(No Model.)

C. C. BALSTON.

POCKET KNIFE.

No. 492,620. Patented Feb. 28, 1893.

Fig. 1.

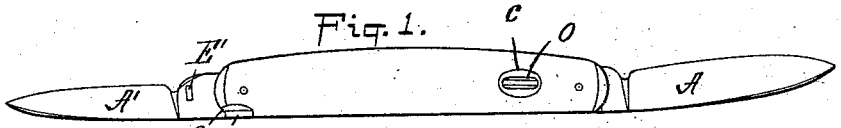


Fig. 3.

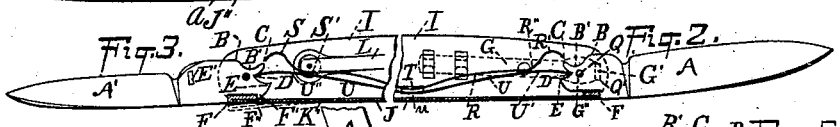


Fig. 2.

Fig. 5.

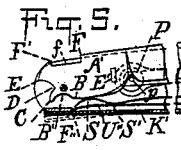


Fig. 4.

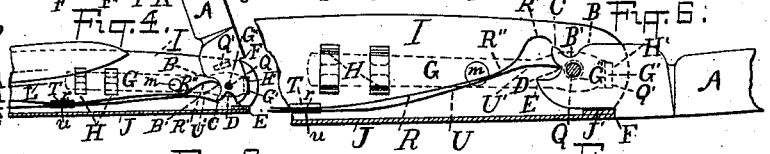


Fig. 6.

Fig. 7.

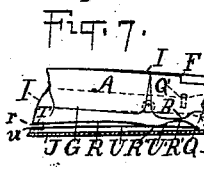


Fig. 8.

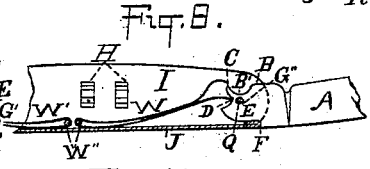


Fig. 9.

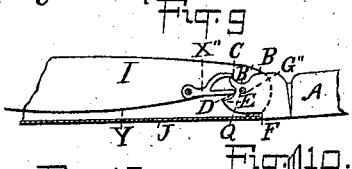


Fig. 12.

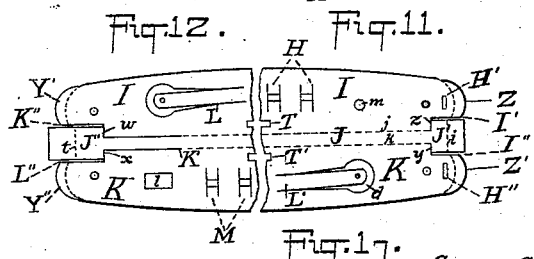


Fig. 11.

Fig. 13.

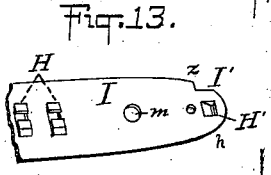


Fig. 10.

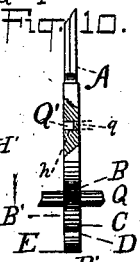


Fig. 14.

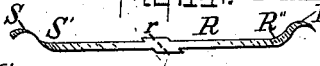


Fig. 17.

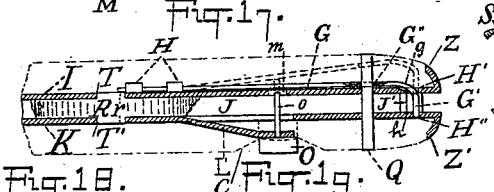


Fig. 15.

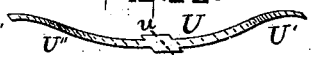


Fig. 18.

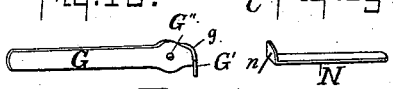


Fig. 19.

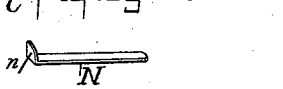


Fig. 16.

