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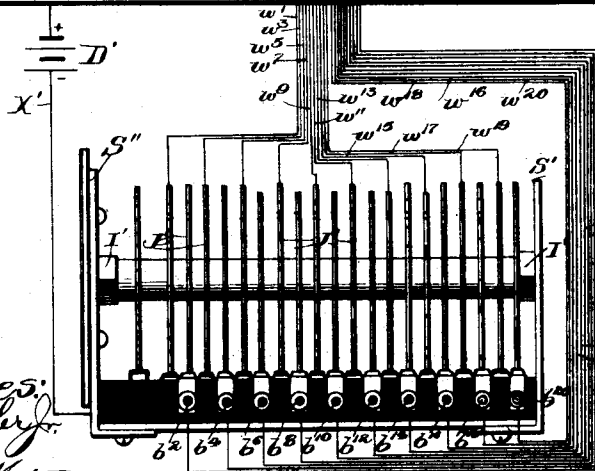
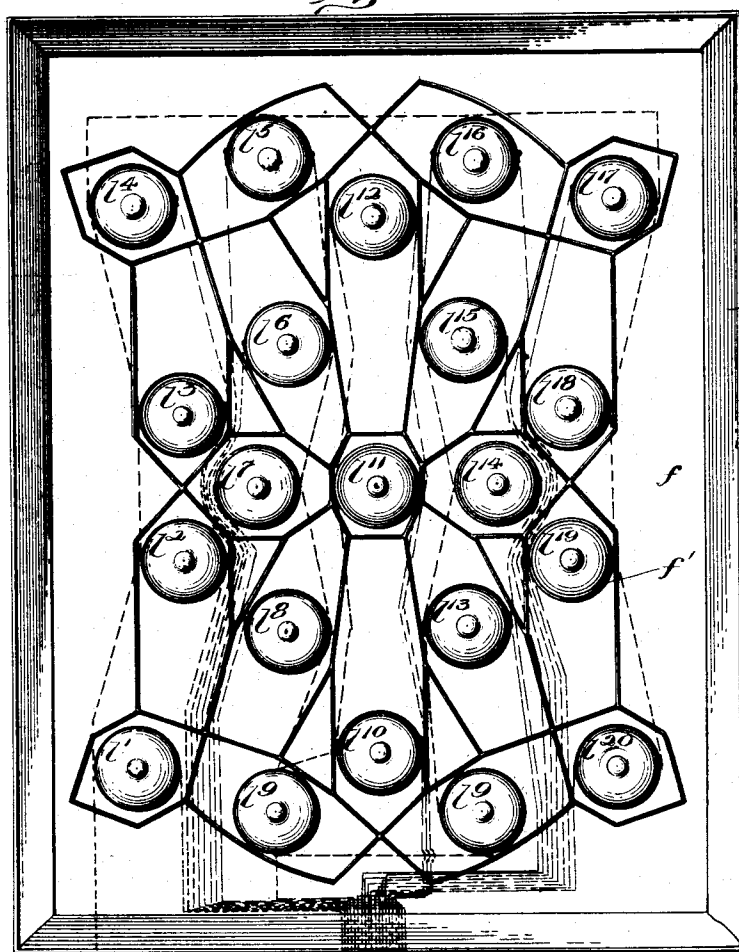
INTERCHANGEABLE ELECTRIC DISPLAY APPARATUS.

(Application filed Sept. 10, 1898.)

(No Model.)

5 Sheets—Sheet 2.

Fig. 2.



