Aug. 18, 1931. E. E. RICHARDSON ET AL 1,819,973

SPINDLE BOLT REMOVER

Filed May 24, 1930

FIG. 1.

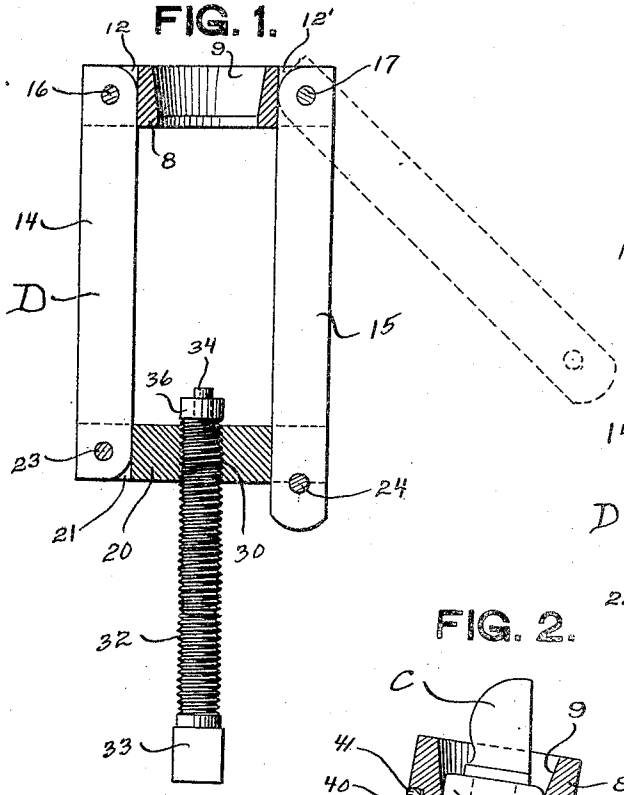


FIG. 3.

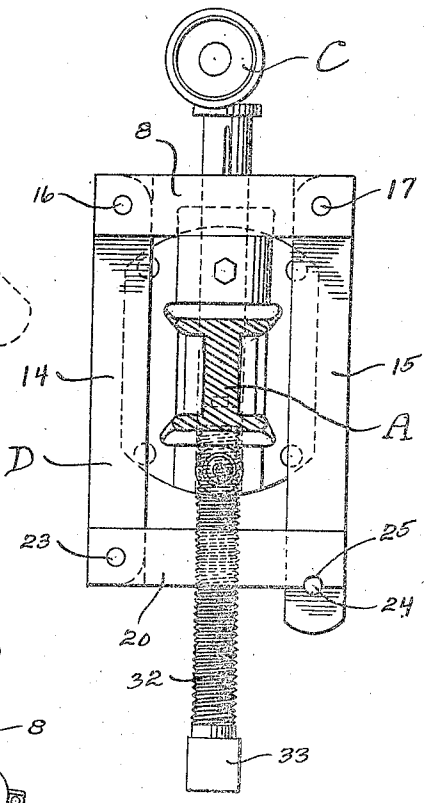


FIG. 2.

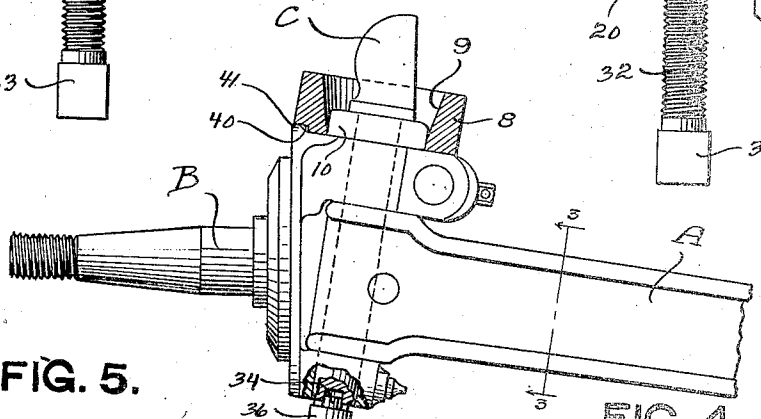


FIG. 5.

