

Nov. 17, 1942.

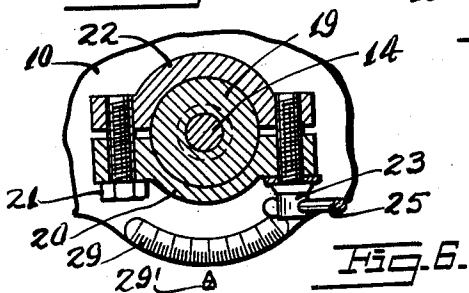
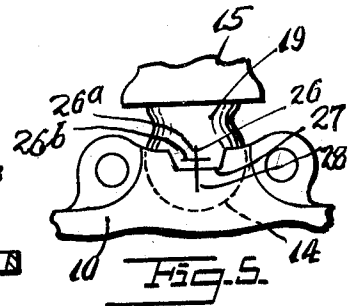
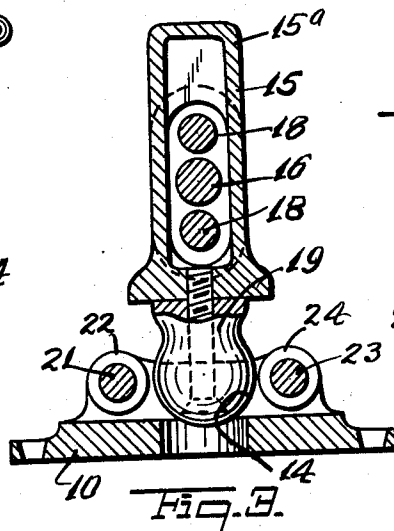
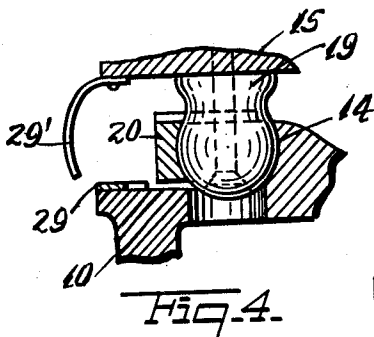
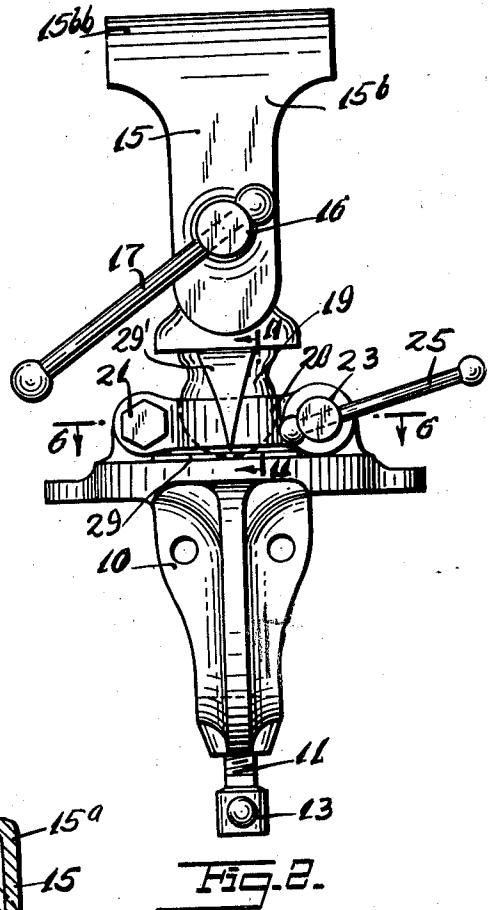
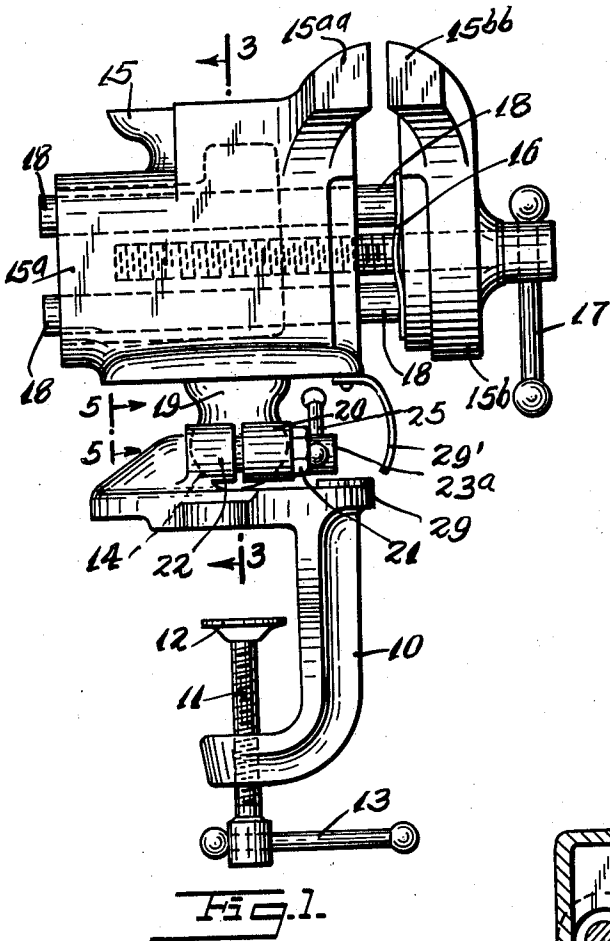
A. BORSELLA