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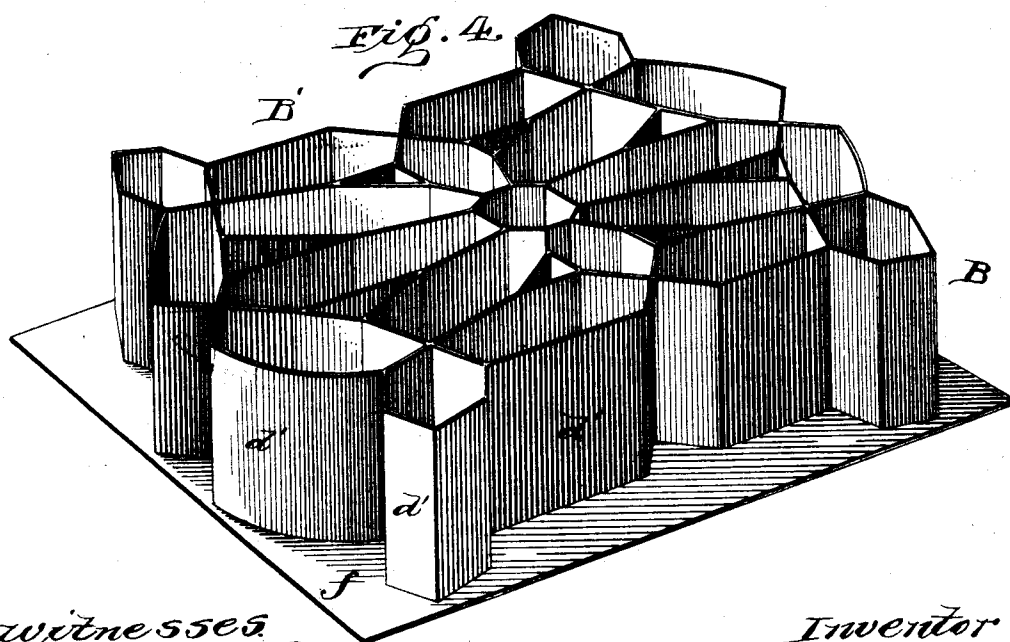
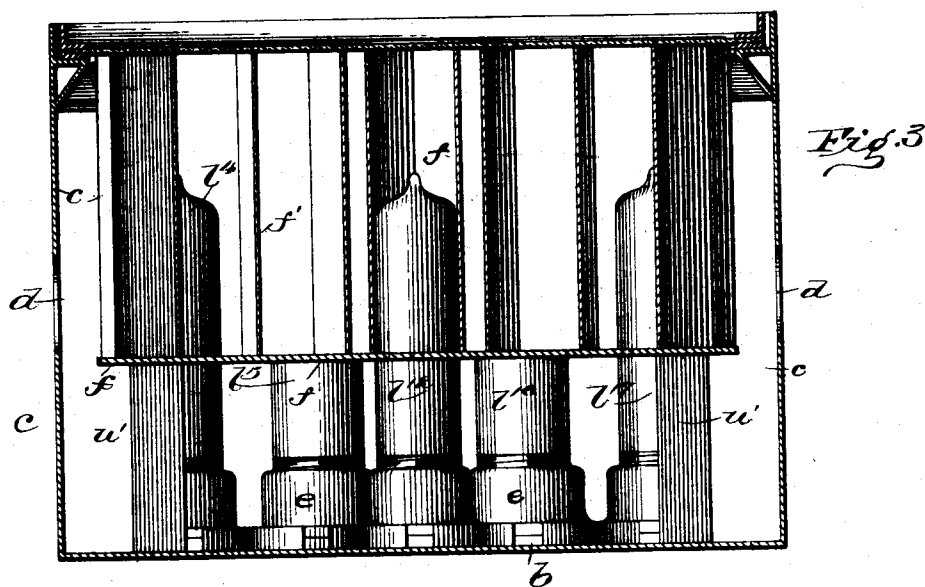
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INTERCHANGEABLE ELECTRIC DISPLAY APPARATUS.

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5 Sheets—Sheet 3.

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Fig. 5.

