Oct. 29. 1946. N. T. BREAUX 2,410,262

OVERSHOT

Filed Aug. 20, 1945 3 Sheets-Sheet 1

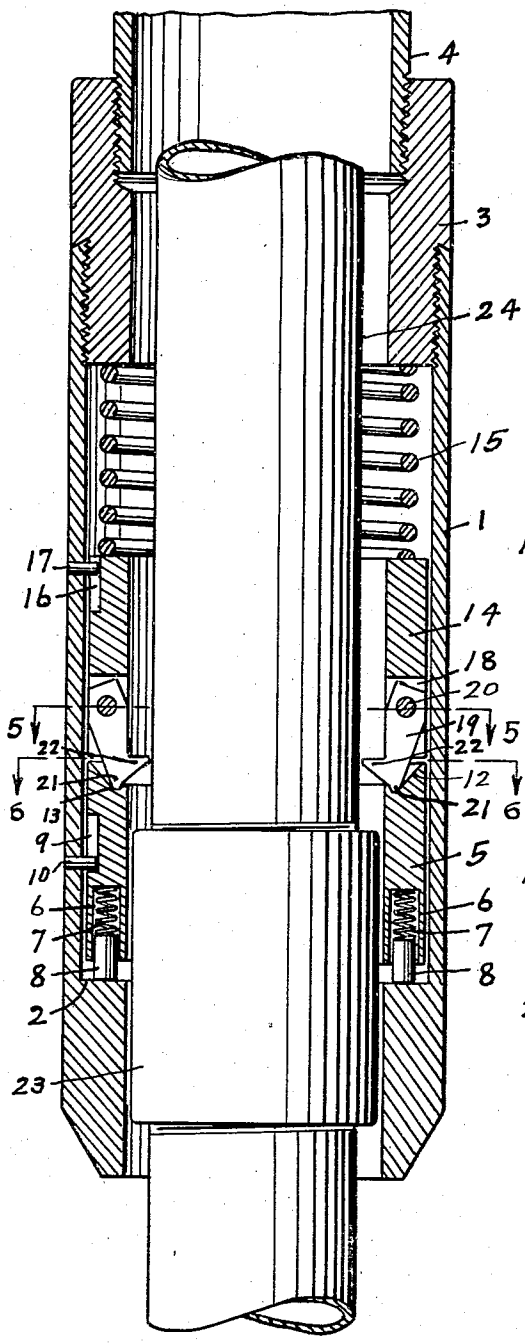


Fig. 1.

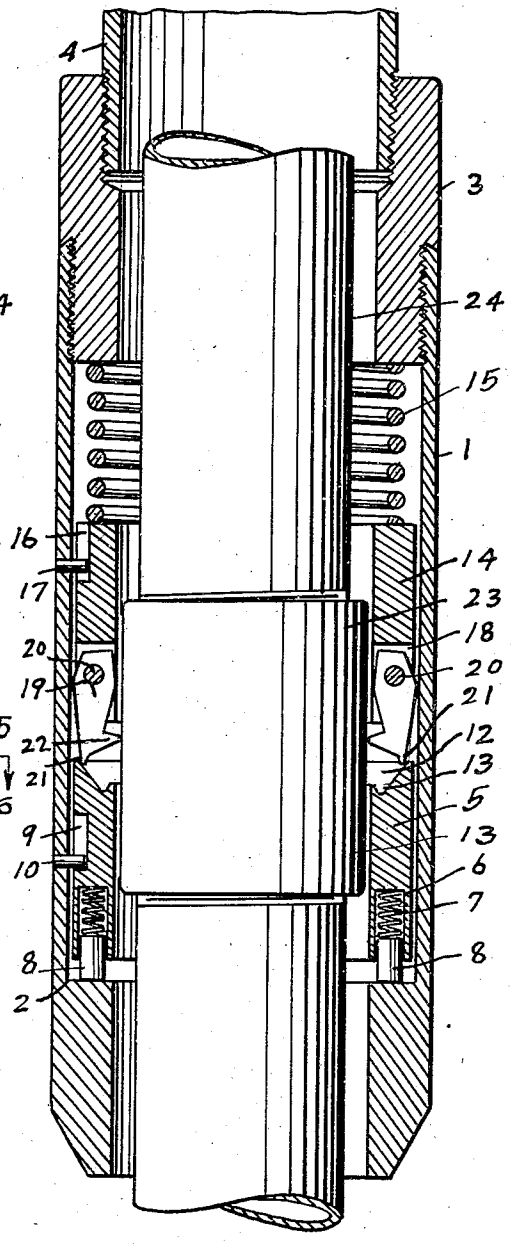


Fig. 2.

