Nov. 10, 1925. 1,561,236

E. H. HUNT

RELEASABLE COMBINATION SOCKET

Filed Dec. 2, 1922

FIG. 1.

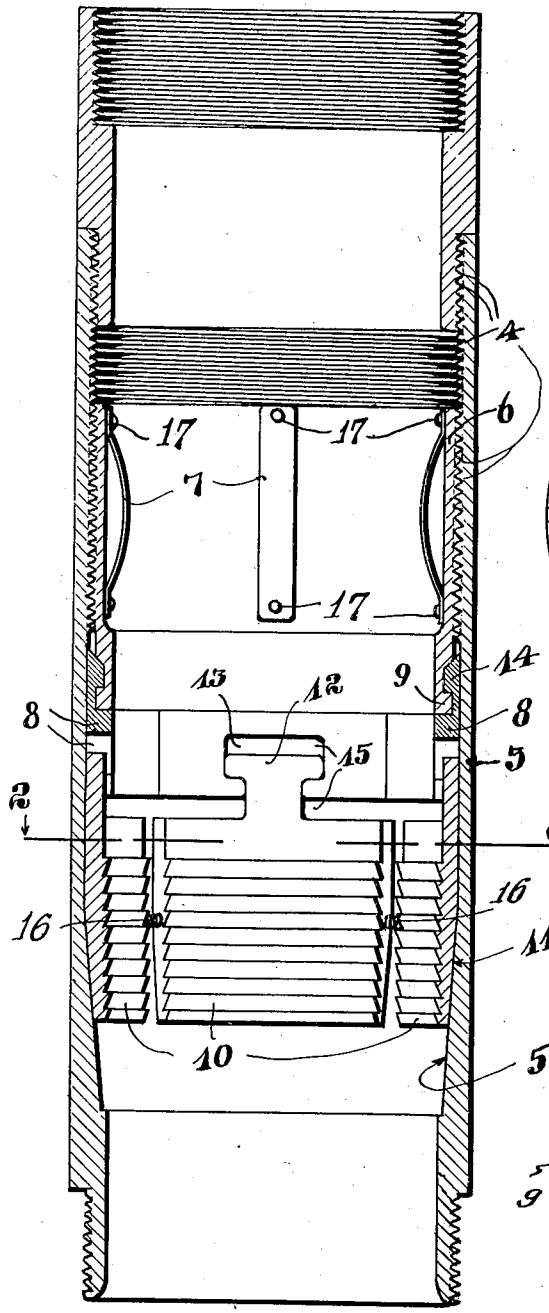
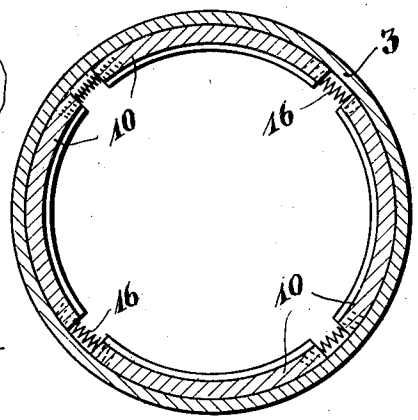


FIG. 2.



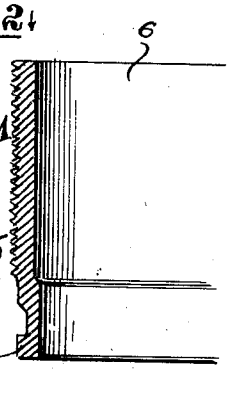


FIG. 3.

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Patented Nov. 10, 1925. 1,561,236

UNITED STATES PATENT OFFICE.

ELIJAH H. HUNT, OF MONTEBELLO, CALIFORNIA.

RELEASABLE COMBINATION SOCKET.

Application filed December 2, 1922. Serial No. 604,571.

To all whom it may concern:

Be it known that I, ELIJAH H. HUNT, a citizen of the United States, residing at Montebello, in the county of Los Angeles and State of California, have invented new and useful Releasable Combination Sockets, of which the following is a specification.

This invention relates to devices used for recovering tubings, casings, tools, and other articles from deep wells.

One of the objects of this invention is to provide a combination socket that may be either engaged or disengaged by a turning or rotating of the device.

Another object is to provide friction means to engage with the article to be recovered in connection with a threaded sleeve for actuating the engaging jaws.

Another object is to provide a threaded sleeve in connection with expanding jaws operative by friction means.

