

[54] WIRE CUTTER BAYONET OR KNIFE

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[57] ABSTRACT

A bayonet, or knife, and a sheath therefor modified for wire cutting operation in combination by providing a wire cutting notch at a thick edge of the bayonet blade and a projecting metallic plate or bracket mounted on the end of the sheath and also provided with a wire cutting notch. Pivotal interlinking means between the sheath and the blade permits to pivotally and removably assemble the sheath and bayonet together in a scissor or snip-like fashion for cutting a wire introduced through the notches.

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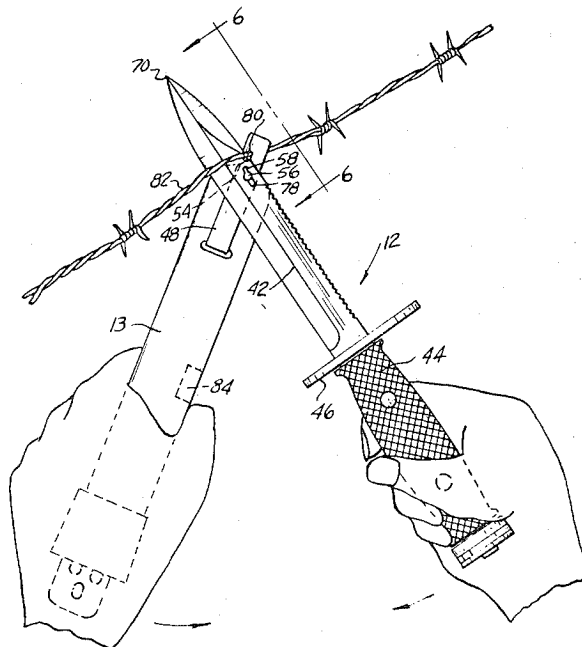
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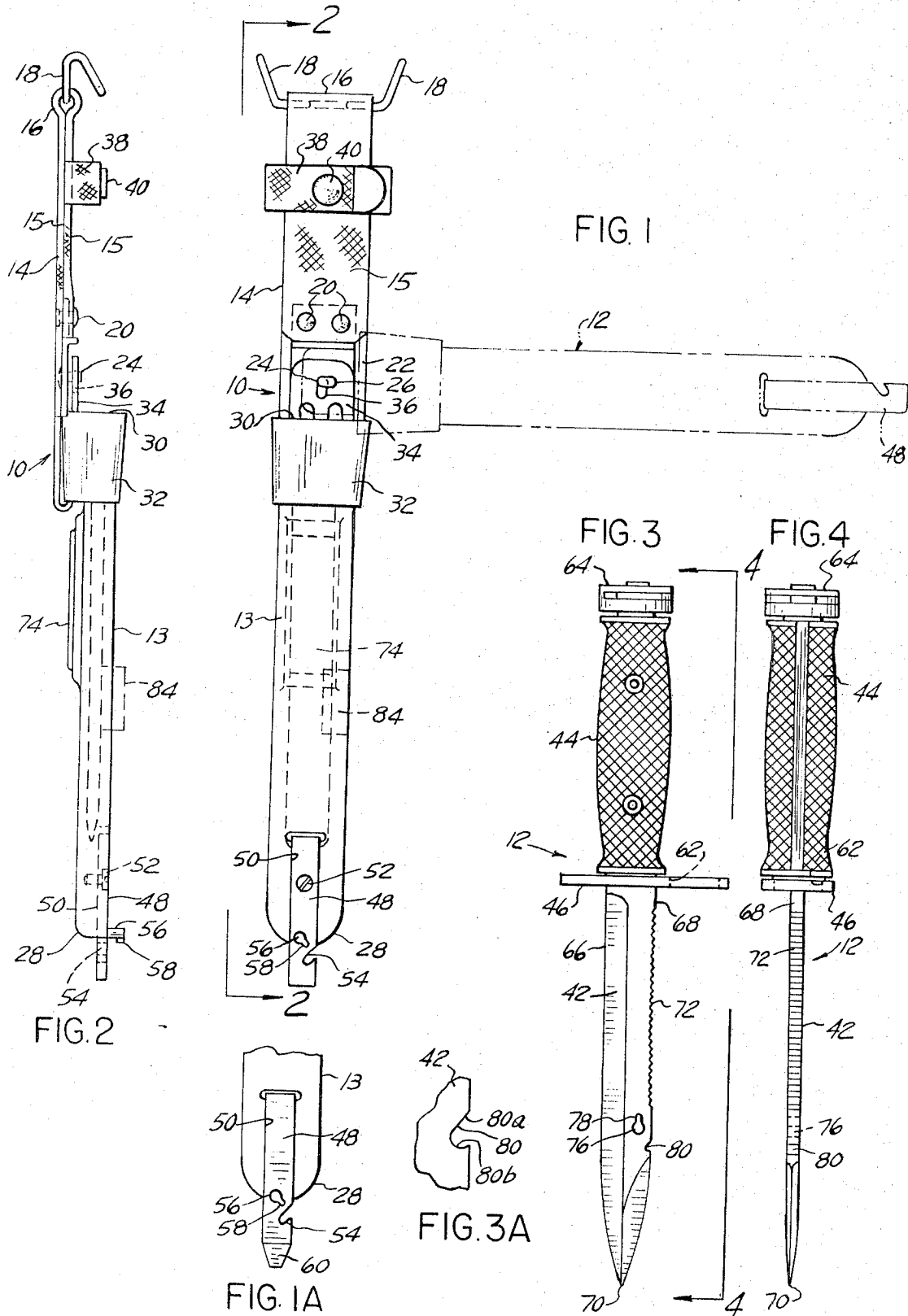
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23 Claims, 8 Drawing Figures





