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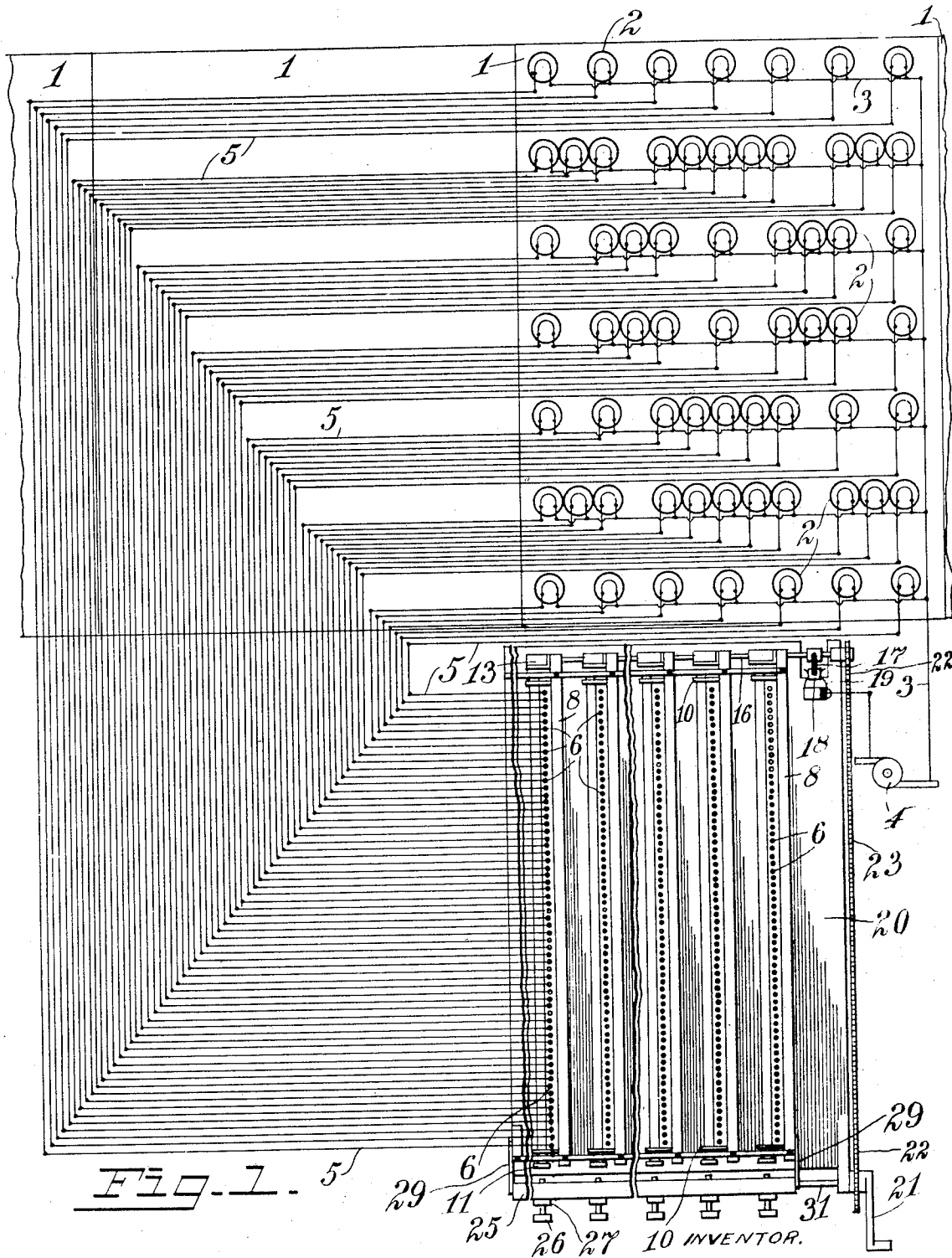
ELECTRIC SIGN.

APPLICATION FILED JULY 9, 1910.

Patented May 26, 1914.

7 SHEETS—SHEET 1.

1,098,211.



