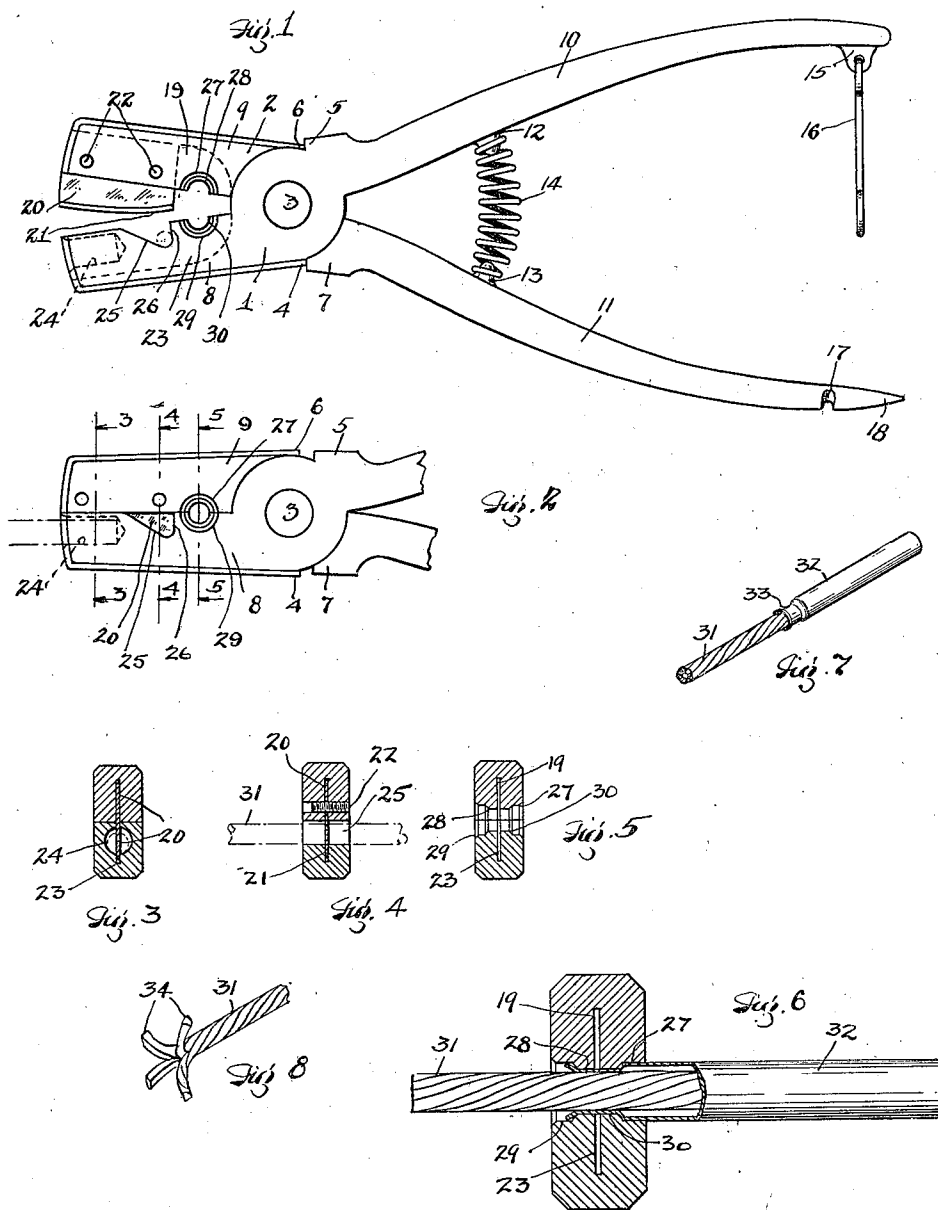


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BLASTING FUSE IMPLEMENT.  
APPLICATION FILED DEC. 8, 1920.

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# UNITED STATES PATENT OFFICE.

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## BLASTING-FUSE IMPLEMENT.

