P. J. ROBINSON.

CALIPERS.

APPLICATION FILED MAR. 11, 1914.

1,109,467.

Patented Sept. 1, 1914.

3 SHEETS—SHEET 1.

Fig. 2.

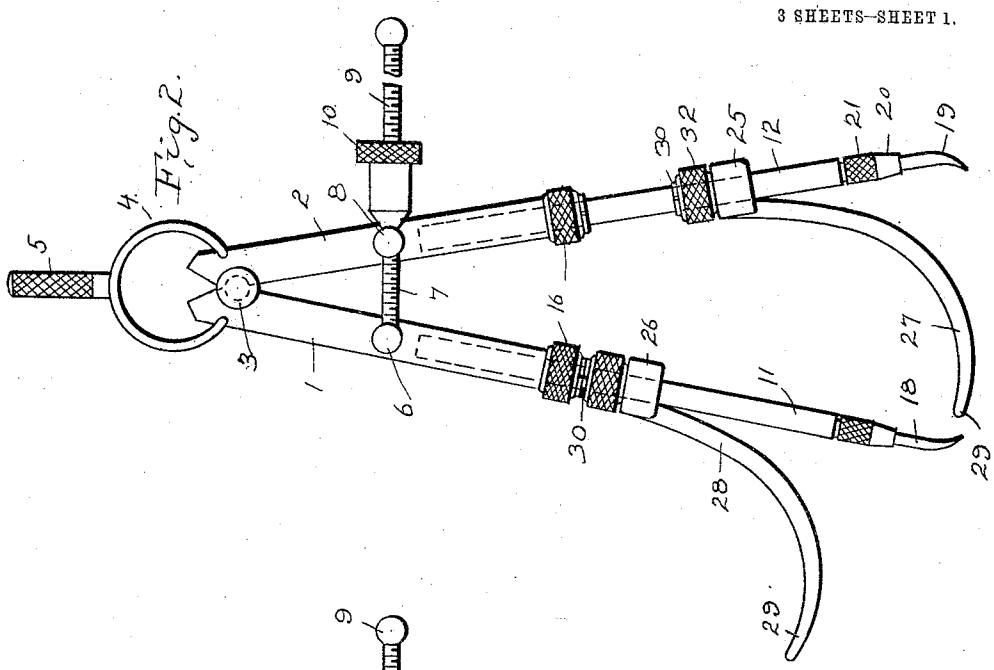


Fig. 1.

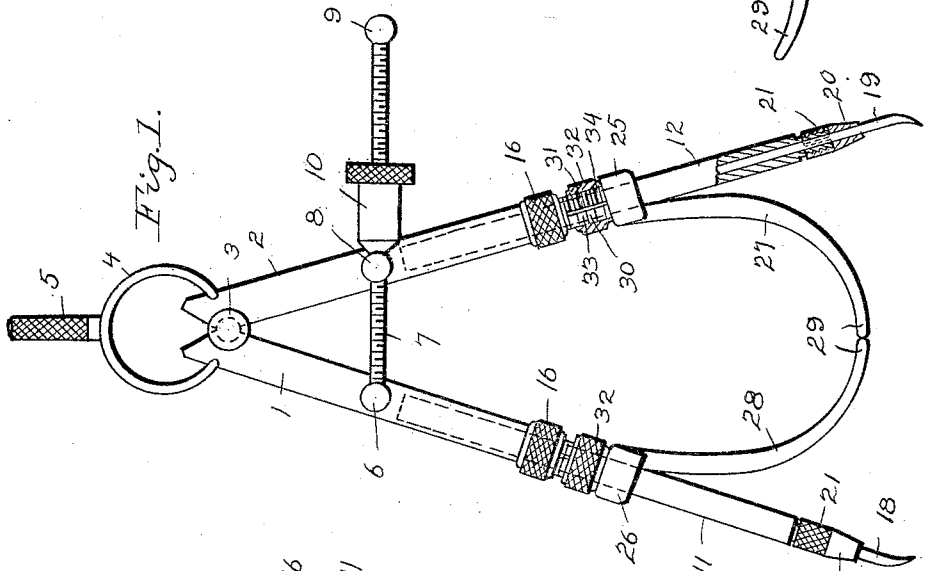
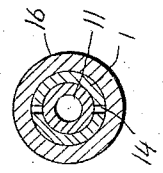


Fig. 7.



