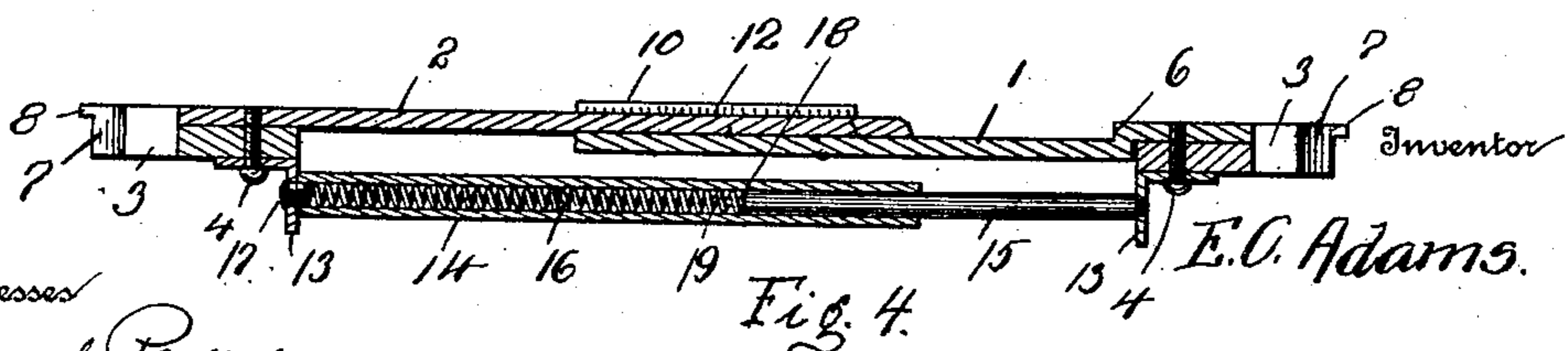
