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G. T. SWINNEY

2,326,410

TELESCOPING GAUGE

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Fig. 1

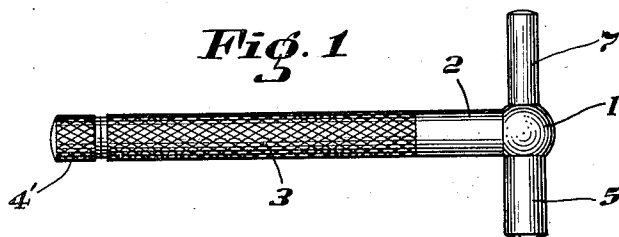


Fig. 2

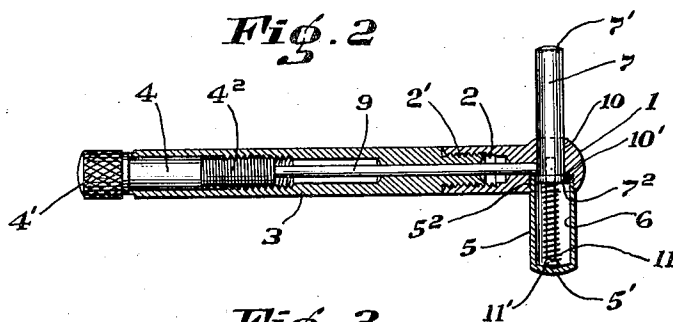


Fig. 3

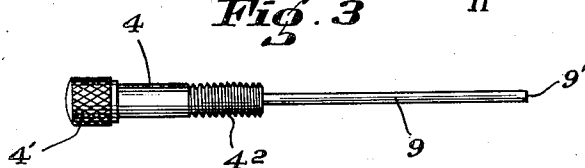


Fig. 4

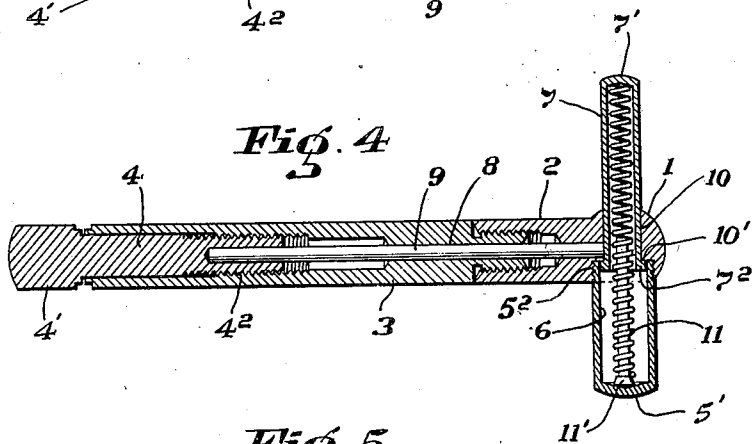
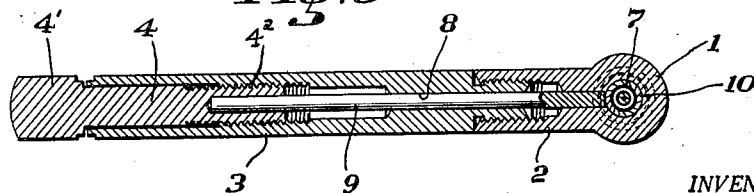


Fig. 5



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TELESCOPING GAUGE

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Application September 17, 1942, Serial No. 458,643

2 Claims. (Cl. 33-143)

My present invention relates to certain improvements in telescoping gauges, and particularly those of the type or structure of the patent to Starrett and Adell No. 905,110, of November 24, 1908.

These gauges have been on the market since the date of the above noted patent, and since its expiration have been also produced by manufacturers other than the original assignee, in substantially its original form.

In these commercial gauges the smaller telescoping member had on one side a longitudinal groove with abrupt ends into which the lock pin projected and acted as a stop. This has been the structure of all makes with which I am familiar and was on the whole generally satisfactory, but I have discovered that it had the defect of confining the telescoping member against rotation so that wear came always along the same longitudinal lines and the abrupt ends of the groove tended to hammer the end of the lock pin laterally under the action of the expansion spring when the lock was released. My concept is of a free rotatability of the smaller slide leaving its surface smooth and capable of making and maintaining an accurate sliding fit.

As another and somewhat correlated improvement I make the body of my head so that it is a coacting member and not a mere collar for attaching a handle as in the prior art.

One of the specific difficulties in the old gauges was that restricted space had seemingly limited its clamp tightener to a small threaded engagement with the body of the head portion. This I have overcome by the use of a relatively shorter tightening rod of small diameter, but held against buckling in a close fitting bore, and by providing the zone of the binding screw engagement at the central or middle portion of the handle where its threads can be made of greater size and area.

