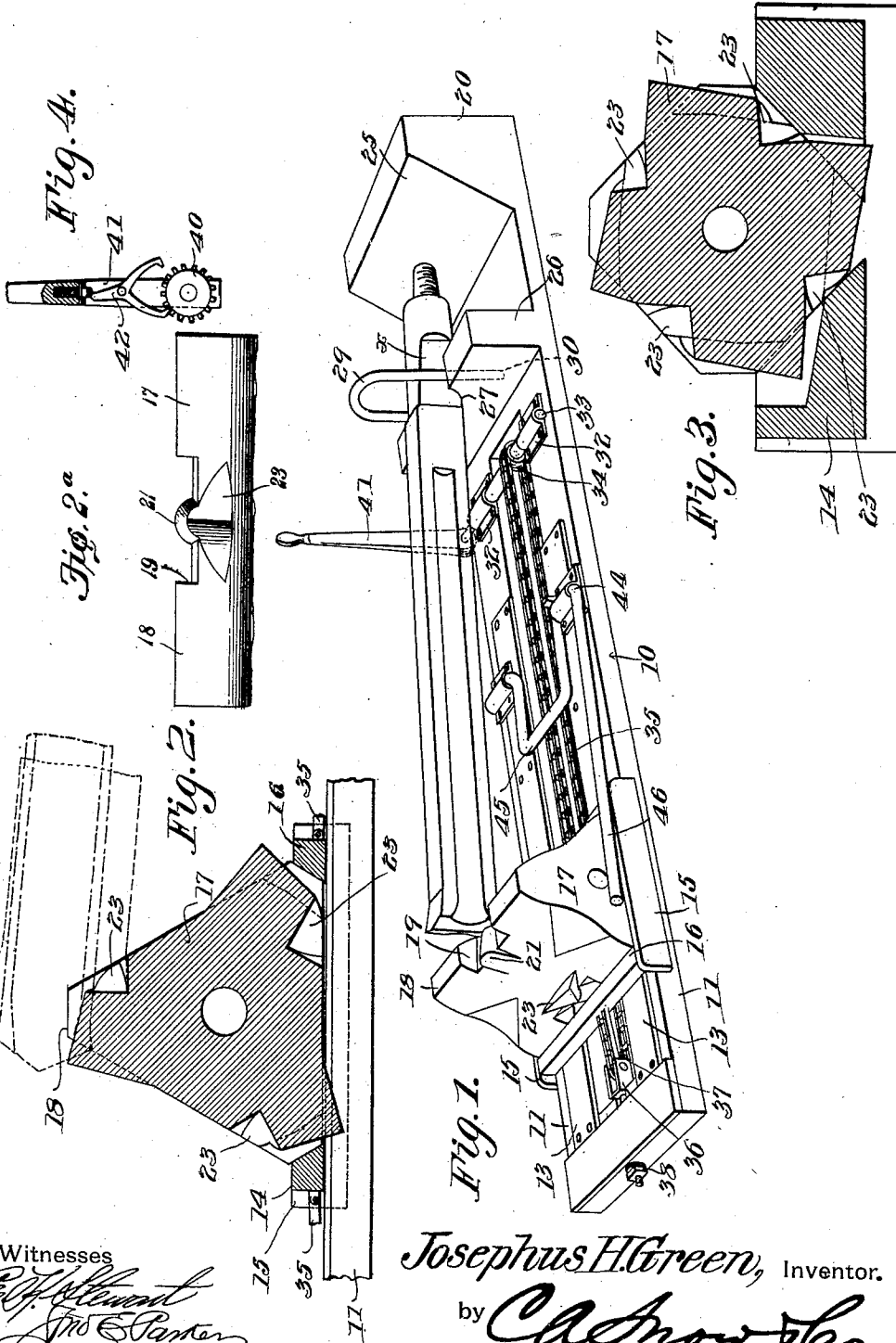


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PATENTED JAN. 1, 1907.

J. H. GREEN.
DRILL SHAPING MACHINE.
APPLICATION FILED MAY 22, 1906.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPHUS H. GREEN, OF MARIETTA, OHIO.

DRILL-SHAPING MACHINE.

No. 839,835.

Specification of Letters Patent.

Patented Jan. 1, 1907.

