

W. F. KOEPPEN.
MACHINE VISE.

(Application filed Jan. 10, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

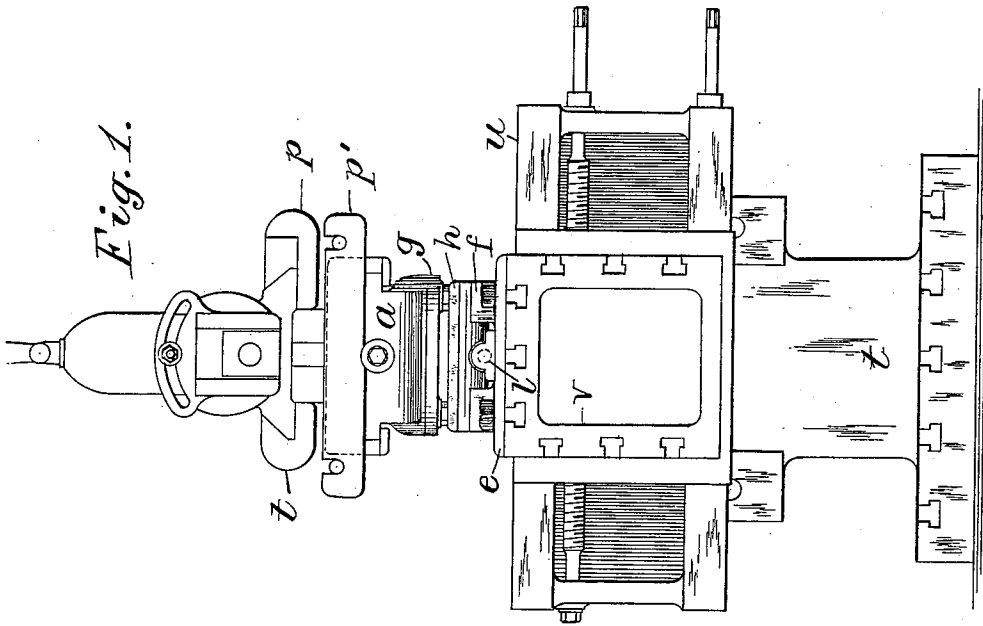
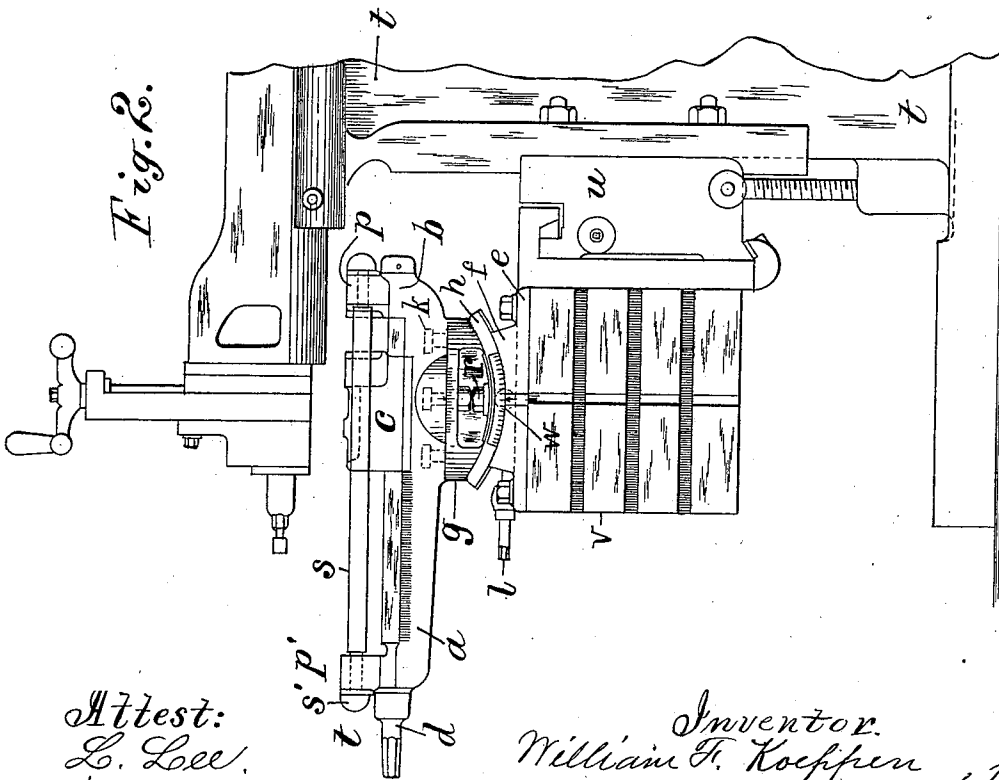


Fig. 2.