Witnesses

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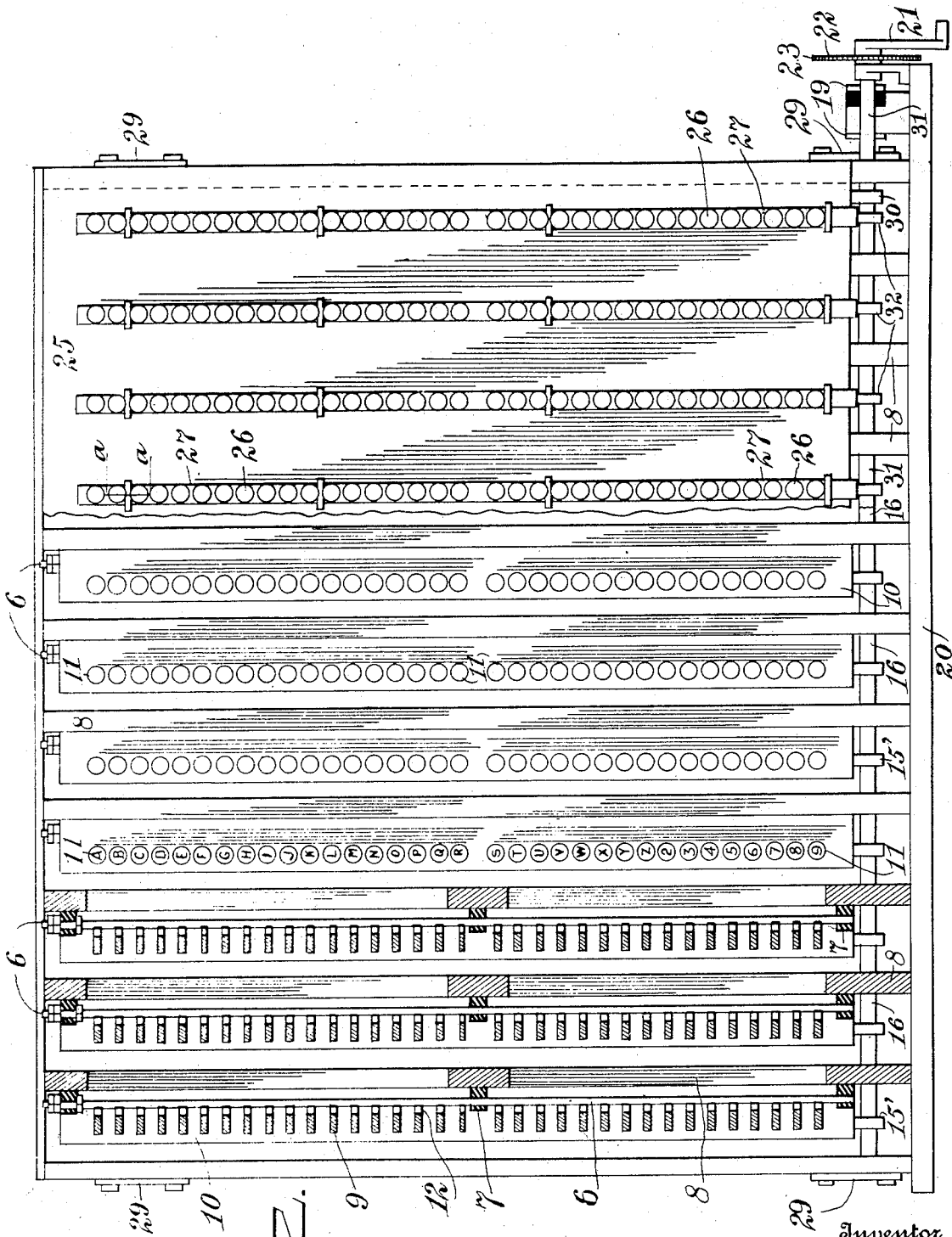
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7 SHEETS—SHEET 2.

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Witnesses
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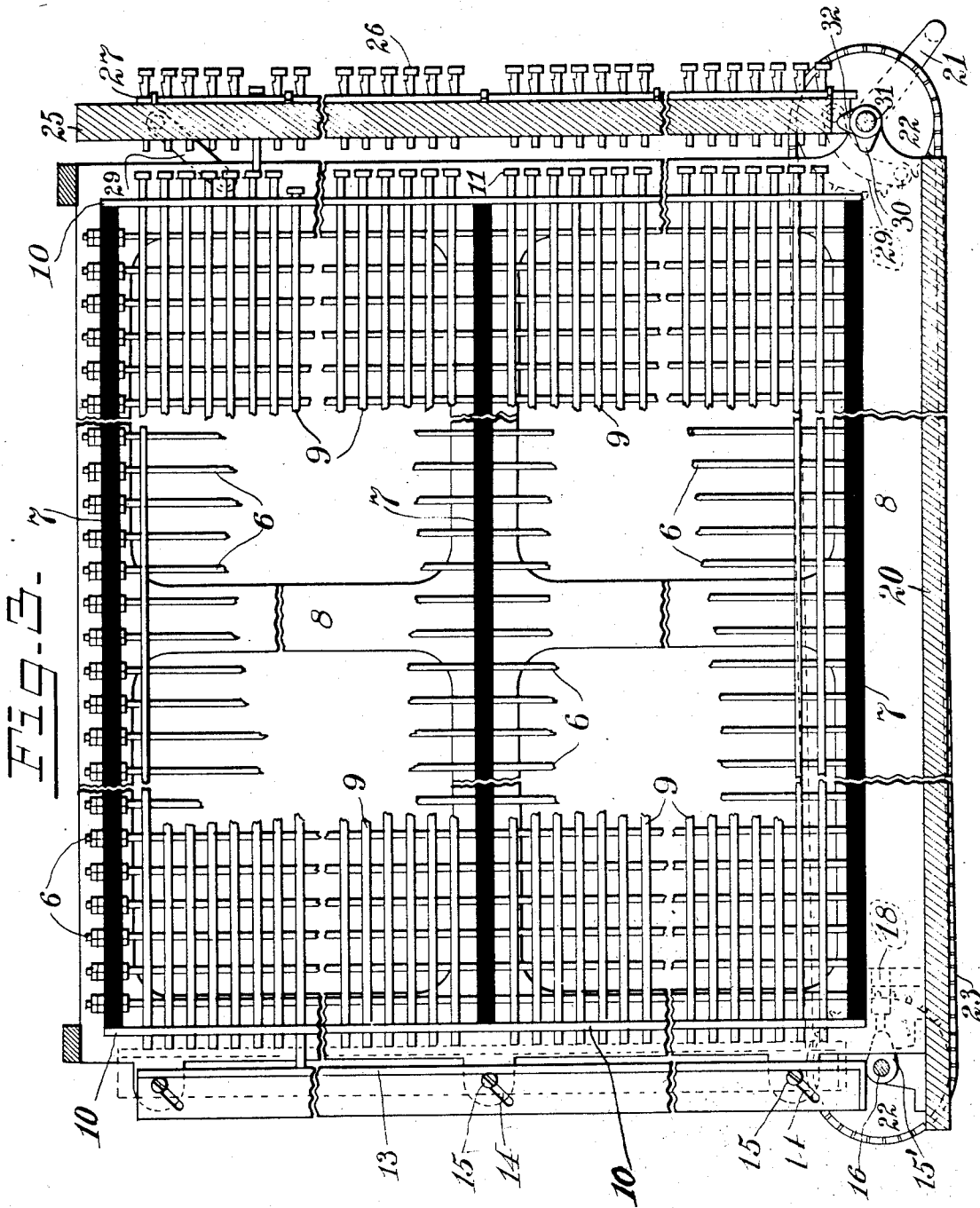
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ELECTRIC SIGN.