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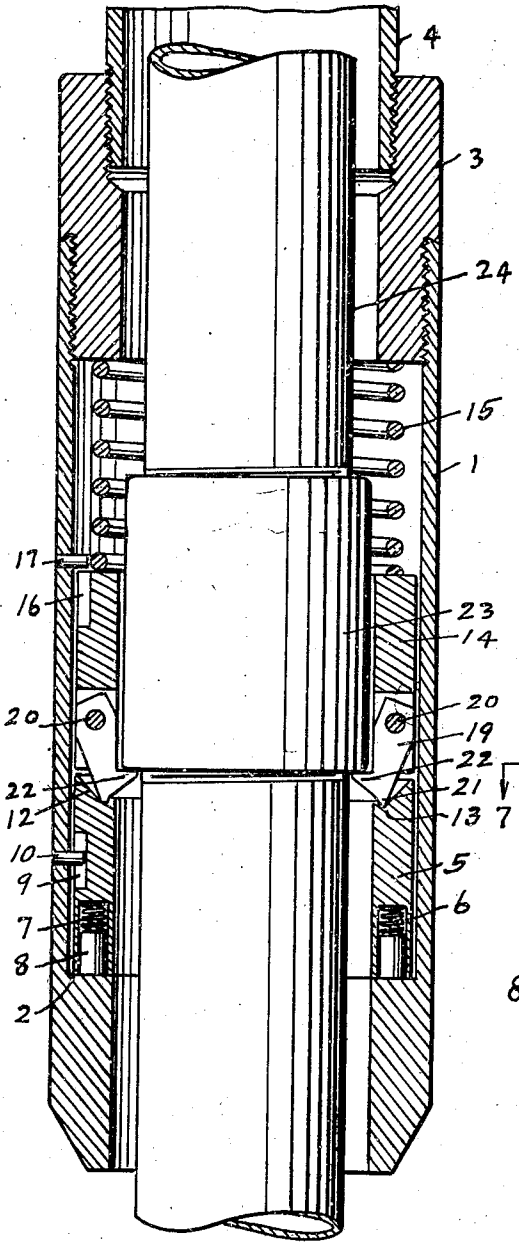


Fig. 3.

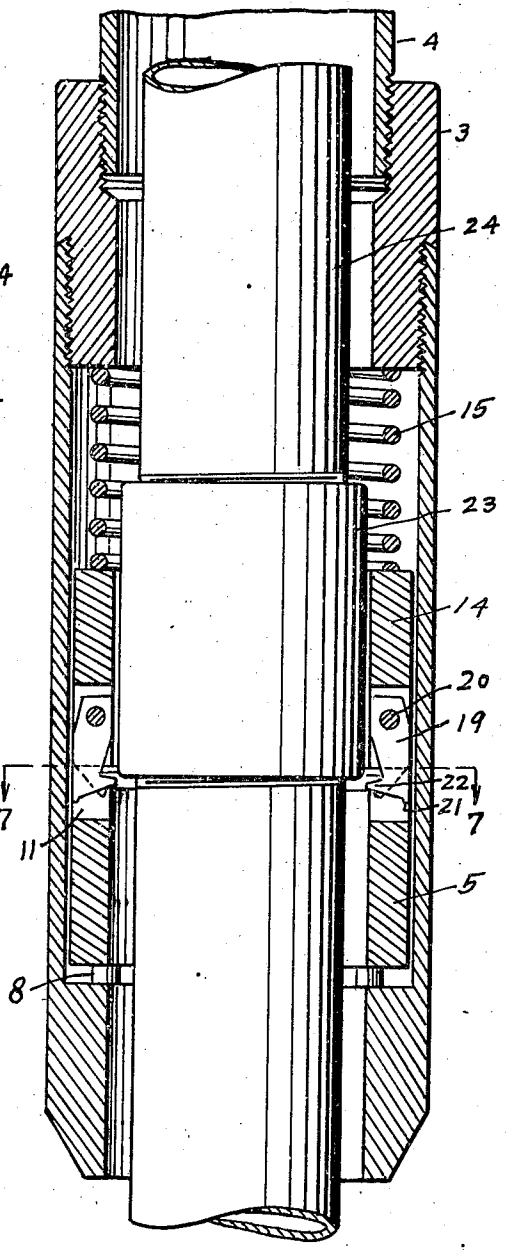


Fig. 4.

