

April 26, 1955

J. V. MILLER

2,706,849

SLEEVE WITHDRAWING DEVICE

Filed Nov. 5, 1951

2 Sheets-Sheet 1

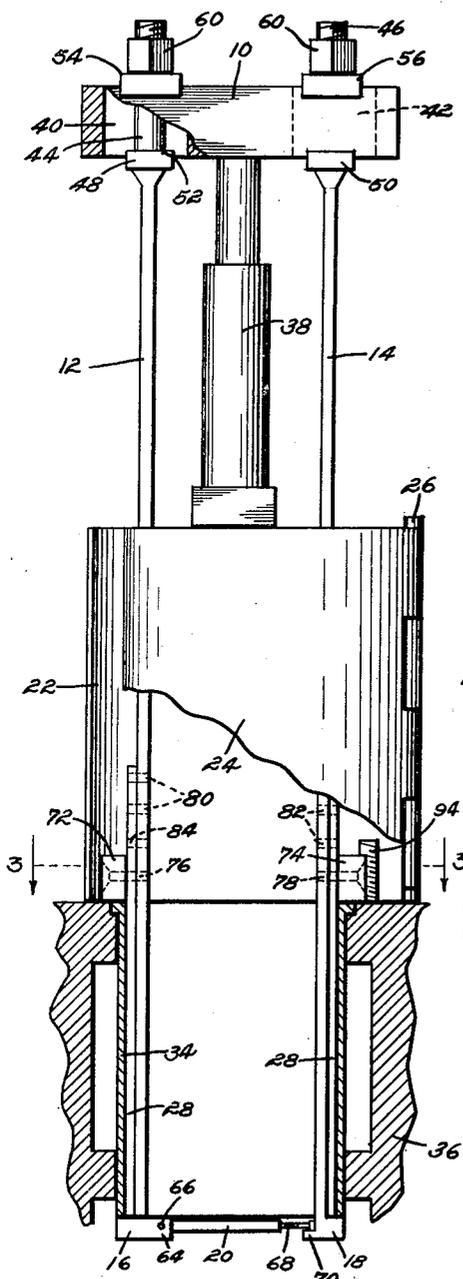


Fig. 1.

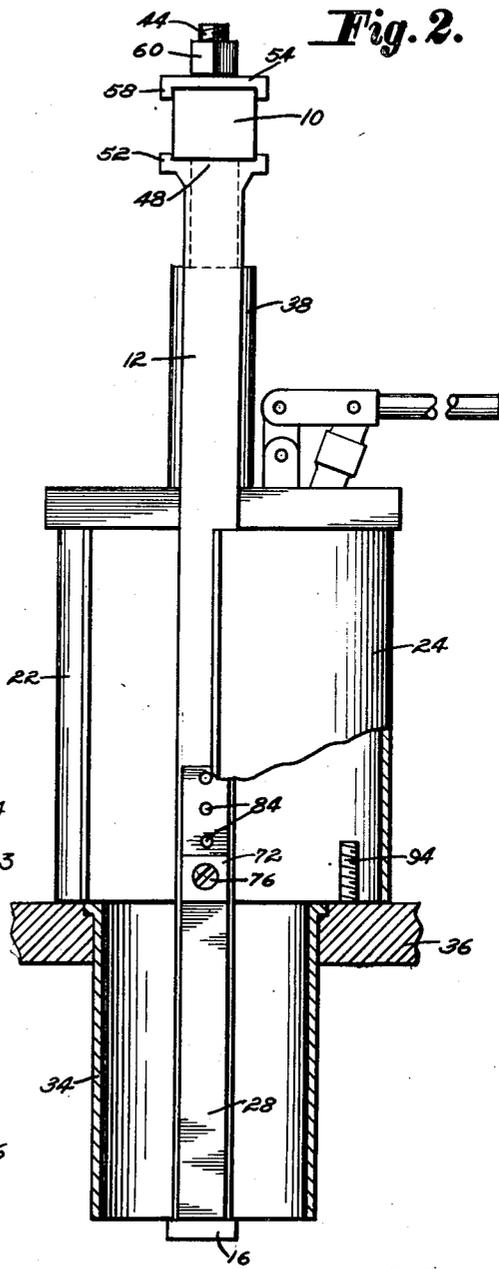


Fig. 2.

INVENTOR.
JOHN V. MILLER
BY *Arthur H. Sturges*
Attorney

1

2,706,849

SLEEVE WITHDRAWING DEVICE

John V. Miller, Fancy Prairie, Ill.

