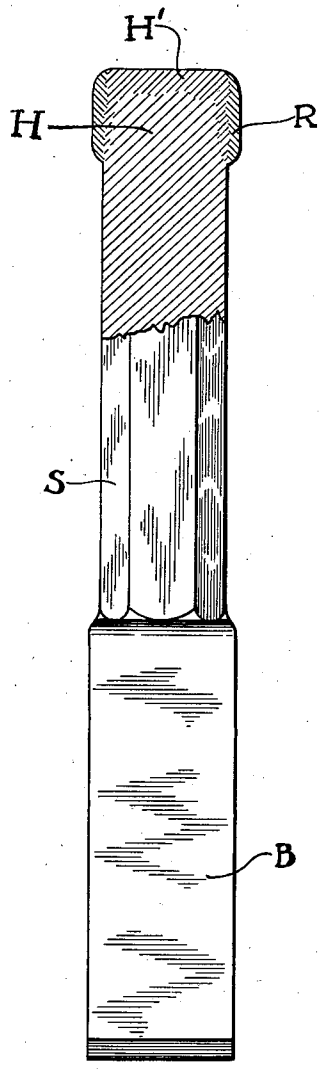
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TOOL AND METHOD OF MAKING THE SAME

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TOOL AND METHOD OF MAKING THE SAME

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This invention relates to tools such as chisels, drills, punches and the like for use in metal or stone working and to the method of making the same; and particularly to improvements in the construction of the heads of tools which are subjected to impacts.

Such tools are usually made from bars of rather high carbon steel, the operating ends of which are tempered or otherwise suitably treated to provide wear-resisting points or cutting edges of suitable hardness. The portions of these tools above the hardened operating ends are left unhardened in order to provide the tools with tough shock-resisting shanks terminating in impact-receiving heads. Were the impact heads hardened these ends would, if unreinforced, be too brittle to be of value in ordinary use. In use, the unhardened impact heads of these tools become battered down and mushroomed over thereby objectionably reducing the length of the shanks and producing heads having a rough irregular overhanging flange, portions of which from time to time fly off during impact and become a source of injury to an operator.

It is an important object of the invention to provide an improved construction in tools of this character such that the life of the resulting tool will be prolonged and danger from metal particles flying off therefrom under impact will be eliminated.

Another object of my invention is to provide a construction which will permit the impact-receiving head to be tempered or hardened and at the same time avoid fracturing of such head in use.

A further object of the invention is to provide an improved process of manufacturing tools of the above and similar character which are subject to impact in use.

These and other objects and novel features of the invention will become apparent from the following description taken with the accompanying drawing in which the single figure is a view in partial section of a cold chisel made in accordance with the principles of this invention.

The chisel as illustrated comprises a solid bar or shank S of homogeneous composition, preferably of tough shock-absorbing metal such as fairly high-carbon steel which will respond to hardening and tempering treatments. A point, a blade, or a cutting portion B is formed upon the lower or cutting end of the shank S. The point or blade B is commonly hardened and tempered to provide a highly wear-resistant portion of an extent adapting it to repeated dressing or sharpening whereby the life of the tool is prolonged.

The life of the tool is further prolonged and is otherwise improved by surrounding and securing to the periphery of the upper end or impact-receiving head H thereof a protective and reinforcing ring or band R, desirably of relatively soft or ductile metal or metallic alloy, such as a bronze or brass alloy. I have found it advantageous to use a copper-base alloy such as phosphor bronze of the following approximate composition: Tin 2.50%, phosphorus 0.08%, and the remainder copper. The band R is formed of suitable thickness and width to materially reduce or substantially prevent damage such as mushrooming of the head H and the spalling or chipping off of steel particles during impact. The outer edge of the band preferably is coextensive with the head end of the shank, thus leaving bare only the extreme end surface of the shank to receive the blows of a hammer or the like.

In the manufacture of a tool of this character, the blank or body from which the tool is to be formed is first shaped as desired. The pointed or cutting end B of the tool may then be tempered or otherwise brought to the desired hardness. The tool shank may then be ground off slightly around and adjacent its impact-receiving head to provide a smooth peripheral surface free from oxides, and then the ring or band R is applied to the surface so prepared.

The band R may be applied and permanently secured to the head H in various ways; and preferably by fusing metal from a suitable welding rod, as by means of an oxy-acetylene or similar high-temperature flame, and depositing and welding such fused metal peripherally about and directly to the prepared surface adjacent the tool head. By this procedure, a protective and reinforcing metal band of appropriate thickness and width may be readily and permanently secured around the tool head, and the extreme end of the head of the tool within the band is left exposed to receive hammer blows. Moreover, the high-temperature heat thus applied to the tool head in building up the band R may be additionally utilized to improve the quality of the metal at the head end of the tool. By quenching the heated head end of the tool in water or other cooling medium immediately after welding the protective band thereto, the impact-receiving end portion of the tool may be tempered, as indicated by the close hatching H', so as to increase its hardness to the desired degree and thus con-

siderably increase its resistance to wear and mutilation by impact.

