Sept. 25, 1934. M. ANDIS 1,974,558

KEY HOLDER

Filed Dec. 24, 1932

Fig. 1.

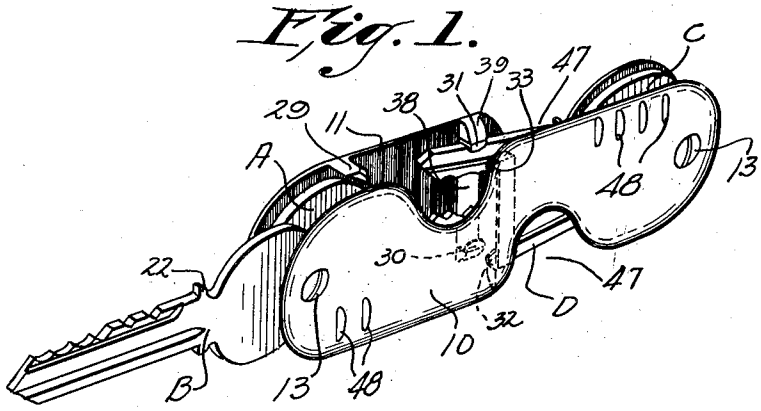


Fig. 2.

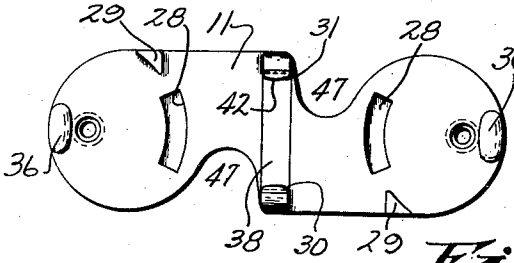


Fig. 3.

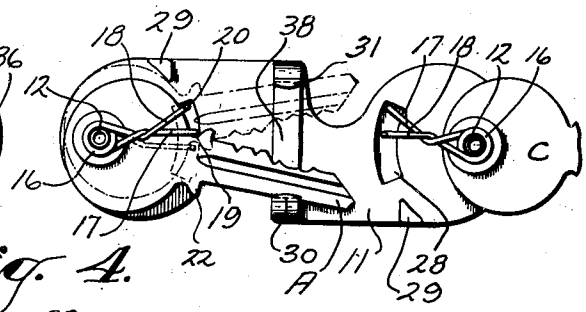


Fig. 4.

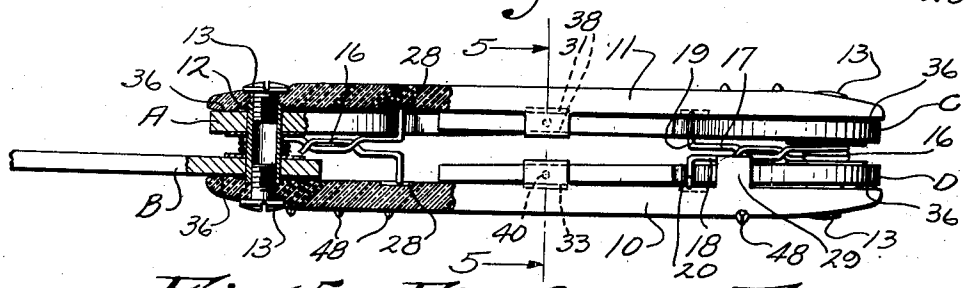


Fig. 5.

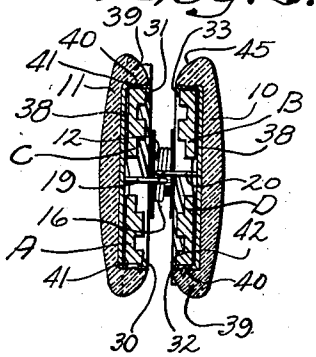


Fig. 6.

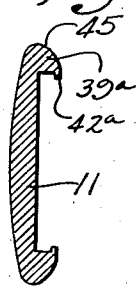
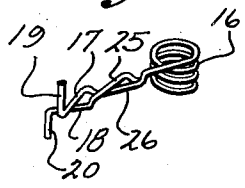


Fig. 7.



