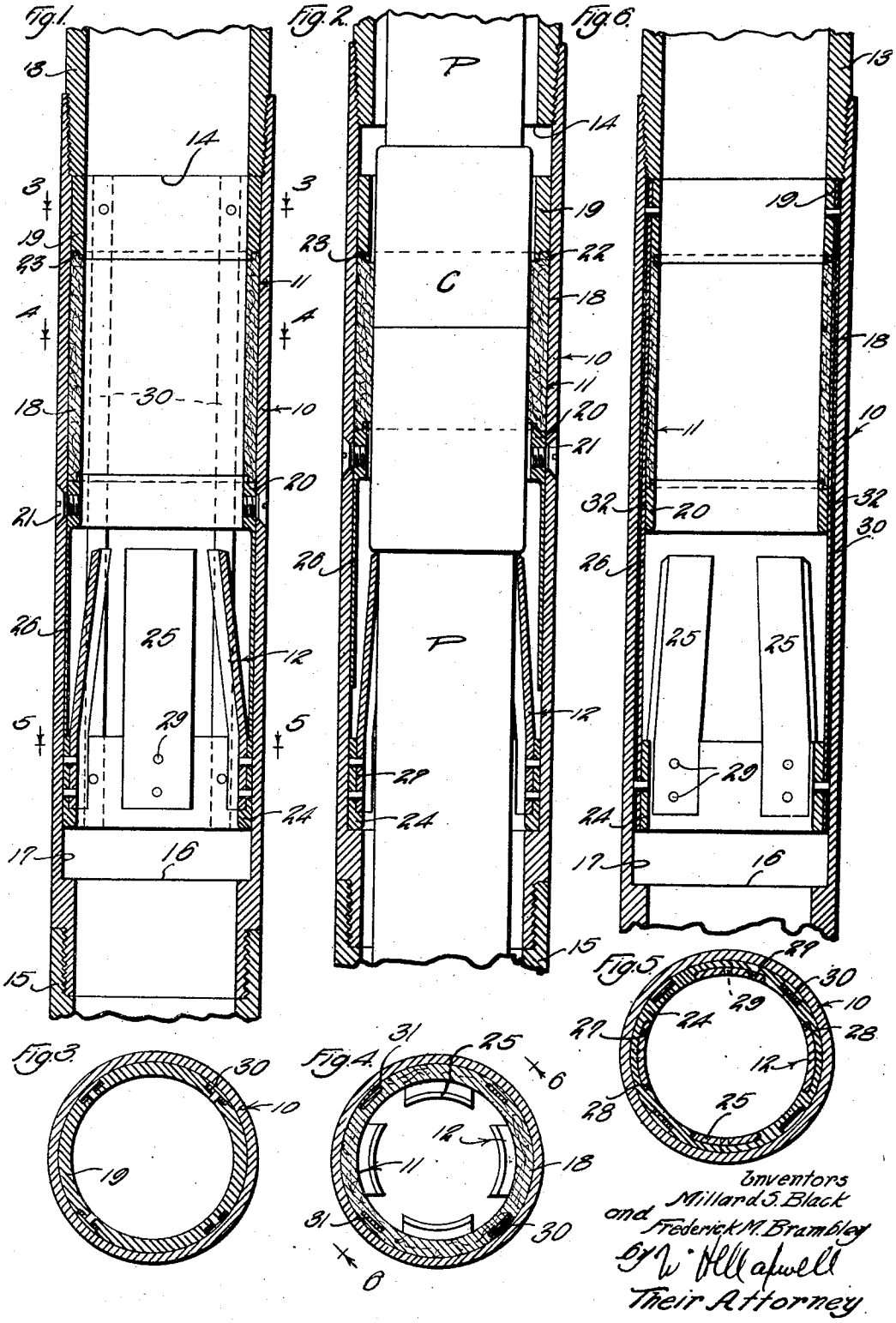
Sept. 22, 1931. M. S. BLACK ET AL 1,824,191

PACKING OVERSHOT

Filed June 18, 1930



Patented Sept. 22, 1931 1,824,191

UNITED STATES PATENT OFFICE

MILLARD SUMTER BLACK, OF HUNTINGTON PARK, AND FREDERICK M. BRAMBLEY, OF BREA, CALIFORNIA

PACKING OVERSHOT

Application filed June 18, 1930. Serial No. 462,018.

