

March 9, 1965

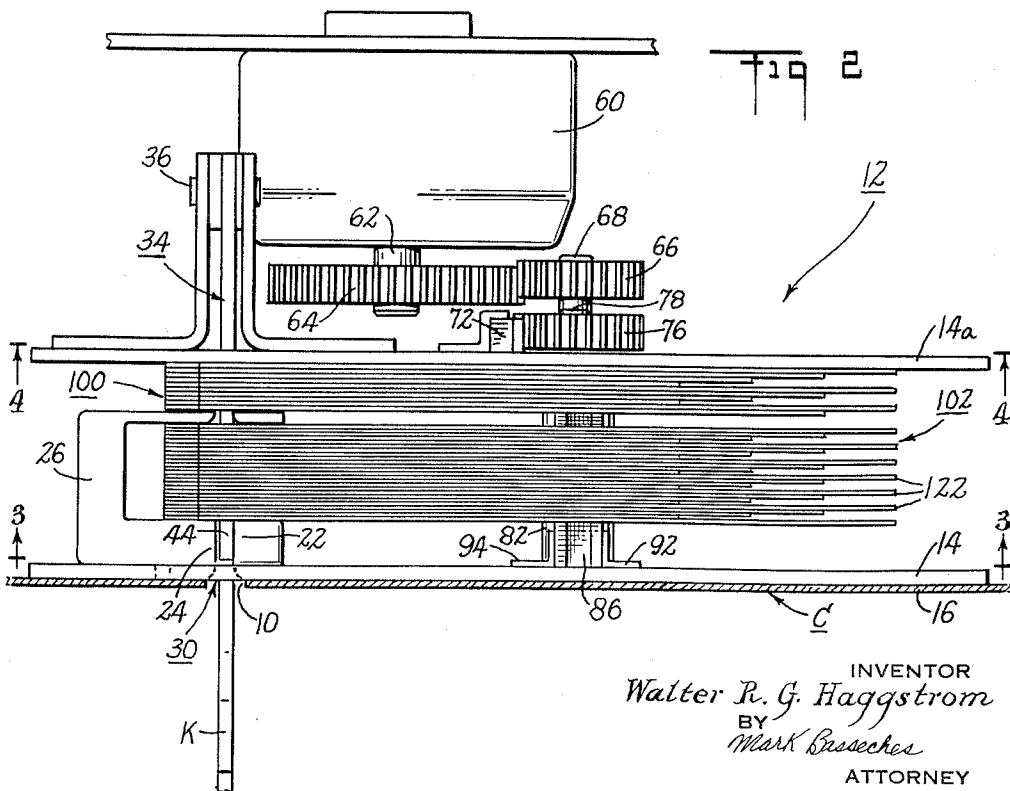
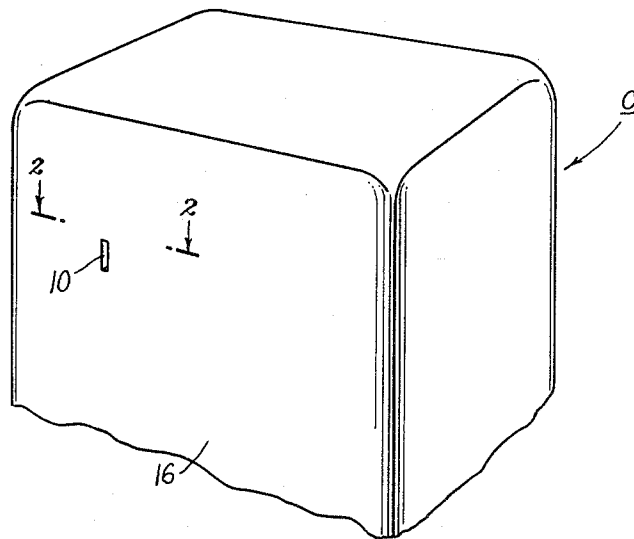
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3,172,969

