

July 12, 1949.

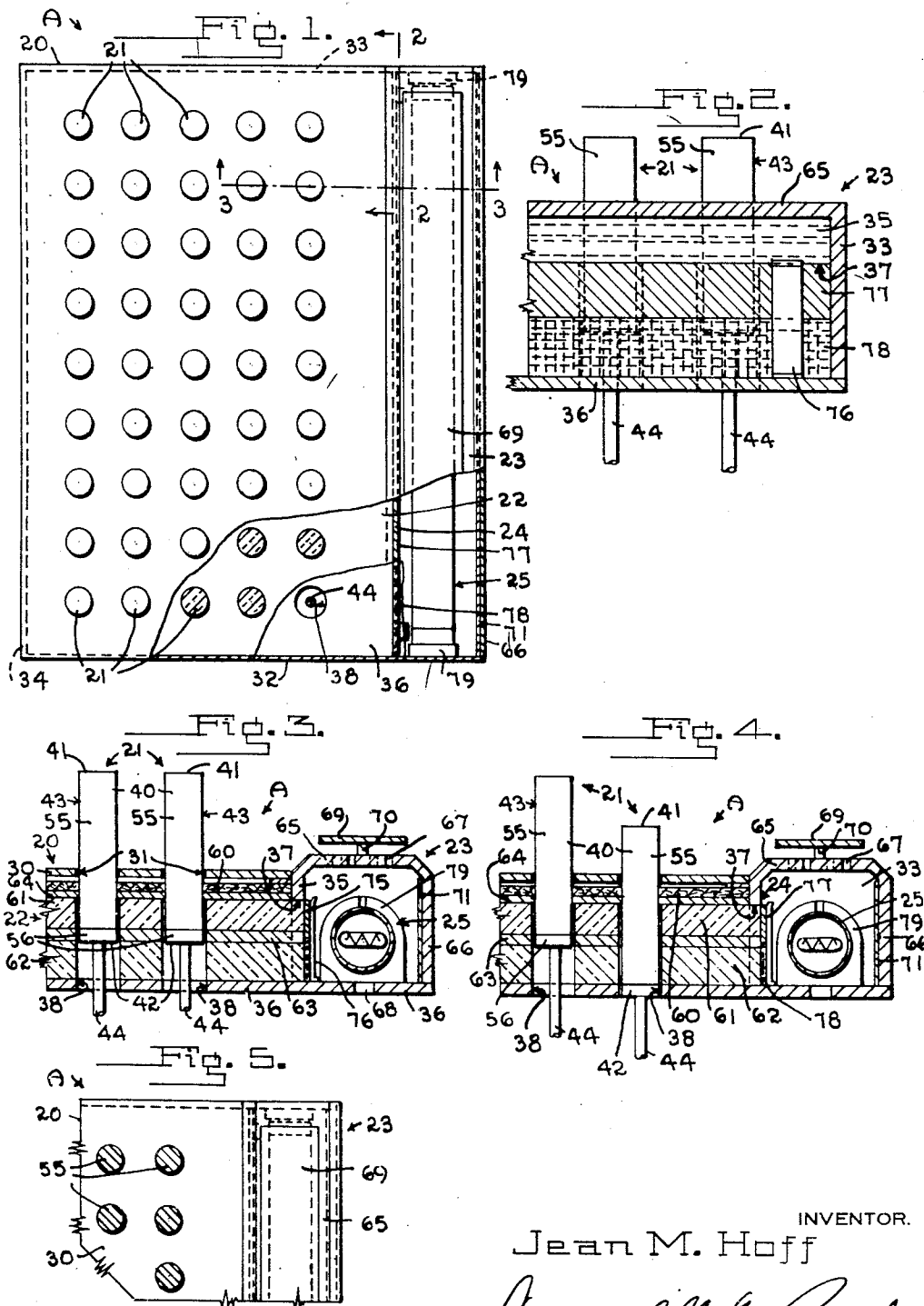
J. M. HOFF

2,476,257

MEANS FOR ILLUMINATING DEPRESSIBLE KEYS

Filed April 15, 1946

4 Sheets-Sheet 1



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July 12, 1949.

