Nov. 15, 1927.

1,649,514

J. P. DEL'EAU

KEY CASE

Filed Jan. 28, 1926

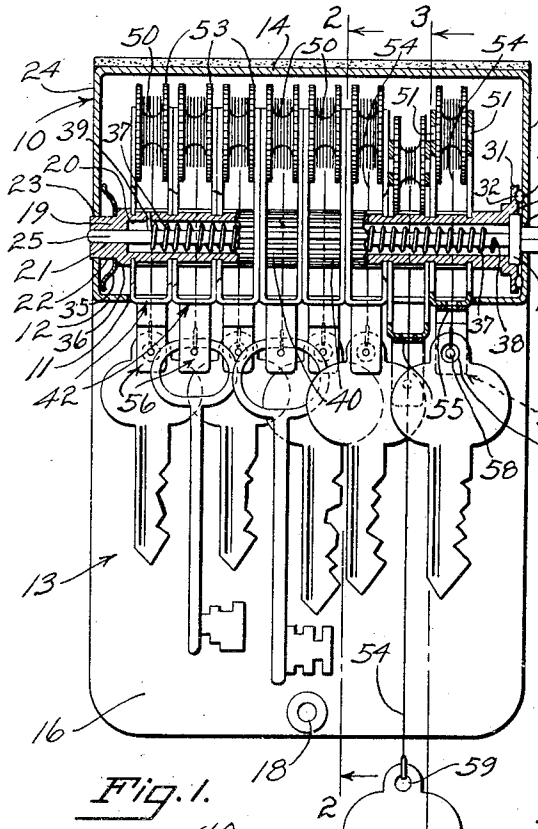


Fig. 1.

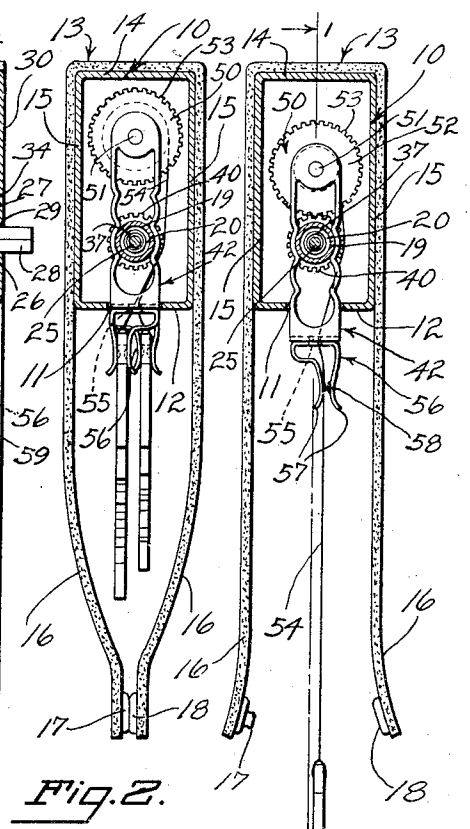


Fig. 2.

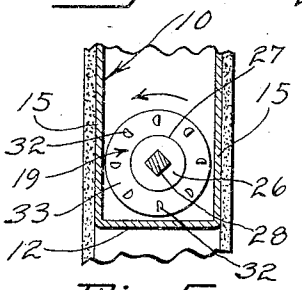


Fig. 5.

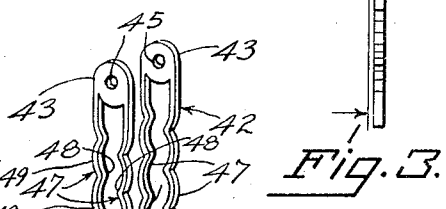


Fig. 3.

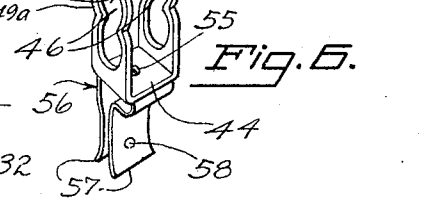


Fig. 6.