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7 SHEETS—SHEET 3.

1,098,211.



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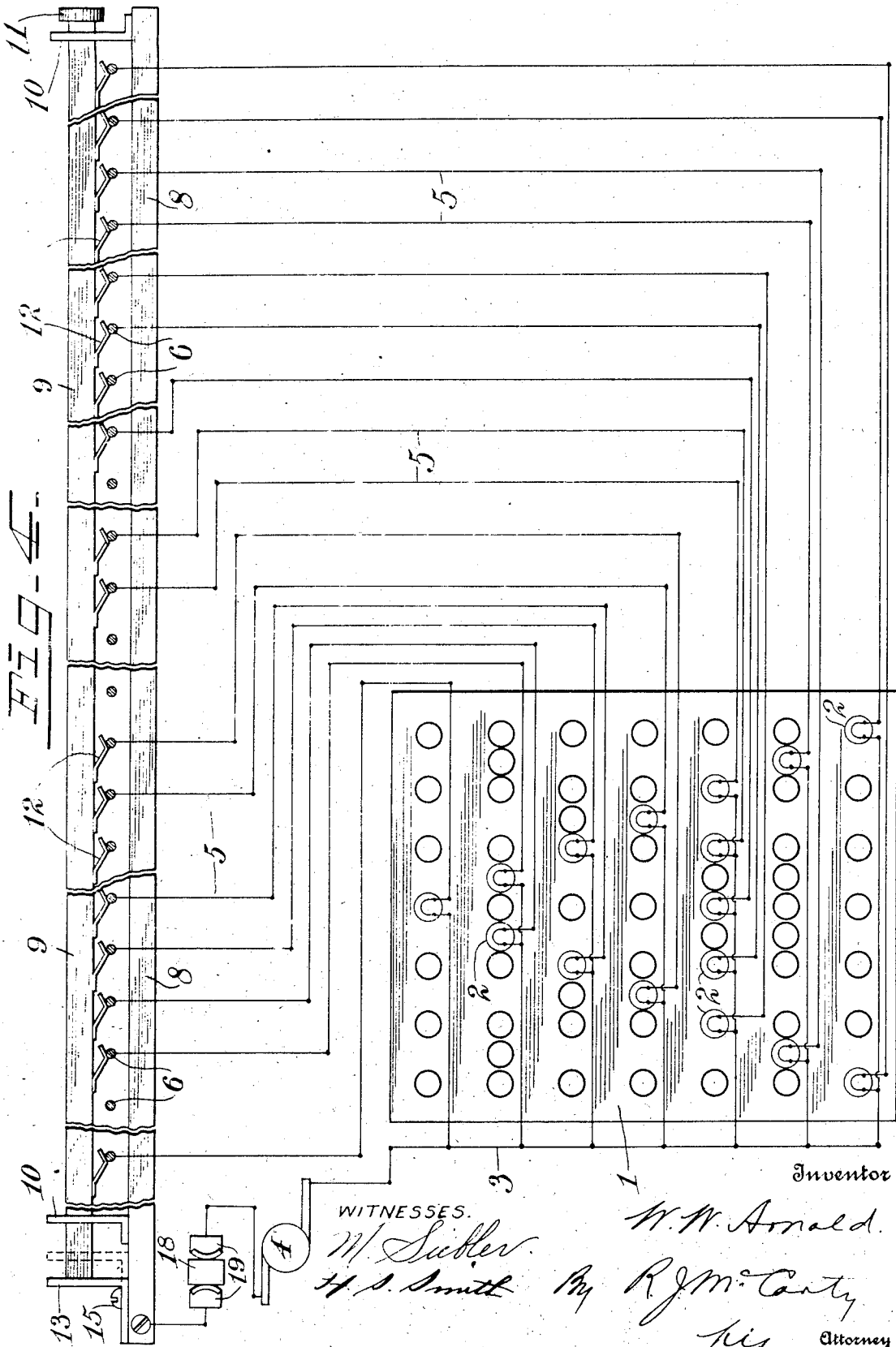
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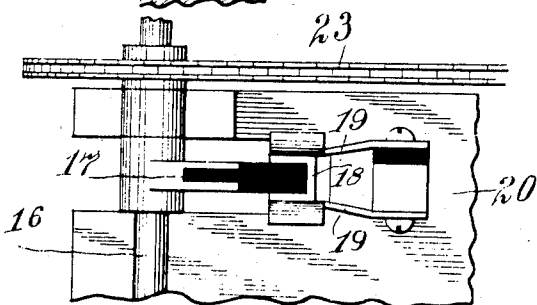
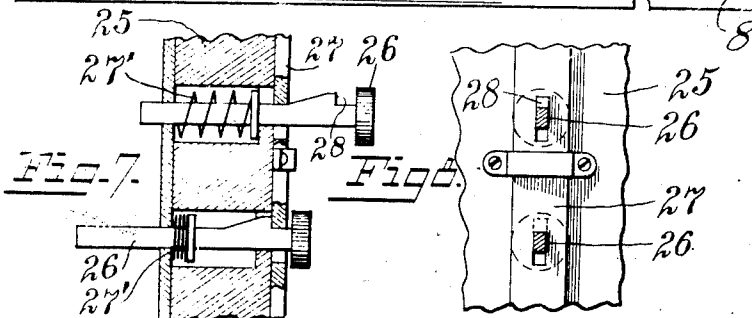
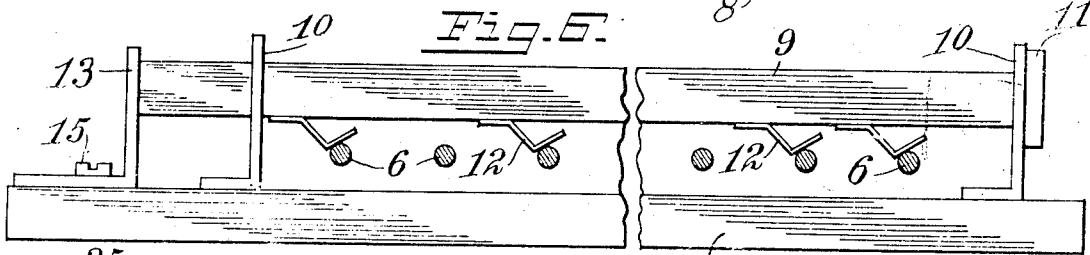
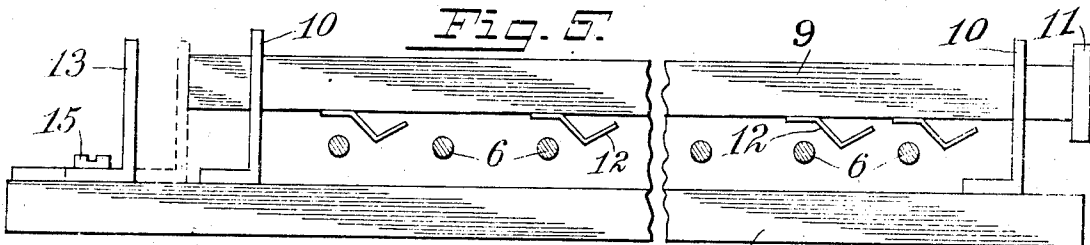
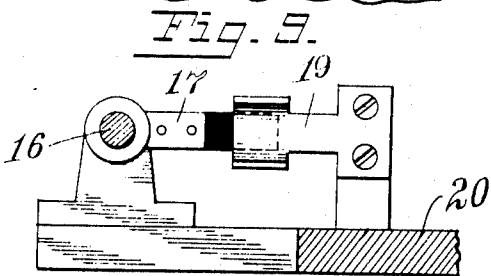
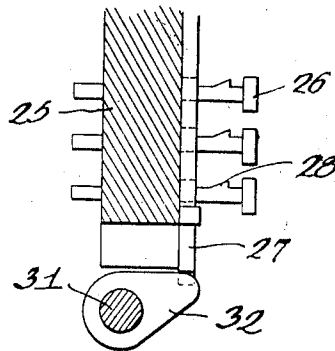