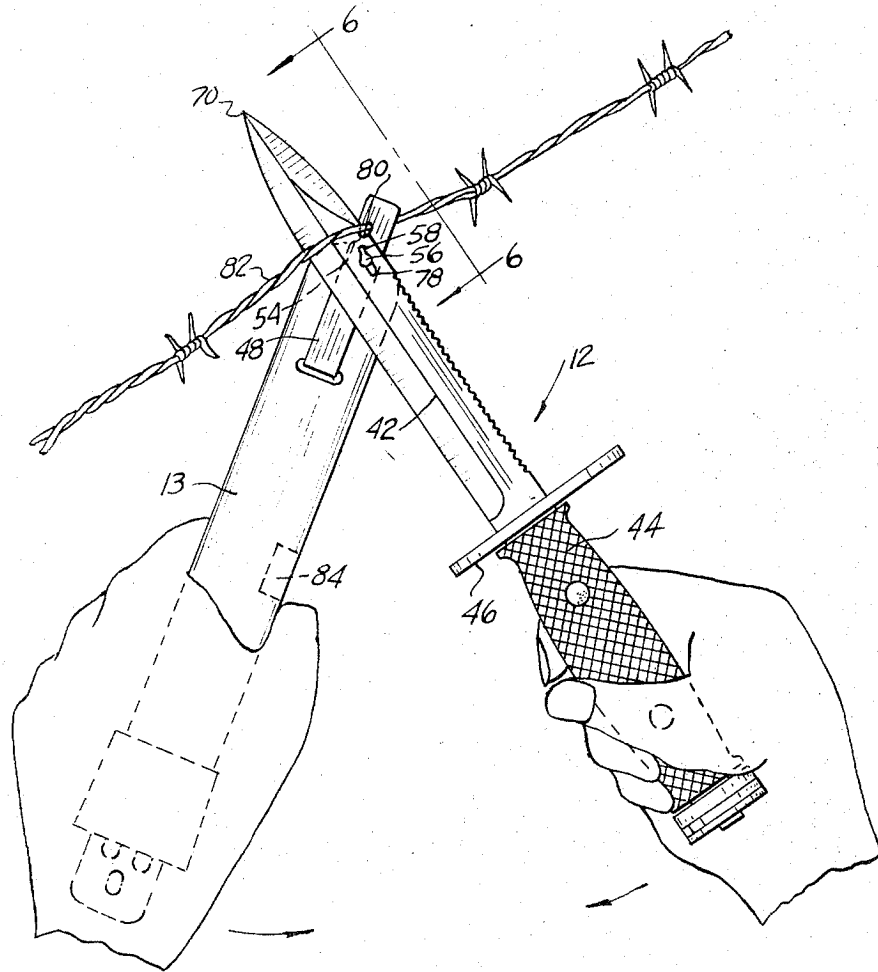


FIG. 5

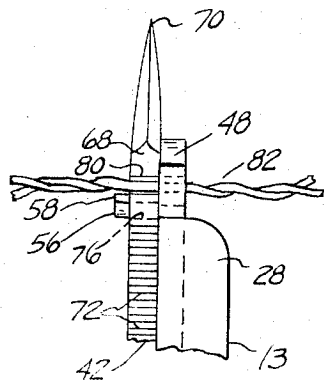


FIG. 6

## WIRE CUTTER BAYONET OR KNIFE

## BACKGROUND OF THE INVENTION

In spite of what may be considered as progress in warfare resulting from the use of high power explosives, rapid fire guns, machine guns and rifles, high velocity rockets and the like, bayonets are still considered by the foot soldier as a handy weapon for hand fighting, either mounted on the end of a rifle barrel or held by hand. However, bayonets have become, in modern times, more a type of multi-purpose tool than a weapon. Bayonets are commonly used by foot soldiers as an ordinary knife, a hunting knife, a light duty hand axe, a can opener, a saw, a lever-cutter for breaking ammunition box steel bands, an improvised crowbar for prying open ammunition boxes and crates, etc.

A particular requirement for bayonets which would be a desirable capability on the battlefield as well as in other places is that of cutting wires, including conventional barbed wires, ribbon barbed wires and electric wires. Some proposals have been made in the past to provide such capability by combining the bayonet with the scabbard in which it is carried to form a snip-like wire cutter. An example of such improvised wire cutter bayonet is the bayonet model KCB70 made by NWM De Kruithoorn in Holland which utilizes the unnotched back of the bayonet blade for cutting a wire engaged in a slit on the end of the scabbard, and which allows the wire to slip off the back of the bayonet blade, thus preventing the wire from being cut. Attempts to provide a bayonet effectively capable of cutting wire have either been unsuccessful or they have left much to be desired because they require modifications of the bayonet blade, for example by providing therein a pivot aperture combined with a pivot pin on an end of the scabbard, which considerably weakens the blade such that the bayonet is no longer capable of efficiently fulfilling its other requirements.

