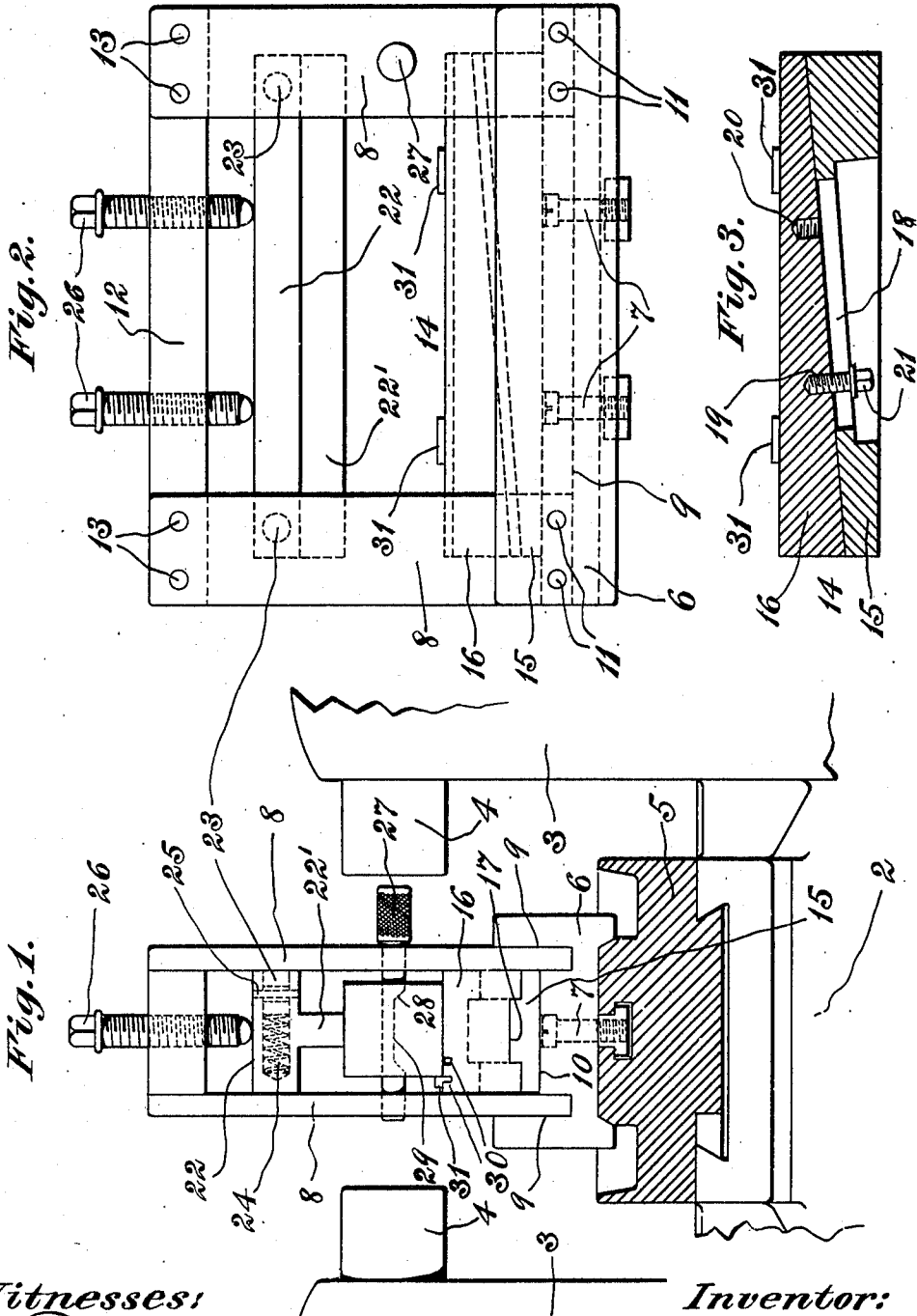


B. M. W. HANSON.
VISE.

APPLICATION FILED APR. 2, 1909.

989,004.

Patented Apr. 11, 1911.



Witnesses:
[Signature]
[Signature]

Inventor:
B. M. W. Hanson
By his Attorneys,
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UNITED STATES PATENT OFFICE.

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WISE.

989,004.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed April 2, 1909. Serial No. 487,451.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Vises, of which the following is a specification.

This invention relates to vises and more especially to that class thereof employed for holding the work in metal working machines of various kinds the object of the invention being to provide an effective article of this type for maintaining the work in a steady true position while the same is being operated upon.

In the drawings accompanying and forming part of the present specification I illustrate in detail one simple and effective form of embodiment of the invention which to enable those skilled in the art to practice the invention will be fully set forth in the following description while the novelty of the invention will be included in the claims succeeding said description.

Referring to said drawings, Figure 1 is a front elevation of a vise involving my invention and showing the same as associated with a milling machine. Fig. 2 is a side elevation of the vise detached from said machine. Fig. 3 is a longitudinal section of an adjustable support.