Although the tool blank preferably consists of a single bar of steel and the increased hardness of the working portion is imparted by suitable heat treatment, pieces of dissimilar metals or alloys may be united, as by welding, and the impact-receiving portion may then be reinforced as already described. While the invention is herein described as applied to a cold chisel, it will be understood that the invention may be similarly applied to the portion of any metal tool, hammer, or other metal member that is subjected to receiving or delivering impacts. Devices embodying this invention are much safer to operate than those not provided with a protective and reinforcing band; and, since periodic dressing of the impact head is rendered unnecessary, a considerable reduction in tool expense may be secured in shops and other places where a large number of such tools are used.

I claim:

1. A chisel, drill, punch, or the like comprising a solid metal bar having a metal portion that is adapted to be subjected to impacts, and a protective metal band extending around and permanently secured to said portion to reduce damaging and mushrooming of said portion by such impacts.

2. A chisel, drill, or the like having a solid metal shank provided with an impact-receiving metal head portion at one end and a metal point or blade at its other end, and a protective and reinforcing metal band extending around the periphery of and permanently secured to said head portion.

3. A tool having a hardened metal portion that is adapted to be subjected to impacts and a comparatively ductile metal band extending around and welded to said hardened portion, said hardened portion having a bare surface adapted to receive such impacts.

4. A tool comprising a solid metal bar having an impact-receiving hardened metal head portion at one end and a hardened point or blade at its other end, and a band of ductile metal extending around the periphery of and permanently secured to said head portion to reduce mutilation of the latter by such impacts, said hardened head portion having a bare surface adapted to receive such impacts.

5. A tool of the class described comprising a head portion of a steel that is adapted to be hardened by heat treatment; an operating end; and a protective band of softer material than said head portion surrounding the latter, said band and said head portion being welded together and said head portion being hardened by heat treatment.

6. A method of making a tool which comprises forming a hardenable metal part having a surface intended to be subjected to impact, welding a band of ductile metal to and around the periphery of such part adjacent to the surface which is subjected to impact, and quenching such part immediately after such welding operation to harden said metal part.

7. A method of making a tool which comprises providing a metal part having a surface intended to be subjected to impact, and welding a reinforcing band of copper-containing alloy to and around the periphery of such part adjacent to its surface which is subjected to impact.

8. A method of making a tool which comprises providing a metal part having a surface intended to be subjected to impact, applying welding heat to said part, and building up a protective and reinforcing band of metal on said part by fusing metal and depositing the fused metal around the periphery of said heated part adjacent said surface.

9. A method of making a chisel, drill, punch, or the like which comprises forming a point or cutting edge at one end of a solid bar of metal, and permanently securing a protective band of metal to the periphery of said bar close to its other end to reduce damaging of said periphery by impacts applied to said other end.

10. A method of making an impact-receiving tool which comprises forming a blank of a metal adapted to be hardened by heat treatment, applying a protective band adjacent to the impact-receiving portion by fusion-welding a deposit of ductile metal around the periphery of said portion, and quenching said portion while said deposit is still hot from the welding operation.

11. A method of making an impact-receiving tool which comprises forming a solid shank of steel adapted to be hardened by heat treatment; fusion-welding a deposit of copper-containing alloy to said shank adjacent to and around the impact-receiving end thereof, to provide a permanent protective metal band adjacent said end; and quenching said end while said deposit and said end are still hot from the welding operation.

12. A tool comprising a solid steel head portion adapted to be subjected to impacts; and a protective band, of metal more ductile than said steel head portion, extending around and permanently secured to the periphery of said head portion, said band being adapted to reduce mutilation and mushrooming of said head portion by such impacts.

13. A chisel, drill, punch or the like comprising a solid steel bar having a head portion adapted to be subjected to impacts; and a protective band, of metal more ductile than steel, extending around and welded to the periphery of said head portion to substantially prevent mutilation and mushrooming of said head portion by such impacts, said head portion having a bare end surface adapted to receive such impacts.

14. A tool comprising a metal head portion having a surface adapted to be subjected to impacts; and a protective band of ductile copper-containing alloy extending around the periphery of said head portion and welded thereto adjacent said surface, said band being adapted to reduce mutilation of said head portion by such impacts.

15. A method of making a tool which comprises forming a metal part having a surface intended to be subjected to impacts, and welding means to and around the periphery of such part adjacent to said surface to reinforce said part and reduce damaging of the same at said periphery.

16. A tool having a solid metal head provided with a surface intended to be subjected to impacts, the periphery of said head adjacent said surface normally tending to become damaged due to such impacts; and means for reducing such damage, said means being welded to and extending around the periphery of said head adjacent said surface.

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