## SUMMARY OF THE INVENTION

The present invention provides a multi-purpose bayonet or knife which, in addition to fulfilling all the requirements generally associated with such a device, provides a multi-purpose tool, and also an effective wire cutter in association with the scabbard in which the bayonet, or knife, is normally carried. The bayonet is provided with an aperture through its blade for pivotal interlinking with a pin provided plate on an end of the scabbard sheath such as to form therewith a wire cutter or snip, the cutting action being locally limited to a notched portion of the blade and to a notched portion of the sheath plate, the metal of the blade at the notch and at the aperture locally heat-treated in such manner as to maintain intact the blade metallurgy, characteristics and functions without weakening of the blade, and so as to provide long wear of the pivot means surfaces and of the wire cutting notches.

The diverse objects and advantages of the present invention will be readily apparent to those skilled in the art when the following description of some of the best modes contemplated for practicing the invention is read in conjunction with the accompanying drawings, wherein like numerals refer to like elements.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan elevation view of a scabbard for a bayonet or knife, modified according to the present invention;

FIG. 1a is a fragmentary view thereof illustrating a further modification;

FIG. 2 is a lateral end elevation view of the scabbard of FIG. 1 as seen from line 1—2 of FIG. 1;

FIG. 3 is a plan elevation view of a knife, a bayonet in the particular example illustrated, for carrying in the scabbard of FIGS. 1-2;

FIG. 3a is a fragmentary view thereof;

FIG. 4 is an elevation view thereof as seen from line 4—4 of FIG. 3;

FIG. 5 is a schematic view of the scabbard and bayonet in operation for cutting wire; and

FIG. 6 is a fragmentary enlarged view as seen from line 6—6 of FIG. 5.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Although a typical example of the present invention is hereinafter described relative to a scabbard and bayonet combination, it will be appreciated that the principles of the invention are equally applicable to a hunting knife, or other knife, and scabbard combination.