Other objects will appear from the following description and appended claims as well as from the accompanying drawing, in which—

Fig. 1 is a longitudinal midsectional view of a combination socket, embodying the invention, the illustrated device being of the type commonly used for engaging over articles to be recovered, forming one device in combination with which the invention may be applied.

Fig. 2 is a cross section on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary longitudinal midsectional view of the actuating ring.

In drilling and developing deep wells, joints of casing, tubing, or tools are frequently lost in the wells, by breaking or disengaging.

So-called fishing tools are used for recovering the lost articles. One particular fishing tool is commonly known as a combination socket, made in different forms, each of the various forms being of very general usefulness. The illustrated device is of a form that will easily slip over the end of a lost joint in a well, and then engage and grip the lost article to be lifted out of the well. Other tools are of a form to engage inside of a tubing or casing, and are provided with similar engaging means for obtaining a firm hold on the inner walls of such tubing or casing, to allow a lifting.

The tubular body 3 of the illustrated form is provided with a threaded portion 4 and with a taper portion 5. A threaded sleeve 6 is turnably mounted or disposed within the body 3. Spring members 7 are provided on the sleeve 6, for frictionally engaging over a lost article. Spring members 7 are shown as secured at their ends to the sleeve 6, as indicated at 17. Of course, the springs may be secured at one end or both ends, such slight modifications being of little importance as long as curved portions of the spring may engage over an article lost in a well. It is also of little importance whether such a securing is accomplished by riveting, screwing, or welding.

If, for instance, a drill pipe is lost in a well, and this device is successfully passed over the drill pipe, the spring members 7 are designed and intended to engage over the outside of the drill pipe to such an extent that the threaded sleeve will be prevented from turning when the tubular body is being rotated. By rotating the tubular body, either, in the left-hand or right-hand direction, the threaded sleeve is caused to screw or move in a desired direction longitudinally to the body 3.

Zig-zag threads have been indicated in the drawing, but it must, of course, be understood that any other type of threads may be used, especially between the tubular body 3 and the sleeve 6, where square threads will, under heavy duty work, that is, with large-sized devices, be very much preferable, since zig-zag threads or any taper threads normally tend to cause some binding effect in a threaded joint.

One end of the threaded sleeve is designed to engage with the clamping or engaging jaws of the device.

A ring 8 is inserted between the engaging end 9 and the jaws 10, to make the whole tool more pliable or yieldable, but this ring may easily be omitted, as will easily be understood from the following description.

The outside of the jaws is designed to engage with the taper bore 5 of the body 3, as indicated at 11.

In screwing the threaded sleeve 6 in the direction towards the taper bore 5, the jaws are compressed for the purpose of engaging the article over which the device has been disposed. Such an engagement between taper surfaces may become so firm that the

jaws cannot be rotated within the body 3. Since the threaded sleeve 6 must be rotated to operate, the engagement between the threaded sleeve and the jaws must under the above conditions be rotatable. On the other hand, the jaws must move radially when moving along the taper bore 5, to produce the clamping and disengaging action of the clamping jaws. To allow a radial moving of the jaw members, the upper edges or ends of the jaws are provided with extension ends 12 to engage with cooperating engaging cut-outs 13 in the ring 8.

For extensive radial movements, the hook-engagement 12—13 is absolutely necessary, as, where the device is to be used for varying sizes. In such a case, the ring 8 is preferably inserted.

More commonly, however, and especially when a drill pipe is lost within a proportionally small casing, the space between the casing and the drill pipe is limited, and the fishing tool must of necessity be of thin or light material, with very little radial movement required for the clamping jaws. In such a case, the hook-engagement, indicated at 14, is fully sufficient for the rotating as well for the radial movement between the threaded sleeve 6 and the jaws 10. A direct engagement between the threaded sleeve 6 and the jaws is then preferable over the form with the ring 8 inserted.

After the threaded sleeve 6 has been screwed down, to bring the jaws 10 in engagement with a drill pipe, a lifting is usually or normally attempted.

On lifting the lost drill pipe, the jaws 10 are liable to slip to some extent before the jaws firmly grip and set, and the jaws have the tendency to slip in the taper bore until the teeth of the jaws become set in the material of the drill pipe. Since the threaded sleeve 6 normally cannot give, the necessary yielding is allowed by spacing the hook-engagement as indicated at 15.

The engaging ring 8 is preferably made in sections so that the ring may easily be hooked over the outside of the threaded sleeve 6; if four jaws are provided in a tool of this type, the ring 8 is naturally made in four sections.

