(No Model.)

W. G. RICHARDS.

MACHINE VISE.

No. 510,293. Patented Dec. 5, 1893.

Fig. 1.

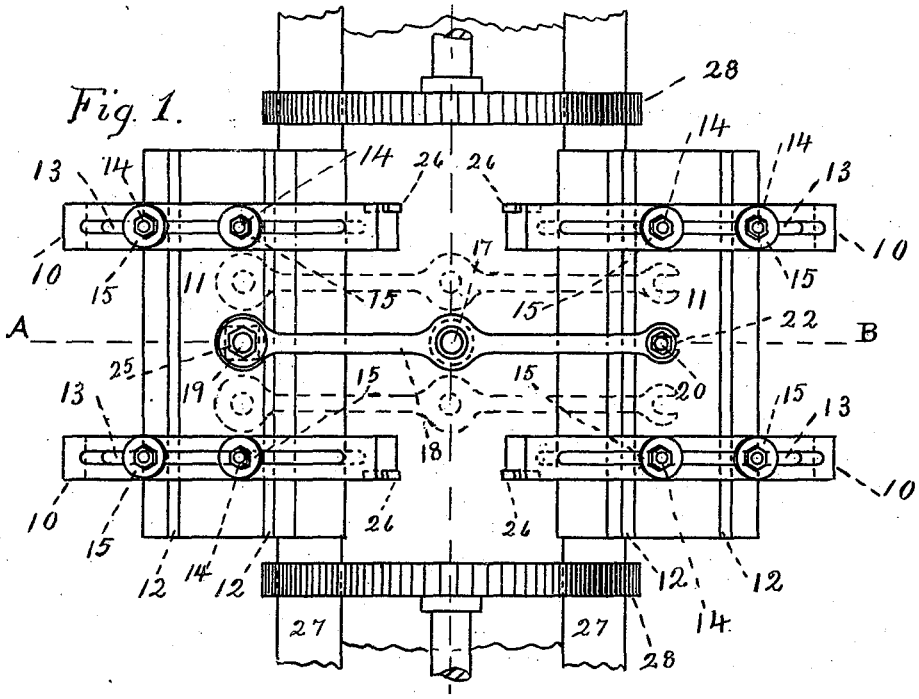
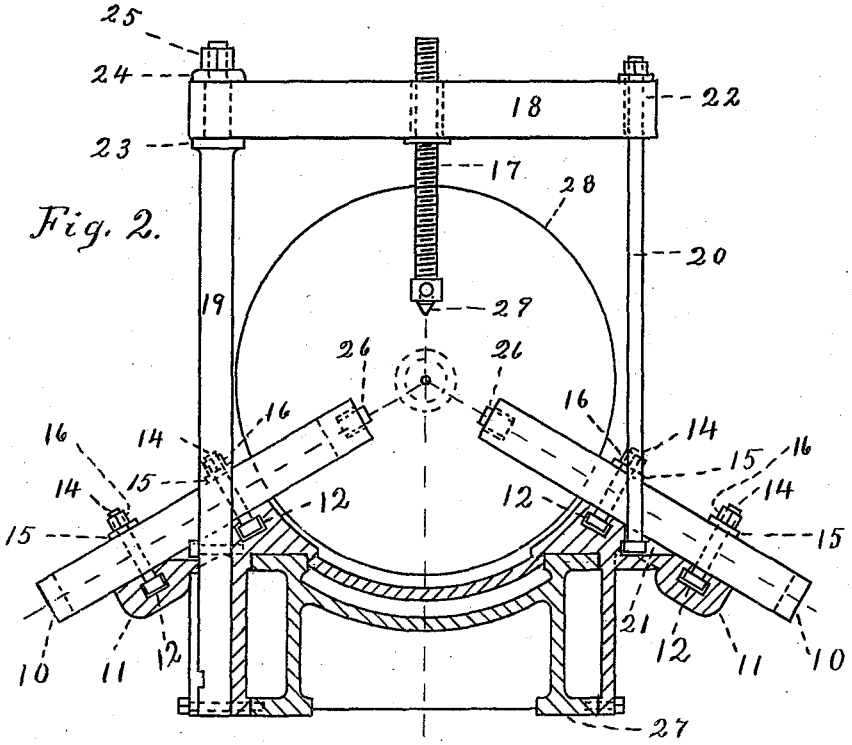


Fig. 2.



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MACHINE-VISE.

SPECIFICATION forming part of Letters Patent No. 510,293, dated December 5, 1893.