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No. 650,644.

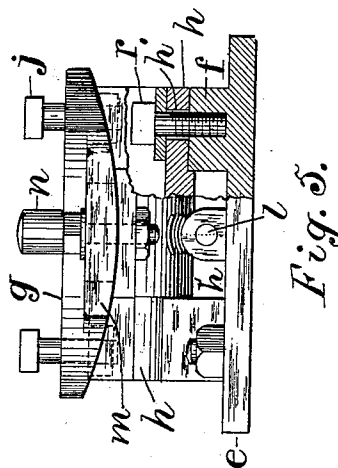
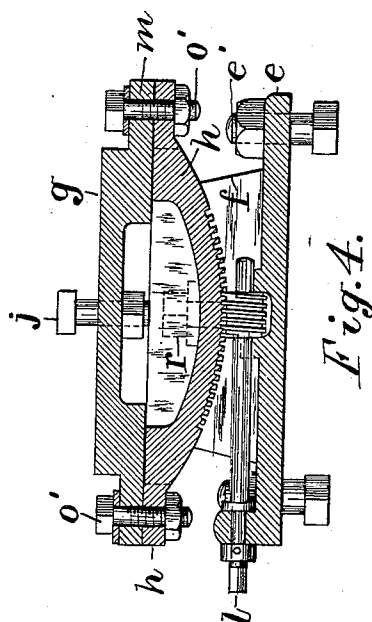
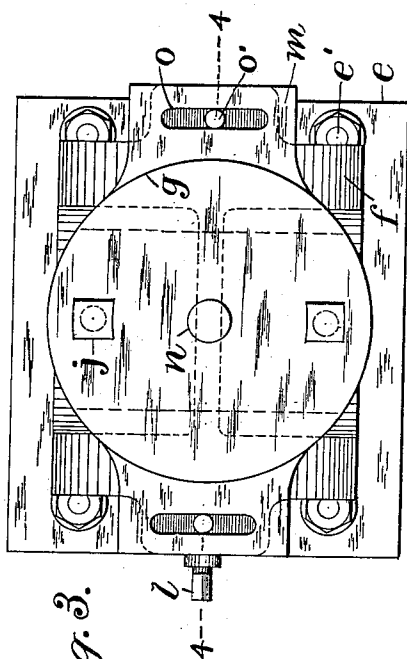
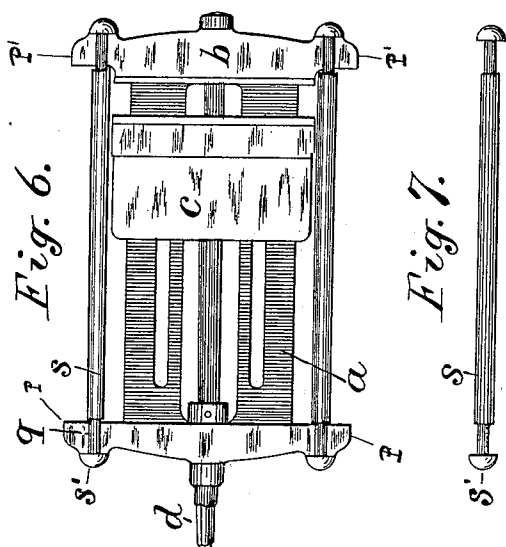
Patented May 29, 1900.

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WILLIAM F. KOEPPEN, OF MARION, INDIANA, ASSIGNOR TO ULRICH
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MACHINE-VISE.

SPECIFICATION forming part of Letters Patent No. 650,644, dated May 29, 1900.

