

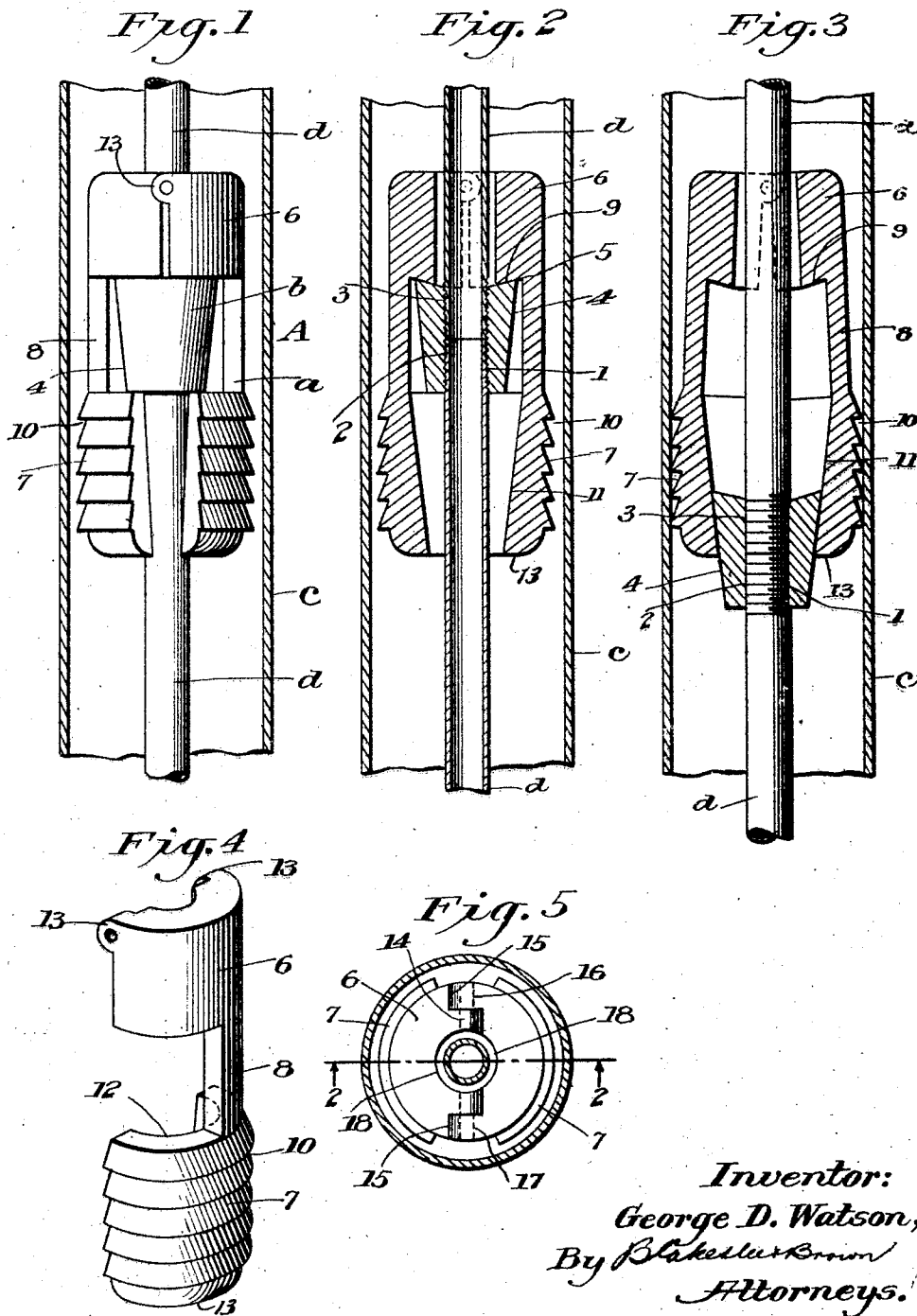
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TUBING CATCHER

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UNITED STATES PATENT OFFICE.