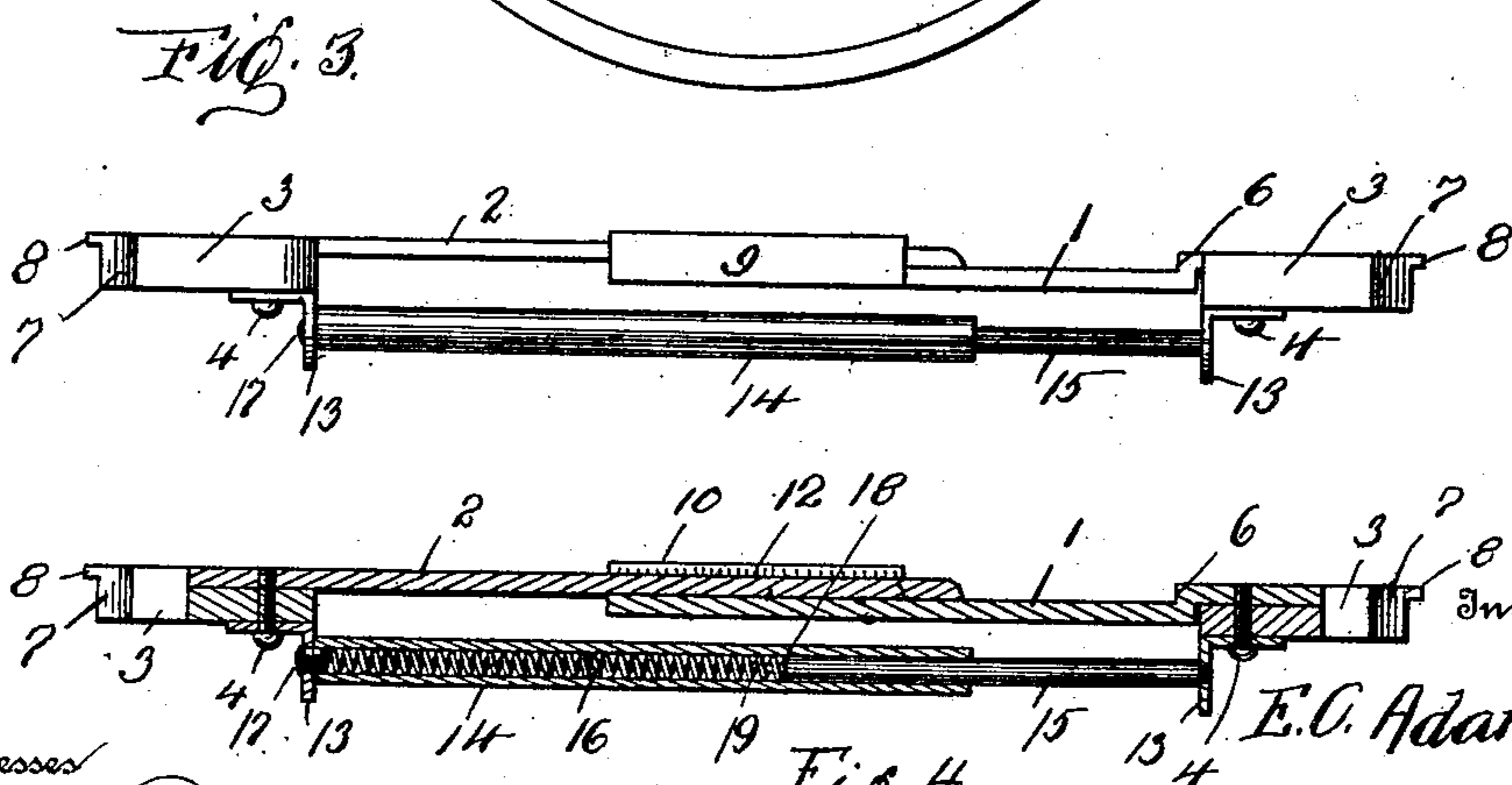
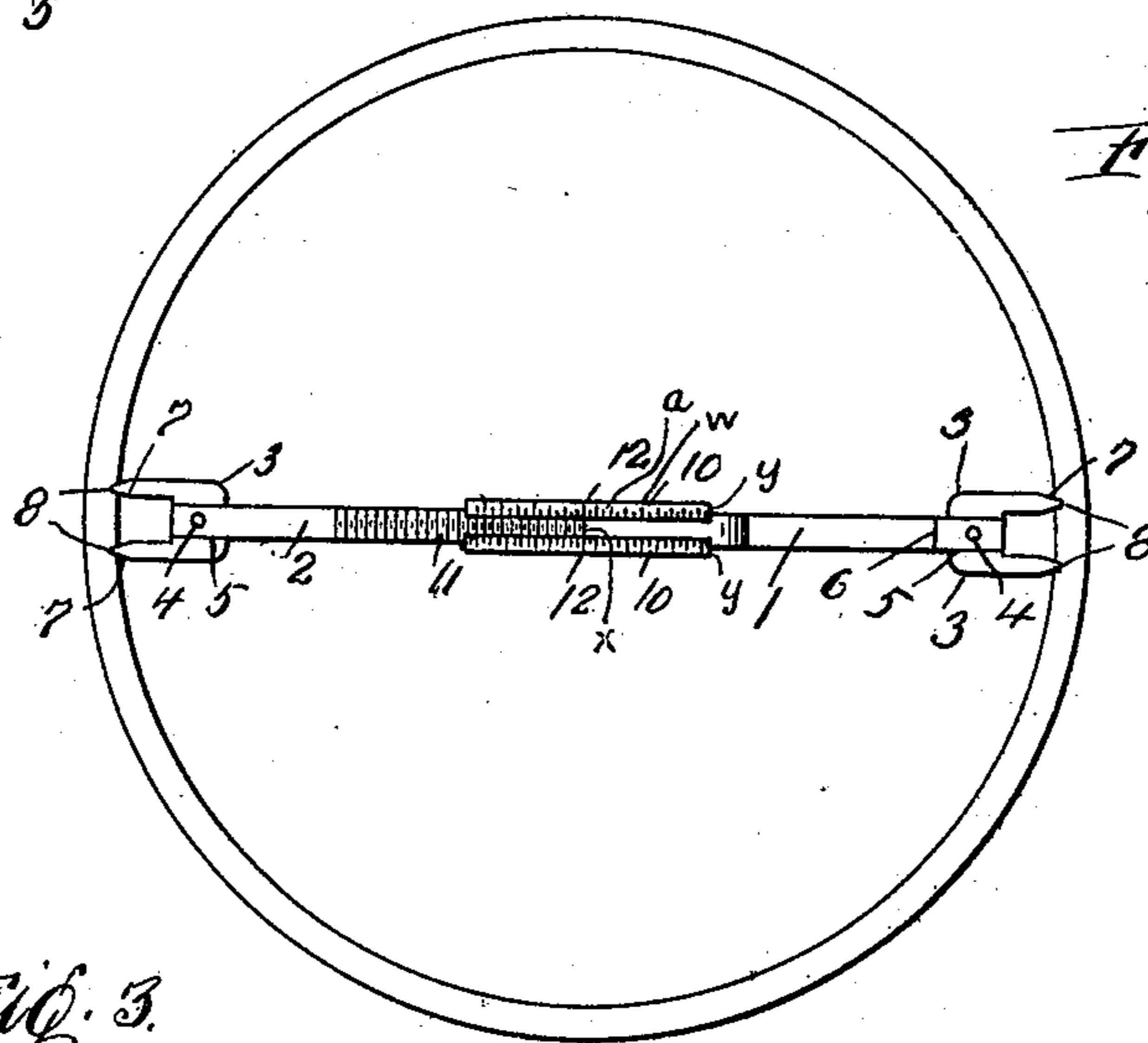