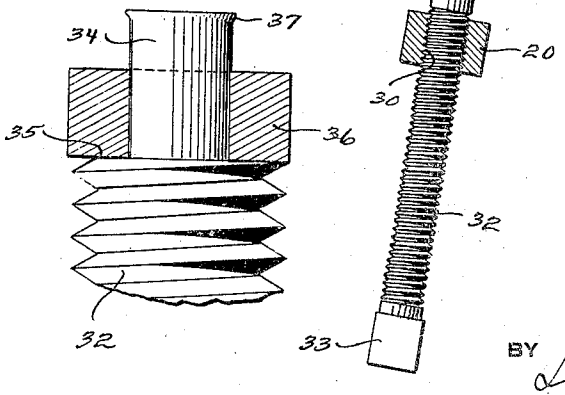
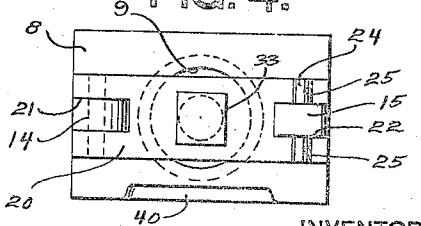


FIG. 4.



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UNITED STATES PATENT OFFICE

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SPINDLE BOLT REMOVER

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The present invention relates to spindle bolt removers and more specifically to a tool of this character adapted for use in removing spindle bolts from model "A" Ford cars and model "AA" Ford trucks such as disclosed in the illustrative booklet copyrighted 1929 by the Ford Motor Company of Detroit, Michigan.

The primary object of the invention is to provide a spindle bolt remover having a construction permitting quick and easy attachment of the tool for use.

A further object of the invention is to provide a spindle bolt remover for Ford cars and trucks which is of such specific construction as to permit proper application of the tool so as to exert pressure axially upon the spindle bolt.

A further object of the invention is to provide a tool of this character embodying features of construction rendering the tool extremely strong and capable of exerting the required pressure for removal of the spindle bolt.

Other objects and advantages of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, and in which drawings:

Figure 1 is a longitudinal section thru the improved tool,

Figure 2 is a sectional view thru the tool shown applied for use,

Figure 3 is a section on line 3—3 of Figure 2 and showing the spindle bolt partially removed,

Figure 4 is a bottom plan view of the tool, and

Figure 5 is an enlarged detail view of the spindle bolt engaging end of the pressure screw.

In the drawings, and wherein similar reference characters designate corresponding parts thruout the several views, the letter A designates a front axle of a motor vehicle having spindles B mounted upon each end thereof as by the spindle bolt C having a pressed fit thru the axle A. The letter D may designate the improved tool for removing the spindle bolt C to permit separation of the spindle B from the axle A.

The tool D includes a flat, rectangular-shaped top or head plate 8 provided with a centrally disposed circular opening 9 which preferably has a slight flaring taper toward the upper surface of the plate. This circular opening 9 is of a diameter to allow the top plate to readily slip over the head of the spindle bolt and bearing 10 at the top of the spindle body. Provided in each end of the top plate 8 and at the longitudinal center thereof are terminally opening slots 12 and 12′ the first of which receives one end of a coupling arm or strap 14 and the latter of which receives one end of a latch arm or strap 15.

The coupling arm 14 is pivotally mounted in the slot 12 by means of a hinge pin 16 permitting free swinging movement of the head plate in a direction longitudinally of the arm. The latch arm 15 is pivotally connected at one end in the slot 12′ by means of a hinge pin 17 whereby the latch arm may swing free in a direction parallel to the direction of swinging movement of the coupling arm 14. The arms 14 and 15 are so mounted in the slots 12 and 12′ as to be capable of swinging movement into longitudinal alignment with the rectangular-shaped top plate so that if so required the elements 8, 14 and 15 may be disposed in straight longitudinal alignment for positioning of the tool about the spindle.