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Patented Sept. 25, 1934 1,974,558

UNITED STATES PATENT OFFICE

1,974,558

KEY HOLDER

Mathew Andis, Racine, Wis.

Application December 24, 1932, Serial No. 648,753

24 Claims. (Cl. 59—96)

My invention relates to improvements in key holders of that type designed to normally retain keys in definite relation to each other within a protective casing in such a manner as to facilitate the projection and return of a selected key.

An object of my invention is to provide an improved form of key holder having paired side plates between which keys may be folded and fixedly held under resilient pressure, subject to the manual release of a selected key for projection to a position convenient for use, or removal,—said holder also permitting the removal and replacement of keys without material change in tension of the pressure applying means or in the pressure upon a remaining key held by the same means.

Further objects are to provide a holder having paired side plates and suitable spacing means adapted to also hold the keys between the plates with their shanks in pivotal relation thereto; to provide tensioning means for resiliently urging the ward carrying portions of the keys in engagement with the side plates or with associated detents; to provide means whereby suitable detents of wear resisting material may be connected with non-metallic holder members or plates; and to provide improved means for identifying the respective keys when observation is not possible by reason of darkness or for any other reason.

A general object is to provide an inexpensive key holder to be carried in the pocket of the user to not only connect keys in a group, but to keep them in a predetermined order, protect the clothing from wear, and facilitate key selection and manipulation.

In the drawing:

Figure 1 is a perspective view of my improved key holder showing one of the keys projected in position for use.

Figure 2 is an inner face view of one of the side plates with the keys and springs removed.

Figure 3 is a similar view showing the springs in position with one key folded and a fragment of another key projected.

Figure 4 is an elevation partly in section through one of the pivotal spacing connections and exposing the extremities of the resilient key actuating arms.

Figure 5 is a section drawn to line 5—5 of Figure 4.

Figure 6 is a similar section showing a modification adapted for use when the side plates are formed of metal.

Figure 7 is a detail view of one of the springs.

Like parts are designated by like reference characters throughout the several views.

My improved key holder is formed with a pair of side plates 10 and 11, preferably formed of composition material such as bakelite, although if desired it may be formed of metal in which case aluminum will be preferred.

Near each end, each plate is provided with a circular socket which receives a spacing sleeve 12 against the ends of which the plates are clamped by connecting screws 13, the heads of which may be counter sunk in the outer faces of the plates. These screws pass through apertures in the plates and have threaded engagement within the spacing sleeve 12 as best illustrated in Figure 4.

By removing one of these screws, the plate may be moved outwardly to a slight extent and swung laterally upon its connection at the opposite end to allow an apertured key shank to be adjusted to the end portion of the spacing sleeve, whereupon the plate 10 (or 11) may be swung back into position and clamped to the end of the sleeve 12. By employing clamping screws 13 at each side, two keys may be pivotally mounted on the sleeve 12 at each end of the plate.

A spring 16, coiled about the central portion of the sleeve 12, is adapted to urge both key shanks toward their associated plates 10 and 11 respectively, and the end portions of this spring are extended to form a pair of arms 17 and 18, having elbowed extremities 19 and 20, which are each adapted to engage an associated key at the junction of its shank head with the ward carrying portion or between the shank head and the stop flanges 22 at the base of the ward carrying portions.

The spring arms 17 and 18 are preferably provided with intermediate oppositely extending offset portions 25 and 26, which allow the arms to be crossed and interlocked with each other as shown in Figure 7, whereby each arm limits the outwardly swinging movement of the other when the springs are released from normal assembly with the plates and pivotal spacing sleeves 12.

When in normal assembly the extremities of the elbowed portions 19 and 20, may extend across their associated keys into arcuate sockets 28 formed in the plates 10 and 11, whereby these sockets may serve to limit rotative movement of the coil 16 about its sleeve 12. Stops 29 require correct insertion of keys.

