No. 611,391. Patented Sept. 27, 1898.

H. A. PIKE.

CALIPERS.

(Application filed Sept. 10, 1897.)

(No Model.)

Fig. 1.

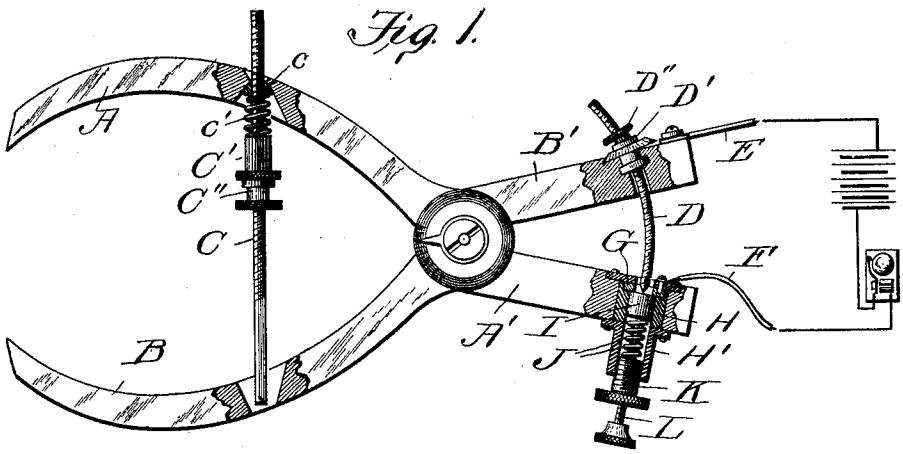


Fig. 2.

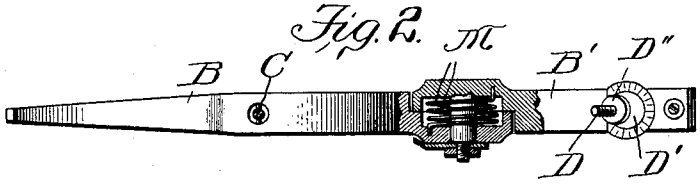


Fig. 3.

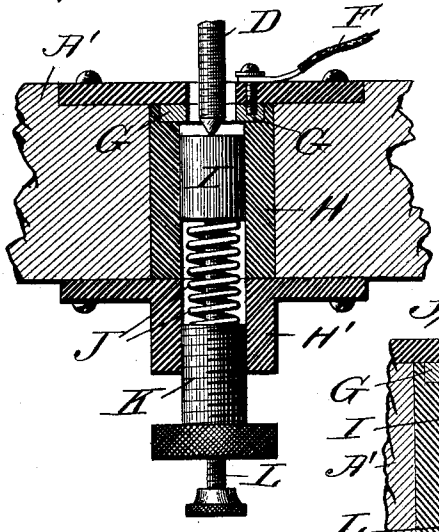


Fig. 4.

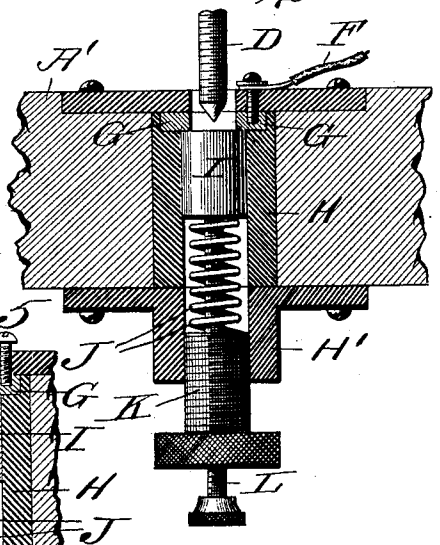
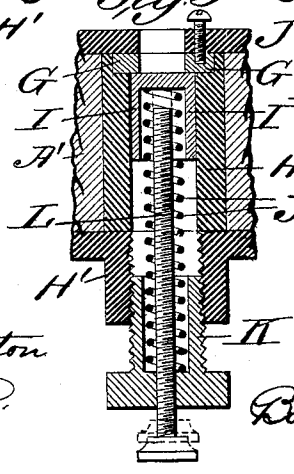


Fig. 5.



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UNITED STATES PATENT OFFICE.

HARVEY A. PIKE, OF ST. LOUIS, MISSOURI.

CALIPERS.

