No. 625,412. Patented May 23, 1899.

C. W. PASHLEY.

BALL AND SOCKET JOINT.

(Application filed Oct. 29, 1898.)

(No Model.)

Fig. 1.

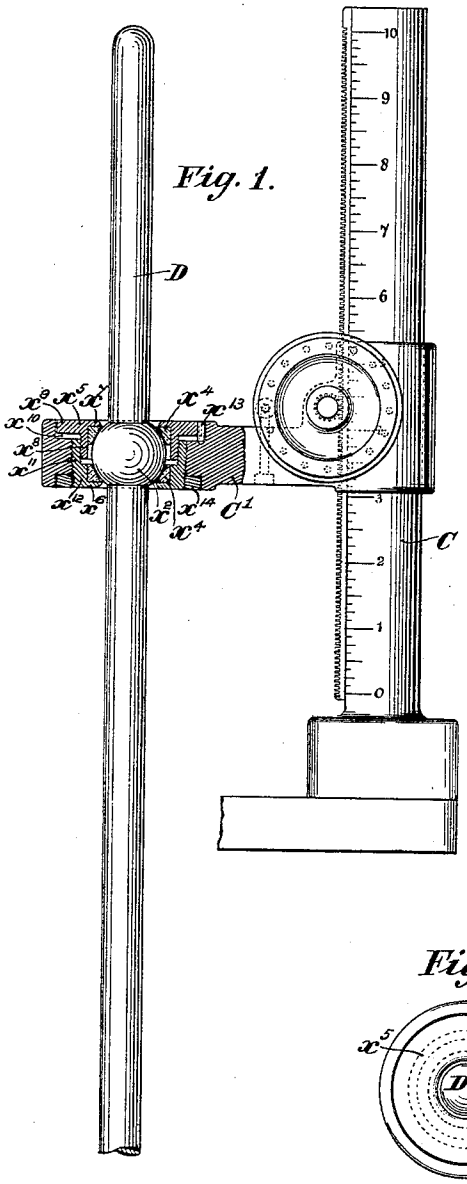
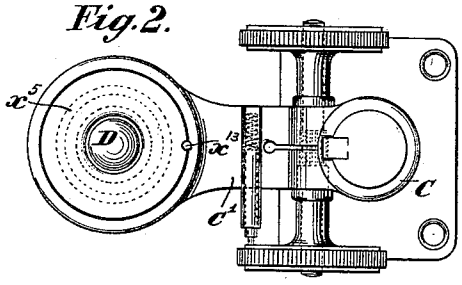


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

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BALL-AND-SOCKET JOINT.

SPECIFICATION forming part of Letters Patent No. 625,412, dated May 23, 1899.

Application filed October 29, 1898. Serial No. 694,974. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WALTER PASHLEY, residing at Sinderland Lane, Dunham, in the county of Chester, England, have invented certain new and useful Improvements in Ball-and-Socket Joints; and I do hereby 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.

The present invention relates to improvements in ball-and-socket joints and bearings. In the latter as generally made hitherto the wear can be taken up only by setting one portion of the socket or one of the so-called "cones," as the case may be, up toward the other, and consequently moving the ball or moving portion of the joint till its center stands away from its original position by a distance equal to the take-up.

The object of the invention is to endow any joint or bearing of the type just described with a faculty of being taken up without either portion of the socket or either cone being advanced toward the old center of the joint more than the other portion or cone or without moving the ball or moving member of the joint out of its original position. That object is realized by the means illustrated in the accompanying drawings, which are to be taken as part of this specification and read therewith.

Figure 1 is a side elevation, partly in section, illustrating the application of the invention to the tracer-rod of the engraving-machine described in the specification of Letters Patent No. 11,938 of 1895; and Fig. 2 is a plan.

