

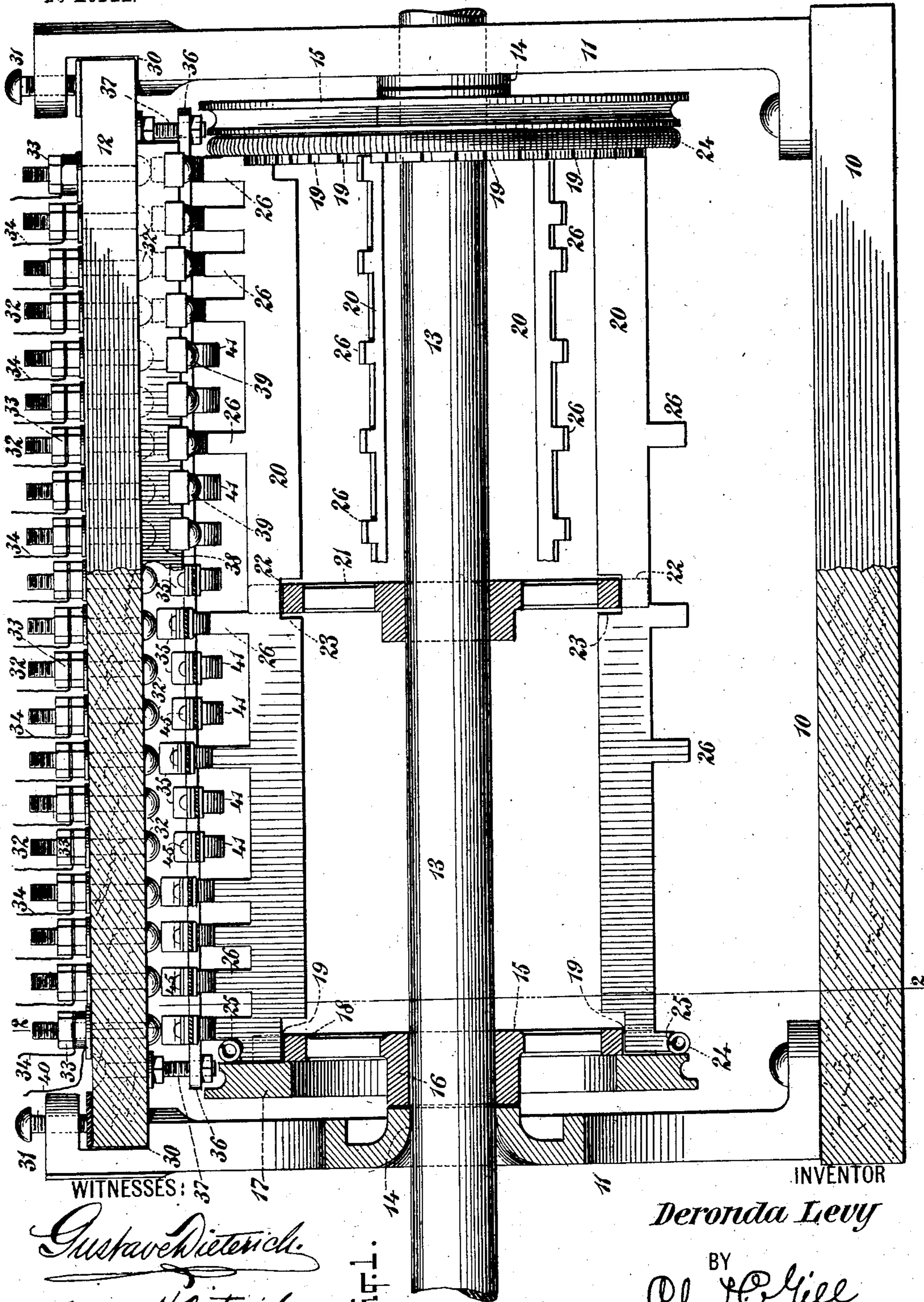
D. LEVY.

INTERCHANGEABLE ELECTRIC DISPLAY APPARATUS.

APPLICATION FILED FEB. 10, 1903.

2 SHEETS—SHEET 1.

NO MODEL.



WITNESSES:

Gustave Dietrich.
Edwin H. Dietrich.

Fig. 1.