2,302,523

BENCH VISE

Filed March 22, 1940

2 Sheets-Sheet 1



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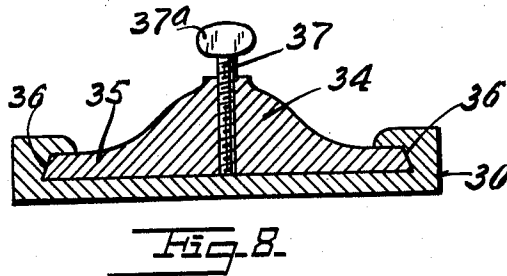
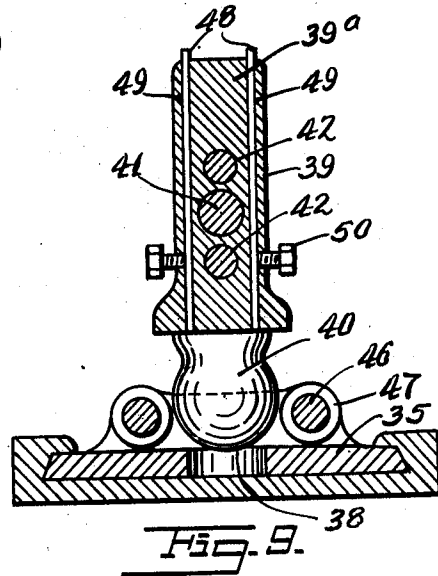
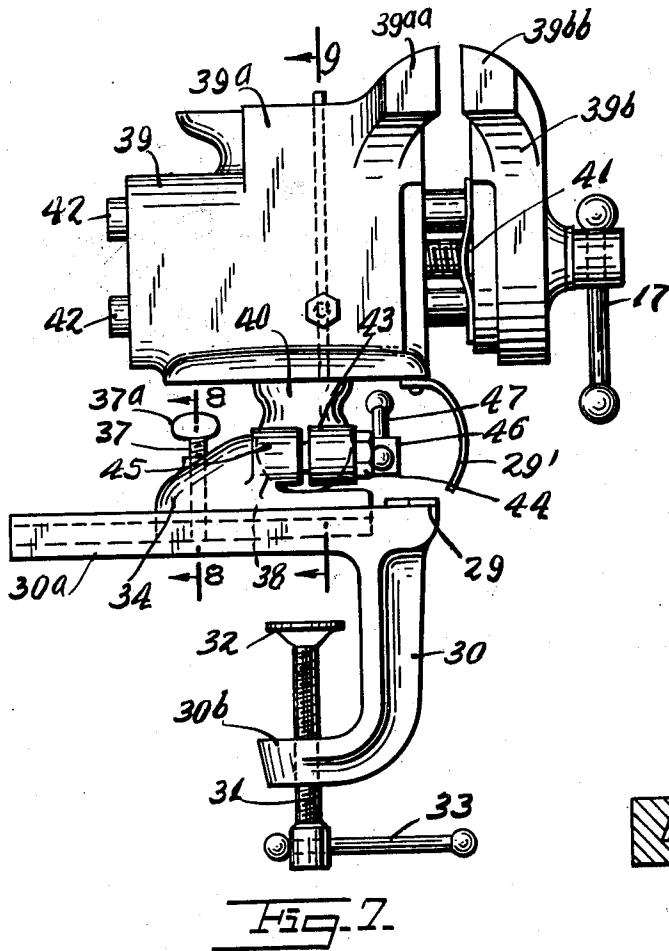
A. BORSELLA