Like characters refer to like parts throughout the several figures.

A vise comprising my invention can be used with utility in many different connections it being especially useful when employed in conjunction with a machine for milling key seats or slots and in Fig. 1 I have shown portions of such a machine which will now be briefly described. The base of said machine is denoted by 2 and from the same rise upright portions or members 3 in which are journaled the spindles 4 which are provided with suitable means (not shown) for holding the milling tools. In addition to the rotative movement given in practice to said spindles they are also advanced or moved toward each other step by step they being intermittently operated at the ends of the strokes of the work-supporting carriage 5 which is supported for reciprocatory movement in a direction transverse to the axes of motion of said spindles.

The foregoing statements concisely out-

line a spline or slot cutting machine of known construction and for this reason it is unnecessary to go further into detail with respect to said machine.

The vise involves in its make up a base 6 which is adapted for longitudinally adjustable connection with the carriage 5 of the milling machine, for instance by means of T bolts as 7. I have shown as rising from the corners of the base 6 the posts or uprights 8 which are set into grooves 9 extending downward from the bottom of the channel 10 formed in the upper side of said base, said uprights or posts being rigidly fastened to the base 6 by means of pins 11 or otherwise. A plate 12 has its ends fitted between the opposite pairs of corner posts and is connected thereto in some rigid manner, for instance by pins 13.

The base 6 sustains the normally fixed jaw of the vise and a jaw of this nature which answers satisfactorily my purpose is shown in the drawings being denoted in a general way by 14. When I speak of this jaw as being "normally fixed" I mean that when in use it is absolutely rigid the work being clamped to the said fixed jaw by a second jaw as will hereinafter appear. Said jaw 14 presents in effect an adjustable support for the work in that one of its members or sections is adjustable relatively to the companion section, said sections being denoted respectively by 15 and 16. Said jaw 14 fits closely between opposite side posts 8 so that there is no possibility of lateral motion thereof. I have shown as formed on the upper side of the lower section 15 a tongue 17 fitting a groove in the underside of the upper section 16 said tongue being formed upon an incline or slant on its upper surface and said inclined or slant surface being adapted to engage a correspondingly shaped surface on the upper wall of the said groove. From this it will be evident that the effective depth of the said jaw 14 can be regulated by a relative endwise motion of said sections 15 and 16. The section 15 is shown as having a longitudinal slot 18 while the section 16 is represented as having two tapped holes 19 and 20 to interchangeably receive the screw 21 which extends upward through said slot. By virtue of this construction the maximum vertical adjustability of the sectional jaw 15 is provided. It might be added that the screw is shown as fitted in

the tapped hole 19. By moving the section 16 to the left in Fig. 3 with respect to the companion section 15 the height or depth of the said jaw 14 may be decreased while opposite movement thereof will increase said height or depth, and a considerable range of adjustment is afforded by the described construction. To change an adjustment it may be necessary to simply loosen the screw 21 and when said adjustment is obtained said screw will be set to maintain the same. There may be cases, however, where the screw will have to be removed from the hole 19 and fitted into the hole 20. By the adjustable support or jaw I can effectually support work of different sizes as will be obvious.

The movable or clamping jaw is designated by 22 and in the present instance it is frictionally fitted or held between the end pairs of posts or uprights 8 it bridging the space or interval between said end pairs of posts. Said jaw 22 is shown as equipped with transversely disposed spring plungers 23 the outer faces of which engage against the inner faces of diagonally opposite corner posts so as to frictionally maintain the said jaw in position and against dropping. These spring plungers present a simple means for holding the jaw in position in the manner set forth. The springs for said plungers are denoted by 24 pins 25 being provided to prevent the plungers being displaced when the jaw as a whole is separated from its framework of which said posts form a part. Coöperative with said jaw 22 are adjusting or clamping screws as 26 shown as tapped through the head or top plate 12 of the framing and which are run down to move the said jaw 22 toward and into clamping engagement with the work. When a piece of work has to be removed from the vise the screws 26 are backed out or elevated the necessary distance after which the jaw 22 is thrust upward by hand and owing to its described mounting it remains in its elevated position until again lowered directly by hand or through the intervention of the screws 26.

In conjunction with the fixed jaw 14 I provide a gage device as will hereinafter appear which is of such a nature as to always insure a cut being made vertically centrally of the work no matter how deep or shallow such work may be within the limits of the vise. A gage device which operates satisfactorily is a pin 27 which is removably fitted in perforations in two opposite corner posts said pin having a milled head to facilitate its insertion and withdrawal into and from respectively the transversely alined perforations. The said gage device or pin 27 is shown as having a recess or aperture 28 the top of which is preferably perfectly horizontal and which presents a

