L. S. GARDNER.

CALIPERS.

APPLICATION FILED OCT. 28, 1912.

1,092,254. Patented Apr. 7, 1914.

Fig. 1.

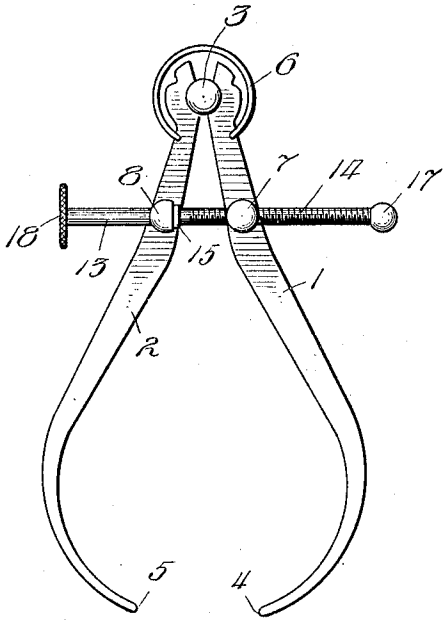


Fig. 2.

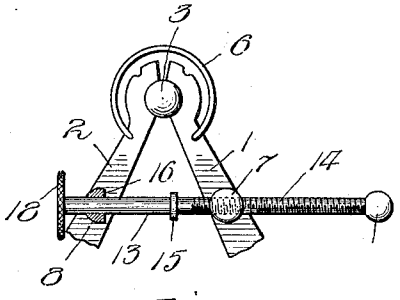
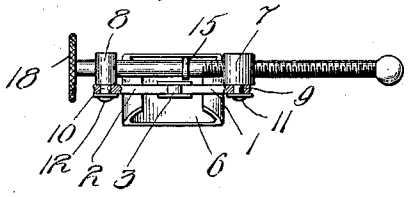


Fig. 3.



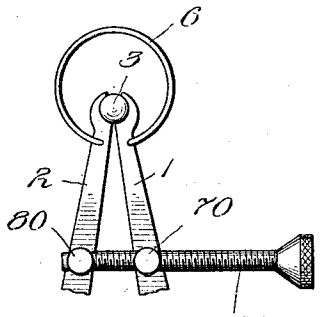


Fig. 4

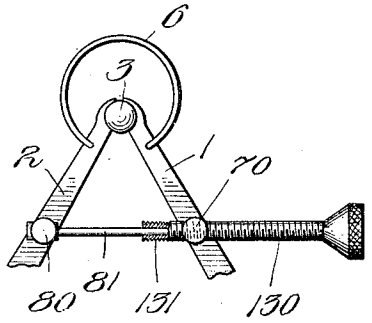


Fig. 5.

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UNITED STATES PATENT OFFICE.

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CALIPERS.

1,092,254. Specification of Letters Patent. Patented Apr. 7, 1914.

Application filed October 28, 1912. Serial No. 728,069.

To all whom it may concern:

Be it known that I, LEVI S. GARDNER, a citizen of the United States, residing at Shreveport, parish of Caddo, State of Louisiana, have invented a certain new and useful Improvement in Calipers, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide a simple and reliable attachment for calipers which will permit them to be opened for removal from the thing to be measured and thereafter to be closed accurately to bring the points into the relative position which they occupied at the time of contact with the thing measured.

The various features of novelty whereby my invention is characterized will be hereinafter pointed out with particularity in the claims; but, for a full understanding of my invention, and of its object and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a side elevation of a pair of calipers arranged in accordance with a preferred form of my invention; Fig. 2 is a view similar to Fig. 1 of the upper portion of the calipers, showing the legs spread apart; Fig. 3 is a bottom plan view of the calipers with the legs broken away; and Figs. 4 and 5 are views corresponding to Figs. 1 and 2, illustrating a modification, only the upper portion of the calipers being shown.

Referring to Figs. 1 to 3 of the drawings, 1 and 2 represent two legs of a pair of calipers suitably hinged together at their upper ends at as 3 and having contact points, 4 and 5, at their lower ends.

6 is a spring curved about the hinged ends of the members 1 and 2 and engaging therewith at points below the hinge axis.

The parts just described are the elements of any ordinary pair of spring calipers and I wish to be understood as not lomiting myself to any particular form of calipers in carrying out my invention.

