

April 27, 1948.

F. E. BEST

2,440,428

KEY BIT

Original Filed Jan. 8, 1942

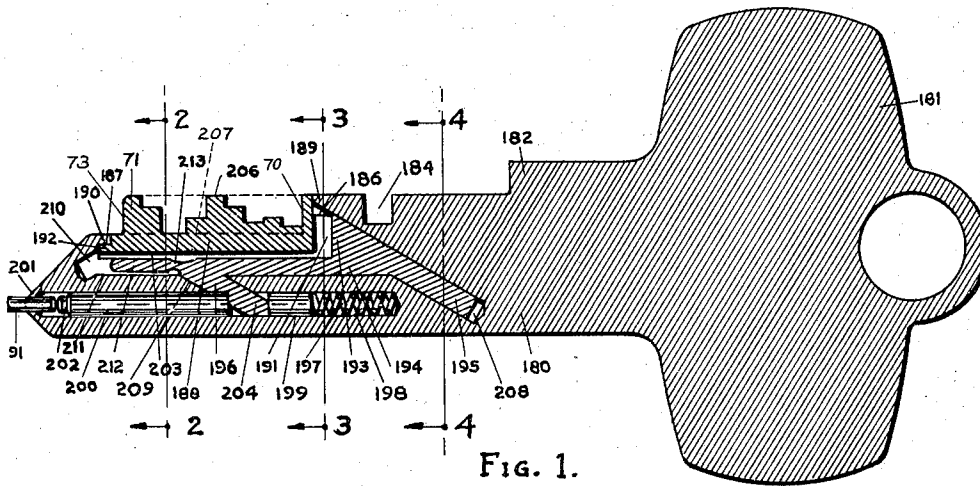


FIG. 1.

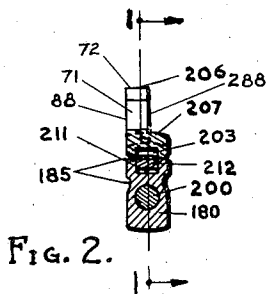


FIG. 2.

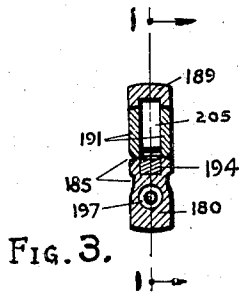


FIG. 3.

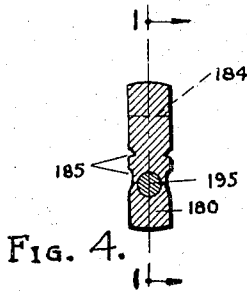


FIG. 4.

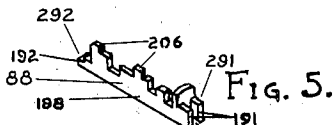


Fig. 5.

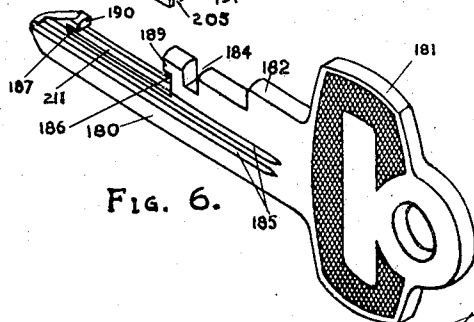


FIG. 6.

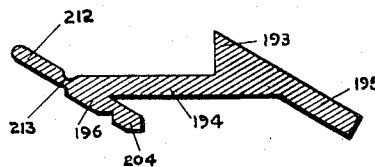


FIG. 7.

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UNITED STATES PATENT OFFICE

2,440,428

KEY BIT

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Original application January 8, 1942, Serial No. 425,952. Divided and this application January 15, 1945, Serial No. 572,901.

12 Claims. (Cl. 70-409)

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Nature and objects

This is a divisional application of my copending application on Unpickable lock, filed January 8, 1942, Serial No. 425,952, now abandoned.

This invention pertains to key bits used in connection with detachable-bit keys, in which the combinatable portion of said key, called a key bit, is separable from the rest of the key and adapted to be attached thereto and disattached therefrom by latch means.

The principal object of this invention is to provide a unique detachable bit adapted to serve as a portion of a detachable-bit key as required for certain types of lock, and particularly for my unpickable lock as set forth in my copending application.

