March 19, 1940. F. E. JOHNSON 2,194,089

WORK HOLDER

Filed Nov. 16, 1938

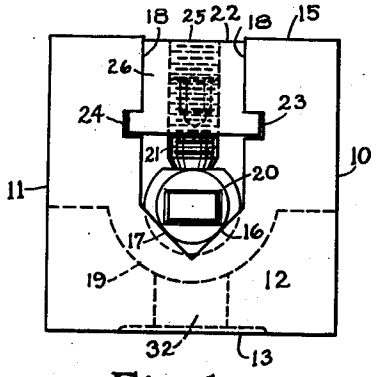

Fig. 1.

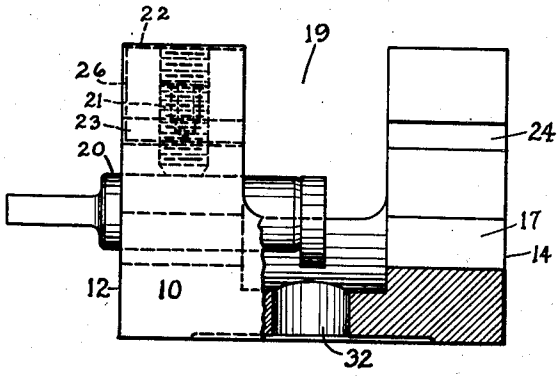

Fig. 2.

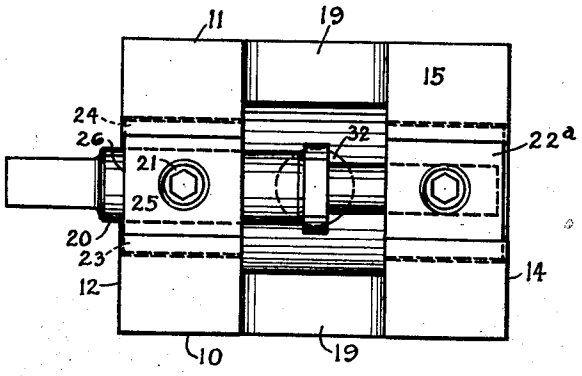

Fig. 3.

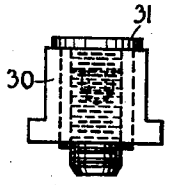

Fig. 4.

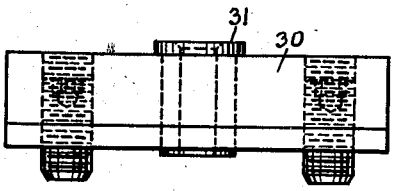

Fig. 5.

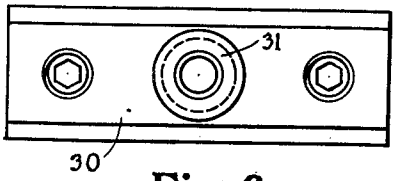

Fig. 6.

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WORK HOLDER

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Application November 16, 1938, Serial No. 240,700

8 Claims. (Cl. 51—217)

While the present invention may be of general application, it is designed primarily for holding a blank during the cutting, forming and grinding thereof into a polyangular die punch.

Punches, as is well known, have heretofore been cut, formed and machined by successive settings of the blank in the holding fixture cooperating therewith. Unless the fixture had more than one plane face, it was necessary to re-set the blank for each face worked on. This has resulted in a laborious process.

The present invention is designed to permit cutting, forming and machining of all faces while retaining the original setting of the blank. In other words, the present invention contemplates a single setting holder or fixture for working on all faces of a punch blank, and eliminates the necessity for repeated settings.

With the above and other objects in view, as will be apparent, this invention consists in the construction, combination and arrangement of parts all as hereinafter more fully described, claimed and illustrated in the accompanying drawing, wherein:

Fig. 1 is an end view of a holder embodying the features of this invention, and showing the head of a punch blank in operative position relative thereto.

Fig. 2 is a side view, partly in section and broken away to illustrate the use of a recess intermediate the ends of the holder providing access for grinding a portion of the head of the punch blank at a predetermined selected angular relationship to the sides of the punch.

Fig. 3 is a top plan view, with certain additions to illustrate the use of an auxiliary clamping block to hold a rod which is adjusted at the beginning of a job to establish the length of a series of punches and maintain uniformity of length based on the initially set punch.

Figs. 4, 5 and 6 are various views of a drill fixture clamping element adapted for use in connection with the present holder.

The holder contemplated in this invention and as shown in the accompanying drawing comprises a body of suitable metal having faces 10, 11, 12, 13, 14 and 15 defining a rectangular prism. The faces 16 and 17 at the bottom of a slot 18 cut inwardly or downwardly from the top face 15 of the holder define a V-groove coextensive with the length of the holder and present cooperating surfaces for receiving and supporting the shank of a punch blank in true parallel relation to the sides 10, 11 and 13 and top 15 of the holder, and in true perpendicular relation to the sides 12 and 14 of the holder. By means of relatively deep slot 19 intersecting the slot 18 centrally of the fixture, a space or recess is provided intermediate the faces 12 and 14 perpendicular to the axis of the tool shank for accommodating the head of the punch and rendering a face thereof accessible to a grinding device.

The shank of the tool or punch, designated as 20, is adapted to be held in position in the slot 18 by means of a socket screw 21 or the like, arranged within the body of a clamping block 22. The clamping block 22 has a tongue and slot connection with the walls of the slot 18, as at 23 and 24, which permits relative sliding movement of the block for purposes of easy withdrawal or adjustment, if desired. The faces 25 and 26 of the clamping block 22, which it will be observed are those faces contiguous to the top face 15 and upright face 13 of the holder, are preferably coplanar or slightly inward of the holder faces so as to permit use of all holder faces as machine bed bearing faces as contemplated by this invention.

