Sept. 12, 1967 C. E. BRANICK 3,341,175

SPRING COMPRESSION TOOL

Filed Sept. 30, 1965 2 Sheets-Sheet 1

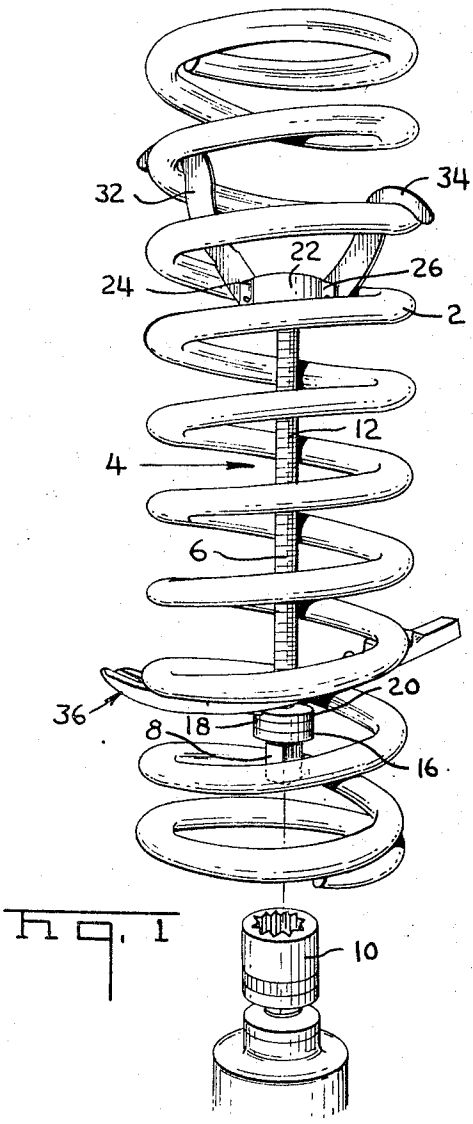


Fig. 1

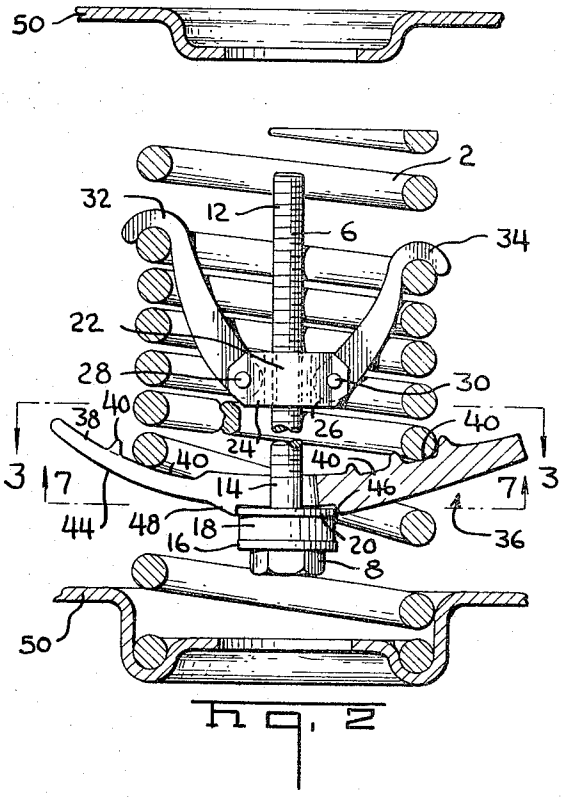


Fig. 2

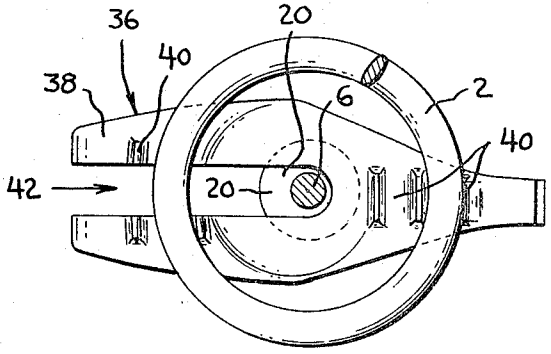


Fig. 3

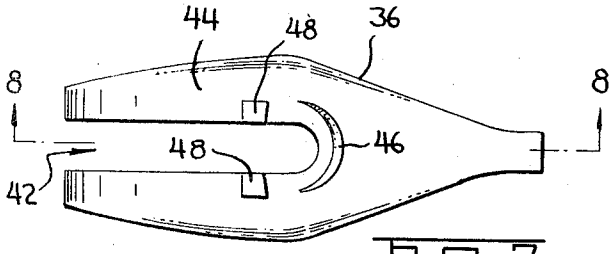


Fig. 7

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SPRING COMPRESSION TOOL

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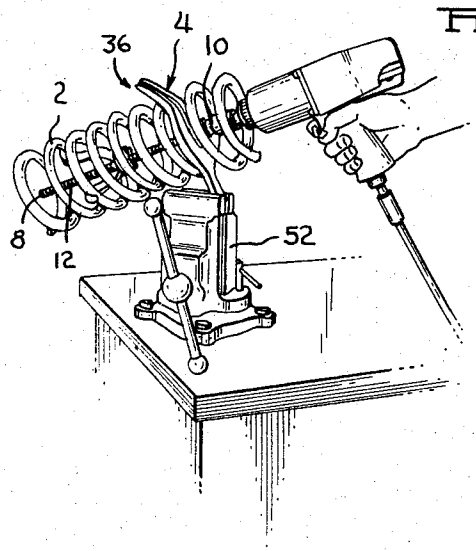


Fig. 4

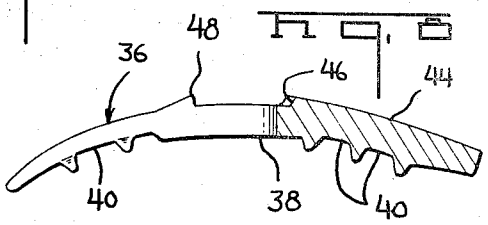


Fig. 1

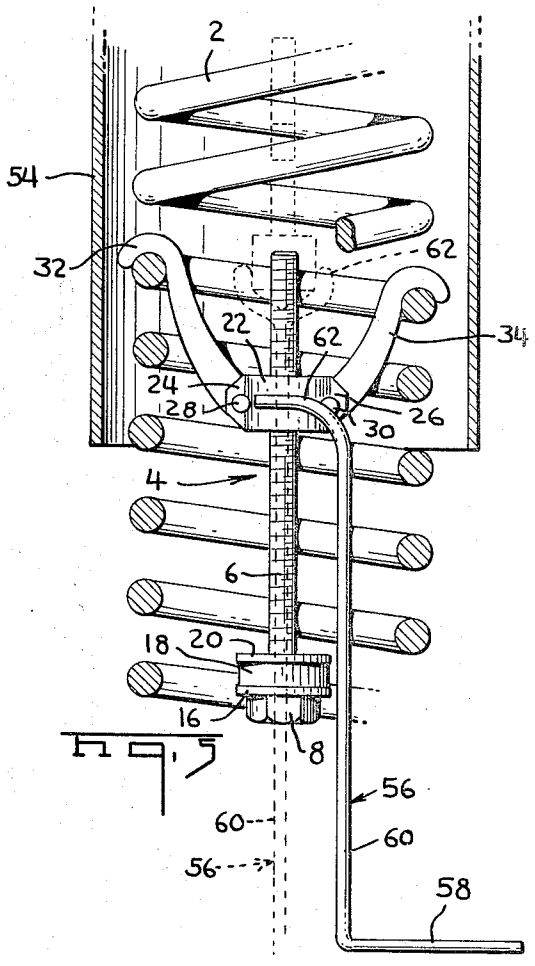


Fig. 5

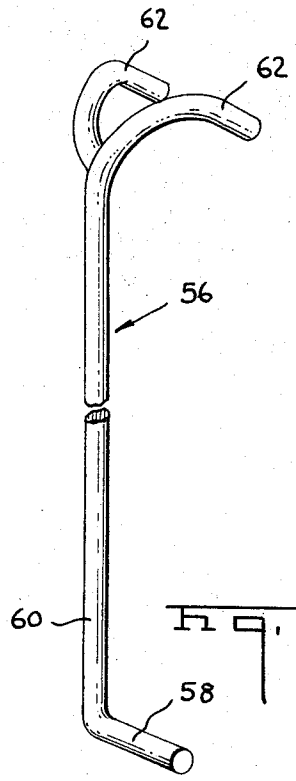


Fig. 6

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SPRING COMPRESSION TOOL

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13 Claims. (Cl. 254—10.5)

ABSTRACT OF THE DISCLOSURE

A device for shortening a helical spring comprising a pair of grippers for engaging the coils of the spring and a bolt mechanism engaging both grippers for drawing the grippers together. One of the grippers is a bifurcated member formed with a plurality of ribs to form grooves on one surface to engage the coils of springs of various diameters and a central recess on the opposite side for maintaining the bolt centered. The member is curved to diminish movement in the event the coil is accidently removed from the groove during operation.

This invention relates to spring compressing tools and more particularly to improvements in a tool for compressing the frame supporting coil spring associated with the wheels of automobile vehicles for insertion or removal of the coil spring from the vehicles described in Patent No. 3,051,443 of Castoe which is incorporated herein by reference.