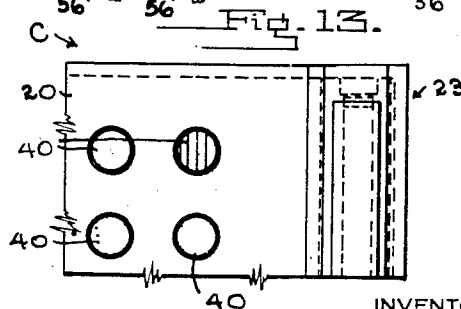
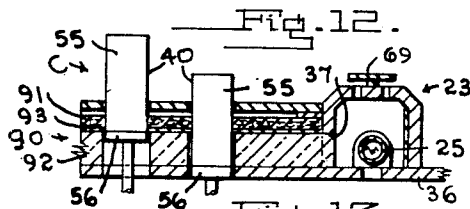
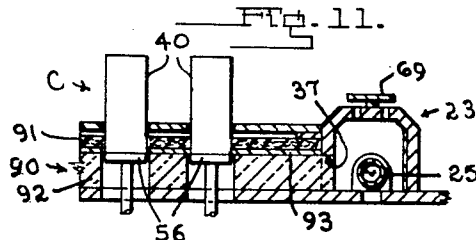
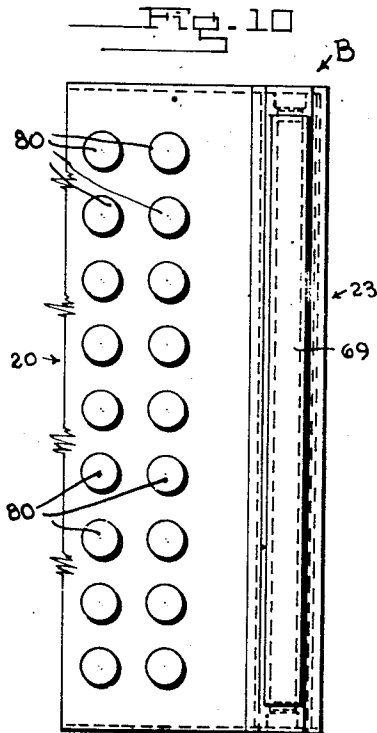
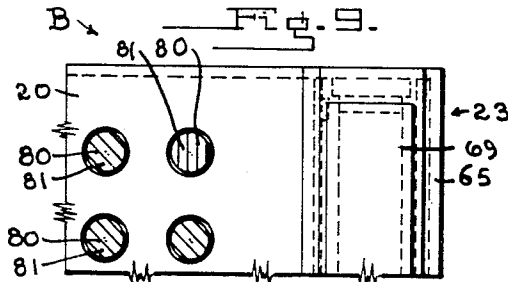
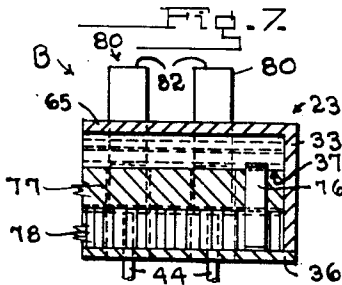
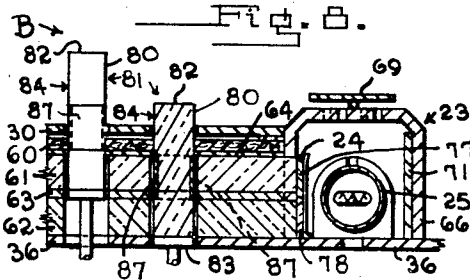
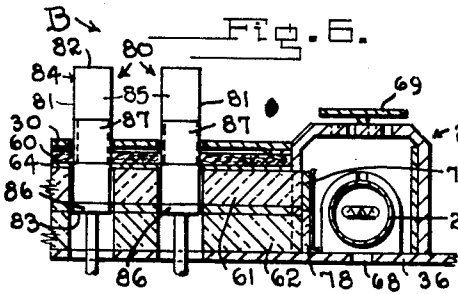
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2,476,257

MEANS FOR ILLUMINATING DEPRESSIBLE KEYS

Filed April 15, 1946

4 Sheets-Sheet 2



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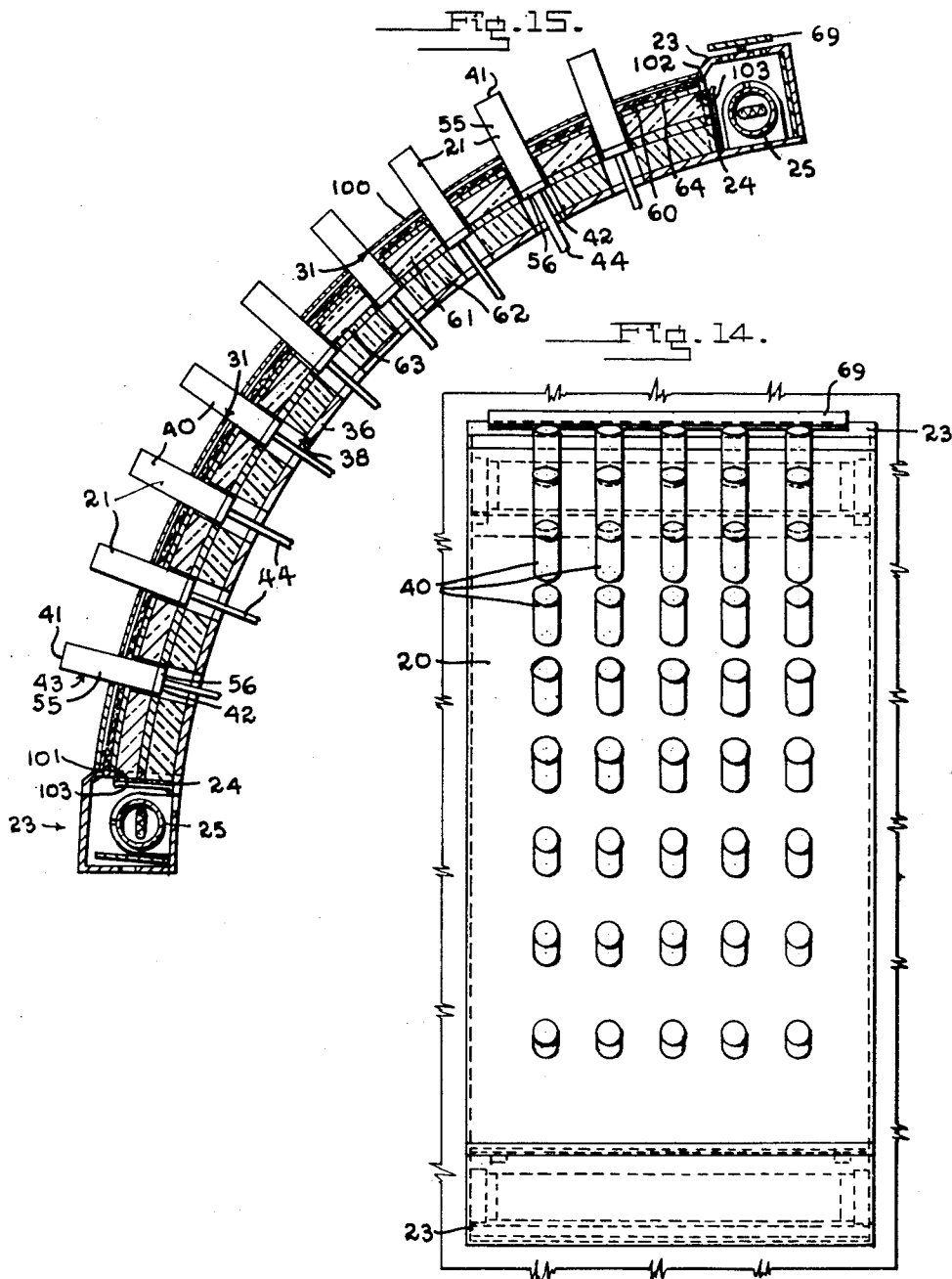
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2,476,257