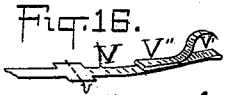


Fig. 20.

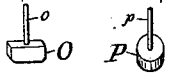


Fig. 21.

Fig. 23.

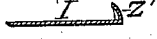


Fig. 24.

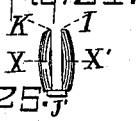


Fig. 22.

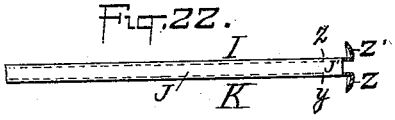
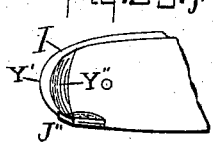


Fig. 25.



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E. E. Meares

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BY Jno. Barker

ATTORNEY.

UNITED STATES PATENT OFFICE.

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POCKET-KNIFE.

SPECIFICATION forming part of Letters Patent No. 492,620, dated February 28, 1893.

Application filed July 2, 1892. Serial No. 438,771. (No model.)

To all whom it may concern:

Be it known that I, CLYDE CHESTER BALSTON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Pocket and other Knives, of which the following is a full, clear, and exact specification.

My invention relates to improvements in automatic knives; and the objects of my invention are, first, to provide a knife the tangs of the blades of which shall be operated upon by a spring, or springs, so formed and arranged as to exert a constant pressure upon the blade tangs at any and all positions thereof; secondly, to provide an automatic knife having a constant spring pressure upon the tangs of the blades and furnished with release and locking devices to hold the blades in position when open or closed and enabling them to be easily released from either position; and thirdly, to provide a device of the above mentioned character, which shall be simple and effectual in its construction and operation.

With these ends in view I refer to the annexed specification and drawings explaining the construction and arrangement of parts, and combination of parts, in which my invention consists, as hereinafter pointed out in the claims.

In the accompanying drawings Figure 1 is a side view of the completed knife with the blades extended, showing the position of a push piece or button and the metal end caps or shields; also the end of a locking device with a nick formed over the same. Fig. 2 is a view in part, showing one plate removed to expose the manner of construction of the blade tang, the springs and locking device. Fig. 3 is a view in part with one plate removed, showing the blade and spring action; the push spring, and a modified form of locking device. Fig. 4 presents the same view as Fig. 2 with a broken blade partly thrown open, illustrating the action of the springs upon the blade tang. Fig. 5 is a part of the same view as Fig. 3, showing the position of the blade when closed, and the action and position of the springs and lock. Fig. 6 is an enlarged view of Fig. 2 showing more clearly the shape of the blade tang, springs, and locking device, and their relation to each other. Fig. 7 is a part of the same view as Fig. 4 with the blade entirely closed and locked, showing action of the spring and lock. Fig. 8 is a similar view in part to Fig. 2 with the lock spring removed, showing the action of a modified form of main spring. Fig. 9 is a view in part, with one plate removed, showing the position and action upon the blade tang of a pivoted jaw actuated by a plain spring. Fig. 10 is a vertical sectional view of a knife blade and tang, with a broken pin inserted in the pivot hole, and a portion of the tang removed revealing the lock recess, or hole and bevel. Fig. 11 is a plan view in part of the side plates and back, showing a push spring, a lock spring fastening device, lock recesses or punctures, and the end shields or butts. Fig. 12 is a view in part of the side plates and back and other devices of Fig. 11, with the additional back lock and spring. Fig. 13 is a view in perspective of one half of a side plate with the lock spring fastening device, back shoulder, and the lock recess or hole, and bevel. Fig. 14 shows the upper or back action spring in perspective, with the bearing lugs at its sides. Fig. 15 is a perspective view of the lower or main spring with the bearing lugs at its sides. Fig. 16 is a modified form of a single spring taking the place of the springs shown in Figs. 14 and 15. Fig. 17 is a sectional plan view of one half of the knife with the blade removed, showing a portion of the upper or back action spring in place, the action of the push spring, button, and pin, upon the lock spring; the position of the lock spring in the recesses or slots; the attachment of the lock spring to the side plate and the form of the butt ends or shields. A portion of the lock spring is broken away showing the passage of the blade pivot through the spring to guide and strengthen its action. Fig. 18 is a face view of the detached lock spring. Fig. 19 is a view in perspective of a modified form of a catch spring. Fig. 20 is an elongated push button and pin. Fig. 21 is another form of the same. Fig. 22 is a view in part of the knife back, end and tongue, and shields in cross section. Fig. 23 is a horizontal sectional view of a portion of a side plate and shield. Fig. 24 is an end view of the shields and doubled tongue. Fig.

