April 20, 1943. W. VAN TRIEST 2,316,904

GRINDER ATTACHMENT

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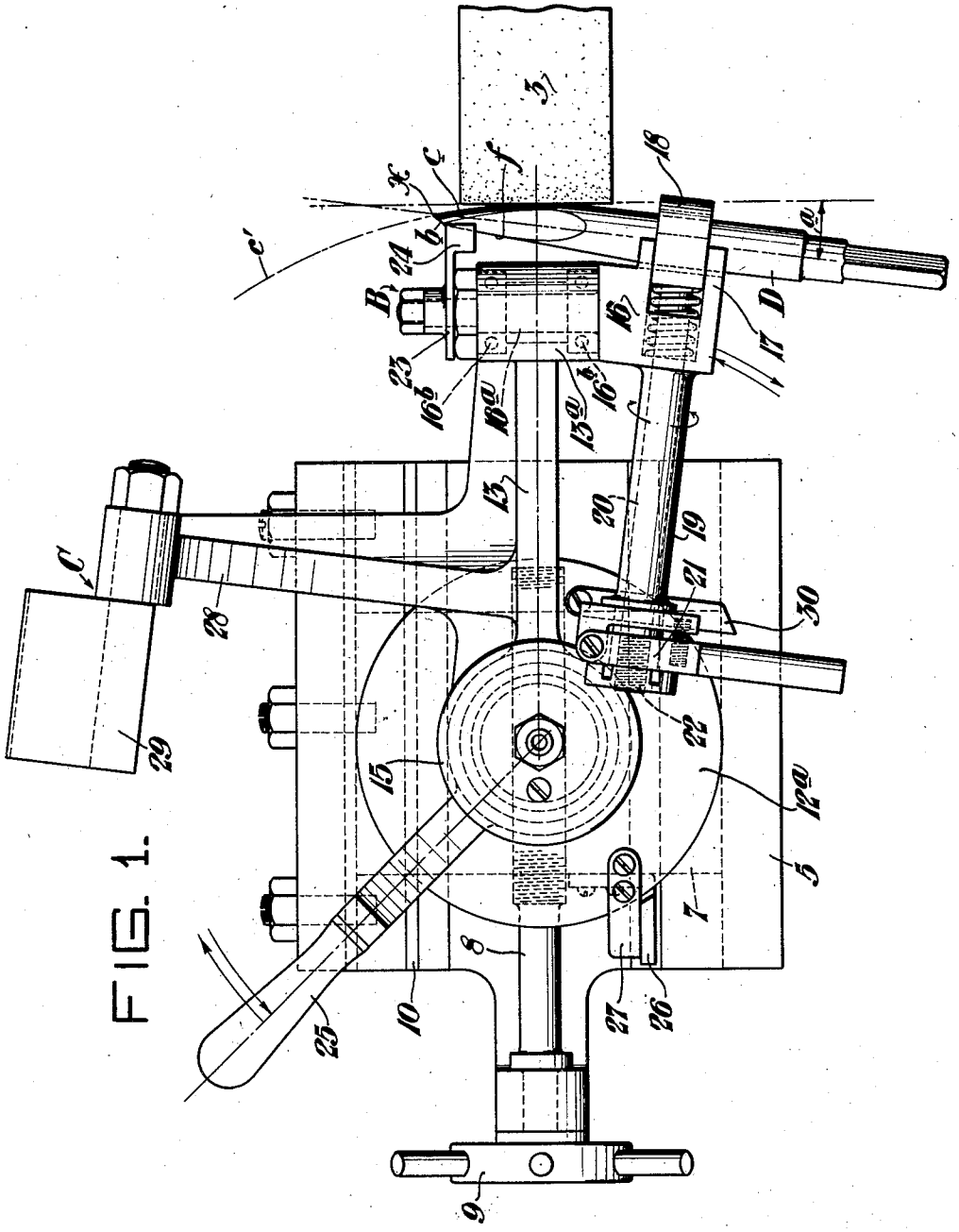


FIG. 1.

