May 15, 1956 G. L. LEAKE 2,745,448

SCREW REMOVING TOOL

Filed Jan. 31, 1955

FIG. 1.

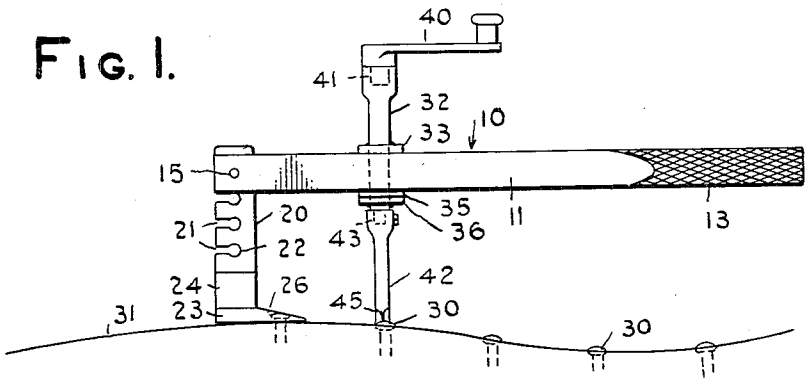


FIG. 2.

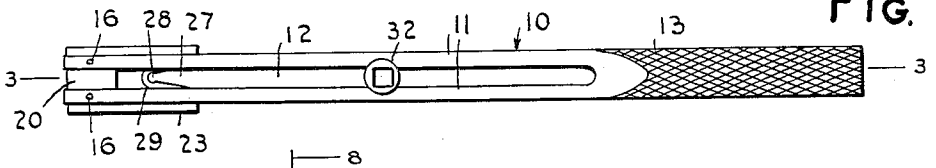


FIG. 3.

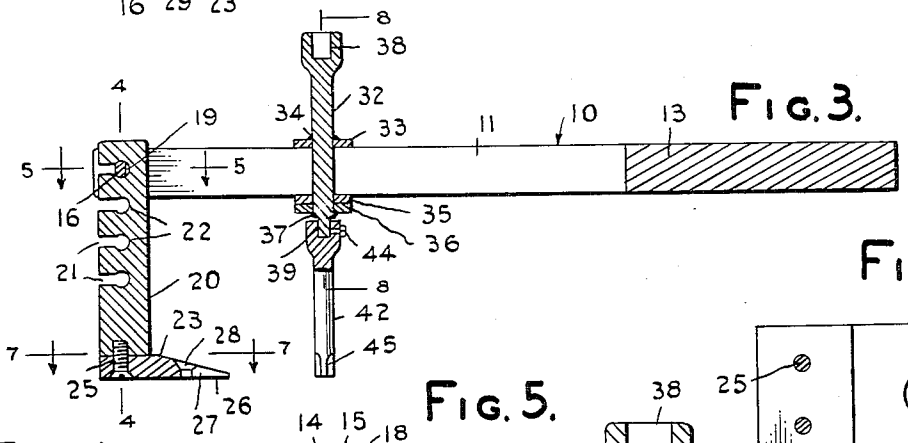


FIG. 7.

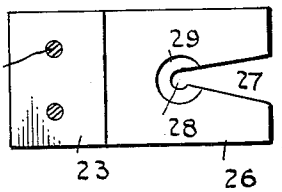


FIG. 5.

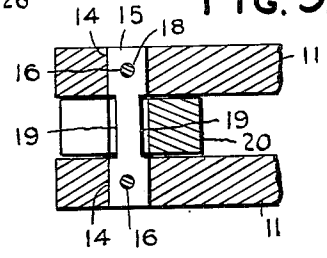


FIG. 4.

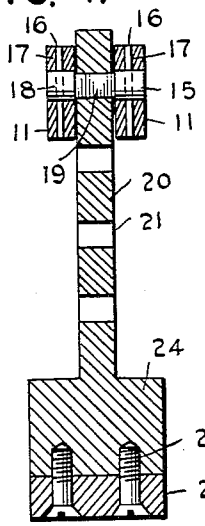


FIG. 6.

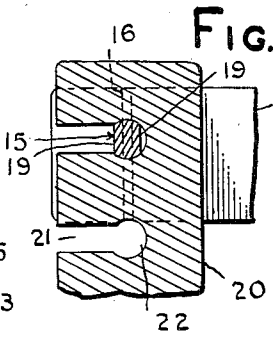
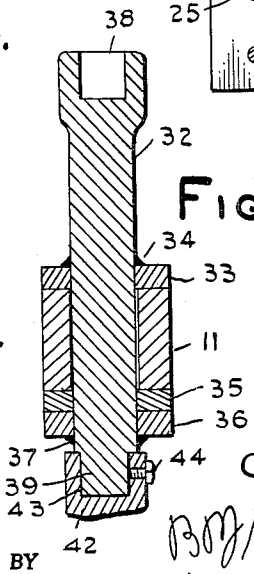


FIG. 8.



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SCREW REMOVING TOOL

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Application January 31, 1955, Serial No. 484,921

3 Claims. (Cl. 144—32)

My invention relates to a screw removing tool.