25 is a perspective view in part of the completed knife end of Figs. 3 and 5 with blade removed, showing a plate, shield, back lock spring and handle.

A represents a knife blade, pivoted to the side plate I by means of pivot Q. On the tang of said blade are formed a tooth C, and extensions B E forming between them the recesses B′ D, Figs. 2, 4, 6, 7, 8, 9. In the tang of blade A is a recess, or hole Q′, which, as will be hereinafter described serves as a means for locking the said blade in position when open. The lock recess Q′ in blade A may be so formed as to pass only partially, or wholly through the said blade, as shown by the dotted lines *q* Fig. 10.

With the plates I K are arranged the main spring R and the reaction spring U, each having their side lugs or extensions *r u* inserted into the slots T T′ Figs. 2, 4, 6, 7, 11, 12, 17 when the said plate K is placed in its proper position. The reaction spring R is stamped from spring sheet or ribbon metal and is formed straight between the points R″ S′ and upward at said points to R′ S, then downward toward its ends. The main spring U is also stamped from spring sheet or ribbon metal, preferably thicker than that employed for spring R, and is formed upward between the points U′ U″, and slightly downward from the said points toward its ends.

In the springs W W′ Fig. 8 the ends are formed to correspond to the shape of the ends of the springs R U, and near their central portions they are each bent or doubled around the pins W″, the lower part of the under portion of the said springs resting against the knife back J, (each spring formed of one piece of spring sheet or ribbon metal.)

The single spring V, Fig. 16 is formed of one piece of spring sheet or ribbon metal with the lugs or extensions *v* and folded upon itself at V′ V″, its extreme ends so shaped as to correspond with the same portions of the springs R U.

In Fig. 9 a jaw X″ is pivoted to the side plates and acted upon by means of a plain spring Y; the said jaw acting upon the projections of the blade tang precisely as the teeth of two cog wheels act upon each other.

To the plate I is attached by means of the fastening device H formed out and over as in Figs. 13 and 17, the lock piece or spring G, Fig. 18 having the guide hole G″ through which passes the blade pivot Q. The said lock spring is bent at *g* to form the lock or tongue G′ which passes through the recess or slot H′ of plate I, Figs. 2, 6, 17, or into the beveled aperture of said slot, Fig. 13.

In the plate K is formed the push spring L′ bent out and away from said plate Figs. 11, 17, and surrounded at its free or movable end by the opening *d*. To the said spring is attached, by means of the pin *o* or *p* the push piece or button O or P, Figs. 20, 21; the pins of either of the said buttons being firmly secured to the spring L′, and passing through the hole *m* of the plate I rest against the lock piece or spring G.

The body plates I K having the back J; the push springs L L′, both bent out and away from said plates; the fastening devices H M formed as in Figs. 11, 12, 13, and 17; the lock recesses or slots H′ H″; the slots T T′, Figs. 11, 12, 17; and the projections or shields Z Z′ Y′ Y″; the recesses I′ I″ K″ L″ forming the shoulders *z y*, *w x*, against which the tongues J′ J″, doubled at the dotted lines *i t* fit; are all cut and formed of one piece of metal and folded on the dotted lines *j k*, Figs. 11 and 12.

Fig. 22 represents a partial view of the back J folded as before stated, with the side or body plates I K, the shields Z Z′ are here shown in cross section. The tongue J is doubled under as at the dotted line *i* and fitted into the recesses I′ II″ against the shoulders *z y* Fig. 11, and made flush at its edges and face with the side plates and back.

