C. McCARTER.

VISE.

APPLICATION FILED SEPT. 23, 1920.

1,413,676.

Patented Apr. 25, 1922.

2 SHEETS—SHEET 1.

FIG. 1

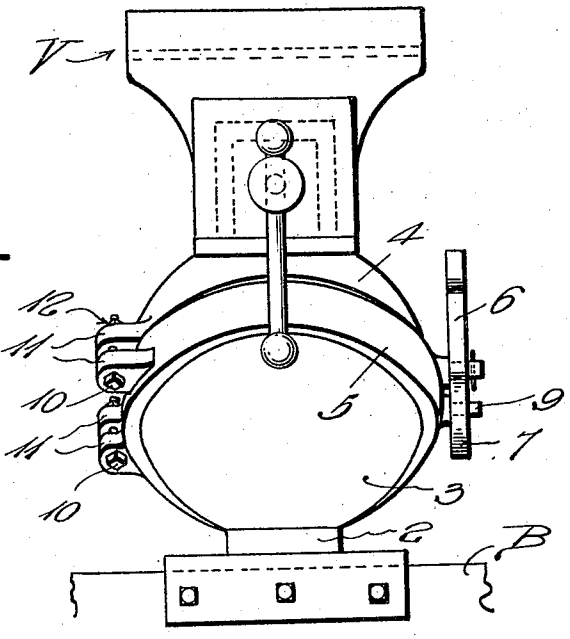
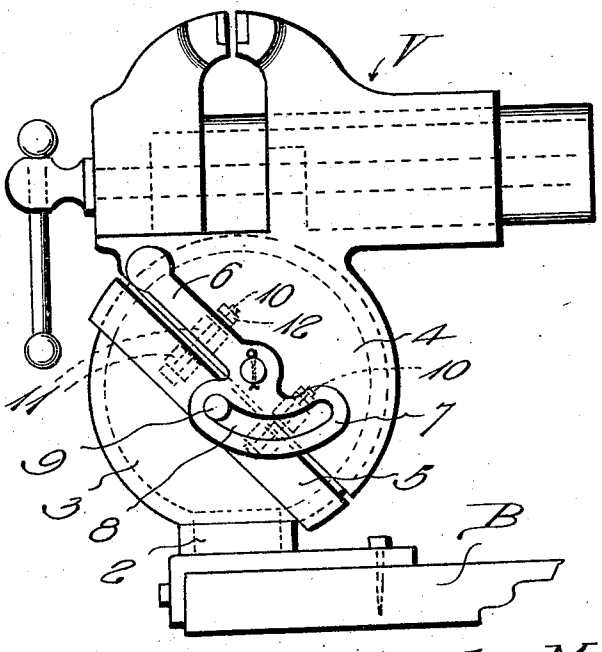


FIG. 2



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2 SHEETS—SHEET 2.

FIG. 3

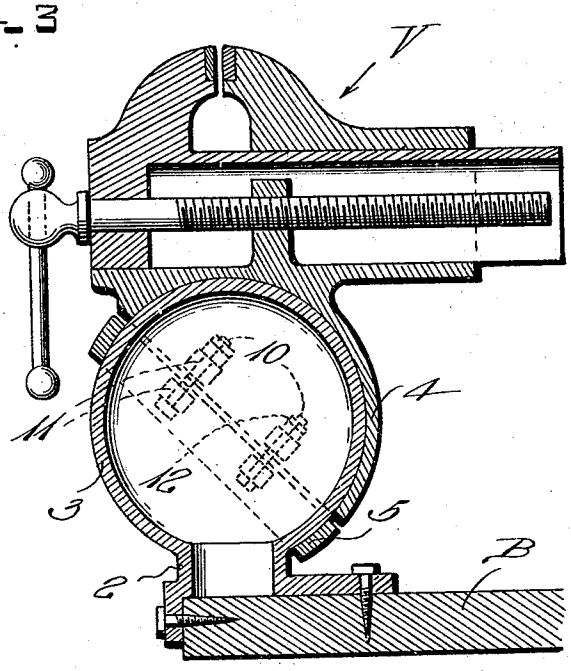


FIG. 4

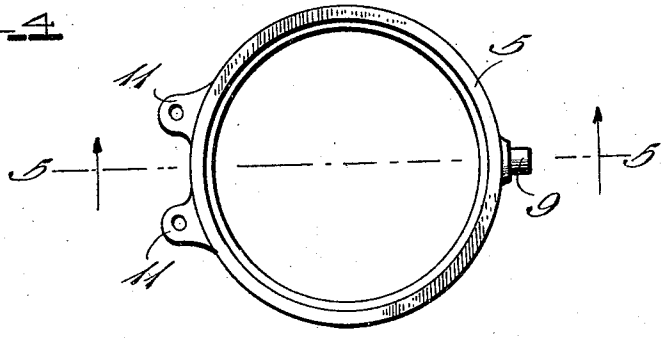
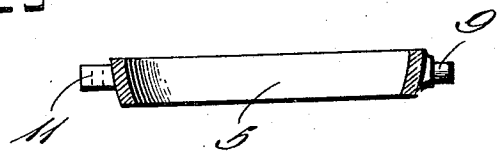


FIG. 5



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UNITED STATES PATENT OFFICE.