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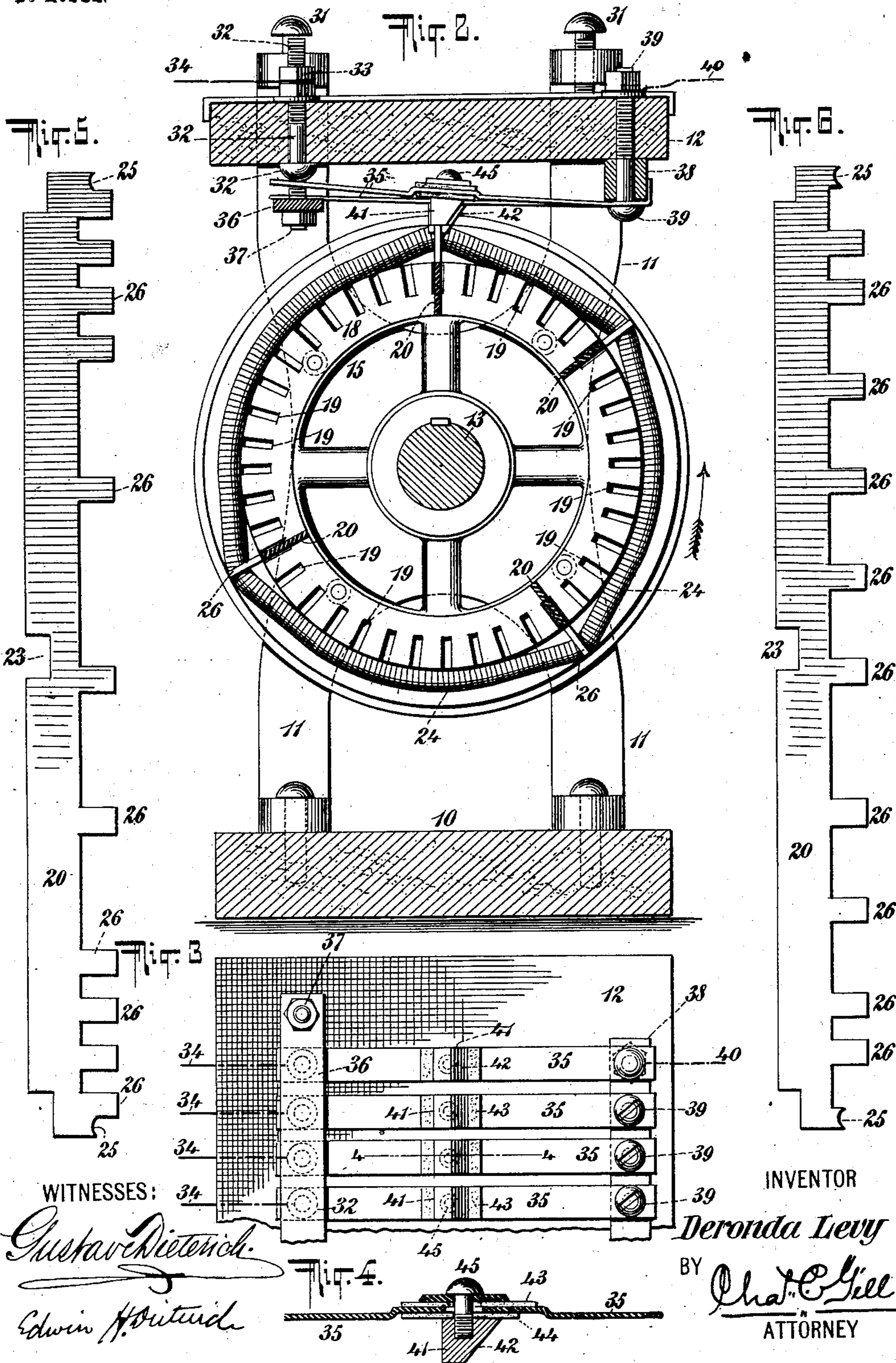
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

DERONDA LEVY, OF NEW YORK, N. Y., ASSIGNOR TO MASON MONOGRAM COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INTERCHANGEABLE ELECTRIC DISPLAY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 728,944, dated May 26, 1903.

Application filed February 10, 1903. Serial No. 142,764. (No model.)

To all whom it may concern:

Be it known that I, DERONDA LEVY, 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.

The invention relates to improvements in interchangeable electric display apparatus, this apparatus being adapted for electrically producing display-signs, such as letters or numerals, by successively lighting different combinations of lamps arranged within a given field or space to exhibit in the light the formation of the letter or character desired.