Witnesses

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3 SHEETS—SHEET 2.

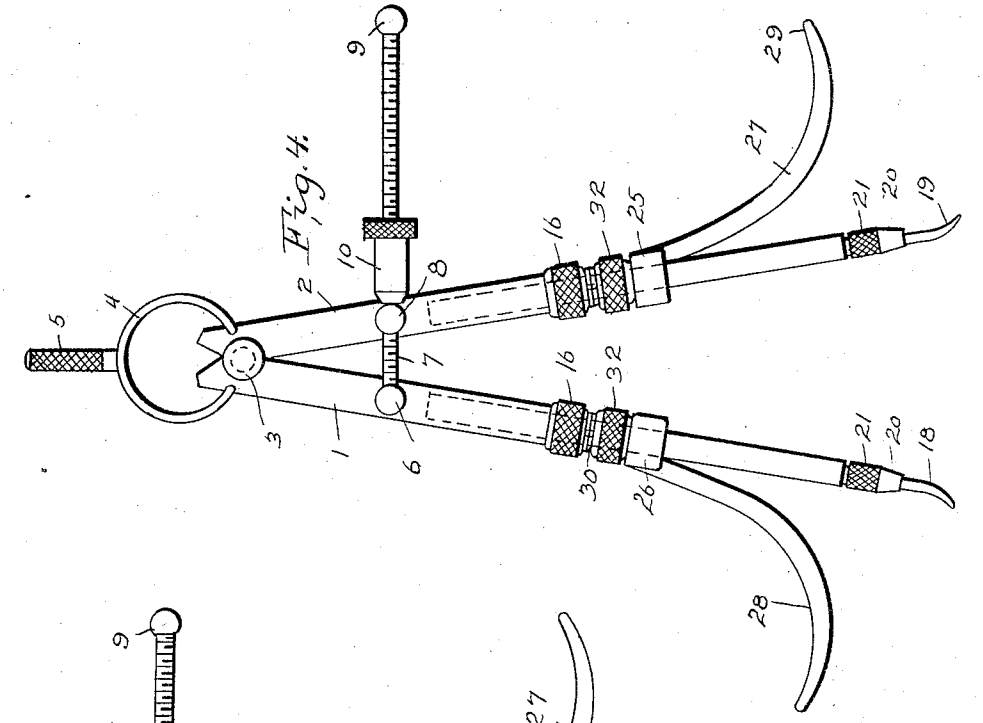


Fig. 4.

