

April 7, 1931.

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1,799,731

ELECTROMECHANICALLY OPERATED APPARATUS FOR ADVERTISING PURPOSES

Filed May 29, 1929

3 Sheets-Sheet 1

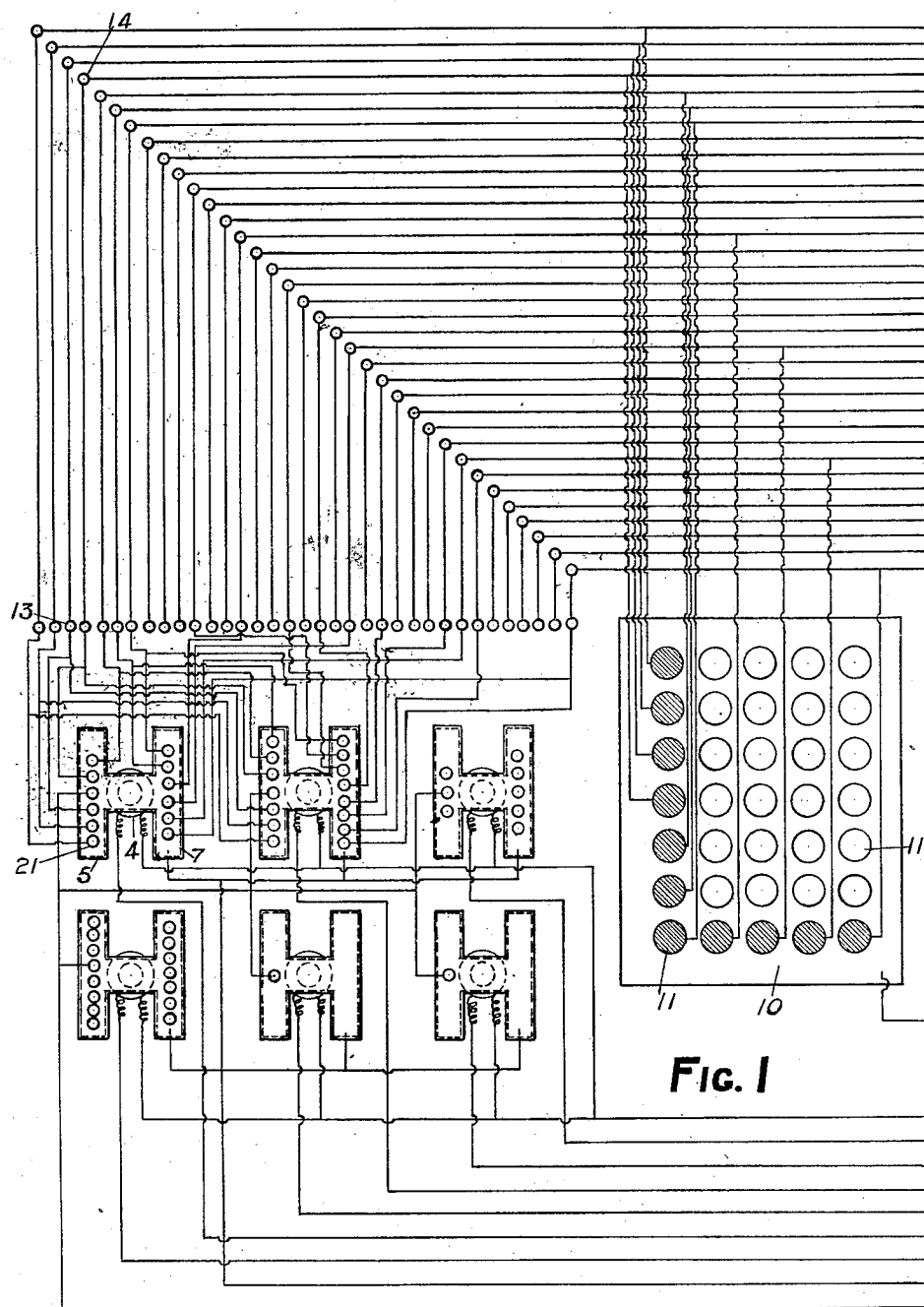


FIG. 1

