(No Model.)

R. E. SWARTZ.

BALL AND SOCKET CLAMP.

No. 605,527. Patented June 14, 1898.

FIG. 1.

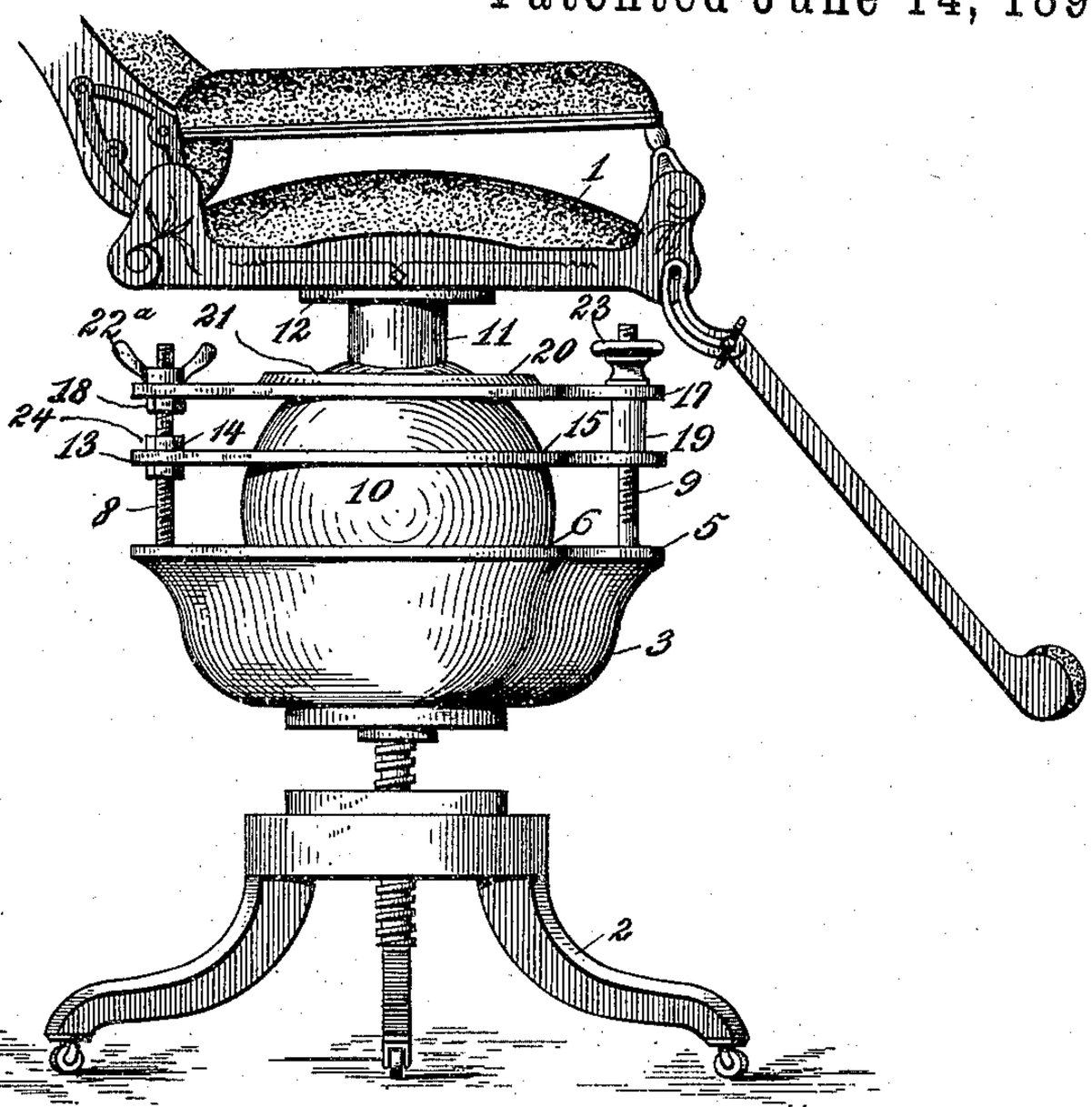


FIG. 2.