Description

I obtain this and other objects by means illustrated in the accompanying drawings in which:

Fig. 1 is a view in longitudinal central section taken substantially on broken lines 1-1 of Figs. 2 to 4 inclusive showing a detachable bit, in connection with a key, constructed in accordance with my invention, said bit being in its released position ready to be detached from the blade by arcuate sidewise movement of the bit relative to the blade.

Figs. 2, 3 and 4 are transverse sections taken on broken lines 2-2, 3-3, and 4-4 respectively of Fig. 1.

Fig. 5 shows an isometric view of a combined bit.

Fig. 6 shows an isometric view of the blade and handle.

Fig. 7 shows a sectional view of latch bolt 194 ready for assembly into blade 180.

Structural description

The key comprises a blade 180 having the usual lobe or handle 181 on its outer end and having a shouldered portion 182 adjacent the handle. The blade portions 180 and 182 are adapted to enter a keyway of a lock and the shouldered portion 182 is adapted to abut against a shoulder in the lock to position the key longitudinally in the lock and to provide a strong member for transmitting torque.

A notch 184 is provided in the blade 180 a short distance forwardly of the shouldered portion 182 for engagement with key retaining means in a lock.

The blade 180 has the usual side flutes or grooves 185 and one edge portion of said blade is provided with two longitudinally spaced apart notches 186 and 187 for the reception of the bit

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designated 188. Overhanging key lugs 189 and 190 are provided, in connection with the respective key notches 186 and 187, to fit into upper end notches 291 and 292 of the key bit 188 and to engage with lugs 191 and 192 on the respective ends of the bit. These notches and lugs are preferably arcuate in cross section as best shown in Figs. 2 and 3.

The key bit 188, which is a substantially rectangular block, extends, in uncombined form, to dotted line 206 and has an anvil side 88 adapted to fit a flat surface so as to properly take the reactions of the combination biting process, which is preferably a punching process, without producing undue distortion. Opposite this anvil side 88 is a relieved side 238 being relieved, in thickness, upward from line 207, Figs. 1 and 2, and bounded at the lobe end by line 70 to provide a combination receiving portion 71 of substantially rectangular shape extending to the top edge 206 and tip end 73 of the key bit 188.

The top edge 206 which is the bitted edge of said key bit comprises, when bitted, a series of stepped portions 206 which may or may not have abrupt or square corners and which are of individually distinctive heights and are longitudinally offset from each other the proper distances to cause the stepped portions of the key bit always to align themselves with respective lock tumblers when the key, incorporating said bit, is in the correct lock operating position in a mating lock.

The lugs 191 on the lobe end of the key bit member are preferably two in number and are transversely spaced apart to provide a groove 205 therebetween thus forming a grooved end of the lobe end of the bit for the entrance of a locking lug 193 of a latch bolt 194, see Fig. 1, that is embedded in the key blade 180 of the key means shown. The latch bolt 194 has two inclined portions 195 and 196 that are guided in the key blade 180 in such a manner as to cause the latch bolt to be moved toward the bit when it is moved toward the tip ends of the key blade and bit and to be moved away from the bit when it is moved toward the lobe end of the key.

A compression spring 197 in a bore 198 in the key blade presses against one side of a latching pin 199 that engages with a lug 204 of the latch bolt 194. The other side of the lug 204 is engaged by a latch releasing pin 200 that extends to the forward end of the key 180 and is adapted to be engaged and actuated by a pin 91, which may be a part of a lock, being secured rigidly in the end of the keyway thereof, or which may otherwise be held rigidly, and thus adapted to co-

operate with the forward movement of the key thereover to release the latch bolt 194, as shown Fig. 1.

The end of the key is crimped inward around bore 198 at 201 to prevent the removal of latch releasing pin 200. Said latch releasing pin 200 is rounded and shouldered at 202 so as to match the contour of the key point and said crimped portion 201 when the key is moved away from pin 91.

A shallow groove 203 is provided in the bottom edge of the bit to receive the top edge of the latch bolt 194 and thereby cooperate with the locking lug 193 to lock the bit against transverse displacement.