SPECIFICATION forming part of Letters Patent No. 611,391, dated September 27, 1898.

Application filed September 10, 1897. Serial No. 651,209. (No model.)

To all whom it may concern:

Be it known that I, HARVEY A. PIKE, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Calipers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevational view of my improved calipers, parts of the jaws being shown in section to more clearly illustrate the invention. Fig. 2 is an edge view of the calipers, the pivot-joint between the two jaws being shown in section. Fig. 3 is an enlarged detail view illustrating the position of the parts when contact is broken by the jaws moving in one direction. Fig. 4 is a similar view showing the position of the parts when the contact is broken by the jaws moving in an opposite direction. Fig. 5 is an enlarged sectional view of the contact making and breaking device and its coöperating parts.

This invention relates to a new and useful improvement in calipers, the object being to provide calipers with means influenced by the moving jaws of the calipers whereby when said jaws make the proper measurement of the article being measured an audible signal will be sounded; but should said jaws be opened wider apart than the required measurement or move closer together than said required measurement then an electric contact will be broken and said signal will not sound.

With these objects in view the invention consists in providing caliper-jaws with electric contacts, one of which is adjustable to accommodate the adjustment of the caliper-jaws and the other of which is stationary relative to one of said caliper-jaws, but movable or yielding relative to said jaw This movable or yielding contact is placed under tension, so as to partially counterpoise the tension on the caliper-jaws when said jaws are adjusted to their proper position.

The invention further consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, A and B are the two caliper-jaws, pivotally secured together at one end, as is well understood. These jaws may be arranged for inside or outside measurements, as desired, without in the least departing from the nature and principle of my invention.

C indicates a threaded rod pivotally mounted in the jaw B and passing through a follower *c*, arranged in a socket in the jaw A. Rod C is threaded, as shown, and carries a nut C′, between which and the follower *c* is interposed a spring *c*′. It will be noted in this connection that when the nut C′ is turned on the rod to the right it will, through the spring *c*′, tend to force the jaws A and B apart, preventing said jaws from moving together a greater distance than is permitted by the compression of spring *c*′.

A jam-nut C″ is preferably arranged to coöperate with the nut C′ to lock the same in place.

A torsional spring M is arranged at the joint of the calipers, which spring tends to close the jaws against the spring *c*′. The jaws are thus spring-balanced, having a limited movement in either direction.

A′ is an extension of the jaw A, and B′ an extension of the jaw B, said extensions carrying the contact making and breaking devices, which will now be described. I wish to be understood, however, as not limiting myself to the location of these contact making and breaking devices on rearward extensions of the caliper-jaws, because they could as well be located on the caliper-jaws proper, with little or no change in construction and operation.

D indicates a threaded rod which is preferably curved, so as to be concentric with the pivotal point of the caliper-jaws, thus practically fixing its contact-making point, which is located at its lower end, so that it will move in a given path.

D′ indicates a nut, preferably marked with a scale on its upper face, as shown in Fig. 2, so as to accurately adjust the bearing-point of the threaded rod D relative to the contact-making device located in the extension A′, with which it coöperates.

D″ is a jam-nut on the rod D coöperating with the nut D′ to lock the same and the threaded rod D in their adjusted positions.

E indicates a wire secured to extension B′, said wire running to a battery and audible signal, such as a bell, the return-wire F being secured to an insulation-piece on the extension A′ and connecting with the contact-making device or ring G, insulated from the extension A′, as shown more clearly in Figs. 3, 4, and 5.

H indicates an insulation-sleeve arranged in an opening in the extension A′, said sleeve being held in position by a flanged washer H′, also made of insulation material.

I indicates a contact-making device arranged to move freely in the sleeve H and make contact with the ring G, which ring is of smaller diameter than the sleeve H, thus forming a shoulder against which the contact-making device I normally rests.

J indicates a spring bearing against the contact-making device I and tending to normally hold the same against the ring G.

K indicates a nut or spring-seat threaded in washer H′ for regulating the compression of spring J.

L indicates a locking-bolt threaded in nut K and engaging the contact-making device I to lock the same against the ring G when it is desired to set the caliper-jaws a certain distance apart by adjusting the rod D.

