

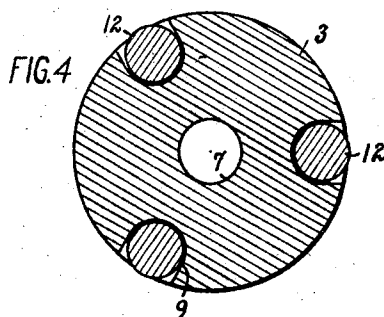
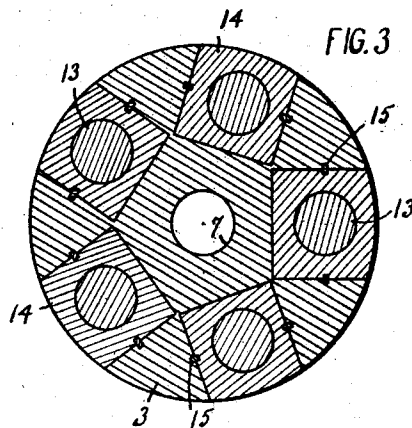
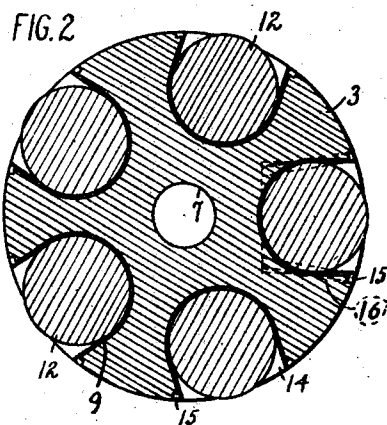
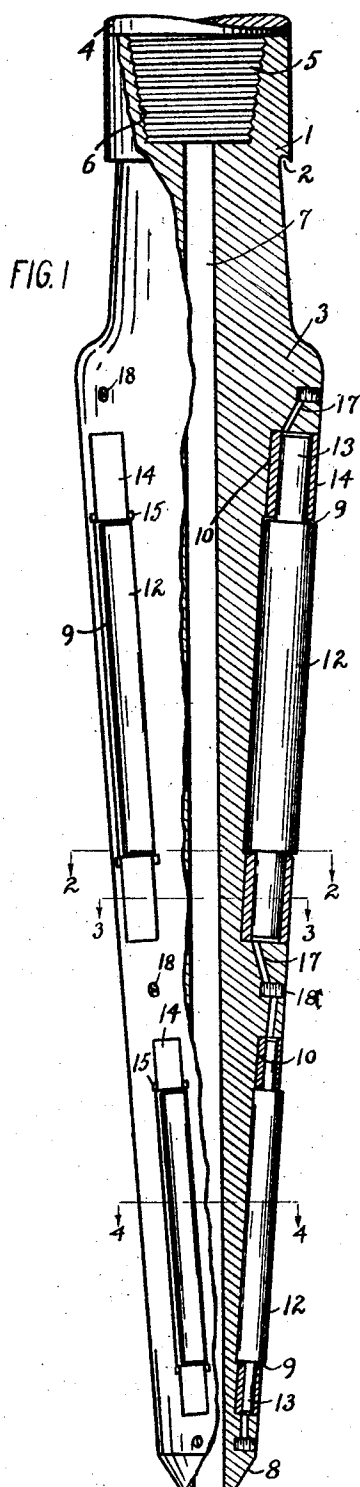
Jan. 25, 1927.

D. G. LORRAINE

1,615,306

TOOL FOR OPENING COLLAPSED PIPES OR CASINGS

Filed Oct. 1, 1923



INVENTOR
DAVID G. LORRAINE
BY
R. L. Smith.
ATTORNEY.

UNITED STATES PATENT OFFICE.

DAVID G. LORRAINE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO ADRIAN R. REYNOLDS, OF GLENDALE, CALIFORNIA.

TOOL FOR OPENING COLLAPSED PIPES OR CASINGS.

Application filed October 1, 1923. Serial No. 665,857.

This invention is a tool particularly adapted for use in wells, and has for its object the provision of novel means, which may be readily connected to a drill pipe and inserted in a well, for straightening or opening a clear passage through a collapsed section of the well casing.