MEANS FOR ILLUMINATING DEPRESSIBLE KEYS

Filed April 15, 1946

4 Sheets-Sheet 3



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MEANS FOR ILLUMINATING DEPRESSIBLE KEYS

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4 Sheets-Sheet 4

FIG. 16.

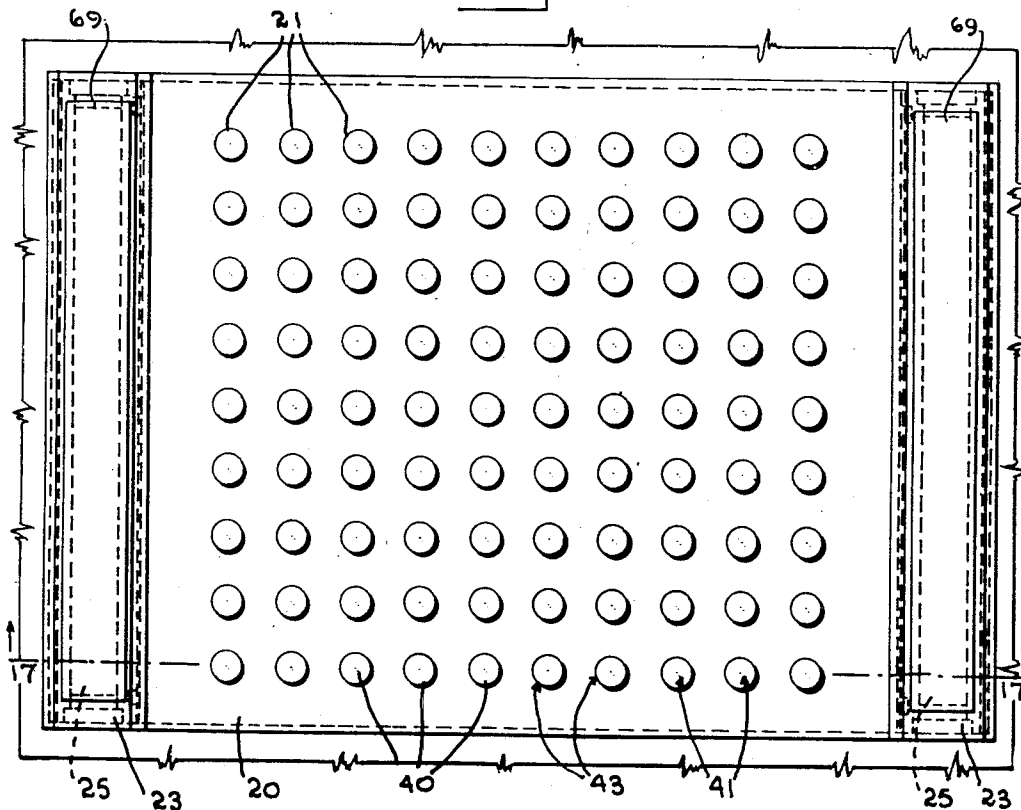


FIG. 17.

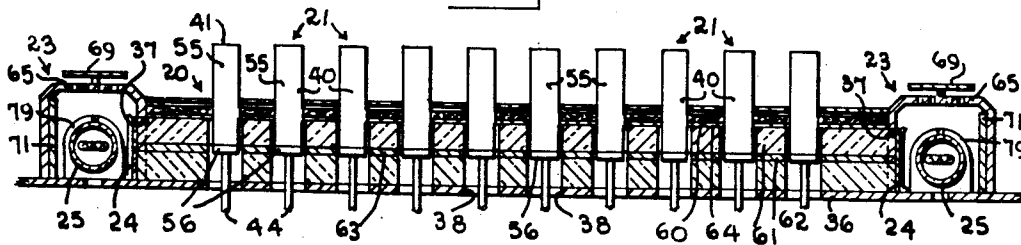
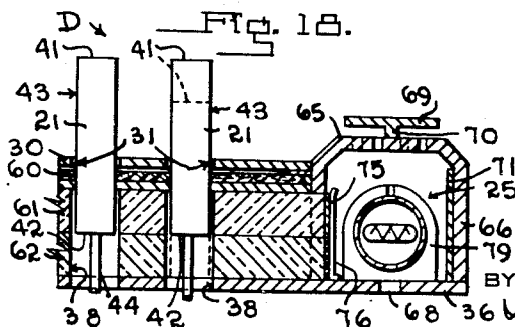


FIG. 18.