Fig. 15.



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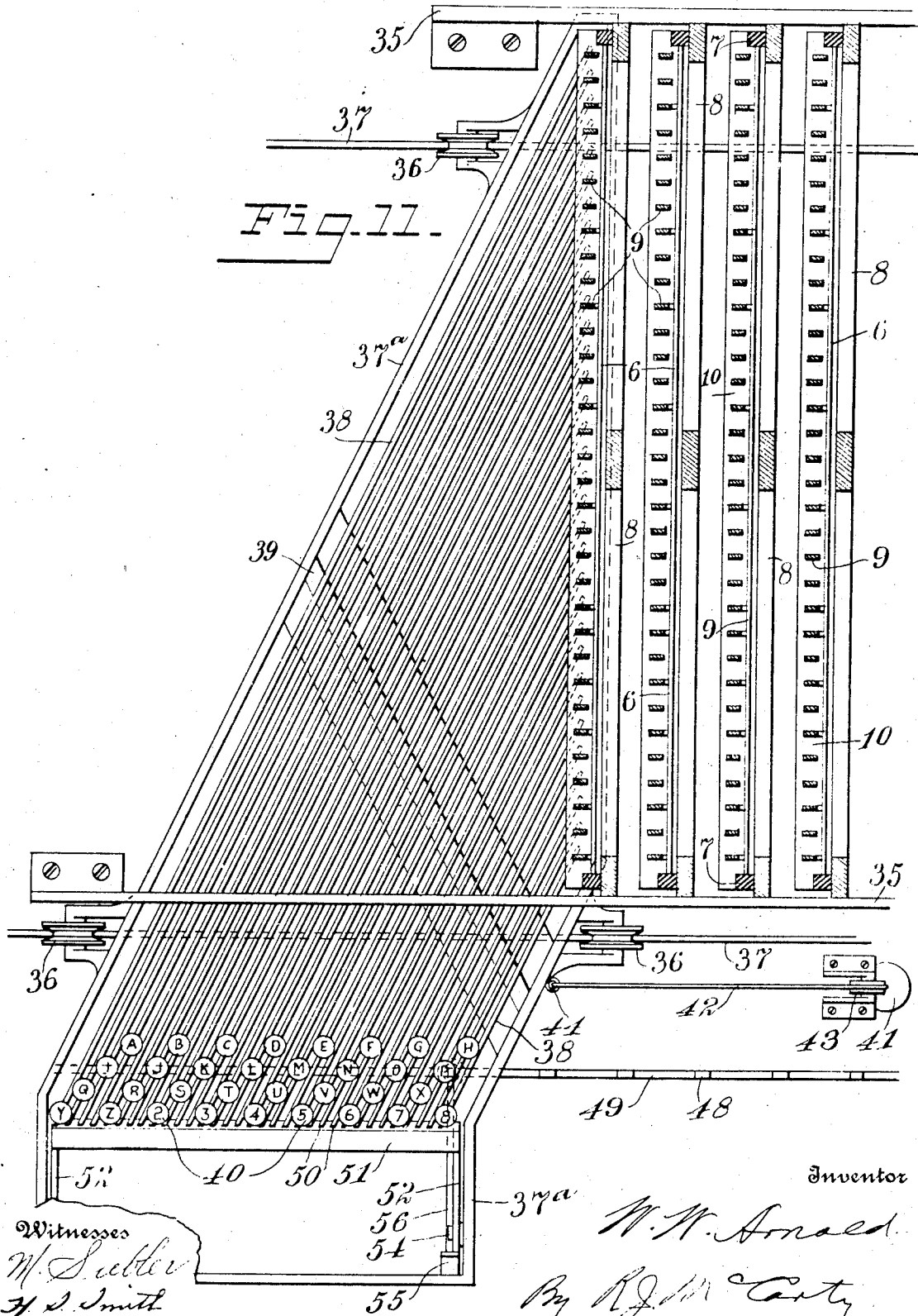
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7 SHEETS—SHEET 6.