As shown in Fig. 3, a clamping block 22*a* corresponding with but auxiliary to the clamping block 22, may be utilized in connection with the present holder for the purpose, for example, of holding a rod or blank which is adjusted at the beginning of an operation in accordance with a selected predetermined length. In this manner, a uniform length may be maintained in cutting, forming and machining a series of punch blanks, with maximum accuracy and minimum effort.

The clearance provided in proximity to the head of a punch blank by means of the recess extending transversely of the block and intermediate the faces 12 and 14 of the block, provides ready access to this portion of the blank for the purpose, for example, of grinding a locking flat on the head at a selected predetermined angular relationship to the sides of the punch blank.

Figs. 4, 5 and 6 show a clamping block 30 of slightly modified form. In this construction, the clamping block is adapted to span the intersection of the slots 18 and 19 and is coextensive with the length of the slot 18. The position of the clamping block 30 in overhanging relation to the intersection of said slots 18 and 19 is preferably provided with a jig bushing 31 to allow for guiding a drill or the like in true perpendicular relation to the axis of the work held in the holder. An opening 32 is provided in the

underside of the holder, in vertical alignment with said jig bushing to provide clearance for a drill or the like as it is passed through the work held in the holder.

From the foregoing it will be apparent that the present holder provides a device for supporting a punch or the like which utilizes clamping means that will permit the use of any side of the holder as a machine-bead bearing face, thereby eliminating the necessity for re-setting the punch or work at any interval of its machining process. Furthermore, it provides means for grinding the inner end of the punch confined within the limits of the outer faces of the holder.

While the holder and clamping elements shown and described herein present the best embodiment of my invention, it will be evident that the same may be modified in many particulars without departing from the scope or spirit of this invention. As an example of a modification within the scope of this invention, it will be obvious that a holder having faces defining other than rectangular shapes may be developed without affecting the efficiency of the holder.

What is claimed is:

1. A holder for grinding punch blanks and the like comprising a body of polyangular form, clamping means whose external limits permit the use of any face of the holder as a machine bed bearing face, and means through which uniform length in a series of punch blanks may be maintained in accordance with selected predetermined lengths of an initially held blank including a clearance slot intermediate the faces of the holder perpendicular to the axis of the blank.

2. A punch grinding holder comprising a block of rectangular prismatic form, means adapted to centralize the shank of a punch therein comprising a V-shaped slot cut lengthwise of the fixture, clamping means for locking the shank of a punch in said slot including a clamping block having tongue and slot connections with the sides of said slot, and means for rendering a portion of the blank disposed internally of the outer limits of the holder accessible to a working operation comprising a transverse slot intersecting said V-slot.

3. A punch grinding holder comprising a block of rectangular prismatic form, means adapted to centralize the shank of a punch therein comprising a V-shaped slot cut lengthwise of the holder, clamping means for locking the shank of a punch in said slot including a clamping block having tongue and slot connections with the sides of said slot, and means for rendering a portion of the blank disposed internally of the outer limits of the holder accessible to a working operation comprising a transverse slot intersecting said V-slot centrally of the length of the fixture.

4. A punch grinding holder comprising a block of rectangular prismatic form, relatively deep slots intersecting centrally of the top face of said block, the faces of the bottom of one of said slots being adapted to receive and position a punch shank in central longitudinal and transverse relation to the outer faces of said block, and clamping means cooperating with the walls of said slot and having its external limits in non-protruding relation to the faces of said holder.

5. A punch grinding holder comprising a body of polyangular form, relatively deep slots intersecting centrally of and extending inwardly from a selected face of said block, the faces of the bottom of one of said slots being adapted to receive and position a punch shank in central longitudinal and transverse relation to the outer faces of said block, clamping means cooperating with the walls of said slot and having its external limits in non-protruding relation to the faces of said holder, and means in overhanging relation to the intersection of said slots for guiding a drill or the like through the punch and in true perpendicular relation to the longitudinal axis of said punch.

6. A holder for grinding punch blanks and the like comprising a body of polyangular form, clamping means whose external limits permit the use of any face of the holder as a machine bed bearing face, means through which uniform length in a series of punch blanks may be maintained in accordance with selected predetermined lengths of an initially held blank including a clearance slot intermediate the faces of the holder having sides perpendicular to the axis of the blank, and means for guiding a drill or the like through a blank retained in said holder including an opening intersecting said clearance slot and a face of said holder remote therefrom.

7. A holder for grinding punch blanks and the like comprising a body of polyangular form, means adapted to centralize the shank of a punch therein comprising a V-shaped slot cut lengthwise of the holder, clamping means whose external limits permit the use of any face of the holder as a machine bed bearing face, and means for rendering a portion of the blank disposed internally of the faces of the holder accessible to a working operation comprising a slot intersecting faces of said holder remote from said V-shape slot.

8. A holder for grinding punch blanks and the like comprising a body of polyangular form, means adapted to centralize the shank of a punch therein comprising a V-shaped slot cut lengthwise of the holder, clamping means whose external limits permit the use of any face of the holder as a machine bed bearing face, means for rendering a portion of the blank disposed internally of the faces of the holder accessible to a working operation comprising a slot intersecting said V-shaped slot and faces of said holder remote from said V-shaped slot, and means for guiding a drill or the like through work supported in said V-shaped slot including an opening intersecting said slots and a face remote from said slots.

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