An important object of the invention is to provide a device of the above-mentioned character, which may be employed to quickly and conveniently remove screws from surfaces such as airplane surfaces.

A further object of the invention is to provide a tool of the above-mentioned character for removing screws applied to curved or irregular surfaces and which is adjustable toward and from the surface and also angularly adjustable with respect to the surface.

A further object of the invention is to provide a tool of the above-mentioned character which is of simple construction and is cheap to manufacture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout same,

Figure 1 is a side elevation of a tool embodying my invention, showing the same in use,

Figure 2 is a plan view of the tool, parts omitted,

Figure 3 is a longitudinal section taken on line 3—3 of Figure 2,

Figure 4 is a transverse section taken on line 4—4 of Figure 3,

Figure 5 is a horizontal section taken on line 5—5 of Figure 3,

Figure 6 is an enlarged section similar to Figure 3, parts broken away, showing the upper end of the supporting leg,

Figure 7 is a horizontal section taken on line 7—7 of Figure 3, and,

Figure 8 is a transverse vertical section taken on line 8—8 of Figure 3.

In the drawings, where for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a supporting arm or bar including forward spaced sides 11, forming a longitudinal vertical passage 12 between them. Formed integral with the rear end of this supporting arm or bar is a handle 13. The sides 11 are provided near their forward ends with transverse cylindrical openings 14, receiving a cylindrical pin 15, removably held in place within the openings 14 by pins 16 which extend through openings 17 formed in the sides 11 and openings 18 formed in the pin 15. The pin 16 is securely held in place upon the arms 11 but may be removed therefrom, when desired. The pin 15 is provided with intermediate flats 19.

The numeral 20 designates an upstanding supporting leg, which is preferably in the form of a strap. This supporting leg has horizontal vertically spaced slots 21 formed therein, passing through the forward edge of the supporting leg and these slots lead into cylindrically curved recesses or openings 22, having diameters slightly larger than the transverse dimensions of the slots. The openings or recesses 22 are spaced from the rear edge of the supporting leg, as shown.

The supporting arm or bar 10 may be vertically arranged with respect to the supporting leg 20, and this will bring the flats 14 parallel with the side walls of the slots 21, and in this position, the pin 15 may be passed through a selected slot 21, and the supporting arm or bar then swung at substantially right angles to the supporting leg at which time the side portions of the pin 15 will project beyond the walls of the selected slot 21 and will prevent the separation of the elements 11 and 20, but the supporting arm or bar is pivotally connected with the supporting leg, and may be swung with respect to the same. The slots 21 are spaced and arranged in a group which extends longitudinally of the supporting leg and this renders it possible to mount the supporting arm or bar 10 upon the supporting leg at different selected elevations with respect to the work.

The numeral 23 designates a screw engaging foot rigidly and detachably secured to an enlargement or boss 24, formed integral with the lower end of the leg 20 and detachably secured thereto by screws 25. This foot has an inclined upper surface forming claws 26, and a slot 27 is arranged between the claws and this slot leads to an opening 28 and recess 29. The opening 28 is designed to receive the shank of the screw and recess 29 the head of the screw. The screws are designated by the numeral 30, Figure 1, and these screws have heads provided with slots or recesses to receive the tangs of the screw driver element. The screws 30, Figure 1, are shown secured to the work 31, which may have a curved surface.

The tool further comprises a rotary spindle 32, disposed at right angles to the supporting arm or bar 10 and this spindle extends through and has a sliding fit within the passage 12. The spindle has a ring or collar 33 mounted thereon, above the supporting arm or bar 10, and this ring or collar 33 is rigidly secured to the spindle 32 by any suitable means, such as welding 34. Arranged beneath the supporting arm or bar 10 is a floating washer 35, rotatable upon the spindle 32. This washer is arranged above a ring or collar 36, rigidly mounted upon the spindle 32 and secured thereto by welding 37 or the like. It is thus seen that the spindle 32 is held at right angles to the supporting arm or bar 10 and is free to be shifted longitudinally of the same and is rotatable with relation to the supporting arm or bar. The spindle 32 is provided at its upper end with a socket 38, having a recess which is square in cross section and is provided at its lower end with a bit 39, square in cross section.

The spindle 32 may be rotated by any suitable means and for the purpose of illustration, I have shown a rotary crank 40 having a shank 41, square in cross section, to engage within the socket 38 for turning the spindle. The spindle may be power operated, if desired.

Arranged beneath the spindle 32 is a screw driver element 42, provided at its upper end with a socket 43, having a recess square in cross section, to receive the bit 39 and the socket may be clamped to the bit by a bolt or set screw 44. At its lower end, the screw driver element 42 has tangs 45 to engage within the slots or recesses formed in the head of the screw.