W. W. ARNOLD.

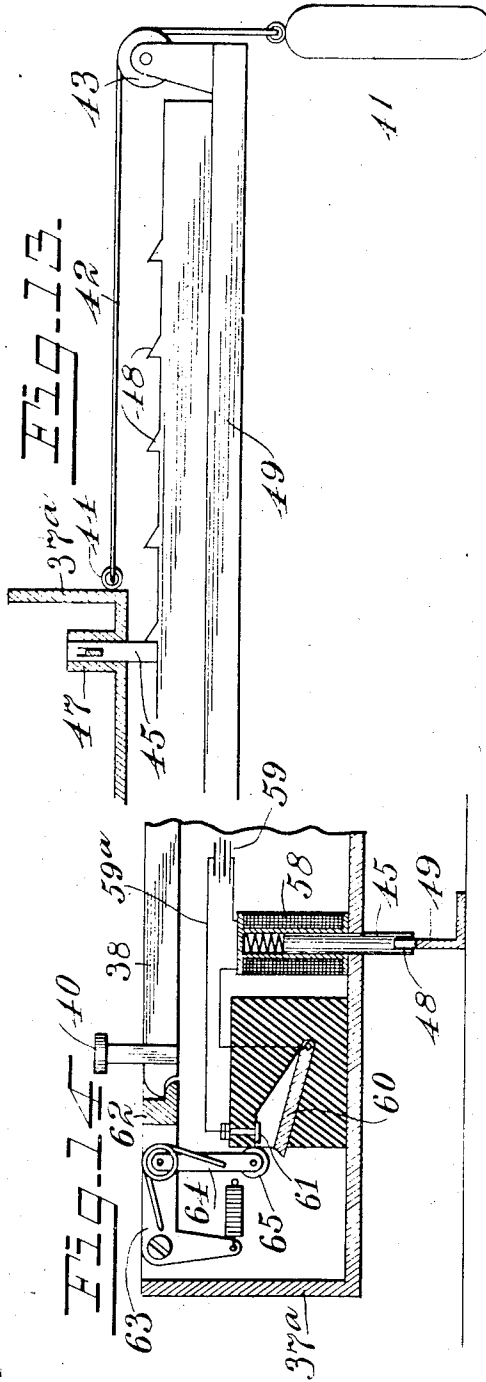
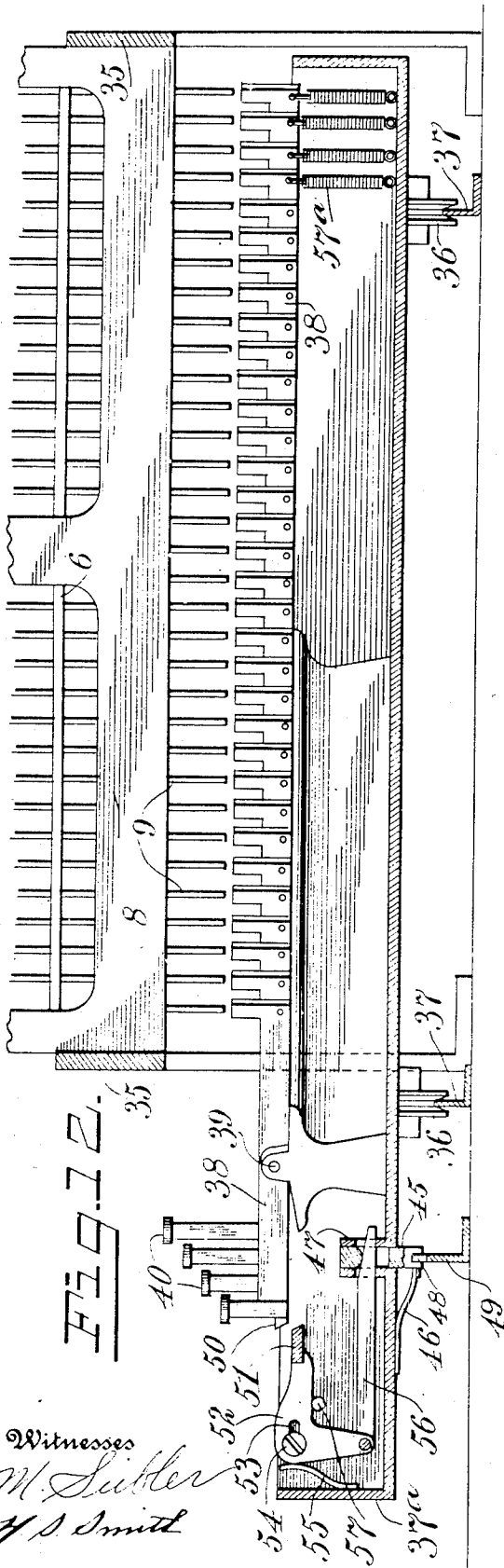
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7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGN.

1,098,211.

Specification of Letters Patent.

Patented May 26, 1914.

Application filed July 9, 1910. Serial No. 571,178.

To all whom it may concern:

Be it known that I, WILLIAM W. ARNOLD, a citizen of the United States, residing at Hamilton, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Electric Signs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in electric signs.

The object of the invention is to provide means of the above type, for displaying any advertisement, legend or design, the same being operated from a key-board containing the necessary letters or characters.

A further object of the invention is to provide mechanism for the above purpose that is simple and durable in construction and efficient in operation.

The device as constructed according to my present application, is an improvement upon the device of my copending application, Serial No. 512,162, filed Aug. 10, 1909.

