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C. R. EDWARDS

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PIPE TAP

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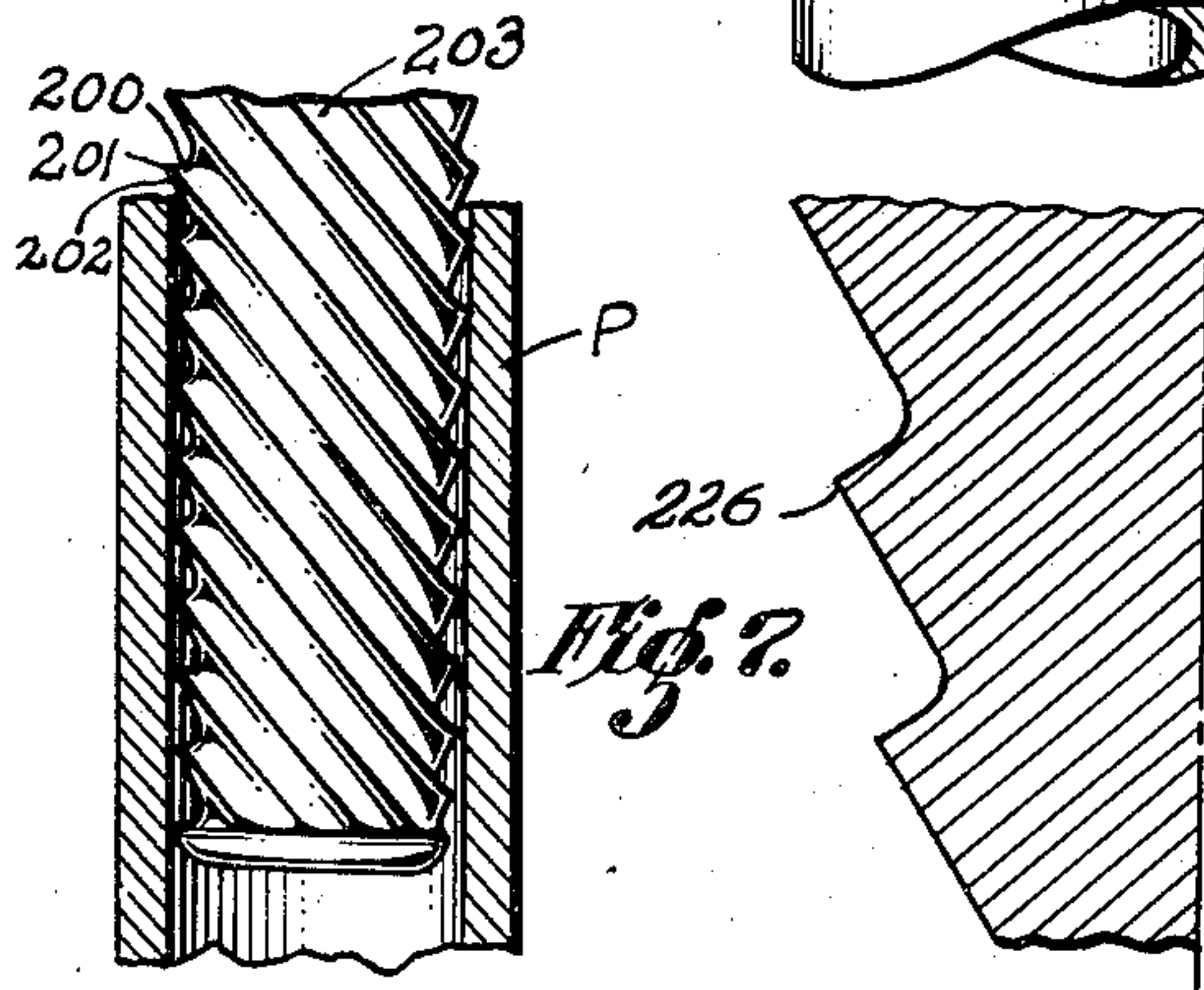