In the spring shown in Figure 7, the tension of the coil 16 tends to swing the arm 18 in a clockwise direction and the arm 17 in a counter-clock-

wise direction with reference to the open end of the coil exposed to view in Figure 7.

Therefore, when assembled in association with a pair of keys on opposite sides of the arms 17 and 18, each of the keys will be urged in a direction tending to project it from between the plates in a swinging movement by pressure of the elbowed end portions of the arms 17 and 18 against the front margins of the keys i. e., the margin facing inwardly and occupied by the wards in each instance.

In Figure 3 one key of the left hand pair is absent and the extremity 19 of the arm 17 is shown in full lines at the exposed end of the arcuate recess 28. The wall of the recess serves as an abutment to take the reactionary pressure of the spring, which remains under tension and continues to urge the elbowed portion 20 of the other arm in a direction tending to project its associated key A from its normal folded position between the plates. But normally such key is prevented from being so projected by a hook shaped detent 30 on the plate 11 in which the back side of the ward carrying portion engages as best shown in Figure 5, said back side facing outwardly.

If another key, corresponding with the key B in Figure 4, is inserted in the holder from the opposite side, the head of its shank will further compress the same spring coil 16. This key will first occupy a projected position, and when swung to the folded position will engage and carry the elbowed end portion 19 to the position indicated by dotted lines in Figure 3, whereupon the ward carrying portion of the second key B may be engaged with the hook shaped detent 32 on the plate 10.

It will, of course, be understood that when the second key is engaged with the pivot or spacing sleeve 12 as assumed in the foregoing paragraph, its holding plate 10 will be swung to normal position and secured by its clamping screw 13 before such key will be swung to folded position and engaged with the detent 32, on the plate 10.

The spring 16 will serve as a compression spring, preferably under tension at all times when the plates 10 and 11 are in normal connected position, at least when either one or both of the keys A and B are present in the holder. The keys C and D at the other end of the holder will be similarly supported and held in position by similar detents 31 and 33 on the plates 11 and 10 respectively.

It will be observed that the spring 16 is not only under compression tending to press the pivot heads of the key shanks against the respective plates 10 and 11, but it is also under coiling tension tending to separate the arms 17 and 18. By interlocking the portions 25 and 26 of these arms, their movement of separation is limited although each arm is left free to be moved by its associated key in opposition to the spring tension. Therefore, the keys will be normally held against movement, not only by the detents, but against movement on the pivot sleeves 12 by being pressed against the adjacent plate. By providing the extremity of each plate with an inwardly projecting boss 36 to receive the pressure of the key shank head at the side of the pivot opposite that occupied by the ward carrying portion, I utilize these springs 16 to press the ward carrying portions in the direction of the adjacent plates, the keys occupying a slightly oblique position within the holder. The pressure of the spring not only prevents the keys from rattling or vibrating, but it also tends to urge any key that may be improperly engaged with the detent toward a proper or full engagement therewith.

If the side plates 10 and 11 are formed of non-metallic material or of soft material, I preferably employ sheet metal detent strips 38 of harder material and anchor them in slightly recessed channels in the inner faces of the plates as indicated in Figure 5, in which the plates 10 and 11 are provided with shoulders 39 to receive the hook shaped ends of the detent strip 38 and the detent strips are anchored in position by projections 40 on the shoulders 39, adapted to be received in sockets or apertures 41 formed in the hooked ends of the detent strip. The inturned extremities 42 prevent an accidental release of the key after it has once been properly engaged between these extremities and the central portion of the strip 38. By slightly buckling the central portion, the end portions may be inserted between the shoulders 39, whereupon the strip may be sprung into the position in which it is illustrated in Figure 5. It will then be retained against movement longitudinally of the holder by its anchorage in the receiving channel, and it will be retained against movement perpendicular to its associate side plate 10 or 11 by engagement of the rounded projections 40 in the sockets or apertures 41.

Where the side plates are formed of metal, having sufficient hardness and strength to resist wear or breakage, they may be formed with shoulders 39*a* and anchoring projections 42*a*, in which event the detent strips 38 may be omitted.