The general class of apparatus to which my invention pertains is illustrated in Letters Patent of the United States No. 683,133, granted September 24, 1901, to Mason Monogram Company as assignee of G. L. Mason.

The present invention pertains more particularly to a novel commutator and switch mechanism for simultaneously throwing the desired lamps in the monogrammic field into and out of circuit, it being necessary that at times certain of the lamps in the field should be lighted to represent a letter or character and that at other times a different set of lamps should be lighted to display a different letter or character. The monogrammic field may contain for illustration twenty lamps, which may be utilized in different combinations to produce when lighted different letters or numerals, some of the lamps being lighted at one time to produce one letter or numeral and other of the lamps being lighted at another time to produce a different letter or numeral. These monogrammic fields may be arranged in series, so that when desired the letters produced on the series of fields will spell some definite word or words, there being one monogrammic field for each letter and one commutator with switches of my invention for each monogrammic field. If there should be twenty lamps in a monogrammic field there would be twenty switches with their circuit-wires in coöperative relation with the commutator of my invention, there being one commutator and one full set of switches for each monogrammic field and

each commutator being adapted during its rotation to make such circuits as will cause the lighting of such of the lamps in the field as may be necessary to produce the letter or character it is desired should be rendered visible in said field.

The commutator of my invention comprises a rotary frame adapted to detachably receive commutator-bars each especially constructed with the view of moving certain of the switches for the purpose of making certain definite circuits necessary for the production of the letter or character desired in the monogrammic field.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in central vertical section, of a commutator and set of switches constructed in accordance with and embodying the invention, the right-hand half of the figure being in elevation and the left-hand half of the figure being in central vertical section. Fig. 2 is a vertical transverse section of same on the dotted line 2 2 of Fig. 1. Fig. 3 is a detached view looking at the lower side of a portion of the switchboard. Fig. 4 is a detached central vertical longitudinal section through one of the switches. Fig. 5 is a detached elevation of one of the commutator-bars, this bar being constructed to make when the commutator is in the proper position the circuits for producing the letter "H" in the monogrammic field; and Fig. 6 is a like view of another commutator-bar, this bar being constructed to make when the commutator is in the proper position the circuits for producing the numeral "8" in the monogrammic field.

In the drawings, 10 designates a suitable base of non-conducting material, such as slate; 11, suitable side frames mounted upon said base; 12, a switchboard of non-conducting material, such as slate, detachably secured to the upper ends of said side frames, and 13 the shaft for the rotary commutator, this shaft being mounted in suitable hubs 14, furnished by the end frames 11.

Upon the shaft 13 adjacent to the inner sides of the frames 11 are mounted to rotate

with the shaft the heads 15, which correspond with each other and each of which comprises a hub 16, an outer body portion 17, and an inner annular shoulder or portion 18, having
5 along its periphery the series of radial slots 19, adapted to receive the ends of the commutator-bars 20. In the present instance I illustrate forty of the slots 19 in each of the heads 15, and hence I may mount forty of
10 the commutator-bars 20 in said heads or any smaller number thereof as may be required for any special intended purpose. In Fig. 2 I illustrate four of the commutator-bars in position in the slots 19; but I may use a
15 greater number of the bars at one time as occasion may require.

Intermediate the heads 15 I mount upon the shaft 13 to rotate therewith a disk 21, having in its periphery a series of slots 22, corresponding in number and position with the
20 slots 19 of the heads 15, and the said slotted disk 21 is to receive and sustain the middle portions of the commutator-bars 20, as illustrated in Fig. 1, it being desirable that the
25 commutator-bars 20 may be firmly held at their ends and middle portions and maintained rigidly during the use of the apparatus.

The commutator-bars 20 are formed from strips of metal and are of a thickness adapting them to enter the slots 19 and 22. The
30 bars 20 are of such length as to enable them to fit snugly between the body portions 17 of the heads 15 and at their middle portions are recessed, as at 23, to enable them on entering
35 the slots 22 to extend inwardly along the opposite vertical side portions of the disk 21, as shown in Fig. 1. The bars 20 are detachably seated in slots 19 and 22, and for the purpose of conveniently retaining the bars 20 in said
40 slots and permitting of their ready removal therefrom I provide bands 24 in the nature of coiled wire springs, which extend around and encompass the shoulder portions 18 of the heads 15 and by their spring tension exerted
45 against the outer ends of the bars 20 serve to detachably retain said bars in position. The bars 20 at their outer ends are formed with the recesses 25, Figs. 5 and 6, to receive the spring-bands 24 when said bars are in position.
50