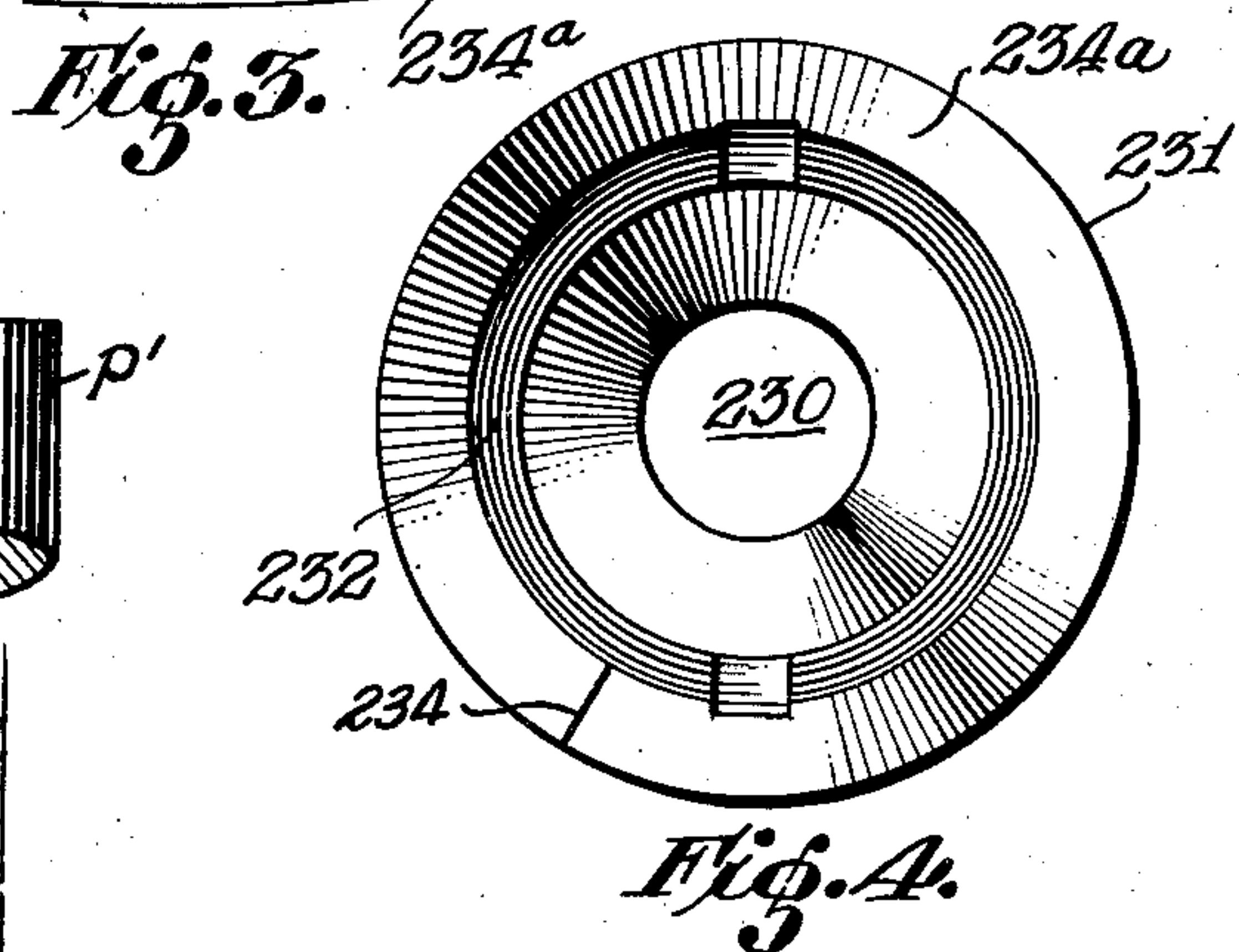
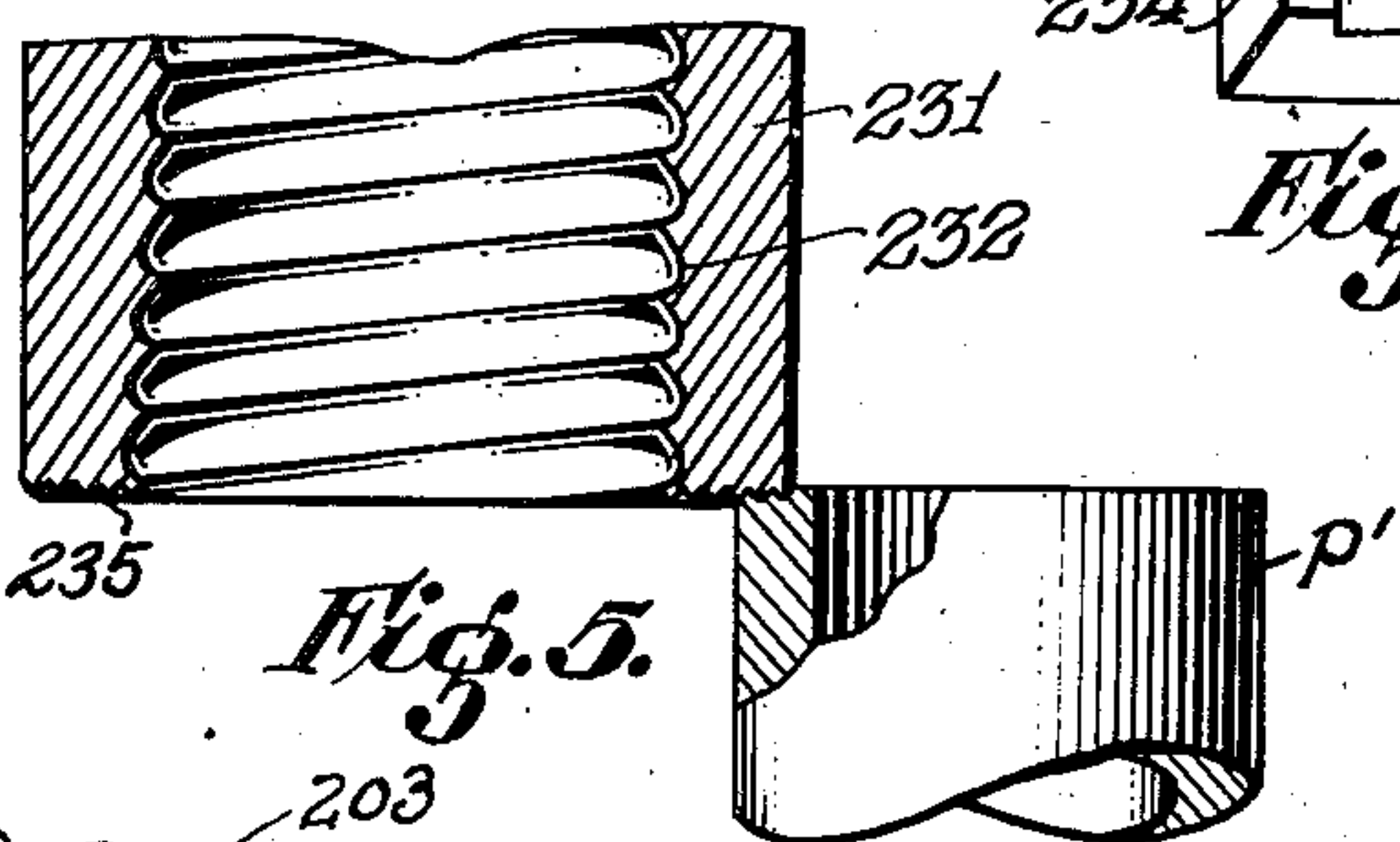