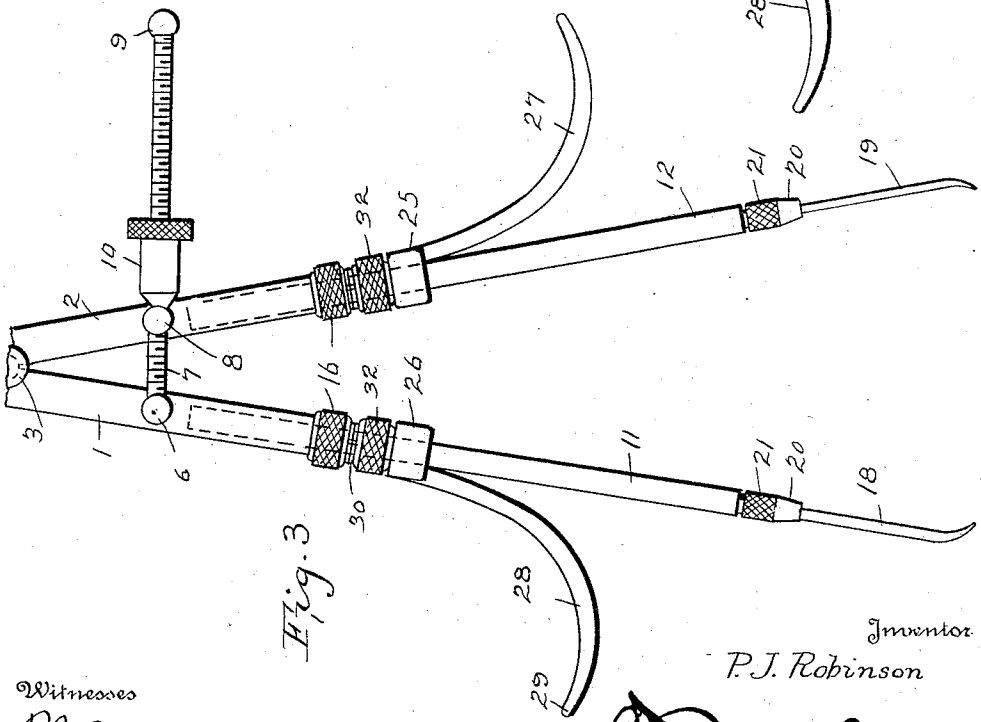


Fig. 3.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 8.

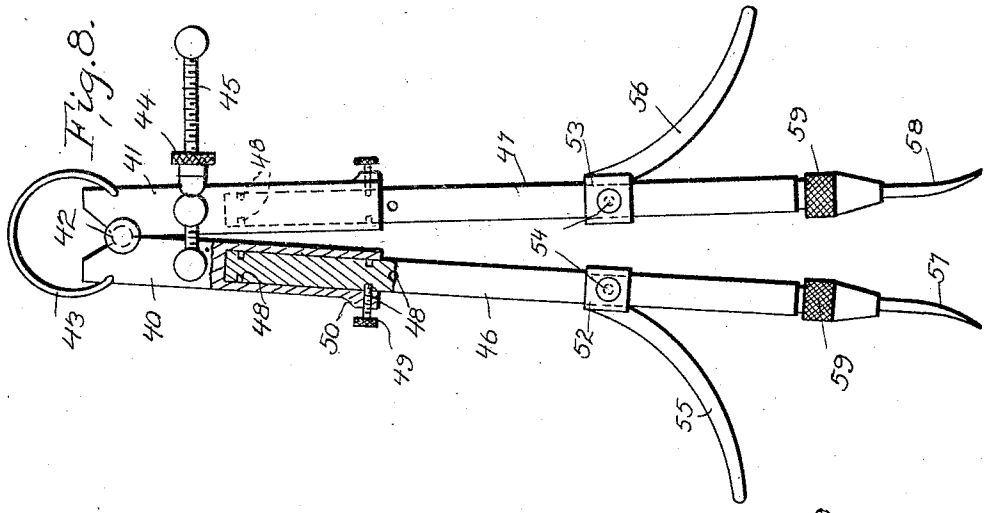


Fig. 5.

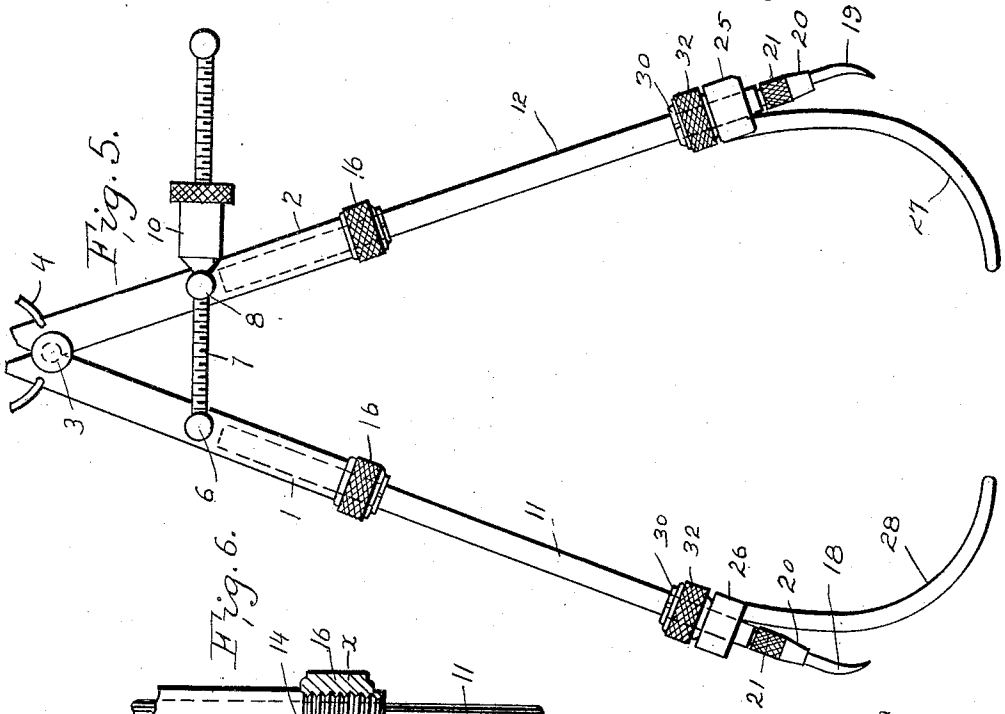
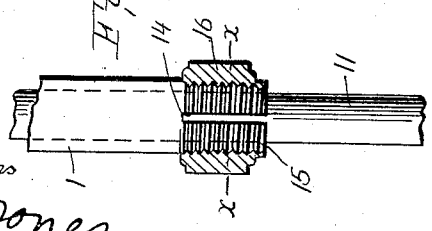