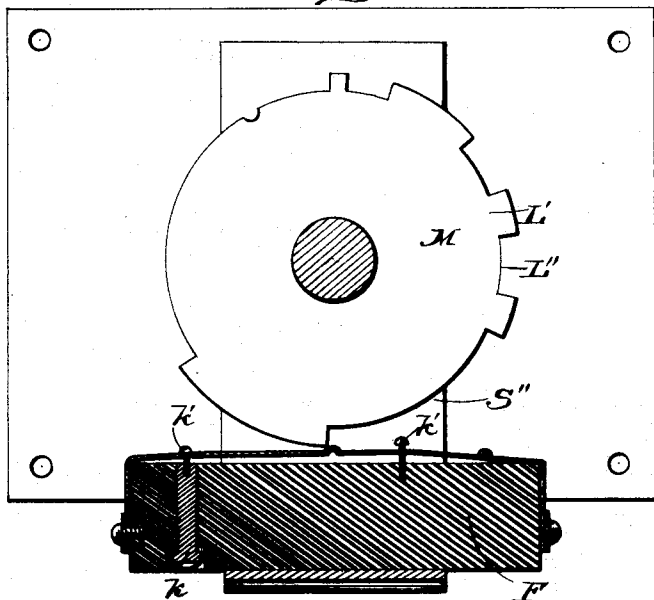
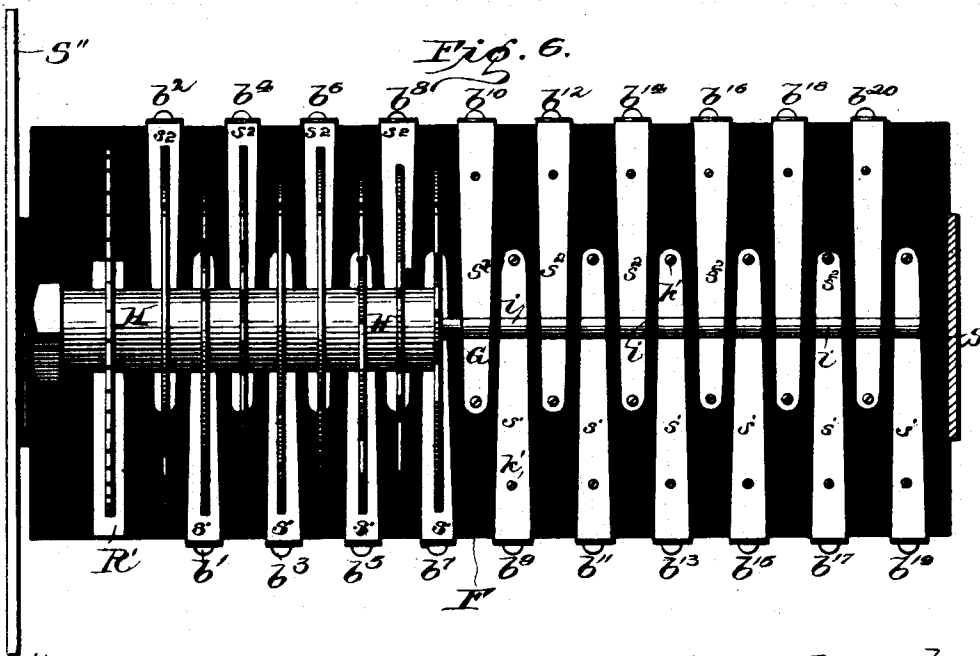


Fig. 6.



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(Application filed Sept. 10, 1898.)

(No Model.)