Application filed January 10, 1900. Serial No. 1,027. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. KOEPPEN, a citizen of the United States, residing at 911 Spencer avenue, Marion, county of Grant, State of Indiana, have invented certain new and useful Improvements in Machine-Vises, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present improvements in machine-vises relate partly to the support for the vise, whereby it may be tipped from a level position in a small degree either longitudinally or transversely. This part of the invention embraces an intermediate bed inserted between the vise and the work-table upon which it is supported and formed in two sections with opposed segmental surfaces and having means for sliding the sections transversely to the curved joint, so as to tip the vise in the desired degree. The convex section may be hollowed transversely and a convex bearing-plate secured adjustably thereon to support the vise and permit the tipping of the same in a direction transverse to that provided by the first-named sections. The improvements also include lugs projected at opposite ends of the vise beyond the ends of the movable jaw, and formed with longitudinal slots, and tie-rods fitted detachably to such slots, with heads to embrace the lugs. When the vise is used to hold objects which do not project beyond the ends of the jaws, the tie-rods may be placed in the slots and serve to brace the jaws in the most rigid manner, while the tie-rods are readily removable, if necessary, to hold in the vise something which would project in the line of the rods.

The vise is illustrated in the annexed drawings in connection with a crank-planer, as the improvements are primarily designed for the uses of such machines, although applicable to planing-machines or milling-machines.

Figure 1 is a front elevation of a crank-planer with the vise applied to the work-table. Fig. 2 is a side elevation of the vise with the work-table and the front end of the crank-planer. Fig. 3 is a plan of the intermediate bed adapted for double adjustment. Fig. 4

is a longitudinal section on line 4 4 in Fig. 3. Fig. 5 is a front elevation of the bed with part of the right-hand side broken away to the center line. Fig. 6 is a plan of the vise, and Fig. 7 a plan of one of the tie-rods detached from the vise.

The tie-rods are shown inserted in the notched lugs in Figs. 1, 2, and 6; but the heads are omitted from the rods in Fig. 1 to clearly show the slots in the lugs.

Figs. 3, 4, and 5 are drawn upon a larger scale than the remaining figures.

t designates the frame of the crank-planer, *u* its cross-head, and *v* its work-table.

a designates the vise, having fixed jaw *b* and movable jaw *c*, actuated in the usual manner by hand-screw *d*.

The intermediate bed is shown formed with bottom plate *e* to secure upon the work-table *v* and provided with concave segmental seats *f*. In Figs. 1 and 2 the intermediate bed is formed with two sections only, the upper one having the circular plate or turn-table *g*, attached to a convex segment *h*, which is fitted to the concave segment *f* and secured thereto by bolts *r*. Slots *h'* are formed transversely in the ends of the plate *h* to permit the same to move upon the bolts *r*. (See Figs. 4 and 5.) The plate *g* is provided with the usual bolts *j*, fitted to annular slot *k* in the bottom of the vise to adjust the same in a horizontal plane. A screw or worm shaft *l* is provided upon the bottom plate *e* and has a spiral thread fitted to a nut or teeth upon the convex segment *h* for adjusting the same to tip the vise longitudinally at the required angle.

The movement of the vise is necessarily limited to the movement possible with the opposed segmental surfaces, which in the present example is about ten degrees upward or downward from the level position.

In Figs. 3, 4, and 5 the convex section *h* is hollowed longitudinally upon the top, and the turn-table *g* is provided with convex bearing-plate *m*, fitted thereto. The turn-table is provided with a central pivot *n*, upon which the vise may be turned, as is common to set it in relation to the tool, and then clamped by the bolts *j*. The pivot *n* is omitted from Fig. 3 to

show the bolt *j*. The bearing-plate *m* is provided at opposite ends with transverse slots *o*, and bolts *o'* are inserted through the same and the section *h* to secure the parts together.

5 No means for sliding the turn-table transversely upon the plate *h* is shown, as such adjustment is very seldom required, and the movement may be effected by hand. An index *w* is shown in Fig. 2 upon the side of the
10 plate *h* to cooperate with a mark upon the bottom plate *e* in setting the vise at various vertical angles. With the construction shown in Fig. 5 an index-mark may also be provided at the junction of the plate *h* and the bearing-plate *m* to set the turn-table level when
15 desired. The vise-body *a* is shown in Fig. 6 with parallel sides, upon which the jaw *c* is adapted to move to and from the fixed jaw *b*. The ends of the fixed jaw are provided with
20 lugs *p*, and similar lugs *p'* are provided at the opposite ends of the vise, with longitudinal slots or notches *q* in the upper sides of all the lugs to admit the tie-rods *s* beyond the sides of the jaw *c*. The tie-rods are formed with
25 heads *s'*, fitted snugly to the outer sides of the lugs, to resist the thrust which is produced by the screw *d* upon the opposite ends of the body. The jaw is thus able to move between the rods for clamping anything shorter than
30 its own length, while the open slots permit the rods to be readily removed at any time when a longer piece is to be held in the vise.