The operation of the tool is as follows:

Where the screws 30 are in a row, one screw may be partly unscrewed and the foot 23 engaged beneath the head of this screw. The foot 23 faces in the direction of the free end of the handle 13. This foot will securely attach the supporting leg to the work. The supporting arm or bar 10 is vertically adjusted with respect to the supporting leg, depending upon the desired elevation of the arm 10, which in turn is regulated by the elevation of the screw to be removed. Since the first screw to be removed is in upper elevation, the pin 15 is held within the

uppermost opening or recess 22 of the leg. The supporting arm or bar 10 may be angularly adjusted with respect to the supporting leg 20 and the screw, to bring the screw driver element 42 into accurate axial relation with respect to the screw. The spindle 32 is now adjusted longitudinally of the supporting arm or bar 10 to bring the screw driver element 42 close to the selected screw and the supporting arm or bar 10 is now swung downwardly so that the tangs 45 will engage within the slots or recesses of the head of the screw. Downward pressure may be exerted upon the handle 13 to retain the screw driver element in proper engagement with the screw and during this operation, the spindle 32 is rotated to drive the screw driver element 42 in the proper direction for unscrewing the screw. As stated, this driving action may be effected manually or the spindle may be power driven. To remove the next screw 30, the spindle 32 is adjusted longitudinally of the supporting arm or bar 10 to bring the screw driver element close to such next screw, and the operation is repeated. When the screw to be removed is at a considerably lower elevation, the pin 15 will be inserted into the selected lower opening or recess 22.

In order that the spindle 32 may be applied to the supporting arm or bar 10, the pin 15 must be removed, and the pin is substantially returned in place.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A tool for removing screws from flat or irregular surfaces comprising an upstanding leg to be arranged generally at right angles to the surface of the work, said leg provided in one vertical side thereof with a plurality of vertically spaced slots extending transversely through the leg and opening through said side, there being a corresponding number of enlarged cylindrical recesses at the inner ends of said slots and communicating therewith near the transverse center of the leg, a foot secured to the lower end of the leg for engaging the surface of the work and having spaced claws extending transversely beyond one side of the leg, said claws adapted to receive between them a partly removed screw, an elongated supporting arm to be arranged generally horizontally above the work and including spaced sides forming a longitudinal passage between them adapted to receive said leg, a transverse pin extending between and connecting said sides near their free ends, said pin provided upon opposite sides thereof with flat faces, whereby the pin may enter and pass through a selected one of the slots when the flat faces of the pin are arranged parallel to the opposite sides of the slot, the supporting arm and pin then being turned upon the axis of the pin so that the pin will be held within said enlarged cylindrical recess and form therewith a pivotal connection between the leg and said supporting arm, a spindle engaging through said longitudinal passage between the sides of the supporting arm and shiftable longitudinally of the arm, means for maintaining the spindle substantially at right angles to the supporting arm, and means adapting said spindle for connection with a screw driver element beneath the supporting arm, the upper end of said spindle being adapted for connection with rotary driving means above the supporting arm.

2. A tool for removing screws from flat or irregular surfaces comprising an upstanding leg, said leg being provided in one vertical side with a plurality of vertically spaced slots opening through said side and extending entirely through the leg transversely thereof, the leg having a corresponding number of enlarged cylindrical recesses extending transversely therethrough at the inner ends of said slots and having their longitudinal axes arranged horizontally, whereby the slots open through the sides of said cylindrical recesses, a substantially horizontal foot secured to the lower end of said leg and including a pair of spaced claws extending beyond the vertical side of the leg opposite to said slots, an elongated supporting arm to be arranged generally horizontally above the work and having a handle portion at one end thereof remote from said leg, said arm having a long longitudinal slot formed therethrough forwardly of said handle portion and opening through the opposite end of the arm and adapted to receive the leg, a transverse cylindrical pin secured to said arm near its end remote from the handle portion and extending across the slot of the arm and being provided upon opposite sides and within the slot with a pair of parallel flat faces, said faces being normal to the sides of the slots in said leg when the arm is at right angles to the leg, said faces being parallel with the sides of the slots of the leg when said arm is turned to extend longitudinally of the leg, whereby the pin may pass through a selected one of the slots of the leg and engage within the corresponding cylindrical recess to form therewith a free pivotal connection between the arm and leg, a spindle engaging the slot of the arm and guided thereby and shiftable longitudinally of the slot of the arm, means carried by the spindle and engaging said arm to maintain the spindle substantially at right angles thereto, a screw driver element secured to the lower end of the spindle below said arm, and means to drive the spindle.

3. A tool for removing screws or the like comprising a rigid leg to be arranged generally at right angles to the surface of the work, said leg having transverse slots formed therein and spaced longitudinally of the leg, said slots having outer open ends and inner closed ends, a foot secured to the lower end of the leg adjacent to the work and having spaced claws to receive between them a partly removed screw, a supporting arm including spaced sides forming a passage between them to receive the rigid leg when the leg is positioned near the ends of said sides, a pin connecting said sides near their ends and adapted for insertion within a selected slot of the leg, said pin being pivotally mounted within said slot and removable laterally from the slot, whereby the pin serves to pivotally connect said arm to the leg and also facilitates adjusting the arm vertically with respect to the leg, a spindle mounted within the passage between said sides and adjustable longitudinally of said sides, means to hold the spindle substantially at right angles to the sides, means arranged above the supporting arm to drive the spindle, and a screw driver element secured to the spindle.

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