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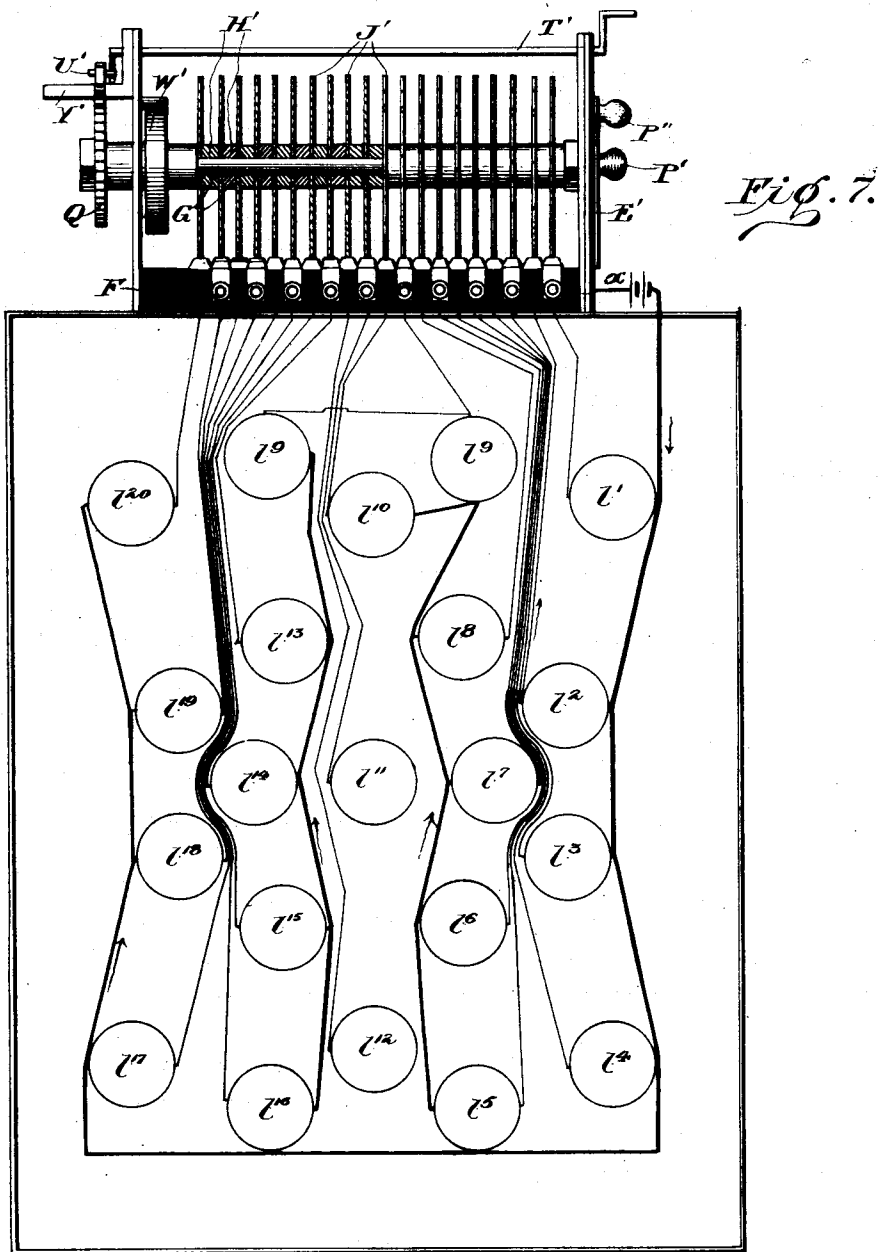
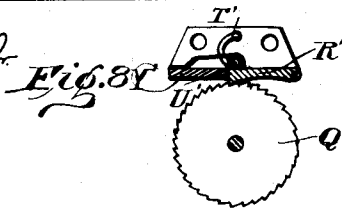


Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE LAFAYETTE MASON, OF NEW YORK, N. Y., ASSIGNOR TO THE
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INTERCHANGEABLE ELECTRIC DISPLAY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 683,133, dated September 24, 1901.

Application filed September 10, 1898. Serial No. 690,832. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LAFAYETTE MASON, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Interchangeable Electric Display Apparatus, of which the following is a specification.

This invention relates to the general class of devices and apparatus for electrically producing visible signs by successively lighting different combinations of lamps arranged within a given field or space to exhibit in light contour the formation of any desired letter or character.

Heretofore various attempts have been made to utilize the ordinary incandescent electric lamps for purposes of such display, and letters and characters have been portrayed in dotted light by placing a number of lamps in studded arrangement or rows upon a background, the arrangement of the lamps being such as to afford the illumined delineation of the contours of characters by completing the circuits through certain combinations of lamps.

My invention consists, essentially, in the means for producing in bars or blocks of light the elements of letters and their combinations to form illumined characters that are thereby accentuated in outline; and my invention has for its principal objects to reduce the number of lamps employed to produce the elements of all the letters and characters required, and consequently effect a saving in the cost of equipment and operation, as well as furnishing a more attractive and novel display.

A further object of my invention is to provide a switch mechanism for throwing lamps simultaneously into circuit and simultaneously out of circuit and also for simultaneously throwing them into and out of circuit and with greater rapidity and less sparking than could be obtained heretofore and with absolute accuracy.

The means for attaining these objects consist, primarily, in massing and arranging the lamps to be employed upon a suitable background within an inclosing casing and controlling or isolating the light emitted from

any combination of lamps by the employment in connection with said lamps and inclosing casing of a compound or universal monogrammic framework or device for obtaining within the space or field afforded thereby any configuration or effect desired in the forming of letters or characters; and, further, of connecting the said lamps individually to a multiple-switch device that will synchronously form, by manipulation, any required combination of closed lamp-circuits to form different combinations of light to represent successively the different illuminated characters.