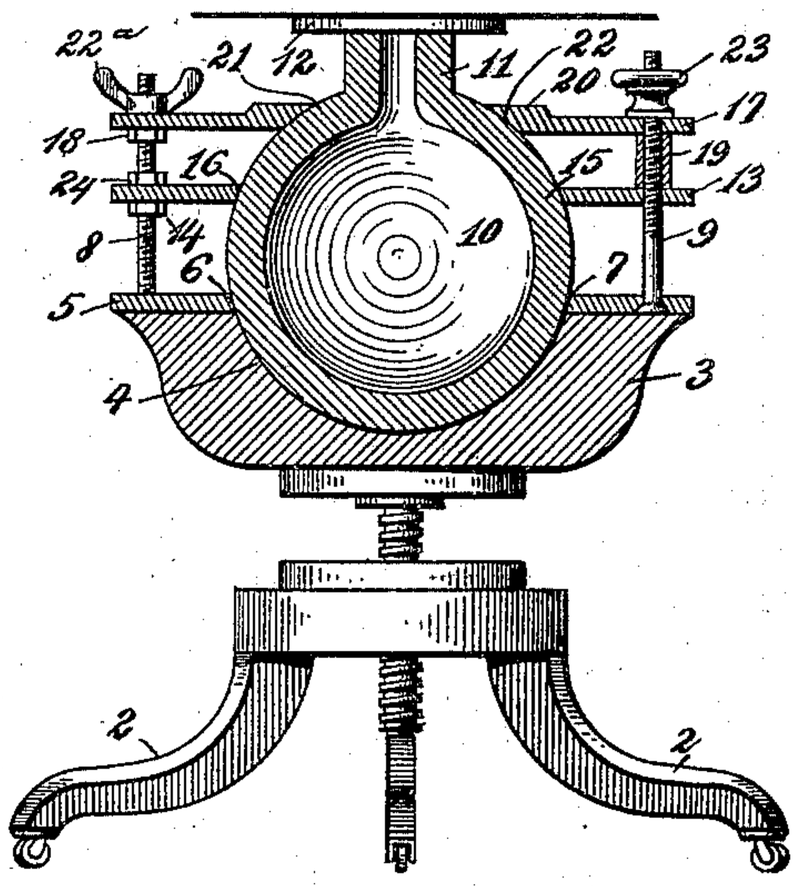
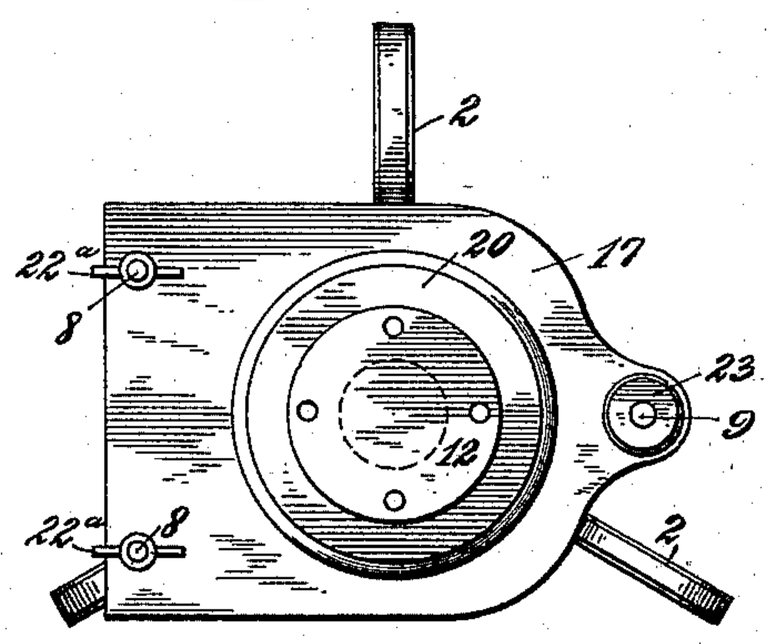


FIG. 3.



Inventor

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Witnesses

John F. Dieffenwierl

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By his Attorneys,

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UNITED STATES PATENT OFFICE.

ROBERT E. SWARTZ, OF CRESTON, IOWA, ASSIGNOR OF ONE-HALF TO H. E. W. BARNES, OF SAME PLACE.

BALL-AND-SOCKET CLAMP.

SPECIFICATION forming part of Letters Patent No. 605,527, dated June 14, 1898.

Application filed May 22, 1897. Serial No. 637,771. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. SWARTZ, a citizen of the United States, residing at Creston, in the county of Union and State of Iowa, have invented a new and useful Ball-and-Socket Clamp, of which the following is a specification.

This invention relates to certain improvements in ball-and-socket clamps for use in surgeons' chairs and tables, dental and barbers' chairs, reclining-chairs, and similar articles, its object being to provide a simple, cheap, and efficient ball-and-socket connection between a table or a chair-seat and the supporting-base which may be clamped in any desired position, whereby the table or seat may be adjusted to the desired angle of inclination and be clamped in its adjusted position.

The invention consists in the several details of construction and combination of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

In order to illustrate my invention, I have in the accompanying drawings shown it as applied to a dental chair, in which—

Figure 1 is a side elevation of a dental chair embodying my invention. Fig. 2 is a vertical section through the ball-and-socket joint. Fig. 3 is a plan view of the same.

Similar reference-numerals indicate similar parts in the several figures.

1 indicates the seat of the chair, which may be of any suitable form or construction, and 2 indicates the supporting-legs and the framework attached to them.

3 indicates a block connected to the supporting-framework 2 in any suitable manner to have vertical adjustment relatively thereto, and this block forms a part of the base-support for the seat of the chair. In the drawings I have shown a simple screw connection between the parts; but any other means may be employed.

The block 3 is provided with a semispherical recess in its upper face, and a plate 5 is firmly secured to the upper face of the block. This plate is provided with a central opening which registers with the recess 4, and the edge of the metal around the opening is beveled, as indicated at 7, for a purpose to be hereinafter referred to.

