March 8, 1960 H. F. WILKE 2,927,773

IMPACT DRIVER FOR WELL POINTS AND THE LIKE

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Fig. 1

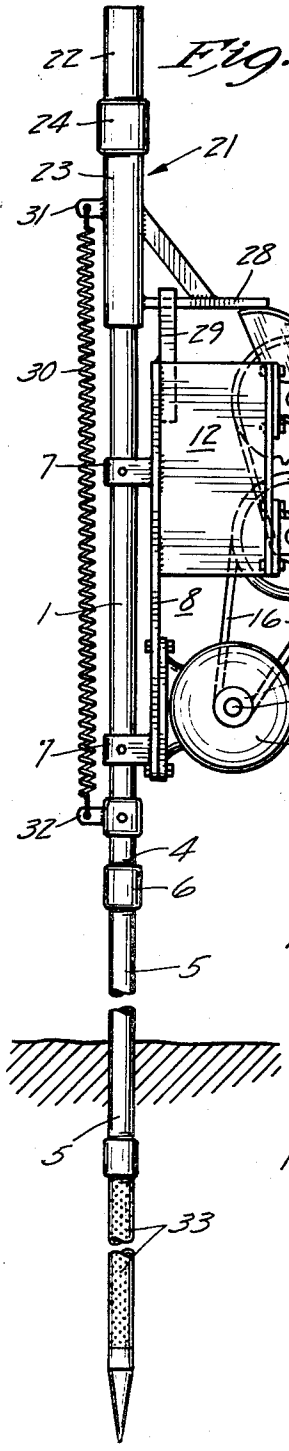


Fig. 2

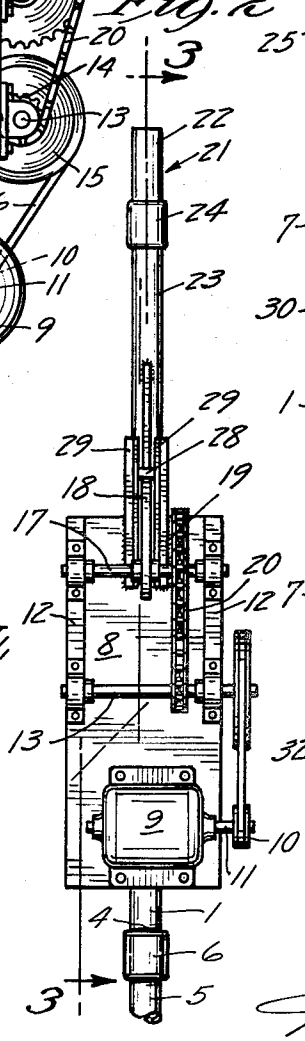
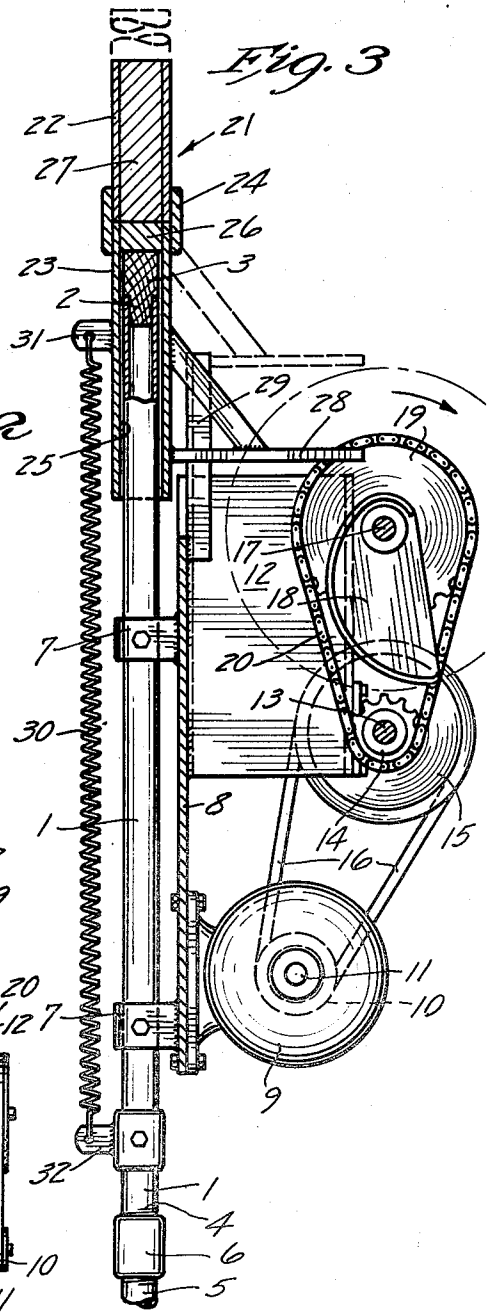


Fig. 3



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IMPACT DRIVER FOR WELL POINTS AND THE LIKE

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1 Claim. (Cl. 255—5)

My invention relates to impact tools and more particularly provides a novel impact driver for well points and the like.

The primary object of my invention is the provision of a relatively light-weight portable motor driven impact tool which may be detachably secured to the upper end of pipe sections for the driving of shallow wells.

A further object of my invention is the provision of a device of the class immediately above described which is relatively inexpensive to produce, which has a minimum of working parts, which may be operated with a minimum of knowledge and experience, and which is rugged and durable.

A still further object of my invention is the provision of a device of the ciass described which is provided with novel replaceable impact absorbing means between the impact element and the upper end of the driving stem on which it is mounted.

The above and still further objects of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings wherein like characters indicate like parts throughout the several views:

Fig. 1 is a view in side elevation of my novel impact tool, some parts being broken away;

Fig. 2 is a fragmentary view in front elevation of the structure shown in Fig. 1; and

Fig. 3 is an enlarged fragmentary view corresponding to Fig. 1 but showing a different position of some of the parts, with some parts broken away and shown in section.

