

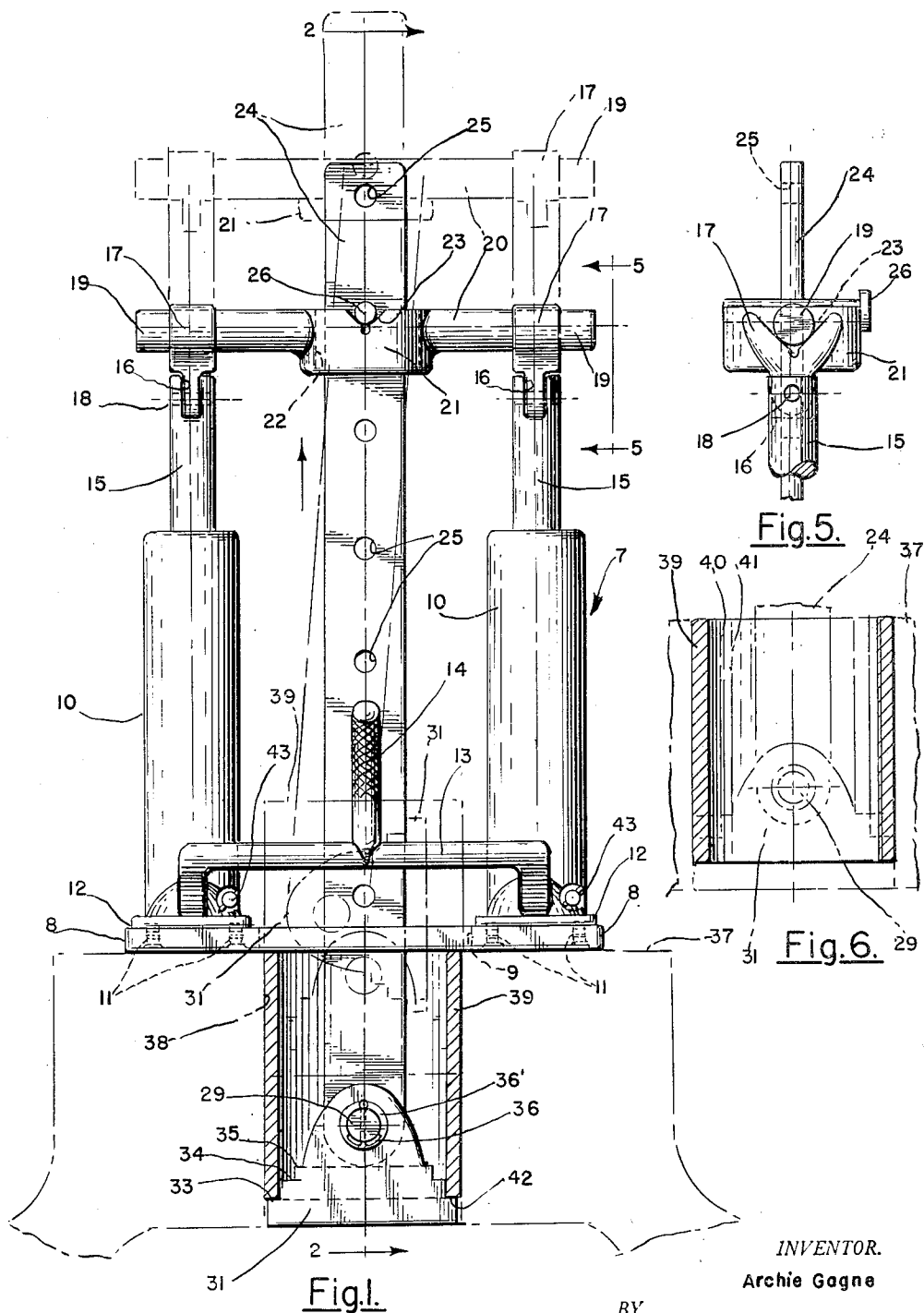
May 9, 1950

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YOKE AND DRAWBAR ELEMENT FOR HYDRAULIC
SLEEVE-PULLING DEVICES

2,507,003

Filed Nov. 22, 1948

