Jan. 23, 1945. D. F. JORGENSEN 2,367,945

TOOL GUARD

Filed Sept. 15, 1941

Fig. 1

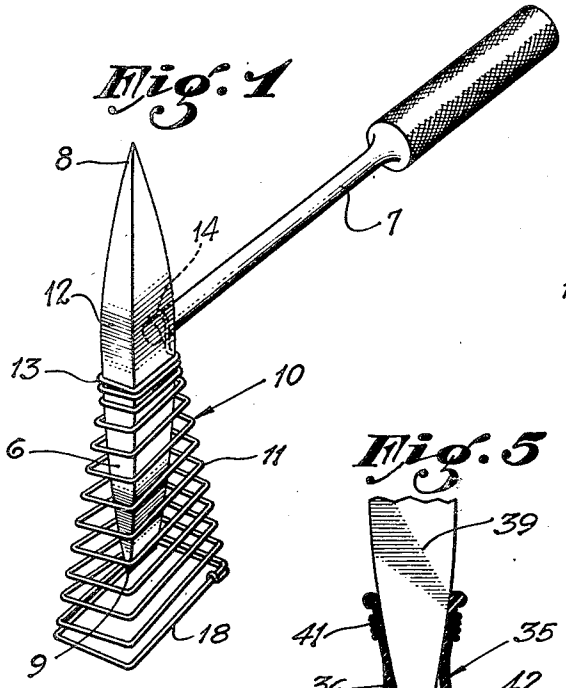


Fig. 2

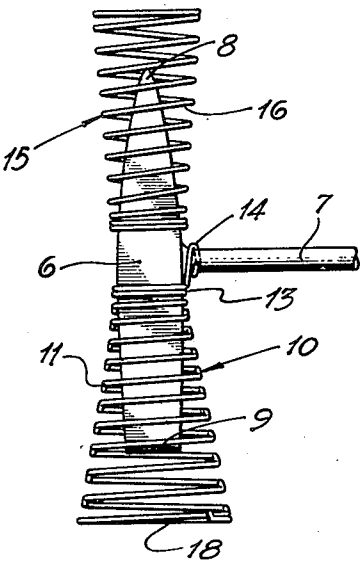


Fig. 5

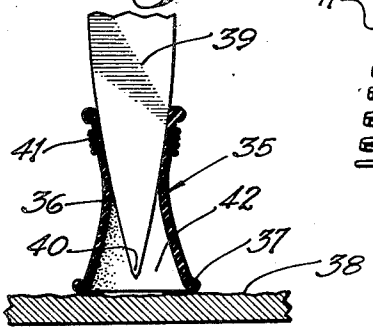


Fig. 4

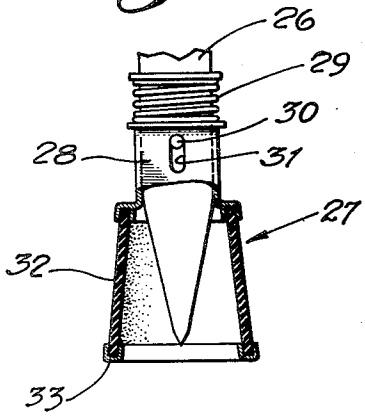
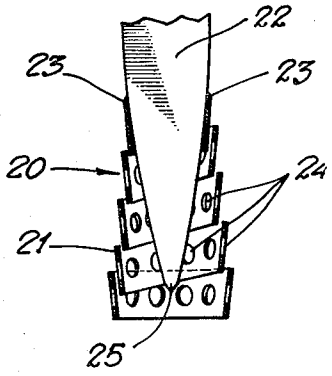


Fig. 3



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TOOL GUARD

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Application September 15, 1941, Serial No. 410,909

6 Claims. (Cl. 29—81)

My invention relates to tools of percussion type, such as chipping hammers and chisels, and relates in particularly to a tool of this type having a simple guard means for preventing the chips or particles dislodged by the tool from flying.

A particular utility of my invention is in conjunction with electric welding practices. In electric welding of steel, steel rods of suitable composition are employed, such rods having thereon a coating of a material to vaporize at the high temperature produced by the arc, producing around the arc an atmosphere which tends to minimize observation of the molten metal entering through the weld. The coating employed on the rod likewise forms a protective coating for the weld while it exists at a temperature susceptible to oxidation. Before a subsequent weld may be applied over the previous weld, it is necessary to chip off this coating, referred to as "slag," and for this purpose a small chipping hammer is employed. The slag is quite brittle and has rough or sharp edges. Likewise, at the time the chipping operation is performed the weld and the slag are both hot. The chips of slag normally fly in all directions, striking the person of the welder and such others as may be working nearby. Even though the welder may employ guards for the hands and arms and wear goggles, hot pieces of the slag often drop down inside the welder's shirt, causing burns, or, if a burn is not caused, the welder is subject to the discomfort of particles of sharp or rough material inside his clothing. Burns resulting from the chipped slag heal slowly due to the chemical composition of the slag, some of which is imparted to the burn at the time it occurs.

