

No. 856,719.

PATENTED JUNE 11, 1907.

W. E. NAGLE.
SHEARING KNIFE.
APPLICATION FILED NOV. 5, 1906.

Fig. 1.

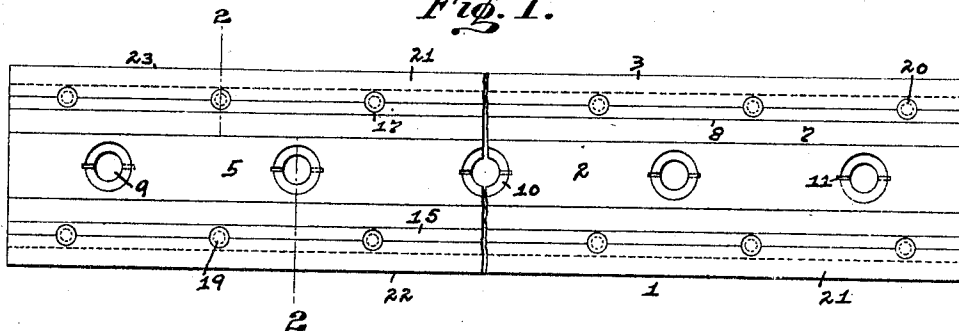
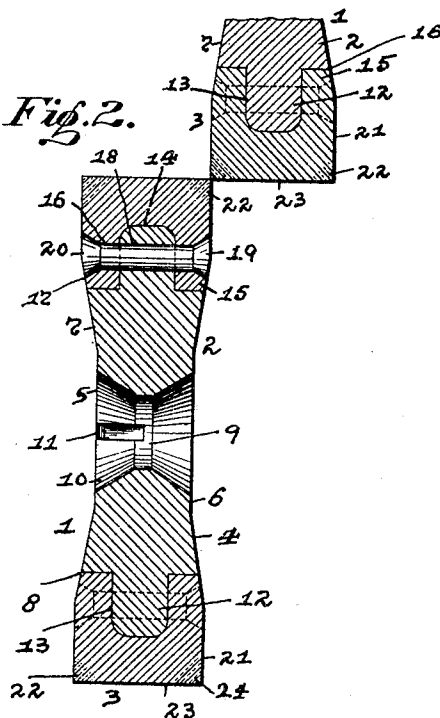


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM E. NAGLE, OF WILMERDING, PENNSYLVANIA.

SHEARING-KNIFE.

No. 856,719.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed November 5, 1906. Serial No. 341,989.

To all whom it may concern:

Be it known that I, WILLIAM E. NAGLE, a resident of Wilmerding, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Shearing-Knives; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to shearing knives and has special reference to such knives as are used in the shearing of metal, such as billets, plates, bars, rods, etc.

The object of my invention is to provide a cheap and efficient form of a shearing knife which can be easily and cheaply manufactured and one having a separate cutting or shearing portion thereon which can be removed or renewed when desired.

My invention consists, generally stated, in the novel arrangement, construction and combination of parts, as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved shearing knife, I will describe the same more fully, referring to the accompanying drawing, in which—

Figure 1 is a side elevation of a shearing knife embodying my invention. Fig. 2 is a cross-section of the knife on the line 2—2 Fig. 1 and showing a portion of the other knife above the same and in section.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

Heretofore, in some classes of shearing machines the knives thereof were required to be made entirely of what is known as "carbon steel" and in machines were knives of lengths running from a foot or less to eight or nine feet and to possibly fifteen feet, thus involving considerable expense to manufacture said knives from such a metal as a high speed or tungsten steel, as is now desired. This steel being very expensive the expense for knives for a shearing machine would, of course, be greatly increased where the knives were constructed entirely of this steel in case of the knives becoming broken from any cause or from wearing out and requiring new knives.