Pivotally connected at one end to the lower end of the coupling arm 14 is a cross-bar 20 provided with terminally opening slots 21 and 22 forming forked ends. The lower end of the coupling arm 14 is pivotally connected in the slot 21 by a hinge pin 23 extending parallel with the pins 16 and 17 and permitting swinging movement of the cross-bar into longitudinal alignment with the coupling arm.

The lower or free end of the latcharm 15 is adapted to be detachably coupled to the cross-bar 20 and is provided adjacent its free end with a latch pin 24 which projects thru the arm and is seated in semicircular shaped grooves 25 provided in the lower side of the

cross-bar at opposite sides of the slot 22. When the ends of the latch pin 24 are engaged in the grooves 25, with the latch arm disposed in the slot 22, the top plate 8 will be connected, by the arms 14 and 15 in parallel relation, to the cross-bar 20.

Formed centrally thru the cross-bar 20 is a threaded opening 30 for threaded reception of a pressure screw 32 provided at one end with a wrench square 33. The inner end of the screw 32 is reduced and formed with a plain cylindrical guide extension 34 extending co-axial with the threaded portion of the screw and forming an annular shoulder 35. Mounted upon the guide extension 34 is a sleeve 36 having a height less than the length of the extension so that a portion of the extension projects beyond the sleeve. The sleeve is freely rotatable upon the guide extension and may be held against displacement by slightly upsetting the end of the extension as at 37. The sleeve may be of a diameter equal to the diameter of the threaded portion of the screw and act to prevent the screw from being separated from the cross-bar 20. The end of the axial guide extension 34 which projects beyond the sleeve 36 is intended to be received in the usual opening provided in the lower end of spindle bolts as shown in Figure 2. The sleeve 36 is of a diameter slightly less than the diameter of the spindle bolt and is adapted to engage the lower end of the bolt when the tool is applied for use. The sleeve 36 acts as a bearing to prevent injury to the threads on the screw 32 and bears against the shoulder 35 when the sleeve engages the spindle bolt.

When the head plate 8 and cross-bar 20 are connected by the arms 14 and 15, the threaded opening 30 will be in axial alignment with the opening 9.

The head plate 8 is provided along one lower side edge with a rabbet or recess 40 to provide clearance for a flange 41 formed on the spindle body portion. This recess 40 allows the top or head plate 8 to fit flat on the top of the spindle body so that pressure may be exerted in a straight line upon the spindle bolt.

In applying the tool for use, the latch arm 15 is first uncoupled from the free end of the cross-bar 20 and the sections 8, 14, 15 and 20 swung in such angular relation to one another as to permit easy placing of the head plate 8 over the head of the spindle bolt. When in this position the pivotally connected arms 14 and 15 will pendently hang from the head plate with one of the arms disposed at each side of the axle A. The screw 32 may then be grasped and act as a handle for swinging the cross-bar into a position across the lower side of the spindle head so that the latch pin 24 may be engaged in the grooves 25 and the tool assembled into a frame extending about the spindle body. The screw 32 may then be rotated and the extension 34 guided into the opening in the lower end of the spindle bolt, and continued rotation of the screw will force the spindle bolt upwardly thru the end of the axle A.

While the tool has been shown of a construction especially well adapted for removing spindle bolts from model "A" Ford cars and model "AA" Ford trucks, the tool may readily be adapted for use in removing spindle bolts from various other types of motor vehicles thru slight changes in the formation of the head plate.

Changes in detail may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

We claim:

1. A spindle bolt remover comprising a head plate provided with a spindle receiving opening, an arm pivotally connected with each end of the head plate, a cross-bar pivotally connected at one end to the opposite end of one of said arms, means detachably coupling the opposite arm to the opposite end of the cross-bar, and a pressure screw threaded thru the cross-bar for axially aligning with the opening in the head plate.