Springs 16 are preferably disposed between the several jaws, as indicated in Fig. 2, to keep the jaws normally spaced and in a position to easily slip over lost articles, so that engagement is only established by the operation of the threaded sleeve 6.

The engagement between the sleeve 6 and the ring 8 is in form of oppositely facing annular shoulders, the end 9 of the sleeve 6 being in form of an outwardly projecting annular shoulder member, and the end 14 of the ring 8 being in form of an inwardly projecting annular shoulder member, so that the sleeve 6 may be rotated within the ring 8. The ring 8 is, of course, made in sections in order to allow a placing of the ring over the annular shouldered hook-end 9 of the sleeve 6.

When the device is disposed over a lost article in a deep well, the springs 7 are intended to engage first, so as to cause a rotating or screwing of the sleeve 6 within the body 3, as soon as the body is rotated, the springs 7 with the sleeve 6 naturally remaining stationary with the engaged lost article in the well.

By such a screwing movement of the sleeve 6, the ring 8 with the jaws 10 are caused to move downwardly within the taper portion 5 of the body 3.

As soon as the jaws come in touch with the lost article, a turning of the body is retarded, since the jaws then show a tendency of remaining stationary with the lost article. This can easily be detected.

A short and quick upward pull of the body is then normally sufficient to engage the jaws fully with the lost article, the jaws being able to slip to some extent downwardly within the taper portion 5 of the body by reason of the play or space indicated at 15 and referred to above.

In case the lost article cannot be recovered from the well, so that an unscrewing of the device from the lost article becomes necessary, the body can easily be jarred downwardly to a suitable extent to free the jaws again in a similar manner as they were finally engaged with the lost article. On being jarred loose to such an extent, the springs 7 are still engaged enough with the lost article to make an unscrewing and clear disengaging of the device from the lost article possible.

Having thus described my invention, I claim:

1. In a combination socket, a body member, a threaded sleeve turnably engaged with the body member, and jaw members having means to engage with the threaded sleeve.

2. In a combination socket, a body member, a threaded sleeve turnably engaged with the body member having friction means adapted to engage with an article to be recovered by the device for rotating the sleeve in relation to the body member, and jaw members having means to engage with the threaded sleeve.

3. In a combination socket, a body member, a threaded sleeve turnably engaged with the body member having friction means adapted to engage with an article to be recovered by the device for rotating the sleeve in relation to the body member and having engaging means for cooperating jaw members, and jaw members having means to engage with the threaded sleeve for radial and rotating movements.

4. In a combination socket, a body member having a threaded portion and having

a taper portion, a threaded sleeve turnably engaged within the threaded portion of the body, and jaw members having corresponding taper portion to slidably engage with the taper portion of the body member and having means to engage with the threaded sleeve to be operative by the sleeve.

5. In a combination socket, a body member having a threaded portion and having a taper portion, a threaded sleeve turnably engaged within the thread portion of the body, and jaw members having corresponding taper portions to slidingly engage with the taper portion of the body member and having means to engage with the threaded sleeve for radial and rotating movements.

6. In a combination socket, a body member having a threaded portion and having a taper portion, a threaded sleeve turnably engaged with the threaded portion of the body member, a ring member turnably engaged with the sleeve, and jaw members engaged with the ring member for radial movements.

7. In a combination socket, a tubular body having a threaded bore in one portion and having a taper bore in another portion, a threaded sleeve turnable within the threaded bore of the body, friction members on the sleeve, a ring member turnably engaged with the sleeve, and jaw members engaged with the ring member for radial movements.

8. In a combination socket, a tubular body having a threaded portion and a taper portion within its bore, a threaded sleeve turnable within the threaded portion of the body, friction members on the sleeve for actuating the sleeve, a ring member turnably engaged with the sleeve, jaw members engaged with the ring member for radial movements, and springs disposed between the jaw members for normally keeping the jaw members in inoperative position.

9. In a combination socket, a tubular body having a threaded portion and a taper portion within its bore, a threaded sleeve turnable within the threaded portion of the body, jaw members disposed within the taper portion of the body movable in longitudinal and rotary direction in relation to the body, a ring member disposed between the threaded sleeve and the jaw member having means for operatively connecting the threaded member and the jaws, and means for holding the jaws in inoperative position.

In testimony that I claim the foregoing as my invention I have signed my name.

ELIJAH H. HUNT.