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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CALIPERS.

1,109,467. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed March 11, 1914. Serial No. 823,996.

To all whom it may concern:

Be it known that I, PHILIP J. ROBINSON, a citizen of the United States, residing at Leominster, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Calipers; 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.

This invention relates to measuring tools and more particularly to calipers used for measuring the diameter of cylindrical or round bodies.

The primary object of this invention is the provision of a tool as specified embodying various adjustable parts, by the adjustment of which the tool may be converted into calipers for various uses, such as internal and exterior measuring, dividers or various other measuring tools which will be hereinafter more fully described.

With the foregoing and other objects in view this invention consists in such novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and claimed.

In describing the invention in detail reference will be had to the accompanying drawings wherein like characters of reference designate like or corresponding parts throughout the several views, and in which:—

Figure 1 shows the improved measuring tool adjusted for outside or exterior measuring. Fig. 2 shows the parts adjusted to form hermaphrodite calipers. Fig. 3 shows the parts adjusted to form dividers of extended radial capacity. Fig. 4 is a view similar to Fig. 3, showing the parts of the caliper adjusted for internal measuring. Fig. 5 is a view showing the parts adjusted for outside or exterior measuring, and extended so as to increase the measuring capacity of the caliper legs. Fig. 6 is a detail view showing partially in section, the parts for holding the adjustable parts of the caliper in adjusted positions. Fig. 7 is a cross sectional view on the line x—x of Fig. 6, and Fig. 8 is a view of a modified form of the improved measuring tool.

Referring more particularly to the drawings, 1 and 2 designate the main supporting legs of the measuring instrument or calipers which are pivotally connected at their upper terminal ends, as is shown at 3. The upper terminal ends of the supporting legs 1 and 2 of the calipers have an arcuate spring 4 connected thereto and arching over and above the ends of the caliper legs, so as to tend to spread the legs 1 and 2 at all times. The spring 4 has a handle 5 secured to the uppermost portion thereof, or the portion which is farthest from the pivotal point 3 of the legs 1 and 2, which handle 5 is provided for the convenient holding of the calipers during the actuation thereof.

The supporting leg 1 of the calipers has a lug 6 secured to one side thereof, which lug has a screw threaded bar 7 secured thereto and extending laterally from the leg 1, being slidably seated in a lug 8 which is carried by the supporting leg 2 of the calipers. The screw threaded bar 7 has an enlarged head 9 formed upon its free terminal end, which head forms a restrainer for the operation of the nut 10, which is adjustably mounted upon the screw threaded bar 7, for holding the legs 1 and 2 of the caliper in various radially adjusted positions, and also for adjusting the legs for measuring of the diameter of various cylindrical or round bodies.

The legs 1 and 2 of the calipers have their lower free ends recessed, for the insertion thereinto of the auxiliary legs 11 and 12. The lower terminal ends of the supporting legs 1 and 2 of the calipers are split upwardly, as is shown at 14 in Fig. 6 of the drawings, and the outer periphery of the portion of the legs which is split, are provided with external screw threads 15 upon which are adjustably mounted the turn nuts 16. The nuts 16 have their outer surfaces corrugated, so as to facilitate the operation or rotation thereof by the fingers of the person operating the calipers. The auxiliary legs 11 and 12 which are slidably seated within the supporting legs 1 and 2, are hollow in cross section and they have slidably seated therein the pointed rods 18 and 19. The outer terminal ends of the rods 18 and 19, which project beyond the outer terminal ends of the auxiliary legs 11 and 12, are pointed and slightly curved as is clearly shown in the drawings, so as to provide divider points, when it is desired to use the measuring tool as dividers, and also to provide slightly curved surfaces, for internal or external measuring or gaging of circular bores or bodies.