KEY IDENTIFIER DEVICE AND SWITCH MEANS THEREFOR

Filed Aug. 9, 1962

4 Sheets-Sheet 1



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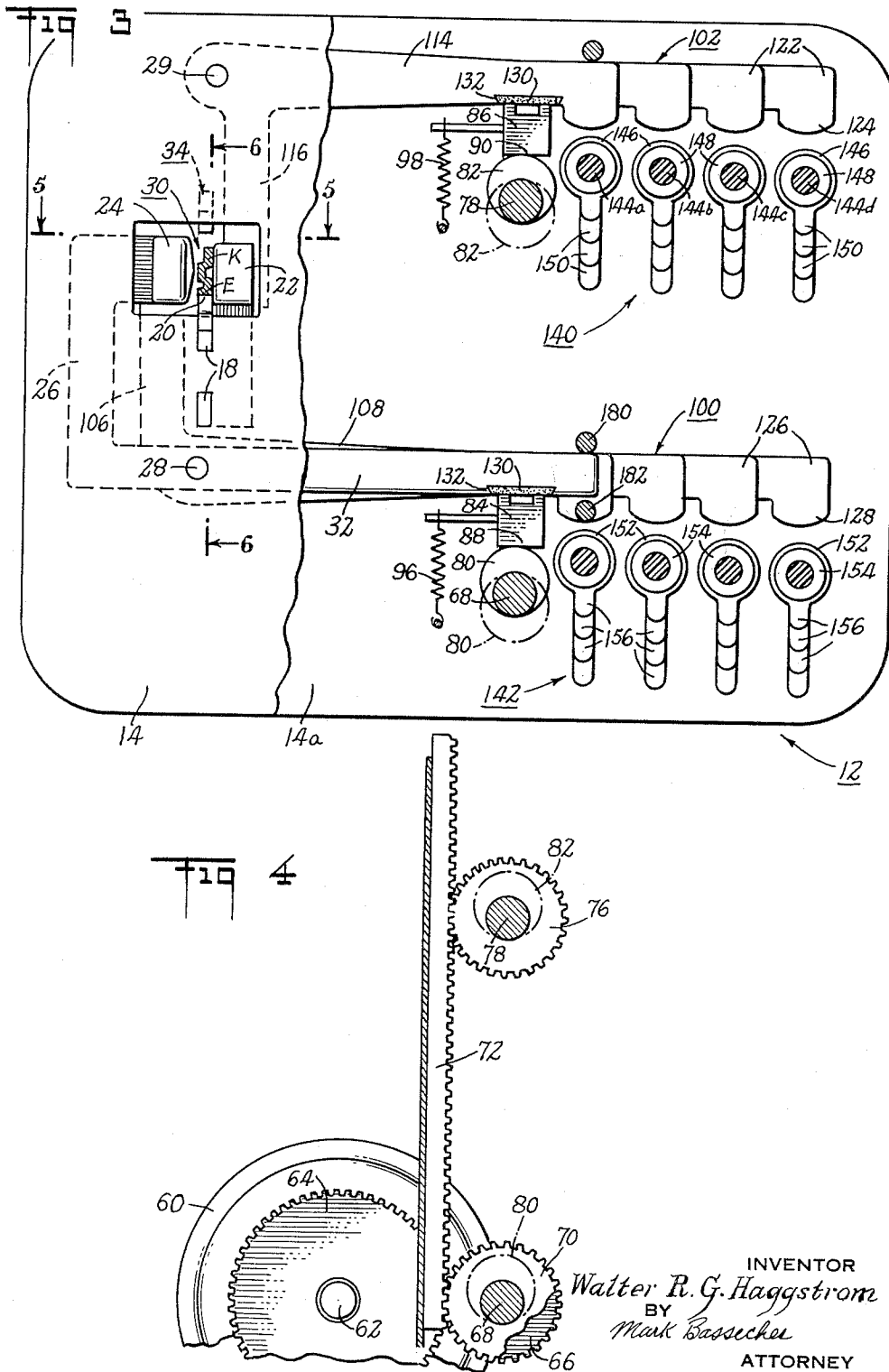
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KEY IDENTIFIER DEVICE AND SWITCH MEANS THEREFOR