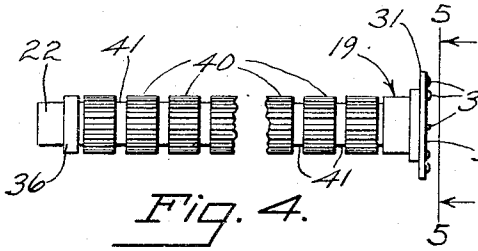


Fig. 4.

Inventor
John P. del'Eau
by W. N. Orrick
Attorney

Patented Nov. 15, 1927. 1,649,514

UNITED STATES PATENT OFFICE.

JOHN P. DEL'EAU, OF LOS ANGELES, CALIFORNIA.

KEY CASE.

Application filed January 28, 1926. Serial No. 84,282.

This invention relates to pocket key cases, adapted to encase and retain a plurality of keys in convenient arrangement for ready use, and from which they may be individually withdrawn for use without detachment from their securing means.

Key cases of this same general character have been heretofore provided, wherein the keys are retained by various arrangements to permit individual extraction of the keys from the confines of the cases, without separation from their fastening means; but the securing means used do not admit of sufficient removal nor sufficient flexibility to permit easy turning in the lock. It is, therefore, a particular object of my invention to overcome these defects by providing a case from which individual keys may be selectively withdrawn a sufficient distance from the case to permit easy use in more or less inaccessible places and complete flexibility and freedom of movement, unhampered by close proximity of the case, with an automatic return to the confines of the case.

The invention of the instant case is somewhat similar to my invention shown and described in a copending application, filed April 16th, 1925, Serial No. 23,714, entitled Key cases, but differs therefrom in that in this case the device is characterized by a mechanism including a plurality of longitudinally extensible, flexible key-securing members, one for each key, any of which may be selectively withdrawn from the confines of the case independently of the other. The mechanism is arranged to permit selective, manual withdrawal of the keys from the case and an automatic return.

A further feature of the present invention is the arrangement of the operating mechanism with a view to compactness, especially in the direction of depth, so the case will lie flat in the pocket, and also so the keys will lie flat in the case without bunching and in relative arrangement to facilitate ready selection.

Further details of construction and operation of my device are set forth in the following specification, reference being made therein to the accompanying drawing wherein I have illustrated my preferred specific embodiment. It is to be understood, however, that the details of my device, as illustrated and described herein, is but one form of embodiment of the principles I employ, and that I do not wish to be confined to the precise arrangement shown but rather reserve the right to make such changes and alterations in structure as will properly come within the scope of the claims appended hereto.

In the drawings:

Fig. 1 is a sectional plan view of my improved case, taken as indicated by the line 1—1 of Fig. 3;

Fig. 2 is a transverse sectional view taken as indicated by the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2 taken as indicated by the line 3—3 of Fig. 1;

Fig. 4 is a detailed elevation of the gear sleeve;

Fig. 5 is an end view of the gear sleeve taken as indicated by the line 5—5 of Fig. 4; and

Fig. 6 is an enlarged perspective view of one of the key carriers.

Referring now to the drawings the numeral 10 designates generally a metal case for housing the moving parts of the mechanism. This is substantially oblong in configuration and comparatively flat, in the direction of depth, so as to occupy a minimum of space in the pocket. It may be stamped out of any suitable sheet metal and is preferably closed on all sides except for an elongated aperture or slot 11 in its bottom side 12. A covering 13, of leather or a similar material, extends around the top 14 and sides 15 of the housing, beyond its bottom 12 and terminates in a pair of flexible flaps 16. The flaps 16 are arranged to encase the keys, as shown in dotted lines, and these may be detachably secured together by means of a stud 17 and socket 18, or any preferred type of separable fastener. Inasmuch as the flaps 16 are merely for the purpose of protecting the pocket from excessive wear by the keys, and to generally hold the keys in flat arrangement, end flaps need not be provided.