A scabbard, generally designated by numeral 10 at FIGS. 1-2, is normally used attached to the belt of a person for carrying a knife or bayonet generally designated by numeral 12 at FIGS. 3-4. The scabbard 10 may be a conventional scabbard attachable directly to the belt or it may preferably be made of two separate elements, as illustrated. As best shown at FIGS. 1 and 2, the scabbard 10 is in the form of a sheath 13, made of plastic impregnated cloth and having an outer smooth plastic molded surface, which is attached to a belt suspender portion 14 made of a length of sewn up canvas 15 forming a top loop 16 through which is disposed a wire hook 18 for fastening to the belt. The ends of the length of canvas 15 are fastened by any convenient means such as a pair of rivets as shown at 20, which are further used to fasten thereto a metallic plate or bracket 22 provided with a projecting pin 24 having on its end an integral key portion 26 projecting substantially along a horizontal axis as shown in the drawing. The sheath 13 has a closed end 28 and an open end 30 provided with a metallic sleeve fastened to the peripheral surface of the sheath proximate the open end thereof. The metallic sleeve 32 has a bracket 34 with an axially disposed aperture in the form of a slot 36, with its axis normally about the vertical axis.

In this manner, the sheath 13 is removably mounted on the end of the belt suspender portion 14, the sheath 13 and the belt suspender portion 14 being first interconnected by disposing the sheath along a horizontal axis, as shown in phantom line at FIG. 1, and by introducing the pin 24 into the slot 36, and leaving the sheath 13 normally hung vertically as shown in full line at FIG. 1, the key portion 26 of the pin 24 preventing the sheath 13 from being removed from the belt suspender portion 14, unless the sheath is swung to the position shown in phantom line at FIG. 1 for indexing the slot 36 within the key portion 26, and pulled away so as to remove the pin 24 from within the slot 36.

The belt suspender portion 14 of the scabbard 10 is also provided with a canvas strap 38 having an appro-

priate fastener 40, such as a pressure snap fastener, so as to hold the handle of a bayonet or knife disposed in the scabbard, with the blade thereof introduced into the sheath 13.

The bayonet or knife 12 of FIGS. 3-4 is normally carried in a scabbard, such as scabbard 10, with the blade 42 of the bayonet disposed in the sheath 13. The bayonet has a handle 44, a shield 46 between the handle and the blade such that the handle and the shield are the only visible portions of the bayonet when the blade 42 is slipped into the sheath 13, the shield 46 abutting against the end of the sleeve 30. The strap 38 is snapped around the bayonet handle 44 for holding it in position in the scabbard. The sheath 13 is slightly longer than the bayonet blade 42 and is hollow only to the extent necessary to accept the bayonet blade 42, which is frictionally held in the sheath by means of a flat spring, not shown, partly imbedded in an inner wall of the sheath. Because the hollow portion of the sheath 13 does not extend all the way to the lower end 28 of the sheath, the lower end 28 of the sheath is thus thick enough to accept a generally rectangularly shaped metallic plate 48 disposed in a rectangular pocket 50 formed in the surface of the sheath 13, and held in position by any convenient means such as a screw 52. The end of the plate 48 that axially projects from the body of the sheath 13 has an angled relatively deep notch 54 formed on a side thereof, and a pin 56 projecting perpendicularly to the surface of the plate 48 is pressfitted and welded in a hole, not shown, in the plate 48 proximate to the notch 54. The pin 56 has an integral key portion 58 on the end thereof, projecting at a right angle to the axis of the pin.

The modification of FIG. 1a represents a plate 48, disposed at the end 28 of the sheath 13, identical to the structure of FIGS. 1-2, but provided with a screwdriver tip 60.

The shield 46 of the bayonet 12 (FIGS. 3-4) has a side thereof provided with a circular aperture 62, and a gun mount locking clip 64, not part of the present invention, is fastened to the end of the handle 44 for mounting the bayonet on the end of a rifle barrel. It is evident that a hunting knife version, or the like, of the present invention would omit such rifle mount elements as unnecessary.

The bayonet blade 42 has a sharp edge on one side, as shown at 66, and a substantially flat edge 68 on the other side of the blade. Proximate the end of the blade both edges are preferably sharp and converge into a sharp point or tip 70. The flat edge 68 of the blade is preferably, and as shown, provided with a plurality of saw teeth 72 which, although acting more like the teeth of a broach, permit to use the bayonet as a saw for cutting odd, thin metals, etc., or as a rasp.

For the purpose of sharpening the cutting edge 56 and the tip of the bayonet, the sheath 13 of the scabbard 10 is provided with a sharpening or honing stone 74 mounted, such as by cementing, in an appropriate pocket in the side of the sheath 13, as shown at FIGS. 1-2.