The commutator-bars 20 correspond in every respect with each other with the exception of the order or arrangement of fingers 26, projecting outwardly from the outer edges of
55 said bars, and the fingers 26 of the bars 20 will be arranged with respect to the special letter or character it may be desired to produce in the monogrammic field, each bar 20 being adapted to make the circuits for one
60 letter or character in said field. Each bar 20 will therefore have its projecting fingers 26 so disposed as to enable them to make the special circuits required for the definite letter or character it is desired should be produced
65 in the monogrammic field. The commutator illustrated is intended for use with a monogrammic field containing twenty electric

lamps, and the commutator-bars 20 will have their projecting fingers 26 so disposed with respect to the switches that each bar 20 when arriving at the proper position may make the
70 proper circuits for lighting such of said lamps as will represent in display the desired letter or character. I illustrate several of the commutator-bars 20, so as to disclose the manner
75 of arranging the fingers 26 thereof with respect to the switches, to be hereinafter described, Fig. 5 and the upper middle portion of Fig. 1 illustrating a commutator-bar having its fingers 26 so disposed as to be able
80 when said bar is in position represented in Fig. 1 to make the circuits for causing a display of the letter "H" in the monogrammic field. In Fig. 6 I illustrate the commutator-bar having its fingers 26 so disposed as to enable it when in the proper relation to the
85 switches to produce in the monogrammic field the numeral "8." In the lower part of Fig. 1 I illustrate a commutator-bar having only three fingers 26, and this bar will at the proper
90 time cooperate with the switches to produce in the monogrammic field the letter "I." Each commutator-bar 20 is thus intended to effect the lighting of a particular combination of lamps in the monogrammic field, and the fingers 26 of said bars will be disposed with respect to the particular letters or characters it is desired shall be represented by the combinations of lighted lamps in the monogrammic field.
95

The shaft 13, heads 15, disk 21, and commutator-bars 20 will during the use of the apparatus have a simultaneous rotary motion by power applied to the shaft 13, and this rotary motion of the shaft 13 and parts connected therewith will be intermittent, so that during the use of the apparatus the letters or characters displayed in the monogrammic field will change from one to another as the shaft 13 rotates and will remain on display
100 or visible while the shaft 13 is stationary. With each intermittent motion of the shaft 13 one commutator-bar 20 will be carried from the switches and another commutator-bar 20 brought into engagement with the switches.
105 Thus with each intermittent motion of the shaft 13 the circuits for displaying one letter or character in the monogrammic field will be broken and another set of circuits for displaying another letter or character in the monogrammic field will be formed, so that as one letter or character in the light disappears from the monogrammic field another set of lamps will be lighted in said field for displaying or rendering visible another letter or character.
110 Any suitable means may be employed for imparting intermittent rotary motion to the shaft 13, and hence it is not necessary to illustrate any of the well-known mechanical means for imparting such motion to a shaft. When
115 a series of the monogrammic fields and a series of the commutators are employed in one equipment, there being one commutator for each monogrammic field, all of the commu-

tators will be mounted upon the one shaft 13, so that all of the commutators may have corresponding action; but as one commutator will be an exact duplicate of the other commutators it is only necessary in this application to show and describe one commutator.

The switchboard 12 rests within recesses 30, formed within the facing sides of the upper ends of the vertical frames or standards 11, and said switchboard is detachably held within said recesses by means of screws 31. The switchboard 12 is equipped with, in the present instance, twenty binding-posts 32, all exactly alike and each being in the form of a screw whose head engages the lower surface of said board and whose body portion extends upwardly through an aperture in said board and receives upon its upper threaded end the nuts 33, by which the binding-post is held in position and which enables the proper securing to the binding-post of a conducting-wire 34, there being twenty of the binding-posts 32 and twenty of the conducting-wires 34, each of the latter passing to one of the lamps in the monogrammic field in a well-known manner not claimed herein. The heads of the binding-posts 32 are adapted to be contacted with by the series of spring-switches 35, whose free ends may normally rest upon a longitudinal bar 36, suspended by screws 37 directly below the heads of the binding-posts 32, said switches 35 being idle and out of circuit when resting upon said bar 36 and only forming the circuit when in their upper position in contact with the heads of the binding-posts 32. The binding-posts 32 are all in line with one another adjacent to one longitudinal edge of the switchboard 12, and at the opposite longitudinal portion of the switchboard 12 is secured below the same a metallic bar 38, the latter having secured to its lower edge one end of all of the switches 35, these switches 35 being held against said bar 38 by means of the screws 39, whose heads bind the switches to the bar 38, as shown. One end screw 39, in the form of a bolt, is connected with the return-wire 40 from the monogrammic field. There is thus adjacent to one edge of the switchboard 12 the series of binding-posts 32 in electrical connection with the conductors 34 and normally free of the switches 35, and adjacent to the other edge of the switchboard 12 the bar 38, to which the restrained ends of all of the switches 35 are secured by means of screws 39, the latter corresponding in position with the binding-posts 32 and one of said screws 39 having connected with it the return-wire 40 from the monogrammic field. Each of the switches 35 carries at about its center a downwardly-projecting lug 41, (shown in detail in Fig. 4,) having one inclined or cam-shaped edge 42 to receive the impact of the fingers 26 of the commutator-bars 20 during the rotation of the commutator-frame, said frame when in use rotating in a direction to carry