8 indicates threaded bolts which extend upwardly from what, for the sake of distinction, will be termed the "rear" end of the plate 5, and these bolts are firmly secured to the plate in any suitable manner.

9 indicates a bolt which extends up from the front end of the plate and is threaded at its upper end.

10 indicates a ball which is adapted to be seated in the opening 6 in the plate 5 and the semispherical recess 4 in the block 3, and the beveled edge 7 around the opening 6 will enable the ball to fit snugly in the opening and not be subject to any unnecessary abrasion when the ball is moved in the recess. The opening 6 and recess 4 will be of such size as to receive not more than one-third of the ball, and they may be made of such dimensions as to receive any less quantity, as desired. The ball 10 is provided with an integral shank 11, and this shank has a plate portion 12 at its upper end which is adapted to be firmly secured to the under face of the seat.

13 indicates a plate which is provided with suitable openings to enable it to fit over the bolts 8 and 9, and the rear end of this plate is supported by nuts 14, which are adjustable on the bolts 8. The plate is also provided with a central opening (indicated by 15) to enable the plate to fit over the ball, and the edge of the metal around this opening is beveled, as indicated at 16, to fit snugly on the surface of the ball. The opening in the plate 13 will be of such size as to permit the plate to drop down over the ball to the extent of about two-fifths of the diameter of the ball.

17 indicates a plate which is provided with suitable openings at its rear and front ends to fit over the bolts 8 and 9, and the rear end of the plate is supported by nuts 18, which are adjustable on the bolts 8, and the front end is supported on a thimble 19, which fits over the bolt 9, between the plates 13 and 17. The middle portion of the plate 17 is reinforced or thickened, as indicated at 20, and is provided with a central opening 21 to enable it to fit over the upper portion of the ball 10, and the edge of the metal around this

opening is beveled, as indicated at 22, in order that the plate may bear snugly against the ball.

22ª indicates hand-nuts on the upper ends of the bolts 8, which are adapted to engage the upper face of the plate 17 and hold its rear end in the desired position.

23 indicates a hand-nut on the upper end of the bolt 9, adapted to engage the upper face of the front end of the plate 17, and this hand-nut serves to force the plates 17 and 13 into tight frictional engagement with the ball 10, and thereby hold it in any position to which it has been adjusted. In order to prevent the rear end of the plate 13 from moving up on the bolts 8, I provide locking-nuts 24, which work on the bolts 14 and engage the upper face of the plate 13.

In order to adjust the chair-seat to the desired angle of inclination, the hand-nut 23 will be loosened, and this will relieve the plates 13 and 17 from their tight frictional engagement with the ball, and the seat can then be turned to the desired angle of inclination, either longitudinally or laterally, and when in the desired position the hand-nut 23 will be tightened and cause the plates 17 and 13 to bind on the ball 10 and hold it in its adjusted position.

From the foregoing description it will be seen that I have produced an exceedingly simple and efficient device for regulating the inclination of a chair-seat or other similar object and that such device can be produced at much less expense than the devices now in common use to effect such adjustment.

The balls may be of any desired diameter, ranging from two to twelve inches or even larger, and they will preferably be made of brass or steel. The plates will preferably be of some rigid metal, such as steel, and may range in thickness from a half to two inches, this of course depending on the amount of strain to which they will be subjected.

It will be understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

It is also obvious that the chair-seat or other object may also be given a rotary movement through the ball-and-socket joint and be clamped in the desired position.

Having thus described the invention, what I claim is—

1. The combination with a base-support having a recess, of a plate secured to the base and provided with an opening registering with said recess, threaded bolts secured to and extending upwardly from opposite ends of the said plate, a ball seated in said opening and recess and having a shank adapted to be secured to an object, such as a chair-seat, spaced plates provided with openings to fit over the ball and bolts respectively, means to adjustably support and hold the spaced plates at one end on the bolts, and a hand-nut working on the bolt at the other end of the plates to force them simultaneously into tight frictional engagement with the ball, substantially as described.

2. The combination with a base-support having a recess, of a plate secured to the base and provided with an opening registering with said recess, a series of threaded bolts secured to and extending upwardly from the said plate at one side, and a single threaded bolt secured to and extending upwardly from the plate at the opposite end, a ball secured in said opening and recess and having a shank adapted to be secured to an object, such as a chair-seat, a pair of spaced plates provided at their opposite ends with openings to fit over the said bolts, and with central openings to fit over the upper portion of the ball and engage it at different points, nuts adjustable on the said series of bolts to support and hold the ends of the spaced plates fitted over them, a thimble fitted over the said single bolt between the spaced plates, and a nut working on the last-named bolt and engaging the upper plate to simultaneously force the spaced plates into tight frictional engagement with the ball, substantially as described.

3. The base provided with a recess for the ball, combined with the ball partially seated therein, an upper or end plate engaging the ball at a point opposite the base, an intermediate plate engaging with the ball between the upper or end plate and the base, bolts rigidly seated in the base and connecting the intermediate plate and the upper or end plate, and means for spacing or separating the intermediate plate from the end plate and also for clamping the parts together, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT E. SWARTZ.

Witnesses:
C. S. STRYKER,
HUGH M. FRY.