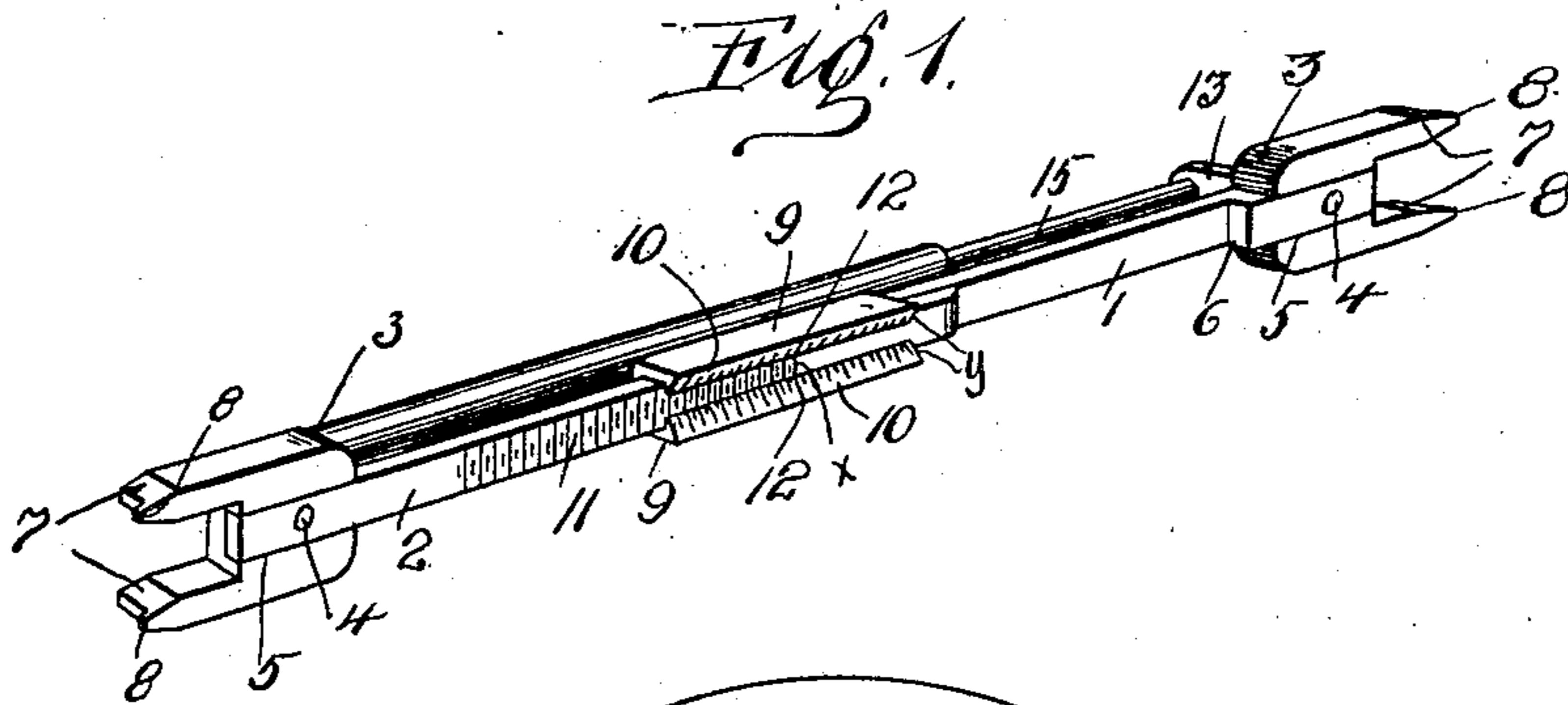