said fingers against said surface 42, as in the direction of the arrow shown in Fig. 2. The switches 35 are insulated from the lugs 41 by means of small pieces of mica 43 44, intermediate the upper surface of the lug and the lower surface of the switch and intermediate the upper surface of the switch and the head of the screw 45, employed for securing the lug to the switch, there being a rather enlarged hole through the switch 35, as shown in Fig. 4, for the passage of the screw 45, while there is a snugly-fitting hole through the pieces of mica 43 44 for said screw. The switches 35 are all exactly alike, and each carries a lug 41, having a cam or inclined surface 42. The switches 35 extend transversely over the rotary commutator-frame carrying the commutator-bars 20, and the lugs 41 are centrally over said frame. When the commutator-frame is in such position that no one of the commutator-bars is vertically below and in contact with the lugs 41, all of the switches 35 at their free ends will rest upon the supporting-bar 36, and there will be no completed circuits through said switches to the lamps of the monogrammic field; but when during the intermittent rotation of the commutator-frame one of the bars 20 is carried upwardly against the inclined surface 42 of the lugs 41 the said bar will lift such of said switches as may have their lugs 41 in the path of the fingers 26 of said bar, as shown in Fig. 2, whereby such of said switches 35 as may be acted upon by the fingers of said bar will be moved upwardly into contact with and held against their respective posts 32, this being for the purpose of establishing and maintaining as long as may be desired the circuits through such of the lamps in the monogrammic field as may be denoted by the fingers on the bar 20 then engaging the lugs 41 of the lifted switches 35. The switches 35 which may not be acted upon by the bar 20 then at the upper side of the commutator-frame will remain idle upon their supporting-bar 36, and no circuits will be formed through them. The rotary commutator-frame has an intermittent motion, and each of its motions will end when the commutator-bar is directly below the lugs 41 of the switches 35, and the lamps of the particular combination selected will remain lighted so long as the commutator-frame is at rest with one of its commutator-bars holding a set of the switches 35 in their upper position. The lugs 41 are provided with the inclined surface 42, so as to enable the fingers 26 of the commutator-bars 20 to easily lift the switches 35 and pass under the flat lower end of said lugs.

During the rotation of the commutator-frame first one bar 20 and then another and then another during the entire series will pass below and contact with the proper lugs 41 of the switches 35, so that as each bar engages the lugs of its switches the proper circuits will be established for displaying in the

monogrammic field the proper letters or characters designated by the bar while in engagement with the lugs 41 of its switches. Upon the movement of a bar 20 from the lugs 41 of its switches the latter will descend to the supporting-bar 36 and the circuits will be broken.

My invention thus comprises the novel commutator-frame hereinbefore described adapted to detachably receive and carry the commutator-bars 20 in combination with the series of switches adapted to be engaged and acted upon by the variably-disposed fingers of said bars.

Each of the bars 20 is of sufficient length for use in connection with a monogrammic field containing twenty lamps, and therefore the switchboard 12 is equipped with twenty switches; but I do not, of course, limit my invention to the employment of a monogrammic field containing twenty lamps nor to a switchboard 12 containing twenty switches. The number of switches employed will vary with the number of lamps which may be employed in the monogrammic field.

