July 27, 1943. E. W. GENT 2,325,125

HAND TOOL FOR TESTING SPRINGS

Filed June 4, 1941

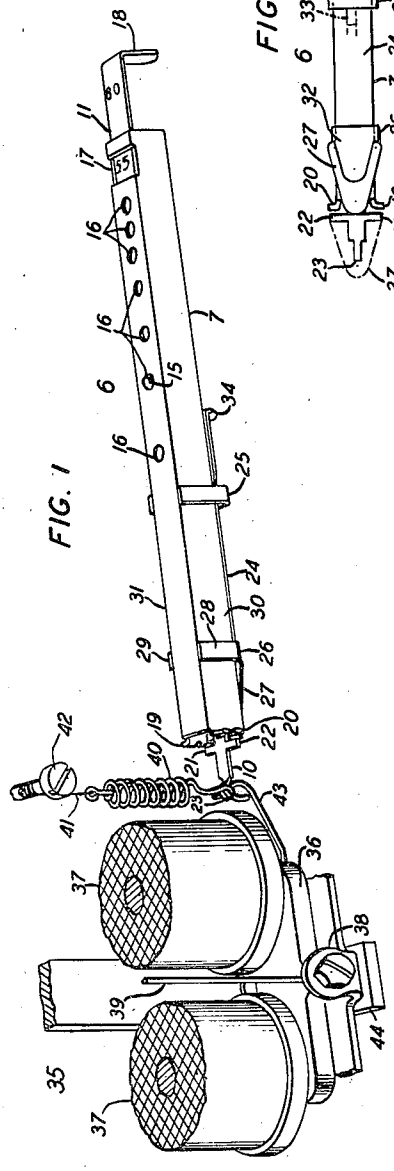

FIG. 1

FIG. 5

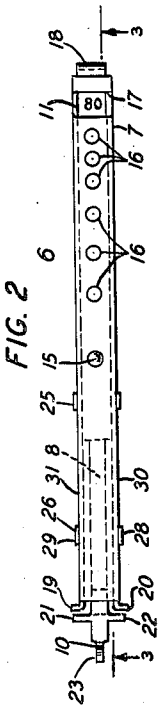

FIG. 2

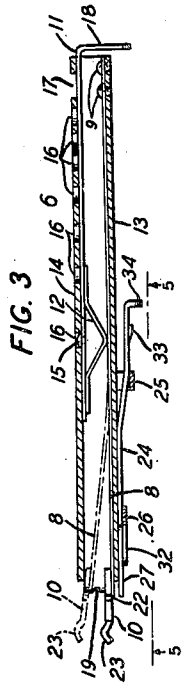

FIG. 3

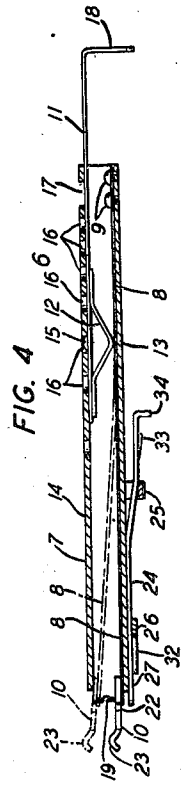

FIG. 4

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Patented July 27, 1943

2,325,125

UNITED STATES PATENT OFFICE

2,325,125

HAND TOOL FOR TESTING SPRINGS

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Application June 4, 1941, Serial No. 396,541

3 Claims. (Cl. 265—18)

This invention relates to a hand tool and more particularly to a hand tool for measuring spring tensions or pressures. The object of the invention is to provide a hand tool for readily measuring the tension or pressure of a spring or a spring-pressed member.

The tool is adaptable for measuring the spring pressures of various spring type elements and the condition of spring-pressed members, the tool may be used for instance in measuring the spring biased condition of an armature in a telephone ringer.

In the drawing:

Fig. 1 is a view in perspective and partly in section of a portion of a telephone ringer and the tool in engagement with a portion of the ringer;

Fig. 2 is a top plan view of the tool shown in Fig. 1 and drawn on a somewhat reduced scale;

Fig. 3 is a side view, partly in section, of the tool taken on the line 3—3 of Fig. 2 and showing a spring member of the tool in two positions;

Fig. 4 is a view corresponding to Fig. 3 but with the slide bar of the tool in a different position; and,

Fig. 5 is an undersurface view of a portion of the tool and shows two positions of a guard member thereon.