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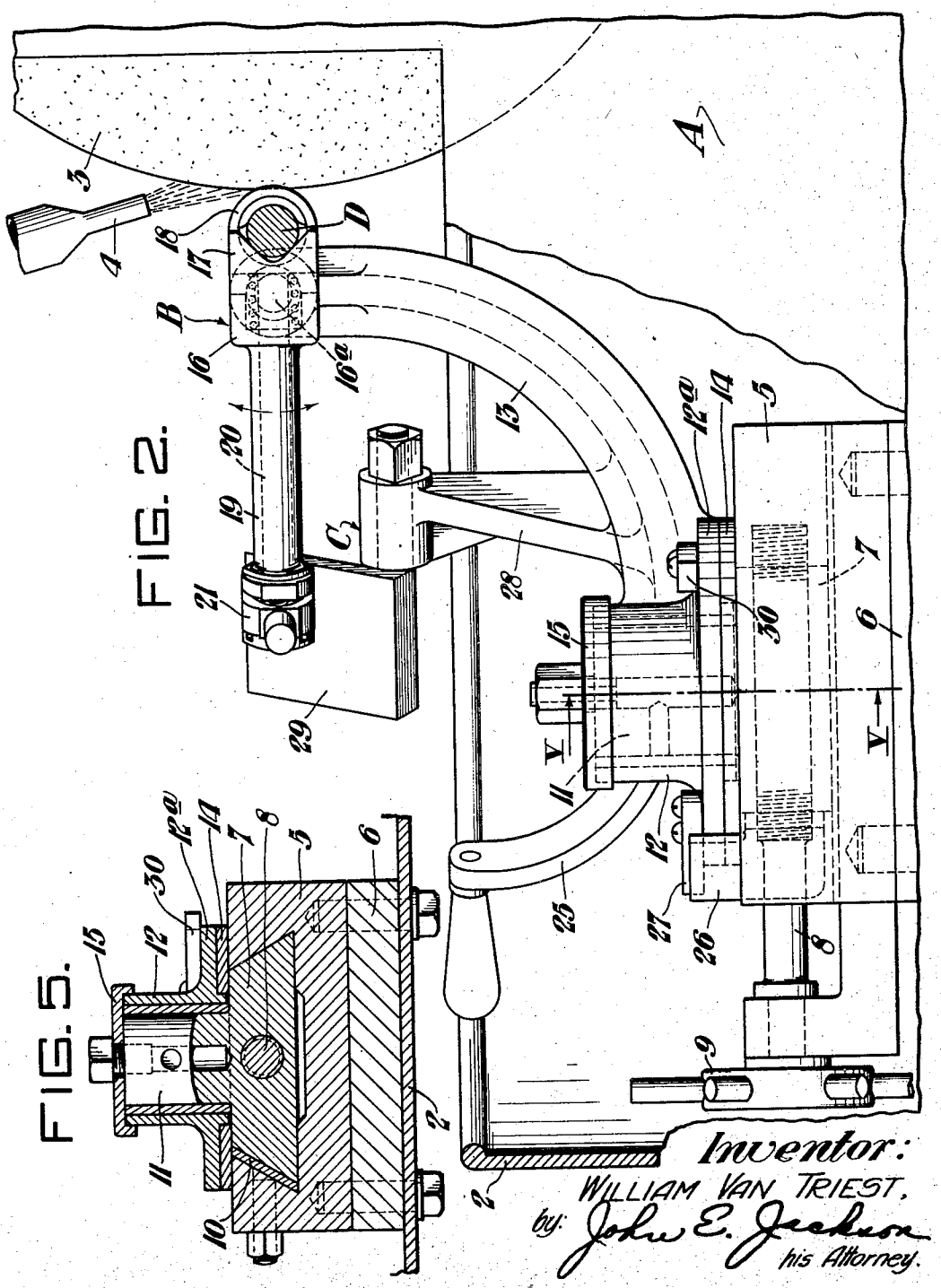


FIG. 2.