The tracer-rod D works through a ball-and-socket joint supported by a bracket C′, adjustable upon the standard C. x^2 is the ball or moving part of the joint, through which the rod D passes and is capable of working freely therein in a vertical direction. These parts are not affected by the present invention, and for that reason more detailed specification of them is unnecessary, further than this, that the bracket C′ stands for the fixed part that carries the improved joint or bearing.

There is a cone x^4 on each side of the ball x^2. Both cones x^4 are of a proper diameter to hold the ball x^2 between them in practically the same way, as far as the mere holding it is concerned, as the moving part of any ball or socket joint has been usually held hitherto. The faces which bear upon the ball x^2 are straight. The two cones are held up to the ball x^2 by two bushes x^5 x^6.

The bush x^5 is T-shaped in cross-section. One portion x^7 of it fits down upon the respective face of the respective cone x^4, and the central portion x^8, which is parallel with the axis of the rod D, fits up to the respective face of the said cone, each in the way usual in cone-bearings, while the third portion x^9 stands in a recess x^{10} in the bracket C′, but at a proper distance from the bottom of that recess to allow of it being moved up to the said bottom to take up wear, as indicated in Fig. 1, which shows an appreciable distance between the two. Further, the portion x^8 is prolonged for as much as is required by the take-up action described farther on.

The bush x^6 is L-shaped in cross-section and embraces the respective cone x^4 in the same way as the portions x^7 x^8 of the bush x^5 embrace their cone x^4. x^{11} is an annular prolongation of that portion x^{12} of the bush which is alined with the portion x^8 above described. There is a suitable recess in the bracket C′ to receive the bush x^6. The outer surface of the portion x^8 and the inner surface of the prolongation x^{11} are screw-threaded to engage with each other. The outer surface of the prolongation x^{11} and of the portion x^{12} and the opposite surface of the last-mentioned recess in the bracket C′ are screw-threaded to engage with each other, the two screw-threads just described being the one between the bush x^5 and the bush x^6, and those between the bush x^6 and the bracket C′ are dissimilar in pitch, the latter being twice as fine as the former—*i. e.*, if the thread of the bush x^5 has twenty threads to the inch that of the bush x^6 has forty threads.

x^{13} is a pin, and x^{14} a locking-nut, for respectively holding the bushes x^5 x^6 in their adjusted positions to the bracket C′.

The parts of the improved joint are put together in the following way: The cones x^4 x^4

are inserted in their respective bushes x^5 x^6, and the bush x^6, with the ball x^2 resting upon the respective cone x^4, is screwed into the bracket C′ until that ball is in its correct position. The bush x^5 is next screwed into the bush x^6 until its cone just touches the ball x^2. The hole for the holding-pin x^{13} is then drilled, half of it in the bracket C′ and half of it in the bush x^5, and the pin x^{13} inserted therein. The locking-nut x^{14} is then screwed over the bush x^6 and up to the bracket C′ to prevent the said bush working loose.

To take up wear, the locking-nut x^{14} is loosened and the bush x^6 screwed up until both cones x^4 press with sufficient tightness upon the ball x^2, whereupon the nut x^{14} is screwed up again.

The above-described proportion between the two screw-threads insures a constant position for the ball x^2 no matter how much wear has to be taken up, because the bush x^5 is moved twice as far in the direction of the rod D as the bush x^6 is, the motion in the same direction of the bush x^6 overlapping half of the corresponding motion of the bush x^5. The said proportion between the screw-threads is the correct one for a joint where the weight of the moving part will not cause more wear on one side than on another. To meet a case in which the wear is unequal, that proportion may be varied according to the excess wear on the one side.

I claim—

In a ball-and-socket joint, the hereinbefore-described combination with the rod having the ball or moving portion of the joint, of a cone and a bush on each of the opposite sides of the ball, one bush engaging the other by a screw-thread on the outside thereof and the fixed part that carries the joint by a second screw-thread, the respective pitches of the threads having the specified relation to each other.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CHARLES WALTER PASHLEY.

Witnesses:

JOHN L. WORTHINGTON,

WILLIAM HENRY BURLING.