W. A. YERZLEY.

KNIFE.

APPLICATION FILED DEC. 13, 1911.

1,056,081.

Patented Mar. 18, 1913.

Fig. 1.

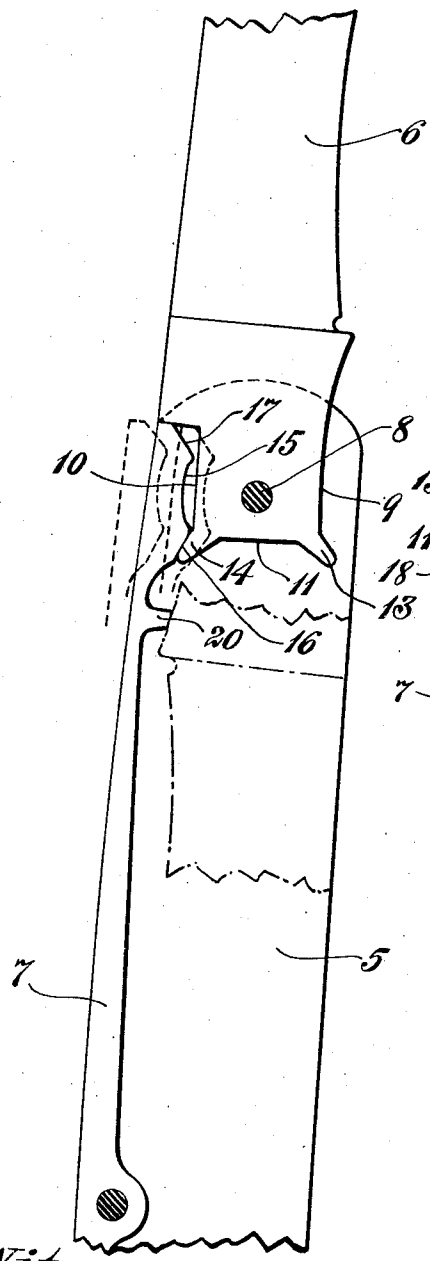


Fig. 2.

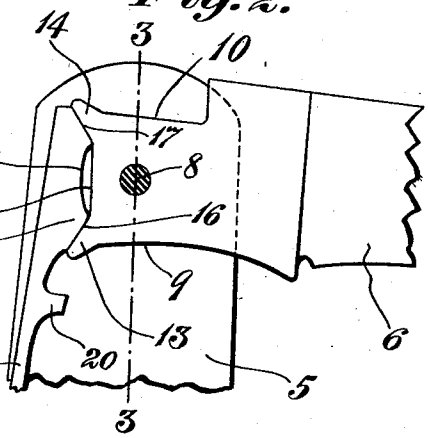
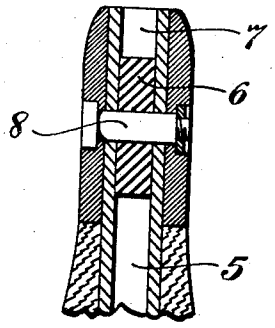


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM A. YERZLEY, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NAGLE RE BLADE KNIFE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KNIFE.

1,056,081. Specification of Letters Patent. Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM A. YERZLEY, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Knives, of which the following is a specification.

This invention relates to knives, and although I do not restrict myself to the incorporation thereof in any particular type or character of such an article, it is of especial utility when employed in connection with a pocket-knife, and among the objects of the invention are the provision of simple and effective means whereby the blade can be held in either an open or a closed position or both with the maximum amount of pressure and whereby the pressure of the spring on the opening and closing of the blade can be increased.

As already intimated the improvement can be used in conjunction with different kinds of knives, although I might observe that it is of especial utility when embodied in a removable-blade knife. I am familiar with a knife of this kind wherein the blade may be readily removed when in a half open position or one where said blade extends at approximately a right angle to the handle. The blade in such construction has three faces each of which is adapted for engagement by the free portion of the spring so as to hold the blade in the desired relation, two of these faces being upon the sides of the blade and the the other upon the butt or extreme inner end thereof and being intermediate the lateral faces. The intermediate face is nearer the center of motion of the blade than the two lateral or side faces so that when the blade is half open and when the spring is against the said intermediate face there is practically no tension upon the spring, it being in effect lax, so that it is a comparatively simple matter to remove the blade and substitute therefor another, this being done when a blade becomes broken or when it is desired to employ one of a different nature. A knife of this type is advantageous owing to the facility and ease with which the blade can be removed, but it is open to at least one serious objection, in that owing to the short distance between the center of motion and the intermediate face, the blade cannot flex or bend the free portion of the spring sufficiently to adequately tension the same, by reason of which said spring cannot operate against the blade with the proper amount of power.