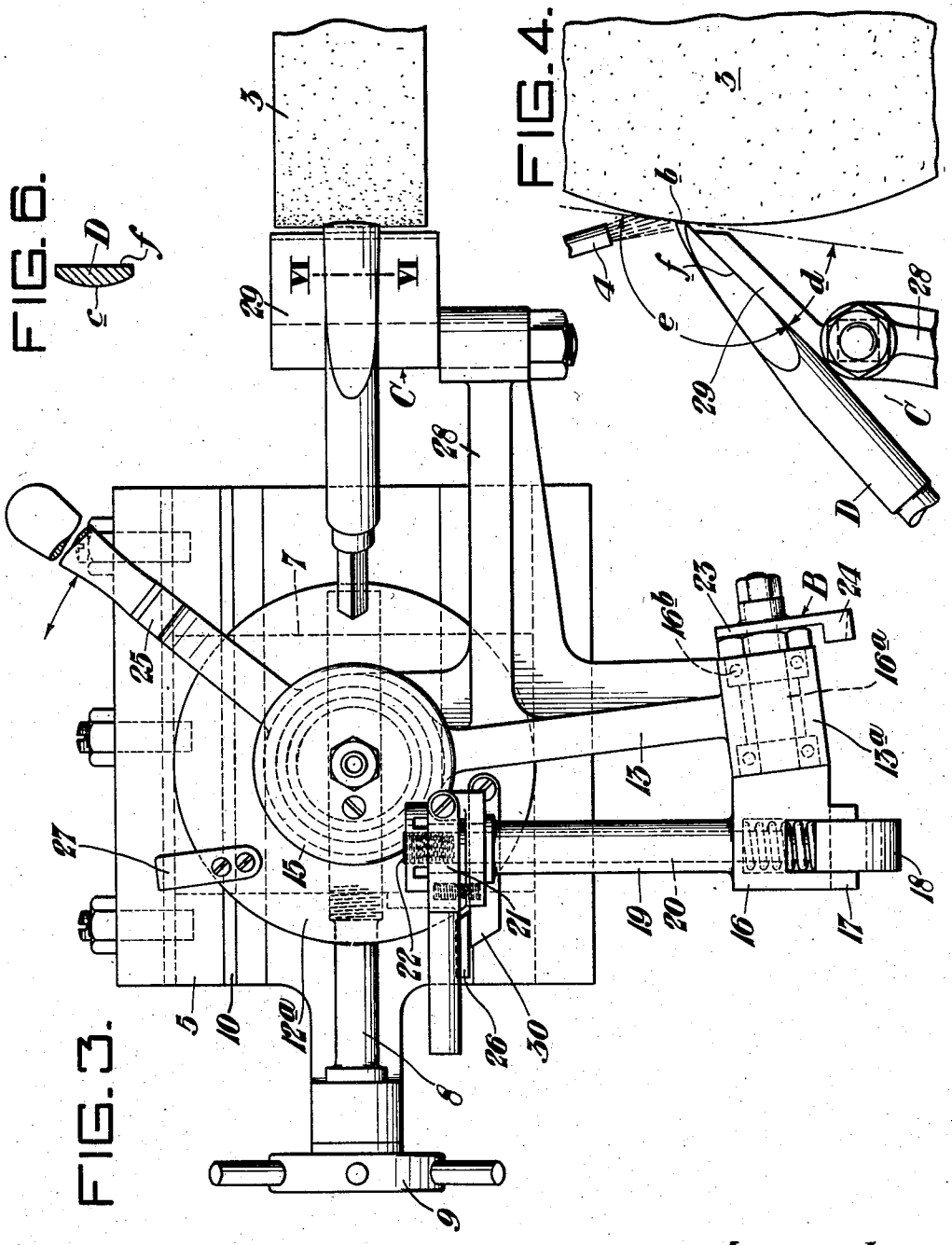
FIG. 5.

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UNITED STATES PATENT OFFICE

2,316,904

GRINDER ATTACHMENT

William Van Triest, Pittsburgh, Pa.

Application November 22, 1940, Serial No. 366,749

3 Claims. (Cl. 51—234)

This invention relates to improvements in grinder attachments, and more particularly to an attachment for the grinding of metal-chipping chisels and the like.

In the surface conditioning of steel billets and slabs, defects and seams are frequently removed by machine chipping with pneumatic hammers and chisels, and the efficiency of such an operation depends largely upon the sharpness of the chisel. The old method of hand sharpening such chisels results in nonuniformity and waste, thereby increasing the cost of the chipping operation. Also, careless hand grinding frequently results in burning and loss of temper of the chisels, causing unnecessary expense.

It is a prime object of my invention to provide a grinder attachment for the uniform grinding and sharpening of metal-chipping chisels and the like, to thereby eliminate the waste attendant upon the common practice of hand sharpening, and to improve the efficiency of the chipping operations and the like employing said chisels.