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4 Sheets-Sheet 2



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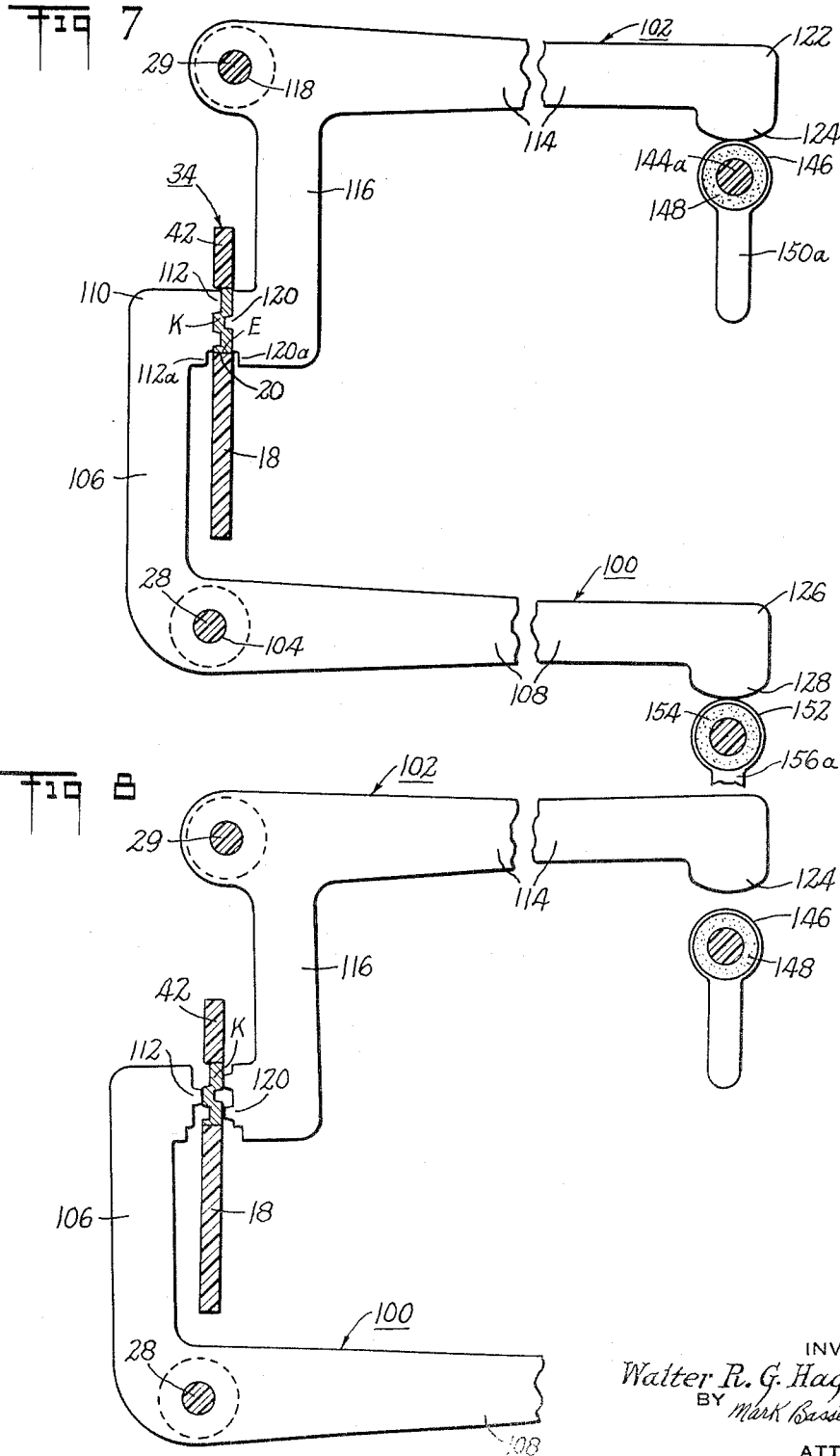
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KEY IDENTIFIER DEVICE AND SWITCH MEANS THEREFOR

Filed Aug. 9, 1962

4 Sheets-Sheet 4



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3,172,969

KEY IDENTIFIER DEVICE AND SWITCH MEANS THEREFOR

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11 Claims. (Cl. 200—61.59)

This invention relates to a key device; more particularly, to an identification device for automatically discriminating between a selected group of keys and for completing a selected one of a plurality of circuits responsive to the characteristics of a key inserted into the device.

Still more particularly, this invention relates to a device including a plurality of profiled template portions shiftable toward and away from the milled side faces of a key blade, such profiled portions each being associated with a separate circuit, the profiled portions being variously configured and including means for closing the circuit associated with the profiled portions which conform to the key inserted.

The operation of preparing a duplicate key, when carried out at the retail level, constitutes generally two distinct steps. The customer submits the key for which a duplicate is desired and as a first step the locksmith or clerk must select from a myriad of key blanks, the blank having a cross-section identically matching the cross-section of the submitted key. Heretofore the operation of selecting the matching key blank has been time-consuming and subject to human error. The normal mode of selecting such corresponding blank involves comparing the submitted key with the blanks in stock by utilizing such indicia as head shape and code number marked on the key blank, and finally and most accurately, comparison of the cross-section of the key.

The selecting operation aforesaid, unless carried out by an experienced, skillful locksmith, often results in the selection of an improper blank which, when cut or bitted in accordance with the second step hereinafter set forth, will not enter or operate the plug of the lock for which it is intended.

The problem of proper key blank selection has become increasingly serious in view of the current trend for establishments such as garages, shoe shine parlors, chain stores or the like, which organizations are not normally staffed by experienced locksmiths, to enter the key duplicating field.

After the key blank has been selected, the second step in the manufacture of the duplicate key consists in cutting the key blank, through the use of any of a number of key cutting devices, to form thereon a tumbler operated bitted edge which matches the biting of the pattern or original key.

The present invention is directed to the first step aforesaid, namely, selecting the proper blank to match the key to be duplicated.

In view of the large number of key blanks presently in use, it will be readily recognized that an automatic selector desirably should be capable of discriminating between a large number of different key blanks. The selection problem is made more difficult by reason of the relatively small area available for sensing on the milled side faces of keys, such area being a maximum, in the longest keys commonly in use, of about 1 to 1¼".

It is therefore an object of the invention to provide a key selector device arranged to select the proper key blank to match a key inserted into the device. A further object of the invention is to provide a sensing device for automatically selecting a key blank responsive to the

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sensed configuration or side profile of a key to be duplicated.

Still a further object of this invention is to provide a selector device of the type described wherein a single device is capable of discriminating between a large number of differently cross-sectioned keys.

Still a further object of the invention is to provide a discriminator device for selecting the proper blank to match a key, said device including a large number of side-by-side disposed profile sensing templates wherein each template is independently movable toward and away from a key to be sensed, and wherein means are provided for urging each template member independently against said key to be sensed.