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UNITED STATES PATENT OFFICE

2,476,257

MEANS FOR ILLUMINATING
DEPRESSIBLE KEYS

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Application April 15, 1946, Serial No. 662,379

17 Claims. (Cl. 116—114)

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This invention relates to visual signalling and more particularly to means for signalling the position of a manipulatable member, which member is adapted to actuate a mechanism. One illustrative application of the invention is to the illumination of the depressible keys of a calculating machine.

An important object of the invention is to provide means for illuminating members, such as keys, plungers, throttles, switch buttons and the like, by means of light rays passing through the members, in contra-distinction to light rays reflected from the surfaces of such members, so that the relative positions of the members may be visually indicated. Thus, when the operator of a calculating machine, for example, notes a certain colored light shining from a certain key he will know whether the key is depressed or not and, thus, he will become aware of the accidental position of any of the keys.

Another important object is to provide visual signalling means, wherein the visual signals are rays of light transmitted through manipulatable members during portions of their movement. As a result, all the members, when not manipulated, may be of the same color but, as soon as a member is moved, it will change color, due to light rays of a color, different from that of the non-manipulated members, passing through the manipulated one. Thus, the manipulated members will visually differ from the non-manipulated members, and both will be readily recognized.

A further important object is to provide means as described, wherein the members, such as keys, contain light rays-transmitting portions cooperating with other portions, so that, as the operator looks down upon the members, he will see, at a glance, whether one or more members have been manipulated. Thus, the visual signals are not provided by portions colored differently (as by enamel coatings) than are other portions, but the signals are in the nature of light rays passing through certain portions of the members. Such enamel and similar coatings wear off, chip, and become smudged.

Since the position of a depressible key of a calculating machine cannot be readily recognized when looking directly down upon it, this invention provides a means for the ready recognition of depressed keys by an operator looking directly down upon the keys.

Yet another object is to provide a novel depressible key for use in calculating machines and the like.

Other objects and advantages of the invention

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will be apparent during the following detailed description of the invention, taken in connection with the accompanying drawings, forming a portion of this specification, and in which drawings

Figure 1 is a top plan of one embodiment of the invention, for association with a substantially flat-surfaced machine, such as many calculating machines.

Figure 2 is an enlarged fragmentary longitudinal section, substantially upon the line 2—2 of Figure 1.

Figure 3 is a fragmentary transverse section, substantially upon the line 3—3 of Figure 1, including two non-depressed keys.

Figure 4 is a like section, but showing one key depressed.

Figure 5 is a fragmentary top plan of a corner of the novel device with the keys thereof in horizontal section.

Figure 6 is a fragmentary transverse section, somewhat like Figure 3 but of another embodiment of the invention.

Figure 7 is a fragmentary longitudinal section, somewhat like Figure 2, but on a reduced scale, of the embodiment of the invention as in Figure 6.

Figure 8 is a section, somewhat like that of Figure 4 but of the embodiment of the invention of Figures 6 and 7.

Figure 9 corresponds somewhat with Figure 5 but is of the invention's embodiment as in Figures 6, 7 and 8.

Figure 10 is a fragmentary top plan of the embodiment of the invention in Figures 6 to 9 inclusive.

Figure 11 is a transverse sectional view, somewhat akin to that of Figures 3 and 6, of a third embodiment of the invention.

Figure 12 is a sectional view of this third embodiment, and corresponds somewhat with the showings in Figures 4 and 8.

Figure 13 is a fragmentary top plan of a corner of the embodiment in Figures 11 and 12.

Figure 14 is a top plan of this adaptation.

Figure 15 is a longitudinal section through an adaptation of the invention to an arcuate surfaced machine, such as a cash register.

Figure 16 is a top plan of an adaptation of the invention to a wide machine.

Figure 17 is a vertical section, upon substantially the line 17—17 of Figure 16.

Figure 18 is a fragmentary transverse section, somewhat like Figure 3 but showing a modification of the structure.

In the drawings, wherein for the purpose of illustration are shown a preferred and three

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modified forms of the invention, and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates the preferred form, the letter B one modified form, C another modification, and D a third modification. By way of illustration form A is shown in Figures 1 to 5 inclusive for association with a machine as a calculating machine, having a substantially flat outer surface from which the keys are adapted to project, and in Figures 14 and 15 for association by way of illustration, with a machine as a cash register, having an arcuate outer surface, from which the keys project.

The form A shown in Figures 1 to 5 inclusive, includes a main housing 20, a plurality of manipulatable members 21, extending outwardly of the housing 20, and operatively connected with a mechanism adapted to be moved by the members 21, a body portion 22 within the housing and associated with the members 21, an auxiliary housing 23 at one end of the main housing, 20, an insert 24 preferably within the auxiliary housing 23 and associated with the body portion 22, and a light source 25 within the auxiliary housing 24.