Referring to the accompanying drawings, Figure 1 is a top plan view of the device, showing one of the switch-boards in electric connection with one of the spaces of the sign; Fig. 2 is a front elevation of the key-board with portions shown in section; Fig. 3 is a side elevation of one of the switch-boards with portions appearing in section; Fig. 4 is a diagrammatic view of one of the switch bars of the switch-board in electric connection with one of the spaces of the sign and showing the letter A illuminated by the lamps; Figs. 5 and 6 are detail views of portions of the switch bars, showing the same in different positions; Fig. 7 is a sectional view on the line *a-a* of Fig. 2, showing the keys of the key-board in detail; Fig. 8 is a front elevation of the keys shown in Fig. 7 with the buttons removed; Figs. 9 and 10 are details of the main switch; Fig. 11 is a view of a modified form of key-board; Fig. 12 is a side elevation of the same with portions of the carriage or frame shown in section; Fig. 13 is a detail of the releasing mechanism for the key-board shown in Fig. 11; and Fig. 14 is a modified form of releasing mechanism. Fig. 15 is a fragmentary view

of the setting keys and means for resetting the same.

Throughout the specification and drawings, similar reference characters indicate corresponding parts.

Referring to Fig. 1, 1 designates one of any number of sign or display spaces, on which are mounted a plurality of electric lamps 2. These lamps are so arranged that, by electrically energizing certain selected lamps, any character or letter may be outlined on the sign space. One of the terminals of each lamp is connected to a common wire 3 in which is placed a source of electric energy 4. The other terminals of the lamps 2 are connected to individual wires 5 which, together with the common wire 3, lead to the switch board. It will be seen that, if the circuit through any one of the individual wires 5 is completed by being connected to the common wire 3, the respective lamp 2 of that individual circuit will be energized; and, if a plurality of individual wires 5 are electrically connected with the common wire 3, the respective lamps of the individual wires will outline a character on the space 1, and the character may be selected or controlled by selecting the individual wires 5 to be electrically connected with the common wire 3. The selection of the individual wires is accomplished as follows: As shown in Figs. 1 and 3, each of the individual wires 5 are connected to an individual contact bar 6 which may be mounted in insulating material 7, on a frame 8. As shown in Fig. 3, the contact bars 6 are placed vertically, and extending across said bars are horizontal reciprocating switch bars 9, supported by guides 10 mounted on the frame 8. There is one of these switch bars 9 for each possible character that may be displayed on the sign. The switch bars are provided with buttons or finger pieces 11 having the respective character of the particular switch bar 9 impressed thereon to distinguish the same. As shown in the drawings, the switch bars 9 are in electric connection with the common wire 3, through the guides 10 and frame 8, the common wire being connected to the frame 8 through a switch hereinafter described. The switch bars 9 are adapted to reciprocate in the guides 10, and mounted on each of said switch bars is a suitable number of contact pieces 12, see Figs. 2, 4 and 5. These contact pieces are adapted to engage the contact bars 6 to complete the circuits

through the individual wires 5. Referring to Fig. 4, the lamps 2, which are necessary to outline the letter A, are shown illuminated; and it will be noted that the contact pieces 12 are so placed on the switch bar 9, which in this case is the "A" bar, that only those contact bars 6 corresponding to the lamps of the letter A will be illuminated by contact pieces 12. It will therefore be seen that the arrangement of the contact pieces 12 determines the character outlined on the space 1. Each switch bar 9 is provided with contact pieces 12 so arranged as to outline its respective character on the space. The switch bars 9 are actuated by pressing the finger on the buttons 11, and when actuated, are held in a set position by the contact pieces 12, as follows. These contact pieces are of a resilient nature, and when the switch bars 9 are actuated, ride over and press against the contact bars 6, thereby holding the switch bars in position.

Mounted upon each of the frames 8 is a bar 13 adapted to engage the ends of the switch bars 9, and, in connection with the contact pieces 12, maintain the switch bars in a set position, see Figs. 1, 4 and 5. These bars 13 are provided with inclined slots 14, see Fig. 3, through which pass screws or pins 15 which form guides for the bars 13. It will be seen that, when one of the bars 13 is moved vertically, said bar will also have a horizontal movement due to the inclined slot 14, and if one of the switch bars 9 has been set, said switch bar will be returned to a normal position. The bars 13 are moved or actuated to reset the switch bars 9 by cams 15' engaging the lower ends of the bars 13. The cams 15' are mounted on a shaft 16 hereinafter referred to.

To avoid the various circuits being broken at the contacts 12, and thus prevent arcing, there is connected in the common wire or circuit a switch constructed as follows, Figs. 1, 8 and 9. Mounted on the shaft 16 is an insulated arm 17 having a metallic cap 18 thereon. The cap 18 is adapted to engage two resilient contact members 19, one of which is connected to the common wire 3 and the other of which is grounded to a base member 20 on which the frames 8 are mounted. The shaft 16 may be rotated by means of a crank 21, sprockets 22 and chain 23; and when it is desired to extinguish the sign and reset the key-boards, the crank 21 is rotated. The initial movement of the crank 21 breaks the circuit, the subsequent movement resets the switch bars, and the final movement closes the main switch.