2 Sheets-Sheet 1



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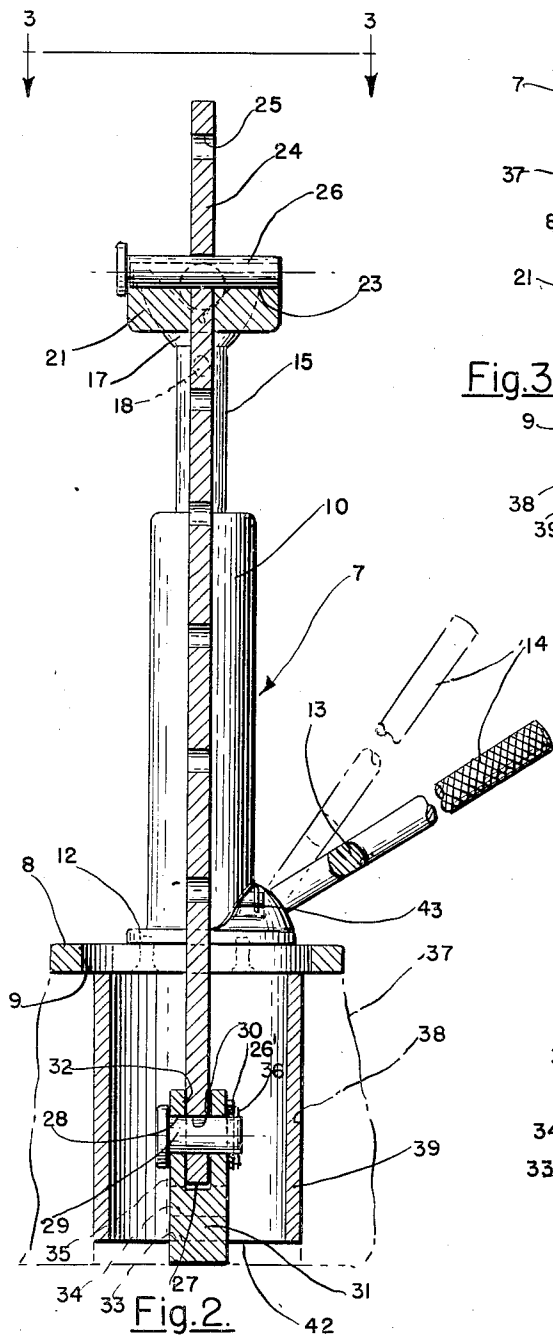


Fig. 2.

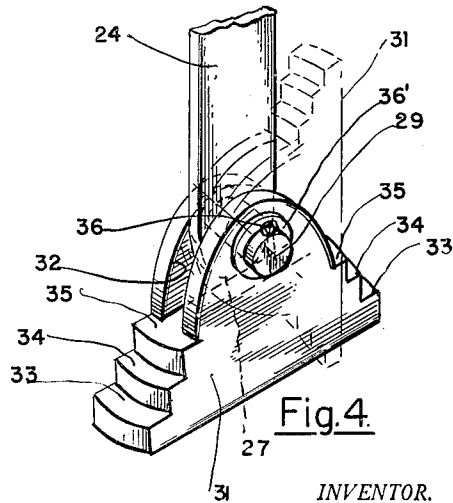
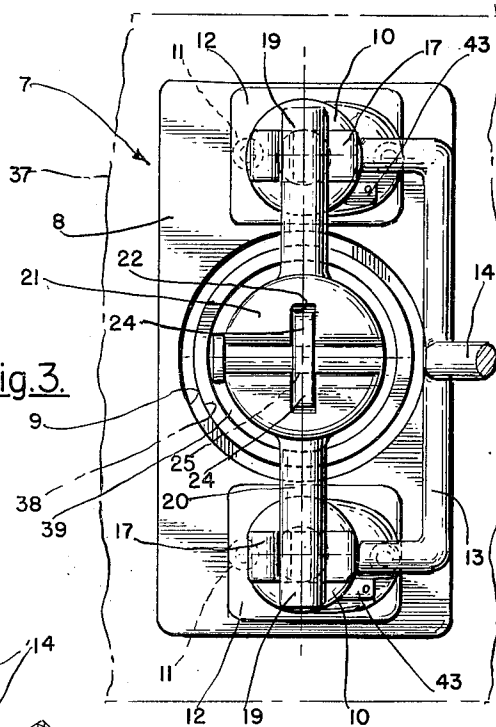


Fig. 4.