Application filed October 14, 1889. Serial No. 327,027. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. RICHARDS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Machine-Vise, of which the following is a specification.

My invention relates to improvements in vises for holding work to be operated upon by lathes or other machines, and the objects of my invention are, first, to provide an apparatus having a wide range as to dimensions and form of work it will hold; second, to combine great strength and rigidity, with ease and rapidity of operation. I attain these objects by the mechanism illustrated in the accompanying drawings forming part of this specification, in which—

Figure 1 is a plan of the vise placed upon the bed of a double end lathe, and Fig. 2 is a sectional elevation of the same, taken on line A, B, Fig. 1.

Similar characters designate like parts in both figures of the drawings.

My improved machine-vise has a series of adjustable jaws 10 and 17, supported on a base or frame and radiating from a common axis, the whole forming an adjustable vise for holding varying sizes and forms of valve-bodies, or other articles which are to be operated upon by lathes or other machine to which the device is applied; the axis of the vise and of the machine with which it is to be used should, of course, coincide approximately. The vise may be placed at the end of a machine upon an independent foundation, or upon the bed of a machine as in the drawings, or upon the wing bearings hereinafter described, which may be an integral part of the machine-bed.

A saddle is formed of two or more adjustable jaws 10 radiating from the axis of the vise, at an inclination to, and below, a horizontal line drawn through said axis, which jaws are supported upon wing bearings 11, placed, preferably, longitudinally parallel to the axis of the vise, and coincident to the plane of inclination of the jaws 10, which they support.

In the surface of wing bearings 11, T-slots 12 are made longitudinally parallel to axis of the vise. The jaws 10, supported upon the wings, as before stated, radiate from, and at right angles to the axis of the vise and the machine with which it may be used, the preferred inclination being about thirty degrees with relation to a vertical line drawn through the axis of the vise. Formed in the said jaws are vertical slots 13 running nearly their entire length. Clamping-bolts 14 are placed with their heads in the T-slots 12 in the wing and passed upward through slots 13 in jaws 10, where they are secured in place by nuts 16, heavy washers 15 being interposed between said nuts and the jaws, as shown. By loosening the nuts 16, it will be seen, that the jaws 10 may be moved in a direction parallel to the axis of the vise or at right angles to said axis without departing from lines radiating from the axis of the vise or from the center of the work being operated upon.

To accommodate the jaws to various forms and sizes of work to be operated upon, the arrangement of the jaws, slots and connections are such that, if desired, the jaws may be set at various angles with relation to the axial line of the vise.

From the foregoing it will be seen that owing to the diversity of adjustments of the jaws very small pieces varying greatly in form, may be quickly placed upon, and between jaws 10, and that very large pieces may be accommodated with equal facility, thus covering a wide range of work.

To make this device effective, one or more jaws 17, (which may be in the form of a screw, provided with means for operating the same,) are placed in a radial line with relation to the axis of the vise, above and between jaws 10. Said jaw or jaws 17 are suspended preferably in a vertical plane from, and work in, one or more transverse girders 18, said girders 18, supported at one end by, and swinging in a horizontal plane upon, one or more columns 19, placed at one side of the vise. At the side of the vise opposite column or columns 19, a removable tie-rod, or tie-rods 20, pass from one wing-bearing 11, up to the free, or swinging end of the girder, or girders 18. The lower end of tie-rod 20 is inserted in a transverse T-slot 21, in wing-bearing 11 and the upper end is extended through the slot 22, in the swinging end of the transverse girder, or girders 18. The column or columns

19, are secured rigidly to one of the wing-bearings 11, or in case the vise is placed upon a machine, to the bed of said machine, or to each, as may be convenient. The upper end of column or columns 19, are turned to fit the bearing formed in the anchored end of the girder or girders 18, and are enlarged below, to form a collar 23. A loose collar 24, bearing on a shoulder or column 19 and a threaded nut 25 are placed above the girder or girders 18. This arrangement provides a strong support for the girder or girders 18, and permits the girders to be easily swung around in a horizontal plane to admit of the placing and adjustment of work to be operated upon, without obstruction. In case the vise is used upon a double end lathe as shown in Fig. 1, the face-plates 27 will carry the cutting-tools.

The various parts making up the vise as a whole may be of any size or material desired.

For convenience and economy in construction, the jaws 10 may be of mild steel and may have a piece of hardened steel 26, with a serrated or toothed work-engaging edge inserted in the bearing end of each; also, the jaw or jaws 17 may have upon the bearing end, a piece of hardened steel 29, in the form of an inverted cone, or it may have a flat, serrated surface, and be made in such a manner that the jaw, or jaws 17 may turn within, or upon it.