The above is an outline of the features which constitute my invention, although there are many details which will be more definitely described in connection with the drawings which form a part of this specification, and in which—

Figure 1 represents in front elevation the combined display-box and multiple-switch mechanism electrically connected therewith. Fig. 2 represents the lamp-box in front elevation with front lid removed and the switch device in side elevation in operative relation thereto. Fig. 3 represents a cross-section of the lamp-box taken on lines X X in Fig. 2, while Fig. 4 represents in perspective the monogrammic framework as it appears when removed from the inclosing casing. Fig. 5 represents in cross-section the switch taken on lines Y Y in Fig. 2. Fig. 6 represents a top plan view of the switch, showing a part of the rotary shaft broken away. Fig. 7 represents a rear view of the lamp-box with the switch device, shown partly in cross-section, mounted thereon, said switch device being shown with a releasing attachment. Fig. 8 shows a detail of the releasing attachment depicted in Fig. 7.

Like letters of reference indicate like parts in the several figures.

In the preferred embodiment of my invention I employ a box or casing A', that is made, preferably, rectangular in shape and which is provided with darkened interior walls c and at a suitable point with ventilative perforations d. This box is intended for the reception and mounting of a bank of lamps that are indicated by the letter l, numbered from

"1" to "20," inclusive, which are individually mounted and screwed into sockets *e*, having suitable binding-posts *b*, and each lamp is included in a separate circuit that leads from the case to a source of supply. The lamp-box is provided at the front with a transparent glass or lens *C'*, that is hinged at *e' e'* to form a lid that serves to expose the light from within and to keep out the moisture and dirt from without.

B' represents a compound or universal monogrammic framework or device which is adapted to be introduced and withdrawn from the body of the box when the lid is removed, and said framework comprises side walls *d'* and a back plate *f*, the latter being provided with lamp-receiving holes (not shown) that register and fit about the respective lamps when the framework is introduced and properly positioned in said case. This framework comprises interiorly a series of permanently-attached and angularly-arranged dividing plates or partitions *f'*, that extend from the back plate to the front and thereacross to form thereby a combined series of open-front compartments for inclosing separately the lamps mounted in said lamp-box. The walls of said compartment structure are provided with reflective surfaces to form thereby light-shafts about each lamp that extend in diverging lines, the edges or ribs at the open front of which abut at right angles with the transparent glass cover to form an outline or tracing that blocks out isolated light when the compartments are illuminated, to form thereby a combination of elements of letters and characters. This compartment structure is so combined as to form a compound or universal monogram, the elements of which are arranged as follows: In the center is arranged an octagonal-shaped compartment from each plane of which radiate eight drawn-out heptagons, the vertical and horizontal extending pairs of which terminate in pyramidal-shaped ends. The structure thus formed is surrounded by a compartment-border comprising twelve irregular hexagonal figures that are divided in configuration as follows: Those at the corners form nearly regular hexagon extensions, the side pairs of which consist of drawn-out hexagons comprising in their configuration oblique and acute angles extending from the respective planes of the abutting acute angles of the corners and meeting at the apex of the adjacent acute angles of the oppositely-disposed member of the pair, while the end pairs comprise irregular drawn-out hexagons, the exterior portion of which consists each of a two-sided configuration, one member of which is formed in a curve while the other joins at an angle thereto and extends in an acute angle to the apex of the adjacent like figure. It will be understood that with a monogram thus constructed any letter can be displayed by the selection and lighting of lamps in the various compartments thus arranged. If desired, each lamp may

be inclosed by a separate compartment and the separate compartments arranged in suitable configurations to obtain the characters required without departing from the spirit of my invention. The bottom or back plate of this monogrammic framework extends beyond the side and end walls thereof to provide a light-excluding flange *f*, that extends nearly to the walls *c*, to form a cut-off to exclude light from the bottom of the box. The bottom or rear face of said back plate is blackened and is positioned and fastened on brackets *g'*, that project outwardly from the walls upon which the lamps are mounted to provide for holding the framework a sufficient distance from the wall to provide an air-space for ventilative purposes. The blackened walls above referred to surround this air-space and are intended, in connection with the framework-flange *f*, to exclude and suppress all fugitive light that may escape through the lamp-receiving holes in the back plate.

For clearness in illustration I have numbered the lamps from *l'* to *l'²⁰*, inclusive, and have numbered the wires connected therewith to correspond *w'* to *w'²⁰*. It will be noticed by reference to Figs. 2 and 7 that the common return-wire *x* is led successively to the binding-posts *b* on one side of all the lamps, as indicated by the arrow, while the leading wires *w'* to *w'²⁰*, inclusive, of each lamp-circuit connect in each case with the opposite binding-post, a system of wiring that does not necessitate the crossing of the return-wire by any of the individual circuit-wires leading to the respective lamps. These wires are insulated, however, and are led through the bottom of the case to the source of supply *D'* and the multiple-switch device *E'*. For the purpose of switching the lamps into and out of circuit I provide the following multiple commutator-switch.