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OVERSHOT

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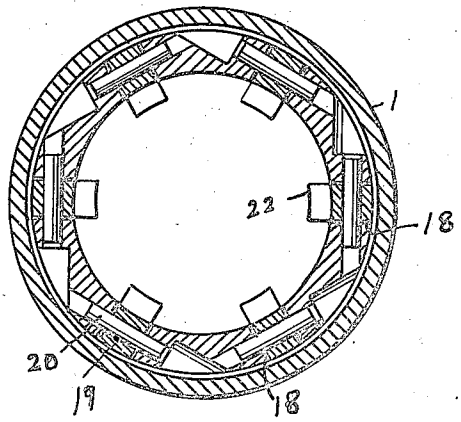


Fig. 5.

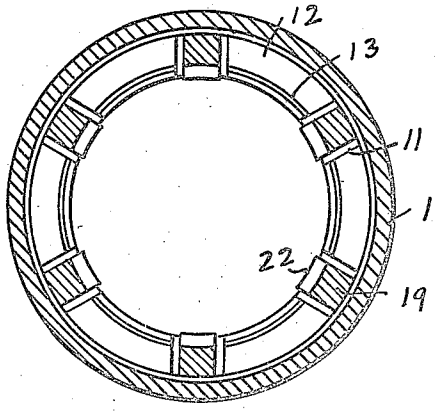


Fig. 7.

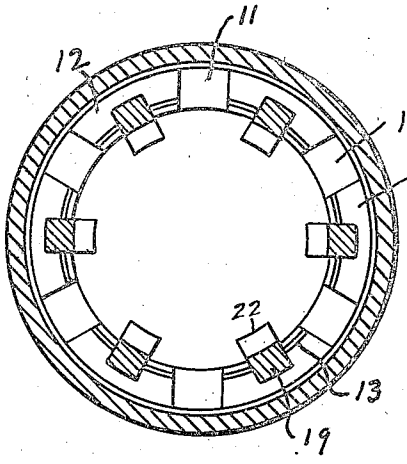


Fig. 6.

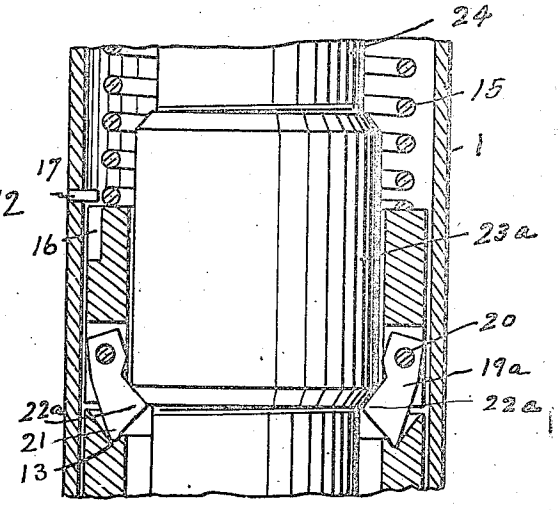


Fig. 8.

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2,410,262

UNITED STATES PATENT OFFICE

2,410,262

OVERSHOT

Neil T. Breaux, Houston, Tex.

Application August 20, 1945, Serial No. 611,487

8 Claims. (Cl. 294—86)

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This invention relates to an overshot type of pipe puller.

An object of the invention is to provide a tool of the character described which may be lowered into a well bore and telescoped over a pipe in the bore and engaged with an external coupling of the pipe whereby the pipe may be pulled from the well bore.

In one embodiment of the invention the overshot is of such construction that it may be engaged with a beveled type of coupling or with the upset portion of the pipe.

Another object of the invention is to provide an overshot which may be readily released from the pipe and withdrawn in case the pipe cannot be pulled.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, examples of which are given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical, sectional view of the tool as being lowered over the stuck pipe.

Figure 2 is a vertical, sectional view thereof showing the coupling-engaging dogs retracted and passing over the coupling.

Figure 3 is a vertical, sectional view showing the dogs in engagement underneath the coupling.

Figure 4 is a vertical, sectional view showing the dogs released so that the tool may be withdrawn.

Figure 5 is a cross-sectional view taken on the line 5—5 of Figure 1.

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 1.