The spring K′ formed by splitting the back J for a short distance on the dotted lines *j k* Fig. 12, and bearing the tongue J″ is a modified form of a back spring lock, so constructed as to engage and lock the shoulder catch F′, which with the shoulder F, forms the lock recess *f* of the blade A′. The blade A′ is a modified form of the blade A, constructed with the shoulder catch F′ to engage the back spring lock J″ of the spring K′.

The outside handles of the knife are cut away on their under sides directly over the lock and push springs to admit of a free action of the same; and are also beveled or chamfered on their outer surfaces about the openings formed for the push buttons, to permit of an easy manipulation of the same.

Having thus described the manner of construction of my invention, in all its details, I will now proceed to set forth the *modus operandi*.

When the blade A of the knife is closed, the lock G′ of the piece or spring G, passing through the recess or slot H′ of the plate I, protrudes behind the extension E of the blade tang, (seen best in Figs. 6 and 7) or passes over and into the recess or slot H″ of plate K, thereby securely holding the said blade in position when closed. To open the blade A a pressure with the finger end upon the piece or button O, presses inwardly the push spring L′ of plate K; the pin *o* passing through the hole *m* of plate I and bearing against the piece or spring G, forces its tongue or lock G′ back through the slot H′ and clear from the extension E of the blade tang. The said blade then being without a check or lock, the spring U bearing upwardly against the reaction spring R at R″, presses the said spring at R′, against the plain or raised part B of the blade tang, thereby throwing it partially open. As the blade opens, the end of the reaction spring R spreads from the main spring U, widening the space between the ends of the said springs till the end of spring R fitting into the recess B′ bears against the blade tang at that

point. When the springs have separated sufficiently at their ends, the tooth C, entering between the said springs, receives the strain of the main spring U, which acting upon the said tooth, throws and holds the blade wide open. As the recess or hole Q′ in the tang of the said blade turns opposite the slot or recess H′ of plate I, the tongue or lock G′ of the spring G passes into the recess or hole Q′ in the blade tang, or by means of the hole through the said tang passes into the slot H″; the bend *g* of the piece G fitting into the bevel *h* of the blade tang, thereby locking the said blade securely in an open position. To unlock and close the said blade, a pressure upon the piece or button O acting upon the push spring L′, the pin *o*, and the lock spring G, displaces the lock or tongue G′ from the slot or hole Q′ of the blade tang, thereby releasing the blade. In closing the blade, the tooth C of the blade tang, pressing against the end of the main spring U, forces it inward toward the knife back J. The reaction spring R pressing upon the main spring U at R″ follows it in its backward course. As the end of the tooth C turns away from the end of the spring U the plain or raised part B of the blade tang bears upon the back action spring R and forces it in and close against the main spring U; the tongue or lock G′ of the spring G then again moves into position behind and under the extension E of the said blade tang, thereby securely locking the blade closed.

The action of the springs upon the tang of the blade A′ is in all respects similar to their action on blade A. The pressure upon the button P presses inwardly the push spring L, and acting by means of the pin *p* through the hole *l* (Figs. 5, 12) forces the catch piece *n* of the spring or piece N (Fig. 19) back and out of the recess E′ of the said blade tang. The blade flying open through the action of the springs, as hereinbefore described, presses out the back lock J″ and the spring K′, which lock snaps into the recess *f* formed by the catch shoulder F′ and the shoulder F on the said blade tang, thereby securely locking it in an open position. To unlock the blade, the lock J″ Figs. 1, 3, 5, 12, is sprung just out of the recess *f* Fig. 5 by means of the finger or thumb nail and the bevel or nick *a*, Fig. 1, in the handle. The blade may then be closed and again locks itself in that position.

The action of the springs W W′ and V is similar to that of R U and needs no description.

By the foregoing devices the springs are made to form into a very small space, admitting of the knife being made compact and neat in size and form, and at the same time strong and effective. The action of the spring actuated jaw X″ upon the parts B C of the blade tang, is similar to the action of two cog wheels upon each other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an automatic knife a blade having projections near its heel, combined with springs arranged to bear consecutively upon said projections as the blade turns to exert a continuous pressure upon the blade as it turns, substantially as and for the purpose set forth.

