Jan. 25, 1938. R. B. LEWIS 2,106,696

EXTENSOMETER

Filed May 31, 1935

Fig. 1.

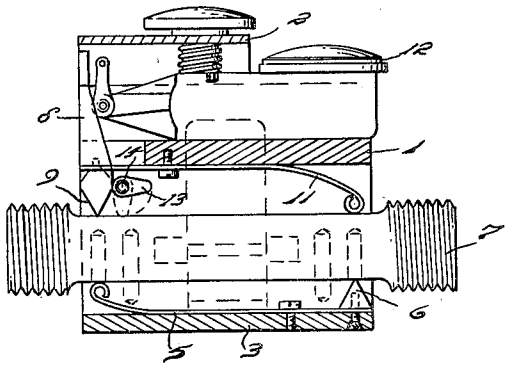


Fig. 2.

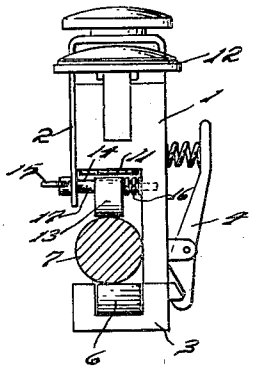


Fig. 3.

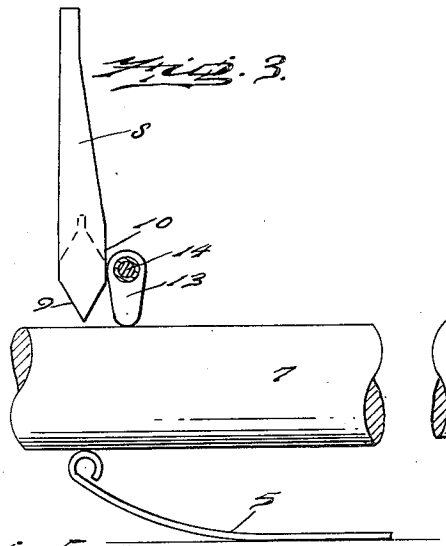


Fig. 4.

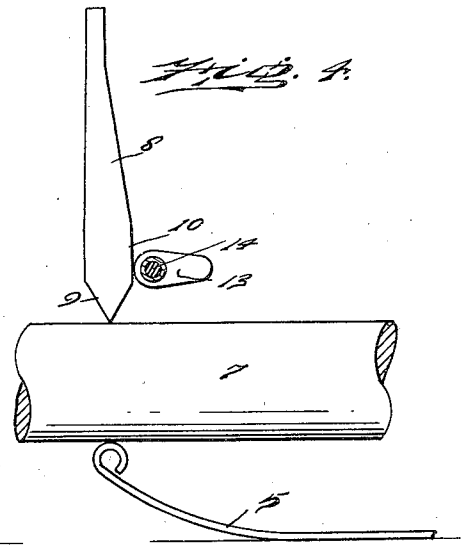


Fig. 5.

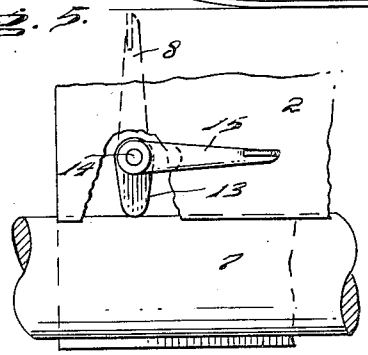
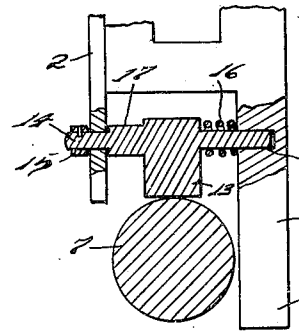


Fig. 6.



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2,106,696

UNITED STATES PATENT OFFICE

2,106,696

EXTENSOMETER

Robert B. Lewis, Philadelphia, Pa., assignor to Tinius Olsen Testing Machine Company, Philadelphia, Pa., a corporation of Pennsylvania

Application May 31, 1935, Serial No. 24,176

3 Claims. (Cl. 33—147)

In my prior Patent No. 1,531,111, March 24, 1925, I have described and broadly claimed a novel construction and arrangement of an extensometer which can be readily attached to and detached from a test specimen and which will indicate changes in length of the specimen under test.

In this instrument, two knife edges are positioned to engage diametrically opposite points of the specimen, and spring actuated rollers engage the specimen at points respectively opposite the knife edges. One of the knife edges is movable and actuates an indicating instrument which indicates the changes in length of the specimen when it is subjected to a deforming stress.

It is important for accuracy of measurement that the distance between the knife edges is exact, and, since one knife edge is movable, I have found that it is advantageous to provide means for maintaining during the clamping operation a fixed and determined distance between the knife edges.