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TUBING CATCHER.

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To all whom it may concern:

Be it known that I, GEORGE D. WATSON, a citizen of the United States, residing at Torrance, in the county of Los Angeles and State of California, have invented new and useful Improvements in Tubing Catchers, of which the following is a specification.

This invention relates to tubing catchers. It is customary in oil well practice to provide some means whereby tubing is held in case of any breaking or parting of the tubing within well casing. Several methods of holding tubing in case of breakage have been used, and the one in most use consists in providing what is known as a tubing catcher.

The average tubing catcher now generally used is of a complicated structure, comprising many parts and is very expensive to manufacture.

An object of the present invention is to provide a tubing catcher which is simple of construction, inexpensive of manufacture, and which is positive in its action.

In practicing the invention I provide a tubing catcher comprising two or more jaws which are hinged together so as to be relatively moveable, and which jaws are adapted to be supported upon a jaw actuating means. The said jaw actuating means may comprise a collar or coupling formed with a cam periphery and adapted to connect lengths of tubing. If the tubing should suddenly part, the jaws, due to inertia, would remain practically stationary while the jaw actuating means associated with the tubing by dropping rapidly will strike the jaws, opening them outwardly for impingement against the inner surface of the casing.

With the above objects and others in view, including general superiority in use and service, the invention consists in the novel and useful provision, formation, construction, association, and relative arrangement of parts, members and features, all as shown in certain of its embodiments in the accompanying drawing, described generally and more particularly pointed out in the claims.

In the drawings Figure 1 is an elevation of the improved tubing catcher associated with tubing and within well casing; the

said tubing and casing being in vertical section and shown fragmentarily.

Figure 2 is a cross-sectional view on the line 2—2 of Figure 5;

Figure 3 is a view similar to Figure 2, and showing operation of the jaws of the tubing catcher, resulting upon drop of the tubing;

Figure 4 is a perspective view of one of the jaws of the tubing catcher; and

Figure 5 is a plan view of the tubing catcher.

Corresponding parts in all the figures are designated by the same reference characters.

Referring now with particularity to the drawings, the improved tubing catcher is designated as an entirety by A, and which tubing catcher includes as elements jaw members *a* and jaw actuating means *b*, both of which elements may be used in practicing one embodiment of the invention.

I have shown at *c* a casing such as an oil well casing, within which the tubing catcher is adapted to be received, and at *d*, well tubing, such as pump tubing. The tubing catcher A is usually placed just above the pump, although in the present instance the tubing catcher, or a series of tubing catchers, may be placed at intervals throughout the tubing length. The jaw actuating means may include a collar formed with a central screw-threaded bore 1, and which collar acts to connect together ends of the tubing *d*, as shown at 2 and 3. The said tubing lengths to this end being screw-threaded for reception on the screw-threads 1 of such means *b*. The said means *b* is provided with a cam surface 4, the said cam surface being preferably formed by beveling the periphery of the collar. The collar is provided with a concave top, as shown at 5. In the present instance I have provided two jaws *a*, both of which include a semicircular head 6, a grip or slip 7, connected with and associated with said head through the medium of an arm 8. The base of the head is convex in form, as shown at 9, and the outer surface of the grip or slip 7 is formed with serrations 10. The inner surface of such grip or slip 7 is pro-

vided with a cam surface 11. This cam surface is preferably a beveled one, being beveled inwardly from the top 12 of the slip to the base 13 thereof, relative to the outer surface of the grip. The head 6 is provided with a pair of diametrically disposed knuckles 13. As has been stated, the present invention contemplates the use of two jaws, and both jaws are similarly formed, one jaw, however, will have the knuckle portions adjacent the peripheral surface of the head thereof, for instance, the jaw shown in Fig. 4, while the second jaw will have the knuckle portions, designated as 14, adjacent the inner curved surface 18 of the head. In other words, there are shoulders 15 formed as between the knuckles 14 and the outer surface of one of the jaws with the knuckles 13 fitted against such knuckles 14 and adjacent the shoulders 15. After so fitting the knuckles, pins 16 and 17 may be passed through the eyes of said knuckles to hold the jaws in co-operative hinged relation.

