

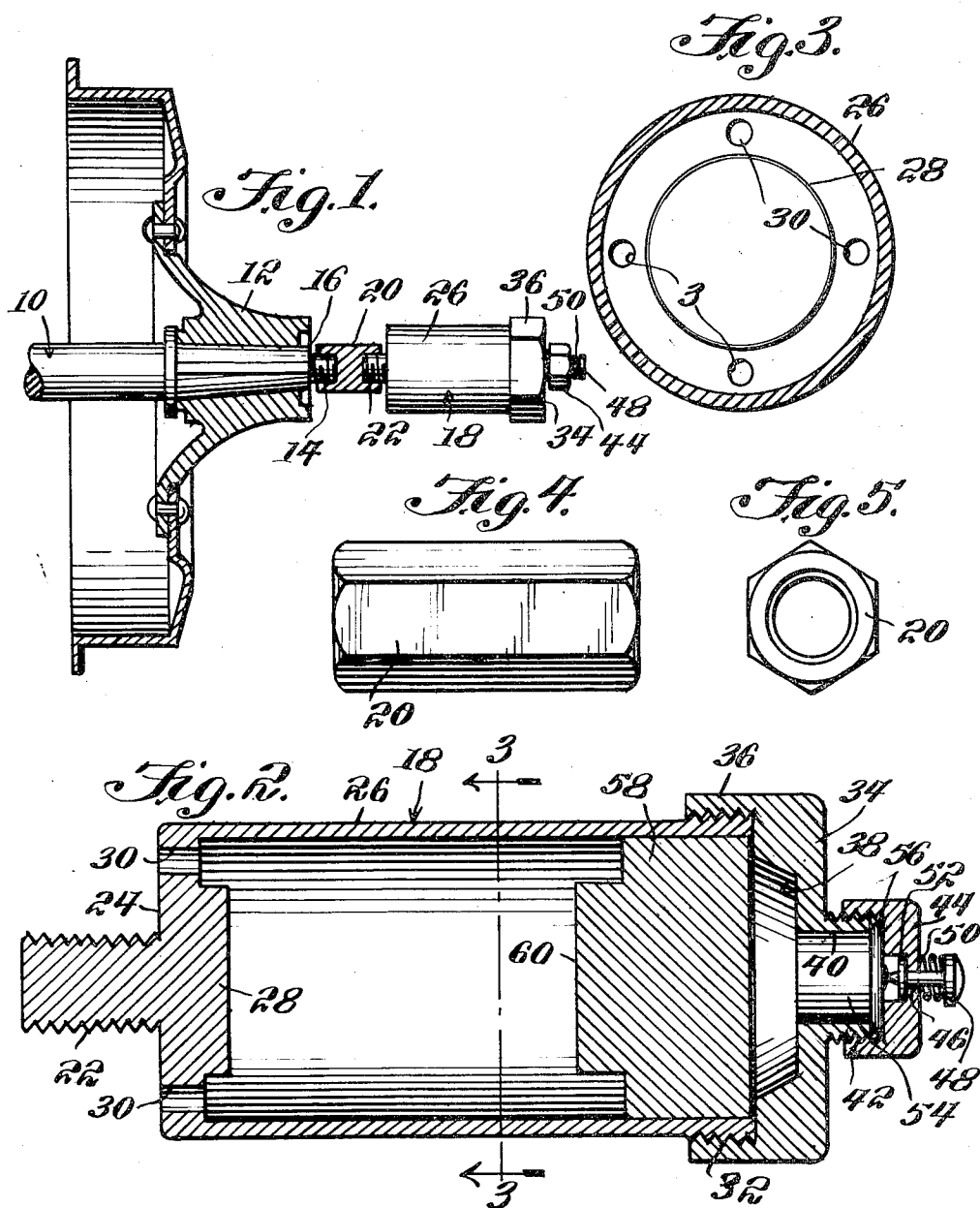
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EXPLOSIVE POWERED HAMMERING APPARATUS

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EXPLOSIVE POWERED HAMMERING APPARATUS

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1 Claim. (Cl. 29—254)

The present invention relates to a hammering tool, particularly adapted to facilitate the removal of the rear wheel drum of an automotive vehicle, from an axle on which said drum is secured.