The spring compressor tool of the above mentioned Castoe patent has proven highly successful in its ability to quickly and easily remove and insert coil springs in automotive vehicles. However, there are many practical applications wherein the Castoe tool has proven difficult, if not impossible, to use due to certain deficiencies therein. For example, the diameter of coil springs of various cars has been found to vary. Accordingly, the coil engaging fork of the Castoe tool has been unable to accommodate varying spring sizes and is usable for only one coil diameter. In addition, many known automotive devices include a shroud about a large portion of the coil spring, thereby making the task of positioning the hook members of Castoe tool difficult and time consuming.

In accordance with the present invention, the above mentioned problems encountered in the prior art are overcome by utilizing a coil engaging fork member having a plurality of grooves formed therein for receiving coil springs of varying diameter. The coil engaging fork member is of arcuate shape to further diminish coil movement laterally therealong in the event the coil is accidentally removed from the grooves in the fork member during operation. The engaging fork member is bifurcated and further includes on the underside thereof a recessed portion and a pair of raised portions on each side of the bifurcation and opposing the recessed portion. There is further provided a rod having a right angle bend and a two pronged fork at one end of the rod, the prongs extending parallel to each other and normal to the rod portion from which they extend for positioning the hook members on the coil when the coil is inaccessible to the operator's hand due to a shroud or the like surrounding the coil.

It is therefore an object of this invention to provide a spring compressor tool which includes a coil engaging fork element capable of handling coil springs of plural diameters.

It is a further object of this invention to provide a spring compressor tool which includes a coil engaging fork element of arcuate shape.

It is a still further object of this invention to provide a spring compressor tool including means for securing

therein against lateral movement, the head of the bolt member of the tool.

It is yet a further object of this invention to provide a rod member of defined shape for positioning inaccessible hook members on coils of a spring from within the spring.

The above objects and still further objects of the invention will immediately become apparent to those skilled in the art when considered in view of the following specification and drawings of a preferred embodiment of the invention which is provided by way of example and not by way of limitation wherein:

FIGURE 1 is a front elevational view of the spring compressor tool in accordance with the invention positioned in a coil spring in the uncompressed condition;

FIGURE 2 is a front elevational view of a coil compressed by the spring compressor tool in accordance with the present invention;

FIGURE 3 is a view taken along the line 3—3 of FIGURE 2;

FIGURE 4 is an elevational view of the spring compressor tool in operation for compressing a spring;

FIGURE 5 is a front view in elevation of the rod member of the present invention adjusting the hook members of the tool;

FIGURE 6 is a view in elevation of the rod member of the present invention;

FIGURE 7 is a view taken along the line 7—7 of FIGURE 2; and

FIGURE 8 is a view taken along the line 8—8 of FIGURE 2.

Referring to the figures, there is shown an expanded coil spring **2** with the spring compressor tool **4** positioned therein. The spring compressor tool **4** comprises a bolt **6** which is shorter than the spring **2** and has an enlarged head **8** adapted for engagement with a wrench **10** or the like for rotation thereof. The body of the bolt **6** includes a threaded portion **12** which extends for the greater portion of the length thereof and an unthreaded portion **14** which carries a thrust bearing assembly comprising a washer **16** engaging the bolt head **8**, an end thrust bearing assembly **18** mounted on the side of the washer **16** opposite the bolt head **8** and the second washer **20** engaging the oppsite side of the bearing **18**. The threaded portion **12** engages a nut component **22** having a pair of arms **24** and a pair of arms **26** (clearly shown in the above mentioned Castoe patent as arms **9, 9** and **10, 10**) disposed at opposite sides thereof, said arms defining slots (not shown) extending parallel to the axis of the bolt **6**. Pivotally mounted within the slots on pivot bolts **28** and **30** extending through the slots are the end of spring coil engaging hook members **32** and **34**. The hook members **32** and **34** engage the spring coil **2** at points diametrically opposite, the hook member **34** being shorter than the hook member **32** to allow hook member **34** to engage the spring coil as shown in FIGURES 1, 2, 4 and 5.

Cooperating with bolt bearing assembly and the nut member **22** having the coil engaging means is a coil engaging fork **36** (shown in detail in FIGURES 3, 7 and 8). The coil engaging fork **36** is of arcuate shape and includes in the concave upper face **38** thereof a plurality of grooves **40** for receiving coil springs of varying diameters. The fork also includes bifurcation **42** for receiving the bolt **6**. The underside **44** of the fork **36** is convex in shape and includes a circular depressed portion **46** and a pair of raised portions **48** disposed about the inner end of the bifurcation **42** for receiving and securing the washer **20** therein against sideways movement.