Still a further object of this invention is to provide a device of the class described wherein pairs of templates disposed to opposite sides of a key support are adapted to be shifted against the sides of a key inserted in said support, and wherein said templates include magnetically responsive iron-containing portions, said device developing a magnetic force adjacent said magnetically responsive portions capable of moving said templates independently toward said key.

Still a further object of the invention is the provision of novel switching means operated by said template portions, whereby a circuit may be completed to indicate, by means of a light or other indicator, the proper blank to be used in forming a duplicate key or, alternatively, the proper blank may be automatically dispensed, as from a vending machine or the like.

Further objects of this invention include the provision of a novel circuit means including, as a conductive component, the blade of the key itself, and novel contact adjusting means for assuring completion of the circuit upon movement of a predetermined magnitude of the templates or sensors.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which—

FIGURE 1 is a perspective view of a cabinet in which the selector device may be maintained.

FIGURE 2 is a magnified section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a section taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary section taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a section taken on the line 5—5 of FIGURE 3;

FIGURE 6 is a section taken on the line 6—6 of FIGURE 3;

FIGURE 7 is a section taken on the line 7—7 of FIGURE 5, in magnified form;

FIGURE 8 is a section similar to FIGURE 7, showing the position occupied by the parts in the use of a different key section;

FIGURE 9 is a magnified view of an embodiment of the invention.

In accordance with the invention, a cabinet C may be provided wherein the selector device may be located, access to the interior of said cabinet being had through key entry slot 10. The cabinet C includes a support member (not shown) wherein the selector device 12 may be fixedly maintained with the front wall portion 14 of said device adjacent the front wall 16 of the cabinet member.

The device 12 includes a framework (not shown) of which the front wall 14 forms a part, on which framework there is fixedly mounted the key support seat 18, preferably of plastic or other non-conductive material, the upper, horizontally disposed surface 20 of which seat

forms a support for the lower, unbitted edge E of a key or key blank.

Spaced side guide portions 22, 22a, fixed to the frame, form side locating means for the lateral positioning of an inserted key, see FIGURES 3 and 5.

The key to be duplicated is, in the operative position of the device, maintained against the portions 22, 22a, by complementary clamp elements 24, 24a, formed on clamp arm 26, which is pivotally mounted on horizontally disposed trunnion member 28 carried by the device.

The leading or outwardly directed surfaces of the portions 22, 22a and 24, 24a, are preferably beveled to facilitate insertion of a key or key blank K into the keyway, hereinafter referred to generally as 30, which is defined by the locating portions aforesaid. It will be understood that the clamp arm 26 is pivotal about trunnion 28, and thus, when the laterally disposed leg 32 is downwardly shifted, portions 24, 24a will be urged toward the portions 22, 22a, securely to hold the key within the keyway 30.

Optionally but preferably, the uppermost edge E' of the key is contacted by a combined switching and hold down lever 34 which serves initially to locate the key, and likewise serves to actuate the clamping and sensing mechanism hereinafter to be described.

The hold down lever 34, which may be generally in the form of an inverted L, as best seen in FIGURE 6, is mounted about a horizontal pivot 36 which passes through a bearing aperture 38 located at the junction of the arms 40, 42, forming the L-shaped member 34. The outermost edge 44 of the lever 34 is formed with an inclined cam portion 46. The lever 34 is normally urged to the dot and dash position shown in FIGURE 6 by spring 48 which tends to shift the arm 42 downwardly to said dot and dash position. It will be recognized that when a key K is inserted into the keyway slot 30, it will engage the cam surface 46, tending to rotate the lever 34 clockwise as viewed in FIGURE 6, whereupon the arm 42 will be raised to a position above the blade of the key and will tend to urge the lower face or edge of the key against the upper edge 20 of the key support seat 18.

The arm 40 of the lever 34 may be provided with a terminal 50 which moves with said arm 40, and when elevated by insertion of the key K, is shifted forwardly into contact with fixed terminal 52, to activate the operating mechanism next to be described.

It will be understood that other forms of switching and/or hold down elements for maintaining the key against the key support seat 18 and for energizing the clamp and sensing mechanism may be equally well employed.

When the switch defined by terminals 50, 52 is closed, i.e. when the key has been inserted into the slot, a rotary solenoid 60 is energized. This solenoid is of known type and rather than providing the usual linear movement of the armature, operates to apply a rotary motion to shaft 62 on which is mounted gear member 64. Gear 64 is meshed in turn with gear 66, keyed to stub shaft 68, rotatably carried between front wall 14 and rear wall 14a of the framework of the device. A further gear 70 is fixed to stub shaft 68 in spaced relation to gear 66, the gear 70 being meshed with a vertically disposed rack member 72 which is slidably guided for vertical movement against the rear wall 14a by one or more guide bracket members 74 made fast to the rear face 14a of the device. An upper gear member 76, keyed to shaft 78, rotatably supported between walls 14, 14a, is likewise meshed with the toothed rack member 72.