As for the main housing 20, this preferably includes an upper wall 30, provided with a plurality of rows of perforations 31, side walls 32 and 33, end walls 34 and 35 and a bottom wall 36. For convenience the end wall 35 may comprise, also, an end wall of the auxiliary housing 23 and this wall is provided with a slot or opening 37. The side walls 32 and 33 may also form the side walls of the housing 23 but, since the latter is, preferably, higher than the housing 20 those portions of the walls 32 and 33 forming the side walls of the housing 23 are also higher. The bottom wall 36 may be the bottom wall of the auxiliary housing and it may be, also, the top wall of the machine with which the novel means is associated. This wall 36 is, preferably, provided with a plurality of perforations 38 substantially corresponding in size with, and axially aligned with, the perforations 31. The bottom wall 36 may, of course, be disposed upon the top wall of the machine with the conventional openings therein, for the keys or the like, axially aligned with the perforations 31 and 38. The various walls mentioned may be of metal or opaque hardened plastic.

The members 21 may be independently operable keys, adapted for reciprocation and, in Figures 1 to 5 each of these is shown as having a cylindrical body 40 defining an upper or finger-engaging face 41, a lower face 42 and a peripheral surface 43, with a stem 44 extending from the axial center of the face 42. The stem 44, of course, is operatively connected with the mechanism adapted to be actuated upon manipulation of the members 21. In the example shown, the members 21 are reciprocated. That is, upon pressure of a finger upon an upper face 41, the member 21 will be depressed and normally retained depressed until a certain result (as a total) is desired, whereupon other mechanism (not shown) is manipulated and one of the results thereof is that the depressed member springs upwardly into a non-depressed position.

Each body 40 shown in form A is composed of a light transmitting portion 55 and an opaque portion 56. The portion 55 may be of glass, hardened plastic, as Lucite, or the like. Translucent material is preferred and the portion 55 is the uppermost portion of the body 40 while the por-

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tion 56 is of less height and may be a relatively thin metallic or hardened plastic disc secured to the portion 55, below the same, as by cement.

The body portion 22 preferably comprises several superposed sections, each provided with a plurality of openings or perforations axially aligned with the perforations 31 and 38. Uppermost is a light rays-blocking section 60 which may be a layer of felt or other fibrous material. Its function is to cut off or block any light rays projected between the peripheries of the bodies 40 and walls of the perforations 31, so that a characteristic of the material of the section 60 is to tend to hug the peripheral surfaces 43 of the bodies 40, even during their reciprocable motion. Below the section 60 are two light rays-transmitting sections 61 and 62. These may be glass or hardened plastic sheets, such as Lucite. Between the sections 61 and 62 is a section 63 of opaque but, preferably, light-reflecting material and upon the upper surface of the section 61 may be a section 64 of opaque but, preferably, light-reflecting material. These may be sheets of tinfoil, coatings of mercury, aluminum paint or the like. They are adapted to reflect light rays so that the rays will be transmitted to the portions 55 of the bodies 40. It will be noted, in Figures 3 and 4, that, preferably, the sections 60 and 64 end at the wall 35 while the sections 61, 62 and 63 extend into the slot 37 with their edges preferably providing a substantially vertical face for partial support of the insert 24 to be subsequently described.

It will be seen in Figure 3 that the non-depressed bodies 40 are so disposed that the disc-like, opaque portion 56 is in the same horizontal planes as is the section 63. Since the section 63 is opaque, it and the opaque portions 56 form a substantially continuous opaque body.

Referring to the auxiliary housing 23, shown more particularly in Figures 1, 3 and 4, the same has an upper wall 65, and an end wall 66 joining the upper wall 65 and side walls 32 and 33 which latter two walls join, of course, the end wall 34. This auxiliary housing 23 contains the light source 25 and, in order to provide for circulation of air therethrough suitable ventilating openings may be provided, as the openings 67 in the upper wall 65 and openings 68 in the bottom wall 36. So that light rays from the source 25 will not shine through the openings 67, into the operator's face, a shield 69 spaced above these openings may be provided and supported by up-rights 70. If desired, the inner face of the end wall 66 may be provided with a section 71 of light reflecting material. While, for the purpose of clarity, the structures 20 and 23 are described separately, it is obvious that the enclosure for the structures 22, 24 and 25 may be considered as one, divided by the wall 35.

The insert 24 is, preferably, a section 75 of glass or substantially transparent hardened plastic material. It may be thin and extend longitudinally of the housing 23 in face to face engagement with the substantially vertical face mentioned, and urged in tight engagement therewith, as by the clips 76 secured to the wall 36 within the auxiliary housing.

It will be noted in Figures 2, 3 and 4 that this section 75 is made up of two longitudinally-extending portions 77 and 78, of different colors. For example, the portion 77 may be of green colored material and the portion 78 of yellow colored material, and the plane of the line of division

between the two portions 77 and 78 extends longitudinally through the section 63. As a result, since this line of division registers with the section 63 and the portion 77 registers with the edge of the section 61 while the portion 78 registers with the edge of the section 62, when the rays from the light source 25 travel through the colored portion 77 and thence through the section 61, they will illuminate the upper portion 55 of the body 40 but the rays travelling through the colored portion 77 and thence through the section 61 are blocked by the opaque section 62 and opaque material of the disc-like portion 56 of the bodies 40.

