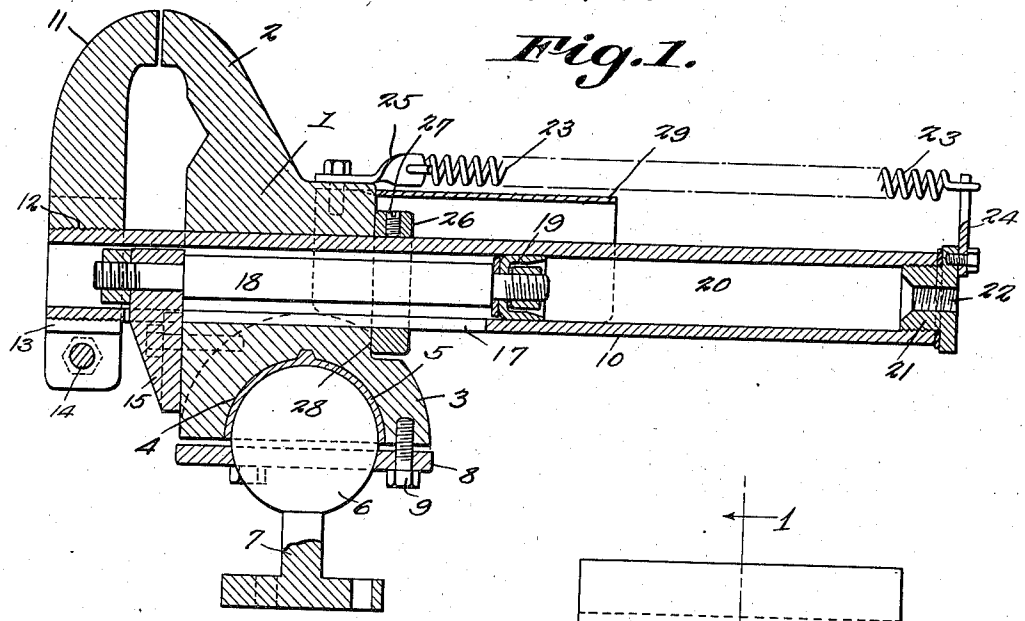
June 29, 1948. V. C. MILLER 2,444,304

HYDRAULIC VISE

Filed May 25, 1945

Fig. 1.



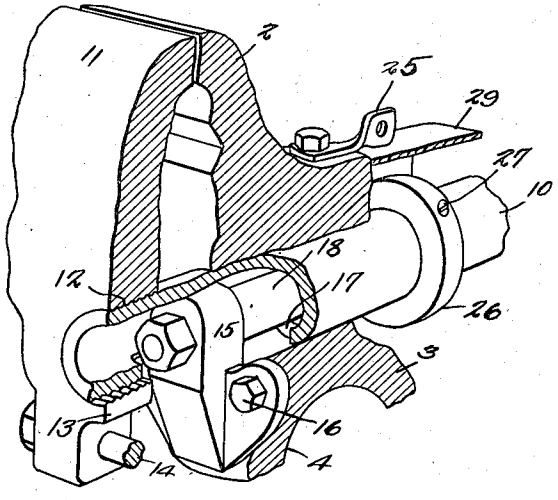


Fig. 2.

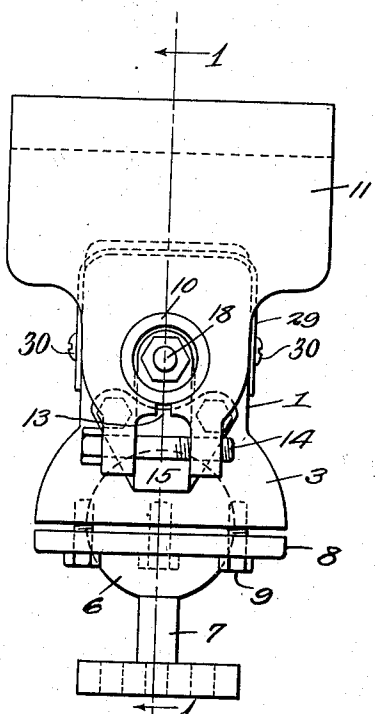


Fig. 3.

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Patented June 29, 1948

2,444,304

UNITED STATES PATENT OFFICE

2,444,304

HYDRAULIC VISE

Verlin Clark Miller, Marion, Ind.

Application May 25, 1945, Serial No. 595,731

1 Claim. (Cl. 81—17.2)

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This invention relates to vises and more especially to a vise the working parts of which are designed to be operated hydraulically.

The invention has for an object the provision of a simple and compact structure which can be actuated readily, will give a tight grip on any object placed therein, and can be supported at any desired angle best adapted to meet the requirements.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing, the preferred form of the invention has been shown.