It is one of the purposes of the present invention to overcome this objection, which can be accomplished in several days within the scope of the invention.

Another object of the invention is the provision of means whereby when the blade of the knife is closed its cutting edge cannot be brought in contact with said spring, while still a further object is the provision of a spring which is strong and not susceptible of easy fracture or breakage.

In the drawings accompanying and forming part of the present specification I have shown in detail one simple and conventient form of embodiment of the invention, which to enable those skilled in the art to practise the invention will be set forth fully in the following description, while the novelty of the invention will be covered in the claims succeeding said description, from which it will be evident that I do not restrict myself to such showing; I may depart therefrom in several respects within the scope of the invention set forth by said claims.

Referring to said drawings: Figure 1 is a longitudinal section of a portion of a knife embodying my invention, the blade being shown as open. Fig. 2 is a similar view of the same, less of the knife and blade, however, being shown, and the blade being illustrated as in half-open position. Fig. 3 is a cross section on the line 3—3 of Fig. 2.

Like characters refer to like parts throughout the several figures of the drawings.

The handle of the knife is denoted by 5, the blade by 6 and the spring by 7, said blade 6 being detachably held in place by a removable pivot as 8 as is common, for which reason it is needless for me to describe the mounting of said blade further in detail. In a knife having blades at its opposite ends, it is customary to support the spring 7 between its ends inside the handle, whereas in a single bladed knife, it is usual to support the spring at only one end; in both cases, however, the spring has a free portion bearing against the tang of the blade to maintain the same in the two extreme positions thereof.

The tang of the blade 6 has the two side faces 9 and 10 and an intermediate face 11

on the inner end of the blade, the last mentioned face being much nearer the center of motion of the blade than the two side faces which in the present instance are equidistant or approximately equidistant from said center.

In Fig. 2 the free end or portion of the spring 7 is against the inner end face 11, the spring when the blade is in said relation being lax, by reason of which it is a very easy matter to remove said blade and readily replace the same with a substitute. Between the face 9 and the face 11 is a projection 13, while between the face 10 and the face 11 is a substantially similar projection 14, said projections being practically at the inner corners of the tang or blade and their lateral faces being upon outwardly converging angles. Said projections as will hereinafter appear act in effect as cams and preferably but not necessarily their ends are rounded, although this is not material. The spring has a concavity or semi-circular depression 15 near its free end and at the ends of said concavity are the inclines 16 and 17 which, as will be perceived are situated at an angle to the longitudinal axis of the spring and the angles of these inclines or inclined faces correspond practically to the angles of the sides of the two projections 13 and 14. The formation of these inclines upon the said spring produces near the free end thereof an extension 18 which projects into the pocket or cavity formed by the two projections 13 and 14 when the blade 6 is in its intermediate position, the spring at this time being lax.

In Fig. 1 I have shown by full and two series of dotted lines the three positions of the spring 7, the full lines indicating the relation of said spring when the blade 6 is either open full or closed, while the inner dotted line position or the one on the right, is that which the spring occupies when the blade is half open, shown in Fig. 2. The left hand dotted line shows the extent to which the free portion of the spring is moved outward on the action of the blade. In other words the two series of dotted lines show the range of motion of the spring which it will be observed is quite considerable, the consequence being that although the blade may be freely removed when in the intermediate position, the spring will when required, exert considerable tension upon the blade and thereby effectually apply its pressure thereto.

In Fig. 2 as already indicated the blade is half open and the opposite side faces of the two projections 13 and 14 are against the inclines 16 and 17. It will be assumed that it is desired to open the blade. In this event said blade is swung upward and as the blade thus moves, the projection 13 passes away from the spring, while the projection 14 rides along the incline 17 and thereby thrusts the spring outward to the dotted line position on the left in Fig. 1, and when the projection 14 passes over the incline 16, the free end of the spring will engage the tang of the blade and thereby hold it open as shown by full lines in Fig. 1. Practically the same operation occurs in closing the blade except that in this case the projection 13 acts against the incline 17.