The tool 6 comprises a tubular body 7 having located therein a leaf spring 8 shown in Figs. 2, 3 and 4. The leaf spring 8 extends the full length of the body 7 and is secured at one of its ends to an end of the body 7 by means of screws or rivets 9—9. The other end of the spring 8 is provided with a hook member 10 which is welded or otherwise fastened to the free end of the spring 8 and extends outward of one end of the body 7. A slide bar 11 carrying a V-shaped shoe 12 is adjustably supported within the body 7, the shoe 12 being in frictional engagement with the spring 8 and serving as a movable fulcrum for the spring 8. It will be seen by looking at Figs. 3 and 4 that the shoe 12 presses the spring 8 against the inner surface of the lower wall 13 of the body 7 and that it may be manually moved by means of the slide bar 11 along the spring 8 to in effect shorten or lengthen the spring 8. The slide bar 11 is pressed by means of the shoe 12 against the inner surface of the upper wall 14 of the body 7 and is provided with a button 15 which is adapted to fit into apertures 16 formed in the upper wall 14 of the body 7. The button 15 in cooperation with the apertures 16 serves as a detent to hold the shoe 12 and the slide bar 11 in adjusted positions, the button 15 being selectively pressed into the apertures 16 as the bar 11 is moved longitudinally within the body 7. The slide bar 11 is calibrated on its upper surface and has numbers provided thereon which appear in a window 17 formed in the upper wall of the body 7 to indicate the pressure required to move the free end of the spring 8 from the normal full line position shown in Figs. 3 and 4 to the dotted line position shown in these figures. The No. 80 appearing in the window 17 in Fig. 2 shows that the tool is set for 80 grams pressure, the shoe 12 under this condition being in the position shown in Fig. 3. In Fig. 1 the slide bar 11 has been longitudinally moved within the body 7 and the No. 55 appears in the window 17 to indicate that the tool 6 is set for 55 grams pressure. In Fig. 4 the slide bar 11 has been further moved to carry the shoe 12 along the spring 8 and set the tool 6 for a still lower pressure. The slide bar 11 is bent at its outer end 18 to facilitate manual movement of the bar 11 and to prevent undue thrusting of the bar 11 within the body 7. The screws or rivets 9—9 will prevent complete withdrawal of the bar 11 from the body 7 in one direction since they serve as a stop for the shoe 12 in one direction of its travel. The body 7 has outwardly turned bifurcated ears 19 and 20 on the end nearest to the hook member 10 to permit supporting of this end of the tool 6 on some suitable support (not shown). Laterally extending ears 21 and 22 are also provided on the hook member 10 to permit engagement of the hook member 10 with devices to be gauged by the tool 6 and which might be so formed as to be not readily engaged by the hook shaped end portion 23.

The guard 24 is adjustably held against the outer surface of the lower wall 13 of the body 7 by means of straps 25 and 26 and is provided with an arrowhead shaped end portion 27. The strap 26 has leg portions 28 and 29 secured to the side walls 30 and 31 of the body 7 and is provided with a tongue portion 32 in frictional engagement with the undersurface of the end portion 27 of the guard 24. The strap 25 is U-shaped and has its leg portions fastened to the side walls 30 and 31 of the body 7 and extends below the lower wall of the body 7. The guard 24 extends through the strap 25 and is offset from the body 7 at the point of extension through the strap 25, and is provided with a lug 33 and a downwardly extending end portion 34. When the tool 6 is not in use, the guard 24 is manually thrust forward to the dotted line position shown in Fig. 5. In this position the arrowhead shaped end portion 27 extends parallel with the hook member 10 and partly beyond the hook member 10 to serve in

some measure to prevent engagement of the hook member 10 with the clothing of a person carrying the tool 6, the guard 24 being retained in this position by the bearing of the lug 33 against one edge of the strap 25 as shown in the dotted line position in Fig. 5. The guard 24 may be withdrawn from the position shown in Fig. 5 to the position shown in the other figures of the drawing by pressing the end portion 34 toward the lower wall of the body 7 to release the lug 33 from engagement with the strap 25 and then by sliding the guard 24 along the body 7 to the position shown in Figs. 1, 3 and 4.