An object of my invention is to provide a chipping tool having therewith a simple guard means which will substantially prevent flying of the slag, and will, in fact, confine the chips to a space surrounding the point at which the chipping operation takes place.

A further object of the invention is to provide a chipping hammer or percussion tool having in a position around the working or cutting edge thereof a guard which will not prevent functioning of the tool for its intended purpose, but will form a barrier around and spaced from the cutting edge, such barrier constituting an enclosure which will hold therein the removed particles which ordinarily tend to fly off in various directions.

A further object of the invention is to provide for a chipping hammer or percussive tool of the general character described, a guard comprising a wall surrounding the cutting edge of the tool, this wall being characterized by yieldability so that it will not interfere with the normal operation of the tool but will have the desired guarding effect.

In describing the guard as being characterized by yieldability, it will be percieved from the later description that I mean that the guard is yieldable in such a manner that movement of the cutting edge or cutting point of the tool into operative engagement with the work is permitted. This yieldability may consist in the ability of only a portion of the guard to yield, or the mounting of the guard in such a manner that it may yield by moving bodily relative to the tool.

An object of the invention is to provide a tool of the general class described having guard means so formed that visibility of the cutting portion of the tool and of the underlying work is possible at least during the time the tool is being moved toward the work.

Further objects and advantages of the invention will be brought out in the following part of the specification.

Referring to the drawing which is for illustrative purposes only:

Fig. 1 is a perspective view showing my invention embodied in a chipping hammer.

Fig. 2 is a side view showing the head of the tool disclosed in Fig. 1, this head having also applied thereto a second guard for the upwardly projecting point.

Fig. 3 is a view showing a portion of a percussion tool having an alternative form of spring element thereon.

Fig. 4 is a fragmentary view showing a portion of a percussion tool having a guard disposed so as to yield bodily relative to the tool.

Fig. 5 is a fragmentary partly sectioned view showing a percussion tool having another form of my guard thereon.

The percussion tool shown in Fig. 1 comprises a chisel 6 with a handle 7 extending therefrom so as to produce a chipping hammer. The upper end of the head or chisel 6 may be ground or shaped so as to have a sharp point 8 opposed to the chisel cutting edge 9. A guard 10 is secured to the chisel 6 in a position to surround the lower portion thereof and to project a suitable distance below the cutting edge 9. This guard comprises a strip of spring metal, such as spring wire 11 wound in a coil so as to produce what is in effect the spring surrounding the working portion of the tool. Although the wire 11 may be wound spirally, I find that it is best to wind the same so as to produce a spring having the shape of a

rectangular pyramid, so that the wire may lie close to the body 12 of the chisel as shown at 13, for purpose of support, and will gradually enlarge as the coils are carried downward to and beyond the plane of the cutting edge 9. The upper end of the wire may be hooked over the adjacent portion of the handle 7 as indicated at 14 in Fig. 1.

In Fig. 2 I have shown a side view of the chisel 6 with the guard 10 thereon, and have shown a second guard 15 positioned so as to surround the upper portion of the chisel 6 and to project above the point 8. This guard comprises a strip of metal 16 wound in semblance of a spring, but instead of defining or enclosing a space consisting of a truncated pyramid, it is wound spirally with gradually enlarging turns so as to define a truncated cone. It will be noted, however, that the guard 15 does not depart greatly from simple cylindrical form.

It will be noted from Figs. 1 and 2 that the guard 10 projects a distance below the cutting edge 9 and that the spaces between the separate turns of the wire are of such width that when the guard 10 is open or relaxed, the cutting edge 9 is visible, and as clearly perceived in Fig. 1, the space below the cutting edge is visible. When the chisel 6 is moved toward the work in the normal and intended use thereof, the lower extremity 18 of the guard 10 first engages the work, and as the chisel 6 continues its downward movement, the guard will yield. That is to say, the upper end of the guard will move downwardly with the chisel 6 so that the vertical dimension of the guard will shorten. Accordingly, the separate turns of the wire 11 will be moved closer together so as to reduce the width of the spaces between them, the result being that when the cutting edge 9 engages the work and the chip is dislodged and impelled outwardly, the separate turns of the wire 11 will be sufficiently close together to stop the chips.

In the alternative form of the invention shown in Fig. 3, the guard 20 is made from a thin flat spring stock 21 of the general character of clock springs. This flat strip 21 is wound in the form of a spiral and is positioned so as to surround the lower portion of a percussion tool 22. As a means for securing the guard 20 to the tool 22, I have shown welds 23 affixing the upper edge of the guard to the surface portion of the tool 22. The strip 21 is shown with perforations 24 serving to decrease the weight of the guard 20, and permitting some small degree of visibility of the working portion 25 of the tool 22, although in some uses of the invention, visibility of the cutting edge of the tool is not necessary, for the reason that the tool is swung into engagement with the surface of the work fairly rapidly, and the accuracy with which the cutting edge engages the work depends upon the trained arm of the mechanic who swings the hammer. Visibility of the cutting edge is not necessary for the reason that with the guard 20 properly positioned, the user knows that the cutting edge 25 is in centralized relation to the guard. Also, the contact of the cutting edge 25 with the work is substantially instantaneous due to the rebound of the tool so that the tool is raised from the work through sufficient period of time to permit good visibility of the work.