The bayonet blade 42, as shown at FIGS. 3-4 and also FIGS. 5-6, has, proximate the flat edge 68 thereof and at a point located approximately two-thirds of the total length of the blade away from the shield 46, a circular aperture 76 provided with a radially key slot 78. A relatively shallow notch 80 is formed in the surface of the flat edge 68 of the blade, substantially proximate

the aperture 76. As best shown at FIG. 3a, the notch 80 has a substantially straight portion 80a and a substantially circular portion 80b for improved wire holding and shearing action as explained hereinafter.

When it is desired to use the bayonet 12, in combination with the sheath 13, as a wire cutter, the bayonet is removed from the scabbard and the sheath 13 is removed from the belt suspender portion 14. The bayonet 12 and the sheath 13 are assembled together with the pin 56 projecting from the plate 48 at the end 28 of the sheath 13 introduced into the aperture 76 in the bayonet blade 42, the key portion 58 of the pin 56 registering with the keyway portion 78 of the aperture 76. The sheath 13 and the bayonet 12 are then pivoted relatively to each other, to an approximate relative angular position as shown at FIG. 5, the handle 44 of the bayonet being held in one hand and the sheath 13 being grasped with the other hand proximate its open end. A wire, such as barbed wire 82, is placed in the notches 54 and 80, respectively on the edge of the plate 48 of the sheath 13 and the edge of the blade 42 of the bayonet 12, the respective dimensions of the notches and their distance from the pivot point formed by the pin 56 passing through the aperture 76 in the blade being such that the notches register and, by a scissor-like motion in the direction of the arrows of FIG. 5, the wire 82 engaged in the notches is cut by shearing action. The angle and depth of the notch 54 is such that the wire is securely clamped at the bottom of the notch and the shearing action is applied to the wire in a direction preventing the wire from snapping from the notch. The presence of the shallow notch 80 on the bayonet blade edge and the particular shape of the notch with its substantially straight portion 80a and curved portion 80b provides, in combination with the angled relatively deep notch 54 on the plate 48, a positive clamping and shearing action, also preventing the wire 82 from springing from the notches. The notch 80, however, is shallow such as to prevent weakening of the blade 42 and because, as mentioned in detail hereinafter, the steel of the blade is locally and superficially heat-treated about the notch 80 and the pivot aperture 76, the strength of the blade is in no way decreased.

The distance between the notches and the pivot point is very short, such that considerable leverage is exerted by manual pressure on the end of the sheath 13 and the bayonet handle 44. In order to limit the scissor-like relative motion of the pivotally assembled bayonet 12 and sheath 13, an abutment stop plate 84, shown in dash lines, is preferably disposed on the sheath 13 to engage with a side surface, forming abutment means, on the bayonet shield 46.

The handle 44 of the bayonet 12 is made of a plastic or similar dielectric material, and the sheath 13 is also made of a plastic or dielectric material having good electrical insulation. The screws holding the handle 44 on the shank portion of the metallic bayonet shank projection are recessed, such that the assembled bayonet and sheath can be used to cut electrically alive wires, up to a potential of 20,000 volts, or more.

It will be appreciated that in the wire cutting relative position of the elements, FIG. 5, the key portion 58 of the pin 56 and the keyway portion 70 of the aperture 76 in the bayonet blade are directed approximately 180° from each other such as to insure positive pivotal assembly of the two elements, without any risk of one half of the assembly, the bayonet or the sheath, being



pulled away from the other half. It will also be appreciated that the keyway 78 and the key 58 are relatively narrow such that the cylindrical peripheral surface of the pin 56 engages a substantial area of the inner surface of the aperture 76 to minimize wear.

The blade of a bayonet, hunting knife, or the like, is made of specially heat-treated steel to insure substantial hardness coupled with a certain amount of resiliency, which are characteristics not necessarily compatible with resistance to friction wear and to the shearing acting encountered for wire cutting applications. For that reason, the pin 56 on the plate 48 of the sheath 13 is also made of hardened steel, as is the plate 48, and in addition the steel of the blade 42 is locally induction hardened about the periphery of the circular aperture 76 and key slot 78, as is the steel of the blade proximate the notch 80. The superficial localized induction hardened portion of the steel is only very thin. In this manner, the wear surfaces in the pivotal assembly of the two elements for wire cutting operation, and the surface of the notches 54 and 80, are specially adapted to their particular function without reducing in any notable manner the required characteristics of the remaining portions of the elements and especially those of the bayonet blade 42.