It will be assumed that the blade is wide open and that it is desired to close the same. In this event said blade will be swung down, and as it thus moves the projection 14 will ride along and then off the incline or angular face 16 and will then traverse the concavity 15. As soon as the projection 14 passes off the concavity 15 the free end of the spring or the extension 18 of said spring can snap into the described pocket in the inner end of the blade, this action occurring at the time the latter is in half closed or half open position. On the continuation of the closing movement of the blade the projection or ear 13 will ride along the incline 16, then pass off the same and ride along and then off the concavity 15 at which time the spring can snap against the outer inclined face of said projection 13, the blade at this time being closed. When the blade, therefore, is in its two extreme positions there will be engaging angular faces upon the spring and blade which faces, as will be evident, are at an angle to the longitudinal axis of the spring whereby said spring will effectually and securely maintain the blade in its two extreme positions.

The spring 7 is of an advantageous type, being as will be apparent tapered from its place of mounting toward its free end (or ends) so that in this way the spring is made strongest at its area of flexure thereby materially decreasing the possibility of said spring breaking at the bending zone. A spring of this character is very much more effective and satisfactory than those of the present type, although it is no heavier and no more expensive or difficult to make.

Means of a positive character are provided to prevent the cutting edge of the blade from coming in contact with the spring as in case there is such a contact, this tends to dull the blade, and although said means may vary in character a projection or stop as 20 answers satisfactorily in this connection, said projection or stop being adapted to engage the tang of the blade so as to prevent the cutting edge of the latter engaging the spring when said blade is closed as shown by dotted lines in Fig. 1.

What I claim is:

1. A knife comprising a handle, and a blade connected therewith shiftable to occupy open and closed positions, and a spring for holding the blade in said two positions,

the blade having a tang rectangular in general outline with projections at its inner corners and the spring having inclines at its free ends to alternately engage the outer sides of one or the other of said projections when the blade is in the open and closed positions respectively, the lines of engagement when the blade is in such relations being at angles to the sides of the tang.

2. A knife comprising a handle, a blade having a tang connected to the handle, said blade being shiftable to occupy two extreme positions, the tang of said blade being rectangular in general outline, and having a projection extending diagonally from one corner, and a spring having a flat surface adapted to engage one side of said projection to hold the blade in at least one of said positions.

3. A knife, comprising a handle, a blade having a tang connected to the handle, said blade being shiftable to occupy two extreme positions, the tang of said blade being rectangular in general outline, and having a projection extending diagonally from one corner thereof, a spring having a flat surface adapted to engage one side of the said projection when the blade is in one of said extreme positions, the engaging surfaces of the spring and projection being at an angle to the sides of the tang.

4. A knife comprising a handle, a blade having a tang connected to the handle, said blade being shiftable to occupy two extreme positions, the tang of the blade being rectangular in general outline, and having projections at the two corners remote from the blade, a spring adapted to engage either of said projections to hold the blade in one of its extreme positions, the engaging surfaces of the spring and projections being diagonally placed with respect to the sides of the tang.

5. A knife, comprising a handle, a blade having a tang pivoted to the handle, a spring for holding the blade in open and closed positions, the tang of the blade being rectangular in general outline and having projections at its inner corners, the spring having inclines at its free end adapted to engage alternately the outer sides of said projections when the blade is opened and closed, and to engage the inner sides of said projections when the blade is in the half open position, the lines of engagement when the blade is in any of such relations being at angles to the faces of the tang, the inner face of the tang being nearer the center of motion of the blade than are the side faces of the tang.

6. In a pocket knife, a pivoted blade, said blade having a tang the side faces of which are substantially parallel, and an end face perpendicular to the said side faces, projections extending diagonally from the corners of said tang, and a spring having at its free end two surfaces inclined toward each other, said inclined surfaces being adapted to bear against said projections when the blade is in different positions.

7. A knife comprising a handle, a blade having a tang connected to the handle, said blade being shiftable to occupy two extreme positions and an intermediate position, the tang of said blade being rectangular in general outline and having a projection extending diagonally from one corner, and a spring having a flat surface adapted to engage one side of said projection when the blade is in one of said extreme positions and the other side of said projection when the blade is in the intermediate position.

8. A knife comprising a handle, a blade having a tang pivoted to the handle, said blade being shiftable to occupy two extreme positions and an intermediate position, the tang of said blade being rectangular in general outline and having a projection extending diagonally from one corner, and a spring having a flat surface adapted to engage one side of said projection when the blade is in one of said extreme positions and the other side of said projection when the blade is in the intermediate position, the angle between the side of the projection adjacent the side of the tang and a radius drawn from the pivot of the blade to the extremity of the projection being greater than the angle between the same radius and the side of the projection adjacent the end of the tang.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. YERZLEY.

Witnesses:
F. E. ANDERSON,
HEATH SUTHERLAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."