A tubular shaft 19, which I will hereinafter term the gear sleeve, has an axial bore 20, terminating at one end in a reduced coaxial bore 21. It also has a reduced end 22 revolubly journalled in a bearing aperture 23 in the end 24 of the housing 10. A shaft 25 extends axially through the bore 20 and is journalled at one end in the reduced bore 21. Its opposite end is provided with an integral annular flange 26, in the form of a collar, which revolubly seats in a counter bore 27 in the opposite end of the gear sleeve

19. It also has an integral non-circular stud portion 28 extending beyond the collar 26, which extends through a non-circular bearing aperture 29 in the opposite end 30 of the housing 10. By this means the shaft 25 is held against rotation, relative to the housing 10, yet is capable of axial movement in its bearings 21 and 29. Thus the gear sleeve 19 is revolubly journalled at one end in the bearing aperture 23 and is also revolubly supported at its opposite end upon the shaft 25, through the medium of the collar 26 engaging in the recess 27.

An annular flange or collar 31 is formed upon the gear sleeve 19 and a plurality of ratchet teeth 32 are radially disposed upon its outer face 33. These teeth are adapted to engage similar teeth 34 formed on the inner face of the housing end 30 and disposed radially relative to the axis of the shaft 25. A leaf spring 35, surrounding the reduced end 22, of the gear sleeve 19, is confined between an annular shoulder 36, formed thereon, and the adjacent end 24 of the housing. This spring operates to yieldingly hold the gear sleeve 19 to the right in Fig. 1, so the ratchet teeth 32 and 34 will yieldingly engage upon its rotation. A helical spring 37 surrounds the shaft 25, being secured thereto at one end—as at 38—and at its opposite end to the gear sleeve 19—as at 39. This spring operates to yieldingly hold the gear sleeve 19 against rotation relative to the shaft 25 and to automatically rotate it in the opposite direction, or return it to its normal position, after it has been manually rotated in the manner hereinafter explained.

A pluralty of gears 40 are arranged upon the periphery of the gear sleeve 19, and these may be formed integral therewith merely by serrating its periphery in the form of gear teeth. These are separated by annular channels 41.

A plurality of key carriers 42 are mounted upon the gear sleeve 19 for movement relative thereto in and out of the housing 10. These are of a generally U-shaped configuration, and may be stamped out of any light sheet metal of a resilient or semi-resilient character. Each has spaced arms 43, joined by an integral bottom portion 44; the arms 43 having coaxial bearing apertures 45 in their free ends. The intermediate portions of the arms 43 are stamped out—as at 46—to form ribs 47. These ribs are comparatively small to permit slight yielding action towards and away from each other. The gear sleeve 19 extends through the aperture 46, between the ribs 47, and these ribs are of a size to rest within the annular channels 41. They are mounted upon the gear sleeve 19, as particularly shown in Fig. 1, so that the ribs 47 of adjacent carriers will fit closely side by side in the annular channels 41 and in sliding engagement with each other. Indents 48 are formed in the ribs 47 to provide arcuate seats 49 and 49a in the inner opposed faces of the ribs. The degree of curvature of these seats is the same as that of the gear sleeve 19, within the annular channels 41, so there will be a close yielding engagement between the ribs 47 and the sleeve, as clearly shown in Figs. 2 and 3. By the yielding action of the ribs 47, as will be more fully hereinafter explained, the carriers 42 are held in different positions relative to the gear sleeve 19.

Reels 50 are revolubly mounted between the upper ends of arms 43, by means of spindles 51 extending into the bearing apertures 45 therein. The sides 52 of the reels 50 have tooth peripheries, as shown at 53, which are adapted to mesh with the teeth of gears 40, when a carrier is moved outwardly, as shown in Fig. 3. The spindles 51 will fit closely within the bearing apertures 45, and arms 43 will be made to engage the reel sides 52 closely, to provide a slight frictional contact to normally hold the reels against free rotation.

Cords 54 are rove around the reels 50 and secured thereto at one end, thence passed around the gear sleeve 19 and through aperture 55 in the carrier bottoms 44, and are provided on their outer ends with any suitable means for securing the keys thereto. Various types of fasteners now well known in the market may be used for this purpose. While I term the elements 54 "cords" any equivalent means, such as small chains or the like, may be provided for this purpose. Clips 56 are secured to the outer faces of the carrier bottom portions 44 and provided with a pair of spring fingers 57 for the reception of the keys, as clearly shown in Figs. 1 and 2. These are provided with small pressed out nubs 58, in opposed relation, to yieldingly engage in the key eyes 59. The clips 56 are mounted upon the several carriers 42, in relatively staggered relation, as shown in Fig. 2, to permit overlapping of the keys so they will lie flat between the flaps 16, as shown in Fig. 1.