2. In an automatic knife a blade having extensions B C and recess B′ combined with springs formed at their ends to operate consecutively upon said extensions on the blade, the extension B resting upon one of said springs when the blade is closed, substantially as and for the purpose set forth.

3. In an automatic knife the combination of a blade having projections B C with the springs R U arranged to press upon said projections consecutively as the blade turns, and a stop to pass under a projection on the blade when the blade is closed, to hold it in the latter position, substantially as shown and described.

4. In an automatic knife the combination of a blade having a projection C with two springs, one of the said springs bearing against the blade to partly open it and spring the projection C into position to be acted upon by the other spring, the latter spring being placed in position to act on the projection C to fully open the blade, substantially as shown and described.

5. The combination in a knife of a blade having projections B C E and recesses B′ D, with a spring formed with side lugs or projections to enter recesses in the inner sides of the knife handle said spring being arranged to operate and exert a constant pressure upon said blade in any and all positions of the latter substantially as described.

6. In an automatic knife a handle having recesses T T′ combined with the springs R U bearing the side lugs or extensions *r u* that are adapted to enter said recesses whereby the springs are held in the handle, substantially as shown and described.

7. In an automatic knife a blade having an indenture on one side of the pivot and an extension on the opposite side thereof combined with a lock piece attached to the handle and adapted to pass through its side into the indenture in the blade when the latter is open to serve as a lock, and fitting upon the extension on the blade when the latter is closed to serve as a catch to hold the blade shut, combined with a spring to operate on said extension on the blade to open the latter, substantially as described.

8. In an automatic knife the side or body plates I K, the push springs L L′ integral therewith and cut therefrom, and the lock recesses or slots H′ H^2 in said plates, combined with the locking piece to enter said recesses and to be operated by said springs, and a blade to be held by the locking piece substantially as set forth.

9. In an automatic knife the side or body plates I K, the push springs L L′ integral therewith and cut therefrom and the locking recesses or slots H′ H^2 cut therein and the

fastening devices N M also cut therefrom, combined with a locking piece held by said fastening devices and with a blade, substantially as set forth.

10. In an automatic knife the side or body plates I K the push springs L L′ integral therewith and cut therefrom, the lock recesses or slots H′ H² stamped therein, and the projections or shields Z Z′ Y′ Y″ integral with the side plates, substantially as shown and described.

11. In an automatic knife the combination of the side plates I K with a back J, the said sides and back being formed in one piece, the back J terminating with the tongues J′ J″, said tongues being doubled back on the dotted lines *i t* to stiffen them and fitting against the shoulders *z y*, *w x* of the recesses I′ I″ K″ L″, substantially as described.

12. In an automatic knife the combination of the side plates I K with the back J all formed in one piece, the back J terminating with the tongues J′ J″ doubled back upon themselves on the dotted lines *i t* and fitting against the shoulders *z y w x* of the recesses I′ I″ K″ L″, the said side plates having a push spring L L′ cut therefrom and made integral therewith, substantially as described.

13. In an automatic knife the combination of the side plates I K with the back J, the said sides and back formed in one piece, the back J terminating with the tongues J′ J″ doubled back upon themselves at the dotted lines *i t* and fitting against the shoulders *z y*, *w x* of the recesses I′ I″ K″ L″, together with the lock recesses H′ H″, the lock piece fastening device H M formed in one piece with the sides and the aperture *m*, substantially as described.

14. In an automatic knife the combination of the side plates I K with the back J the said back and sides formed in one piece and terminating with the tongues J′ J″ doubled back upon themselves at the dotted lines *i t* and fitted against the shoulders *z y*, *w x*, and the recesses I′ I″ K″ L″ the said back being split for a distance at one end on the dotted lines *j k* to form the spring K′ to serve as a back lock, and a blade having a notch to receive the enlarged part of the said spring whereby the blade is locked in the open position substantially as described.

15. In an automatic knife the combination of a blade and a locking device therein with a push spring cut from the material of the handle, a push button attached to the spring and a pin extending from the spring across the handle to operate the locking device, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of June, 1892.

CLYDE C. BALSTON.

Witnesses:
MARK M. DECKER,
E. E. MEARES.