The outer terminal ends of the auxiliary

legs 11 and 12 are slightly reduced, and split as are the outer terminal ends of the supporting legs 1 and 2 and the split portion 20 of the auxiliary legs 11 and 12 have nuts 21 rotatably mounted thereupon, which nuts are similar in construction to the nuts 16 which are mounted upon the lower ends of the supporting legs 1 and 2. In mounting the auxiliary legs 11 and 12 within the supporting legs 1 and 2, the nuts 16, are rotated, so as to relieve the binding of the split ends of the supporting legs 1 and 2, and this will permit of the openings 14 to expand, to substantially their normal position, which will relieve the binding engagement between the terminal ends of the legs 1 and 2 and the outer peripheries of the auxiliary legs 11 and 12, permitting the auxiliary legs to be moved for various adjustments, after which adjustments the nuts 16 are again rotated upon the terminal ends of the supporting legs 1 and 2, so as to force the two sections of the split ends of the supporting legs inwardly and into binding engagement to the outer surface of the auxiliary legs, for securely holding the auxiliary legs in the adjusted position.

The rods 18 and 19 are slidably mounted within the auxiliary sleeves 11 and 12, and the adjustment thereof is controlled through the operation of the nuts 21, which nuts operate in a manner identical with the nuts 16, for compressing the two sections of the split ends of the auxiliary legs, for binding engagement with the outer surfaces of the rods 18 and 19, for holding them in adjusted position.

The auxiliary legs 11 and 12 have slidably mounted thereupon collars 25 and 26, which collars have connected to one edge thereof arcuate arms 27 and 28. The arcuate arms 27 and 28 are oppositely curved, so that their terminal ends 29, will coact for measuring the exterior of a cylindrical or circular body, when the two arms 27 and 28 are positioned as is illustrated in Fig. 1 of the drawings, or so that the terminal ends will gage or measure the diameter of the bore when positioned as is illustrated in Figs. 3 and 4 of the drawings. The sleeves or collars 26 and 27 have sleeves 30 formed upon one edge thereof, which sleeves extend oppositely from the arcuate arms 27 and 28, and are provided with external screw threads upon their outer surfaces. The sleeves 30 are split as at 31, and encompass the auxiliary legs 11 and 12, having nuts 32 adjustably mounted upon their outer surfaces, which nuts are provided with internal screw threads for coaction with the external screw threads upon the sleeves 30, for forcing the two sections 33 and 34 of the sleeves 31 inwardly and into binding engagement with the outer surface and of the legs 11 and 12, for holding the collars 25 and 26, and the arcuate arms 27 and 28 in various adjusted positions upon the auxiliary legs 11 and 12, so as to permit of greater or less measuring capacity of the arcuate arms.

In Fig. 1 of the drawings, the arcuate arms 27 and 28 are shown as mounted adjacent the terminal ends of the supporting legs 1 and 2 of the calipers, and extending inwardly toward the central radius of the adjustment of the caliper legs, so as to measure the outside of various bodies, of relatively small diameter, and also the rods 18 and 19 are illustrated as having their pointed ends curving inwardly, for purposes similar to the usage of the arcuate arms 27 and 28.

In Fig. 2 of the drawings, the arcuate arm 27 is shown adjusted for coaction with the curved pointed ends of the rod 18, thus forming hermaphrodite calipers. The auxiliary legs 11 and 12 are also shown as slightly extended out of the supporting sleeves 1 and 2 of the caliper legs so as to increase the measuring capacity of the calipers.

In Fig. 3 of the drawings, the auxiliary legs 11 and 12 are extended to their capacity, and the rods 18 and 19 are shown slightly extended, while the arcuate arms 27 and 28 are at the upper terminus of their sliding adjustment, so as to leave the pointed ends of the rods 18 and 19 free from impediment by the arcuate arms, so as to permit of their free usage as the points of a pair of dividers.