The outer margins of the shouldered portions of the plates are preferably rounded or bevelled as indicated at 45 whereby, when any key is returned to the holder after having been projected as indicated at the left hand in Figure 1, it will be guided by this rounded or bevelled face of the holder into the space between the plates and under continued folding pressure will be brought to a position where the spring 16 will swing its ward carrying portion underneath the anchorage projection 42 or 42*a*. The side margins of the plates 10 and 11 are provided with rounded recesses 47 adapted to admit the finger or a thumb of the user to push the key inwardly to folded position or to release a key from the detent or anchorage projection 42 by first pressing it toward the center line of the plate and then pressing it toward the center of the space between the plates until it passes from beneath its retaining anchor or detent.

To permit identification of the keys in the dark or at any time when they can not be readily identified by vision, the outer surfaces of the plates 10 and 11 are provided with elongated projections 48, so arranged that the key D would be identified by a single projection on the outer surface of the plate near the pivotal connection of that key. The key C will be similarly identified by two projections, the key B by three projections, and the key A by four projections, the number and arrangement of projections in each case not being material if differentiated from the identifying projections of the other keys.

The outer surfaces of the plates 10 and 11 and of the identifying projections are contoured or rounded to prevent injury to clothing and reduce wear to a minimum, the key holder being adapted to be carried in a pocket as a pocket knife is carried. All of the keys are normally held fixedly in the holder since the springs are under

coiling tension and the coils are under compression, at least when one or both of the associated keys are in position.

Also, the uncoiling or tension relieving movement is primarily limited by the keys themselves when engaged with their detents; by the end walls of the arcuate recesses 28 when projection or removal of a key allows a slight recoil; and by the interlocking of the offset portions of the arms 17 and 18 when not otherwise held against recoil. This facilitates the insertion of a key in the holder since the mere movement of the key to folded position causes it to engage the extremity of the associated arm 17 or 18 and carry it to its normal key holding position.

I claim:

1. A key holder comprising a pair of spaced holder plates, key holding and pivoting members connecting the end portions of the plates, intermediate key engaging detents and means for resiliently pressing each pivoted key into normal engagement with one of the detents, said detents extending partially across the space between the plates.

2. A key holder comprising a pair of spaced holder plates connected in spaced relation with each other by transverse pins adapted to serve as key supporting pivot members insertable through apertured key shanks, key engaging detents carried by the respective plates, each detent extending partially across the space between the plates with sufficient space between it and the opposing plate and its detents to permit a released key to swing outwardly upon its pivotal connection from between the plates, and means for normally holding each key in releasable engagement with its associated detent.

3. A key holder comprising a pair of plates, spacing sleeves between the plates, screws connecting the spacing sleeves with the plates, and each adapted when released to permit the pivotal connection of a key with the spacing sleeve, a spring coiled about each spacing sleeve under compression and adapted to press a pair of pivoted keys in opposite directions against the respective side plates, and key retaining projections on the inner faces of the side plates intermediate of their ends, said spring having its end portions extended to form arms adapted for tension engagement with the keys at a distance from their pivotal connections to urge them into engagement with the retaining projections and to project them from between the plates when manually released from their associated projections.

4. A key holder comprising a pair of plates, spacing sleeves between the plates, screws connecting the spacing sleeves with the plates and each adapted, when released, to permit the pivotal connection of a key with the spacing sleeve, a spring coiled about each spacing sleeve and adapted to press a pair of pivoted keys in opposite directions against the respective side plates, and key engaging detents on the inner faces of the side plates, intermediate of their ends, said spring having its end portions extended to form arms adapted for tension engagement with the keys at a distance from their pivotal connections to urge them into engagement with the detents and to project a key from between the plates when manually released from its associated detent, said spring arms being interlocked to limit their uncoiling reaction.