In Fig. 4 I show a chisel 26 which may be a portion of a chipping hammer such as shown in Fig. 1 and Fig. 2, or which may be adapted for driving into engagement with the work by a hammer being struck against the upper end thereof. On the chisel 26 I have provided a guard 27 which is yieldable upwardly relative to the chisel by reason of the fact that it includes a sleeve 28 which is slidable upwardly on the chisel 26 against the yieldable force of a spring 29, a stop pin 30 engaging a slot 31 in the sleeve 28 to limit the movement thereof. The guard 27 includes a tube of flexible material 32, such as a rubber compound, and such flexible material 32 may be reenforced with an inserted reenforcing element such as fabric or metal screen. At the lower end of the tubular wall 32 a metal ring 33 is placed, this ring being of a channel cross section so that it may be clamped on the lower edge of the tubular wall 32. The ring 33 serves as a means for engaging the surface of the work at about or prior to the engagement of the cutting edge of the chisel with the work. The wall 32 may yield laterally due to flexibility thereof and the chisel 26 may move down bodily through the guard 27 into engagement with the work with very little deformation of the tubular wall 32 in vertical direction.

It will be understood that the invention is of material value in conjunction with tools employed for chipping operations on materials which are not heated. In such event, I may, as shown in Fig. 5, employ a guard 35 comprising a tubular wall of resilient yieldable compound, this tubular wall 36 having a lip 37 around the lower edge thereof to engage the surface of the work 38. The upper portion of the tubular wall 36 fits snugly around a chisel 39 above its cutting edge 40, and to supplement the normal action of friction to hold the guard 35 on the chisel 39, I may employ a clamping means 41 of the general type of a hose clamp. The clamping means is shown as a wire wound tightly around the portion of the tubular member 36 which surrounds the tool 39. A yieldable material which may be employed for making the guard 35 comprises rubber compound or one of the synthetic substitutes therefor. Likewise, it may comprise a fabric impregnated with a stiffening material. In the form of the invention shown in Fig. 5, the operator does not have visibility of the cutting edge 40, but this cutting edge is centralized within the lower portion of the guard 35. As the tool 39 is moved downward, the lip 37 will first engage the surface of the work 38, and as the downward movement of the tool 39 continues, the wall 36 will be axially compressed, and the lip 37 will be held snugly against the surface of the work 38, the guard 35 defining a chamber or enclosure 42 surrounding the cutting zone to retain the cuttings which would ordinarily fly off.

I claim as my invention:

1. In a percussion tool of the character described, the organization comprising: a tool element having a work engaging portion adapted to be driven against the work, and a guard positioned on said tool element during its normal use, comprising a strip of resilient material wound in a spring-like coil so as to be yieldable in axial direction, placed so as to surround said work engaging portion of said tool element to restrain outward movement of particles which fly off from the work.

2. In a percussion tool of the character described, the organization comprising: a tool element having a work engaging portion adapted to be driven against the work, and a guard comprising a metallic strip wound in a spring-like coil so as to be yieldable in axial direction, placed

so as to surround said work engaging portion of said tool element to restrain outward movement of particles which fly off from the work, said coil having space between turns thereof through which the surrounded portion of the tool element is visible.

3. In a percussion tool of the character described, the organization comprising: a tool element having a work engaging portion adapted to be driven against the work, and a guard positioned on said tool element during its normal use, comprising a strip of resilient material wound in a spring-like coil so as to be yieldable in axial direction, said coil being downwardly flared and placed so as to surround said work engaging portion of said tool element to restrain outward movement of particles which fly off from the work.

4. In a chipping hammer of the class described, the combination of: a handle member, a head on the handle member, said head comprising a downwardly extending chisel and an upwardly extending point, and guard means for said head comprising a pair of coiled spring members, one projecting downwardly so as to surround the lower portion of said chisel and the other extending upwardly so as to surround said point, said spring members defining enclosures surrounding said chisel and said point and providing barriers to stop chips flying off from the object struck by the chipping hammer.

5. In a chipping hammer of the class described, the combination of: a handle member, a head on said handle member, said head comprising a downwardly extending chisel, and guard means for said chisel comprising a spring member with the upper portion thereof wound relatively closely around said chisel, said spring member extending downwardly around the work engaging portion of said chisel in the form of a downwardly expanding truncated rectangular pyramid and the lower end thereof being positioned in a plane below the lower extremity of said chisel.

6. A guard for a tool element having a work engaging portion adapted to be driven against the work, comprising a strip of resilient material wound in a spring-like coil so as to be yieldable in axial direction, and means to attach said coil to said tool element so that it will surround the end portion thereof during the normal use of the tool element, to restrain outward movement of particles which fly off from the work and permit view of the work engaging portion of the tool element.

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