It will be understood that there may be as many spaces 1 as desired, and that there are as many key-boards as there are spaces 1, all of which are constructed and connected with their respective spaces 1, as above described. When an operator wishes to illuminate a

sign as above described, he actuates each switch board consecutively, by pressing the required switch bar 9 of each switch board. On large signs or displays this consecutive operation is detrimental, as considerable time is consumed in outlining the complete sign. In order, therefore, to set all of the switch boards simultaneously, I provide a key-board as follows. Extending across the front of the switch boards is a key-supporting member 25. Mounted in the member 25 is a suitable number of setting keys 26. These keys are arranged in rows, and correspond in number and position to the switch bars 9 of the key-boards. As shown in detail in Figs. 7 and 8, the keys 26 are reciprocally mounted and are controlled by springs 27'. The keys are pressed inwardly to be set, and are held in a set position by a bar or rod 27, which surrounds the keys, engaging a shoulder 28 on said keys. It will be noted that when one of the keys 26 is pressed inwardly, the shoulder 28, which is inclined, will elevate the bar 27 and release any other set key of that series. This allows a mistake to be rectified when an incorrect key is initially set. The supporting member 25 is so placed in relation to the buttons 11 or ends of the switch bars 9, that when one of the keys 26 is set, said key will not move its respective switch bar until the supporting member 25 is moved as a whole as follows: The supporting member 25 is swung on angular links 29 attached to the frames 8, and is given an upward movement to actuate the switch bars by cams 30 mounted on a shaft 31. See Figs. 2 and 3. When the supporting member 25 is given an upward movement by the cams 30, it is also given an inward movement, which actuates the switch bars, due to the angular position of the links 29. The shaft 31 is also provided with cams 32 adapted to engage and actuate the bars 27 to elevate the same and release the keys 26 which have previously been set. See Fig. 15.

The operation of the device as above described, is as follows: The operator first selects the reading matter to be illuminated, by setting the keys 26, one in each vertical series. He then rotates the crank 21. The rotation of said crank initially breaks the common circuit 3 at the switch members 19. The continued movement of said crank resets the switch bars 9 by means of the cams 15 and bars 13, elevates the supporting members 25 by the cams 30, and actuates the switch bars 9 by the set keys 26 coming in contact with their respective switch bars 9. The further continued movement of said cranks 21 allows the supporting member or key-board 25 to return to a normal position and the cams 32 to engage the bars 27 and allow the keys 26 to return to a normal position under the influence of the springs 27'.

The final movement of the cranks 21 closes the main switch.

In Figs. 11, 12 and 13 I have shown a modified form of key-board. In this construction there is one series of setting keys common to all the switch boards. The switch boards are constructed identical with the switch boards as above described, with the exception that the switch bars are placed vertical and the frames 8 are mounted on yokes 35, which provides a space under the switch boards for a traveling carriage containing the setting keys.

Extending under the switch boards are two tracks 37 upon which flanged wheels 36 are adapted to travel. The flanged wheels 36 support a carriage 37^a upon which are mounted key levers 38. All of the levers 38 are pivoted at 39 at their exact centers, thereby allowing the opposite ends of said levers to have the same amount of movement. One end of each of the levers 38 lies under the switch bars 9 of one switch board, and said ends are suitably shaped to engage the lower ends of the switch bars 9 and move the same upwardly to a set position, when the other ends of said levers are depressed. The last named ends of the levers 38 are each provided with a finger piece or button 40 containing the character corresponding to a particular lever. The carriage 37^a is propelled by any form of motor, such as a weight 41 attached to a cable 42, which passes over a pulley 43 and which is attached to the carriage 37^a at 44. The said carriage is held in its various positions, under the switch boards, by a plunger 45 controlled by a spring 46 and mounted in a boss 47. The plunger 45 is adapted to engage the teeth 48 of a bar 49, said teeth being spaced the same distance as are the switch boards. After one of the switch bars 9 has been set by one of the levers 38, the carriage 37^a is released to allow one of the levers to set a switch bar of the next switch-board as follows. The ends of the levers 38, provided with the finger pieces 40, are also provided with cam extensions 50 adapted to engage a common bar 51. The bar 51 is mounted on bell-crank levers 52 provided with slots 53 which straddle pins 54 and are controlled by springs 55 and pins 57. The lower arm of one of the bell-crank levers is attached to a cam rod 56 that engages the plunger 45. When one of the levers 38 is depressed, its cam extension 50 engages the common bar 51 and moves the same horizontally; and when the end of the lever 38 is elevated, the cam extension 50 trips the common bar 51 and rocks the bell crank levers 52 on the pins 54, thereby bringing the plunger 45 under the influence of the cam rod 56, which releases said plunger from the toothed bar 49 and allows the weight 41 to move the carriage to a position for the le-

vers 38 to engage the switch bars 9 of the next switch board. The levers 38 are returned to their normal position by springs 57^a, the action is therefore quick, and the plunger 45 will return to its normal position before the next tooth 48 of the bar 49 is reached.

In Fig. 14, I have shown a modified form of releasing mechanism for the carriage 37^a. In this construction the plunger 45 is electrically operated. The plunger 45 acts as an armature to a magnet 58 energized from a source of electric energy 59 through a circuit 59^a. Within the circuit 59^a is a switch member 60 suitably insulated, and adapted to engage a contact point 61 to complete the circuit. In this construction the ends of the levers 38 are adapted to engage and depress a common bar 62 mounted on spring-controlled levers 63. One of the levers 63 is provided with a spring-controlled arm 64 which carries a roller 65 adapted to engage and actuate the switch member 60. When the roller 65 is depressed by one of the levers 38, the roller 65 rides over the switch member 60; but when the roller 65 is elevated, which elevates the switch member 60, the circuit is completed by the switch member 60 coming in contact with the point 61. This energizes the magnet 58 and elevates the plunger 45, thereby placing the carriage under the influence of the weight 41. When the roller 65 reaches its upper position, it releases the switch member 60, which breaks the circuit and allows the plunger 45 to fall. As the upward movement of the roller is continuous, the circuit will be closed momentarily, and the plunger 45 will fall to its normal position before the next tooth is reached.

Without limiting myself to the precise details of constructions and arrangement shown and described, I claim:

1. In a device of the type specified, a plurality of electric lamps, an electric circuit containing a source of electric energy common to one terminal of all of the lamps, an individual circuit connected to the other terminal of each lamp, a contact bar connected to each of the individual circuits, manually-operated switch bars mounted across said contact bars and electrically connected with the common circuit, contact members mounted on said switch bars, adapted to engage said contact bars and complete the circuit through the lamps, and a bar mounted across the ends of said switch bars and adapted to limit the setting movement thereof and to return said switch bars to a normal position.