CHARLES McCARTER, OF DECATUR, ILLINOIS.

VISE.

1,413,676. Specification of Letters Patent. Patented Apr. 25, 1922.

Application filed September 23, 1920. Serial No. 412,299.

To all whom it may concern:

Be it known that I, CHARLES McCARTER, a citizen of the United States, residing at Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Vises; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates broadly to improvements in vises, and it has for one of its objects to provide a novel mounting for a vise in the form of a ball and socket joint which permits the vise to have a universal movement whereby the work which is being held in the vise may be moved to various angles to obtain the proper light or the best and most advantageous position for effectively performing on the work.

Another object of the invention is to provide a vise including a ball and socket joint which includes a socket and a clamping ring which are relatively movable and are partially connected together by means of a cam lever and projection which produces an extremely advantageous means for insuring effective binding of the clamping ring and quick and easy movement of the latter.

A further object of the invention is to provide a ball and socket joint for mounting vises which includes the above named socket and clamping ring partially connected by a cam connection, these parts being also loosely connected by means which permits them to have relative movement and serve to take up wear of the parts.

A still further object of the invention is to generally improve upon devices of this class by producing one of extreme simplicity and durability which includes the above named constructional features and is extremely inexpensive to both the manufacturer and the user.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is an end elevation of a conventional type of vise equipped with my improved ball and socket mounting.

Figure 2 is a side elevation thereof.

Figure 3 is a central longitudinal sectional view of the vise and the improved mounting.

Figure 4 is a detail view of the clamping ring.

Figure 5 is a sectional view taken on the line 5—5 of Fig. 4.

In carrying out my invention I associate my ball and socket mounting with a stationary member and a movable member, and one of these members I provide with a spherical head while the other member I provide with a socket which includes a portion to fit over approximately one-half of the head and a clamping ring which fits over a portion of the remainder of the head, the ring and the adjacent portion of the socket being relatively movable, and there being a novel cam connection between the ring and the adjacent portion of the socket for obtaining relative movement of these parts. Also by preference, I further provide a loose connection between the ring and the adjacent portions of the socket which is arranged at a point opposite the cam connection and this loose connection serves to permit relative movement of the parts and is such that it serves as a means for taking up wear.

Referring to the drawings wherein the preferred embodiment of my invention is disclosed, the letter V designates a conventional type of vise, which under ordinary circumstances is rigidly mounted on a bench B. My invention, as before stated, contemplates the universal mounting of the vise on the bench instead of mounting it in a stationary manner as ordinarily done. To this end, I provide a novel ball and socket joint which includes a suitable attaching plate 1 which is connected in any suitable manner to the bench B. This attaching plate carries a neck 2 and a head 3 of spherical form. By preference, this head and neck may be hollow since it is desirable to reduce the cost of manufacture as much as possible. Connected, either integrally or in the form of an attachment, to the stationary jaw of the vise, is a semi-spherical socket 4 which fits over approximately one-half of the surface of the ball 3, this socket being freely movable on the ball to permit the vise to assume various angles with respect to the bench. At this point I wish to mention that ball 3 could well be connected to the vise and the socket 4 could well be connected to the bench and the same action of parts obtained. For this reason, I do not wish to be restrict-

ed to the particular arrangement just described. I am aware that, so far as the description of the device has gone, it has set forth a construction well known and patented as used in connection with a mounting for vises. The real novelty therefor of my device resides in the means for retaining the parts in a set position and the manner in which this means is associated with the ball and socket.

The means above referred to is in the form of a clamping ring 5 which is of a diameter less than the greatest diameter of the ball and this ring fits on the ball and covers a portion of the remaining half of the ball which is not covered by the socket 4. Ring 5 is normally slightly spaced from the socket 4 and is slightly movable toward and away from the same to permit the socket to be moved or locked as the case may be. There are two independent connections between the ring and the socket. One of these connections is in the form of a cam made up of a lever 6 which is fulcrumed on one side of the socket at a point adjacent the clamping ring, this lever being provided with an enlarged portion forming a head 7 which is provided with a cam slot 8 receiving a stud 9 carried by the clamping ring. The construction and arrangement just referred to is clearly disclosed in Fig. 2. By referring to this figure, it will be seen that the parts are in a position to lock the socket and in turn to prevent further movement of the vise. A careful examination of this figure, will disclose the fact that in order to permit movement of the vise and socket, it is only necessary to move the lever 6 in the direction indicated by the arrow. The other connection between the clamping ring and the socket above referred to, consists of a plurality of bolts 10 which extend through laterally apertured ears 11 formed on the socket and clamping ring and arranged in alignment with one another. It will be noted that the last named connection is preferably disposed at a point approximately diametrically opposite to the cam lever 6. The bolt connection couples the clamping ring and socket together in such a manner as to permit them to move freely toward and from each other and at the same time serves the additional function of adjusting the members closer toward each other to take up wear. If desired, the bolts may be provided with additional nuts 12 which serve as locknuts and prevent accidental displacement of the adjusting and connecting bolts.