From the above description it will be understood that the oscillation of the section *h*
35 upon the transversely-curved seat *f* serves to tip the vise longitudinally, while the oscillation of the turn-table upon the longitudinally-curved section *h* (when the turn-table is provided with a convex bearing, as the plate *m*)
40 serves to tip the vise laterally. Work-holders have been provided with a variety of means for holding the work at various angles to the tool, the work-table itself being sometimes hinged or mounted upon a pivot, so that it can
45 be turned at various angles, and the work-holder being sometimes formed with vertical cheeks which are held movably between vertical faces, so that the holder may be inclined at various angles. None of these constructions furnishes a solid bearing-surface directly beneath the work-holder, like the concave bed *f* employed in my construction, and none of them, therefore, supports the vise or
50 work piece with the same solidity that is provided by my invention.

55 In my invention the weight rests upon the curved supporting-surface independently of the clamping devices, and does not, therefore, depend upon the fastenings for its rigidity, as in the jointed devices which I have referred to. My construction is not adapted or intended to permit a wide range of adjustment, as such is not required in a machine-vise which holds the work-piece beneath an automatically-operating tool; but it holds it with greater
65 firmness than any hinged structure, which is

the primary requisite in a vise-support for such purpose.

I do not claim, broadly, means for tipping the machine-vise, but the intermediate bed
70 constructed, as described, with flat upper and lower surfaces disposed centrally beneath the turn-table *g*, so that the weight imposed upon the turn-table may be supported by the direct contact of such curved surfaces. The op-
75 posed segmental surfaces furnish such adjustments with a very compact and strong construction, which can be effected by segmental bearings, as it is not often required in practice to tip the vise more than ten de-
80 grees from the horizontal.

It has been common heretofore to hinge one end of the vise-bed upon the work-table and to tip the same by means of set-screws; but with such construction the entire load is sus-
85 tained upon a few points, as the hinge and the points of the screws, while in my construction the opposed segmental surfaces afford a large bearing and support the vise very firmly, and thus prevent trembling or so-called "chattering" when the tool is operat-
90 ing upon the work-piece.

It is obvious that the fixtures forming my intermediate bed form a unitary structure when the bolts *o'* and *j* are clamped to hold
95 the several sections together, and it may thus be constructed and sold for use with machine-vises in any machines where such vises are employed.

Having thus set forth the nature of the in-
100 vention, what is claimed herein is—

1. The combination, with the machine-vise having parallel body and movable jaw *c* with turn-table seat upon the body, of the inter-
105 mediate bed provided with a turn-table and formed with two sections *f* and *h* having opposed segmental surfaces, such surfaces being disposed horizontally and centrally beneath the turn-table and the sections having trans-
110 verse slots with fastening-bolts extended through the same to clamp the sections together.

2. The combination, with a machine-vise having parallel body and movable jaw *c*, of the intermediate bed having flat upper and
115 lower surfaces and formed in two sections *f* and *h* with opposed segmental surfaces disposed horizontally and centrally between such flat surfaces, the convex section having worm-teeth thereon, and the concave section hav-
120 ing horizontal spindle with worm fitted to such teeth for adjusting the sections in relation to one another.

3. The combination, with the machine-vise body, of the intermediate bed having oppo-
125 site flat surfaces and formed with the two sections *f* and *h* having opposed segmental surfaces, and the convex section *h* hollowed transversely, with the convex bearing-plate *m* secured adjustably thereon to support the vise.
130

4. The combination, with the vise having a parallel body with jaw *c* movable thereon,

of the lugs *p* projected at opposite ends of the
vise beyond the sides of the movable jaw, and
formed with the longitudinal slots *q* as set
forth, and tie-rods *s* fitted detachably to such
5 slots with heads *t* to embrace the lugs, as and
for the purpose set forth.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing
witnesses.

WILLIAM F. KOEPPEN.

Witnesses:

G. A. HENRY,

JOHN P. KOEPPEN.