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To all whom it may concern:

Be it known that I, JOSEPHUS H. GREEN, a citizen of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented a new and useful Drill-Shaping Machine, of which the following is a specification.

This invention relates to devices for reshaping and repairing drill-bits, its principal object being to provide a readily-portable device adapted for the dressing of oil-well tools when they require reshaping or sharpening.

A further object of the invention is to provide a novel form of anvil adapted for the dressing of drill-bits of different size or of different shape, the anvil being so arranged that any one of its operating-faces may be quickly adjusted to the required position.

A further object of the invention is to provide a mechanism in which tool supporting and holding devices are employed in connection with an adjustable anvil so arranged that it may be readily and accurately adjusted in accordance with the length of the bit, and, further, to provide means for supporting the bit during the various operations of reshaping, dressing, or sharpening and for properly manipulating and supporting the bit during these operations.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a perspective view of a drill-bit-shaping mechanism constructed in accordance with the invention. Fig. 2 is a transverse sectional view, on an enlarged scale, illustrating particularly the construction of the triangular anvil and its supporting-carriage. Fig. 2^a is a detail elevation of a portion of the anvil, illustrating the position and contour of the anvil-recesses. Fig. 3 is a view similar to Fig. 2, showing an anvil of rectangular form in cross-section and provided with four operating-faces to be used in connection with drills of different size or shape. Fig. 4 is a detail view of the ratchet mechanism for ef-

fecting adjustment of the anvil with respect to the drill-bit guiding and supporting devices.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The apparatus forming the subject of the present invention is of the portable type and is intended to form a part of the equipment of a drilling-gang. The base 10 is formed of wood or other suitable material and preferably includes a pair of longitudinal parallel sills 11, that are spaced from each other for the greater portion of their length to afford room for the anvil-adjusting device. The sills, which are formed of wood, are protected by parallel wear-strips 13, which serve as supports for a carriage 14. The carriage comprises end plates 15, that extend down over the outer faces of the sills, and cross-bars 16, the inner faces of which are inclined and serve as supports for an anvil 17.

The body portion of the anvil is triangular in cross-section, presenting three faces, the meeting edges of which are slightly flattened, as at 18, and these flattened faces rest against the inclined inner faces of the cross-bars 16 in order to prevent any lateral movement of the anvil. Each of the edges 18 is provided with a recess 19 for the reception of the end of the drill-bit, and the opposite side walls of the recess are arranged on curved or inclined lines following the contour of the opposite sides of the bit. The lower wall of the recess is beveled or arranged on a slightly-inclined line that tapers downward toward the rear of the apparatus, or in the direction of the heel-block 20, in order that the bit may rest within the recess at a slight angle from the horizontal. The central portion of the lower inclined wall of the recess is provided with a rounded tapering projection 21, forming a fuller or creaser that is designed to enter the watercourse of the drill and preserve the shape of the drill during the dressing operation. The several recesses and projections are respectively of different size, so that drills of different diameter may be operated upon, and as the anvil is approximately in the form of an equilateral triangle in cross-section any one of its flat sides may form the base and any one of the edges adjusted to working position.

In order to support the drill during the shaping operation, each side of the anvil is provided with an approximately triangular

recess 23, into which the edge of the drill extends, as shown in Figs. 1 and 3, and these recesses are of a size corresponding to the size of the adjacent drill-receiving recesses 19, so that after the preliminary shaping operation in the recess 19 the bit may be turned and entered in the recess 23 for the final sharpening operation. The heel 20, against which the drill-rod-attaching end of the bit rests, is provided with an inclined face 25 for engagement with the bit, and in advance of this block is a pillow-block 26, extending forward from the base and provided with a recess 27 for the reception of the shank end of the bit, so that the latter may be properly supported with reference to the anvil, while the heel prevents any rearward movement of the bit during the dressing operations.

The bit herein shown is of the conventional type, being approximately rectangular in cross-section, its two longer edges being slightly rounded or convex, while the two flat surfaces are provided with the watercourses, as usual, and near the shank portion the flattened side is extended, as shown at *x*. When the drill is turned to the position shown in Fig. 1 for the final sharpening or shaping operation, a yoke 29 is placed in suitable openings 30, formed in the pillow-block, the vertical arms of the yoke resting against the vertical faces *x* of the shank of the bit and preventing any turning movement of the bit, so that its cutting ends may be properly supported within the recess 23 of the anvil. This yoke 29 is removable, so that during the preliminary shaping operations the bit may be turned in order that the flattened faces containing the watercourses may be disposed in the same vertical plane.