In said drawing,

Figure 1 is a vertical longitudinal section through the device, taken substantially on line 1—1 of Figure 3.

Figure 2 is a perspective view, partly in section and partly in elevation, of the two jaws and adjacent parts.

Figure 3 is an end elevation.

Referring to the figures by characters of reference, 1 designates a block constituting the body portion of the device, this block carrying a fixed jaw 2 and a recessed base 3. The base, which has a semi-spherical recess 4 therein, can be suitably lined as at 5, and thus adapted to receive a ball 6 carried by a pedestal 7 to be suitably secured to a supporting structure. The clamping plate 8 surrounds and is fitted upon the ball 6 and has screws 9 extending therethrough and into the base 3 whereby, by tightening the screws, the ball can be gripped tightly between plate 8 and base 3, thus providing a universal joint.

Slidably mounted in the block 1 is a tubular shank 10, to one end of which is secured a movable jaw 11 adapted to cooperate with jaw 2 for the purpose of gripping the work. This movable jaw can be secured onto shank 10 as at 12 and can be split as at 13, so that, by means of a binding screw 14, the movable jaw can be securely held to the shank.

A head 15 is located between the movable jaw 11 and the block 1 and is secured to said block by means of bolts 16 or the like. The head extends through a longitudinal slot 17 formed in one end portion of the shank 10 and secured

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to the head is one end of a stem 18 which is extended longitudinally within shank 10 and provided with a piston 19 which has close fit against the inner surface of shank 10. The space between this piston 19 and that end of the shank remote from the jaws constitutes a pressure chamber 20 and the end of the shank is closed by a plug 21 having a port 22 through which fluid under pressure can be directed from any suitable source into the chamber 20.

A coiled spring 23 is secured at one end to a bracket 24 extending from and secured to the plug 21 and the other end of this spring is connected by a coupling plate 25 to the block 1. This spring serves normally to hold the plug 21 pressed toward the stationary piston 19 and the movement of this plug and the tubular shank 10 under the action of spring 23 is limited by an adjustable collar 26 which is mounted on the shank and is adapted to be held in any desired position thereon by a set screw 27. The collar normally bears against a stop shoulder 28 formed on the base 3 of the block 1. As illustrated in Figure 1, the collar, when in engagement with the block 1 and shoulder 28 maintains the jaw 11 a short distance away from the jaw 2. Obviously, by shifting the adjustable collar 26 to the right on shank 10, the normal distance between the two jaws can be considerably increased. After the parts have been adjusted to meet the requirements, the work is placed between the jaws and thereafter fluid under pressure is directed into chamber 20 by way of port 22. A flexible hose, not shown, can be used for conveying the fluid under pressure to the tool. As the pressure enters the chamber 20, it expands the chamber by forcing plug 21 away from piston 19 with the result that the jaw 11 is pulled against the work and against the action of spring 23 so that the work thus will be tightly gripped. As soon as pressure is released, the spring returns the parts to their normal positions so that the vise thus acts quickly to release the work.

A shield 29 in the form of a channel-like inverted plate is disposed between spring 23 and shank 10. The shield is removably secured to block 1 by screws 30. Shield 29 has its bottom edges spaced from and substantially in a common plane with the slotted bottom of the shank 10, and extends over the collar 26. The shield thus avoids the possibility of injury due to the movement of collar 26 and the slotted shank.

It is to be understood that various types of

work-gripping plates can be mounted on the active faces of the jaws 2 and 11.

What is claimed is:

A vise including a support engaging block having an integral fixed jaw, a tubular shank slidably mounted in the support engaging block having a single longitudinal slot adjacent one end and forming a hydraulic cylinder at the other end, there being a port in an end wall of the cylinder for the admission of fluid under pressure, a head fixedly secured to the support engaging block and straddled and slidably engaged by the slotted portion of the tubular shank, a movable jaw fixedly joined to said slotted end of the tubular shank, a piston rod fixedly secured to said head and coaxial with and projecting into the tubular shank, a piston head fixedly secured to the projecting end of said rod and having wiping contact with the interior surface of the cylinder portion of said tubular shank, a tension spring connecting the support engaging block to said end wall of the cylinder, a collar adjustably mounted on the tubular shank cooperating with the support engaging block to limit the movement of the shank in one direction under the action of the spring, said shank being movable

in the opposite direction by fluid under pressure admitted to said cylinder and reacting against said end wall and against the piston, and an inverted channel-like shield positioned between said spring and said tubular shank and extending partially around the tubular shank and collar, said shield being removably secured to the support engaging block.

VERLIN CLARK MILLER.

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