It is well known that in many instances, it is very difficult to remove the rear wheel drum of an automobile from its associated axle. At present, it is the conventional practice to hammer upon the axle and drum, to loosen the drum, and it will be appreciated that this requires the expenditure of considerable time and effort on the part of the mechanic.

The present invention, accordingly, is intended as a hammering tool which is specially designed for loosening an axle relative to a rear wheel drum fixed thereupon, it being proposed, in this regard, to design the tool in such a manner as to cause detonation of an explosive charge to be effective for shifting a piston-like hammer forcibly against an anvil secured directly to the axle. It will be seen, accordingly, that the invention is so designed as to cause a single heavy blow to be directed against the wheel axle, along lines extending axially thereof, thereby to instantaneously loosen the axle and drum to an extent sufficient to permit subsequent removal of the drum with considerable speed and ease.

Another object is to provide a device as described which will have adaptor means associated therewith, connectible directly to a conventionally designed automotive vehicle axle, the entire device being connectible to the axle and being clear of the drum, thus to cause the full force of the blow to be taken by the axle.

Another object is to provide a device as stated wherein the detonation of the explosive charge will be accomplished by a relatively light blow directed against a firing pin mounted in a removable cap of the apparatus, the removal of said cap being adapted to facilitate insertion of a piston-like hammer means, and being further adapted to facilitate maintenance of the interior of the tool, thus to assure against the setting up of friction tending to reduce the velocity of the hammer during its movement against the anvil.

Yet another object is to provide, in said removable cap, a centrally disposed recess adapted to receive an explosive charge in the form of a cartridge, said charge-receiving recess being provided in an axial stud of the removable cap, with the bead of the cartridge engaging against the outer end of the stud, the removable cap being further provided with a cartridge cover threadable upon the stud against said bead, the cartridge cover having the firing pin slidably mounted therein.

Other objects will appear from the following description, the claim appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a sectional view taken diametrically through a conventional rear wheel drum of an automotive vehicle, an axle on which said drum is mounted being illustrated fragmentarily and in elevation, the hammering tool constituting the present invention being shown partly

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in elevation and partly in longitudinal section as it appears when ready for use;

Figure 2 is an enlarged longitudinal sectional view through the hammering apparatus per se;

5 Figure 3 is a transverse sectional view on line 3—3 of Figure 2;

Figure 4 is an enlarged side elevational view of the adaptor means of the apparatus; and

10 Figure 5 is an end elevational view of said adaptor means.

The reference numeral 10 has been applied in the drawing to designate a conventional rear wheel axle of an automotive vehicle, a rear wheel drum 12 being fixedly secured to said axle. The axle is provided with the usual axial stud 14, said stud being externally threaded throughout its length and being of reduced diameter relative to the diameter of the associated end portion of the axle. As a result, a circumferential shoulder 16 is provided upon the axle, at the base of the stud.

20 The invention has been designated generally at 18, and includes, at one end thereof, an adaptor 20 formed as a cylindrical member having a solid mid-length portion, and provided at its ends with axial bores opening at the ends of the member. The bores of the adaptor are threaded throughout their lengths, one of said bores having the stud 14 engaged therein.

25 The adaptor is greater in length than the stud, and threaded in the other bore of the adaptor is a threaded, axial stud 22 extending from the center portion of a circular end wall 24 of a cylindrical barrel 26. End wall 24 is integrally formed with a thickened center portion or anvil 28. The anvil 28 is of generally flat, circular formation, and is arranged concentrically with the adaptor and axle. Accordingly, it will be seen that 30 a blow struck against the anvil will be directed against the axle, along lines extending longitudinally and centrally of the axle.

35 In the marginal portion of the end wall 24, and spaced equidistantly about the anvil, are apertures 30, said apertures being adapted for permitting air to be exhausted from the barrel interior, during use of the tool in a manner to be made presently apparent.