Shafts 68 and 78 are provided, respectively, with longitudinally extending eccentric cam members 80 and 82, which are keyed for rotation with the shafts aforesaid, extending substantially between the walls 14 and 14a. There are additionally provided lower and upper permanent magnet members 84 and 86, respectively, said

magnet members similarly being horizontally disposed and extending substantially between the walls 14 and 14a, the under faces 88 and 90 of said permanent magnets resting atop the eccentric cam members 80 and 82, and the pole portions of said magnets being upwardly directed.

The magnets 84, 86 are guided for vertical movement between slide brackets 92, 94 fixed to the wall 14, the ends of said magnets adjacent the wall 14a being likewise guided by brackets (not shown).

The magnets are biased downwardly by coiled springs 96, 98, the under faces 90, 88 of the magnets being pressed against the eccentric cams 82 and 80, respectively. The magnets are normally maintained in the "up" position, FIGURE 3, by the action of the eccentric cams which are normally in the position shown in said figure. However, upon energizing of the solenoid 60, shaft 62 is rotated in a clockwise direction, as seen in FIGURE 4, inducing a counter-clockwise rotation of shaft 68, thereby urging the rack slide 72 vertically downward through the engagement of gear 70, which is fixed to said shaft 68, and the rack slide 72.

The downwardly moving rack slide 72 causes a concomitant counter-clockwise rotation of the upper shaft 78 through the engagement of the rack slide 72 and gear 76. The movement of the shafts 68 and 78, the extent of which is governed by the extent of movement of the armature of the solenoid 60, shifts the eccentric cam in a manner to permit springs 96, 98 to shift the magnets 86, 84 downwardly from the position shown in FIGURE 3 in solid lines, to the dot and dash position therein shown. As will hereafter become apparent, the downward movement of the magnets aforesaid will cause the sensors comprising the sensing mechanism, next to be described, and the clamp arm 26 to be shifted into operative position.

The device is provided with a pair of horizontally disposed spaced trunnions 28 and 29 disposed, respectively, below and above the keyway 30. Upon the trunnion 28 there is mounted a laminated construction consisting of a plurality of sensor levers 100, which are preferably of very thin sheet stock. A similar laminated construction comprising a plurality of sensor levers 102 is pivotally mounted on the upper trunnion 29.

As best seen in FIGURE 3, the levers 100 are generally L-shaped and are provided with bearing apertures 104 at the junction of arms 106, 108, rotatably receiving the trunnion 28. Each arm 106, at its uppermost end 110, see FIGURE 7, is provided with a vertically directed edge 112 which is formed to define a profile or template calculated intimately to interfit with the milled side profile of one of the keys which may be processed by the device. It will be understood that the edge 112 of each of the levers 100 is provided with a different profile portion, to accommodate itself to a different key.

The upper levers 102 are of similar construction and include horizontally disposed arms 114, 116, said levers 102 being pivoted on bearing apertures 118 rotatably mounted on trunnion 29. The arms 116 and levers 102 are likewise provided with profiled, inwardly directed faces 120 which, like the faces 112 of levers 100, are formed to provide templates interfitting the opposite side of the blade of a key positioned in the keyway 30.

It will be understood that in accordance with the preferred form of the invention, the profile edges 112 and 120, calculated to fit any particular key, are disposed opposite each other—that is to say, the lever 102 carrying a template matching the right side of a particular key, as viewed in FIGURE 7, is disposed vertically above the lever 100 carrying a template matching the left side of the same key.

The trailing ends 122 of upper levers 102 are formed with downwardly directed contact portions 124, it being understood that in the preferred illustrated embodiment, all of the levers are formed of an electrically conductive material. Similarly, the trailing ends 126 of arms 108

and lower levers 100 are provided with downwardly directed contact portions 128. Each of the levers 100 and 102, intermediate the arms 108 and 114, respectively, is provided with an insert 130 of magnetically responsive material, such material being optionally but preferably formed of an epoxy cement or the like containing a quantity of pulverized ferrous materials suspended therein. The cementitious mass may be secured within dovetail shaped cutouts 132 formed on the under surfaces of said levers, the magnetically responsive portions of the upper levers 102 being disposed directly above the upper permanent magnet 86 and the corresponding portions of the lower lever 100 being disposed adjacent the lower magnet 84.

It will be understood that the insert and filling composition may be eliminated if the levers are fabricated of a ferrous or other magnetically responsive material. However, in view of the susceptibility of such material to corrosion or rusting, and in further view of the desire that the gauge or thickness of the levers be held to a minimum, the use of phosphor bronze levers having the magnetically responsive inserts aforesaid has been found desirable.

To the framework between walls 14, 14a there are mounted upper and lower sets of contacts 140, 142, respectively. In view of the close grouping of the levers, it has been found preferable to make arms 108 and 114 of said levers of varying lengths, whereby the contact portions are staggered, making more room available to make contact with the lower portions 124, 128 of the levers. Thus, for instance, as best shown in FIGURE 3, four horizontally spaced insulator rods 144a, 144b, 144c, 144d, have their ends fixed between walls 14 and 14a. On these rods there are mounted conductor rings 146, which rings are separated by annular insulating spacers 148. The rings 146 have depending terminal tabs 150 which, for ease of soldering, etc., optionally are of varying lengths to extend in staggered condition between the rods 144a, 144b, 144c, 144d.