2,302,523

BENCH VISE

Filed March 22, 1940

2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,302,523

## BENCH VISE

Anthony Borsella, Bronx, N. Y., assignor of twenty-four and one-half per cent to Abraham Miller and twenty-four and one-half per cent to Manuel Hirsch, both of New York, N. Y.

Application March 22, 1940, Serial No. 325,303

2 Claims. (Cl. 81—41)

This invention relates to new and useful improvements in a bench vise.

More specifically, the invention proposes the construction of a bench vise characterized by a bench clamp adapted to be mounted upon a bench and provided with a vise universally mounted thereon and arranged in a manner to assume any desired position with relation to the bench top.

Still further it is proposed to provide the bench clamp with the zone of a spherical recess within which a spherically shaped member formed on said vise is adapted to be engaged.

Still further it is proposed to provide a means upon the bench clamp for holding said spherical shaped member in various fixed positions within said spherical recess in a manner to hold the bench clamp in various pivoted positions.

Still further it is proposed to slidably mount the vise upon said bench clamp in a manner to permit the same to be moved to various fixed adjusted forward and rearward positions upon the top of said clamp.

Still further it is proposed to provide a means for permitting the vise to be held in various adjusted elevated positions with relation to said clamp in a manner to permit the vise to be elevated with relation to the top of the bench when desired.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is an elevational view of a bench vise constructed in accordance with this invention.

Fig. 2 is a front elevational view of Fig. 1.

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a partial elevational view looking in the direction of the line 5—5 of Fig. 1.

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 2.

Fig. 7 is an elevational view similar to Fig. 1 but illustrating a modification of the invention.

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 7.

Fig. 9 is a vertical sectional view on the line 9—9 of Fig. 7.

The bench vise, according to this invention, includes a bench clamp 10 of substantially U-shape.

This U-shaped bench clamp 10 is adapted to be engaged upon the edge of a bench with the inside face of its top arm resting upon the top face of the bench. The other arm of the bench clamp 10 has a screw 11 threadedly engaged therethrough. The inner end of the screw 11 is provided with a turnably mounted plate 12 which is adapted to engage the bottom face of the bench. The other end of the screw 11 is provided with a radially extending handle 13 which is adapted to be used for turning the screw 11 to cause the plate 12 to bear rigidly against the bottom face of the bench and hold the bench clamp 10 in position thereon.

The bench clamp 10 has the top of its body formed with a zone of spherical recess 14 which is open at the top and at the front. A vise 15 is provided for engagement upon the bench clamp 10. This vise 15 comprises a fixed jaw 15<sup>a</sup> having a jaw element 15<sup>aa</sup>. A movable jaw 15<sup>b</sup> has a jaw element 15<sup>bb</sup> which is adapted to cooperate with the jaw element 15<sup>aa</sup> for securely holding a piece of work in position. The movable jaw 15<sup>b</sup> is moved towards and away from the fixed jaw 15<sup>a</sup> by means of a screw 16. This screw is merely rotatively extended through the movable jaw 15<sup>b</sup> and is threadedly engaged into the fixed jaw 15<sup>a</sup>. A handle 17 is provided for permitting the screw 16 to be rotated. Several guide posts 18 extend from the movable jaw 15<sup>b</sup> and slidably engage into complementary openings formed in the fixed jaw 15<sup>a</sup> for holding the movable jaw 15<sup>b</sup> in alignment with the fixed jaw 15<sup>a</sup>. The bottom of the vise 15 is formed with a substantially spherical member 19 which engages into the recess 14 and which extends from the open top thereof. The spherical member 19 may be made detachable from the vise or be integral therewith.