These and other features of improvement will more fully appear from the drawing and the description hereinafter set forth.

In the accompanying drawing I have shown a gauge improved according to my invention, which is simple to manufacture, yet overcomes the weaknesses supposedly inherent in this type of gauge. In the drawing:

Fig. 1 is a side elevation of one of my improved gauges complete.

Fig. 2 shows the same in partial longitudinal section.

Fig. 3 is a view of the binding screw member, removed, with its tightening rod.

Fig. 4 shows on slightly larger scale the gauge in further vertical section, and

Fig. 5 is a similar section to that of Fig. 4 but transversely at right angles to its plane.

The body 1 of the gauge is preferably of spherical or ball contour where the shank portion 2 joins it, making the so-called T-joint or section to which is attached the handle 3 carrying an axial binding screw piece 4 having a knurled knob 4'.

Axially of the ball shaped body 1 I provide a bore 10 in one end of which is threaded a stationary cup-like anvil 5 having a closed contact end 5' and an inner bore 6.

The tubular plunger 7 has a closed end 7' which in use acts as a contact face opposite to that of the hollow fixed anvil 5 into which its opposite or inner end is guided with a free fit by the close sliding fit of the exterior of the plunger 7 in the bearing portion 10² of the bore 10. The bore 10 is shouldered at 10' and threaded between the shoulder to receive the externally threaded open end 5² of the fixed anvil 5.

The open end of the tubular plunger 7 has an external shoulder 7² forming a stop to limit the outward motion of the plunger by contact with the inner face of the shoulder 10' left by the counterbore 5 into the bore 6 in which it has a free fit so as to be telescoped to shorten the effective over-all length between the contact faces 5' and 7' in taking off a measurement.

The handles of my gauges may be attached in various ways but I find the form shown convenient and adding to the efficiency of the combination by providing maximum guiding length for the slender tightening rod 9 without weakening the handle end. According to my invention the end of the handle 3 is reduced and threaded for engagement with the interior threads 2' of the hollow end of the shank portion 2. Axially through it and part way along that end of the handle 3 is a closely fitted guide bore 8 slidably supporting against buckling tendency the slender tightening rod 9 carried by the binding screw piece 4.

From the end opposite the guide bore 8 the handle 3 is axially counterbored and threaded to form a receiving chamber having walls of substantial diameter for the threaded end 4² of the binding screw piece 4 in the end of which the rod 9 is fixed. This allows for sturdy threads in a large area of engagement generally midway the length of the handle for cooperation with those of the threaded end 4² of the binding piece 4 when it is tightened by its

knurled knob 4' to force the end of the rod 9 against the surface of the plunger 7 to lock it in any position it may assume in axial adjustment. While the rod 9 is of relatively small diameter and of considerable necessary length due to the novel positioning of the binding screw, it is held against any tendency to buckle by its location in the guide bore 8. Its free end is hard and makes direct contact with the outside of the plunger 7 when forced up against it by the binding screw 4².

As best seen in Fig. 4, I interpose between the interior of the end of the fixed anvil 5 and the interior end of the tubular plunger 7 a coiled wire compression spring 11 having a usual guide pin 11'. The coils are of a diameter to fit freely within the telescopic slide 7 and hence have full clearance in the larger diametered axial bore 6 of the fixed anvil 5. The spring 11 may be compressed when the slide is being telescoped for entry into a hole or slot to be measured and locked in that condition until the gauge is properly positioned and then freed by turning back the knob 4' to release the tightening rod 9 and free the slide to make contact with the work being measured. After this the telescopic slide may be again locked prior to removal for measurement with an outside micrometer capable of readings of great accuracy according to the established practice.

Certain modifications in the details of parts may obviously be made without departing from the spirit of my invention and the combinations of the details of the several parts may be variously made as indicated in the appended claims.

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

1. In a telescoping gauge, a body having a bore, an interior shoulder formed about the bore wall at one end, a tubular plunger having a sliding fit in said bore and having a closed contact end and an externally shouldered opposite end slidably engageable with said interior shoulder of the body bore, a hollow stationary anvil having a closed contact end and an opposite open end at the end of said body bore and of an internal diameter freely receptive of the shouldered open end of said plunger, and a compression spring disposed in the interiors of the plunger and said stationary anvil.

2. In a telescoping gauge, a body having a bore, an interior shoulder formed about the bore wall at one end, said body bore being internally threaded below said interior shoulder, a tubular plunger having a sliding fit in said bore and having a closed contact end and an externally shouldered opposite end slidably engageable with said interior shoulder of the body bore, a hollow stationary anvil having a closed contact end and an opposite end at the end of said body bore and of an internal diameter freely receptive of the shouldered open end of said plunger, and externally threaded at its open end and engaging said internally threaded bore below said shoulder, and a compression spring disposed in the interiors of the plunger and said stationary anvil.

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