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2,507,003

YOKE AND DRAWBAR ELEMENT FOR HYDRAULIC SLEEVE-PULLING DEVICES

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Application November 22, 1948, Serial No. 61,437

1 Claim. (Cl. 29—283)

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My invention relates to sleeve-pulling devices.

In present practice the cylinders of heavy duty internal combustion motors such as are used on tractors and trucks are provided with inner sleeves. When the said inner sleeves become worn, they are replaced, which operation is a difficult two-man job. Therefore, I have provided a hydraulic sleeve-pulling device by means of which one man can easily and quickly remove the inner sleeve from the cylinder.

A most important object of my invention is to provide a hydraulic sleeve-pulling device consisting of connected hydraulic jacks, a sleeve-pulling bar, and a sleeve-pulling jaw of stepped formation which may be mounted on the cylinder head of any standard heavy duty internal combustion motor for the purpose of pulling the inner sleeves from the cylinders thereof.

A further important object of my invention is to provide a hydraulic sleeve-pulling device, the sleeve-pulling jaw of which is provided with stepped sleeve engaging portions for engaging any one of the three standard inner diameter sizes which have the same outer diameter to fit in the standard cylinder bore of the said heavy duty internal combustion motor.

A further object of my invention is to provide a hydraulic sleeve-pulling device having articulate connecting means between the hydraulic jack pistons and the sleeve-puller bar yoke.

A still further object of my invention is to provide cradling and locating means between the said puller bar yoke and the sleeve-puller bar.

A further object of my invention is to provide adjustment means on the said sleeve-puller bar for adapting the same to permit pulling inner sleeves of different lengths.

A still further object of my invention is to provide a hydraulic sleeve-pulling device having unitary control, jack manipulating means to allow one man to operate my hydraulic sleeve-pulling device.

Other objects and advantages inherent in my invention will be disclosed in the following description and the accompanying illustrations in which like parts are designated by like numerals and in which:

Fig. 1 is an elevational view of my hydraulic sleeve-pulling device shown in connection with an inner sleeve mounted within the cylinder of a motor block drawn in phantom lines.

Fig. 2 is a side view of my invention, partly in cross section, taken looking in the direction of lines 2—2 on Fig. 1.

Fig. 3 is a top view of my invention taken looking in the direction of lines 3—3 on Fig. 2.

Fig. 4 is an enlarged perspective view of the sleeve-pulling jaw which is one of the important component elements of my invention.

Fig. 5 is a fragmentary side view showing the V-shaped pillow block means of my invention taken looking in the direction of lines 5—5 on Fig. 1.

Fig. 6 is a fragmentary cross-sectional view of the motor block cylinder drawn in phantom lines and showing an inner sleeve mounted therein and showing in phantom lines the I. D. dimensions of several inner sleeves which might be interchangeably used in connection with the sleeve-pulling jaw of stepped formation of my invention.

Referring to the illustrations, my invention is generally designated 7 and consists of an oblong shaped cylinder block rest plate 8 which is placed on the cylinder head 37 with its central opening 9 aligned over the opening of one of the cylinders 38. The said central opening 9 is of a somewhat greater magnitude than the cylinder 38 to permit the inner sleeve to pass freely therethrough. Two hydraulic jacks 10 are mounted with their bases 12 positioned on opposite sides of the central opening 9 and held in place by flat head jack attaching screws 11. A bifurcated pump connecting arm 13, having manipulating handle means unifies the actions of the hydraulic jack pumping mechanism. The said hydraulic jacks 10 are provided with the usual hydraulic oil valves 43. The free ends of the hydraulic pistons 15 are slotted at 16 for mounting V-shaped pillow block 17 thereon. The said V-shaped pillow block 17 is pivoted at 18 and provides an articulate connection capable of limited movement only and support for the yoke ends 19 of yoke 20 which rests therein. The said yoke 20 is provided with a hub portion 21 having a sleeve-puller bar slot 22 of a greater magnitude than the sleeve-puller bar 24. The said sleeve-puller bar 24 is suspended through puller bar slot 22 and supported by a pin 26 pillowed in a V-shaped cradling notch 23 formed on the top surface of hub portion 21. The said pin 26 supports the sleeve-puller bar 24 through one of a number of sleeve puller bar holes 25 which are regularly spaced throughout most of the length of the said sleeve puller bar 24. The rounded lower end 27 of sleeve puller bar 24 is pivoted at 29 through pivot hole 28 in puller bar 24 and pivot hole 30 in the puller bar slot 32 of a sleeve-pulling jaw of stepped formation designated 31. The pivot pin 29 is held in