40 That end of the cylindrical barrel 26 remote from the anvil 28 has external threads 32, for connection of a circular, removable cap 34 to the barrel. Cap 34 has a peripheral, internally threaded flange engageable with the threads of the barrel, the flange being designated by the reference numeral 36.

45 The cap 34 has its inner surface formed with a shallow, large diameter concavity 38 communicating at its center with a charge-receiving recess 40. Recess 40 is formed as an opening in the center of the cap 34, and extends within an axial stud 42 integrally formed upon the cap. The stud 42 is externally threaded for engaging internal threads formed upon the peripheral flange of a cartridge cover 44. The cartridge cover 44 has a small center aperture 46 in which is slidably mounted a headed firing pin 48. Between the head of the firing pin and the outer surface of the cartridge cover, a coil spring 50 is interposed, said spring being so tensioned as to normally urge the firing pin outwardly of the cover 44.

55 The aperture of the cartridge cover 44 opens into a recess formed in the inner surface of the cartridge cover, and disposed within said recess is a collar 56 secured to the inner end portion of the shank of the headed firing pin. The shank of the firing pin is pointed as best shown in Figure 2, so as to strike a cartridge 54 containing an explosive charge. The cartridge 54 fits snugly within the recess or center opening 40 of the cap 34, the bead 56 of the cartridge engaging against the outer end of the stud 42 in which said center opening 40 is formed. When the cartridge cover 44 is 70

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threaded upon the stud 42, it engages against the end of the cartridge and the bead 56, thus to fixedly hold the cartridge in position within its associated recess opening 40.

A hammer has been designated by the reference numeral 58, and is formed as a free floating piston, slidably mounted within the cylindrical barrel 26. The hammer 58, at that end thereof facing toward the anvil 28, has a center boss or thickened portion 60 coextensive in diameter with the anvil 28, and adapted to strike the anvil when the hammer is shifted forcibly against the anvil by detonation of the charge 54.

In use of the device, the striking of the firing pin 48 will be effective to detonate the charge, causing the hammer 58 to strike a single heavy blow against the anvil 28. The force of this blow is transmitted to the axle, in the manner previously discussed herein, thus instantaneously loosening the axle relative to its associated rear wheel drum. The drum can then be manually removed with ease and speed.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claim.

What is claimed is:

An explosive powered hammering apparatus for loosening an axle relative to a wheel drum secured thereto, comprising: a cylindrical barrel having an axial bore extending from end to end of the barrel and formed to a constant diameter, said barrel being formed open at one end and including at its other end an end wall integral with the side wall of the barrel, said end wall being integrally formed at its center portion with a circular anvil concentric with the end wall, the anvil being thickened relative to the portions of the end walls surrounding the same, said anvil facing inwardly of the barrel,

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said end wall having air exhaust apertures in the portion of the same surrounding the anvil, said apertures being spaced equidistantly about the anvil in a series disposed circumferentially of the anvil; a threaded, axial stud integral with the center portion of the end wall and projecting in a direction away from the barrel; an adaptor formed at its opposite ends with threaded recesses, one of said recesses being adapted for engagement of the stud therein, the other recess being adapted for engagement therein of a complementarily threaded, axially extending terminal part of the axle; a cap normally closing the open end of the barrel, said cap being formed with a peripheral, internally threaded flange and the barrel having external threads at its open end engageable with the threads of the flange, the cap having a shallow concavity in its inner surface and a centrally disposed charge receiving recess communicating with said concavity, the cap including an externally threaded axial stud at its center projecting outwardly of the barrel and formed with an opening communicating with said recess; a cartridge cover threadedly attached to the cap stud to close the opening thereof; a firing pin mounted in the cartridge cover for movement under the impact of a hammer-like tool in an axial direction, inwardly of the charge receiving recess; an explosive charge engaged in said recess for detonation responsive to said movement of the firing pin; and a floating piston slidably mounted within the bore of the barrel, said piston having a center boss corresponding in diameter to the diameter of the anvil and faced in the direction of the anvil, said boss and anvil having flat surfaces normal to the axis of the barrel and adapted to contact over their full areas on movement of the piston against the anvil under the force of the exploded charge.

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