June 17, 1947. R. W. McCLURE 2,422,202

CHISEL

Filed Sept. 4, 1945

FIG. 1

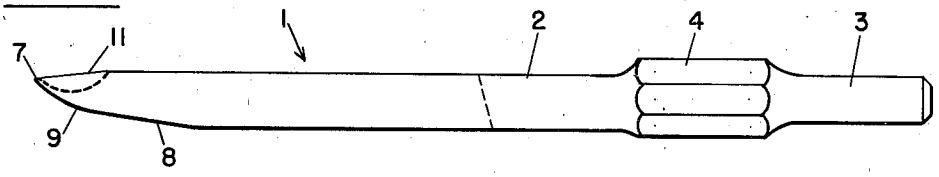


FIG. 2

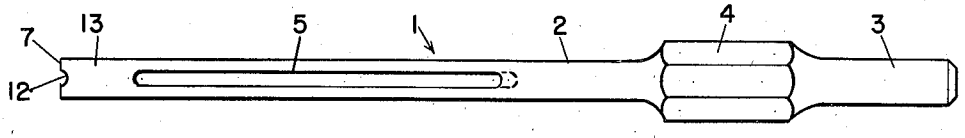


FIG. 3

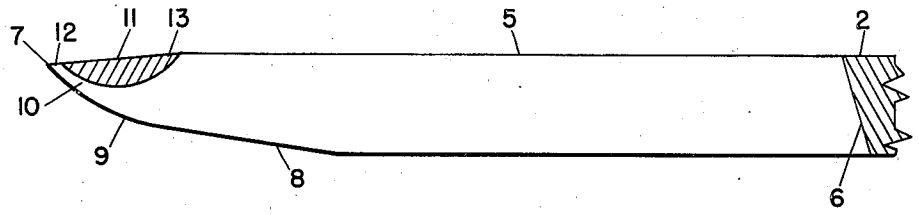


FIG. 4

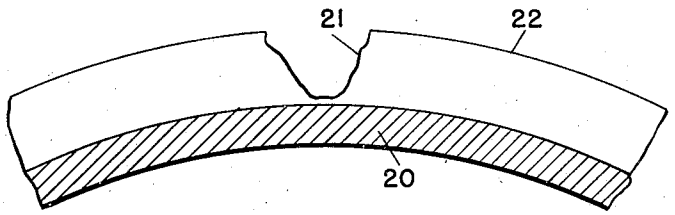
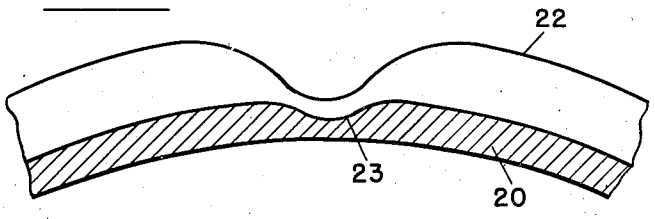


FIG. 5



INVENTOR
ROBERT W. McCLURE
BY
Ralph L Chappell
ATTORNEY

Patented June 17, 1947 2,422,202

UNITED STATES PATENT OFFICE

2,422,202

CHISEL

Robert W. McClure, San Diego, Calif.

Application September 4, 1945, Serial No. 614,334

4 Claims. (Cl. 30—168)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

This invention relates to chisels and particularly chisels of the type used in pneumatic hammers.

An object of the invention is to provide an improved chisel adapted for use in a pneumatic hammer and of such construction as to be primarily adaptable to the reworking and reconditioning of cracked or otherwise damaged cooling fins or other thin, rib-like elements.

Other objects of the invention are to provide an improved chisel of the character described having a centrally-recessed cutting tip for straddling the damaged fin so as to remove portions of the main body on either side of the damaged fin portion upon the removal of the latter, thereby forming a connecting web for reinforcing the undamaged portions of said fin; to provide an improved chisel having its body longitudinally slotted so as to straddle the damaged fin for guiding the movement of the chisel and preventing slipping thereof during the cutting operation; to provide improved elements and arrangements thereof in a chisel of the character described and for the purposes set forth.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a side elevational view of a chisel embodying the features of the present invention.

Fig. 2 is a plan view of the chisel.

Fig. 3 is an enlarged, longitudinal, vertical, sectional view of the outer portion of the chisel.

Fig. 4 is a horizontal, cross-sectional view of a portion of a cylinder having a fractured cooling fin.

Fig. 5 is a view, similar to Fig. 4, showing the fin reconditioned by the chisel.