A means is provided for holding the spherical member 19 in various fixed turned positions within the spherical recess 14 for holding the vise 15 in various pivoted positions with relation to the bench clamp 10. This means comprises a band 20 extended across the open side of the recess 14 and which engages against the side of the spherical member 19. One end of the band 20 is securely held in position. For accomplishing this secure mounting of the end of the band 20, a bolt 21 is engaged through the end of the band 20 and is threadedly engaged into a complementary boss 22 formed upon the body of the bench clamp 10. The other end of the band 20 has a screw 23 freely engaged there-through and which engages a complementary

boss 24 formed upon the body of the bench clamp 10.

The screw 23 is provided with an enlarged head 23<sup>a</sup> which is adapted to abut the face of the band 20 for moving the same towards the spherical member 19 when the screw 23 is threadedly engaged into the boss 24. The head 23<sup>a</sup> also has a handle 25 by which the screw 23 is adapted to be rotated.

A means is also provided for indicating when the vise 15 is arranged exactly horizontal and exactly perpendicular to the bench top to which the bench vise has been applied. This means comprises an alignment marker 26 formed upon the rear portion of the spherical member 19. This alignment marker comprises a vertical line 26<sup>a</sup> and a horizontal line 26<sup>b</sup> which cross each other. The adjacent edge of the body of the bench vise 10 is provided with a horizontal cut-out 27 and a downwardly extending marker 28 which extends downwards exactly at right angles to the edge of the cut-out 27. When the horizontal line 26<sup>b</sup> of the marker 26 is arranged exactly parallel to the edge of the cut-out 27 and lays immediately adjacent thereto, the bench vise will be arranged substantially parallel to the bench top. Similarly, when the ends of the vertical marker 26<sup>a</sup> and the marker 28 are arranged exactly in end alignment the bench vise will be extended exactly perpendicular to the bench top.

The angular position of the vise may also be determined approximately by the angle indicating plate 29 located on the top face of the clamp 10 which is in the vicinity of the lower end of a pointer 29' projecting downwardly from the adjustable vise 15.

The operation of this form of the invention is as follows:

To adjust the position of the bench vise to assume any desired position with relation to the bench clamp 10 and the top of the bench to which the vise has been applied, it is merely necessary to loosen the screw 23 freeing the spherical member 19 and permitting the same to be turned to any desired position within the spherical opening 14. The bench vise 15 is then free to be turned into any desired position and to again clamp the vise 15 in its adjusted position it is merely necessary to tighten the screw 23, causing the band 20 to again bear against the spherical member 19 and fixedly hold the same in position within the spherical opening 14.

According to the modification of the invention shown in Figs. 7-9 inclusive the bench vise comprises a bench clamp 30 which is substantially U-shaped in construction. The U-shaped bench clamp 30 is turned on its side forming a top arm 30<sup>a</sup> and a bottom arm 30<sup>b</sup>. The top arm 30<sup>a</sup> is substantially longer than the bottom arm 30<sup>b</sup> and is adapted to rest on the top face of a bench to which the vise is applied. The bottom arm 30<sup>b</sup> carries a screw 31 threadedly extended there-through. A plate 32 is mounted on the top end of the screw 31 and is adapted to be clamped against the bottom face of the bench. The bottom end of the screw 31 carries a handle 33 by which the screw 31 is adapted to be conveniently rotated for causing the plate to be brought into and out of contact with the bottom face of the bench.

