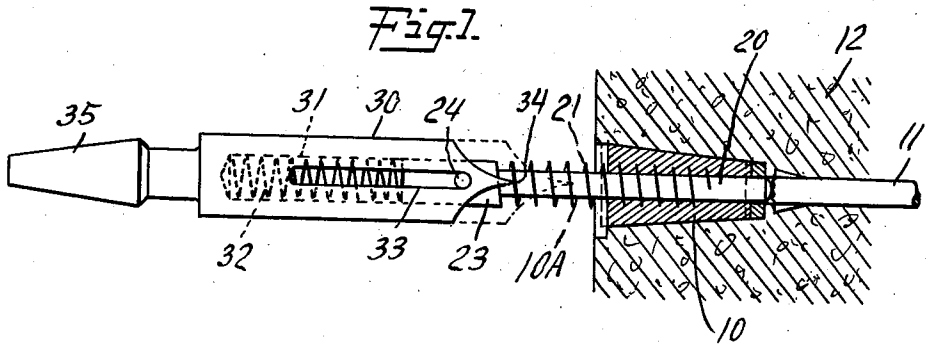
Nov. 5, 1940. H. H. MACKAL 2,220,376

EXTRACTOR

Filed Sept. 2, 1937

Fig. 1.



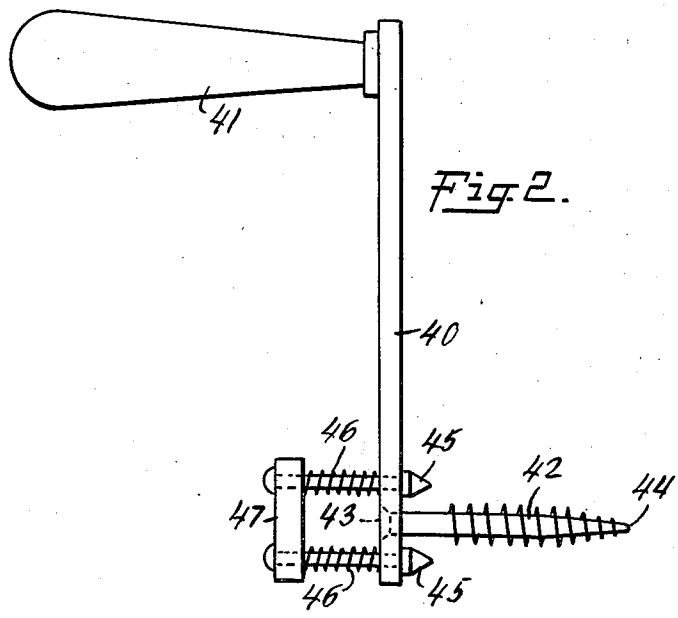


Fig. 2.

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EXTRACTOR

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Application September 2, 1937, Serial No. 162,088

5 Claims. (Cl. 81—3)

This invention relates to improvements in extractors and its object is to provide a simple tool for pulling spools out of concrete and splitting them. The spools referred to may be those used with concrete form ties such as shown in Patent No. 2,168,990, issued to Daniel C. Hungerford on August 8, 1939, the application for which was copending herewith, which become embedded in the concrete and it is somewhat difficult to remove them. The present invention relates to a tool for facilitating their removal. More specifically, it relates to a threaded tool which may be screwed into and through the spools longitudinally which has an end adapted to abut against the fractured end of the tie rod to arrest the inward movement of the tool and to cause the longitudinal movement to be transferred to the spool. The tool is also provided with an arrangement for splitting the spool after it has been loosened from the concrete to remove it from the tool.

I will describe several arrangements which embody my invention and will point out its novel features in appended claims.

Referring to the drawing,

Fig. 1 is an elevation of a preferred embodiment of my invention, together with a sectional elevation of a spool, a tie rod, and a portion of a body of concrete with the tool shown in operative position to illustrate the manner of its use.

Fig. 2 is an elevation of a structure of modified form which also embodies this invention.

In Fig. 1, a wooden spool 10 of truncated conical shape and with an axial bore, and a tie rod 11, are shown embedded in a body 12 of concrete. The tool shown in this figure comprises a cylindrical shank 20, the outer end of which is smooth and of a diameter to permit it to pass into the bore of the spool. On the remainder of the shank are spiral threads 21, preferably with sharp edges which are adapted to be screwed into the spool. The other end of the shank is of larger diameter and forms a plunger 23. This fits slidably into the cylindrical bore 31 of a body member 30 within which is a spring 32 which presses the plunger out. The body member is slotted on opposite sides, as at 33, to receive a pin 24 which is driven into the plunger and extends into these slots. This prevents relative rotation between the body member and the plunger and limits the outward movement of the plunger.