To place the tool into operation, the hook members **32** and **34** are positioned against the bolt **6** and the entire bolt assembly as shown in FIGURE 5 is pushed into the interior of the spring through one end thereof and the hook members **32** and **34** are then pushed outwardly to

engage coils of the spring **2**. The coil engaging fork **36** is then passed through the lower coils of the spring **2** so that the washer **20** rests in the depression **46** and abuts the raised portions **48** thereof, the coil being seated in two of the coil receiving grooves **40**. The enlarged head **8** of the bolt **6** is then rotated by a wrench **10** (FIGURES 1 and 4) or the like to compress the coil and remove same from the hollow coil seats **50** of the automotive device for easy removal therefrom as shown in FIGURE 2. Of course, the coil compression may take place externally of the automotive device as, for example, in a vise **52** (FIGURE 4) prior to insertion into the vehicle.

In many automotive devices the operator is unable to position the hook members **32** and **34** on the spring coils due to the existance of a blocking member around the coil such as the shroud **54** as shown in FIGURE 5. This problem is overcome by the use of a rod member **56** (FIGURES 5 and 6) having a pair of normal arms **58** and **60**. The arm **60** is longer than the arm **58** and includes at the end thereof remote from the arm **58** a pair of parallel outwardly extending fingers **62** which are normal to the arm **60**. The rod member **56** is also shown in phantom in FIGURE 5 in operating position.

In operation, the rod member **56** is passed through the spring interior until it is positioned between the upper portions of the hooks **32** and **34** where upon the rod member is pulled downwardly, the fingers **62** thereof forcing the hooks **32** and **34** over the coils of the spring **2**. The coil engaging fork **36** is then inserted and the head **8** is rotated.

Though the invention has been disclosed with respect to a specific preferred embodiments thereof, many modifications and variations thereof will immediately become apparent to those skilled in the art.

What is claimed is:

1. In a device for shortening a helical spring for insertion between and removal from spaced spring seats, said device comprising spaced means for engaging the coils of the spring at points removed from the end coils and having means coaxial with the axis of the spring, shorter than the spring when the spring in under maximum expected contraction and completely within the coils of the spring for moving the spaced means toward each other along a path parallel to the axis of the spring, one of said spaced means comprising a bifurcated fork, said fork having a concave upper surface, said upper surface including a plurality of spaced projections thereon, said projections extending in substantially parallel relation with each other.

2. A device as set forth in claim **1** wherein said fork includes a convex lower surface.

3. A device as set forth in claim **1** wherein said plurality of projections comprises at least five projections.

4. A device as set forth in claim **2** wherein said plurality of projections comprises at least five projections.

5. A device as set forth in claim **1** wherein the lower surface of said fork includes means formed therein for retaining said means coaxial with the spring.

6. A device as set forth in claim **2** wherein the lower surface of said fork includes means formed therein for retaining said means coaxial with the spring.

7. A device as set forth in claim **3** wherein the lower surface of said fork includes means formed therein for retaining said means coaxial with the spring.

8. A device as set forth in claim **4** wherein the lower surface of said fork includes means formed therein for retaining said means coaxial with the spring.

9. A device as set forth in claim **5** wherein said means formed in the lower surface of said fork includes a depression at the inner end of said bifurcation and extending toward said bifurcation and a raised portion on each side of said bifurcation and spaced from said depression.

10. A device as set forth in claim **6** wherein said means formed in the lower surface of said fork includes a depression at the inner end of said bifurcation and extending toward said bifurcation and a raised portion on each side of said bifurcation and spaced from said depression.

11. A device as set forth in claim **7** wherein said means formed in the lower surface of said fork includes a depression at the inner end of said bifurcation and extending toward said bifurcation and a raised portion on each side of said bifurcation and spaced from said depression.

12. A device as set forth in claim **8** wherein said means formed in the lower surface of said fork includes a depression at the inner end of said bifurcation and extending toward said bifurcation and a raised portion on each side of said bifurcation and spaced from said depression.

13. In a device for shortening a helical spring for insertion between and removal from spaced spring seats said device comprising spaced means for engaging the coils of the spring at points removed from the end coils and having means coaxial with the axis of the spring, shorter than the spring when the spring is under maximun expected contraction and completely within the coils of the spring for moving the spaced means toward each other along a path parallel to the axis of the spring, one of said spaced means comprising a bifurcated fork the lower surface of said fork including means formed therein for retaining said means coaxial with the spring, said means formed in the lower surface of said fork includes a depression at the inner end of said bifurcation and extending toward said bifurcation and a raised portion on each side of said bifurcation and spaced from said depression.

References Cited

UNITED STATES PATENTS

2,695,157	11/1954	Wilson	254—131
3,051,443	8/1962	Castoe	254—10.5
3,237,919	3/1966	MacKay	254—10.5
3,256,594	6/1966	Howard et al.	254—10.5

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