2. In a device of the type specified, a plurality of electric lamps, an electric circuit containing a source of electric power common to one terminal of all of the lamps, an individual circuit connected to other termi-

nals of each lamp, a contact bar connected to each of the individual circuits, manually-operated switch bars mounted across said contact bars and electrically connected with the common circuit, contact members mounted on said switch bars adapted to engage said contact bars and complete the circuit through the lamps, a resetting bar adapted to engage said switch bars and to return said switch bars to a normal position, a switch mounted in said common circuit, and means for actuating said switch and said resetting bar consecutively, whereby all of the circuits are broken at said switch, thereby preventing arcing at the contact members.

3. In a device of the type specified, a plurality of series of switch bars, contact members mounted on said switch bars and adapted to lock said switch bars against movement in one direction, means for limiting the movement of said switch bars in the other direction, a plurality of series of contact bars adapted to be engaged by said contact members, a movable key-board mounted across the ends of said switch bars, a plurality of series of independently movable setting keys corresponding in number with said switch bars and mounted on said key-board, means for holding any of the keys of each series in a set position, said key-board being adapted to be actuated to bring the set keys in contact with their respective switch bars, whereby any switch bar of each series may be actuated concurrently with any switch bar of the other series, and the switch bars maintained in set positions while the keys of the key-board are being set.

4. In a device of the type specified, a plurality of series of switch bars, contact members mounted on said switch bars and adapted to lock said switch bars against movement in one direction, means for limiting the movement of said switch bars in the other direction, a plurality of series of contact bars adapted to be engaged by said contact members, and a key-board common to all of said switch bars and provided with a plurality of independently movable setting keys, whereby the switch bars of each series may be placed in a set position simultaneously, and said switch bars may be maintained in set positions while the keys of the key-board are being set.

5. In a device of the type specified, a frame, a plurality of series of switch bars mounted on said frame, a series of contact bars mounted on said frame, contact members mounted on said switch bars and adapted to engage the contact bars, means for limiting the movement of said switch bars, a movable key-board mounted on said frame, a plurality of series of independently movable setting keys, one series for each series of switch bars mounted on said

frame, said keys being adapted to engage the ends of respective switch bars, means for holding any of the keys of each series in a set position to engage their respective switch bars when the keyboard is actuated and means for actuating said key-board whereby all the switch bars corresponding to the set keys are actuated simultaneously and the switch bars may be maintained in a set position while the keys of the key-board are being reset.

6. In a device of the type specified, a series of supporting frames, a plurality of contact bars mounted on each frame, a plurality of switch bars mounted on each of said frames and lying across the contact bars, contact members mounted on said switch bars and adapted to engage the contact bars, a resetting bar mounted on each frame, and adapted to engage said switch bars, means for actuating said resetting bars to reset said switch bars, setting keys adapted to engage said switch bars, a key-board upon which said keys are mounted, means for actuating said key-board, whereby said keys engage said switch bars and place the contact members in engagement with the contact bars, and means for actuating said resetting bar actuating mechanism and said key-board actuating mechanism consecutively.

7. In a device of the type specified, a series of supporting frames, a plurality of contact bars mounted on each frame, a plurality of switch bars mounted on said frames, contact members mounted on said switch bars and adapted to engage said contact bars, a key-board mounted adjacent said frames, a series of setting keys, one series for each frame, mounted on said key-board and in operative relation with the switch bars and adapted to be placed in a set position, holding bars mounted on said key-board, one for each series of setting keys and adapted to hold said keys when set, means for actuating said key-board whereby the set keys carried thereby engage and actuate their respective switch bars, means for actuating said holding bars to release the set keys, resetting bars mounted on said frames and adapted to return the switch bars to a normal position, means for actuating the resetting bars, and means connecting said resetting-bar actuating means, said key-board actuating means, and said holding-bar actuating means whereby the same are actuated consecutively.

8. In a device of the type specified, a series of supporting frames, a plurality of contact bars mounted on each frame, a plurality of switch bars mounted on said frames, contact members mounted on said switch bars and adapted to engage said contact bars, a key-board mounted adjacent to said frames, a series of setting keys, one

series for each frame, mounted on said key-board in operative relation with said switch bars and adapted to be placed in a set position, holding bars mounted on said key-board, one holding bar for each series of setting keys, said holding bars being adapted to hold said keys in a set position, means for actuating said switch board whereby the set keys carried thereby actuate their respective switch bars, means for actuating said holding bars to release the set keys, resetting bars mounted on said frames and adapted to return the switch bars to their normal position, means for actuating the same, a switch electrically connected with said switch bars, and means for actuating said switch, said resetting-bar actuating mechanism, said key-board actuating mechanism and said holding-bar actuating mechanism consecutively.

9. In a device of the type specified, a frame, a series of contact bars mounted on said frame, a series of switch bars mounted across said contact bars on said frame, contact members mounted upon said switch bars and adapted to engage said contact bars, a resetting bar mounted on said frame and adapted to limit the movement of

said switch bars, said contact members and said resetting bar being adapted to hold the switch bars in a set position.

10. In a device of the type specified, a plurality of series of contact bars, a plurality of series of switch bars, means for limiting the movement of said switch bars, contact members mounted on said switch bars and in operative relation with said contact bars, said switch bars being adapted to be locked in set positions, a movable key-board common to all of said switch bars, said key-board being provided with a plurality of series of independently movable setting keys, and means for maintaining any of the keys of each series in a set position, whereby any switch bar of any series may be placed in a set position simultaneously with any switch bar of the other series, and said switch bars may be maintained in set positions while the keys of the key-board are being reset.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM W. ARNOLD.

Witnesses:

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