Figure 7 is a cross-sectional view taken on the line 7—7 of Figure 4; and

Figure 8 is a fragmentary, vertical, sectional view of another embodiment adapted for engagement with a beveled coupling or upset end of a pipe section.

Referring now more particularly to the drawings wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates the tubular body of the tool whose lower end is internally thickened forming the inside, annular, upwardly facing shoulder 2. The lower end of the body is also downwardly and inwardly tapered as shown. Screwed into the upper end of the body there is a coupling 3 which is connected to the lower end of the tubular operating string 4.

Within the body 1 there is the tubular actuator 5 whose lower end has the vertical bores 6 and

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enclosing the coil springs 7. There are the supporting legs 8 whose lower ends are seated on the shoulder 2 and whose upper ends support the coil springs 7 whereby the actuator 5 is yieldingly supported.

The actuator 5 has a side slot, or keyway 9 cut therein and a key 10 is anchored to the body 7 and its inner end projects into the keyway. The keyway 9 is of limited length so as to limit the range of vertical movement of the actuator 5.

This actuator has the spaced slots 11 cut in its upper end and between said slots said upper end has the upwardly and outwardly tapered faces 12 which are provided with the arcuated grooves 13 near their lower margins, as more accurately shown in Figures 1, 2 and 6.

Within the body 1 above the dog actuator 5 there is the tubular carrier 14 and interposed between the upper end of this carrier and the lower end of the coupling 3 there is a coil spring 15.

The carrier 14 has an external longitudinal keyway 16 therein leading downwardly from the upper end thereof and a key 17 is anchored to the body with its inner end projecting into the keyway 16.

The lower end of the carrier 14 has the vertical slots 18 spaced apart therearound, as more accurately shown in Figures 1, 2 and 5, and pivotally mounted in these slots are the coupling-engaging dogs 19 whose upper ends are pivoted on the transverse pins 20 which are mounted in the carrier. The extreme lower ends of the dogs are formed with the depending arcuate ribs 21 which seat in the corresponding grooves 13 when the dogs are in engaged position and above said ribs the dogs are formed with the inwardly extended projections 22 provided to engage under the coupling 23 of the stuck pipe 24, as more accurately shown in Figure 3.

The tool may be assembled as shown and lowered into the well bore over the pipe 24 to be pulled. While being lowered the actuator 5 will be held in its upper position by the springs 7 and the carrier 14 will be held in lower position by the spring 15 with the projections 21 of the dogs 19 seated in the grooves 13. The projections 22 of said dogs will thus be held in their inner position. When the lower ends of the dogs strike the upper end of the collar 23 said dogs will be moved outwardly and upwardly along the upwardly flared faces 12, as shown in Figure 2, thus placing the spring 15 under compression. When the projections 22 of said dogs pass the lower end of the coupling 23 they will be free to move in-

wardly and they will be forced inwardly by the tapering faces 12 being forced inwardly by the pressure of the spring 15, as illustrated in Figure 3. An upward pull may now be exerted on the tool through the operating string 4 and as the tool moves upwardly the springs 7 will be compressed until the inside shoulder 2 engages the lower end of the actuator 5. The dogs will thus be locked in engaged position and an upward pull may be taken on the operating string 4 and the pipe 24 may thus be withdrawn from the well.

In some cases the sections of pipe may be coupled together by means of a pipe coupling as 23a which is beveled at its ends. In such case the shape of the dogs 19a is somewhat different from the shape of the dogs 19, the difference being that the inward projections 22a do not have an abrupt upwardly facing shoulder but these projections are tapered to conform to the taper of the coupling, all as shown in Figure 8. This embodiment of the tool, as shown in Figure 8, may also be used for pulling up-set pipe, that is pipe the abutting ends of whose sections, are bell shaped.

If the engaged pipe is so tightly stuck that it cannot be withdrawn it is desirable to release the overshot. This may be done by maintaining tension on the operating string so as to hold the key 17 disengaged from the keyway 16, as shown in Figure 3, and turning the overshot either to the left or right until the dogs 19, or 19a, as the case may be, register with the slots 11 and thereupon they will move outwardly in said slots into the position shown in Figure 4 and will clear the coupling, or external enlargement, of the pipe so that the tool may be withdrawn from the well.

What I claim is:

1. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly mounted in the body but keyed against rotation therein, a tubular carrier in the body, a yieldable seat above the carrier in the body against which the carrier is seated, dogs pivoted to and depending from the carrier, said actuator and dogs having co-operating parts effective to move the dogs inwardly into engagement underneath an external projection on the pipe upon downward movement of the carrier relative to the actuator.

2. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly supported in the body, but keyed against rotation therein, a tubular carrier in the body above the actuator, dogs pivoted to and depending from the carrier and adapted to be moved outwardly by an external projection on the pipe as the overshot is moved downwardly over said projection, yieldable means acting against the carrier, said actuator and dogs having co-operating parts effective to place said yieldable means under compression as said dogs move outwardly and to force said dogs inwardly, by said yieldable means, when the dogs have passed beneath said projection to cause the dogs to engage underneath said projection.

3. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly mounted in the body but keyed against rotation therein, a tubular carrier in the body, means, releasable upon upward movement of the body relative to the carrier, for preventing the rotation of the carrier relative to the body, a yieldable seat above the carrier in the body against which the carrier is seated, dogs pivoted to and depending from the carrier, said

actuator and dogs having co-operating parts effective to move the dogs inwardly into engagement underneath an external projection on the pipe upon downward movement of the carrier relative to the actuator, said actuator having slots to receive the dogs to permit their release from the projection upon release of said means and rotation of the body.

4. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly supported in the body, but keyed against rotation therein, a tubular carrier in the body above the actuator and keyed to, but releasable from, the body, dogs pivoted to and depending from the carrier and adapted to be moved outwardly by an external projection on the pipe as the overshot is moved downwardly over said projection, yieldable means acting against the carrier, said actuator and dogs having co-operating parts effective to place said yieldable means under compression as said dogs move outwardly and to force said dogs inwardly, by the action of said yieldable means, when the dogs have passed beneath said projection to cause the dogs to engage underneath said projection, said actuator having upper end slots to receive said dogs upon said release of the carrier and rotation of the body to release the dogs from said projection.

5. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly mounted in the body but keyed against rotation therein, a tubular carrier in the body above the actuator, means, releasable upon upward movement of the body relative to the carrier, for preventing the rotation of the carrier relative to the body, a yieldable seat above the carrier in the body against which the carrier is seated, dogs pivoted to and depending from the carrier and adapted to engage underneath an external projection on the pipe, said actuator and dogs having co-operating parts effective to move the dogs inwardly upon downward movement of the carrier relative to the actuator, said actuator having recesses to receive the dogs to permit their release from the projection upon release of said means and rotation of the body.

6. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly supported in the body, but keyed against rotation therein, a tubular carrier in the body above the actuator and keyed to, but releasable from, the body, dogs pivoted to and depending from the carrier and adapted to be moved outwardly by an external projection on the pipe as the overshot is moved downwardly over said projection, yieldable means acting against the carrier, said actuator and dogs having co-operating parts effective to place said yieldable means under compression as said dogs move outwardly and to force said dogs inwardly, by the action of said yieldable means, when the dogs have passed beneath said projection to cause the dogs to engage underneath said projection, said actuator having recesses to receive said dogs upon said release of the carrier and rotation of the body, to release the dogs from said projection.

7. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly mounted in the body but keyed against rotation therein, a tubular carrier in the body above the actuator, means, releasable upon upward movement of the body relative to the carrier, for preventing the rotation of the carrier relative to the body, a yieldable seat above

the carrier in the body against which the carrier is seated, pipe engaging means depending from the carrier and adapted to engage underneath an external projection on the pipe, said actuator and pipe engaging means having co-operating parts effective to move the pipe engaging means inwardly upon downward movement of the carrier relative to the actuator, said actuator being recessed to receive the pipe engaging means to permit release thereof from the projection upon release of said carrier and rotation of the body.

8. An overshot comprising, a tubular body adapted to telescope over a pipe in a well, an actuator yieldingly supported in the body, but keyed against rotation therein, a tubular carrier in the body above the actuator and keyed to, but releasable from, the body, pipe engaging means pivoted to and depending from the carrier

and adapted to be moved outwardly by an external projection on the pipe as the overshot is moved downwardly over said projection, yieldable means acting against the carrier, said actuator and pipe engaging means having co-operating parts effective to place said yieldable means under compression as said pipe engaging means moves outwardly and to force said pipe engaging means inwardly, by the action of said yieldable means, when the pipe engaging means have passed beneath said projection to cause the pipe engaging means to engage underneath said projection, said actuator being recessed to receive said pipe engaging means upon said release of the carrier and rotation of the body, to release the pipe engaging means from said projection.

NEIL T. BREAUX.