In actual use, assuming that the tubing catcher A is in position as shown in Figures 1 and 2, it will be seen that the inner curved surface 18, of each of the heads loosely surrounds the periphery of the pump tubing d , and that the convex base 9 of the head is carried upon the concave top of the collar. This construction assures that the tubing catcher heads will have the grips or slips thereof lying parallel with and out of contact with, the inner surface of the casing c . Thus the tubing d , with the tubing catcher A may be inserted within well casing, or withdrawn therefrom, without in any manner operating the tubing catcher. If for any reason the tubing should break or part the grips or slips 7 would immediately engage into the inner surface of the casing c , as shown in Figure 3, and stop further downward movement of the tubing. This is true for the reason that the weight of the tubing, when it drops, causes the tubing to drop so rapidly that the jaws a , due to inertia, will not obtain any acceleration due to the drop, with the result that the cam surface of the jaw actuating means, co-operating with the cam surfaces of the slips, will move such slips outwardly, to cause the serrations on the slips to bite into the tubing. It is also evident that the tubing would be stopped from dropping, due to the wedge action that would exist between the jaw-actuating means and the grips or slips due to engagement of the cam surface thereof.

The very simplicity of the tubing catcher lends itself admirably to different well practices with a minimum expense in providing such a catcher. Quite obviously the tubing may be moved up and down within the casing without in any manner actuating

the tubing catcher. It is the sudden drop that causes the catcher to operate. In place of providing a given unit, complete in itself as a tubing catcher, it is only necessary, in the present instance, to provide different sizes of jaw actuating means, depending upon the different sizes of tubing used. Thus there would be delivered at a well derrick different sizes of jaw actuating means with one size of jaws.

It is obvious that various modifications and variations may be made in practicing the invention, in departure from the particular showing of the drawing, without departing from the true spirit thereof.

I claim:

1. Improvements in tubing catchers adapted to be associated with well tubing, including jaw actuating means for coupling together lengths of said well tubing, and a pair of hingedly connected jaws directly supported by said jaw actuating means.

2. Improvements in tubing catchers adapted to be associated with well tubing, including jaw actuating means for coupling together lengths of said well tubing, and a pair of hingedly connected jaws supported by said jaw actuating means; said jaw actuating means being provided with a cam surface for contact with the jaws to swing the jaws about their hinge centers, resultant upon sudden drop of the tubing.

3. Improvements in tubing catchers adapted to be associated with well tubing, including a jaw having a grip portion and a head associated therewith, said grip being formed with a cam surface; jaw actuating means associated with the head of the jaw and adapted to become disassociated therefrom to contact with the cam surface of the grip to move the grip resultant upon drop of the tubing.

4. Improvements in tubing catchers adapted to be associated with well tubing, including a pair of jaws surrounding said well tubing, said jaws comprising grip members, arms joined to the grip members and heads associated with the arms, and jaw actuating means carried by the well tubing; said jaw heads normally being associated with the jaw actuating means to carry the said jaws.

5. Improvements in tubing catchers adapted to be associated with well tubing, including a pair of jaws surrounding said well tubing, said jaws comprising grip members, arms joined to the grip members and heads associated with the arms, and jaw actuating means carried by the well tubing; said jaw heads normally being associated with the jaw actuating means to carry the said jaws, and hinge means between the said heads.

6. Improvements in tubing catchers adapted to be associated with well tubing, including a pair of jaws surrounding said well

tubing, said jaws comprising grip members, arms joined to the grip members and heads associated with the arms, and jaw actuating means carried by the well tubing; said jaw
5 heads normally being associated with the jaw actuating means to carry the said jaws; said jaw actuating means comprising a member having a concave top portion, and said heads being provided with convex shoulders adapted to cooperate with the concave top
10 portion.

In testimony whereof, I have signed my name to this specification.

GEORGE D. WATSON.