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place by a washer 36' and a cotter pin 36 and provides articulation and equalization for the said sleeve-pulling jaw 31 upon sleeve-puller bar 24. Stepped sleeve engaging portions 33, 34, and 35 are oppositely formed on the lower portion of sleeve pulling jaw 31 to engage the lower edge 42 of one of the inner sleeves designated 39, 40 or 41. The said inner sleeves 39, 40, or 41 have different I. D. dimensions, but the same O. D. dimension in order to fit frictionally within the common cylinder 38.

It is common practice in heavy duty internal combustion engine construction to standardize the size of cylinder blocks and cylinders and to provide different magnitudes of cylinder bores by inserting inner sleeves having the same O. D. dimension but of different I. D. dimensions. When the inner sleeves designated 39, 40 or 41 become worn, they are replaced. To pull an inner sleeve using my hydraulic sleeve-pulling device, the cylinder head is removed and my hydraulic sleeve-pulling device is placed upon the top surface of the cylinder block 37, with the central opening 9 thereof aligned over the opening of one of the cylinders 38. The pistons 15 of hydraulic jacks 16 are retracted and sleeve-puller bar 24, together with sleeve-pulling jaw 31 is lowered into cylinder 38. Phantom lines in Fig. 1 show the sleeve-pulling jaw 31 turned articulately sidewise and the sleeve-pulling bar 24 rocked slightly to permit the said sleeve-pulling jaw 31 to be lowered to the bottom of cylinder 38 so that one of the pairs of stepped sleeve engaging portions 33, 34, or 35 may engage the lower edge 42 of one of the inner sleeves 33, 34, or 35 when the sleeve-pulling jaw 31 is righted. To pull the sleeve 33, 34, or 35, bifurcated pump connecting arm 13 is manipulated by handle means 14 in the usual manner, raising or pulling the said inner sleeve through connected sleeve-pulling jaw 31, sleeve-pulling bar 24, yoke 20 and V-shaped pillow block 17. If the inner sleeve is of such a length that more than one pulling operation is required, the yoke 20 may be set at a lower puller bar adjusting hole 25 to permit a second pulling operation.

A principal advantage of my hydraulic sleeve-pulling device resides in the fact that it may be operated with ease by one man who can quickly and easily do the work which in present practices

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is performed with much labor and time-consuming effort.

A further important advantage of my hydraulic sleeve-pulling device lies in the construction of the sleeve-pulling jaw of stepped formation by means of which the three conventional sizes of inner sleeves designated 39, 40, and 41 may be pulled without changing or replacing any part of my sleeve-pulling device.

Although my invention has been described, the terms used are to be deemed terms of description rather than terms of limitation, my intention being to retain the right to all mechanical equivalents of the structural elements depicted, provided they fall within the purview of the appended claim.

Having thus disclosed and revealed my invention, what I claim as new and desire to secure by Letters Patent is:

In a puller mechanism, yoke means provided with a central body portion having a slotted portion therein the said body portion terminating in two yoke supporting extensions, puller bar means slidably fitted in the said slotted portion, a multiplicity of adjustment holes in the said puller bar means, the said yoke means being also provided with cradling notch equalizer means at the top of the said central body portion thereof, and pin means secured removably in one of the said adjustment holes and cradled in the said cradling notch equalizer means.

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