F' represents a block of insulating material. Mounted thereon and extending inwardly from a series of binding-posts *b'* to *b'¹⁹*, alternately at one side thereof, are disposed in parallel relation a series of electrically-conductive spring-strips *s'*, that are properly spaced to allow for the alternate interposition in the same plane of a like series of parallel-disposed strips *s²*, that extend, respectively, from binding-posts numbered alternately from *b²* to *b'²⁰*, positioned on the opposite side. These circuit-selecting spring-plates *s'* and *s²* are provided each with raised contact portions *i*, that are disposed near the respective ends of the spring-plates so as to aline with those of both series centrally throughout the block, and each plate is provided with individual adjusting means that comprise the adjusting-screws *k k'*, that are adapted to raise and lower the contact-points as required.

S' S² represent metal standards that are supported in vertical relation to the block at its respective ends. Journaled in and be-

tween the standards in a line parallel with the line of raised contacts of the spring-strips is a rotatable shaft G' , of conducting material, which is connected through one of the standards at x to the terminal of the common circuit. Mounted and keyed to said shaft by means of the collars H' and clamp-nuts I' are concentrically-arranged disks J , that correspond in number and relative position to the commutator-springs s' and s^3 , arranged on the block directly beneath. Said disks comprise each a central flat portion M' and a series of segmental extensions L' and interspaces L^2 , that extend at varying lengths and intervals about the periphery and in the same plane as the central portion. By this arrangement the segments can be turned and then keyed in a given position to those lineally adjacent, so as to form lines from left to right along the entire stretch of disk-peripheries to form different combinations of terminals that can be brought synchronously and successively into engagement with the commutator-strips that lie in range and directly beneath the respective disks, whereby by reason of the manner of supporting the circuit-selecting springs throughout their length and also by reason of the adjusting means the make and break of contacts can be made simultaneously and in a most positive fashion.

In connection with the contact making and breaking means I employ indicating means which comprise a stationary dial N' , that is secured to the standard S^2 . This dial is provided with an annular series of indicating letters or characters "A," "B," &c., and "1," "2," &c., that are arranged circumferentially about the dial in thirty-six spaces. The movements of the rotary disks are controlled and directed through the instrumentality of a manually-operated switch-actuator and indicating device O' , that consists of a hand or pointer that is mounted at one end of the shaft to rotate with it and that is provided with hand-turning knobs P' P^2 , and said indicator is arranged adjacent to the dial-face. Mounted upon the shaft concentrically with the disks is a ratchet-wheel Q' , the teeth on the periphery of which are controlled by the spring-holding pawl R' , that engages therewith, and which device is adapted to maintain the disks from wrongful turning without the positive turning of the hand-actuator. In Figs. 7 and 8 is shown an attachment in which the pawl is shown in a position to take effect on the ratchet-teeth when the pawl is held in engagement therewith by the pressure of the spring-finger Y' , but which is provided with an arm U' , projecting out from the pawl, and which latter is in operative engagement with pivoted lever T' . Wound around the shaft-collar H , adjacent to the standard S' , is a clock-spring that tends to return the shaft always to a point where the indicator-point shows zero. When the pivoted lever T' is turned to withdraw the pawl R' from its engagement with the ratchet-

wheel, the clock-spring in its attempt to uncoil carries the shaft and the dial-indicator back to its normal position.

Having described my invention, what I desire to claim as new and useful is—

1. The combination with a lamp-box of a removably-seated monogrammic framework comprising varied-shaped compartments that are arranged within a given field in such relative position, as to provide means within said field, whereby any letter of the alphabet or numeral can be successively blocked out in light, substantially as and for the purpose set forth.

2. A monogrammic framework comprising in its organization varied-shaped compartments that are arranged within a given field in such relative position, as to provide elements of letters when illuminated, whereby any letter of the alphabet or numeral can be successively blocked out in light within said field, substantially as described.

3. The combination with a lamp-box, having darkened inner walls and a series of ventilative openings, of a removably-seated monogrammic framework mounted in said box and a removable transparent covering seated upon the face of said monogrammic framework.