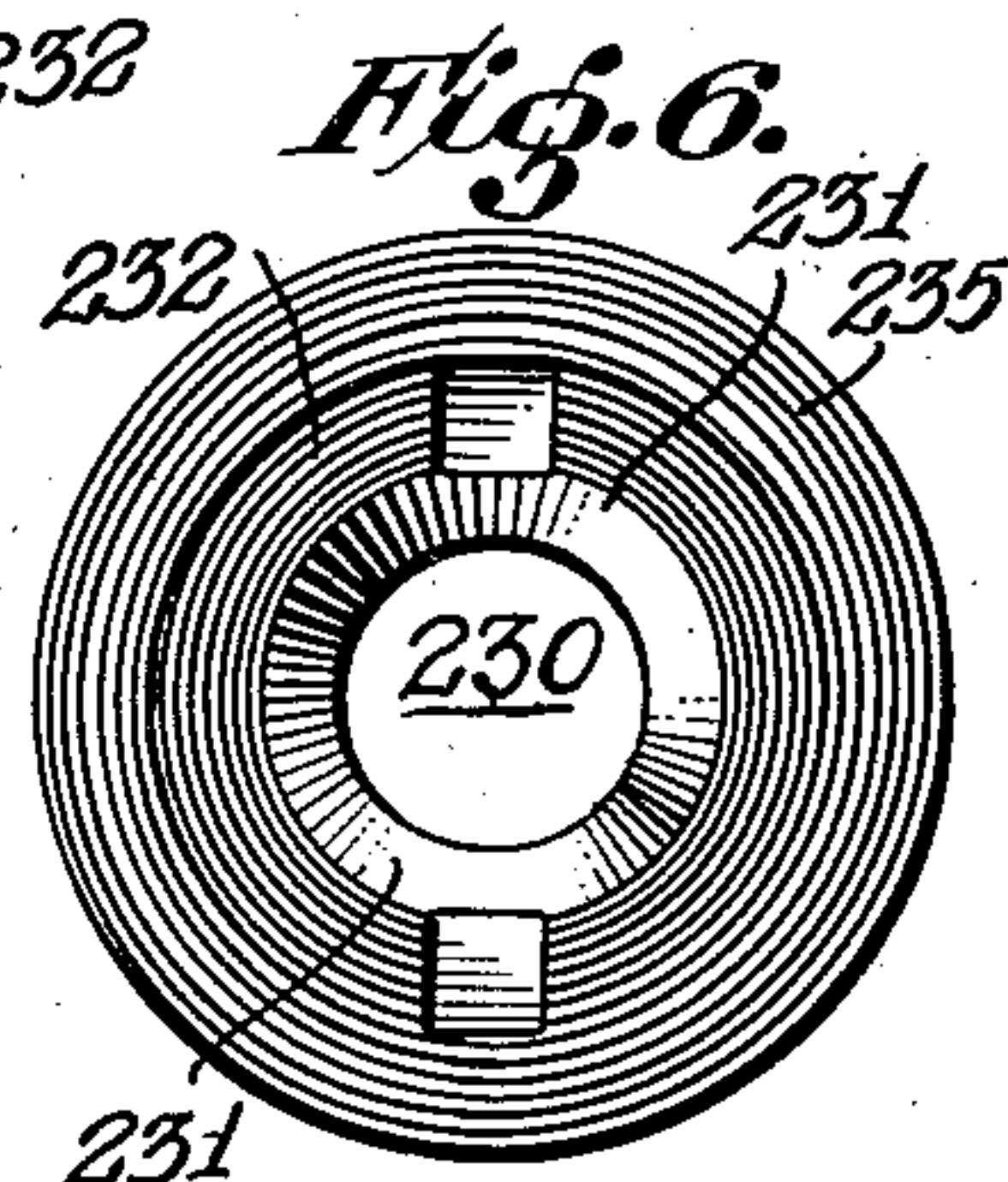
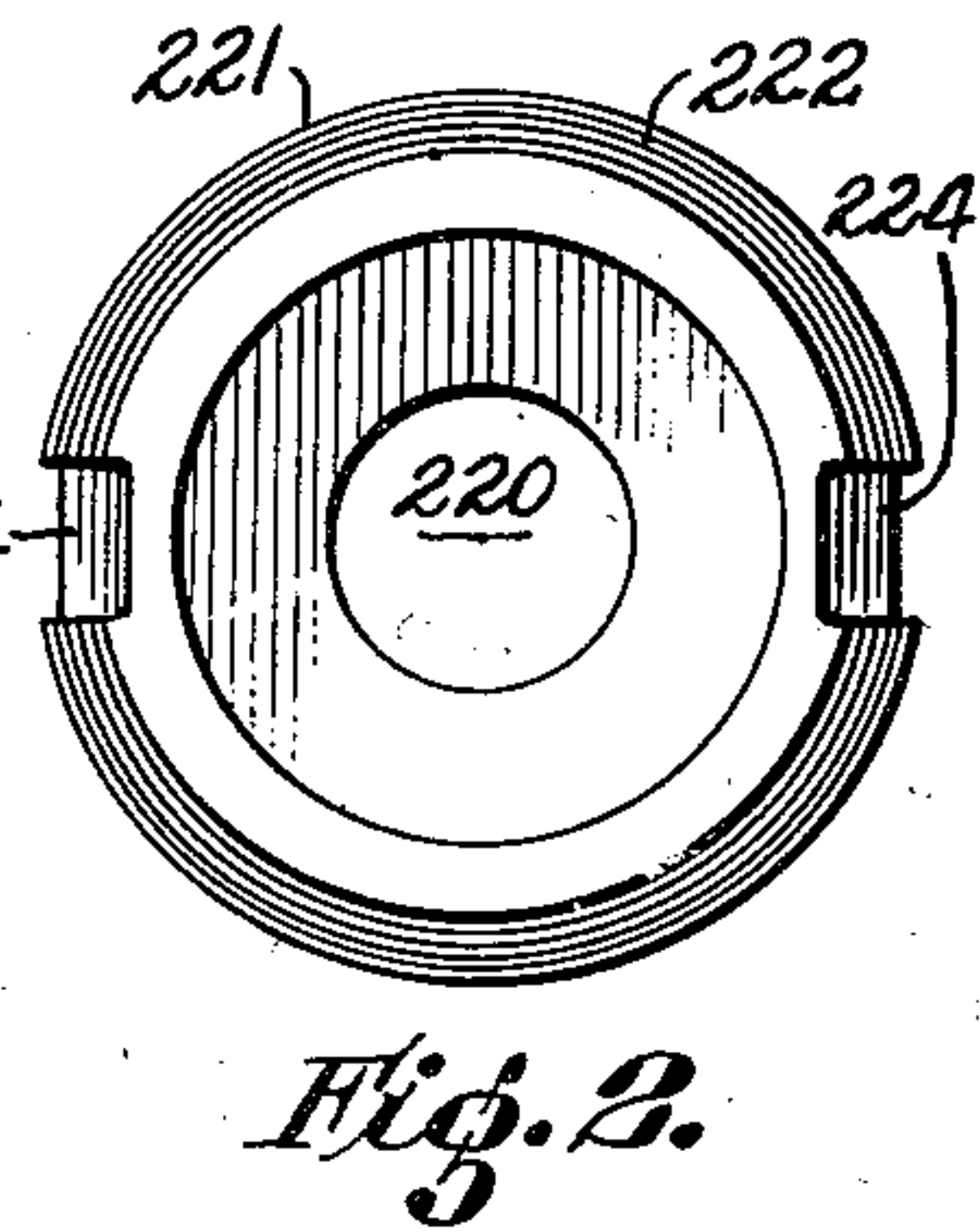