straight edge said top or straight edge being denoted by 29 and being in precise coincidence with the axes of motion or longitudinal centers of the two opposite spindles 4 for a purpose that will hereinafter appear. It will be assumed that it is desired to cut a slot or key seat in a piece of metal or bar two inches deep. In such a case as this I take a size block one inch deep and mount the same upon the upper side of the jaw 14 the screw 21 prior to this time having been loosened sufficiently to permit substantially easy manipulation or endwise adjustment of the section 16 of the said jaw 14. The size block is then placed between the straight edge 29 and the upper side of the jaw 14. The section 16 is then moved endwise and this of course lifts the size block such action continuing until the size block firmly abuts against the straight edge 29. The jaw 14 with the size block is then carefully removed from place so as not to disturb the relation between the sections 15 and 16 after which the screw 21 is firmly set up. The jaw 14 is then put into place and if the stock or work be long the gage pin 27 will be removed to admit of the proper mounting of the work. The two jaws when in coöperative relation are approximately vertically alined. When the work is put upon the jaw 14 the jaw 22 is lowered to carry the fin 22' thereof into engagement with the upper side of the work and to obtain a substantial clamping of the work the clamping or binding screws 26 are run down. The jaw 22 might be lowered simply through the action of the screws 26 or the jaw could be lowered first and the screws afterward set.

I have shown as formed in the upper side of the section 16 several longitudinally extending channels 30 to receive lateral defining stops 31 two of which are shown and which in use are in longitudinal alinement. The bodies of these stops removably fit said channels so that they can be taken from one and put into the other their disposition depending upon the width of the work. These stops in addition to properly defining the work also prevent side motion thereof. Said stops are made practically of L-form cross sectionally which produces a stop having a vertical body provided with a transverse head by reason of which great range of lateral adaptability is secured, so that these stops will effectively operate with practically any size stock.

Many variations may be adopted within the scope of my claims.

From the preceding description taken in connection with the annexed drawings it will be observed that I provide a vise having work-holding means and also having open sides to permit the simultaneous operation of two tools from opposite sides upon said work. The vise is therefore of open

construction its sides presenting skeleton like parts by reason of which the two milling tools can simultaneously advance toward the work and can slot the same from opposite sides thereof owing to the relative motion between the work and the milling-tool spindles.

What I claim is:

1. A vise comprising a jaw having two sections one of which is adjustable with respect to the other to vary the depth of said jaw, a second jaw movable toward and from the companion jaw, manually-operable means for actuating said second jaw, and frictionally-operative means for holding said second jaw in any position in which it may be set.

2. A vise having a jaw comprising sections, one of which is adjustable with respect to the other to vary the depth of said jaw, a second jaw, the two jaws being co-operative to clamp an object therebetween, means for positively moving said second jaw toward the first jaw, and frictionally operative means carried by the second jaw for holding the same in various positions of adjustment.

3. A vise comprising a pair of jaws co-operative to clamp an object one of said jaws comprising two sections having engaging inclined faces and one of the sections being movable with respect to the other to vary the depth of said sectional jaw and a screw for clamping said sections together, one of the said sections having longitudinally separated tapped holes to interchangeably receive said screw.

4. A vise comprising a pair of jaws co-operative to clamp an object therebetween, one of said jaws involving two sections having engaging inclined faces and being relatively operable to vary the depth of said sectional jaw, one of the sections having a longitudinal slot and screw means extending through said slot and tapped into the other section of said sectional jaw.

5. A vise comprising a pair of jaws co-operative to clamp an object therebetween, one of said jaws involving two sections having engaging inclined faces and being relatively-operable to vary the depth of said sectional jaw, one of the sections having a

longitudinal slot and the other having two longitudinally separated tapped holes, and a screw to extend through said slot and interchangeably fit said holes.

6. A vise comprising a relatively fixed gage member having a straight edge and work-supporting means adjustable toward and from said straight edge said work-supporting means and straight edge presenting a space to receive a size-block.

7. A vise comprising a relatively fixed gage member having a straight edge and a sectional jaw for supporting the work one section of said jaw being adjustable with respect to the complementary section to regulate the distance between the work-supporting surface of said jaw and said straight edge.

8. A vise comprising a relatively fixed, removably-mounted gage member having a straight edge and work-supporting means adjustable with respect to said straight edge to vary the distance between the work-supporting surface of said work-supporting means and said straight edge.

9. A vise comprising a base, uprights rising from said base at longitudinally separated points, a jaw resting on the base and fitting at its ends between said uprights, said jaw comprising sections one of which is adjustable with respect to the other to vary the depth of said jaw, and a second jaw adjustable at its ends between said uprights, the spaces between said uprights at the sides of the vise being open.

10. A vise provided with a base-member, posts rising from said base member at the corners thereof, a top-plate connecting said corner posts, a jaw supported by said base member, a second jaw supported by said corner-posts, and means carried by said top-plate for moving the second jaw toward the first jaw, the spaces between the end corner posts being open to permit the simultaneous operation by two tools from opposite sides upon the work held between said jaws.

In testimony whereof I affix my signature in presence of two witnesses.

BENGT M. W. HANSON.

Witnesses:

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