My present invention comprehends novel means for maintaining a fixed and determined distance between the knife edges in an extensometer.

Other novel features of construction and advantage will hereinafter more clearly appear in the detailed description and the appended claims.

For the purpose of illustrating the invention, I have shown in the accompanying drawing a typical embodiment of it, which, in practice, will give reliable and satisfactory results. It is, however, to be understood that this embodiment is typical only and that the various instrumentalities of which my invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein set forth.

Figure 1 is a vertical section of an extensometer, embodying my invention.

Figure 2 is an end elevation.

Figure 3 is a schematic view on a much enlarged scale, showing more particularly the position of the movable knife edge before it contacts with the specimen.

Figure 4 is a view similar to Figure 3 but showing the movable knife edge engaging the specimen.

Figure 5 is a side elevation partly broken away of a portion of the extensometer.

Figure 6 is an end elevation, partly broken away for clearness of illustration.

Similar numerals indicate corresponding parts.

Referring to the drawing:—

As the general construction and arrangement of the extensometer is clearly set forth in my prior patent herein identified and is now well known to the trade, I will describe it with only sufficient detail for one skilled in this art to understand its construction and operation.

The body portion 1 has connected to it a retaining plate 2. 3 designates a clamping member having limited relative movement with the body portion in the same manner as shown in my prior patent and retained in clamped position by a spring pressed hooked lever 4 fulcrumed on the body portion. The clamping member has fixed to it a flat spring 5 which at one end is fixed to a fixed knife edge 6. The free end of the spring 5 is bowed upwardly from the clamping member and terminates in a rounded end to bear against the test specimen 7. 8 designates a lever fulcrumed on the body portion and carrying a knife edge 9 which forms a movable knife edge and has at one side a flat face 10. This movable knife edge is diametrically opposite the rounded end of the spring 5.

11 designates a spring fixed to the body portion and having a rounded end opposite to the fixed pivot 6. The opposite end of the spring 11 bears against the lever 8. The lever 8 is operatively connected with an indicating device 12 in the manner illustrated and described in my prior patent, herein identified. The lever 8 is free to rock on the body portion and in order to accurately align it during the clamping of the test specimen in the extensometer, I provide a guide arm 13 having trunnions 14 mounted in the body portion 1 and retaining plate 2, and provided with an actuating arm 15.

A spring 16 encircles one of the trunnions between the body portion and the arm 13 and the cam has a collar 17 adjacent the retaining plate.

In order to determine the change in length of a test specimen, the specimen is mounted in a testing machine so that it may be subjected to stress tending to change its length. In order to determine the change in length of the specimen under test, the clamping lever 4 is released and the instrument applied to the test specimen with the arm 13 in the position seen in Figure 3. The knife edge 6 and the rounded end of the spring 11 engage the specimen at one pair of opposite points. The rounded end of the spring 5 and the arm 13 engage the specimen at opposite sides but the movable knife edge 9 has a clearance of about one one-hundredth of an inch with the specimen. The operator now actuates

the arm or handle **15** to move the arm **13** out of engagement with the specimen and as its hub portion is a fixed radius contacting with a flat portion of the knife edge, the spring **5** raises the specimen into engagement with the movable knife edge **9** at the second pair of opposite points. The changes in length of the specimen under test are indicated by the indicating device.

I thus provide a definite length of the specimen between the planes of the two pair of points, and between the knife edges.

The body portion and clamping member **3** form a frame to receive the test specimen.

It will now be apparent that I have devised a new and useful extensometer which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which will give in practice satisfactory and reliable results, it is to be understood that this embodiment is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. An instrument for indicating changes in length, comprising a frame clampable to the test specimen, two specimen engaging members on the frame, and means movable to a position to contact with the test specimen to prevent one of said members engaging the specimen during the initial clamping operation and movable to another position to guide such member into contact with the specimen and thereby maintain a fixed and definite distance between said members when the frame is clamped to the specimen by the members.

2. An instrument for indicating changes in length, comprising a frame clampable to the test specimen, two specimen engaging members carried by the frame, one of which is fixed and the other of which is movable, and a manually actuated member on the frame adjacent the movable specimen engaging member and movable into one position to prevent the movable specimen engaging member from engaging the specimen and movable into a second position to accurately position and guide the movable specimen engaging member into engagement with the specimen to determine an accurate base length between the members.

3. An instrument for indicating changes in length, comprising a frame, two clamping members to engage diagonally, opposite points of a specimen, one of said members being fixed to and the other of said members being movable on said frame, two spring members mounted to engage the specimen at points respectively opposite the specimen engaging clamping members, and means movable into a position to engage the specimen and prevent the movably mounted member from engaging the specimen, and movable into another position to engage and guide the movably mounted member into engagement with the specimen at a fixed distance from the plane of the fixed clamping member.

ROBERT B. LEWIS.