However, when a body 40 is depressed, as is the right hand one in Figure 4, the light rays travelling through the section 61 may travel through the upper portion 55 of the body 40, since the disc-like portion 56 is now below the horizontal planes of the section 62. As a result, the operator, when all bodies 40 are not manipulated, will see green rays shining through all the bodies 40 but, as soon as a body is depressed, the rays will be yellowish green and he will be able to see, at a glance, the differences in color and note a depressed body 40 which should not be in that position. The light source 25 may be a so-called fluorescent tube extending longitudinally of the auxiliary housing 23, paralleling the insert 24 and supported, at either end, by conventional brackets 19. Obviously, the insert 24 may be dispensed with and the sections 61 and 62 comprise glass or plastic each of a different color or shade, or one may be clear colorless glass or plastic and the other colored. It is also obvious that one or both sections may be of several colors arranged in bands longitudinally of the sections.

Referring to form B of Figures 6 to 10 inclusive, where parts similar to those of form A are shown like reference characters are employed. In fact the difference between form A and B is in the construction of the manipulatable members which are designated as 80 and may be keys adapted for reciprocation. Each preferably comprises a cylindrical body 81 defining an upper or finger engaging face 82, a lower face 83 and a peripheral surface 84, with a stem 44 extending from the axial center of the face 83. Each body 81 is composed of an uppermost, light-transmitting portion 85 and a lowermost opaque portion 86. The portion 85 may be of translucent glass, hardened plastic (as Lucite) and the like. The lowermost portion 86 is secured to the portion 84 in any approved way, as by cement.

It should be noted in Figure 8 that the intermediate part of the uppermost portion 85 is reduced peripherally and accommodates an inlay 87 of opaque material. This inlay may be, for example, a band of metal or opaque hardened plastic material. It will be appreciated, from Figure 8 that, when the bodies 81 are in a non-depressed position (as is the left-hand body 81), light rays travelling through the section 61 will also travel through the uppermost portion 85 but rays travelling through the section 62 will be blocked by the disc-like portion 86. However, when a body 81 is depressed (as the right-hand one of Figure 8 which is also the upper right-hand one of Figure 9), light rays travelling through the section 61 will be blocked by the inlay 87 but the disc-like portion 86 will no longer block the rays, travelling through the section 62, and they may travel through the portion 85.

Form C illustrated in Figures 11 to 13, differs from form A in the arrangement of the body portion 90 to take the place of the body portion 22

of form A and dispenses with the inserts 24 of forms A and B. The body portion 90 comprises a less number of superposed sections than those of form A, but each is provided with a plurality of openings or perforations axially aligned with the perforations 31 and 38. The uppermost section 91 is like the uppermost section 60 of the body portion 22, and provided for the same purpose. Below the section 91 is but one light rays-transmitting section 92 which may have a section 93 of opaque but light-reflecting material upon its upper face. The section 92 extends into the opening 37. This section 92 may be clear, uncolored glass or hardened plastic or may be colored glass or hardened plastic either of one or several horizontal layers of color. Since the bodies 40 of form C may be like those of form A, it is obvious that their disc-like portions 56 will cooperate with the section 93 to block light rays travelling through the section 92 from reaching the upper light-transmitting portion 55 of the body 40, when the latter is in the position of the left-hand body 40 of Figure 12 but when the body 40 is depressed, like the right-hand body 40 of Figure 12, which is the upper right-hand body 40 of Figure 13, these rays are not blocked. By the use of form C, there will be light rays travelling through the body 40 only when the latter is depressed.

Form D shown in Figure 18 is quite similar to form A but the section 63 of opaque material of form A is omitted and the two light rays-transmitting sections 61 and 62 of Lucite are shown in face-to-face contact in Figure 18, in their association with the rest of the means to transmit light rays of two colors. In addition, the opaque portions 56 of the keys 21 are omitted, and the lower faces 42 of the keys, when the keys are not depressed, are in substantially the same plane as the contacting faces of the sections 61 and 62. This modification is found desirable in some cases, particularly where Lucite is employed for the sections 61 and 62 and the key bodies. While it would not appear, at first, desirable to provide the construction disclosed in Figure 18, the worth of this construction has been proven by me and it will be found that the depressed keys are easily and readily distinguished from the non-depressed keys and vice versa. Reference characters, similar to those employed in Figure 3 are used for corresponding parts in Figure 18.

Figures 14 and 15 illustrate the application of the invention to a machine having a curved outer surface, such as some conventional cash registers. For illustration, the dual auxiliary housings 23, inserts 24 and light sources 25 of Figures 16 and 17 are disposed at the sides of the main housing which is designated as 100, instead of at the ends thereof and, of course, the two side walls 101 and 102 of the main housing 100 are provided with the openings 103, corresponding with the opening 37.

Figures 16 and 17 illustrate the employment of dual auxiliary housings 23 disposed at both ends of the main housing 20, dual inserts 24 and dual light sources 25. This construction is particularly adapted to the use of the invention with a wide machine, although it may be, in some cases, desirable to employ dual light sources 25 in narrow machines for increase or evening of the intensity of the light from the keys.

From the foregoing it is seen that the operator of the means disclosed herein, when one of the manipulatable members 21 or 80 is depressed, will be quickly aware that such member has been depressed because the member will change color,

and when the member has again assumed its non-depressed position, it will have again changed color and, as it changes color, will be readily noted.

Various changes may be made to the forms of the invention herein shown and described without departing from the spirit of the invention or scope of the claims.