One desirable feature of my invention is that the commutator-frame and its shaft and supporting-base and standards or side frames are at all times out of the electric circuits, there being no current through any part of the apparatus presented with the exception of the spring-switches 35, screws 39, bar 38, and binding-posts 32. A further very desirable feature of my invention is that the bars 20 are detachably connected with the heads of the rotary commutator-frame, so that they may be varied at will, it being entirely convenient to remove any one of the commutator-bars and replace it with another bar. In the present instance the ends of the commutator-bars 20 are held within their slots 19 by means of the spring-bands 24, and these spring-bands being of a yielding nature may be pulled outwardly, so as to permit of the ready extraction of any one or more of the bars 20. I do not limit my invention to the employment of the specific continuous spiral spring-band 24 for securing the bars 20 in position, since other means may be employed for detachably holding the bars 20 in their socket-slots 19; but the spring-bands 24 are what I have used to advantage for conveniently holding the bars 20, and they may be used for this purpose with entire satisfaction.

Each bar 20 is indicative of a certain letter or character to be rendered visible in the monogrammic field, and hence at times it will only be necessary to use a few of the bars 20 in the commutator-frame, while at other times it may be desirable to employ as many as forty of said bars in said frame, it being possible to produce forty combinations of lamps in the monogrammic field, each rendering visible a special letter or character. The number and character of the bars 20 employed in the commutator-frame at any one time will depend upon the particular number and nature of the letters or characters it may

be desired to have displayed in the monogrammic field.

My invention is not limited to any special monogrammic field of electric lamps, since these fields are of varied construction and well known; but I prefer to employ my said invention in connection with the monogrammic field fully shown and described with all of the circuits in the Letters Patent No. 683,133, hereinbefore referred to.

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

1. In apparatus of the character described, the series of electric switches, combined with the rotary commutator for acting on said switches, said commutator comprising the frame having the series of radial slots and the series of longitudinal commutator-bars seated in said slots and provided with the projecting fingers in predetermined arrangement for coöperation with said switches; substantially as set forth.

2. In apparatus of the character described, the series of electric switches, combined with the rotary commutator for acting on said switches, said commutator comprising the frame having the series of radial slots, the series of longitudinal commutator-bars seated in said slots and provided with the projecting fingers in predetermined arrangement for coöperation with said switches, and yielding means for detachably retaining said bars in said slots; substantially as set forth.

3. In apparatus of the character described, the series of electric switches, combined with the rotary commutator for acting on said switches, said commutator comprising the frame having the series of radial slots in its ends, the series of longitudinal commutator-bars seated in said slots and provided with the projecting fingers in predetermined arrangement for coöperation with said switches, and the encircling spring-bands for detachably retaining said bars in said slots at the ends of said frame; substantially as set forth.

4. In apparatus of the character described, the series of electric switches, combined with the rotary commutator for acting on said switches, said commutator comprising the frame having the heads and intermediate disk, the slots in said heads and disk, and the series of longitudinal commutator-bars seated in said slots and provided with the projecting fingers in predetermined arrangement for coöperation with said switches; substantially as set forth.

5. In apparatus of the character described, the series of electric switches, combined with the rotary commutator for acting on said switches, said commutator comprising the frame having the heads 15, and the series of longitudinal commutator-bars carried thereby and provided with the projecting fingers in predetermined arrangement for coöperation with said switches, said heads 15 comprising the outer body portion 17 and the inner annular shoulder portion 18 containing

the series of radial slots adapted to receive the ends of said bars; substantially as set forth.

6. In apparatus of the character described, the switchboard 12 having at one edge the series of binding-posts 32 and at the other edge the series of electric switches 35, the latter being held at one end and at their other end being adapted to be placed into electrical contact with said binding-posts, and each of said switches being provided with the projecting cam-lug 41 insulated from the switch, combined with the rotary commutator for engaging said lugs and moving said switches into electrical connection with said binding-posts; substantially as set forth.

7. In apparatus of the character described, the switchboard 12 having at one edge the series of binding-posts 32 to which the wires of the electric circuits are connected, the bar

38 secured to said switchboard and in electrical connection with the return-wire from the electric circuits, the series of spring-switches 35 connected to said bar 38 and adapted to be moved into electrical contact 25 with said binding-posts, and the bar 36 for limiting the movement of said spring-switches in a direction from said binding-posts, each of said switches having a projecting lug 41 insulated from the switch, combined with the 30 rotary commutator for engaging said lugs and moving said switches into contact with said binding-posts; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 9th day 35 of February, A. D. 1903.

DERONDA LEVY.

Witnesses:

CHAS. C. GILL,
ARTHUR MARION.