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*To all whom it may concern:*

Be it known that I, HARRY PRINCE, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Blasting-Fuse Implements, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention is an implement wherein are combined all the necessary means to facilitate the connection of a fuse to a blasting charge.

Heretofore the various operations of cutting a proper length of fuse, crimping a detonating cap upon one end thereof, splitting the other end for priming or easier ignition, and finally forming a hole in the blasting charge to receive the detonating cap, have been performed with a number of implements or with a pocket knife and like improvised means. In this way much time is consumed and not infrequently the fuse and its connections are so injured that the charge is unexploded or a delayed explosion is caused with all its attendant danger to life and property.

The object of my invention is to combine in a single hand implement means for carrying out each of these operations in a practical scientific way so that each step may be properly performed and all danger of unexploded or delayed charges avoided. At the same time the correct timing of the explosion may be more accurately gauged. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain construction embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—

Figure 1 is a side view of the device in its normal position for use, the jaws being shown in open position; Fig. 2 is a fragmentary side view, showing the jaws in closed position; Figs. 3, 4, and 5 are transverse sections taken respectively along the lines 3—3, 4—4, and 5—5, shown in Fig. 2, looking in the direction of the arrows; Fig.

6 is an enlarged cross-sectional view of the jaws, as shown in Fig. 5, with a fuse and cap in place between said jaws illustrating the crimping action of the same; Fig. 7 is a perspective view of the fuse with the cap crimped thereon after the completion of the operation illustrated in Fig. 6; and Fig. 8 is a perspective view of the end of the fuse after the completion of the slitting operation by means of the parts indicated in Fig. 3, the slits being made in both vertical and horizontal directions through the end of the fuse.

As is clearly shown in Fig. 1, two crossed members 1, 2, are provided having a pivot 3 at their point of intersection, which is preferably of the type wherein an enlargement is provided on each member of half the usual thickness of the remaining portion thereof; thereby forming a recess to receive the like part of its companion member. Registering transverse apertures are made centrally of the enlargements for the reception of the pivot pin. Each of these crossed members is provided on opposite sides with oppositely facing shoulders 4, 5 and 6, 7 which, when the parts are in assembled relation, limit the amount of opening movement of the ends of said members. The ends of the members upon one side of the pivot comprise the jaws 8 and 9 of the implement, and the portions on the opposite side of the pivot 10 and 11 comprise the operating handles and are preferably of a length several times greater than the length of the jaws so as to secure the desired amount of leverage. Upon the inner side of each of the handle portions of the implement is provided a projecting stud 12, 13 upon which are seated the opposite ends of an expansion spring 14. One of the handle portions is preferably tapered so as to provide a sharp point 18 at its end and adjacent thereto to be of a diameter corresponding to that of the usual detonating cap employed in setting off explosive charges. Near the end of this member, upon the outer side, is provided a notch 17 over which may be engaged a loop upon a latching member 16, the other end of which is supported within a perforated lug 15 provided adjacent the inner side of the end of the opposite handle portion. The jaw portions of the implement are respectively provided with longitudinal slits 19, 23 cut into their inner faces

and extending from a point adjacent the pivot through their outer ends. Within the slit 19 in one of the jaw members is inserted a knife blade 20 which is preferably held in position by means of several screw studs 22 inserted through apertures drilled transversely through the knife and jaw member at that point. The inner edge 21 of the knife member is preferably of curved formation so as to make the knife blade of lesser width at its extreme inner end for a purpose to be hereinafter explained.