No. 886,106.

PATENTED APR. 28, 1908.

E. C. ADAMS.  
MEASURING DEVICE.  
APPLICATION FILED OCT. 19, 1906.



Witnesses  
Samuel Payne

*E. C. Adams*

By *H. C. Everett & Co.* Attorneys

# UNITED STATES PATENT OFFICE.

EARL C. ADAMS, OF ALLEGHENY, PENNSYLVANIA.

## MEASURING DEVICE.

No. 886,106.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed October 19, 1906. Serial No. 339,641.

*To all whom it may concern:*

Be it known that I, EARL C. ADAMS; a citizen of the United States of America, residing at Allegheny, in the county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Measuring Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to measuring instruments, and more particularly to that class of devices known as "center finders", especially adapted for ascertaining with accuracy the diameter of tubes or other cylindrical  
15 bodies.

The invention comprises a center-finder consisting of longitudinally adjustable sections provided with graduations and spring mechanism for controlling the telescopic  
20 movement of the sections.

The invention also comprises certain detail features of construction and combinations of parts all of which will be fully described hereinafter in connection with the accompa-  
25 nying drawing, which forms a part of this specification and defined in the appended claims.

In the drawing, Figure 1 is a view in perspective of a center finder constructed in accordance with my invention, Fig. 2 is a front elevation of the same applied to the interior of a tube, Fig. 3 is a side elevation of the device, and Fig. 4 is a longitudinal section of the  
30 same.

35 The reference numerals 1 and 2 designate two overlapping bars, preferably of rectangular form in cross section, to the outer end of each of which is secured a bifurcated head 3 by means of screws 4 or like securing means.  
40 Each of the heads 3 is recessed on its outer face to receive the ends of the bars as indicated at 5, and the bar 1 is offset at 6 adjacent to its outer end to bring said bar into parallel relation with the bar 2. The ends 7  
45 of the forks or arms of the heads 3 are beveled as shown, and the extremity of each of said arms is recessed to provide lugs 8 adapted to engage the end of a tube as illustrated in Fig. 2.

50 The inner end of the arm 1 is provided with parallel plates 9 projecting from the opposite edges of the arm, and having oppositely projecting flanges 10 overlapping the outer face of the bar 2 to serve as a guide to maintain  
55 the bars 1 and 2 in proper relation in their telescopic movement.