In use, the carriers are normally in the positions illustrated in Fig. 2, and to the left in Fig. 1, with the cords 54 rove around the reels 50, so their free ends terminate about the clips 56, and with keys attached thereto the upper ends of the keys are inserted between the yielding fingers 57, where they are yieldingly held against accidental removal. There is always a slight tension upon the spring 37 due to fairly close frictional engagement between the carrier ribs 47 and the gear sleeve 19, and the gear sleeve is also yieldingly held to the right, in Fig. 1, so the ratchet teeth 32 and 34 are in position to engage each other.

When it is desired to use a key, the flaps

16 are separated, as shown in Fig. 3, and the key taken between the fingers and drawn outwardly. The spring action of the clip fingers 57 engaging the key will be sufficient to force the carrier ribs 47 apart, moving the carrier outwardly until the seat faces 49 engage in the annular channels 41. This moves the reel teeth 53 into mesh with the teeth of the adjacent gear 40. Continued pulling upon the key will force its removal from between the clip fingers 57 and cause rotation of its reel through the medium of its cord 54. This will cause rotation of the gear sleeve 19 against the action of the spring 37. When the key has been withdrawn from the confines of the case, as illustrated in Figs. 1 and 3, to the required length of the cord 54, the ratchet teeth 32 and 34 will engage to prevent reverse rotation of the gear sleeve 19 by the action of spring 37. After the key has been used it is only necessary to press the non-circular end 28, of shaft 25, inwardly, which will move the gear sleeve 19 axially, against the action of leaf spring 35, and move ratchet teeth 32 out of engagement with the ratchet teeth 34 on the casing end 30. When these ratchet teeth are out of engagement the gear sleeve 19 will be reversely rotated by the action of spring 37, and the reel, through the medium of its gear teeth 53 in mesh with the teeth of the adjacent gear on the sleeve 19, will cause reverse rotation of the reel, winding up the cord 54 and withdrawing the key adjacent the clip fingers 57. Inasmuch as the clip fingers 57 will be of sufficient strength to hold the keys fairly tight, it may be necessary to force the key end between the fingers 57 until the nubs 58 engage its eye. In forcing the key end between the clip fingers 57 the carrier will be moved from the position shown in Fig. 3 to that shown in Fig. 2, and thus move the reel 50 out of meshing engagement with the adjacent gear 40.

By this arrangement any one of the keys may be individually withdrawn without effecting any mechanical movement of any of the others. The act of removing the key throws the appropriate mechanism into meshing engagement with the automatic return, while its return conversely disengages these members.

It may be here mentioned that the carriers 42 are, in addition to being yieldingly supported upon the gear sleeve 19, slidably supported at their outer ends in the aperture 11 of the housing 10, as clearly shown in Figs. 2 and 3. This gives a comparatively rigid support with the ease of movement desired in devices of this kind.

While the gear sleeve and cooperative arrangement of the reels is my preferred construction, nevertheless, mere frictional engagement between the periphery of the sleeve 19 and the reel sides 50, to effect their cooperative rotation, will also come within the broad principles of my invention and may be utilized if desired.

Having described a preferred form of my invention, I claim:

1. In a device of the character described, the combination of a rotatable gear, spring means to yieldingly hold the gear against rotation, a reel normally out of operative engagement with the gear and having teeth adapted to mesh therewith, a cord wound upon the reel, the gear and reel being relatively movable to effect co-operative engagement whereby unwinding the cord from the reel will effect rotation of the gear against the action of the spring means and said spring means will effect reverse rotation of the reel to rewind the cord thereon.

2. In a device of the character described, the combination of a rotatable gear, spring means to yieldingly hold the gear against rotation, a reel normally out of operative engagement with the gear and having teeth adapted to mesh therewith, a cord wound upon the reel, the gear and reel being relatively movable to effect co-operative engagement whereby unwinding the cord from the reel will effect rotation of the gear against the action of the spring means and said spring means will effect reverse rotation of the reel to rewind the cord thereon.