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3 Sheets-Sheet 2

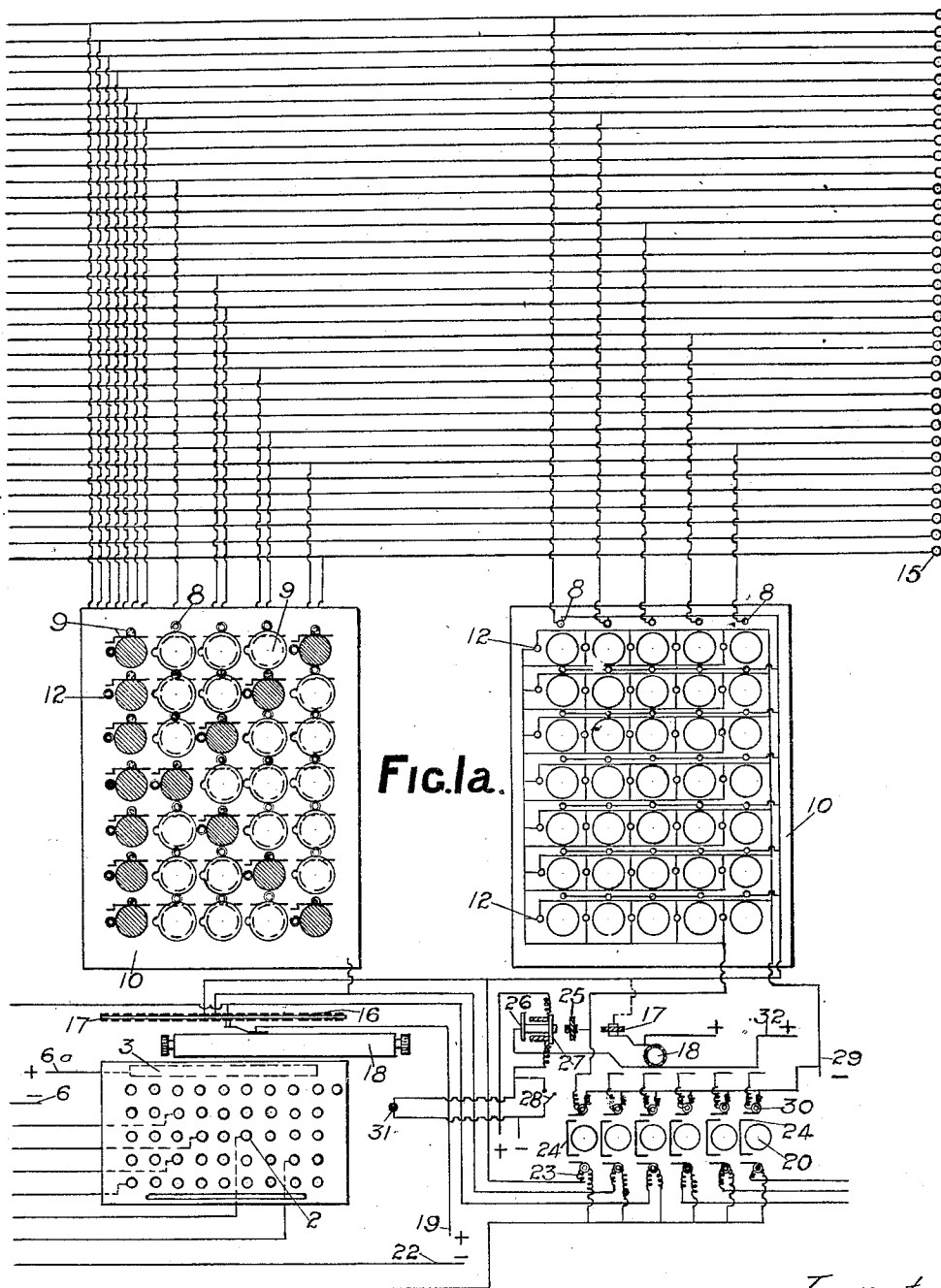


Fig. 1a.

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3 Sheets-Sheet 3

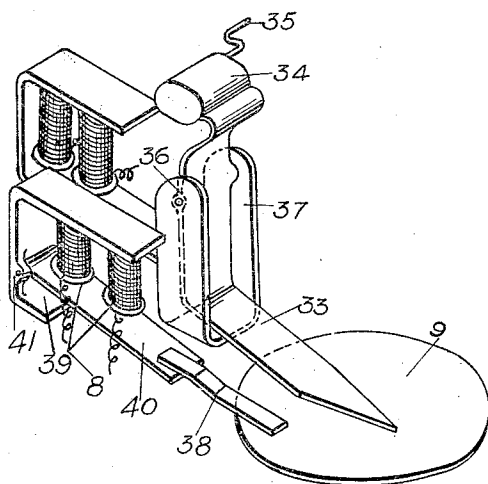


FIG. 2.