The operation of the device is as follows: Assuming that the vise is in the usual horizontal position which it assumes when it is stationarily mounted, as under ordinary circumstances, and deeming it necessary to change the angle thereof to obtain the proper light on the work held in the vise, this may be done by simply grasping the lever 6 and swinging it on its pivot in the direction indicated by the arrow in Fig. 2. By so moving this lever, the clamping ring which is ordinarily slightly spaced from the socket, will be free to be moved further away from the socket thus releasing its frictional grip on the spherical head and permitting the vise to be moved to the desired angle. When the desired angle is obtained, the vise may be retained in this position by simply returning the locking lever to its normal position as indicated in Fig. 2. Constant moving of the clamping ring over the spherical head, will no doubt, cause considerable wear of the ring. When this wear occurs, it may be taken up by tightening the nuts on the adjusting bolts 10.

From the foregoing description, it will be seen that I have devised an extremely advantageous mounting for the vises, which will permit the vise to be moved at various angles with respect to the bench on which it is positioned in order to have the work at the most advantageous position for effectively working on it, and also obtaining the proper and best light, which circumstances are not obtainable with the ordinary stationarily mounted vise. The construction of the mounting means is extremely simple and consists of extremely few parts which renders the device very inexpensive to both the manufacturer and the user, and at the same time permits it to be easily manipulated and insures entirely effective results.

While I have shown and described my improved ball and socket mounting for use in connection with a vise, I wish it to be understood that it may be equally well used as a mounting for various other devices.

A careful consideration of the foregoing description taken in connection with the accompanying drawings will enable persons skilled in the art to which this invention appertains, to obtain a clear understanding of the same, therefore, a more lengthy description is deemed unnecessary.

Since probably the best results may be obtained with the construction and arrangement disclosed and described, this construction and arrangement will be taken as the preferred embodiment of my invention. However, I wish it to be understood that various minor changes in the shape, size, and arrangement of parts may be resorted to as long as they do not depart from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In combination, a stationary member and a movable member, one of which is provided with a spherical head, the other member being provided with a socket including a portion to fit over approximately one-

half of said head and a ring to fit over a portion of the remainder of the head, said ring and adjacent portion of the movable member being relatively movable, means connecting said ring and said socket together, and separate and independent means disposed at an approximate diametrically opposite point to permit such relative movement of the ring and socket and having the additional function of moving these parts together to compensate for wear.

2. In combination, a stationary member and a movable member, one of which is provided with a spherical head, the other member being provided with a socket to fit over a portion of said head, a ring to fit over another portion of the head and being designed for co-action with said socket for connecting the two members together and preventing relative movement thereof, and cam co-acting means between the ring and socket for moving the ring toward and from the socket to permit relative adjustment of said members, said cam co-acting means serving also to bind the ring against the head for locking the members against relative movement.

3. In combination, a stationary member and a movable member, one of said members being provided with a spherical head, the other member being provided with a socket including a portion to fit over approximately one-half of said head and a ring to fit over a portion of the remainder of the head, said ring and adjacent portion being relatively movable, said ring being provided with a stud, a lever fulcrumed on said first named portion of the socket and being provided with a cam slot receiving said stud.

4. In combination, a stationary member and a movable member, one of said members being provided with a spherical head, the other member being provided with a socket including a portion to fit over approximately one-half of said head and a ring to fit over a portion of the remainder of the head, said ring and adjacent portion being relatively movable, a bolt loosely connecting the ring and adjacent portion of the socket, permitting relative movement of these parts and serving to take up wear, and a cam connection also between the ring and adjacent socket portion.

5. A device of the class described comprising an attaching plate carrying a neck and a spherical head, a vise provided with a semi-spherical socket fitting over and movable on the head, a clamping ring also fitted on said head, being of less diameter than the greatest diameter of the head and carrying a lateral stud, a bolt associated with and loosely and adjustably connecting the socket and ring, permitting relative movement thereof, a lever fulcrumed on the socket, being provided with a head having a cam slot receiving said stud.

6. In combination, a stationary member and a movable member, one of which is provided with a spherical head, the other being provided with a socket movably fitted on said head, a clamping ring also fitted on said head and designed for co-action with said socket, being relatively movable with respect to said socket, said ring being provided with a stud, and a lever fulcrumed on said socket, being provided with a slotted head, said pin extending through said slot.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES McCARTER.

Witnesses:
C. F. EVANS,
A. R. IVENS.