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F. M. MYERS

2,465,030

SPRING TOOL

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FIG. 1

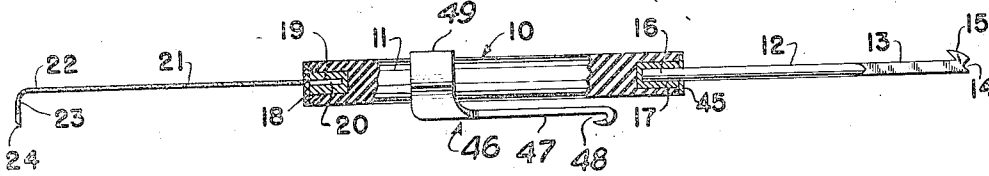
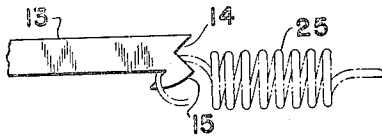


FIG. 2

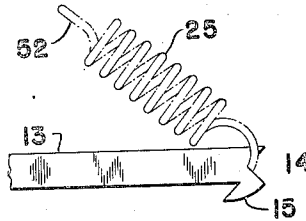


FIG. 3

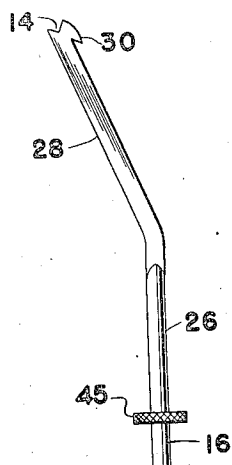


FIG. 4

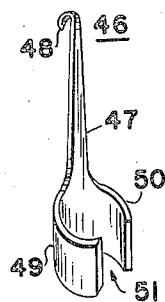


FIG. 7

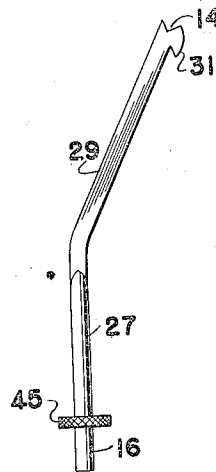


FIG. 5

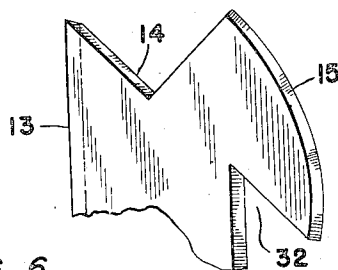


FIG. 6

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SPRING TOOL

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1 Claim. (Cl. 29—227)

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This invention relates to hand tools and more particularly to an improved tool for the manipulation of otherwise inaccessible springs.

An object of this invention is to provide such a tool with cooperating means to engage, retract, advance, extend and install such springs. Another object is to provide means for the like manipulation of such springs and similar objects regardless of certain intervening obstructions.

Further objects will more plainly appear from the detailed specification and drawings herein presented in exemplification but not in limitation of the present invention. Like reference characters designate like parts in the accompanying drawings which represent diagrammatically in, 5

Fig. 1 a longitudinal view of the assembled tool with end portions of the handle shown partly in longitudinal cross section,

Fig. 2 an enlarged fragmentary view in profile of the operating bit shown in engagement with a spring in retracting position, 20

Fig. 3 a like view of the bit in a spring projecting position,

Fig. 4 an enlarged view in profile of a modified form of the bit with the retracting spur arranged in a left oblique position, 25

Fig. 5 a like view of the spur arranged in a right oblique position,

Fig. 6 an enlarged fragmentary view in perspective of the combination bit showing the arrangement of its wedge action edges, 30

Fig. 7 a somewhat enlarged view in perspective of a modification comprising a grip arranged to slide on the handle of the tool shown in Fig. 1.

Various means for handling springs have formerly been suggested such as the tool shown in U. S. patent to J. A. Allievi, 2,042,287, patented May 26, 1936, but heretofore none have solved the problem presented by the need for the rapid repair, adjustment and placement of coil springs in, for example, radio receivers, clocks and other assemblies, without the necessity of taking such assemblies apart.

The improvement afforded by the present invention has met this need by providing a single tool capable among other things of engaging such a spring for retraction or advance without changing the alignment of the tool. The advantage of this arrangement is instantly apparent to all repair men.

A preferred embodiment of my invention is shown in Fig. 1 wherein the tool 10 comprises an insulated handle 11, a bit member 12, slideable grip member 46 and a probe member 21. The foot 16 of bit member 12 may be held in the

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handle 11 by means of a suitable bushing 17 and a collar 45. The foot 16 is arranged to engage the handle 11 and the bushing 17 with a removable forced fit. Or if desired the members 12, 21, 26 and 27 may be fixed to the handle by various means well known in the art. The insulated handle 11 prevents the passage of current from the working end of the tool.

The bit 12 is provided with a blade-like head portion 13 which may be formed by flattening the end portion of the shank 12. The head portion 13 terminates in the combined spur 15 and grooved portion providing a notch 14. As shown in Fig. 6, the spur 15 is preferably provided with a bevel edge 15', and the outer edge 13' of the groove member 14 is also beveled. The spur 15 is convex in form to assist the wedge action of the bevel edge 15' when it is inserted between the coils of the spring 25.