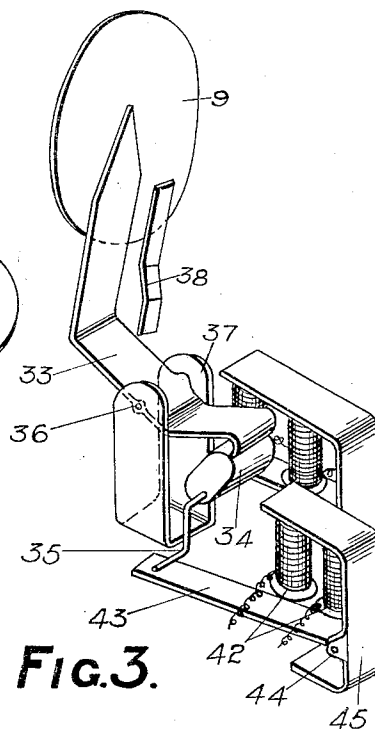


FIG. 3.

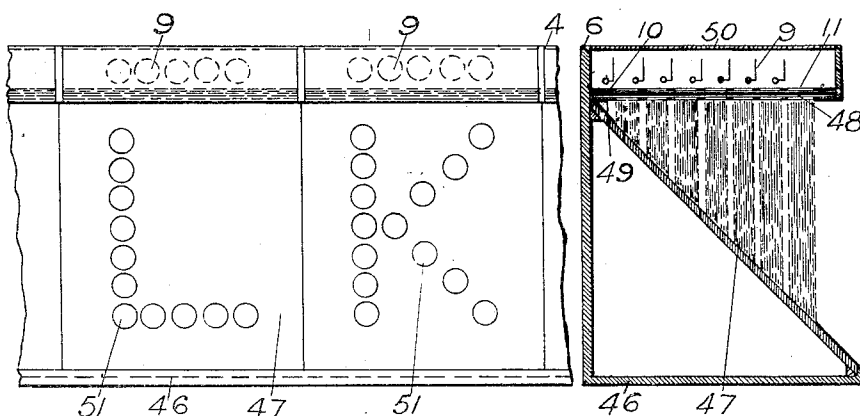


FIG. 4.

FIG. 5.

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UNITED STATES PATENT OFFICE

ARNOLD VIVIAN CASSELS, OF WEST END, NEAR BRISBANE, AUSTRALIA, ASSIGNOR TO
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ELECTROMECHANICALLY-OPERATED APPARATUS FOR ADVERTISING PURPOSES

Application filed May 29, 1929, Serial No. 366,983, and in Australia June 20, 1928.

This invention is for an improved electro-mechanically operated apparatus for advertising purposes and the like.

At present with electrical signs especially for advertising, the cost of maintenance is considerable owing to the amount of current required and the replacement of parts.

Those electrical signs wherein each letter of the sign consecutively appears until the full sign is completed require a great amount of mechanical apparatus to control them, and are then limited to the particular arrangement of letters or words set up by the controls, such arrangements continuing until the whole set of controls is re-set for new matter.

The object of this invention is to provide a relatively simple and cheaply constructed apparatus whereby a brilliant day-light sign may be erected and operated with low maintenance cost, and be usable also as a night sign, and wherein the subject matter of the sign may be composed and changed at will from a typewriter keyboard by electro-mechanical means which will be fully described as the specification proceeds.

The sign when erected consists of a long horizontal narrow casing, open at the front, and having a mirror disposed at an angle of 45° to the top so that the under surface of the top is reflected forward. The top is divided into a number of letter forming units, each unit having a number of apertures conventionally arranged, so that by uncovering certain of them a letter of the alphabet is formed, and by uncovering other series of apertures other letters or numerals are formed. By uncovering various series of apertures in the different units a word or words may be formed according to the length of the casing, which word or words are reflected forward by the mirror. In daylight, therefore, no lamps are required to form the letter, the sun's rays being sufficient to give a very bright sign. At night only several lamps are required to illustrate the sign. These apertures may be uncovered, and covered by shutters either of the sliding or lifting type, preferably electromechanically operated.