The jaw member opposite the blade carrying jaw member is provided at its end with a seat or socket 24 preferably drilled into the end of this member centrally thereof and in line with the slit 23, already referred to. Rearwardly of this longitudinal seat or socket this jaw is provided with a transverse seat preferably formed by providing a notch having a vertical face 26 at its inner end and a face inclined upwardly and outwardly therefrom to form its other side 25. The shape of this notch adapts it to co-operate with the curved inner end portion of this knife blade, and causes a section of fuse placed within the notch to be severed by such blade by means of a shearing cut wherein the inner portion of the blade first engages said fuse and the edge of the blade is progressively advanced through it with a greater movement of the outer portion until the cut is first completed at the outer portion of the fuse. The vertical face 26 receives the thrust of the blade during this shearing operation and holds the fuse rigid, insuring a clean cut squarely across the fuse. Inwardly of the position of the knife and the co-operating slit portion of the opposite jaw, each of the jaw members is provided with co-operating sections of the crimping device. This comprises co-acting transversely grooved portions 27, 29 upon the inner faces of the jaws, having co-operating raised central portions 28, 30. Thus, when the jaws are in closed position, they present a transverse tubular aperture of a diameter, at each of the outer ends, of a size to correspond with the diameter of the cap 32 to be crimped upon the fuse 31, and an inner tubular section of smaller diameter which produces the crimping action.

As illustrated in Fig. 7, when the crimping action just referred to is completed, the cap will present at its end adjacent the fuse a depressed annular portion 33. This depression need not be made at the extreme end of the cap, but may be placed at any desired position above the lower end thereof, which normally contains the detonating compound. The operation performed by the longitudinal socket and the co-acting portion of the blade is illustrated in Fig. 8, wherein is shown the end of a

fuse slitted in two directions at right angles to one another, thus providing four ends which are easy of ignition and to which may be applied a priming compound, customarily a portion of the explosive charge itself.

The use of this implement will be apparent from the description of its construction above outlined. Thus, the fuse is first cut squarely across at each end by means of the transverse notch and the co-acting portion of the blade, one end is then inserted in the detonating cap and the crimping portion of the implement is used upon the inner end of the cap to fasten the cap upon the fuse, and the other end of the fuse is then slitted in one or as many directions as desired, and the handle section, having the pointed end, is then inserted in the powder charge to provide a recess of sufficient depth to receive the cap.

The advantages residing in the construction and use of my device it is believed are clear from the description set out above. By inserting my blade in a slit and making it of sufficient length to coact with several positioning elements in performing successive cutting operations in different directions, I may use a very thin blade of the safety razor type. The steadiness of the blade and the accuracy of the cutting operation are increased by the coacting longitudinal slot which guides the cutting edge. The crimping jaws are located at the point where the greatest mechanical advantage is obtained for the compressing operation.

Where a large number of shots are to be set off at a predetermined time, in a mine working, for example, the use of my implement will insure the explosive being properly placed, with more speed and with greater accuracy than where the operation is attempted to be carried out without the aid of such device.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the construction herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a compound tool, a pair of crossed members pivoted at their intersection and each comprising a jaw section and a handle section, a knife blade having a cutting edge convexly curved at its rear end mounted longitudinally of the inner face of one of the jaw sections, a longitudinal slit provided in the inner face of the other jaw section adapted to receive said knife blade, a longitudinal socket formed in the last mentioned jaw section and bisected by the path of said blade, and a transverse notch in said jaw sec-

tion immediately back of said socket and intersected by the path of said knife blade, said notch having a vertical face at its inner end and an inclined lower portion to co-act  
5 with the curved portion of said knife to produce a shearing cut.

2. In a compound tool, a pair of crossed members pivoted at their intersection and each comprising a jaw section and a handle  
10 section, a knife blade mounted longitudinally of the inner face of one of the jaw sections, a longitudinal slit provided in the inner face of the other jaw section adapted to receive said knife blade, a longitudinal  
15 socket formed in the last mentioned jaw sec-

tion and bisected by the path of said blade, a vertical and an oblique wall presenting a transverse notch in said jaw section immediately back of said socket and intersected by the path of said knife blade, co-  
20 operating elements providing a series of shoulders adapted to crimp a fuse cap formed in each of the jaws adjacent the pivot and inside of the position of said knife blade, and a fuse cap recess forming element  
25 provided upon the end of one of said handles.

Signed by me this 1st day of December, 1920.

HARRY PRINCE.