This invention relates to a well tool and relates more particularly to a packing overshot useful for fishing or removing objects from a well. It is a general object of the present invention to provide a packing overshot of the general character fully described and claimed in Letters Patent No. 1,554,553, for new and useful improvements in packing overshots, issued to us September 22, 1925.

It is an object of the present invention to provide a simple, practical, and dependable packing overshot that is operable to effectively grip a broken off or lost portion of a string of drill pipe, or the like, within a well and to provide an effective seal between the lost portion of the drill pipe and the fishing string so that fluid may be circulated through it from the fishing string.

It is another object of this invention to provide a packing overshot that embodies means for gripping the fish or lost object that operates packing for sealing or packing with the fish, which means is limited in its packing actuating movement so that the packing cannot be put under undue strain when the overshot is operated to lift or hold the fish.

Another object of this invention is to provide a packing overshot of the character mentioned that operates effectively and fully in a comparatively small space.

Another object of the present invention is to provide a packing overshot that embodies but few simple parts which may be formed sufficiently heavy to be effective and dependable in operation.

It is a further object of the invention to provide a packing overshot of the character mentioned in which the various parts are easily and quickly removed from the body of the tool in a single assembled unit for repair or replacement.

Other objects and features of our invention will be best and more fully understood from the following detailed description of a typical form and application of the invention, throughout which description reference is had to the accompanying drawings, in which:

Fig. 1 is a longitudinal detailed sectional view of the tool provided by the present invention showing the various parts in the normal or unactuated position. Fig. 2 is a view similar to Fig. 1 illustrating the overshot in gripping and sealing engagement with a string of drill pipe. Fig. 3 is a transverse detailed sectional view taken as indicated by line 3—3 on Fig. 1. Fig. 4 is a transverse detailed sectional view taken as indicated by line 4—4 on Fig. 1. Fig. 5 is a transverse detailed sectional view taken as indicated by line 5—5 on Fig. 1, and Fig. 6 is a longitudinal detailed sectional view taken as indicated by line 6—6 on Fig. 4.

The packing overshot provided by the present invention includes, generally, a body 10, packing means 11 within the body adapted to be actuated to engage a drill pipe extending through the body to provide a fluid tight seal between the drill pipe and the body, and means 12 carried by the body to grip or engage the string of drill pipe to lift it and for actuating the packing means 11 to seal with the drill pipe upon the body 10 being moved upwardly to lift or raise the drill pipe.

In the drawings we have illustrated a form of the invention intended primarily to be employed for fishing or removing drill pipe from a well. A portion of a string of drill pipe composed of sections of pipe P connected by a coupling C is shown extending through the tool. It is to be understood that the tool may be designed to handle other objects and that the invention is not to be construed as limited to the particular form illustrated in the drawings.

The body 10 is adapted to be carried by or connected in a fishing string of casing or pipe. The body 10 is preferably an integral tubular member and its upper end may be internally screw threaded to be connected with a coupling or suitable connecting device at the lower end of a fishing string. In the drawings a connecting or coupling member 13 carried at the lower end of a fishing string is shown screw threaded into the upper end of the body 10. The lower end of the coupling member 13 provides

a downwardly facing shoulder 14 in the upper end of the body 10. The lower end of the body 10 may be externally screw threaded to connect with or carry a suitable guide shoe 15, or the like, for guiding objects into the body. The exterior of the body 10 is preferably smooth and of uniform diameter throughout its length. An upwardly facing seat or shoulder 16 is provided in the opening 17 of the body adjacent its lower end. The opening 17 is preferably of uniform diameter between the shoulder 16 and the upper end of the body and the walls of the opening 17 are preferably smoothly finished.

The packing means 11 for engaging or sealing with the drill pipe or drill pipe coupling C is arranged in the upper portion of the body 10 and includes an annular body of expansible packing 18, a compressing collar or ring 19 at the upper end of the packing 18, and an abutment ring 20 at the lower end of the packing 18. The rings 19 and 20 and the packing 18 are adapted to be assembled or arranged through the upper end of the body 10. The abutment ring 20 is provided to support the packing 18 in the body and to form an abutment against which the packing 18 may be compressed upon its actuation by the means 12. The ring 20 is removably mounted in the opening 17 of the body at a point spaced between the shoulder 16 and the upper end of the body. The abutment ring 20 may be detachably secured in the body 10 by suitable screws 21 threaded through the walls of the body. The upper ring 19 is arranged at the upper end of the expansible packing 18 and may be normally arranged immediately below the lower end 14 of the coupling member 13.