When a key, equipped with a bit, is inserted in a lock provided with a pin 91, the pin 91 will be moved relatively into the end of the key, as shown in Fig. 1, and the latch bolt 194 and lug 193 will likewise be moved out of engagement with the groove 203 and lugs 191 respectively. When this occurs the bit will be released as respects the blade 180; and bit and blade can be moved side-wise and rotatively relative to each other. When the bit is locked to the blade the lugs 191 and 192 thereof are held beneath the overhanging lugs 199 and 199 of the blade that fit into upper end notches 291 and 292 of the key bit. The lug 193 is positioned in groove 205 between the lugs 191; and the upper edge of latch bolt 194 is positioned in the groove 203. This binds the bit firmly and immovably to the blade; and said bit will not be normally detached from the blade at any time except when a pin 91 is inserted as shown Fig. 1. Also said bit will be re-engaged with the blade as the key is being removed from the said pin 91.

When the bit is engaged with the blade the bottom edge of the bit will coincide with one of the longitudinal flutes 185 in the sides of the key and the lines of the bit and blade will merge in such a manner that they will appear to be one piece and the fact that the key has a detachable bit will not ordinarily be noticed by persons looking at the key.

The combinatable portion 206 of the bit is thinner than the base portion thereof, as best shown in Fig. 2, to provide on the key bit, a shoulder 207 that is adapted to be engaged by an overhanging ledge in a lock.

The blade is provided with three bores 208, 209 and 210 and a groove 211 adapted to accommodate latch bolt 194.

The said latch bolt is shown in Fig. 7, as it is originally made. After assembly, leg 212 is bent down at the narrow portion 213 as shown in Fig. 1 so as to provide tongue and groove engagement between latch bolt 194 and bit and blade throughout the full length of the bit.

The words "edge," "end" and "side" as used to define general surfaces of the key bit are used in the ordinary sense in which they would be used to treat the surfaces of a rectangular object, such as an ordinary book, that has two sides, of an area equal to the length multiplied by the width, bounded by two edges and two ends, the sides having the greatest surface area and the ends the least surface area of the six surfaces.

The ends and sides of an ordinary book are substantially flat, while the front edge is straight lengthwise but concave crosswise.

Thus the key bit whether combined or plain; i. e., with or without the combinations cut therein, is book like and these common, ordinary terms may be applied thereto with the ordinary force and effect.

The key bit has an "anvil" side adapted to "fit" a flat surface so as to properly take the reaction of a key-bitting operation of a punching nature.

It is desirable that this be substantially flat particularly throughout the combinatable portion thereof to enable the key to be thus bitted without objectionable distortion.

Going back to the simile of the book, the ordinary book has bead hinges that connect the side covers with the back edge and that are raised above the general flat surface of the cover. Thus the ordinary book does not "fit" the flat table when laid upon it on its side cover. But, with that type of book that has flush beads, it can be properly said that such a book fits the flat table, even if the name and certain designs, such as a monogram and border lines, are indented therein.

It is in this sense that I use the term "fit." Thus, in instances in which the major part of one side of the combinatable portion of the bit can be placed in substantial fitting proximity to a flat surface, such as that of an anvil or table, that extends beyond the said key bit in all directions in the plane of said anvil or table surfaces, this relation is defined herein as to "fit."

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge, adjacent said anvil side, that is substantially straight throughout the length of said block, and a groove in said bottom edge adapted to cooperate with key means adapted to fit thereinto to detachably retain said key bit in said key.

2. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a lobe end, adjacent said anvil side, that is substantially perpendicular with said anvil side, and a groove in said lobe end adapted to cooperate with key means adapted to fit thereinto to detachably retain said key bit in said key.

3. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end substantially perpendicular with said anvil side and each other, and grooves in said bottom edge and side lobe end adapted to cooperate with key means adapted to fit thereinto to detachably retain said key bit in said key.

4. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge, adjacent said anvil side, that is substantially straight lengthwise of said bottom edge, a lobe end, adjacent said anvil side and said bottom edge, a groove in said bottom edge and a groove in said lobe end running lengthwise of said respective bottom edge and lobe end adapted to cooperate with key means to detachably retain said key bit in said key means.

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5. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge having a groove therein, a lobe end having a groove formed between two lugs thereon, a tip end having a lug thereon, said grooves and said lugs being adapted to cooperate with key means in said key blade to releasably retain said key bit in said key blade.

6. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a thickness-relieved combination portion of said key bit occupying an upper portion of the key bit, a bottom edge and a lobe end having grooves, and lugs at both ends, said grooves and said lugs being adapted to cooperate with key means in said key blade to releasably retain said key bit in said key blade, and said combination portion being adapted to be variously notched from the top edge downward to produce any one of a group of permutatable combination settings.

7. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end substantially perpendicular with said anvil side and each other, a tip end, opposite the lobe end, a top edge opposite the bottom edge, grooves in said bottom edge and said lobe end adapted to cooperate with key means to detachably retain said key bit in said key means, and a relieved side opposite to said anvil side being relieved in thickness to a substantially common depth throughout a substantially rectangular area beginning with the top edge and tip end and extending to within relatively short distances of said bottom edge and said lobe end.

8. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end substantially perpendicular with said anvil side and each other, a tip end, opposite the lobe end, a top edge opposite the bottom edge, grooves in said bottom edge and said lobe end adapted to cooperate with key means to detachably retain said key bit in said key means, a relieved side opposite to said anvil side being relieved in thickness to a substantially common depth throughout a substantially rectangular area beginning with the top edge and tip end and extending to within relatively short distances of said bottom edge and said lobe end, and a portion of said block adjacent the bottom edge extending lengthwise of the block beyond the longitudinal extension of said rectangular area to form a lug on an end adapted to cooperate with overhanging key means to releasably retain said key bit in said key means.

9. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end

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substantially perpendicular with said anvil side and each other, a tip end, opposite the lobe end, a top edge opposite the bottom edge, grooves in said bottom edge and said lobe end adapted to cooperate with key means to detachably retain said key bit in said key, a relieved side opposite to said anvil side being relieved in thickness to a substantially common depth throughout a substantially rectangular area beginning with the top edge and tip end and extending to within relatively short distances of said bottom edge and said lobe end and a notch in the block at the top of the lobe end adapted to nest a projection of the key means and thus cooperate with overhanging key means to releasably retain said key bit in said key means.

10. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end substantially perpendicular with said anvil side and each other, a tip end, opposite the lobe end, a top edge opposite the bottom edge, grooves in said bottom edge and said lobe end adapted to cooperate with key means to detachably retain said key bit in said key, a relieved side opposite to said anvil side being relieved in thickness to a substantially common thickness throughout a substantially rectangular area beginning with the top edge and tip end and extending to within relatively short distances of said bottom edge and said lobe end, and a portion of said block adjacent the bottom edge extending lengthwise of the block beyond the longitudinal extension of said rectangular area to form lugs on the tip end and lobe end adapted to cooperate with overhanging key means to releasably retain said key bit in said key means.

11. In a separable key bit consisting of a substantially rectangular block adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil side adapted to fit a flat surface, a bottom edge and a lobe end substantially perpendicular with said anvil side and each other, a tip end, opposite the lobe end, a top edge opposite the bottom edge, grooves in said bottom edge and said lobe end adapted to cooperate with key means to detachably retain said key bit in said key, a relieved side opposite to said anvil side being relieved in thickness to a substantially common thickness throughout a substantially rectangular area beginning with the top edge and tip end and extending to within relatively short distances of said bottom edge and said lobe end, and a portion of said block adjacent the bottom edge extending lengthwise of the block beyond the longitudinal extension of said rectangular area to form lugs on the tip end and the lobe end adapted to cooperate with overhanging key means to releasably retain said key bit in said key means, and a combinatable portion of the key bit consisting of the said rectangular area adapted to be cut away in part from the top edge to form the combination setting of the bit.

12. In a separable key bit consisting of a substantially rectangular block adapted to receive combination bittings on one edge thereof and further adapted to be releasably attached to a key blade in the formation of a multiple-element key, the combination of elements comprising an anvil

side, a bottom edge comprising surfaces that are straight lengthwise and indented crosswise to fit a mating key blade and provide a longitudinal groove in said bottom edge, a lobe end substantially perpendicular with said anvil side and said indented surfaces of said bottom edge, a groove in said lobe end formed between two lugs thereof, a tip end, a lug on said tip end and said lugs and grooves being adapted to cooperate with key means to detachably retain said key bit in said key blade, and a relatively thin rectangular portion partly forming said anvil side, comprising

the combinatable bit-receiving portion adapted to have the combination biting thereof cut therein.
FRANK ELLISON BEST.

REFERENCES CITED

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

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10 Number	Name	Date
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