones, the contact-board is mounted so as to oscillate, rock, or yield, so as to insure the practically simultaneous making of all the multiple contacts by any key, and particularly of those which are provided with the larger numbers of such points.

Each key is, in effect, at least, a multiple-contact armature, and no two keys make the same group of contacts; but each key makes such contacts as are necessary to produce the illumination of the elements necessary to produce the outline of the letter indicated upon the button upon each key. The illumination

of the elements continues as long as the circuit made by the contact is maintained, and when the pressure upon the key is removed the circuit is broken and the lights extinguished. In this manner the letter "A" is produced by the illumination of the monogrammic elements $c, f, e, k, m, i, j, n, p,$ and d ; "B," by illuminating $c, f, e, a, k, m, i, n, p, j, r,$ and s ; "F," by illuminating $a, e, f, c, n, k, m,$ and b , as shown in Fig. 4.

It will be readily understood from the above how the other letters can be produced by various combinations of the monogrammic elements. One button shows a dash, and when this armature key is operated either of the elements $k, m, n, p, r,$ or s will be illuminated, and only one, because that key has only one contact-point and makes contact with only one bar. Another button shows a cross, and when its armature key is operated the elements $g, n, p,$ and h are illuminated. Another button shows the whole monogram, and when its key is operated the whole monogram is illuminated, this armature key being adapted to make contact with all of the contact-bars.

I do not limit myself to the precise number or arrangement of the elements in the monogram, as I can make such connections as to cause elementary illumination of various kinds of signs, symbols, characters, numerals, fanciful designs for cipher communication, cipher-code signals, punctuation-marks of all kinds, and the code of telegraphic signs, including the Morse and other alphabets, and also including the letters of any language. The monogram may consist of any number of elements and such element may be illuminated, displayed, exhibited, thrown onto screens, or otherwise made prominent and active, over those which are left dormant, either singly or in groups of elements; also, the lights or lamps may be erected behind a screen, either solid or provided with openings, slots, or apertures, or behind either plain, opaque, or colored glasses, in any ordinary manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a monogrammic display-frame of rectangular form and having central cross-bars and corner extensions and also having series of incandescent lamps disposed thereon, of a key-board comprising a series of spring-controlled key-bars, each having a series of contact-points, a contact-board comprising a series of insulated contact-bars, a battery, and electrical connections between the battery and display-frame, between the battery and key-board, and between the contact-board and display-frame; substantially as described.

2. The combination with a display-frame having series of incandescent lamps disposed thereon, of a key-board comprising a series of spring-controlled key-bars, each having a series of contact-points disposed longitudinally thereof, an oscillating contact-board compris-

ing a series of insulated contact-bars arranged transversely of the key-board, whereby is insured the practically simultaneous making of all of the contacts, by any key, a battery, and
5 electrical connections between the battery and display-frame, between the battery and key-board, and between the contact-board and display-frame; substantially as described.

3. The herein described monogrammic display-frame, consisting of end and side bars, central, bisecting cross-bars and corner extensions, the respective bars having disposed

along their lengths illuminable signaling devices, whereby on the one device the several letters of the alphabet or other predetermined
15 symbols may be produced; substantially as described.

In witness whereof I have hereunto set my hand this 15th day of February, 1893.

LUCIEN S. CRANDALL.

In presence of—

C. W. SMITH,

HOWARD P. DENISON.