What is claimed is:

1. In means for illuminating keys, a housing, a plurality of reciprocable keys extending therefrom, each key including a light rays-transmitting portion, means to slidably accommodate at least a part of each key, comprising a body of light rays-transmitting material within said housing and provided with a plurality of openings, one for each key, and means for projecting light rays through said body and through at least a part of any one of said keys when at least a part of said light rays-transmitting portion thereof is within its opening in said body.

2. In means for illuminating keys, a housing, a plurality of reciprocable keys extending therefrom, each key including a light rays-transmitting portion and an opaque portion, means to slidably accommodate at least a part of each key, comprising a body of light rays-transmitting material and a body of opaque material above said first-named body within said housing and provided with a plurality of openings, one for each key, and means for projecting light rays through said first-named body and through at least a part of any one of said keys when at least a part of said light rays-transmitting portion thereof is within its opening in said body, said opaque portion being constructed and arranged to normally register with said body of opaque material when said keys are in one position.

3. In means for illuminating keys, a housing, a plurality of reciprocable keys extending therefrom, each key including a light rays-transmitting portion and an opaque portion below said first-named portion, means to slidably accommodate at least a part of each key, comprising a body of light rays-transmitting material and a body of opaque material above said first-named body within said housing and provided with a plurality of openings, one for each key, and means for projecting light rays through said first-named body and through at least a part of any one of said keys when at least a part of said light rays-transmitting portion thereof is within its opening in said body, said opaque portion being constructed and arranged to normally register with said body of opaque material when said keys are in one position.

4. In means for signalling the positions of reciprocable keys, a housing, including an upper opaque wall provided with a plurality of spaced-apart openings, a plurality of keys, one projecting outwardly of each opening and slidable therein, each key having a light rays-transmitting portion and an opaque portion below said first-named portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of opaque material and an innermost section of light rays-transmitting material, the thickness of said intermediate section being substantially the same as the thickness of said opaque portion, a light source, and means cooperating with said light source for projecting light

rays of one color through said upper section and for projecting light rays of another color through said lower section, including a light rays-transmitting insert interposed between said light source and said sections, said insert having an upper portion of one color and a lower portion of another color with said upper section and portion in register and said lower section and portion in register, the line of division between said sections registering with said intermediate section.

5. In means for signalling the positions of reciprocable keys, a housing, including an upper opaque wall provided with a plurality of spaced-apart openings, a plurality of keys, one projecting outwardly of each opening and slidable therein, each key having a light rays-transmitting portion and an opaque portion below said first-named portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of opaque material, having a light rays-reflecting surface, and an innermost section of light rays-transmitting material, the thickness of said intermediate section being substantially the same as the thickness of said opaque portion, a light source and means cooperating with said light source for projecting light rays of one color through said upper section and for projecting light rays of another color through said lower section, including a light rays-transmitting insert interposed between said light source and said sections, said insert having an upper portion of one color and a lower portion of another color with said upper section and portion in register and said lower section and portion in register, the line of division between said sections registering with said intermediate section.

6. In means for signalling the positions of reciprocable keys, a housing, including an upper opaque wall provided with a plurality of spaced-apart openings, a plurality of keys, one projecting outwardly of each opening and slidable therein, each key having a light rays-transmitting portion and opaque portion below said first-named portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of opaque material and an innermost section of light rays-transmitting material, the thickness of said intermediate section being substantially the same as the thickness of said opaque portion, a light source, and means cooperating with said light source for projecting light rays of one color through one of said sections, including a light rays-transmitting insert interposed between said light source and said one of said sections.

7. In means for signalling the positions of reciprocable keys, a housing, a plurality of reciprocable keys extending outwardly and inwardly of said housing and each key having a periphery, a light rays-transmitting portion, means within said housing to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of opaque material constructed and arranged to closely surround the peripheries of said keys, a light rays-transmitting section inwardly of said outermost section and a section of substantially opaque ma-

terial also inwardly of said outermost section, and means within said housing to project light rays through said light rays-transmitting section and thence through said light rays-transmitting portion of any of said keys when at least a part of said light rays-transmitting portion is within its opening in said body.

8. In means for signalling the positions of reciprocable keys, a housing, a plurality of reciprocable keys extending outwardly and inwardly of said housing, each key having a periphery, a light rays-transmitting portion and an opaque portion extending to said periphery and disposed inwardly of said first-named portion, means within said housing to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of material constructed and arranged to closely surround the peripheries of said keys, a light rays-transmitting section inwardly of said outermost section and a section of substantially opaque material also inwardly of said outermost section, and means within said housing to project light rays through said light rays-transmitting section and thence through said light rays-transmitting portion of any of said keys when said opaque portions thereof are out of register with said opaque section.

9. In means for signalling the positions of reciprocable keys, a housing having an opaque wall provided with a plurality of openings, a plurality of reciprocable keys extending outwardly and inwardly of said housing through said openings, each key having an outer end, an inner end, a periphery, a light rays-transmitting portion at said outer end, an opaque portion at said inner end and extending to said periphery, and a second opaque portion of less length than said light rays-transmitting portion, spaced from said first opaque portion and said outer end and extending about said periphery at said light rays-transmitting portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of substantially opaque material and an innermost section of light rays-transmitting material, a light source, and means cooperating with said light source for projecting light rays of one color through said outermost section and for projecting light rays of another color through said innermost section, including a light rays-transmitting member interposed between said light source and said sections, said member having one portion thereof of one color and a second portion thereof of another color with said one portion and said outermost section in register and said second portion and innermost section in register, the line of division between said sections being constructed and arranged to register with said intermediate section, the length of said second opaque portion being substantially the same as the thickness of said outermost section and the shortest distance between the innermost edge of said second opaque portion and the adjacent first opaque portion being substantially the same as the thickness of said innermost section.