The jaw or jaws 17 may be operated with a cam or other device instead of a screw.

I do not desire to limit myself to the exact construction and arrangement of saddle shown in the drawings, nor to the exact number of work-holding jaws therein shown, as the general construction and arrangement might be varied and the number of jaws increased to suit different classes and forms of work, without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. A machine-vise, for use in connection with lathes and other machines, comprising a saddle formed of lower jaws, adjustable radially and parallel to the axis of the vise, and upper radially-adjustable jaws supported by, and working in, girders arranged to swing in a horizontal plane about a pivot at one end, as a center, substantially as described.

2. A machine-vise, consisting of a saddle formed of adjustable jaws radiating downwardly from the axis of the vise, and upper radially-adjustable jaws supported by, and working in, girders pivotally-supported upon a column secured to a winged bearing of the saddle, said girders being arranged to swing in a horizontal plane, substantially as described.

3. In a machine-vise, the combination of a saddle having adjustable jaws, one or more clamping jaws, and a column secured to said saddle and fitted at its upper end for carrying a jaw-supporting girder, substantially as described.

4. In a machine-vise, a saddle having adjustable jaws, a vertical column, a girder supported by, and swinging in a horizontal plane about said column, and a clamping-jaw carried by said girder, substantially as described.

5. In a machine-vise, a saddle having adjustable-jaws, a vertical column, a girder supported at one end by and swinging in a horizontal plane about said column, and held at its opposite end by a vertical tie-rod, and a clamping-jaw adjustably-secured to and carried by said girder, substantially as described.

6. In a machine-vise, the combination of the upper clamping-jaws, each supported by a girder which is in turn supported at one end by, and swings in a horizontal plane about a vertical column, wing bearings to support the lower clamping-jaws, and lower clamping-jaws having clamping-bolt slots therein, and adjustably-secured to said wing bearings, substantially as described.

7. In a machine-vise, the combination of the saddle having slotted, radially inclined, wings, the faces of which are longitudinally parallel to the axis of the vise, slotted jaws secured to said wings in such manner as to be adjustable radially and parallel to said axis, a vertical column secured to one of said wings, a horizontal girder pivotally-secured at one end to said column so as to swing in a horizontal plane around said column, clamping-jaws vertically and adjustably supported by said girder, and a tie-rod adjustably-secured at its lower end in a slot in one of the wings and adapted to engage and hold the girder at its upper end, substantially as described.

8. In a machine-vise having lower work-grasping jaws, as described, the vertical column secured at its lower end and having a girder-supporting collar or flange at its upper end, a horizontally swinging girder pivoted at one end to the upper end of said column and having its opposite end slotted, as described, a jaw vertically and adjustably-supported by said girder at or near the center of said girder, and a tie-rod removably engaging and holding the slotted end of the girder, substantially as described and for the purpose set forth.

9. In a machine-vise, the vertically inclined wing bearings having the T-slots in their faces which slots extend longitudinally to the axis of the vise, the longitudinally-slotted jaws supported thereby, and headed fastening devices seated in the slots in the wings and extended through the slots in, and secured to the jaws, whereby the said jaws may be adjusted in a line parallel, and also at right angles, to the axis of the vise, substantially as described.

10. In a machine-vise, a vertical column, a girder pivoted at one end to, and swinging in a horizontal plane about said column, and fitted at its opposite end to receive a tie-rod, as described, in combination with the upper threaded jaw adjustably-supported by said

girder, and lower slotted adjustable jaws, a slotted bearing to support said lower jaws, and means as described, adjustably securing the lower jaws to the bearing, substantially as described.

11. In a machine-vise, the combination of a base or frame having oppositely disposed and adversely inclined jaw-supporting faces, lower jaws supported thereby and adjustable longitudinally of said faces and also crosswise thereto, and the upper jaw adjustably-secured to a horizontally-swinging girder and co-acting with the lower jaws to hold work of varying sizes, all of said jaws radiating from a common center, substantially as described.

12. In a machine-vise, the combination of a base or frame having slotted and oppositely inclined jaw-supporting faces, lower slotted jaws, adjustably-secured thereto by bolts, as described, a vertical column fixed at its lower end to said base, a girder pivotally-supported at one end upon the column so as to swing horizontally and having its opposite end bifurcated, as shown, a vertical jaw supported by said girder, and a vertical tie-rod adjustably secured to the base and removably secured to the bifurcated end of the girder, substantially as described.

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