The probe member 21 may be joined to the handle 11 in a manner similar to that described for the bit member 12. The foot 20 of the probe 21 may thus be held in the handle 11 by means of a bushing 19, and a collar 18 fixed to the probe 21. A removable forced fit may be provided between the bushing 19 and the foot 20. The probe 21 is provided with an elbow portion 23 terminating in a blade member 24. An insulating coating 22 is preferably provided for the probe 21 and if desired a like coating may be applied to the bits 12, 26, and 27.

Modifications of the bit 12 are shown in Fig. 4 and Fig. 5 which respectively reveal a left oblique bit 26 and a right oblique bit 27.

In Fig. 4 the bit 26 comprises the foot portion 16, the collar 45, the arm 28, the groove portion 14 and the left hand spur member 30. 35

In Fig. 5 the bit 27 preferably comprises the foot 16, the collar 45, the arm 29, the groove portion 14 and the right hand spur member 31. The arm members 28 and 29 are preferably formed so that they are inclined from the normal longitudinal center line of the tool at an angle within the range of approximately 5 to 30 degrees.

The grip 46 shown in Fig. 7 preferably comprises a shank 47, a hook member 48, and jaw members 49 and 50 arranged to slideably grip the handle 11 in the opening 51. When the grip 46 is in position on the handle 10 the shank 47 extends outwardly so that the hook 48 points toward the groove 14, and so that the shank 47 extends in the same general direction as the bit 12. 50

The operation of moving a spring by a pulling action is shown in Fig. 2 wherein the spur 15 is 55

hooked into the loop of the spring 25 so that the loop is firmly held in the crotch 32 of the spur 15. This permits pulling the spring even if one or both ends of the spring are free or not free.

The operation of moving a spring by a pushing action is shown in Fig. 3 wherein the grooved portion 14 engages the loop of the spring 25 so that the spring 25 may be pushed forward even if one or both ends of the springs 25 are free or not free.

In the event that coil springs 25 are not provided with engaging loops, then the edge 15' may be forced with the wedging action of its bevel curved edge between the coils of the spring so that the bit 13 may be subsequently turned so that the spur 15 or the groove 14 may then engage one of the coils of the spring 25. In a like manner the bevel knife edge 13' may also be employed.

Another unique advantage of the present invention is also shown in Fig. 2. Therein it will be seen that without changing the alignment of the tool 10 in the hand of the operator, it is possible with a slight reciprocating longitudinal motion to alternately pull or push the spring 25 by alternately pulling in engagement with the loop of the spring by means of the spur 15, and subsequently pushing by engaging the adjacent coil of the spring by means of the grooved portion 14 of the bit 13.

In operation the modification embodying the left oblique arm 28 shown in Fig. 4 is used to work springs obstructed by an element in an assembly located on the left of the aperture available for manipulation. In a like manner the modification embodying the right oblique arm 29 shown in Fig. 5 operates to avoid obstacles on the right of the aperture available for manipulation.

In operation the grip 46 shown in Fig. 7 is arranged to slide along the handle 11 when pushed by the finger of the operator. In this manner the hook 48 may for example engage the end 52 of the spring 25 shown in Fig. 3, while the other end of the spring 25 is held in the groove 14 of the bit 12. When thus engaged the grip 46 may then be pulled back by the finger of the operator. This will stretch the spring 25 so that it may be held in a stretched position for installation in its assembly. The pull of the spring 25 on the hook 48 creates a tendency in the grip 46 to tilt which causes the jaws 49 and 50 to exert a binding action on the handle 11, which aids the operator in holding the grip 46 in its retracted position.

The probe 21 operates as a fishing implement to retrieve parts loose in an assembly, and the blade 24 operates to scrape contacts clean for soldering. The insulation at 11 and 22 protects the operator from electric currents in assemblies electrically connected.

The overall length of the tool 10 shown in Fig. 1 has been found to be preferably approximately 10 inches for radio use but varying lengths may of course be used for various jobs. The probe 21 may preferably be made of Number 55 music wire which may subsequently be dipped in heat resistant insulation 22. The elbow 23 may be ground to a knife edge at 24. The handle 11 may be made of approximately $\frac{3}{8}$ inch diameter tubular fiber or plastic material of required insulating characteristics. The bits 12, 26 and 27 are preferably made of No. 36 hard steel round stock and the head portions 13, 28 and 29 are preferably flattened and the edges 13' and 15' beveled and sharpened. The foregoing qualities have been found desirable for use in radio assemblies but it is obvious that they may be modified for use in other types of electrical assemblies, automotive assemblies, clock work assemblies, and all mechanisms requiring the manipulation of otherwise inaccessible springs and like objects.

While the foregoing exemplifies a preferred embodiment of the present invention it is intended to include all modifications and embodiments within the spirit and scope of the appended claim.

I claim:

An implement for installing each end of a longitudinally coiled spring in its operating engagement and for subsequently removing each of said ends from said engagement, said implement comprising in combination: a longitudinally disposed handle portion; a bit member arranged to extend longitudinally from one end of said handle portion; a slideable grip member arranged for longitudinal sliding movement along said handle portion toward and away from said bit member; said grip member comprising: a jaw portion arranged to loosely and slidably hold said grip member on said handle portion; and a rearwardly facing hook portion extending forwardly from said jaw portion toward said bit member; said bit member comprising a blade-like head portion having therein a forwardly facing notch, said notch being positioned when in operation to hold one end of said spring while the other end of said spring is held by said hook portion.

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REFERENCES CITED

The following references are of record in the file of this patent:

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