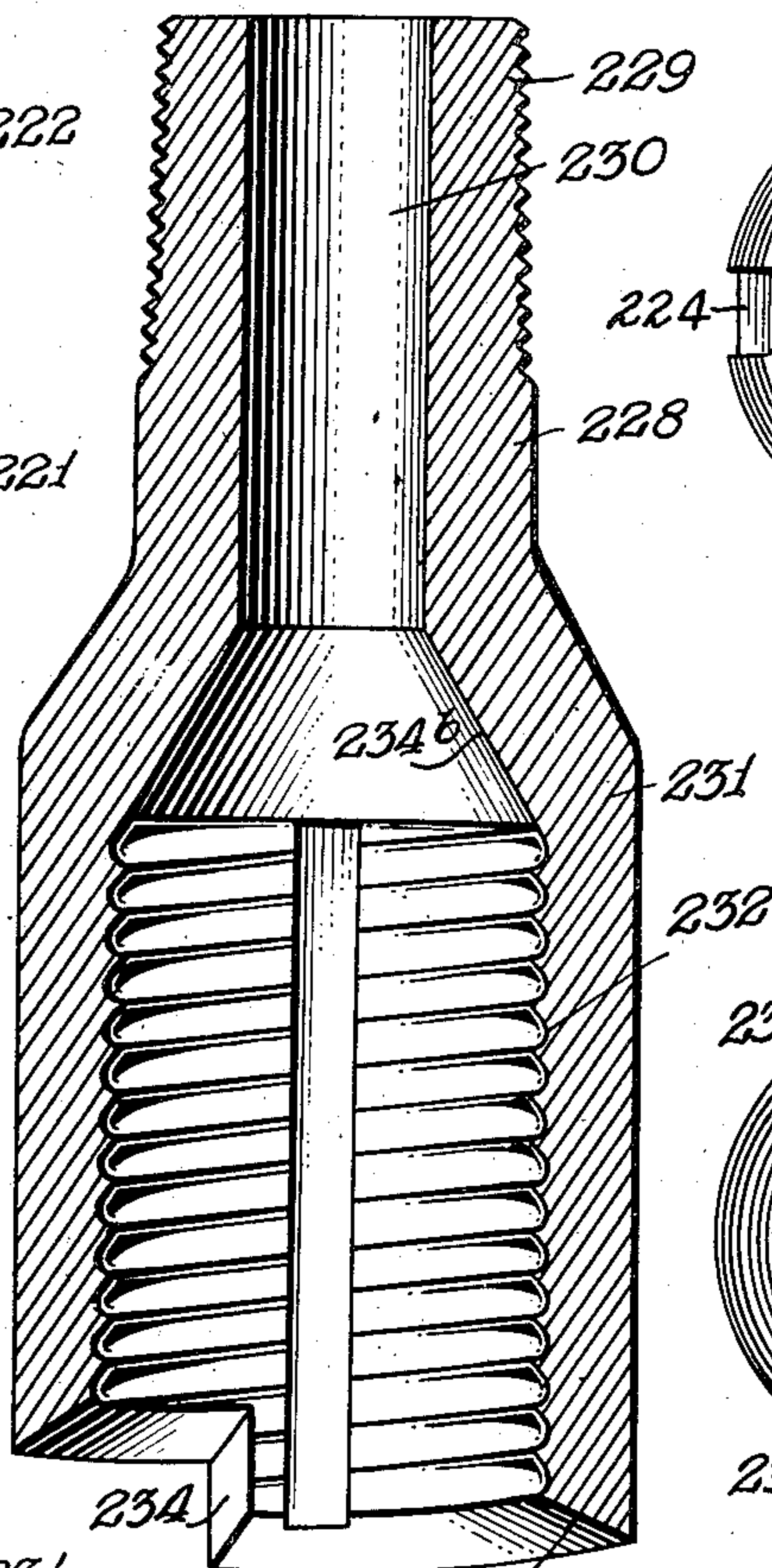
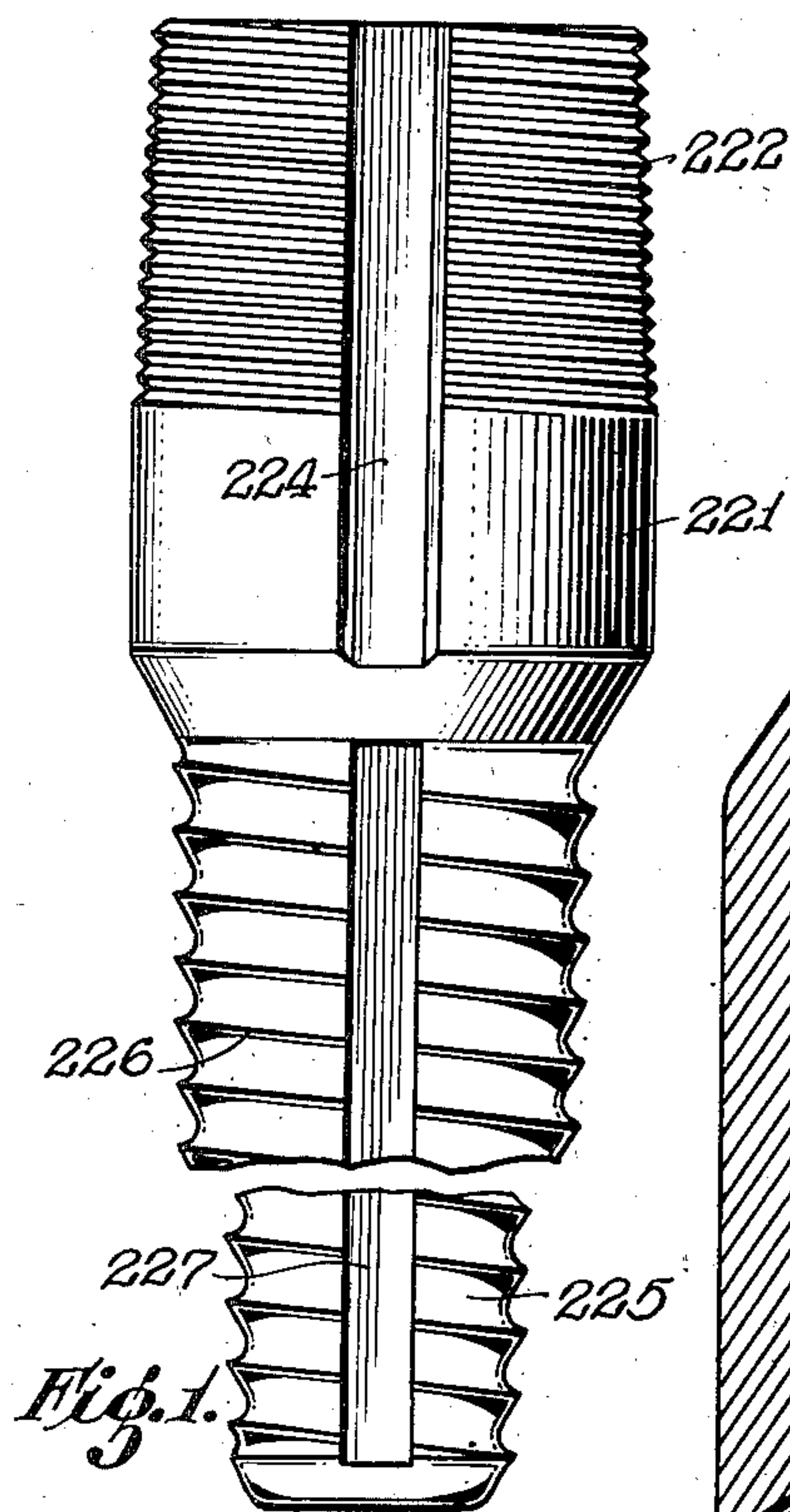


