

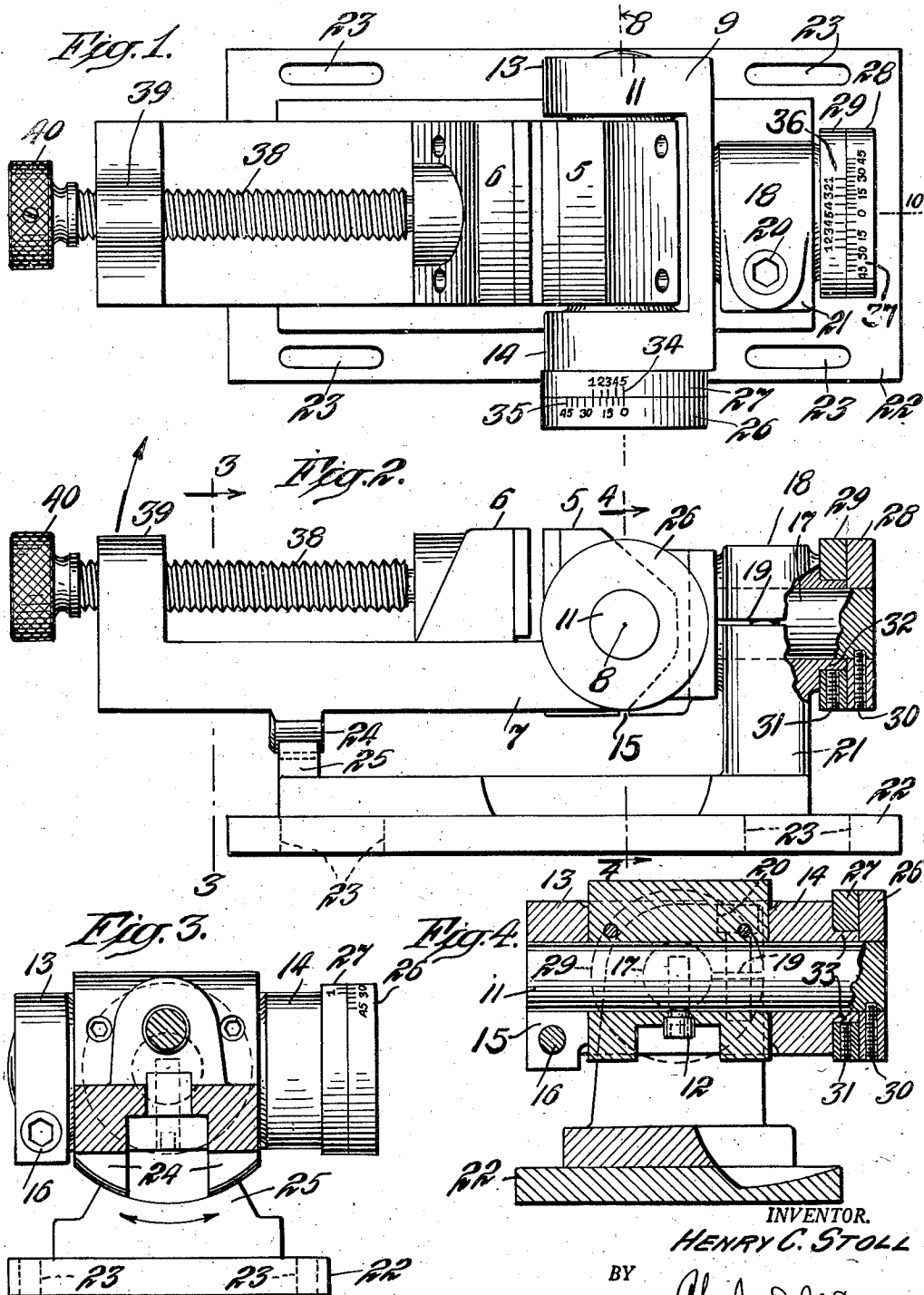
Aug. 21, 1945.

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2,383,170

UNIVERSAL VISE

Filed Oct. 20, 1943



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2,383,170

UNIVERSAL VISE

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Application October 20, 1943, Serial No. 507,216

2 Claims. (Cl. 81-41)

The invention herein disclosed relates to vises, such as used for holding work pieces in different angular relations in grinding machines, milling machines, drill presses and the like.

Objects of the invention are to provide a universally adjustable vise for the uses such as mentioned, which while capable of all necessary angular adjustments, will be of simple mechanical structure, consist of but few, rugged parts, be small and compact in size and arrangement of parts and be quickly, easily and accurately adjustable throughout an extended range of adjustment.

Other desirable objects and accomplishments of the invention will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates a present commercial embodiment of the invention, but structure may be modified and changed within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a plan view of the vise.

Fig. 2 is a side elevation of the same, partly broken away and in section to show details of the end vernier adjustment scale.

Fig. 3 is a cross-sectional view on substantially the plane of line 3-3 of Fig. 2.

Fig. 4 is a broken cross-sectional view as on substantially the plane of line 4-4 of Fig. 2.

The vise shown, comprises fixed and movable jaws 5 and 6, on a base piece 7, trunnioned at one end on an axis 8, in the arms of a yoke 9, which in turn is trunnioned on a rectilinearly intersecting axis 10.