10. In means for signalling the positions of reciprocable keys, a housing having an opaque wall provided with a plurality of openings, a plurality of reciprocable keys extending outwardly and inwardly of said housing through said openings,

each key having an outer end, an inner end, a periphery, a light rays-transmitting portion at said outer end, an opaque portion at said inner end and extending to said periphery, and a second opaque portion of less length than said light rays-transmitting portion, spaced from said first opaque portion and said outer end and extending about said periphery at said light rays-transmitting portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of substantially opaque material and an innermost section of light rays-transmitting material, a light source, and means cooperating with said light source for projecting light rays of one color through said outermost section and for projecting light rays of another color through said innermost section, including a light rays-transmitting member interposed between said light source and said sections, said member having one portion thereof of one color and a second portion thereof of another color with said one portion and said outermost section in register and said second portion and innermost section in register, the line of division between said sections being constructed and arranged to register with said intermediate section, the length of said second opaque portion being substantially the same as the thickness of said outermost section and the shortest distance between the innermost edge of said second opaque portion and the adjacent first opaque portion being substantially the same as the thickness either of said innermost and outermost sections, said second opaque portion being normally disposed within its opening in said wall and outwardly of said outermost section.

11. In means for illuminating keys, a plurality of keys, each key including a light rays-transmitting portion, means to slidably accommodate at least a part of each key, comprising a body of light rays-transmitting material provided with a plurality of openings, one for receiving each key, and means for projecting light rays through said body and through at least a part of any of said keys when at least a part of said light transmitting portion thereof is within its opening in said body.

12. In means for signalling the positions of reciprocable keys, a housing, including an upper opaque wall provided with a plurality of spaced-apart openings, a plurality of keys, one projecting outwardly of each opening and slidable therein, each key having a light rays-transmitting portion and an opaque portion below said first-named portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, an intermediate section of opaque material and an innermost section of light rays-transmitting material, the thickness of said intermediate section being substantially the same as the thickness of said opaque portion, a light source, and means cooperating with said light source for projecting light rays of one color through said upper section and for projecting light rays of another color through said lower section.

13. In means for signalling the positions of reciprocable keys, a housing, including an upper opaque wall provided with a plurality of spaced-apart openings, a plurality of keys, one projecting

outwardly of each opening and slidable therein, each key having a light rays-transmitting portion and an opaque portion below said first-named portion, means to slidably receive at least a part of each key, comprising a body having a plurality of openings, one for each key, said body being provided with an outermost section of light rays-transmitting material, in intermediate section of opaque material, having a light rays-reflecting surface, and an innermost section of light rays-transmitting material, the thickness of said intermediate section being substantially the same as the thickness of said opaque portion, a light source and means cooperating with said light source for projecting light rays of one color through said upper section and for projecting light rays of another color through said lower section.

14. As an article of manufacture, a reciprocable key having a body, provided with an upper face, a lower face and an outer surface joining said faces, a portion of said body, from and including one of said faces to short of the other face, being of light rays-transmitting material and surface covered, for a portion of its length, and intermediate its ends, with substantially opaque material, and another portion from said other face to said first portion being of substantially opaque material.

15. In means for illuminating keys, a light-transmitting body provided with means to transmit light rays of one color, including a section of light rays-transmitting material, and means to transmit light rays of another color, including a section of light rays-transmitting material, said body being provided with a plurality of spaced-apart openings extending into said sections; a plurality of keys slidably disposed within said openings and constructed and arranged to be manipulated from outwardly of said body, each key having a light rays-transmitting portion such that, when in one position, said portion will transmit light rays from one of said sections and, when in another position, said portion will transmit light rays from at least the other of said sec-

tions; and means to project light rays to said sections.

16. In means for illuminating keys, a plurality of keys, each key including a light rays-transmitting portion, means to slidably accommodate at least a part of each key, comprising a body of light rays-transmitting material provided with a plurality of key-receiving openings, and means for projecting light rays through said body and through at least a part of any of said keys when at least a part of said light ray-transmitting portion thereof is within one of said openings.

17. In means for illuminating keys, a light-transmitting body provided with means to transmit light rays of one color, including a section of light rays-transmitting material, and means to transmit light rays of another color, including a section of light rays-transmitting material with said sections one above the other, said body being provided with a plurality of spaced-apart openings extending into said sections; a plurality of keys slidably disposed within said openings and constructed and arranged to be manipulated from outwardly of said body, each key having an outer face and an inner face and a light rays-transmitting portion such that when in one position, with the plane of said inner face being in substantially the same plane as the contacting faces of said sections, said portion will transmit light rays from one of said sections and, when in another position, said portion will transmit light rays from at least the other of said sections; and means to project light rays to said sections.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,931,012	Sampson et al.	Oct. 17, 1933
2,265,124	Andres	Dec. 9, 1941
2,285,374	Dohsmann et al.	June 2, 1942
2,331,590	Andres	Oct. 12, 1943