The front face of the bar 2 is provided with graduate marks 11 the flanges 10 also having graduate marks extending from end to end of the flanges, the central or middle  
60 graduate mark on each flange being indicated by the reference numeral 12. It will be understood of course that the bar 2 may be provided with a greater number of graduate  
65 marks, so as to give a wider range to the use of the instrument, though the amount of graduate marks shown on the bar 2 is generally sufficient for all ordinary use of the device.

As shown in Fig. 2 of the drawings, the  
70 center of the pipe is found to be exactly at the point indicated by the graduate marks 12 on the flanges 10. Assuming, however, that the device is placed in a pipe a half inch smaller in diameter than the one shown, the  
75 end graduation  $x$  on the bar 2 will then have been moved to the end  $y$  of the flanges 10; the distance from the ends  $y$  of the flanges 10 to the graduation marks 12 is exactly one-half inch. To determine the center, the  
80 graduate marks between the ends  $y$  of the flanges 10, and the end graduation  $x$  are counted, the number thereof divided by 2, and consequently the center of the pipe will  
85 be a quarter of an inch to the right of the graduate mark 12, and a quarter of an inch to the left of the ends  $y$  of the flanges 10. Again, it will be observed that if the graduate  
90 mark  $x$  on the bar 2 was moved to the graduate mark  $w$  on the flanges 10, the graduations between graduate mark  $x$  of the bar 2 and the graduate marks 12 of the flanges, are  
95 counted, and the amount divided by 2, in which instance the graduate mark  $a$  would indicate the center.

Secured to the rear face of each of the heads 3 by the screw 4 which secure the bars 1 and 2 to the heads, is a perforated bracket 13, these brackets serving as bearings for a  
100 sectional telescopic guide rod comprising a tubular section 14, and a rod 15. Within the tube 14 is a coil spring 16 bearing at one end against a plug 17 fitted within the outer end of the tube 14 and at its opposite end  
105 against a shoulder 18 formed on the rod 15 by circumferentially reducing the inner end of said rod to provide a stem 19 which projects into the adjacent end of the coil spring.

The utility and operation of the improvement constructed as thus described will be  
110 readily understood. The device is placed within the end of the tube to be measured,

and the lugs 8 engage the edge of the tube as shown in Fig. 2.

It will be apparent that the tendency of the spring 16 is to force the telescopic sections apart and hence after the arms 1 and 2 are forced together against the tension of the spring, the expansion of said spring will clamp the heads 3 against the inner walls of the tube. Thus the device is adapted for use with tubes or other cylindrical bodies of various sizes.

Instead of employing the tube 14 closed by a plug 17, the tube may be formed by boring out a solid rod leaving the outer end closed. Other changes in the details of the device may be resorted to which do not involve a departure from the terms and scope of the claims.

What I claim and desire to secure by Letters Patent, is:—

1. In a centering device, two overlapping bars, flanges carried by one bar and receiving the overlapping portion of the other bar and provided with an indicating mark, the other of said bars being provided on its outer face with graduations, heads carried by the outer ends of the bars, and means suspended from the heads and including a spring exerting its tension to normally force the heads away from each other.

2. A center-finder comprising two telescopic bars of equal length, one bearing graduations on its outer face, while the other bar bears an indicating mark, heads secured to the outer ends of said bars, and a sectional spring pressed guide secured to said heads.

3. A center-finder, comprising two telescopic bars of equal length, recessed heads secured to the outer ends of said bars, brackets secured to said heads, and a telescopic guide comprising a rod secured to one of said heads, a tube secured to the opposite head and inclosing the inner end of said rod, and a coil spring within said tube.

4. A center-finder, comprising two telescopic bars of equal length, one of said bars having flanged plates serving as a guide for the other bar, bifurcated heads secured to the outer ends of said bars, and having their ends formed with lugs, brackets secured to said heads, and a telescopic guide supported by said brackets and comprising a tube, a rod extending within the tube, and a coil spring within said tube.

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

EARL C. ADAMS.

Witnesses:

H. C. EVERT,  
MAX H. SROLOVITZ.