4. An illuminating character or symbol device, comprising a chamber having a transparent face and a back wall and also having partition-walls, said partition-walls being arranged on angular lines to form at the front of the chamber a series of light-openings that are shaped to form elements of letters, substantially as described.

5. The combination with an inclosing casing, having darkened inner walls and a plurality of ventilative openings, of an interior monogrammic framework or shell having an open front provided with a transparent covering and comprising partitions that extend at right angles to said covering, to form monogrammic elements; and means for illuminating the spaces formed by said partitions, substantially as described.

6. The combination with an inclosing casing for display-lights, having darkened walls and a plurality of incandescent lamps projecting interiorly, of a monogrammic framework or shell having an open front and a back plate that is provided with a light-excluding flange and that is adapted to be disposed within said inclosing casing, said framework having at its front a transparent covering, and that is provided with angularly-arranged reflective partitions that extend at right angles to said covering to form monogrammic elements about the lamps projecting therein, substantially as described.

7. In a portable lamp-box for displaying lights comprising an outer containing case, provided with a bank of lamps and ventilating-holes, and a transparent lid therefor, the combination of an inner shell having interiorly a compartment structure with open front, and exteriorly a light-excluding flange exten-

sion that is adapted to rest between the walls of the shell and the box; and lamps arranged to penetrate into the respective compartments; and a switch mechanism mounted thereon and electrically connected with the lamps in said box and with a source of electrical supply substantially as set forth.

8. The combination with a rectangular-shaped lamp-box having a transparent lid, of a rectangular-shaped shell or framework adapted to be introduced into the body of said box, said framework comprising side walls and backing-plate, and a series of permanently-attached, angularly-arranged, dividing plates or partitions that extend from bottom to top and thereacross, thereby forming a combined series of separated open-top compartments for inclosing the lamps in said lamp-box, the back plate of said shell having a plurality of holes that correspond and register with the lamps, whereby they are permitted to fit over the lamps when the shell is introduced in said box; and a fastening device for normally holding said framework or shell longitudinally disposed at a suitable distance from the lamp-supporting wall to provide a suitable air-space; and a light-excluding flange extension projecting outwardly from the walls of said shell and adapted to fit snugly in said lamp-box substantially as described.

9. The combination with a rectangular-shaped lamp-box having a transparent lid, of a substantially rectangular-shaped shell or framework adapted to be introduced into the body of said box, said framework comprising the following-arranged compartment structure made up of elements as follows: an octagonal-shaped compartment from each plane of which radiate eight drawn-out heptagons, the vertical and horizontal extending pairs of which terminate in pyramidal-shaped ends; the structure thus formed being surrounded by a compartment-border comprising twelve irregular hexagonal figures, that are divided in configuration as follows: those at the corners forming nearly-regular hexagon extensions; the side paths of which consist of drawn-out hexagons comprising in their con-

figuration, oblique and acute angles extending from the respective planes of the abutting acute angles of the corners and meeting at the apex of the adjacent acute angles of the oppositely-disposed member of the pair; while the end pairs comprise irregular drawn-out hexagons, the exterior portion of which consists each of a two-sided configuration, one member of which is formed in a curve, while the other drawing at an angle thereto and extends in an acute angle to the apex of the adjacent like figure; and a back plate having a plurality of holes that correspond and register with the lamps, whereby they are permitted to fit over the lamps when the shell is introduced in said box, the whole arranged as and for the purpose set forth.

10. The combination with a series of electric lamps of circuits extending from each lamp to a source of current-supply, a switch for synchronously introducing the current to a given number of lamps, said switch comprising a series of rotary contact-disks corresponding to the number of lamps, and which are mounted and keyed concentrically to a single shaft, each of said disks having segmental peripheral extensions and interspaces arranged adjacent to each other to afford contacts for different combinations of lamp-circuits, said contact extensions being adapted to be brought into operative relations successively with coöperating circuit-selecting spring-raised contacts insularly mounted in the pathway directly beneath the respective disks; and a dial arranged concentrically with said shaft and disks, whereby the relative lineal groupings of the peripheral contacts can be indicated when in operative relation to the commutator-plates; and a releasing means for allowing the indicator hand and disk to be returned to normal position.

Signed at New York city, in the county of New York and State of New York, this 25th day of August, A. D. 1898.

GEORGE LAFAYETTE MASON.

Witnesses:

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