As the arrangement of the shutters and apertures is the same in each unit, the in-

vention contemplates the employment of common means for the selection of shutters for forming any particular letter on each unit; that is to say, for example, upon the depression of the letter "L" key of the typewriter keyboard the means of selecting and opening the particular shutters for that letter for any unit are the same. The location of the letter upon the particular unit is governed by the position of the typewriter carriage as it moves from side to side, suitable contacts adjacent to the carriage and brush mounted on the carriage determining the unit. By these means a considerable amount of wiring is dispensed with and the operation of displaying a particular letter or letters upon a particular unit or units is simplified.

In the accompanying drawings which illustrate an embodiment of this invention, similar parts in the different figures are denoted by the same reference numerals.

Figures 1 and 1^a are diagrammatic views of the circuits employed for bringing about the display of a letter upon each letter forming unit by the depression of a key of the typewriter which is connected up to the circuit; and for lighting a lamp to indicate that the particular letter circuit is efficient; and for obliterating a wrong letter (and extinguishing the particular indicator lamp) if accidentally struck on the keyboard; and for selecting a particular letter for each or any letter forming unit; and for eliminating the sign after having been utilized to its desired extent.

Figure 2 is a pictorial view of a shutter shown in closed position together with its controlling magnets.

Figure 3 is a pictorial view of a shutter shown in open position (relative to the aperture) together with its controlling magnets.

Figure 4 is a front view of two letter forming units together with the reflecting mirror.

Figure 5 is a sectional view of the left hand letter forming unit ("L" of Figure 4).

For convenience, Figure 1 shows the wiring for one letter forming unit, and the letter L has been selected. Certain wiring for the letter K is also shown. Letter L (2) is

shown in the keyboard of typewriter (1). There is a common positive (6a) consisting of a metal plate (3) (shown dotted) situated at the base of the typewriter (1). Upon depressing letter L (2) it makes contact with metal plate (3) letter L (2) being connected to electromagnet (4) the other side of which is connected to negative (6). This completes the circuit and the letter L switch (5) is closed. Electromagnet (4) being now energized attracts the negative plate (7) (shown dotted) and brings it into contact with a series of studs (21) on the letter L switch (5). Each of these studs (21) is in direct contact with an electromagnet (8) which opens a shutter (9) on the letter forming unit (10).

The letter forming unit (10) consists of a plate having a series of circular or other shaped apertures (11) (in the drawings 35 apertures are shown) which are covered or uncovered by shutters (9) operated in the first instance by electromagnets (12) (for closing) and in the second instance (when closed) by electromagnets (8) (for opening). Each shutter opening electromagnet (8) is in contact with one of a series of studs (13) (also 35 in number). The studs (14) and (15) are merely insulated carrier studs.

Upon the depression of letter "L" (2) on keyboard of typewriter (1) the studs (21) on the letter forming switch (5) required to form the letter "L" on the letter forming unit (10) are selected; for example in forming the letter "L" on the letter forming unit (10) the left hand vertical and bottom horizontal apertures (shown in left hand diagram) must be opened and the electromagnets (8) governing them are in contact through studs (13) with studs (21) on the letter forming switch (5).

Upon electromagnet (4) being energized (as before mentioned) negative switch (7) comes into contact with the studs (21) thus conveying the current from negative (22) to the electromagnets (8) required. Only one stud (13) is allowed for each opening electromagnet (8) and if the same stud (13) is required for other letters it is adopted for one or all. To complete the circuit the contact from the other side of electromagnet (8) comes into contact with one of a series of studs (16) situated at the back of the typewriter (1). The brush (17) connected to the carriage (18) of the typewriter makes contact respectively with one or other of the studs (16) as the carriage progresses from side to side. This brush (17) is in direct contact with the positive pole (19) of the battery. This completes the circuit and the letter L is formed by the open apertures (shown shaded in left hand diagram of letter forming unit (10)).

To enable the operator to ascertain whether the circuit is being completed for that par-

ticular letter forming unit a lamp (20) is employed. The circuit commences from any stud (21) (in the drawings an extra stud—the centre stud—is shown) switch (5) coming into contact with negative pole (22) of the battery synchronizing with the switching on of the current to the stud (21). This stud (21) carries the negative current through to one side of the electromagnet (23) operating the "on" switch of the beforementioned lamp (20) continuing through the coil of the magnet (23) to the particular stud in the series of studs (16) (in contact with circuit of the particular letter forming unit (10) being operated upon) thence through the brush (17) on a carriage (18) to the positive (19). This energizes electromagnet (23) bringing into contact switch (24) switching on the current from an outside source (not shown) and lighting the particular lamp (20).