Referring with greater particularity to the drawings, the numeral 1 indicates a vertically disposed stem preferably formed from suitable tough metal and being tubular at its upper end for the reception of the reduced portion 2 of an impact absorbing member 3, preferably formed from tough wood such as oak or the like, and the function of which will hereinafter be made clear.

At its lower end, the stem 1 is preferably screw threaded as at 4 for detachably securing same to the screw threaded upper end of a pipe section 5, through the medium of a conventional screw threaded coupling sleeve 6. Rigidly secured to the stem 1, as shown, through the medium of vertically spaced lock collars 7, is a vertically disposed mounting plate 8. On the lower end of the mounting plate is securely mounted an electric motor 9 having a sheave 10 secured to its drive shaft 11. Rigidly secured to the mounting plate 8, through the medium of a pair of laterally spaced upstanding mounting flanges 12, is a jack shaft 13 upon which is mounted for common rotation therewith a relatively small sprocket 14 and a relatively large sheave 15. An endless belt 16 runs over the sheaves 10 and 15. Also rigidly secured to the mounting plate 8, through the medium of the mounting flanges 12, in overlying relationship to the jack shaft 13 is a cam shaft 17 upon which is mounted fast a cam element 18 and a sprocket 19, shown as being considerably larger than the sprocket 14. A chain 20 runs over the sprockets 14 and 19.

An impact member, identified in its entirety by the

numeral 21, preferably and as shown comprises alignable upper and lower sections 22 and 23 respectively which are detachably secured together through the medium of a coupling sleeve 24 having screw threaded engagement with adjacent ends thereof. As shown, the lower section 23 is tubular and provides a downwardly opening socket 25 for the slideable reception of the upper end of the stem 1 and the impact absorbing member 3 carried thereby. The upper end of the lower section 23 of the impact member 21 is shown as being solid metal throughout its diameter, as indicated by the numeral 26, whereas the entire core of the upper section 22 is shown as being solid metal such as lead or the like, as indicated by the numeral 27. Upper section 22 may be interchangeable with other similar sections of greater or less weight as particular driving conditions may require.

Rigidly secured to the lower end portion of the lower section 23 of the impact member 21 and projecting horizontally therefrom in overlying relationship to the path of travel of the cam element 18 is a cam follower in the nature of an arm 28. Rigidly secured to the mounting plate 8 and projecting vertically therefrom in laterally spaced relationship, one on each side of the cam follower arm 28, are a pair of guide bars 29 which are of a length to retain the arm 28 in the same vertical plane during reciprocal movements imparted thereto by lifting movements of the cam element 18 and subsequent dropping thereof under the action of gravity. Supplementing the action of gravity and increasing the force of the impact member 21 with the stem 1 (through the medium of the impact absorber 3) is a coil tension spring 30, opposite ends of which are detachably secured to laterally projecting ears 31 and 32, the former on the lower section 23 of the impact member 21 and the latter on the lower end of the stem 1.

When it is desired to drive a relatively shallow well with my novel structure, the stem 1 is secured to the screw threaded upper end portion of a pipe section 5. As shown in Fig. 1, the pipe section 5 has previously been fitted with a conventional perforate sand point 33. After mounting on the upper end of the stem 1 of an impact member 21 a desired weight, the electric motor is started and, through the driving mechanism associated therewith and the jack shaft 13 and cam shaft 17, rotational movement is imparted to the cam element 18 in a clockwise direction, whereby reciprocal movements are imparted to the impact member 21 through raising and lowering of the cam follower arm 28 carried thereby. Obviously, as each section 5 is driven to a point near the ground, the motor 9 is stopped, the stem 1 detached from the section 5 and an additional section added thereto and the stem 1 again detachably secured to the top of said last-mentioned section. This process is repeated until the desired depth of the sand point 33 is attained.

While I have shown no means for supporting my novel impact driver in its operative position, either at the beginning of or during drilling operations, it suffices to state that any suitable means may be utilized for this purpose. In fact, I have found that the device may be retained in a vertical position by hand during initial driving movements, until the first pipe section 5 has been driven deep enough to support the device thereafter.

My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects and while I have shown a preferred embodiment thereof, it should be understood that same is capable of modification without departure from the scope and spirit of the appended claim.

What I claim is:

An impact driver for well points comprising an elongated stem disposed vertically in use, said stem having a lower end adapted for connection with a pipe to be driven, a vertical mounting plate arranged close to a side of the

stem intermediate its ends and secured to the stem, motor means secured to said mounting plate near the lower end of the mounting plate, a horizontal rotary cam shaft journaled upon said mounting plate near its upper end and disposed above the motor means, a single trip cam only secured to said cam shaft for rotation therewith and disposed opposite said stem in spaced relation thereto, driving connecting means between said motor means and rotary cam shaft, a tubular weighted reciprocatory impact member engaging telescopically over the upper end of said stem and containing a shock absorbing element engageable with the top of the stem, a horizontal laterally outwardly extending cam follower arm secured to the impact member near its lower end and overlying said trip cam and arranged in the vertical plane of rotation of the trip cam to be engaged by the latter for reciprocating the impact member vertically during rotation of the trip cam, a pair of spaced vertical guide bars secured to said mounting plate and projecting above the top thereof and disposed on opposite sides of the cam follower arm in close relation thereto to guide the same vertically and to maintain the cam follower arm in vertical alignment with

the trip cam during reciprocation of the impact member, and a retractile spring connected with the impact member and said stem and urging the impact member downwardly toward contact with the upper end of the stem, the impact member and cam follower arm being readily removable upwardly from the stem to permit replacement of said shock absorbing element.

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