3. In a device of the character described, the combination of a non-rotatable shaft, a member revolubly mounted on said shaft, a spring secured at one end to said shaft and at its opposite end to the rotatable member to yieldingly hold said member against rotation in one direction, a reel, a cord wound upon the reel, and means to operatively connect said reel and revoluble member whereby unwinding of the cord from the reel will rotate the revoluble member against the action of the spring and the spring will operate to rotate the reel in the reverse direction to rewind the cord thereon.

4. In a device of the character described, the combination of a non-rotatable shaft, a gear revolubly mounted on said shaft, a helical spring secured at one end to the shaft and at its opposite end to the gear to yieldingly hold said gear against rotation in one direction, a reel, a cord wound upon the reel, and means to operatively connect said reel and gear whereby unwinding of the cord from the reel will rotate the gear against the action of the spring and the spring will operate to rotate the reel in the reverse direction to rewind the cord thereon.

5. In a device of the character described, the combination of a non-rotatable shaft, a gear revolubly and axially movably mounted on the shaft, a spring secured at one end to the shaft and at its opposite end to the gear to yieldingly hold said gear against rotation in one direction, ratchet teeth fixed

adjacent the gear, a ratchet in connection with the gear adapted to co-operatively engage the first mentioned teeth to hold the gear against rotation by the spring, means to yieldingly hold said teeth in engaging relation, a reel having teeth adapted to mesh with the gear teeth, a cord wound upon the reel, said gear and reel being relatively movable to effect co-operative engagement whereby unwinding the cord from the reel will effect rotation of the gear against the action of its spring and said spring will operate to rotate the reel in the reverse direction to rewind the cord thereon.

6. In a device of the character described the combination of a rotatable member, a plurality of independently movable reels, cords wound upon said reels, means to yieldingly hold the rotatable member against rotation in one direction, said reels being normally out of operative connection with the rotatable member and there being means whereby the reels may be independently operatively connected with the rotatable member to effect a rewinding of the cords thereon after they have been unwound therefrom.

7. In a device of the character described, the combination of a rotatable gear, a plurality of independently movable reels mounted adjacent the gear, means to rotate the gear, cords wound upon the reels, and means to independently operatively connect the reels with the gear whereby the cords are rewound thereon atfer they have been unwound therefrom.

8. In a device of the character described, the combination of a rotatable member, spring means to yieldingly hold said member against rotation in one direction, a plurality of reels mounted adjacent said revoluble member and normally out of operative connection therewith, cords wound upon said reels, and means to selectively, independently operatively connect said reels and rotatable member whereby unwinding of the cords from the reels will effect rotation of the rotatable member against the action of its spring, and said spring will effect reverse rotation of the reels to rewind the cords thereon.

9. In a device of the character described, the combination of a rotatable gear, spring means to yieldingly hold the gear against rotation in one direction, a plurality of reels independently mounted adjacent the gear and normally out of operative connection therewith, cords wound upon said reels, said reels having teeth adapted to mesh with the gear, said reels being independently movable to selectively operatively connect them with the gear whereby unwinding of the cords from the reels will effect rotation of the gear against the action of its spring and said spring will effect a reverse rotation of the reels to rewind the cords thereon.

10. In a device of the character described, the combination of a non-rotatable shaft, a sleeve gear revolubly mounted on the shaft, a spring secured at one end to the shaft and at its opposite end to the gear to yieldingly hold said gear against rotation in one direction, means for releasably holding said gear against rotation by the spring, a plurality of reels independently mounted adjacent the gear and normally out of operative connection therewith, cords wound upon said reels, said reels having teeth adapted to mesh with the gear, said reels being independently movable to selectively operatively connect them with the gear whereby unwinding of the cords from the reels will effect rotation of the gear against the action of its spring and the spring will effect reverse rotation of the reels to rewind the cords thereon.

In witness that I claim the foregoing I have hereunto subscribed my name this 24 day of December 1925.

JOHN P. DEL'EAU.