Having thus described the invention by way of a specific example thereof, what is sought to be protected by Letters Patent is as follows:

1. In combination a bayonet and a scabbard for carrying said bayonet comprising a handle portion and a blade portion, said blade portion having a relatively shallow notch formed at a relatively thick edge thereof proximate the end of said blade, an aperture through said blade in close proximity to said notch, said scabbard being in the form of a sheath having an open end and a closed end, a metallic elongated flat member having a portion projecting beyond an end of said sheath and having a face at least flush with a side surface of said sheath, a lateral relatively deep notch formed at a side edge of the projecting portion of said flat member, a pivot pin member projecting from said face of said flat member in close proximity with said notch, whereby by removing said bayonet from said scabbard and pivotally linking said bayonet and said scabbard by means of said pivot pin engaged in said aperture in said blade a cutter is formed for cutting a wire by engagement of said wire through said notches and by manual pressure applied on the handle portion of said bayonet and on the opposite end of said sheath such as to pivot said sheath and bayonet in opposite directions.

2. The combination of claim 1 wherein said aperture is circularly shaped and provided with a radially disposed keyway and said pivot pin is correspondingly circularly shaped and provided with a radially disposed key portion projecting proximate the end of said pivot pin, the relative angular disposition of said keyway and key portion being arranged such as to enable pivotal linking of said bayonet with said sheath in a given angular position different from the relative angular position thereof for cutting said wire.

3. The combination of claim 1 wherein the metal of said blade portion is locally hardened at said notch.

4. The combination of claim 3 wherein the metal of said flat member is at least locally hardened at the notch in said member.

5. The combination of claim 1 wherein said notch on said blade has a substantially straight portion and a sub-

stantially curved portion, said curved portion being disposed toward the tip of said blade.

6. The combination of claim 1 wherein the metal of said pivot pin is hardened and the metal of said blade portion is locally hardened at said aperture.

7. The combination of claim 1 wherein said bayonet has an edge portion provided with saw teeth extending from proximate said notch to proximate said handle.

8. The combination of claim 1 further comprising a screwdriver tip formed at the end of the projecting portion of said plate member.

9. The combination of claim 1 further comprising means disposed on a face of said sheath for sharpening the edge of said bayonet.

10. The combination of claim 1 wherein said sheath is removably attached to a belt fastening portion.

11. The combination of claim 10 wherein said sheath comprises a plate fastened proximate the open end thereof, said belt fastening portion is provided with a plate normally downwardly extending, and pivotal interlinking means are provided on said plates for fastening said plates together for an angular position of said sheath corresponding substantially to a vertical and for disconnecting said plates in a single position corresponding to said sheath being angularly pivoted substantially 90° away from said vertical.

12. The combination of claim 1 wherein said sheath and the handle portion of said bayonet are made of dielectric material.

13. The combination of claim 1 further comprising abutment means for limiting the relative angular motion of said bayonet and said sheath in the course of a wire cutting operation.

14. In combination, a knife comprising a blade portion having a tip, a sharp edge and a relatively thick edge, a notch formed at said thick edge proximate said tip, a sheath for said knife, a plate member dependent from said sheath, a notch formed at an edge of said plate member and means for removably and pivotally interlinking said knife and said sheath for cutting a wire disposed in said notches when aligned by a scissor-like action of said interlinked knife and sheath.

15. The combination of claim 14 wherein said means for pivotally interlinking said knife and said sheath are arranged to prevent separation thereof except in a relative angular single position remote from the wire cutting position thereof.

16. The combination of claim 14 further comprising saw teeth formed on the thick edge of said blade.

17. The combination of claim 14 further comprising a screwdriver tip at the end of said plate.

18. The combination of claim 14 further comprising means for sharpening said blade disposed on said sheath.

19. The combination of claim 14 further comprising abutment means dependent from said knife and said sheath for limiting the relative pivoting of said sheath and said knife in the course of a wire cutting operation.

20. The combination of claim 14 wherein said knife has a handle made of dielectric material and said sheath is made of dielectric material.

21. The combination of claim 14 wherein said notch in said plate member is relatively deep.

22. The combination of claim 21 wherein the notch in said blade is relatively shallow.

23. The combination of claim 22 wherein said notch in said plate is disposed at an angle and said notch in said blade has a relatively straight portion and a relatively curved portion, said curved portion being disposed toward the tip of said blade.

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