5. A key holder comprising a pair of plates, spacing sleeves between the plates, screws connecting the spacing sleeves with the plates, and each adapted, when released, to permit the pivotal connection of a key with the spacing sleeve, a spring coiled about each spacing sleeve under tension and adapted to press a pair of pivoted keys in opposite directions against the respective side plates, and key retainers adapted to normally hold the keys between the plates, said spring having its end portions extended to form arms adapted for tension engagement with the keys at a distance from their pivotal connections to normally urge them into engagement with the key retainers and project them when released, said spring arms being adapted for engagement with their associated side plates to limit their uncoiling reaction and prevent rotation of the coil upon the pivot sleeve.

6. A key holder comprising a pair of spaced plates, means for releasably supporting keys between the plates, resilient means for pressing the keys in opposite directions against the plates and urging their ward carrying portions outwardly from between the plates, and means for normally holding said ward carrying portions between the plates subject to manual release by manipulation.

7. A key holder comprising a pair of spaced side plates provided with connecting pins each also adapted for pivotally supporting a pair of keys, said plates having inwardly extending key retaining detents near the margins of each plate, each detent being adapted to positively prevent outward movement of the key in the plane which it normally occupies between the plates and requiring manual manipulation of a selected key to release the same from the detent with which it normally engaged.

8. A key holder comprising a pair of spaced side plates provided with connecting means adapted for pivotally supporting a pair of keys, said plates having inwardly extending key retaining detents near the margins of each plate extending across the plane normally occupied by an associated key, resilient means for normally holding each key in engagement with its associate detent in a position requiring manual manipulation of a selected key to release the same from the detent with which it normally engaged, said plates being marginally recessed to facilitate manual pressure in opposition to said resilient pressure to retract from the detent, and effect the release of a selected key.

9. A key holder adapted at its respective ends to engage and pivotally support keys in folded positions within the holder, resilient key projecting means, cooperative means for normally retaining the keys in folded position within the holder, said retaining means comprising normally unyielding detents with each of which an associated key may be held in pressure engagement by key projecting means, each detent being adapted to require its associated key to be manually moved inwardly and laterally preparatory to a projection of the key from the holder.

10. A key holder comprising a pair of plates, spacing sleeves between the plates, screws connecting the spacing sleeves with the plates, and each adapted when released to permit the pivotal connection of a key with the spacing sleeve, a spring coiled about each spacing sleeve under tension and adapted to press a pair of pivoted keys in opposite directions against the respective side plates hook shaped key retaining projections on the inner faces of the side plates intermediate of their ends, and key engaging arms connected with said spring and adapted to engage the keys

at a distance from their pivotal connections to urge them into engagement with the retaining projections under the recoiling tension of the spring and to project a selected key from between the plates when manually released from its associated projection, said plates being provided with arm engaging abutments on their inner faces adapted to limit rotative movement of the coil upon the sleeve.

11. In a key holder having side plates and adapted to support a group of pivotally connected keys, hook shaped key retaining detents on the side plates each adapted to receive the ward carrying portion of one of the keys, and relatively hard facing strips for the detents.

12. In a key holder having walls adapted to support a group of pivotally connected keys, the combination with the holder walls, of hook shaped key retaining detents composed of outer portions integral with said walls and relatively hard lining portions for engagement with the keys.

13. In a key holder, the combination with a set of spaced walls between which keys may be received and a key retaining pivot pin connecting said walls, of a spring coiled about said pivot pin under compression between the walls of the holder and having extended arms formed with key engaging end portions adapted to urge keys in opposite directions to project them from the holder, said coiled spring being under compression tending to urge keys toward the respective ends of the pivot pin, and under coiling tension tending to swing said arms to key projecting positions.

14. In a key holder provided with spaced walls connected by key engaging pivot pins, a key projecting spring coiled under tension and having the ends of the coil extended to form key projecting arms each normally in engagement with an associated key, said arms being adapted to interlock and limit their uncoiling movement to the extent required for projection of a key from the holder, and also adapted to be engaged by said associated keys to normally hold them under greater tension than that of their interlocking position.

15. In a key holder, a key retaining and projecting spring comprising a coil of resilient wire adapted to be compressed between a pair of pivoted key shank heads in the holder, the ends of said wire being extended, crossed, and provided with key engaging end portions, said crossed portions of the wire being adapted to interlock and limit their uncoiling movement after projection or removal of a key, whereby to hold the coil under tension.