It will thus be seen that each of the conductor rings is insulated from each other conductor ring. Also, by reason of the staggered relationship of the under portions 124 of the levers, contact between portion 124 of the upper levers and its associated terminal ring occurs at a point spaced from the contact between each other ring and lever. The arrangement aforesaid greatly facilitates wiring of the device, eliminates shorts between contact rings and increases the accuracy with which the device may operate.

A similar construction is provided in connection with the lower levers wherein the terminal rings are numbered 152, the spacers 154 and the terminal tabs 156.

The profiled faces 112 and 120 of levers 100 and 102, respectively, are provided adjacent their lowermost portions with notches, respectively, 112a and 120a, FIGURE 7. As best seen in said figure, these notches operate upon shifting of the levers to their inwardmost limiting positions, to prevent any contact between an opposed pair of levers.

The operation of the device is as follows:

A key K for which a duplicate blank is sought is inserted by the operator into the keyway and thrust horizontally into the device until one or the other of the shoulders S of the key bears against shoulder 19, FIGURE 6, of the key support seat 18, or shoulder 45 of the hold down lever 34 or both. The insertion of the key will raise the forward edge 44 of the said hold down lever in a manner previously disclosed, to close contacts 50, 52, thereby energizing the solenoid 60. In the manner previously noted, the rotary movement of the shaft 62 and gear 64 of solenoid 60 will drive gears 66 and 70, drawing down sliding rack member 72 which, in turn, rotates gear 76. The cams 80 and 82 will thus be rotated to permit springs 96, 98 to draw the magnets 84, 86 downwardly, as previously described. As the magnets 84, 86

are drawn downwardly, the attraction between said magnets and the ferrous inserts 130 of the sensor levers urges the arms 114 and 108 of said levers downwardly, causing a clockwise rotation of the lower levers 100 and the upper levers 102 about trunnions 28, 29, respectively. At the same time, the magnetic attraction between the lower magnet 84 and the leg 32 of the clamp arm 26 causes a clockwise rotation of this arm, urging the spaced holding portions 24, 24a of said arm against said key at spaced points, forcing the key against side guide portions 22 and 22a, i.e. to the right as shown in FIGURE 5.

Similarly, the clockwise movement imparted to levers 100 and 102 causes the profile portions 112 and 120, respectively, to be shifted toward each other and against the milled side faces of the key.

In FIGURE 7 there is pictured a pair of sensors corresponding to the key section of the key inserted in the device, FIGURE 8 showing the position of a different pair of sensor levers not matching the section of the key.

FIGURE 8 demonstrates that the non-matching profile portions 112, 120 abut the milled faces of the key K, the said abutting relation being such as to prevent a full clockwise movement of the levers, thereby maintaining the contact portions 124, 128, respectively, spaced from the terminal rings 146, 152.

In contrast, the matching faces 112, 120 shown in FIGURE 7 permit a close interfit with the keyway section, allowing clockwise movement of the levers 100, 102, respectively, of a predetermined amount sufficient to provide contact between the portion 124 and terminal ring 146, and the portion 128 and terminal ring 152.

Where such contact is permitted, it will be recognized that a circuit is completed between terminal tab 156a and terminal tab 150a, such circuit including in the illustrated embodiment the levers and the key.

It will be appreciated that the profiles or templates may be so formed that for any given selected key, only one pair of levers may be permitted to shift far enough to provide a completed circuit between a terminal of the upper group 140 and a terminal of the lower group 142.

The circuit thus completed may be used to perform in any of a number of known functions, as will be readily understood. For instance, a key display board having a plurality of lights may be provided, the circuit completed being utilized to energize a selected one of the lights on the board lying adjacent a stack of key blanks matching the key inserted in the device. Similarly, the device may be used for releasing selectively, as in a vending machine, a blank corresponding to the inserted key as sensed by the device.

It will be noted that the device may be used to process short lengthed keys since the shoulder portions 112a and 120a engaging against the side faces of the key seat 18 will prevent any conductive engagement between opposite sensor levers where a key is interposed between the levers. Thus, for example, if the inserted key does not extend rearwardly in the device to a point interposed between the sensor levers adjacent the wall 14a, such innermost levers will be permitted to shift inwardly a distance sufficient to provide a connection between contacts of such levers and their corresponding terminal rings. However, since the template portions of these inner levers are prevented from touching each other and no key is interposed between these template portions, the circuit therethrough will not be completed. Preferably, the trunnions 28, 29 are formed of insulating material, such as nylon, and spacers are disposed between adjacent sensor levers to isolate one from the other.

It will be readily recognized that in certain instances it may be desirable, instead of employing permanently fixed terminal rings 146 and 152, to utilize spring contact members to compensate for variations in the thick-

ness of the key K, or inaccuracies in the dimension of the sensors.