Further objects are to provide a simple attachment for the purposes stated which may be readily applied to standard grinding machines, and one which is readily operable by the workman with efficiency and accuracy.

Additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a plan view of the attachment shown in position for grinding the heel of a metal-chipping chisel;

Fig. 2 is an elevational view of Fig. 1;

Fig. 3 is a view similar to Fig. 1, showing the attachment in position for grinding the cutting edge of said chisel;

Fig. 4 is an elevational view of a portion of Fig. 3;

Fig. 5 is a sectional view taken on the line V—V of Fig. 2, showing the mounting of the attachment; and

Fig. 6 is a cross-section through the chisel taken on the line VI—VI of Fig. 3.

Referring to the drawings, A designates a portion of a standard grinding machine, preferably for wet grinding, including a coolant pan 2 disposed adjacent the grinding wheel 3, which latter is driven by a suitable motor and is supplied with water or other coolant from a spray nozzle 4.

My attachment is designed to be mounted on a frame or stationary portion of the grinder A, as for example, in the coolant pan 2 as shown in Figs. 2 and 5, said attachment being adjacent to the wheel 3 and in front thereof. Thus, a base member 5 is bolted to the pan 2 as shown, employing one or more fillers 6 for proper height.

7 designates the attachment carriage slidably mounted on the base 5 for movement toward and away from the periphery of the grinding wheel 4, as by means of a screw 8 having a hand-wheel 9. A gib is provided at 10 for fixing the slidable carriage 7 in the base. The carriage 7 is provided with a vertical post 11 rotatably mounting the attachment head 12, said head having a lateral bearing flange 12a supported by a bearing washer 14 on the carriage and base. A cap 15 secures the rotatable head upon the post 11.

Head 12 is provided with means comprising a pair of grinding supports B and C designed to be separately related to the grinding wheel 3 by rotation of said head on its post 11. The support B includes a radial arm 13 integral with the head 12 and terminating in a transverse hub 13a, which in turn mounts a rotatable chisel holder 16, as by a stud 16a on said holder supported by ball bearings 16b mounted in said hub. The axis of rotation of the holder 16 in the hub 13a is preferably perpendicular to the radial arm 13.

Holder 16 includes chisel-gripping means comprising a stationary jaw 17 and a movable jaw 18 operable to transversely grip the body of a chisel D, the said gripping means being disposed so as to present the chisel D transversely of the peripheral face of the grinding wheel at a predetermined angle a with respect to the longitudinal axis of said chisel. (See Fig. 1.)

The holder 16 also includes a handle 19 rearwardly of its gripping means, said handle being of tubular form and containing a spindle 20 for actuating the movable jaw 18 as by means of a ratchet wrench 21 at the terminal of said handle engaging a threaded portion 22 on said spindle, whereby the jaw 18 may be moved relative to the jaw 17 for gripping a chisel.

23 designates a chisel guide or gage stop secured to and rotatable with the stud 16a of the holder 16, said guide having a terminal stop 24 disposed in predetermined relation to the holder gripping means for properly defining the position of the cutting face b of the chisel D upon positioning the latter in the holder. A handle 25 is provided on the head 12, preferably extending radially therefrom on the side of said head away from the arm 13 and toward the operator.

Thus, with a chisel D positioned in the holder 16, as in Fig. 1, with its cutting face b at the

guide stop 24, the carriage 7 is moved inwardly toward the wheel 3 by handwheel 9 until the inclined heel c of the chisel engages said wheel. The operator then grasps handles 19 and 25 for compound movement of the chisel on the grinding wheel, handle 25 rotating the head 12 and chisel D about the post 11 for grinding the inclined arcuate heel c on the chisel along the arc c', and the handle 19 rocking the holder 16 and the chisel for simultaneously imparting an arcuate transversely convex contour to said chisel heel c, as shown in Fig. 6.

For the purpose of limiting the heel grinding movement along the arc c', a stop 26 is provided on the carriage 7 adapted to be engaged by a coacting stop 27 on the flange 12a of the head 12, preventing rotating movement of the chisel on the wheel 3 rearwardly along the heel portion c beyond a desired point thereof.