On each leg, on the same side of the calipers, is swiveled a post, these being indicated at 7 and 8 respectively. The pivotal axes of the posts 7 and 8 are parallel with the axis of the hinge 3. The posts may be mounted upon the legs of the calipers in any suitable way. In the arrangement shown, as will be best seen in Fig. 3, each of the posts is provided on the back side with a stem, as indicated at 9 and 10, respectively. These stems extend through the legs of the calipers and have their outer ends riveted, as indicated at 11 and 12. This construction is a simple one as it permits the posts to be applied to a pair of calipers without changing the calipers in any way except to the extent of drilling holes through the legs for the reception of the stems and, after the ends of the stems are riveted over, the posts are held so as to be angularly movable without being capable of tilting or moving otherwise than about their pivotal axes; firmness of support being attained by reason of the considerable area of the bases of the posts which rest directly upon the broad faces of the legs of the calipers. The two posts have cylindrical bores extending therethrough at right angles to their pivotal axes, the parts being so arranged that in a predetermined relative angular position of the posts, the pivotal axes of the posts and the axes of the two bores lie in the same plane parallel with the axis of the hinge at the end of the calipers. Extending through the bores in the posts is a rod 13 having one end screw-threaded, as at 14. The bore in the post 7 is provided with threads fitting the threads on the rod. The end of the rod which lies within the bore in the post 8 is smooth so that the rod may slide back and forth in this post. At the inner end of the screw-threaded portion of the rod is a shoulder 15 adapted to engage with the inner face of the post 8 which is preferably, though not necessarily, flattened on the inner side as indicated at 16. The screw-threaded end of the rod terminates in an enlargement 17 which prevents the rod from being screwed entirely out of the post 7. At the other end of the rod is a button or head 18 for turning the same.

The operation is as follows: Normally the parts occupy the positions indicated in Fig. 1, the spring 6 pressing the legs of the calipers together until the shoulder 15 and the post 8 engage. If the spring be omitted, the post 8 and the shoulder 15 are not necessarily in engagement with each other normally. When it is desired to measure a por-

tion of a thing which has a thicker part past which the points of the calipers must be carried in bringing the points to and taking them away from the portion to be calipered, the legs are drawn apart so as to spread the points far enough to allow them to pass the thickened part of the thing to be calipered, the post 8, during this spreading movement, sliding out along the smooth portion of the rod 13. The legs are then allowed to close at the point where the measurement is to be taken. By turning the rod 13, it is moved lengthwise in one direction or the other relative to the post 7, thus spreading the legs of the calipers or allowing them to approach each other, depending upon the direction in which the rod is turned. By this means an accurate measurement may be taken and thereafter, in order to remove the calipers from the thing which has been measured, the legs are spread apart as before, the post 8 sliding out along the rod 13, until the points are far enough apart to permit them to pass from the thing which has been measured. As soon as the legs of the calipers are released, the spring closes them together until the closing movement is arrested by reason of the engagement of the post 8 with the shoulder 15, bringing the points 4 and 5 exactly into the relative positions which they occupied at the time the measurement was taken.

The swiveled posts permit the calipers to be opened to any desired extent when the rod is turned, without destroying the relation between the post 8 and the shoulder 15, so that the points will always be accurately returned, after the legs are spread apart, regardless of the initial distance between the points. Furthermore, the rod and the posts tie the two legs of the calipers together in such a way as to assist the hinge in keeping the legs in the same plane. In other words, the parts will always be held in such positions that the points of the calipers will engage with each other when the calipers are completely closed, instead of overlapping and passing by each other as is often the case. This is important because a sidewise shifting of the points, that is in a direction parallel with the plane containing the axis of the hinge, interferes with the accuracy of the calipers. In other words, when the calipers are opened to remove them from the article which was measured and are then allowed to close again, the points will be returned exactly to the points at which they were when the measurement was taken and will not be displaced laterally and thus destroy the accuracy of the measurement.

In Figs. 4 and 5 I have shown a modification in which the posts 70 and 80 correspond to the posts 7 and 8 of the first form, the post 70 being just the same as the post 7. The rod 130, corresponding to the rod 13 of the first form, is screw-threaded throughout its entire length and the adjustment of the calipers is determined by the engagement of the inner end of the rod with the side of the post 80. The rod does not extend through the post 80, but is provided with an axial bore 131 into which extends a stem 81 projecting radially from the swiveled post 80. In this arrangement, as the calipers are opened and closed, the stem 81 slides within the rod 130 and guides the inner end of the rod against the side of the post 80 when the legs of the calipers are returned to their initial positions. In Fig. 4 the parts are shown in the normal positions, while in Fig. 5 the legs are illustrated as being spread apart without having changed the adjustment of the screw rod and therefore, when the legs are released, the parts will return to the positions indicated in Fig. 4.

I claim:

1. In a pair of calipers, a post swiveled on one of the legs thereof, a member swiveled on the other leg thereof, a rod member screw-threaded into said post and extending toward the aforesaid member, said members having engaging parts to permit free relative movements in the direction of the axis of the rod member and prevent relative movements in other directions, said members having coöperating abutments engaging with each other to cause the legs of the calipers to be spread when the rod member is turned in one direction.

2. In a pair of calipers, posts swiveled upon the legs thereof, a rod screw threaded into one of said posts, the other post having an opening therethrough, said rod having a smooth portion extending through said opening, and having a shoulder engaging with the inner side of the latter post, and a shoulder on the outer end of the smooth portion of the rod adapted to prevent the complete withdrawal of the rod through the aforesaid opening.

In testimony whereof, I sign this specification in the presence of two witnesses.

LEVI S. GARDNER.

Witnesses:

WM. F. FREUDENREICH,

RUTH E. ZETTERWALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."