Also, in FIGURE 9 there is shown an embodiment of the invention wherein individual adjustability of the terminal rings is provided. As shown in said FIGURE 9, the generally circular rings 170 are provided with eccentrically located apertures 172, threaded over an insulating rod 174. The rings 170 are separated by insulating spacers 176, as described in the prior embodiment, and threaded means, such as nut 178, are provided clamping the spacers and terminal rings tightly together.

With this arrangement of contacts, it will be readily recognized that by a slight rotation of any of the terminal rings 170, the uppermost contacting portion thereof may be raised or lowered, thus providing a precisely adjustable contacting height for engagement with the contact portions of the sensor levers.

If desired, limit pins 180, 182 may be provided for controlling the throw or degree of counter-clockwise movement of the clamp arm 26.

In the event that the inserted key does not correspond to any of the selected group of blanks adapted to be sensed by the device, it will be readily understood that indicator means may be provided for registering this fact, and in the event that the device is used in conjunction with a vending machine, the coin or coins inserted by the user may be returned.

Preferably, the device when activated by the closing of contacts 50, 52 may be utilized to energize a time delay circuit, as is well known in the art. This circuit would be selected first to delay actuation of the solenoid 60 until time has elapsed to permit full insertion of the key K into the keyway 30. Likewise, after energizing of the solenoid, the time delay circuit would maintain the solenoid in such energized condition for a predetermined length of time sufficient to permit dispensing of a key blank, if the device is used in conjunction with a vending machine, or activation of an indicator light source, if the device is used in connection with a key identifying board, as previously noted.

Solenoid 60 is provided with a spring member (not shown) adapted, upon de-energizing of the solenoid, to impart a reverse rotation to the shaft 62, to return the shaft to its initial position. The return rotation of the shaft 62 will, in turn, drive gears 64, 66 and 70, thus driving sliding rack member 72 upwardly which, in turn, rotates gear 76, restoring cams 80 and 82 to a position wherein the latter have elevated magnets 84 and 86, thus restoring all the sensor levers and the clamp lever to the initial position, ready to sense another key blank.

It will be readily apparent from the above, that variations within the spirit of the invention may be made. Thus, for instance, instead of utilizing a gear and rack arrangement for propelling the magnets which, in turn, actuate the various levers, a fixed electro-magnet may be employed, having its pole portions disposed beneath the magnetically responsive inserts 130.

Also, it will be appreciated that other forms of levers than those illustrated may be employed, it being preferred, however, in view of the relatively small distances travelled by the template portions of the levers, to provide a lever arrangement wherein the movement of the contact portions is magnified as compared with the movement of the template portions. It is likewise within the contemplation of the invention to employ sliding templates rather than levers.

The disclosed key sensing or discriminating device provides an efficient and foolproof means for selecting and/or dispensing a key blank whose profile or milling matches the milling of a key to be duplicated. The device is particularly well suited for use in key cutting establishments not employing skilled locksmiths, since it eliminates the discretion which has heretofore had to be exercised in selecting the proper blank for use in the production of a duplicate key.

The novel principles and designs incorporated in the key sensing device permit the use of very thin gauge sensors, for instance in the neighborhood of .003 to .032 of an inch, thereby permitting a single unit or device to discriminate between a relatively large number of dissimilar keys.

If desired, a plurality of said devices may be provided in a single vending or identifying unit, to multiply the number of different profiles which may be serviced by the device.

Having thus described my invention and illustrated its use, what I claim is new and desire to secure by Letters Patent is:

1. A key identifier device comprising, in combination, a key guide portion for holding a key so that the blade thereof occupies a predetermined area, a plurality of side-by-side positioned template members having irregular depth sensing profiled portions independently shiftably supported in said device, a magnetically responsive portion connected with each said member, and means in said device adjacent said magnetically responsive portions for creating a magnetic field adjacent said magnetically responsive portions, thereby to shift said magnetically responsive portions, movement of said portions causing a concomitant movement of the depth sensing profiled portions into said predetermined area, and contact means coupled to said template members for actuating one of a plurality of circuits selectively in response to movement exceeding a predetermined amount of the depth sensing profiled portions of one of said template members into said area.

2. A key identifier device comprising, key positioner means for holding the blade of a key so that the blade occupies a predetermined area, a stack of laminar side-by-side disposed depth sensing template members shiftably mounted to be movable into said area, a magnetically responsive portion connected with each said template member, means independent of said key for creating a magnetic field intersecting said magnetically responsive portions, a contact portion coupled with each said template member to move when said template member moves, contact means normally spaced from said contact portions and positioned to be engaged by said contact portions upon movement of said template members of a selected magnitude, and a plurality of electrically powered mechanisms, each connected in series with a contact portion and a contact means.