In my invention the knife is shown at 1 in the drawing and is formed of the central or body portion 2 and shearing portions 3 connected to each side edge of said body portion,

as hereinafter described. The body portion 2 of the knife 1, in this case, is formed from low grade metal, such as steel, and the sides 4 of the same are recessed, as at 5, for forming the straight portions 6 centrally of the said body 2 and the inclined portions 7 leading from the same to the side edge 8 of said knife. A series of holes 9 are formed through the central straight portions 6 of the body portion 2 for the attaching of the knife 1 to the shearing head of the machine (not shown) by means of the usual bolts (not shown), and said holes are provided with the countersunk faces 10 on each side of the said body for the reception of the head on said bolts. Each of the holes 9 have the countersunk faces 10 on both sides of the same so that the bolt head can be fitted therein and on each side of the knife 1 in case of the turning or reversal of said knife, and a key-way 11 is formed in each of said faces 10 for a reception of a key therein in holding the bolt and its head within its particular face 10.

In the use of "high speed" or "tungsten" steels, it is practically impossible to weld the same to a steel of a low carbon grade at their faces, as to the body 2, so that the shearing portions 3 are rigidly and removably connected to the side edges 8 of said body in the following manner:—The side edges 8 of the body portion 2 are each provided with a tongue 12 extending out therefrom and forming a seat 13 on each side of the same within said body. The shearing portions 3 formed of "high speed" or "tungsten" steel are provided with a groove 14 within the same for fitting over and around the tongue 12 on the body 2 and with the flanges 15 on each side of said groove for fitting within the seats 13 on each side of said tongue. Holes 16 having countersunk faces 17 are formed through the flanges 15 on the shearing portions 3 which are adapted to register with holes 18 formed in the tongues 12 so that bolts 19 can be placed within said holes and be riveted within the same to form heads 20 thereon for fitting within said countersunk faces 17 to hold said shearing portions 3 on said body 2.

The side faces 21 of the shearing portions 3 on the flanges 15 thereof are slightly beveled (not shown) inwardly to a point about central of the bolts 19 in order to permit each of the shearing knives 1 to pass each other freely in the cutting operation, as shown in Fig. 2, and the corners or cutting edges 22 formed by said side faces 21 and the end faces 23 are

preferably air hardened, as shown by the dotted lines 24 in Fig. 2.

When it is desired to remove the shearing portions 3 from the body 2 of the knife 1, the knife is detached from the shearing machine by removing the bolts in said body 2 and then the heads 20 on the rivets 19 can be drilled out by any suitable means or in any suitable manner, so that said rivets will be free and can be taken out of the holes 16 and 18. After this is done the shearing portions 3 can be lifted off the body 2 through the tongue 12 and seats 13 so that the cutting edges 22 can be repaired or new shearing portions placed on said body or for any other purpose desired.

Various modifications and changes in the design, construction and operation of my improved shearing knife may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

It will thus be seen that my improved shearing knife will provide for a great saving in the cost of manufacture of knives for this class of work, and at the same time provide such a knife which can be easily removed and replaced in case of repairing, sharpening, re-hardening, or supplying new shearing portions. The construction is particularly adapted for long shearing knives and the center or body thereof is therefore capable of being used at all times for the shearing portions without having to be renewed except in cases

of breakage, as it is not subjected to any wear or strains as in the case of such shearing portions.

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

1. A shearing knife comprising a body portion, a tongue on said body forming seats in the side of the same, a shearing portion having a groove within the same for fitting over and around said tongue and forming flanges for fitting within said seats, and rivets passing through said tongue and flanges and countersunk within said flanges for removably connecting said body to said shearing portion.

2. A shearing knife comprising a body portion formed of low grade steel, a tongue on said body forming seats in the side of the same, a shearing portion formed of high speed steel having a groove within the same for fitting over and around said tongue and forming flanges for fitting within said seats, and rivets passing through said tongue and flanges and countersunk within said flanges for removably connecting said body to said shearing portion.

In testimony whereof, I the said WILLIAM E. NAGLE have hereunto set my hand.

WILLIAM E. NAGLE.

Witnesses:

J. N. COOKE,
WM. R. McCOMMON.