Means are provided for rectifying an error caused by depressing a wrong letter of typewriter (1) and utilizing the back spacer (provided on the standard machine) as a switch and are as follows: A series of studs (25) (in number agreeing with number of units) is in contact with one side of the closing electromagnet (12) (see right hand diagram) of the letter forming unit (10). This series of studs (25) which is located parallel with studs (16) at the back of the typewriter, and directly beneath them, is wiped by brush (26) brought into operation by an independent electromagnet (27). This brush (26) together with its electromagnet (27) is mounted on a bracket attached to carriage (18) of type writer (1), and is in direct contact with positive (32). To bring the brush (26) into contact with one of the series of studs (25) the current is sent through electromagnet (27) by depressing back spacer key (31) thus bringing the shutter closing electromagnet (12) beforementioned directly into contact with the positive (19) and utilizing the mechanical means for bringing the carriage back one stud (or space). All the shutter closing electromagnets (12) on each unit (10) are wired in parallel and are all energized simultaneously. The current in passing through the coils of the magnets goes directly to the negative pole (29) thus completing the circuit and closing shutter (9). Simultaneously with the closing of shutter (9) the switch (24) controlling the lighting current of lamp (20) is broken by means of electromagnet (30). The energization of the magnet (30) is effected as follows: Starting from positive (32) through brush (26) to one of the studs (26) in contact with that particular letter forming unit (10) the current passes through one side of the electromagnet (30) to the negative pole (29). The lamp is thus switched off.

On completion of the full display, to wipe out the existing letters the following means are provided. A switch (28) (in shunt with

backspacer switch (31)) is turned on thus completing the same circuit as has been described for the elimination of a letter on one letter forming unit (10). The carriage release is then brought into operation and as the carriage travels back the brush (26) makes contact with each of the series of studs (25) in turn closing all shutters (9) and switching off lamps as before described.

When it is desired to allow a blank upon one unit (10) for example, between two words, by depressing the space bar, which is not included in the electrical circuit, but is mechanical, one each of the studs (16) and (25) will be passed by the brushes (17) and (26) respectively.

Referring to Figure 2; the shutter (9) preferably consists of a circular metal plate secured to the end of a lever (33) the other end of which has attached to it a balanced weight (34) upon which is a trip rod (33). This lever (33) fulcrums on pin (36) carried by the arms of bracket (37). Upon one side of the shutter (9) is attached a short flat arm (38). The opening magnet (8) is carried by bracket (39) which also carries a flat plate armature (40) hinged by pin (41) on the bracket (39) and situated immediately below magnet (8). This armature (40) normally lies underneath the end of the short flat arm (38).

In operation; upon the current being sent through coils of magnets (8) they become energized and attract the hinged armature (40) towards them with sudden movement. The end of the armature (40) opposite the hinge comes into sharp contact with the flat arm (38) and propels the shutter (9) upwards. As shutter (9) is finely balanced by its weight (34), on weight (34) passing over the centre of gravity it completes the operation of raising shutter (9) and thereby opens the aperture. When the aperture is fully open the shutter (9) assumes the position shown in Figure 3 and has the trip arm (35) in a position immediately above armature (43).

Referring to Figure 3 which shows the shutter (9) in open position; when it is desired to close the shutter (9) current is passed through the coils of magnet (42) which energizes the poles causing them to attract flat armature (43) hinged by pin (44) to bracket (45). The sudden upward movement of armature (43) against trip arm (35) overbalances weight (34) which brings shutter (9) back to normal position (shown in Figure 2) across the aperture.

Referring to Figures 4 and 5 which show the two units of a series in line forming the full display; a casing (46) comprises a top plate (10) having a series of apertures (11) for forming the letter (see Figure 1), back and bottom plates and open front. A mirror (47) is arranged within the casing (at an

angle of approximately 45°) and a color screen (48) may be situated between aperture plate (10) and a similar supporting plate (49) having corresponding apertures. A ground glass (50) is placed above the shutters (9) and forms a separate compartment wherein the shutters are mounted and housed.

In Figure 4 a letter "L" is displayed by reflection (51) upon mirror (47) on the left hand, and letter "K" is shown on the right. Obviously any letter may be displayed by the opening of suitable shutters.