Application November 5, 1951, Serial No. 254,909

2 Claims. (Cl. 29—252)

This invention relates to sleeve pullers particularly of the type used for removing sleeves used as liners of cylinders of internal combustion engines, and in particular improvements in sleeve pullers such as shims positioned between gripping jaws of pullers and sleeves to insure positive gripping relation between the jaws and a sleeve, and also hinged spacing sleeves extended from cylinder blocks to facilitate positioning the spacing sleeves around projecting cylinder head studs and the like.

The purpose of this invention is to facilitate installing sleeve pullers on engine blocks, insure positive gripping relation between jaws of sleeve pullers and sleeves, and prevent engagement of the gripping jaws of sleeve pullers with the inner surfaces of cylinders in which the sleeves are positioned when the sleeves are comparatively thin.

In the conventional type of sleeve puller and also in sleeve pullers as disclosed in my prior patent No. 2,566,847 difficulty has been experienced in that the jaws reach over the sleeves and engage the cylinder block, and to overcome this objection to pullers of this type this invention provides shims adapted to be positioned between the arms on which the jaws are carried and the sleeves so that the jaws grip only the sleeves to be withdrawn.

With the conventional type of sleeve puller the spacing sleeve positioned against the cylinder block to provide a mounting for a hydraulic jack comes in contact with cylinder head studs projecting from the end of the block and for this reason positioning of the spacing sleeve is difficult. For this reason the sleeve puller of this invention contemplates using a spacing sleeve formed of hinged sections whereby the sections are readily opened and positioned around the said studs.

The invention also contemplates a crosshead mounting for sleeve pullers wherein round studs with T-shaped heads are provided on extended ends of the jaw carrying arms and the threaded ends of the studs extend through slots in the crosshead whereby the crosshead is clamped between the heads of the studs and flanged washers with nuts threaded on the extended ends of the studs.

The object of this invention is, therefore, to improve the structure of sleeve pullers of this type whereby an efficient positive functioning sleeve puller is provided.

Another object of the invention is to provide an improved sleeve puller in which spacing shims are attached to gripping jaws of the puller to compensate for the thin wall of the sleeve.

Another object of the invention is to provide an extended jaw for use on the jaw of a sleeve puller whereby the gripping jaw of a sleeve puller extends over a beveled surface on the inner edge of a sleeve.

A further object of the invention is to provide an improved spacing sleeve for sleeve pullers whereby hinged sections of the spacing sleeve are adjustably positioned to pass between cylinder head studs projecting from the cylinder block.

A still further object of the invention is to provide a sleeve puller having adjustable elements in combination therewith for extending the usefulness and efficiency of the device which is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a sleeve puller having substantially parallel jaw carrying arms extended from a crosshead with a spacing sleeve formed with hinged sections

2

positioned around the arms, with a latch for retaining the extended ends of the arms in spaced relation, and with shims adapted to be attached to outer surfaces of the arms to facilitate using the puller with comparatively thin sleeves.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a front elevational view of the improved sleeve puller with parts broken away and with parts shown in section.

Figure 2 is an end elevational view of the sleeve puller also with parts broken away and parts shown in section.

Figure 3 is a sectional plan through the sleeve puller taken on line 3—3 of Figure 1.

Figure 4 is a detail showing a typical section through one side of the sleeve puller showing a shim positioned between a jaw carrying arm of the puller and a sleeve in a cylinder, and showing the parts on an enlarged scale.

Figure 5 is a view showing a similar detail wherein the shim is provided with an extended jaw for gripping sleeves having beveled inner edges.

Figure 6 is a detail showing one of the shims of the type illustrated in Figure 4.

Figure 7 is a similar detail showing a shim of the type illustrated in Figure 5.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved sleeve puller of this invention includes a crosshead 10, arms 12 and 14 with jaws 16 and 18, respectively, on extended ends thereof, a latch bar 20, a spacing sleeve formed with sections 22 and 24 connected with a hinge 26, a straight shim 28, and a shim 30 having a jaw 32 on one end thereof.

With the parts assembled the jaws 16 and 18 grip a sleeve 34 in a cylinder of a block 36 and a hydraulic jack 38 positioned between the outer end of the spacing sleeve and crosshead applies force to the sleeve 34 whereby the sleeve is withdrawn from the cylinder block.

The crosshead 10 is provided with elongated slots 40 and 42 through which studs 44 and 46 extend and the studs are connected to the arms or flat bars 12 and 14 through heads 48 and 50, respectively, which are provided with flanges 52 that extend over the sides of the crosshead. The studs are provided with washers 54 and 56 that are positioned against the opposite side of the crosshead and the washers are provided with flanges 58 and nest over the sides of the crosshead. The washers are clamped against the crosshead by nuts 60 which are threaded on the studs.