The packing 18 may be formed of rubber, rubber composition, or other suitable expansible packing material, and is preferably in the nature of an integral annular body of packing. The packing 18 is arranged against the walls of the opening 17 between the rings 19 and 20 and normally holds the ring 19 in a position adjacent the lower end of the coupling member 13. The upper ring 19 is slidably arranged in the opening 17 and is adapted to be moved downwardly in the body by the means 12 to compress the packing and expand it inwardly. The collars 19 and 20 may have recesses 22 receiving flanges 23 at the ends of the packing 18.

The means 12 for engaging the drill pipe coupling C to lift the drill pipe upon upward movement of the body 10 and for actuating or compressing the packing 18 to seal with the drill pipe coupling C is arranged within the lower portion of the body 10 between the ring 20 and the seat or shoulder 16. The means 12 includes a collar or ring 24 slidably arranged in the opening 17 of the body and a plurality of resilient fingers 25 for engaging the coupling C or like projecting part on the drill pipe P.

The ring 24 is slidable in the body opening 17 between the shoulder 16 and stops 26 projecting downwardly from the ring 20. The ring 24 is adapted to seat on the shoulder 16 to support the drill pipe P on the body 10 through the fingers 25. The downward movement of the ring 24 is limited by the shoulder 16, while the upward movement of the ring is limited by the stops 26. There may be a plurality of symmetrically or equally spaced stops 26 projecting downwardly from the abutment ring 20 along the walls of the body opening 17. In the particular case illustrated the stops 26 are integral with the abutment ring 20.

The resilient fingers 25 are provided to engage and support the drill pipe and project upwardly and inwardly from the slidable ring 24. There may be four equally spaced fingers 25 provided on the ring 24. The fingers 25 are preferably made comparatively heavy to effectively support the drill pipe. The lower end portions of the fingers 25 may fit in grooves 27 in the inner wall of the ring 24. The vertical edges 28 of the grooves may be relieved or recessed, and the fingers 25 may be formed to fit into the recessed edges of the grooves. The grooves 27 may terminate at points above the lower end of the ring 24 and the lower ends of the fingers 25 may be supported on the lower ends of the grooves. The fingers 25 may be secured to the ring 24 by suitable rivets 29, or the like. The fingers 25 are comparatively long and project freely upwardly and inwardly through the body so that their upper ends are considerable distances above the ring 24. The fingers 25 may be transversely curved to conform to the curvature of the exterior of the drill pipe sections P, or the like. The fingers 25 are made resilient so that they may be sprung or depressed outwardly to lie adjacent the walls of the opening 17 upon the tool being passed over the drill pipe coupling C. The upper ends of the fingers 25 may be beveled or formed to effectively grip under the drill pipe coupling C. The fingers 25 are preferably arranged so that they are spaced between the stops 26. When the body 10 is lowered down over the drill pipe, the supporting fingers 25 are depressed or forced outwardly during their passage over the coupling C and closely engage the sections of the drill pipe P after passing the coupling so that when the body 10 is moved upwardly after the fingers have passed the coupling they will engage under the coupling C. Upon upward movement of the body 10 when the fingers 25 are in engagement with the lower end of the coupling, the ring 24 is held stationary and the shoulder 16 is moved upwardly into supporting

or carrying engagement with the lower end of the ring 24 so that the drill pipe may be carried upwardly or raised with the body.