The operation of the device is as follows: Assuming the extensions A′ and B′ to have the wires E and F connected thereto, as shown, and it is desired to set the caliper-jaws to take a measurement, the general measurement is made by turning the nut C′ until the jaws are separated a sufficient distance, or, preferably, a little less than the required distance, so as to place the springs c' and M under tension when the device is operating, making the jaws more sensitive. The locking-bolt L is now screwed up to lock the contact-making device I against the ring G. The micrometer-nut D′, which is locked against longitudinal movement relative to the rod D, by being seated in a cross-groove in the member B′, as shown, is now turned down until the exact measurement is reached, which can be determined by the scale thereon. Nut D′ is now locked in position on the rod D by turning down the jam-nut D″. The locking-bolt L is now withdrawn, so as to release the contact-making device I, which will cause the rod D to press said contact-making device I away from the ring G, as shown in Fig. 3. The caliper-jaws are now closer together than the required measurement. When the jaws are applied to the article to be measured, they will be spread apart until they reach the proper distance from each other, when the rod D will contact with the piece I and the piece I will contact with ring G, thus completing the circuit, causing the bell to ring, which indicates that the measurement or distance between the jaws A and B is the distance required. Should the jaws be spread too far apart, the rod D will be lifted from the piece I, as shown in Fig. 4, thus breaking contact.

From the above it will be seen that as long as the jaws A and B maintain the proper relation to each other—that is, are kept at the proper distance apart—the signal will be sounded. As soon as this relation is not maintained, the jaws moving closer together or farther apart, as the case may be, the circuit will be broken and the signal cease to sound.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with caliper-jaws, of electrical contacts mounted thereon, which coöperate with each other to make and break an electric circuit and indicate when the proper distance between the jaws has been reached, substantially as described.

2. The combination with spring-balanced caliper-jaws, of electric contacts mounted thereon which coöperate with each other to make and break an electric circuit and indicate when the proper distance between the jaws has been reached, substantially as described.

3. The combination with a pair of caliper-jaws, of an adjustable electric contact mounted on one of said jaws, and a contact arranged on the other of said jaws, said last-named contact being normally fixed relative to the jaw on which it is mounted, substantially as described.

4. The combination with a pair of caliper-jaws, of an adjustable electric contact mounted on one of said jaws, and a yielding contact arranged on the other of said jaws, substantially as described.

5. The combination with a pair of caliper-jaws, of an electric terminal arranged thereon, a movable contact which coöperates with said terminal, and an adjustable terminal arranged on the other of said jaws for coöperating with said movable contact, substantially as described.

6. The combination with a pair of caliper-jaws, of an electric terminal fixed thereon, a movable yielding contact which coöperates with said fixed terminal, and an unyielding contact or terminal adjustably mounted in the other of said jaws for coöperating with said movable contact, substantially as described.

7. The combination with a pair of caliper-jaws, of an electric terminal arranged thereon, a movable contact which coöperates with said terminal, means for locking said movable contact against said terminal, and an adjustable terminal for coöperating with said movable contact, substantially as described.

8. The combination with a pair of caliper-jaws, of an adjustable terminal arranged on one of said jaws, a fixed terminal arranged on the other of said jaws, a movable contact for coöperating with both of said terminals, a spring whose normal tendency is to force said movable contact against said fixed terminal, and means for regulating the compression of said spring, substantially as described.

9. The combination with a pair of caliper-jaws, of an adjustable terminal arranged on one of said jaws, a fixed terminal arranged on the other of said jaws, a movable contact for coöperating with both of said terminals, a spring whose normal tendency is to force said movable contact against said fixed terminal, a locking-bolt for locking said movable contact against the fixed terminal when the caliper-jaws are being adjusted, and means for regulating the compression of said spring, substantially as described.

10. The combination with a pair of caliper-jaws, of a threaded rod arranged on one of said jaws, a micrometer adjustment for said rod, said rod forming one terminal of an electric circuit, and a terminal on the other of said jaws with which said micrometrically-adjusted rod coöperates, substantially as described.

11. The combination with caliper-jaws, of a spring which constantly tends to force the jaws toward each other, a spreading-rod, and circuit making and breaking devices mounted on the jaws, substantially as described.

12. The combination with caliper-jaws, of means which exert a constant tendency to close said jaws, a spreading-rod for forcing said jaws apart, said rod having a yielding connection with one of said jaws, and circuit making and breaking devices which are carried by the jaws, substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 27th day of August, 1897.

HARVEY A. PIKE.

Witnesses:
F. R. CORNWALL,
HUGH K. WAGNER.