The jaw 16 which is positioned on the opposite end of the arm 12 extends outwardly to engage the end of the sleeve 34, and the inner side of the jaw is provided with spaced fingers 62 and 64 between which the latch bar 20 is pivotally mounted by a pin 66. The opposite end of the latch bar is provided with a threaded stud 68 that is positioned to rest upon an extension 70 of the jaw 18 which is positioned on the end of the arm 14. The jaw 18 extends outwardly from the arm 14 to engage the inner end of the sleeve 34.

The outer surfaces of the arms 12 and 14 are provided with positioning blocks 72 and 74, respectively, which are secured in position with screws 76 and 78, and the screws are adapted to be threaded into spaced openings 80 and 82 in the arms whereby the blocks are located to position the jaws on the ends of the arms against the end of the sleeve 34.

When the sleeve puller is used for withdrawing comparatively thin sleeves from cylinders elongated strips such as the straight shims 28 are used against the outer surfaces of the arms 12 and 14, and these shims are provided with spaced openings 84 which register with the openings 80 in the arm 12 and 82 in the arm 14, so that the shims are retained in position with the screws of the blocks 72 and 74. With these shims in position, as illustrated in Figure 4, the extended ends of the jaws 16 and 18 are spaced inwardly from the edge of the cylinder wall so that they will engage the end of the sleeve without engaging the inner end of the cylinder.

The improved sleeve puller of this invention also includes the shims 30 with the jaws 32 on one of the ends

thereof, and when the sleeve is provided with an inner end having a beveled inner edge, such as the surface 86 of a sleeve 88, shown in Figure 5, the shims 30 are used against the outer surfaces of the arms 12 and 14 so that the gripping elements are extended to engage the end of the sleeve beyond the beveled surface. The shims 30 are provided with spaced openings 90 which also register with the openings 80 and 82 of the arms 12 and 14 so that these shims are also retained in position with the screws 76 and 78 of the blocks 72 and 74. The jaws 32 of the shims 30 are provided with recesses 92 into which the jaws 16 and 18 of the arms 12 and 14 extend.

In positioning the wheel puller on a cylinder block the sections of the spacing sleeve are adjusted to clear cylinder head studs 94 that project from the face of the cylinder block as shown in Figures 1, 2 and 3.

With the improvements of this invention it is possible to withdraw comparatively thin sleeves or liners from engine cylinders and also sleeves having beveled inner edges, and where cylinder head studs interfere with positioning the spacing sleeve of the puller, the spacing sleeve is opened as shown in Figure 3, so that it may extend around or between the studs. These improvements, therefore, make it possible to provide a sleeve puller that is adapted for universal use.

From the foregoing description it is thought to be obvious that an improved sleeve puller constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice, except as claimed.

What is claimed is:

1. In a sleeve puller, the combination which comprises a crosshead having spaced longitudinally disposed elongated slots therein, spaced parallel flat elongated bars extended from said crosshead, studs integral with the bars and extended through the slots of the crosshead, nuts threaded on the studs for clamping the bars in adjusted

positions in the crosshead, said bars having jaws on extended ends thereof, a latch bar hinged to the jaw of one end of said flat bars, a stud threaded into the extended end of said latch bar and positioned for engagement with the flat bar spaced from the flat bar on the jaw of which the latch bar is hinged, elongated strips providing spacing shims positioned on the outer surfaces of said flat bars, and positioning blocks adjustably mounted on the outer surfaces of the shims adapted to space said jaws from the end of a cylinder block a distance equivalent to the length of a sleeve in said block.

2. In a sleeve puller, the combination which comprises a crosshead, elongated flat strips of material providing arms adjustably mounted in said crosshead, said arms being positioned with opposed inner faces and having extensions projecting from said inner faces and positioned on ends thereof opposite to the ends mounted in the crosshead, said arms also having jaws extended from outer surfaces thereof and said jaws also positioned on ends of the arms opposite to the ends mounted in the crosshead, a latch bar pivotally mounted in the extension of one of said arms and positioned whereby a screw threaded in the extended end thereof is adapted to rest upon the extension of the other arm, said screw providing means for adjusting the length of the latch bar, shims also having gripping jaws extended therefrom positioned against the outer surfaces of the arms, said shims having notches therein and said notches being positioned to receive the jaws of the arms, positioning blocks spaced the length of a sleeve to be pulled from said jaws of the shims positioned on the outer surfaces of the shims, and bolts extended through said blocks and threaded in the shims and arms.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|-----------|---------------|
| 788,287 | Swanson | Apr. 25, 1905 |
| 1,478,648 | Grahek | Dec. 25, 1923 |
| 1,484,130 | Holmstrom | Feb. 19, 1924 |
| 1,673,227 | Byrd | June 12, 1928 |
| 2,263,778 | Howard | Nov. 25, 1941 |
| 2,566,847 | Miller | Sept. 4, 1951 |