A body 34 is mounted upon the top arm 30<sup>a</sup> of the bench clamp 30. This body 34 is provided with a dove-tailed projection 35 which is adapted to engage a complementary dove-tailed groove 36 formed in the top face of the top arm 30<sup>a</sup>.

A means is provided for holding the body 34 in various fixed positions along the length of the dove-tailed groove 36. This means comprises a screw 37 threadedly extended through the body 34, and which is adapted to abut the bottom face of the groove 36 as shown in Fig. 7 for fixedly holding the body 34 securely in position. The screw 37 is provided with a head 37<sup>a</sup> by which it is adapted to be conveniently rotated.

The body 34 is further provided with a zone of a spherical recess 38 which is open at its top and at its front side. A vise 39 is provided at its bottom with a substantially spherical member 40 which engages within the spherical recess 38 and which extends from the top thereof. The vise 39 comprises a fixed jaw 39<sup>a</sup> having a jaw element 39<sup>aa</sup> and a movable jaw 39<sup>b</sup> having a jaw element 39<sup>bb</sup> cooperative with the jaw element 39<sup>aa</sup>. A screw 41 is provided for causing the movable jaw 39<sup>b</sup> to be moved towards and away from the fixed jaw 39<sup>a</sup>. Several guide posts 42 are also provided for holding the movable jaw 39<sup>b</sup> in alignment with the fixed jaw 39<sup>a</sup>.

Means is also provided for holding the spherical member 40 in various fixed turned positions within the spherical recess 38 to similarly hold the vise 39. This means comprises a band 43 which is extended across the open side of the spherical recess 38 and which engages the spherical member 40. One end of this band 43 is securely held in position. To accomplish this a bolt 44 is extended through the end of the band 43 and is threadedly engaged into a complementary boss 45 formed upon the body 34. The other side of the band 43 is adapted to be releasably attached to the body 34. This is accomplished by means of a screw 46 which freely passes through the band 43 and which threadedly engages a complementary boss 47 formed upon the body 34. An enlarged head 46<sup>a</sup> is formed on the screw 46 and abuts the front face of the band 43. A handle 47 is mounted on the enlarged head 46<sup>a</sup> and is provided for permitting the screw to be conveniently turned to clamp the band 43 against the spherical member 40.

This form of the invention is also provided with a means for holding the vise 39 at various fixed elevational positions with relation to the spherical member 40. This means comprises several vertically extending rods 48 which extend from the top of the spherical member 40 and which pass through openings 49 formed in the vise 39. These rods 48 extend through the fixed jaw 39<sup>a</sup> of the vise and are arranged on either side of the screw 41 and the guide rods 42. The vise 39 is adapted to be moved upwards and downwards upon the rods 48 and a means is provided for fixing the vise in various adjusted positions thereon. This means comprises screws 50 threadedly extended in from the sides of the vise 39 and which are adapted to be clamped against the sides of the rods 48 as shown in Fig. 9 for fixedly holding the vise in various vertical fixed positions.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A bench clamp, a body having a spherical

recess which is open at its top and at its front side, means for holding said body in various fixed forward and rearward positions on the top of said clamp, a vise having its bottom provided with a substantially spherical member engaging said recess and extending from the open top, a band extending across the open side of said recess and engaging the side of said spherical member, and means cooperative with said body for releasably holding said band, upwardly extending rods mounted on said spherical member and slidably extended through vertical openings in said vise so that said vise may be non-rotatively raised to various elevated positions relative to said spherical member, and screws threadedly extended through the sides of said vise to engage said rods and hold said vise in various elevated positions on said rods.

2. A bench clamp, a body having a spherical recess which is open at its top and at its front side, means for holding said body in various fixed forward and rearward position on the top of said clamp, a vise having its bottom provided with a substantially spherical member engaging said recess and extending from the open top, a band extending across the open side of said recess and engaging the side of said spherical member, and means cooperative with said body for releasably holding said band, upwardly extending rods mounted on said spherical member and slidably extended through vertical openings in said vise so that said vise may be non-rotatively raised to various elevated positions relative to said spherical member and means for fixing said vise in various positions on said rods.

ANTHONY BORSELLA.