I claim:—

1. Apparatus for displaying advertisements and the like, comprising a horizontal casing open at its front and having a mirror disposed at an angle of 45° relative to the top plane, and adapted for operation through the open front; character-forming apertures in said casing top; and electro-mechanically actuated shutters to uncover said apertures in predetermined groups to project a display unit upon said mirror.

2. Apparatus according to claim 1, which includes in combination a color screen located below the apertures and a light transmitting screen above the shutters in superimposed relation.

3. Apparatus according to claim 1, which includes means for opening the said shutters to form a character in a character-forming unit, comprising a circuit; a switch key and electro-magnet in said circuit; an armature for the electro-magnet and a series of studs adapted to contact with the armature in predetermined relation; a circuit including the character-forming unit, and shutter-opening electro-magnets in said circuit responsive to the operation of the switch key to open the shutters.

4. Apparatus according to claim 1, which includes means for locating the display of a particular character upon a character-forming unit, comprising a movable carriage; a brush mounted on said carriage; a series of fixed studs; a circuit including the brush and said studs, the studs being respectively in circuit with a character-forming unit when in contact with said brush.

5. Apparatus according to claim 1, which includes means for indicating that the circuit for opening any particular series of character-forming apertures is effective, comprising a movable carriage; a brush mounted on said carriage; a series of studs; a circuit including the brush and said studs, the studs being respectively in circuit with a character-forming unit when in contact with said brush; an electro-magnet in circuit with the character-forming units; a switch actuated by the electro-magnet and a lamp indicator actuated by the switch.

6. Apparatus for displaying advertisements and the like, comprising a casing open at its front and including a top; character-

forming units in the top, each unit comprising character-forming apertures; shutters for the apertures; a shutter closing circuit and shutter-closing electro-magnets in said circuit; means for closing all of the shutters upon completion of the display, comprising a movable carriage; a brush mounted on said carriage; a circuit including the brush and said studs, the studs being in circuit with the character-forming units when in contact with said brush; a shunt circuit and an electro-magnet in said circuit; and a control switch operative with the electro-magnet to bring the brush selectively into contact with the studs to successively actuate all of the shutter-closing magnets.

7. Apparatus for displaying advertisements and the like, comprising a casing open at its front and including a top; character-forming units in the top, each unit comprising character-forming apertures; shutters for the apertures; a shutter-closing circuit and shutter-closing electro-magnets in the circuit; means for closing all of the shutters upon completion of the display, comprising a movable carriage; a brush mounted on said carriage; a shunt circuit and an electro-magnet in said circuit; a control switch operative with the electro-magnet to bring the brush selectively into contact with the studs to successively actuate all of the shutter-closing magnets; indication lights; a circuit for the lights and means in the circuit for extinguishing the lights upon the closing of the shutter-closing circuit.

8. Apparatus for displaying advertisements and the like, comprising a casing open at its front and including a top; character-forming units in the top, each unit comprising character-forming apertures; shutters for the apertures; a shutter-closing circuit and shutter-closing electro-magnets in the circuit; means for rectifying an error comprising a movable carriage; a back spacer key for mechanically moving the carriage back one space at a time; an electro-magnet; a circuit for energizing the electro-magnet and a switch for closing the circuit; a movable carriage and a brush mounted on said carriage; a series of studs adapted to have wiping contact with the brush, thereby energizing the shutter-closing magnets of a particular unit; an indicator lamp for each unit and means for breaking the circuit for a particular lamp.

9. In an apparatus for displaying advertisements and the like, comprising a casing having a top and character-forming apertures in the top; shutters for the apertures; a shutter-opening circuit and shutter-opening electro-magnets in the circuit; a character-forming switch, comprising a plate and a series of studs fixed to said plate, said studs being included in the shutter-opening circuit; an electro-magnet having an armature,

and adapted when energized to cause the armature to contact said plate, thus completing the circuit through the studs and causing the shutter-opening magnets to be actuated to form a particular character.

10. In an apparatus for displaying advertisements and the like, comprising a casing having a top and character forming apertures in the top; a shutter for covering and uncovering an aperture, comprising a lever having a shutter plate secured to one end and a balancing weight at the other end; a trip rod secured to the said weight and a bracket on which the lever is pivotally mounted; a short arm attached to said plate; electro-magnets having armatures and adapted when energized to cause said armatures to alternately contact with the short arm and trip rod to cause the opening and closing of the shutter, respectively.

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