Fig. 8. CHARLES R. EDWARDS,
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UNITED STATES PATENT OFFICE

2,427,524

PIPE TAP

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Application June 9, 1945, Serial No. 598,617

5 Claims. (Cl. 294—86)

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This invention relates to new and useful improvements in means for recovering elements from well bores.

A broad object of the invention is to provide an improved means which includes a suitable tool adapted to be moved downwardly into the well bore, then connected to the lodged pipe through a rotative movement, whereby said tool is firmly connected to the lodged pipe in order to pull the same from the well bore.

One object of the invention is to provide an improved tap which is used to engage the stuck object, wherein said tap, upon rotation, will cause the pipe to move from a position against the wall of the well bore so that it may be engaged by said tap.

A further object of the invention is to provide an outside tap which may be lowered into a well bore, so as to telescope over a stuck pipe, after which rotative movement causes the tap to firmly engage the stuck pipe permitting its withdrawal.

A still further object of the invention is to provide an inside tap which will engage the bore of a stuck pipe in order to pull the same from a well bore.

A specific object of the invention is to provide means on the lower end of an outside tap which will cause the upper end of the stuck pipe to move to a central position in the well bore.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Fig. 1 is an elevation view, showing the inside tap, constructed in accordance with the invention,

Fig. 2 is a top view of the tap shown in Fig. 1,

Fig. 3 is a vertical sectional view of an outside tap, constructed in accordance with the invention,

Fig. 4 is a bottom view of the tap shown in Fig. 3,

Fig. 5 is a vertical view, partly in section and partly in elevation, of another form of the outside tap,

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Fig. 6 is a bottom view of the tap shown in Fig. 5,

Fig. 7 is a partial vertical sectional view of a modified form of inside tap,

Fig. 8 is an enlarged fragmentary sectional view of Fig. 1 illustrating the thread contour.

Inside taps.

There is shown in Fig. 1 what is generally called an inside tap 221, which has its upper end tapered and externally screw-threaded at 222 so that it may be attached to an ordinary drill pipe or the lower end of a reversing tool. The upper portion 222 is provided with a plurality of inwardly-extending keyways or grooves 224 which match complementary keyways in the extreme lower end of the reversing tool. Keys are driven into these matched keyways to prevent unscrewing after the screw threads are made up tight. The tap 221 is provided with a fluid passageway 220 which will allow fluid pumped into the well to pass down through the tap. The lower end 225 of said tap is reduced, and is provided with very coarse specially-formed fishing threads 226.

It will be observed that the outer crest angle at the top of these threads is larger, or about ninety degrees, and that both faces of the threads are substantially straight and are set at unusual angles in relation to the axis of the tap; and that the angle of the upper face is about twice the angle of the lower face. Referring more particularly to Fig. 8, it will be noted that each of the elements of the threads 226 defining substantially the entire length of the upper face thereof lies in a straight line forming an obtuse angle with the longitudinal axis of the tap, and each of the elements of the threads 226 defining substantially the entire length of the lower face thereof lies in a straight line forming an acute angle with the longitudinal axis of the tap. Hence the threads 226 have intersecting substantially straight faces extending at different angles to the axis of the tap and also at different angles to a line normal to the axis of the tap. This construction has several advantages. With the old type of thread generally copied from ordinary screw threads, there is experienced considerable trouble with the thin, equal angled faces collapsing and burning before a secure hold for pulling is secured. This new and improved thread substantially eliminates the above mentioned dif-

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ficulties to such an extent that a greater demand is being made for taps and other grappling devices with this improved thread.

The outer surface of said tap is also provided with a vertical groove 227, so as to assist in screwing the tap into the fish, and which will allow fluid to pass out of a piece of stuck pipe after the tap has been connected therewith. Thus, in using a pipe or a reversing tool connected to the upper screw-threaded portion 222, the coarse threaded portion 225 may be screwed into the open end of a pipe. It is pointed out that the tap is tapered so that it will wedge tighter as it is screwed into the pipe, and by this firm hold on the fish, said fish may be removed.

In Fig. 7, I have shown a modified form of inside tap which differs from the form shown in Fig. 1, in that the threads are arranged with a much steeper lead. For example, the thread 201 extends across the axis of the tap 203 at a sharp angle as compared with the thread 226 in Fig. 1. This angle is approximately 45 degrees but I do not care to restrict the angle since this will depend upon the particular materials involved.

The modified tap 203 has an upper substantially straight face 200 which extends at a much sharper angle to the axis of the tap than the lower substantially straight face 202. In this respect, the tap 203 is similar to the tap of Fig. 1.