More particularly it is the object of the invention to provide anti-friction means at the periphery of a tapering tool, adapted to be rotated and at the same time forced through a collapsed casing or pipe by the drill stem to which it is connected, the anti-friction means engaging the collapsed walls of the casing and thus enabling the tool to be readily rotated, and equalizing the wear of the tool, and also preventing excessive strain against the walls of the casing.

The invention will be readily understood from the following description of the accompanying drawings, in which:

Figure 1 is a side elevation, partly in axial section, of the improved tool.

Figs. 2, 3 and 4 are transverse sections on the lines 2—2, 3—3, and 4—4 of Fig. 1.

The tool comprises a shank 1 of relatively small diameter, having an under-cut shoulder 2 adapted to be engaged by a fishing tool, and a stem 3 depending from said shank, the tool being adapted to be detachably connected to the end of a drill pipe 4, so that it may be rotated and at the same time moved axially through a well casing, for opening a clear passage and straightening the walls of the casing when the latter has collapsed.

The tool may be connected to the drill pipe by a usual tool joint comprising a tapering threaded pin 5 at the end of the drill pipe, and a cooperating tapering threaded box 6 in the upper end of shank 1 adapted to receive said threaded pin.

The tool is preferably provided with an axial bore 7 extending the length thereof for discharge of a flushing medium through the same in usual manner.

The stem of the tool is round in cross-section, and tapers downwardly from its upper end, which is of slightly smaller diameter than the casing in which it is to be used, to an appreciably smaller diameter at its lower end, the extreme lower end of said stem preferably having a sharper taper as shown at 8, so that the tool may be read-

ily inserted between the collapsed walls of a casing.

Anti-friction means, shown as rollers 12, are mounted on the periphery of the tool stem so as to project slightly beyond the same, and are preferably arranged in axially spaced sets having the rollers of each set circumferentially spaced around the tool stem.

Since the diameter of the tool stem decreases toward its lower end, it will be found expedient to decrease the number and the size of the rollers of each succeeding lower set, it being understood that any number of sets of rollers may be employed.

Longitudinally extending recesses for the respective rollers are formed in the periphery of the tool stem, said recesses having their medial portions 9 curved in cross-section, and their ends 10 preferably squared in cross-section.

The rollers 12 are substantially the length of curved recesses 9, and have end bearing pins 13 of decreased diameter extending axially beyond the same and adapted to be journaled in bearings 14. The exterior of said bearings conform to the squared recesses 10 and are adapted to be mounted therein so as to position said rollers lengthwise of the tool stem, the parts being so arranged that the rollers are free to turn in recesses 9 with their peripheries projecting slightly beyond the periphery of the tool stem and parallel to the tapering sides thereof.

The bearings 14 may be fixed in position by keys 15 adapted to be received in slots 16 extending along the sides of the bearings and along the sides of the squared recesses 10 from the periphery of stem 3.

Means are preferably provided for lubricating the bearings for the rollers, and for this purpose conduits 17 may extend through the tool stem from the periphery thereof to the ends of recesses 10, so as to discharge a lubricating medium into the bearings 14, said conduits preferably having closure means at their outer ends shown as screws 18 counter-sunk below the periphery of the tool stem.

By the construction as thus described it will be seen that collapsed walls of a well casing may be wedged apart by rotating the tapering tool stem and at the same time moving the same axially through the casing, the

rotary movement of the tool and the engagement of rollers 12 with the walls of the collapsed casing straightening the latter, and said engagement of the rollers permitting free rotation of the tool and eliminating excessive wear of the parts.

It will be apparent that various changes may be made in the construction, combination, and arrangement of parts as thus described, without departing from the spirit of the invention.

What is claimed is:

1. A tool comprising a tapering stem provided with longitudinally extending peripheral recesses having their medial portions curved and their end portions squared in cross-section, bearings keyed in said end portions of said recesses, and rollers mounted in the medial portions of said recesses and having reduced ends journaled in said bearings, the peripheries of said rollers extending slightly beyond and parallel to the periphery of said tapering stem.
2. A tool comprising a stem provided with a peripheral recess having its medial portion curved and its end portion squared in cross-section, a bearing in the end portion of the recess, and a roller mounted in the medial portion of the recess and having a reduced end journaled in the bearing.

In testimony whereof I have affixed my signature to this specification.

DAVID G. LORRAINE.