16. In a key holder provided with spaced walls connected by key engaging pivot pins, a key retaining and projecting spring comprising a coil of resilient wire adapted to be compressed between a pair of pivoted key shank heads in the holder, said wire being provided with key engaging end portions, and means for limiting the tension relieving movements of the spring arms substantially to the degree of recoil required for projecting a key from the holder.

17. In a key holder, a key retaining and projecting spring comprising a coil of resilient wire adapted to be compressed between a pair of pivoted key shank heads in the holder, the ends of said wire being extended, crossed, and provided with key engaging end portions, said holder being adapted to limit the tension relieving movements of the arms when the portion of the key engaged thereby has been projected from the holder, and said arms being also adapted to interlock and limit such movements independently of the holder and keys, whereby to relieve the pressure of said arms upon the projected key and to hold the coil under tension when the holder is opened for removal or insertion of a key.

18. In a key holder provided with spaced walls connected by key engaging pivot pins, a key ejecting coiled spring having end portions extended and adapted to serve as key ejecting arms, said arms having intermediately offset portions, crossed and adapted to interlock after predetermined key ejecting movements and hold the arms under predetermined minimum tension.

19. In a key holder adapted to support a group of pivotally connected keys, the combination with the holder walls, of rigid inwardly extending hook-shaped key-retaining detents, one for each key, adapted and positioned for normal interlocking engagement with such key to normally limit its swinging movement about its pivotal axis, and resilient means for normally holding each key within the hook of an associated detent subject to release under manual pressure in opposition to said holding means and in a direction to swing the key laterally with reference to the detent.

20. In a key holder, the combination with a wall plate and a key engaging pivot pin, of a projection on the inner face of the plate at one side of the pivot pin, a detent on the plate at the other side of the pivot pin adapted to permit interlocking engagement of a key therewith, and resilient means for pressing the key in the direction of said projection and detent, the projection being adapted to hold the pivoted end of the key at a greater distance from the plate than the end of the key engaged by the detent whereby to normally prevent lateral movement of the key away from the plate and detent.

21. In a key holder, the combination with a side plate and a key engaged pivot pin, of a projection on the inner face of the plate adjacent to and at one side of the pivot pin, a detent on the plate at the other side of the pivot pin, a spring coiled about said pivot pin under tension urging the key toward an oblique position in pressure engagement with said projection near one end of the key and with the side plate near the other end, and means for holding one end of the spring in a relatively fixed position with reference to the key, the other end portion of the spring being engageable with the key and adapted to urge the key under resilient pressure into interlocking engagement with the detent.

22. In a key holder, the combination with a side plate and a key engaged pivot pin, of a projection on the inner face of the plate adjacent to and at one side of the pivot pin, a detent on the plate at the other side of the pivot pin, a spring coiled about said pivot pin under tension urging the key toward an oblique position in pressure engagement with said projection near one end of the key and with the side plate near the other end, means for holding one end of the spring in a relatively fixed position with reference to the key, the other end portion of the spring being engageable with the key and adapted to urge the key under resilient pressure into interlocking engagement with the detent, and a stop connected with said plate in a position for engagement with the key engaging end portion of the spring when the key is removed.

23. In a key holder, the combination with a side plate having a key pivot, of a rounded bearing projecting inwardly at one side of the pivot,

a key engaging detent at the other side of the pivot, and resilient means for holding a key in an oblique position with one end in pressure engagement with the bearing and the other end in pressure engagement with the plate and detent.

24. A key holder provided with non-metallic side plates connected by cross pins adapted to serve as pivotal supports for keys within the holder, said plates having inwardly extending marginal projections with which keys so pivoted may engage, and resilient means for normally urging the keys, each in the direction of one of the projections, said side plates and their projections having lining strips of non-frangible, wear resisting material affixed to their inner surfaces at the points contacted by the keys when swinging into engagement with the projections.

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