2. A spindle bolt remover comprising a broad flat head plate having a spindle receiving opening, a coupling arm pivotally connected at one end to one end of the head plate, a latch arm pivotally connected at one end to the opposite end of the head plate, a cross-bar pivotally connected at one end to the opposite end of the coupling arm, means detachably coupling the opposite end of the latch arm to the opposite end of the cross-bar for disposing the cross-bar in parallel relation to the head plate, and a pressure screw threaded thru the cross-bar in parallel relation to the coupling and latch arms for axially aligning with the opening in the head plate.

3. A spindle bolt remover comprising a flat rectangular-shaped head plate having a spindle receiving opening and terminally opening slots at each end of the plate, a coupling arm pivotally connected at one end in one of the slots, a latch arm pivotally connected at one end in the opposite slot, a cross-bar having terminally opening slots at each end thereof, means pivotally connecting one end of the coupling arm in one of the cross-bar slots, a latch pin carried by the free end of the latch arm for latching engagement with the cross-bar when the latch arm is moved into the slotted end of the cross-bar, and a pressure screw threaded thru the cross-bar for axially aligning with the opening in the head plate.

4. A spindle bolt remover comprising a flat rectangular-shaped head plate having an opening for receiving the upper end of a

spindle bolt and having a terminally opening slot in each end thereof, a coupling arm pivotally connected to the head plate in one of the slots, a latch arm pivotally connected to the head plate in the opposite slot, a cross-bar having a terminally opening slot at each end thereof, means pivotally connecting the lower end of the coupling arm in one of the slots of the cross-bar, said latch arm adapted to have swinging movement into the slot at the opposite end of the cross-bar, a latch pin carried by the free end of the latch arm for engaging in recesses formed transversely across the lower side of the cross-bar at opposite sides of the latch arm receiving slot, and a pressure screw threaded thru the medial portion of the cross-bar.

5. A spindle bolt remover comprising a flat, rectangular-shaped top plate provided with a spindle bolt head receiving opening and terminally opening slots, a coupling arm pivotally connected at one end to the top plate in one of the slots, a latch arm pivotally connected at one end to the top plate in the opposite slot, a cross-bar having terminally opening coupling arm and latch arm receiving slots, means pivotally connecting the lower end of the coupling arm to the cross-bar in the coupling arm slot, arcuate-shaped grooves formed transversely of the lower side of the cross-bar at the latch arm slot, a latch pin carried by the free end of the latch arm and projecting beyond each side thereof for engaging in said grooves for connecting the crossbar in parallel relation to the top plate, and a pressure screw threaded thru the central portion of the cross-bar for axially aligning with the opening in the top plate.

6. A spindle bolt remover comprising a flat head plate having a spindle receiving opening, a cross-bar having a threaded opening thru its central portion, a coupling arm pivotally connecting the head plate and cross-bar, a latch arm pivotally connected with one end to the head plate and having detachable coupling with the cross-bar, a pressure screw threaded thru the opening in the cross-bar and having a reduced guide forming extension at its inner end, and a bearing sleeve freely rotatable on the extension.

7. A spindle bolt remover for Ford cars and trucks, comprising a flat rectangular-shaped top plate having a relatively large spindle-bolt head receiving opening and having a rabbet formed along one lower side edge thereof, a coupling arm pivotally connected to one end of the head plate and depending therefrom, a latch arm pivotally connected to the opposite end of the head plate and depending therefrom, a cross-bar, means pivotally connecting the lower end of the coupling arm to one end of the cross-bar, means detachably coupling the free end of the latch arm to the opposite end of the cross-bar, and a pressure screw threaded thru the cross-bar to extend parallel with the coupling and latch arms when in a frame forming condition connecting the head plate and cross-bar in parallel relation.

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