Upon completion of the grinding of the heel of the chisel as described, the chisel is removed from the holder 16 and placed with its heel side up upon the support C, as in Figs. 3 and 4. Said support includes an arm 28 having a rest 29 adjustably mounted at the terminal of said arm and adapted to be positioned at a predetermined angle d with a tangent of the grinding wheel 3, said angle representing the supplement of the angle e between the inclined front face f of the chisel and the cutting face b thereof.

The supports B and C are angularly disposed with respect to each other and extend divergently from the head 12, whereby their terminals and their respective chisel-receiving portions 16 and 29, respectively, are suitably spaced apart so as not to interfere one with the other during their separate employment for grinding the chisel.

In order to properly align the rest 29 with the grinding wheel, a stop 30 is provided on the flange 12a of the attachment head for engagement with the stop 26, as in Fig. 3.

It will be apparent that the grinding of the cutting face b in the manner described will provide a transversely rounded cutting edge x due to the convex curvature of the heel c, which cutting edge has uniform curvature for efficient chipping or gouging of metal in the deseaming of billets, slabs, or the like.

From the foregoing, it will be seen that I have provided a grinding attachment capable of readily and accurately grinding metal-chipping chisels and the like, particularly as to their heel portions and cutting faces and edges, with uniformity and speed. In actual test, I have found that the complete grinding requires only twenty-five seconds per chisel with an average of 110 chisels ground per man hour. Also, it has been found that my invention reduces the redressings or sharpenings necessary during the life of a chisel.

Due to the ability to select the desired contour for the chisel and to uniformly grind the chisels to that contour, I have obtained as high as 8.5 percent increased overall efficiency for the entire chipping operation by the use of chisels ground by my invention over chipping with chisels ground by the old hand method.

Various changes and modifications are contemplated within the scope of the following claims.

I claim:

1. A grinder attachment of the character described including a base member adapted to be secured to a grinder adjacent the wheel thereof, a carriage slidably mounted on the base for movement in a direction toward and away from said wheel, said carriage having an upright post thereon, a head rotatably mounted on said post and having an arm extending toward said wheel, a support for gripping a chisel disposed at the free end of said arm, the support and chisel being adapted to be rotated in an arcuate path across the wheel, said support including means for supporting the chisel with the longitudinal axis thereof at an angle to the face of said wheel, said support being rotatably mounted on the arm for free rocking movement thereof transversely of said arcuate path, a second arm extending radially from the head and having a chisel grinding support at the free end thereof adapted to be selectively positioned adjacent the wheel upon rotation of the head, and coacting stops on the carriage and head for effecting registry of the supports with the wheel upon rotation of the head.

2. A grinder attachment of the character described including a base member adapted to be secured to a grinder adjacent the wheel thereof, a carriage slidably mounted on the base for adjustment thereof in relation to the wheel, means for securing the carriage in adjusted position, a head mounted on the carriage for rotation transversely of the rotation of the wheel and having a radial arm extending toward said wheel, a holder for gripping a chisel disposed at the free end of said arm, said holder including means for supporting the chisel with its longitudinal axis at an angle to the face of the wheel, the holder being pivoted on said arm for free rocking movement of the holder and chisel about an axis at an angle to said chisel axis, a second arm extending radially from the head and having a chisel grinding support at the free end thereof adapted to be selectively positioned adjacent the wheel upon rotation of the head, and coacting stops on the carriage and head for effecting registry of the supports with the wheel upon rotation of the head.

3. A grinder attachment of the character described including a base member adapted to be secured to a grinder adjacent the wheel thereof, a carriage slidably mounted on the base for adjustment thereof in relation to the wheel, means for securing the carriage in adjusted position, a head mounted on the carriage for rotation transversely of the rotation of the wheel and having a radial arm extending toward said wheel, a holder for gripping a chisel disposed at the free end of said arm, said holder including means for supporting the chisel with its longitudinal axis at an angle to the face of the wheel, the holder being pivoted on said arm for free rocking movement of the holder and chisel about an axis at an angle to said chisel axis, coacting stops on the carriage and head for limiting the rotation of the head in a direction from the cutting face of the chisel along the heel thereof, a second arm extending radially from the head in angularly spaced relation to the first arm, a chisel rest adjustably mounted on the second arm and disposed at an angle with the tangent of the wheel, and coacting stops on the carriage and head for positioning the second arm in relation to the wheel upon rotation of the head.

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