Outside tap

In the event the pipe is bent, or an inside tap cannot enter the open end of the stuck pipe, an outside tap or overshot is used. As shown in Fig. 3, an outside tap 228 has its upper portion 229 reduced and externally screw-threaded. It is to be noted that said outside tap has an axial fluid passageway or bore 230 therein. The outer diameter of the lower portion 231 is enlarged, as is the bore of said tap. The inner surface of said enlarged portion 231 is provided with coarse threads 232, so that said tap telescopes over the stuck pipe or fish, which is engaged by the coarse threads 232. The lowermost edge 234a of the tap may be lipped or undercut at 234 so that in the event the stuck pipe is not in the center of the well, the portion 234 will hook the pipe and spring it towards the center of the well, thereby moving it away from engagement with the casing and allowing the overshot to telescope over said pipe.

There is shown in Fig. 5 further means for moving a piece of stuck pipe P' towards the center of the well. Instead of the undercut hook portion 234, the lower surface of the tap 231 is spirally screw-threaded at 235; thus when the lower surface of the tap engages the exposed end of the stuck pipe, the threads 235 will bite into said pipe, and, as the threads spiral towards the center of the tap, they will act to move the pipe towards the center of the tap when the tap is rotated.

It is to be understood that the threads 232 of the outside tap have faces arranged similarly to the threads 226 of Fig. 1 and 201 of Fig. 7, that is; the upper face of each thread extends at about twice the angle of the lower face, these angles being formed by extensions of the faces which intersect the axis of the tap.

It will, of course, be understood that if desired, the inner threaded bore of the outside tap may be tapered similar to the inside tap.

This application is a continuation-in-part of my co-pending application, Serial No. 334,947,

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filed May 13, 1940, for Methods of and means for recovering elements from well bores.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A pipe tap adapted to engage pipe stuck in a well bore, said tap comprising an upper portion and a lower portion, means on said upper portion to connect said tap to an operating string of pipe, and means on said lower portion to engage a pipe in said well bore, said last named means comprising threads having intersecting substantially straight faces extending at different angles to the axis of said tap, an upper face of one of said threads forming an obtuse angle with said axis, a lower face of one of said threads extending at an acute angle to said axis.

2. A pipe tap adapted to engage pipe stuck in a well bore, said tap comprising an upper portion and a lower portion, means on said upper portion to connect said tap to an operating string of pipe, and means on said lower portion to engage a pipe in said well bore, said last named means comprising threads having intersecting substantially straight faces extending at different angles to the axis of said tap, an upper face of one of said threads forming an obtuse angle with said axis, a lower face of one of said threads extending at an acute angle to said axis, said threads being located upon an external surface of said lower portion.

3. A pipe tap adapted to engage pipe stuck in a well bore, said tap comprising an upper portion and a lower portion, means on said upper portion to connect said tap to an operating string of pipe, and means on said lower portion to engage a pipe in said well bore, said last named means comprising threads having intersecting substantially straight faces extending at different angles to the axis of said tap, an upper face of one of said threads forming an obtuse angle with said axis, a lower face of one of said threads extending at an acute angle to said axis, said tap having a bore extending therethrough and said threads being located in said bore.

4. A pipe tap adapted to engage pipe stuck in a well bore, said tap comprising an upper portion and a lower portion, means on said upper portion to connect said tap to an operating string of pipe, and means on said lower portion to engage a pipe in said well bore, said last named means comprising threads having intersecting substantially straight faces extending at different angles to the axis of said tap, an upper face of one of said threads forming an obtuse angle with said axis, a lower face of one of said threads extending at an acute angle to said axis, said tap having a bore extending therethrough and said threads being located in said bore, the lower edge of said tap having a pocket therein, whereby pipe in said well bore may be moved to the center of said well bore.

5. A pipe tap adapted to engage pipe stuck in a well bore, said tap comprising an upper portion and a lower portion, means on said upper portion to connect said tap to an operating string of pipe, and means on said lower portion to engage a pipe in said well bore, said last named means comprising threads having intersecting substantially straight faces extending at different

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angles to the axis of said tap, an upper face of one of said threads forming an obtuse angle with said axis, a lower face of one of said threads extending at an acute angle to said axis, said tap having a bore extending therethrough and said threads being located in said bore, the lower edge of said tap being provided with spiral threads, whereby pipe in said well bore may be moved to the center of said well bore.

CHARLES R. EDWARDS. 10

REFERENCES CITED

The following references are of record in the file of this patent:

Number
137,414
1,229,560
1,335,431
1,495,212
1,524,265

6

UNITED STATES PATENTS

Name	Date
Burdick	Apr. 1, 1873
Whiteman	June 12, 1917
Fair	Mar. 30, 1920
Wade	May 27, 1924
Lester	Jan. 27, 1925

FOREIGN PATENTS

Number	Country	Date
9,704	Great Britain	Apr. 21, 1911