The end of the body member from which the plunger and shank project, is shaped to form sharp edged wedges 34. Its other end is shaped, as at 35, to be inserted into a turning tool, such as a standard bit stock.

Before specifically describing the structure illustrated in the other figures of the drawing, I will describe the operation of the tool shown in Fig. 1.

The smooth end of the shank 20 is inserted in the bore of the spool 10 and the tool rotated to screw the threads 21 into the spool. This operation is continued until the parts assume the relative positions in which they are shown in full lines. The end of the shank then abuts against the fractured end of the tie rod 11 which is solidly embedded in the concrete. Further rotation of the tool in the same direction will cause the spool to move longitudinally on the shank toward some such position as that in which it is indicated by broken lines at 10A. It is then loosened from the concrete and the tool may be removed with the spool on it.

Now when the end of shank 20 is tapped against some solid body, such as the concrete body 12, the plunger 23 will be driven into the body member 30 against the action of spring 32 to cause the wedges 34 to be driven into the spool to split it. It then falls off from the shank and the tool is ready for a repeated operation.

After the threads 21 are embedded in the spool, the latter can be removed by applying longitudinal pressure on the body member 30 to compress the spring 32 and then suddenly releasing the pressure. The result will be an outward impact of the body member at the end of slot 33 upon the pin 24 which will move the spool outwardly.

The tool shown in Fig. 2 comprises a crank arm 40 with a handle 41 near one of its ends and a threaded shank 42 near its other end. This may be formed, as shown, of an ordinary wood screw with its head 43 welded to the crank arm. Its other end 44 may be blunted, as shown. At the sides of the screw head 43 are pointed plungers 45, 45 retracted by springs 46 with their ends riveted to an anvil block 47.

The spool is extracted from the concrete in the manner previously described. Then the end 44 of the screw or the end of the spool is held against some solid body, such as the next spool to be removed, and the anvil block 47 tapped to split the spool.

Several structures which embody this invention are illustrated and described to show that it is not limited to any specific construction and I intend no limitations other than those imposed by the following claims.

What I claim is:

1. An extractor for spools having axial bores, comprising a shank of a diameter to fit the bore, external spiral threads thereon, spool splitting means at one end of the threads longitudinally movable in relation to the shank, and means for rotating the shank.

2. An extractor for spools having axial bores, comprising a shank of a diameter to fit the bore, external spiral threads thereon, a body member into which the shank is slidably fitted, and means for preventing relative rotation between the shank and the body member, one end of said member being shaped to form a spool splitting wedge and its other end shaped to be engaged by a rotating tool.

3. An extractor for spools having axial bores, comprising a shank of a diameter to fit the bore, external spiral threads thereon, the end of the shank beyond the threads forming an abutment member, a body member into which the shank is slidably fitted, and means for preventing relative rotation between the shank and the body member and to limit the relative movement between the shank and said body member, one end of said body member being shaped to form a spool splitting wedge and its other end shaped to be engaged by a rotating tool.

4. An extractor for spools having axial bores, comprising a shank of a diameter to fit the bore, external spiral threads thereon, a body member into which the shank is slidably fitted, means for preventing relative rotation between the shank and the body member and for limiting the relative movement between the shank and said member, and a spring within the body member pressing against the end of the shank, one end of said member being shaped to form a spool splitting wedge and its other end shaped to be engaged by a rotating tool.

5. A combined extracting and splitting tool for axially bored spools, said tool comprising a shank of a diameter to fit the bore of a spool embedded in a wall, external helical threads near one of its ends to engage the bore of said spool, a splitting member movable longitudinally in relation to the shank, said member being constructed with a slot having parallel sides and closed ends, a transverse pin extending from the shank into said slot whereby rotation of the splitting member will be transmitted to the shank by the engagement of the pin with the sides of the slot, a spring normally urging the splitting member longitudinally away from splitting position to bring the pin against one end of the slot, said slot permitting the splitting member to be driven percussively into a spool engaged by the threads on the shank.

HENRY H. MACKAL.