3. A key identifier device comprising, key positioner means for holding a key to maintain the blade portion thereof in a predetermined area, a plurality of pairs of movably mounted profiled template members, a member of each pair being positioned to the opposite side of said predetermined area than the other member of said pair, the profiled portions of said template members being spaced from said area but shiftable into said area, a contact portion connected with each said template member, a plurality of electrical circuits corresponding in number to the number of pairs of template members, each said circuit including as a component the contacts of a pair of template members, a magnetically responsive portion coupled to each said template member for movement therewith, means for creating a magnetic field effective to urge said template members into said area whereby, when a key is disposed in said area, said template members will be engaged against the profiled side faces thereof, the permitted movement of said members into said area being determined by the interfit of said profiled portions of said template with the side faces of said key and means for activating a selected one of said circuits responsive to movement of a predetermined magnitude of a pair of said templates into said area.

4. A key profile sensing device comprising, a key in a predetermined area support member arranged to hold a key while exposing profiled side portions of the blade thereof, a first plurality of side-by-side disposed, electri-

cally conductive lamellae to one side of said support member, a second plurality of side-by-side disposed, electrically conductive lamellae to the other side of said support member, each of said lamellae being individually movably mounted to be shiftable between first and second limiting positions and having a profiled sensor portion and a contact portion, secondary fixed contact means in number corresponding to the number of said lamellae, each positioned to be engaged by one said contact portion upon movement of said portion of a predetermined magnitude, actuator means for independently urging each of said sensor portions toward said support means and into said predetermined area, and plural electrical circuit means, each including as conductive portions thereof a lamellae of said first plurality, and a lamellae of said second plurality.

5. A key selector device adapted to distinguish between keys of a selected group comprising, key seat means for holding a key in a predetermined area while exposing the profiled side blade portions thereof, a plurality of pairs of movable, irregularly profiled depth sensor elements, one member of each pair being disposed to the opposite side of said seat means from the other member of said pair, means for independently urging said sensor elements into said area and fixed contact portions electrically connected to each member of a pair of sensor elements upon movement of a predetermined magnitude of said elements into said area.

6. A selector device in accordance with claim 5 wherein said sensor elements are profiled in a manner to permit one pair only of sensors to move said predetermined distance when a key of said selected group is supported in said seat means.

7. A key identifier device for actuating one of a plurality of electrically powered devices selectively responsive to the insertion therein of a key chosen from a predetermined group comprising, key support means for holding a key to expose portions of the profiled side faces of the blade of said key to maintain said blade in a predetermined area, a plurality of matched pairs of template means having profiled face portions, one member of each said pair being mounted to the opposite side of said support from the other member of said pair, said template means being shiftable toward and away from said predetermined area, the profiled face portions of each said pair forming mating sections, respectively matching the opposite profiled side faces of the blade portion of a different key of said predetermined group, means triggered by insertion of a key into said support for urging said face portions into said predetermined area, a plurality of first contact means, each being connected with one of said template means to move when said template means moves, and a plurality of second contact means positioned to be engaged by said first contact means upon movement of the latter of a predetermined magnitude into said predetermined area.

8. A key selector comprising a key seat for maintaining

a key in a predetermined area adjacent said seat, a plurality of coded, movable, depth sensing members disposed adjacent said seat, means for urging said sensing members into said predetermined area, said sensing members being of coded profile whereby when one of a selected group of keys is supported in said seat all of said sensing members except a selected pair will be blocked by portions of said key from movements toward said key in excess of a predetermined magnitude, and a plurality of distinct electrical circuits alternatively and selectively actuated responsive to the pair of sensing members whose movements into said area exceed said predetermined magnitude.

9. A key identifier device comprising a key having a coded profile, seat means for holding said key in predetermined position, a plurality of conductive sensor members having different conductive profiled portions, means for urging said profile portions against side portions of said key held in said seat, said device including switch means positioned to be moved in accordance with a movement of each said sensor member, said switch means being closed by movement of its associated sensor exceeding a predetermined magnitude, and a plurality of electrically powered elements alternatively selectively actuated responsive to insertion of said key into said seat, the circuit to said elements flowing in series through two of said switches, the two conductive sensors associated with said switches and said key.

10. A key identifier device having means for distinguishing between keys having irregular milled cross sections, comprising first and second side-by-side stacks of paired conductive templates, each said pair of templates having a laterally directed peripheral configuration complementary to an opposite half of the cross section of a different selected key, means for urging said stacks toward each other and against the milled faces of a key disposed between said stacks, said faces limiting the extent of movement toward each other of all but a selected pair of said templates.

11. A device in accordance with claim 8 and including insulator means for limiting movement of the sensing members forming said pairs toward each other whereby the members of any pair cannot touch each other.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,172,969

March 9, 1965

Walter R. G. Haggstrom

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 8, lines 72 to 74, for "in a predetermined area support member arranged to hold a key" read -- support member arranged to hold a key in a predetermined area --.

Signed and sealed this 17th day of August 1965.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents

**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,172,969

March 9, 1965

Walter R. G. Haggstrom

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 8, lines 72 to 74, for "in a predetermined area support member arranged to hold a key" read -- support member arranged to hold a key in a predetermined area --.

Signed and sealed this 17th day of August 1965.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents