April 27, 1948. F. E. BEST 2,440,429

KEY

Original Filed Jan. 8, 1942

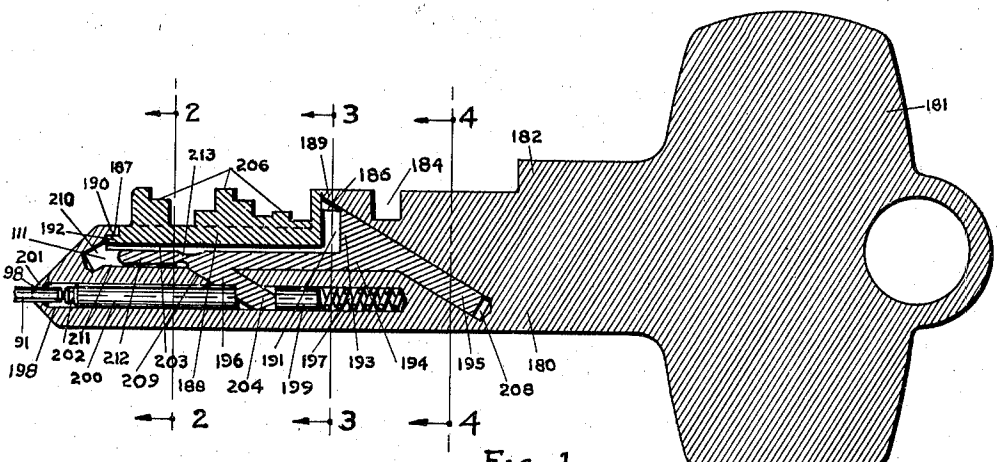


FIG. 1.

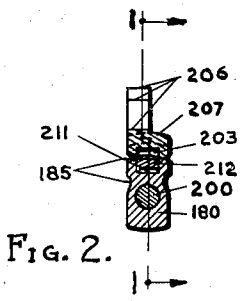


FIG. 2.

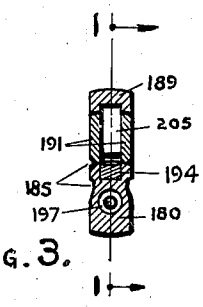


FIG. 3.

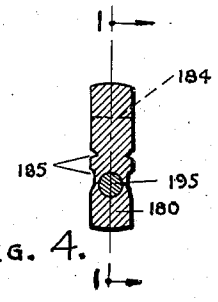


FIG. 4.

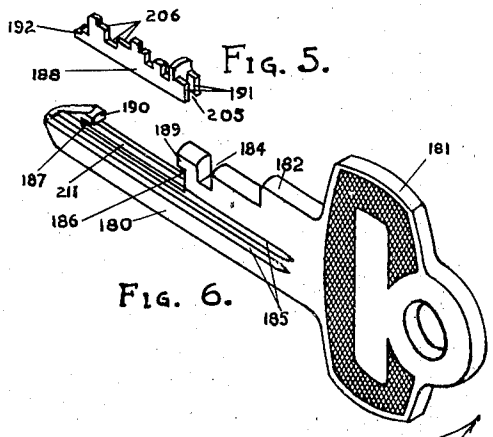


FIG. 5.

FIG. 6.

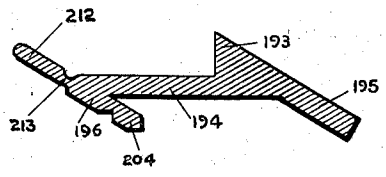


FIG. 7.

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INVENTOR.

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UNITED STATES PATENT OFFICE

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KEY

Frank Ellison Best, Indianapolis, Ind.

Original application January 8, 1942, Serial No. 425,952. Divided and this application January 15, 1945, Serial No. 572,902

29 Claims. (Cl. 70—395)

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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 lock keys and particularly to keys having their combinatable portion, designated the bit, releasably attached to the blade.

The principal objects of this invention are:

1. To provide such a key, comprising a handle, a blade, a bit and latch means, in which the bit is attachable to, and detachable from, the blade by a sidewise rotary movement of one part relative to the other when the latch means thereof is released.

2. To provide such a key in which a certain forward movement of the key, simulating the insertion of such a key in a lock, over a fixed pin, as one fixed in the end of the keyway of a lock, releases the latch means.

3. To provide such a key of the flat type having a comparatively flat, longitudinally-fluted blade, in which the bit forms an extension, of common keyway-fitting form, to the said blade.

4. To make the fact, that the bit is detachable from the blade, as unnoticeable as possible by making the bit and blade close fitting at their junctures and by making the bit of the same general contour as the rest of the blade and so designing the key that the longitudinal division between blade and bit forming the key blade is in corners of fluted grooves on both sides of the key.

5. To make the thus assembled key as strong and rugged as possible by providing tongue and groove construction between the latch means and blade and bit, along one edge and one end of said bit.

Description of figures

I obtain these 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 key, having a detachable bit, constructed in accordance with my invention with the bit in its released position ready to be separated from the blade by arcuate sidewise movement of the blade relative to the bit.

Fig. 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 the bit.

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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

This 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 a separable combinated portion 188 herein referred to as a key bit or simply a bit, jointly forming with said blade, a key blade. Overhanging lugs 189 and 190 are provided in connection with the respective notches 186 and 187 to engage with lugs 191 and 192 on the respective ends of the separable key bit member 188. These notches and lugs are preferably arcuate in cross section as best shown in Figs. 2 and 3.

The bitted edge of the key bit member comprises a series of stepped portions 206 which may 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 is in the correct lock operating position in a mating lock.

The lugs 191 on the end of the key bit member are preferably two in number and are transversely spaced apart to provide a groove or space 205 therebetween for the entrance of a locking lug 193 of a latch bolt 194, see Fig. 1, that is embedded in a recess 111 in the blade 180. The latch bolt 194 has two inclined portions 195 and 196 that are guided in the blade 180 in such a manner as to cause the latch bolt to be moved toward the bit 188 when it is moved toward the tip end of the blade and to be moved away from the bit 188 when it is moved toward the lobe end of the key.

A compression latch spring 197 in a hole, recess

or 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 means 200 that extends to the forward end of the blade 180 and is adapted to be engaged and actuated by a latch-releasing means such as pin 91, foreign to the key and 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 cooperate with the forward movement of the key thereover to release the latch bolt 194, as shown in Fig. 1.

The end of the key is crimped inward around bore 198 at 201 to prevent the removal of latch releasing member 200 and at the same time leaving a hole or recess 98 large enough to freely admit pin 90. Said latch releasing member 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 separable bit member 188 to receive the top edge of the latch bolt 194 and thereby cooperate with the locking lug 193 to lock the detachable bit member 188 against transverse displacement.

When the key is inserted in a lock provided with a pin releasing means 91, the said means 91 will be moved relatively into the hole or recess 98, in 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 separable bit member 188 will be released as respects the blade 180; and bit and blade can be moved sidewise and rotatively relative to each other. When the bit is locked to the blade the lugs 191 and 192 are held beneath the overhanging lugs 189 and 190 of the blade. The lug 193 is positioned 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 latch releasing means 91 is inserted as shown in Fig. 1. Also said bit will be re-engaged with the blade as the key is being removed from the said means 91.

When the bit 188 is engaged with the blade the lower edge of the bit will coincide with one of the longitudinal grooves 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 combinated portion 206 of the bit member is narrower than the base portion thereof, as best shown in Fig. 2, to provide on the key bit member, a shoulder 207 that is adapted to be engaged by an overhanging ledge in a lock.

The blade is provided with four bores 200, 208, 209 and 210 and a groove 211 forming a recess 111 adapted to accommodate latch bolt 194 and related means.

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 bit 188.

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

1. In a key blade, the combination of elements comprising a recess adapted to receive a latch bolt and a latch spring, a latch bolt and a latch spring in said recess and lugs in said key blade adapted to cooperate with said latch bolt and said latch spring to releasably lock a detachable key bit to said blade.

2. In a key blade, the combination of elements comprising a recess in the edge of the key blade adapted to receive a latch bolt, a latch bolt in said edge recess, a recess in an end of the key blade adapted to receive a latch spring, a latch spring in said end recess, overhanging lugs in said key blade adapted to cooperate with said latch bolt and said latch spring to releasably lock a detachable key bit to said key blade to form an extension thereof.

3. In a key adapted to have a detachable bit, the combination of elements comprising a flat blade, a recess in said blade adapted to receive a latch bolt, a latch bolt therein, and lugs in said blade adapted to cooperate with said latch bolt to releasably secure a detachable bit to said blade.

4. In a key adapted to have a detachable bit, the combination of elements comprising a flat fluted blade, a recess in an edge of said blade adapted to receive a latch bolt, said blade having overhanging lugs adapted to cooperate with latch means, in said recess, to releasably secure a detachable bit having end portions adapted to be overhung by said lugs, to said blade to form an extension thereof.

5. In a key adapted to have a detachable bit, the combination of elements comprising a flat fluted blade, a recess jointly formed in an edge and an end thereof adapted to receive a latch bolt and a latch spring, a latch bolt and a latch spring in said recess, and lugs on said blade adapted to cooperate with said latch bolt and latch spring to releasably secure a detachable bit, having projecting end portions adapted to be overhung by said lugs, to said blade to form a keyway-form-fitting extension thereof.

6. In a key adapted to have a detachable bit, the combination of elements comprising a flat fluted blade, a recess jointly formed in an end and an edge thereof, a latch bolt, a latch spring, a latch releasing member and a latching pin in said recess, and overhanging lugs in said blade adapted to cooperate with the named elements in said recess to releasably secure a detachable bit, having projecting end portions adapted to be overhung by said lugs, to said blade to form a keyway-form-fitting extension thereof.

7. In a key adapted to have a detachable bit, the combination of elements comprising a flat blade, a recess in said blade adapted to receive latch means, latch means in said recess, and lug means on said blade adapted to cooperate with said latch means in releasably retaining a detachable bit attached to said blade.

8. In a key adapted to have a detachable bit, the combination of elements comprising a flat fluted blade, a recess jointly formed in an edge and an end thereof, latch means in said recess, and blade means, constituting a portion of said blade, adapted to cooperate with said latch means in releasably securing a detachable bit to said blade as an extension thereof.

9. In a key comprising a blade and a detachable bit jointly forming a flat fluted key blade, the combination of elements comprising a detachable bit, a blade, a recess in said blade, latch means in said recess, and lug means on said blade adapted to cooperate with said latch means

in releasably securing said detachable bit to said blade to jointly form, with said blade, said flat fluted key blade.

10. In a key adapted to have a detachable bit, the combination of elements comprising a flat fluted blade, a recess in said blade, latch means in said recess adapted to releasably retain a detachable bit attached to said blade, and a hole running lengthwise of the blade adapted to receive latch releasing means.

11. In a key blade of the flat type, having longitudinal flutes, the combination of elements comprising a recess adapted to receive latch means, latch means in said recess including a latch bolt and a latch spring, lug means on said key blade adapted to cooperate with said latch means in releasably locking a detachable key bit to said blade.

12. In a key blade, of the flat type adapted to house latch means for securing a detachable bit thereto, a recess in said blade adapted to receive latch releasing means foreign to said key blade.

13. In a key blade, of the flat type adapted to house latch means for securing a detachable bit thereto, a recess in an end of the blade adapted to receive a pin to release the said latch means.

14. In a key adapted to have a detachable kit, the combination of elements comprising a flat blade, a recess jointly formed in an end and edge thereof adapted to receive a latch bolt, and a latch bolt in said recess, adapted to releasably secure a detachable bit to said blade, said recess also being adapted to receive latch-releasing means foreign to said key adapted to release said bit from said blade.

15. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a flat fluted key blade having flutes on both sides of said key blade, said flutes running substantially lengthwise of the key blade, said bit being releasably secured in a recess in the edge of said blade.

16. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade, a longitudinal groove in an edge of said bit, and a latch bolt, housed in said blade, having a portion thereof adapted to fit into said groove throughout a considerable portion of the length of said bit to prevent edgewise displacement of said bit relative to said blade.

17. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade, a longitudinal groove in an edge of said bit, a latch bolt, housed in said blade, having a portion thereof adapted to fit into said groove throughout a considerable portion of the length of said bit to prevent endwise displacement of said bit relative to said blade and latch releasing means, housed in said key, adapted to cooperate with other latch releasing means, foreign to said key, to release said latch bolt from said bit to permit removal of said bit from said blade.

18. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade, a groove in an edge and an end of said bit, and a latch bolt, housed in said blade, having a portion adapted to fit into said grooves to prevent edgewise displacement of said bit relative to said blade.

19. In a key adapted to have a detachable bit,

the combination of elements comprising a blade and a detachable bit jointly forming a key blade, a groove in an edge and an end of said bit, a latch bolt, housed in said blade, having a portion adapted to fit into said grooves to prevent edgewise displacement of said bit relative to said blade, and latch releasing means housed in said blade adapted to be actuated by other releasing means foreign to said key, to release said latch bolt from said bit.

20. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade of the flat type, said blade enfolding a portion of said bit to prevent longitudinal and lateral displacement of the bit relative to the blade, and a latch bolt, housed in a portion of said blade contiguous with said bit, adapted to interlock with said bit to prevent edgewise displacement of said bit relative to said blade.

21. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade of the flat type, said blade enfolding a portion of said bit to prevent longitudinal and lateral displacement of the bit relative to the blade, a latch bolt, housed in a portion of said blade contiguous with said bit, adapted to interlock with said bit to prevent edgewise displacement of said bit relative to said blade, and a latch releasing member adapted to release said latch bolt from said bit to permit edgewise removal of said bit from said blade.

22. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade of the flat type, said blade enfolding a portion of said bit to prevent longitudinal and lateral displacement of the bit relative to the blade, and a latch bolt, housed in portions of said blade contiguous to said bit, adapted to interlock with said bit along one edge and one end of said bit to prevent edgewise displacement of said bit relative to said blade.

23. In a key adapted to have a detachable bit, the combination of elements comprising a blade and a detachable bit jointly forming a key blade of the flat type, said blade enfolding a portion of said bit to prevent longitudinal and lateral displacement of the bit relative to the blade, a latch bolt, housed in portions of said blade contiguous to said bit, adapted to interlock with said bit along one edge and one end of said bit to prevent edgewise displacement of said bit relative to said blade, and a latch releasing means, housed in said blade, adapted to be actuated by other latch releasing means, foreign to said key, to release said latch bolt from said bit to permit edgewise removal of said bit from said blade.

24. In a key, having a handle and a blade, said blade being of the flat type, a detachable key bit adapted to be carried by said blade and forming an extension thereof, said key bit having endwise extending lugs adapted to cooperate with end-enfolding and end-overhanging lugs on the key blade adapted to trap the bit against removal in the plane of the blade, and latch means carried by said blade adapted to releasably secure said bit against sidewise displacement.

25. In a key, having a handle and a blade, said blade being of the flat, fluted type having flutes on both sides of said blade running substantially lengthwise of the blade, a detachable key bit adapted to be carried by said blade and forming an extension thereof, said key bit having end-

wise extending lugs adapted to cooperate with end-enfolding and end-overhanging lugs on the key blade adapted to trap the bit against removal edgewise and lengthwise of said blade, and latch means carried by said blade adapted to releasably secure said bit against sidewise displacement and removal from said blade.

26. In a key, comprising a blade of the flat, fluted type having a longitudinal flute on one side of said key, a detachable key bit adapted to be carried by said blade and to form an extension thereof, said bit joining said blade substantially along a longitudinal flute of said key with the edge juncture of the said parts being substantially parallel with, and meeting along a corner of said flute.

27. In a key, comprising a blade of the flat, fluted type having a longitudinal flute in one side of said key, a detachable key bit adapted to be carried by said blade and to form an extension thereof, said bit joining said blade substantially along a longitudinal flute of said key with the edge juncture of the said parts being substantially parallel with, and meeting along a corner of said flute, part of said flute being formed in said blade and part in said bit.

28. In a key comprising a key blade of the flat, fluted type, having a longitudinal flute on one side of said key, said blade being adapted to carry a detachable bit thereon, a bit-receiving opening in an edge of said blade, said bit-receiving opening having a relatively long, straight surface that runs substantially parallel with said flute and that joins said flute along a corner that is practically an extension of a corner of said flute.

29. In a key, comprising a key blade of the flat, fluted type, having a longitudinal flute on one side of said key substantially parallel with a guiding edge thereof, said blade being adapted to carry a detachable bit in a bit-receiving opening in the other edge of said blade, said bit-receiving opening having a relatively long, straight surface that runs substantially parallel with said flute and that joins said flute along a line that is practically a continuation of a corner of said flute, said surface having a recess for the accommodation of latch means, and said opening comprising notches with overhanging lugs at the ends thereof adapted to cooperate with the latch means in said recess in the locking of a key bit in said opening.

FRANK ELLISON BEST.

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