Referring more in detail to the drawing:

In Fig. 1, the numeral 1 designates a chisel which includes an elongated body 2 of substantially rectangular shape in cross-section and of greater thickness than width. A cylindrical shank 3 is formed on one end of the body for mounting the same in a pneumatic hammer (not shown), while the adjacent inner or intermediate portion of said body is preferably enlarged and of polygonal cross-section to provide a multiplicity of wrench faces 4 for facilitating the mounting of the body.

As is clearly shown in Figs. 2 and 3, an elongate opening or slot 5 extends longitudinally and vertically of the body from its intermediate portion to a point adjacent the outer end thereof. The

2

end walls of the slot preferably are curved or arced transversely of their length and are directed inwardly and upwardly as shown by the numeral 6 (Fig. 3).

A tapered cutting edge or tip 7 is formed on the forward or outer end of the body by inclining or tapering the lower surfaces upwardly toward the upper surface of said end portion shown at 8. The lower inclined surface 8 is preferably provided with an outer or forward, upwardly curved or bevelled portion or face 9 which merges with the upper surface to form the cutting edge 7.

A longitudinal channel or groove 10, semi-circular in cross-section, is formed in the curved face 9 intermediate its lateral margins and in alignment with the slot 5, whereby the rear end of the groove communicates with the forward end of said slot. The upper surface of the outer end portion of the body has its extremity bevelled or tapered slightly as shown by the numeral 11 (Figs. 1 and 3) to provide a relief for the cutting edge 7 and prevent wedging of the same in use.

Due to the provision of the slot 5 and groove 10, a central recess 12 is formed in the cutting edge 7 and an intermediate web 13 is provided rearwardly of the recess. The web 13 is of substantially semi-circular shape and its rear or inner surface is formed by the forward end wall 6 of the slot.

Operation

The operation of a chisel constructed as described is as follows:

The chisel 1 is primarily adapted to be used in trimming or cutting out fractured or cracked sections of radial-type engine cylinder cooling fins to prevent further fracturing or cracking thereof. A portion of an engine cylinder wall 20 having a fracture 21 in one of its cooling fins 22 is shown in Fig. 4.

The body 2 of the chisel is mounted in a pneumatic hammer (not shown) by means of its shank 3 and the wrench faces 4. The fracture 21 is adapted to be trimmed and smoothed by the cutting edge 7 as shown in Fig. 5. Due to the provision of the groove 10 in the curved face 9, the peripheral surface of the fin 22 will engage within said groove during the initial inward or downward cut so as to guide the movement of the chisel body and its cutting edge.

Continued inward or downward movement of the body causes the outer portions of the cutting edge to bite into the cylinder wall 20 and remove portions thereof on either side of the fin, whereby an inwardly-disposed web 23 is formed

for connecting the ends of said fin as shown in Fig. 5. The remainder of the fracture is trimmed and smoothed by upward and outward movement of the body and such movement is guided by the outer peripheral portion of the fin engaging within the slot 5 of said body.

It is noted that the cutting of the fin is accomplished by the central, recess 12 of the cutting edge 7 and the forwardly projecting lateral portions of said edge merely serve to form the connecting web 23. The taper 11 deflects the removed chips outwardly away from the cutting edge.

While I have shown but one embodiment of my invention, it is apparent that the device is susceptible to modification without departing from the spirit of the invention. I do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A chisel including, an elongated body having less width than thickness, a shank formed on one end of the body for mounting the same in a pneumatic hammer, and a tapered cutting tip formed on the other end of said body by curving the lower surface of the end portion upwardly, the tip having a centrally disposed groove extending longitudinally of its lower surface, the body having an elongated slot extending longitudinally thereof, the slot being of such length as to have its inner end terminate at the intermediate portion of said body and its outer end merging with the groove of said tip, the end walls of said slot being curved transversely and being upwardly and inwardly inclined.

2. A chisel including, an elongated body, a shank formed on one end of the body for mounting the same in a pneumatic hammer, a tapered cutting tip formed on the other end of said body, the body being slotted longitudinally from the cutting tip to a point intermediate the length thereof, and a web connecting the body portions at said tip and having its outer lower surface spaced inwardly of the margin of said body to provide a recess in and adjacent to the tip.

3. A chisel including, an elongated body, a mounting shank formed on one end of the body, and a cutting tip formed on the other end of said body by bevelling said end portion, the latter end portion having its lower surface grooved longitudinally intermediate its lateral margins to centrally recess the cutting tip, the body having a slot extending longitudinally and vertically thereof with its outer end communicating with the groove formed in the end portion of said body.

4. A chisel including, a body, a mounting shank formed on one end of the body, and a cutting tip formed on the other end of said body, the tip being centrally recessed to provide a cutting edge having a central offset portion, the body being slotted inwardly of and adjacent said tip.

ROBERT W. McCLURE.