The sills are provided with bearings 32 for the reception of a transversely-disposed shaft 33, carrying a sprocket-wheel 34, over which extends a link belt 35, and at the opposite end of the machine is an adjustable bracket 36, carrying a sprocket-wheel 37, over which said link belt passes, and the opposite ends of the belt are secured, respectively, to the cross-bars 16 of the anvil-carriage. The bracket 36 may be adjusted by turning the nuts 38, so that any slack in the belt may be taken up. On one end of the shaft 33 is secured a pinion 40, and pivoted on the shaft is a lever 41, carrying a double pawl 42, having two actuating-teeth, either of which may be adjusted to operative position with relation to the operation, and by properly manipulating the lever the shaft may be turned in either direction in order to positively move the anvil toward and from the pillow-block 26, so that bits of various length may be accommodated. The frame is further provided with bearings for a shaft 44, having a centrally-cranked portion 45 arranged under the drill-bit, and at one end of the shaft is an operating-handle 46, which

may be turned to move the cranked portion 45 upward into engagement with the drill-bit, so that the latter may be raised clear of the anvil when calipers or other gaging devices are to be applied to the cutting end of the bit.

In the construction shown in Fig. 3 the anvil is rectangular in cross-section and is provided with four active faces of different size, respectively, in order to operate on a corresponding number of drills, the construction and shape of these active faces being the same as previously described with reference to the triangular anvil shown in Figs. 1 and 2. With a device of this character the anvil may be readily adjusted toward and from the drill-bit-supporting devices, so that the end of the bit may be properly presented to the anvil, and after the initial shaping the anvil may be moved outward in order that the reshaped bit may be inserted in one or other of the recesses 23 for sharpening or final finishing operations, and when in this latter position the yoke 29 serves to hold the bit from turning, while endwise movement is prevented by the pillow-block in one direction and the approximately vertical wall of the recess 23 in the opposite direction.

It will be seen that the anvil is provided with die-cavities of a shape corresponding to that of the end of the drill, and when one side of the drill is entered in one of these cavities and the opposite side is operated upon by swaging or shaping devices of any character the lower face, which rests within the die-cavities, will be held in proper shape and cannot become distorted.

Having thus described the invention, what is claimed is—

1. In apparatus of the class described, the combination with a base having at one end a heel, of a carriage mounted on said base and having side flanges arranged to engage the sides of the base, an anvil mounted on said carriage, means for adjusting said carriage longitudinally of the base, and a pillow-block carried by the base at a point between the heel and carriage.

2. In apparatus of the class described, the combination with a base having at one end a fixed heel provided with an inclined face, of a carriage slidably mounted on the base and having side flanges guided by the edges of said base, a pair of sprocket-wheels having supporting devices carried by the base, a link belt extending over the sprocket-wheels and connected at its opposite ends to the carriage, means for turning one of said sprocket-wheels to effect adjustment of the carriage, an anvil supported by the carriage, and a pillow-block arranged on the base between the heel and carriage.

3. In apparatus of the class described, a base, a carriage slidably mounted thereon and provided with parallel cross-bars, the adjacent faces of which are arranged at an

angle with relation to each other, and an adjustable anvil having angular faces arranged to rest against the angular faces of the cross-bars, the latter affording continuous supports for the whole width or length of the anvil, said anvil having die-cavities at its different corners or edges, the cavities corresponding in shape to and being adapted to receive the ends of the drills.

10 4. In apparatus of the class described, the combination with a base, of a pillow-block having a recessed work-support, a detachable yoke or staple carried by the work-support to prevent independent turning movement or twisting of the work, and an anvil
15 adjacent to said pillow-block.

5. In apparatus of the class described, the combination with a base, of a work-support, an anvil having die-cavities at its different corners or edges, and a pivotally-mounted 20 work-elevating member carried by the base at a point between the anvil and the support and arranged to elevate the front end of the work above the anvil.

In testimony that I claim the foregoing as 25 my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPHUS H. GREEN.

Witnesses:

W. E. SYKES,
DAN HANNAN.