One of the uses of the tool 6 is shown in Fig. 1 in which 35 is a portion of a polarized telephone ringer comprising an armature 36 electromagnetically operated by means of the coils 37—37, the armature 36 being pivotedly supported at its central portion in a support 38 and carrying a clapper rod 39. Telephone ringers of this type are often provided with a helical spring 40 to spring bias the armature 36, the spring 40 being attached at one end to a cord 41 anchored to a screw 42, mounted on a convenient support (not shown) but which forms a part of the ringer and the other end of the spring 40 being attached to an arm 43 extending from one end of the armature 36, all of which is well understood in the art. The ringer 35 is provided with the usual permanent magnet 44. The screw 42 may be turned to apply more or less pull on the cord 41 and thus change the tension of the spring 40 and its biasing effect on the armature 36, the cord 41 being wound or unwound on the screw 42 according to the direction of turning of the screw. In some cases it is known that when a ringer is located at a certain station in a signaling system, a certain spring tension is required on the armature of the ringer to make the ringer operable at that station. In other cases it is not known what the spring tension should be and an adjustment must be made of the spring tension until the ringer operates in a satisfactory manner.

The tool 6 may be used in determining the tension of the spring in the ringer and in adjusting the spring to a required tension. When the tool is to be used for either of these purposes the hooked end portion 23 is hooked into one end of the spring 40 and manual pressure is applied to the tool to cause elongation of the spring 40. If in doing this the spring 40 is elongated without causing flexure of the spring 8 in the tool 6 and movement of the hook member 10 from its normal full line position, the tool should be set at a different pressure by sliding the slide bar 11 to a different position. Adjustment should be made of the slide bar 11 until the tension of the spring 8 in the tool 6 is about equal to the tension of the spring 40 in the ringer. When this condition is obtained, the tension of the spring 40 may be determined by reading the number appearing in the window 17 of the tool 6. If it is already known what spring tension is required in the ringer at a particular point in the system and it is desired to set the ringer for the required tension, the tool 6 may be set for the required pressure in grams by sliding the slide bar 11 within the body 7 until the required pressure is indicated in the window 17. The tool 6 may then be applied to the ringer and the tension of the spring 40 may be adjusted to meet this setting of the tool 6 by turning the screw 42 in the ringer 35.

Various types of springs and reeds may be tested by means of this tool to determine their spring pressures or tensions, the tool 6 being placed in engagement with the device or element to be tested and manually pressed against the device or element and by changing the setting of the tool 6 to match the spring pressure or tension of the device under test.

What is claimed is:

1. A hand tool for gauging spring pressures comprising, in combination, a tubular handle having a window therein, a leaf spring secured at one end within the handle and having a free end portion projecting from the other end of said handle, a slide bar movably supported within the handle and having indicia thereon for separate observance through said window, a shoe supported on said slide bar and frictionally engaging said leaf spring, said shoe and said leaf spring cooperating to resiliently press said slide bar into frictional engagement with said handle and said shoe serving as a movable fulcrum for said leaf spring.

2. A hand tool for gauging spring pressures comprising, in combination, a tubular handle having an aperture formed therein, a leaf spring secured at one end within said handle, an end portion on said leaf spring extending longitudinally outward from the other end of said handle, a calibrated slide bar movably supported within said handle, the calibration marks on said slide bar being separately observable through said aperture, a V-shaped shoe carried by said slide bar and engaging said leaf spring and said shoe being manually movable by means of said slide bar along said leaf spring and serving as a movable fulcrum for said leaf spring.

3. A hand tool for gauging spring pressures comprising, in combination, a tubular handle, a leaf spring extending longitudinally within said handle and secured at one end to said handle, an end member secured to the free end of said leaf spring and extending longitudinally outward of said handle, a slide bar supported within said handle and movable relative to said leaf spring, a shoe supported on said slide bar and slidably engaging said leaf spring to serve as a movable fulcrum for said leaf spring, a series of apertures and a window formed in one face of said handle, a button on said slide bar and cooperating with said series of apertures to provide a detent holding means for said slide bar and calibrations on said slide bar separately visible through said window to indicate the setting of said tool for required spring pressures.

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