The trunnions for the base piece 7, are shown provided by a shaft 11, extending through the fixed jaw portion of the base piece and secured by a set screw 12, Fig. 4. The projecting end portions of this shaft are pivotally engaged in the side arms 13, 14, of the yoke and the arm 13, is shown split at 15, and the split portions held by a clamp screw 16, which can be adjusted to regulate the holding friction on shaft 11, and to secure the vise structure in various positions of angular adjustment about the axis 8.

The yoke is trunnioned by having a pivot stud extension 17, rotatably held in a bearing 18, split at one side at 19, and adjustably secured by clamp screw 20.

The split bearing 18 for the yoke is shown as carried by a post 21, upstanding from the base 22, which is shown as having slots 23 therein to receive bolts or other fastenings for mounting the device on the machines or other supports with which it may be used.

In the lowered horizontal position shown, the vise parts are accurately located and supported by means of a convex bearing lug 24, on the underside of base 7, engaging in a concave seat 25, on the mounting base 22, these being curved on an arc struck from the axis 10, of the yoke, so that the vise will be located in horizontal alignment regardless of the angle to which it has been turned about the axis of the yoke.

For accurately setting the vise in different angular relations, the trunnion shaft 11, is shown as carrying at one end a disc 26, scaled or marked to register with a companion disc 27, fixed to the adjacent arm of the yoke.

Similarly, the spindle of the yoke is shown as carrying a disc 28, registering with a disc 29, fixed to the bearing standard 21.

These measuring and angle indicating discs may be pinned or otherwise suitably secured to the parts to which they are related. In the illustration, the outer, movable discs 26 and 28, are shown secured to the shaft elements 11 and 17, by set screws 30, and the fixed or stationary gage discs 27 and 29, are shown similarly held by set screws 31, on extended hub portions 32, 33, of bearing 18 and yoke 9 respectively.

The indicating discs may be marked to show degrees of angularity, and a present preferred method is to provide companion discs with vernier scales, such as shown at 34, 35 and 36, 37, suitably marked to indicate the degrees. These cooperating vernier scales allow for coarser, easier read graduations and permit of the finest adjustments being readily made by shifting the vise on the transverse or the longitudinal axes to accurately effect adjustments of one degree or less by simply bringing the vernier scales into registration, one line at a time.

The movable jaw may be adjusted and secured by screw 38, turning in a screw seat 39, and operated by a hand knob 40.

Constructed as disclosed, the necessary parts are few, rugged in character and relatively small in the sense of being without any excess bulk, so that the device as a whole is small for what it accomplishes and may be used on machines where space or clearances between parts are limited. By turning the yoke, the vise may be adjusted about a longitudinal axis and by rocking the vise body in the yoke, the holding jaws may be inclined about a transverse axis. Thus a piece held in the jaws may be set in any desired angular relation. Any setting can be quickly and accurately made by reference to the vernier scales at the longitudinal and transverse axes

and these scales, because of the relatively wide spacing of the marks following from the vernier design, can be easily read and necessarily fine adjustments accomplished accordingly.

What is claimed is:

1. A universal vise comprising a main base having an upright post at one end and a supporting rest element at a point removed from said post, said post having a bearing extending therethrough in line with said rest element, a yoke having spaced parallel arms disposed at the side of the post toward said rest element and provided with a spindle rotatably engaged in said bearing, means for securing said spindle in various angularly adjusted relations in said bearing, a vise base disposed between the spaced arms of said yoke and having a supporting shaft rotatably engaged in the arms of the yoke on an axis intersecting the axis of the spindle, said vise base extending away from the yoke over the main base and having a companion rest element engaging the rest element on the main base when the vise base is lined up with the spindle, and said companion rest elements in said engaging relation having surfaces engaging on an arc described from the axis of the spindle, means for securing the vise base in variously inclined relations in the arms of the supporting yoke, fixed and movable jaws on the vise base, and screw means on the vise base for effecting adjustments of the movable jaw thereon.

2. A universal vise comprising a main base having an upright post at one end and a supporting rest element at a point removed from said post, said post having a bearing extending therethrough in line with said rest element, a

yoke having spaced parallel arms disposed at the side of the post toward said rest element and provided with a spindle rotatably engaged in said bearing, means for securing said spindle in various angularly adjusted relations in said bearing, a vise base disposed between the spaced arms of said yoke and having a supporting shaft rotatably engaged in the arms of the yoke on an axis intersecting the axis of the spindle, said vise base extending away from the yoke over the main base and having a companion rest element engaging the rest element on the main base when the vise base is lined up with the spindle, and said companion rest elements in said engaging relation having surfaces engaging on an arc described from the axis of the spindle, means for securing the vise base in variously inclined relations in the arms of the supporting yoke, fixed and movable jaws on the vise base and screw means on the vise base for effecting adjustments of the movable jaw thereon, the post having a stationary concentric hub extension about the bearing, a gage disc fixedly mounted on said stationary hub extension, the spindle projecting beyond said hub extension, a companion gage disc fixedly secured on the projecting portion of said spindle at the outer side of the first mentioned gage disc, one of the arms of the yoke having a hub extension, a fixed gage disc engaged on said hub extension, the shaft of the vise base projecting beyond said last mentioned hub extension, and a gage disc fixed on the projecting portion of said shaft at the outer side of said last mentioned fixedly mounted gage disc.

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