In Fig. 4 of the drawings, the arcuate arms 27 and 28 are shown extending outwardly from the center of the calipers forming what is commercially known as a pair of inside calipers, or calipers for measuring the diameter of bores, or internal measuring. The pointed ends 18 and 19 are also shown turned outwardly for the purpose of internal measurement.

In Fig. 5 of the drawings, the arcuate arms 27 and 28 are shown at the lower terminus of their adjustment, and extending inwardly toward the center of the calipers, for external measuring, they being positioned so as to extend beyond the pointed ends of the rods 18 and 19, showing the calipers increased to their utmost capacity for outside measuring, by showing the auxiliary legs 11 and 12 in their utmost extended position.

In Fig. 8 of the drawings a modified form of the measuring tool is shown, which tool has the supporting legs 40 and 41 thereof pivotally connected near their upper ends as at 42, and also have an arcuate spring 43 connected thereto, so as to force the supporting legs 40 and 41 upwardly at all times, against the holding tension of the nut 44 which is adjustably mounted upon the

screw threaded bar 45. The bar 45 is connected to the supporting legs 40 and 41 of the calipers in a manner similar to the connection of the rod 7 to the supporting legs 1 and 2 of the calipers. The supporting caliper legs 40 and 41 have their lower ends recessed, for the insertion thereinto of the upper terminal ends of the auxiliary legs 46 and 47 of the measuring tool. The auxiliary legs 46 and 47 of the measuring tool have a plurality of recesses 48 serially arranged radiating inwardly from their outer surfaces, which recesses are provided for the reception of the terminal ends of the clamping thumb screws 49. The clamping thumb screws 49 are screw threadably seated in the bosses 50, which are formed upon the terminal ends of the supporting legs 40 and 41 of the measuring tool, and when they are inserted in any one of the recesses 48, they will hold the auxiliary legs 46 and 47 from either rotary or vertical movement within the recessed ends of the supporting legs 40 and 41. The auxiliary legs 46 and 47 have sleeves 52 and 53 slidably mounted upon their outer surfaces, the various adjusted positions of which sleeves are controlled by the action of the adjusting thumb screws 54, which extend through the sleeves and engage the outer surfaces of the auxiliary legs 46 and 47 for binding engagement therewith to hold the sleeves in various adjusted positions. The sleeves 52 and 53 have arcuate arms 55 and 56 formed thereupon, which arcuate arms are oppositely curved, as are the arcuate arms 27 and 28, so as to efficiently gage or measure circular surfaces. The auxiliary legs 46 and 47, are hollow and have slidably seated therein rods 57 and 58, which rods have their lower terminal ends pointed and slightly curved as illustrated in Fig. 8. The sliding adjustment of the rods 57 and 58 within the auxiliary legs 46 and 47 is controlled by the nuts 59, which are screw threadably mounted upon the lower split ends of the legs 46 and 47. The nuts 59 coact with the split ends of the auxiliary legs 46 and 47, in a manner identical with the action of the nuts 21, upon the split ends 20 of the legs 11 and 12, for holding the rods 57 and 58 in various adjusted positions.

From the foregoing description taken in connection with the accompanying drawings the advantages of the construction and of the method of operation of the improved calipers will be readily apparent to those skilled in the art to which this invention appertains and, while in the foregoing description, the principle of the operation of this invention has been described together with various features of construction, it is to be understood that certain minor features of construction, combination and arrangement of parts may be altered to suit practical conditions provided such alterations are comprehended within the scope of what is claimed.

What I claim is:—

1. In a pair of calipers, pivoted supporting legs having split sleeves slidably mounted thereupon, arcuate arms formed upon said sleeves, and means coacting with said split sleeves for binding them in engagement with said supporting legs for holding said sleeves in adjusted position.

2. In a pair of calipers, pivoted supporting legs, pointed divider rods adjustable upon said supporting legs for increasing or decreasing the stroke of the dividers, means for holding said rods in adjusted position, and arcuate arms slidably mounted upon said rods.

3. In a pair of calipers, pivoted supporting legs, pointed divider rods adjustable upon said supporting legs for increasing or decreasing the stroke of the dividers, means for holding said rods in adjusted positions, arcuate arms slidably mounted upon said rods, and means for holding said arms in adjusted positions.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP J. ROBINSON.

Witnesses:
ALDERIE FUGERE,
EDMOND FUGERE.

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