The invention provides an operative connection between the pipe engaging or coupling engaging means 12 and the packing means 11 so that the packing 18 is expanded upon upward movement of the body 10 relative to the ring 24. The operative connection between the means 12 and the means 11 may include a plurality of connecting straps or members 30 connecting the upper ring 19 and the slidable ring 24. The connecting members 30 may be flat strap-like members arranged longitudinally through the body 10. The members 30 may have their opposite ends secured to the ring 18 and 24 by means of suitable rivets, or the like. There may be a plurality of connecting members 30 connecting the rings 19 and 24. The members 30 are preferably spaced to connect with the ring 24 at points between the resilient fingers 25. In accordance with the invention the members 30 are slidably arranged through longitudinal openings 31 in the packing 18 and grooves 32 in the abutment ring 20. It is preferred to arrange the connecting members 30 in openings in the packing 18 so that the packing has unbroken engagement with the walls of the opening 17. The ring 24 is connected with the ring 19 by means of the members 30 so that it is normally spaced above the shoulder 16. The packing 18 yieldingly holds the ring 19 in the up position adjacent the lower end of the coupling member 13 and through the members 30 normally supports the ring 24 in the position spaced above the shoulder 16.

In employing the tool the body 10 is connected in or arranged in a fishing string of casing or pipe adjacent the lower end of the fishing string and a guide shoe 15, or the like, may be provided to guide the tool onto the fish or pipe P. The tool is lowered over the drill pipe P until the resilient fingers 25 have completely passed over a coupling C. The body 10 may then be moved upwardly to cause the fingers 25 to engage under the collar or coupling C. Upward movement of the body 10 when the fingers 25 are in engagement with the lower end of the coupling C causes the body 10 to move upwardly relative to the ring 24 and the ring 19 so that packing 18 is compressed between the rings 19 and 20.

The connecting members 30 act to hold the upper ring 19 against movement relative to the ring 24 so that upward movement of the body 10 causes the abutment ring 19 to compress the packing 18 against the stationarily held ring 19. Compression of the packing 18 causes its expansion inwardly into sealing engagement with the collar or coupling C. The extent of upward movement of the body 10 relative to the rings 24 and 19 is limited by the shoulder 16 which engages the lower end of the ring 24 to cause the lifting or raising of the drill pipe P and to limit the extent of compression of the packing 18. It will be obvious how fluid circulated downwardly through the fishing string will be prevented from passing between the body 10 and the coupling C by the packing 18 and will be caused to circulate downwardly through the drill pipe P.

It is to be noted that the overshot provided by the present invention is particularly simple in construction and operation and embodies but few simple, sturdy parts. The tool may be operated through a hole of a diameter slightly greater than the diameter of the drill pipe coupling C. The rings 19, 20, and 24 and the packing 18, being arranged against the walls of the body opening 17, may be made comparatively thin so that the tool may be operated in a minimum amount of space without weakening the construction as they may be made sufficiently long to provide for the necessary strength. The packing 18 being operable to pack against the coupling C, does not need to expand to a great extent and is not subjected to excessive strains or pressures. The extent of compression of the packing 18 is positively limited by the shoulder 16 which limits the downward movement of the rings 24 and 19 and which supports the drill pipe P independently of the packing 18. The resilient fingers 25 for gripping and supporting the fish or drill pipe are carried in the tool so that they may be made sufficiently heavy to dependably support and carry the fish.

Having described only a typical preferred form of our invention, we do not wish to limit ourselves to the specific details set forth, but wish to reserve to ourselves any changes or variations that may appear to those skilled in the art or fall within the scope of the following claims:

Having described our invention, we claim:

1. A tool of the character described for operation on a string of pipe including, a body adapted to pass over the pipe, packing in the body, means movably carried in the body below the packing for engaging the pipe, an operative connection between the said means and the packing whereby the packing is actuated to pack between the body and the pipe upon movement of the said means, and means for limiting the movement of the first mentioned means so that the pipe is supported on the body through the said first mentioned means.

2. A tool of the character described for operation on a string of pipe including, sections of pipe joined by couplings, which tool comprises, a body adapted to pass over

the string, packing in the body adapted to pack with a coupling, means movably carried in the body for engaging a coupling, a direct operative connection between the said means and the packing whereby the packing is actuated to pack between the body and the coupling upon movement of the said means, and means for limiting the movement of the first mentioned means so that the strings may be supported on the body through the said first mentioned means.

3. A tool of the character described for operation on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass over the string, packing in the body adapted to pack with a coupling, means movably carried in the body for engaging the coupling, an operative connection between the said means and the packing whereby the packing is actuated to pack between the body and the coupling upon movement of the said means, and a shoulder on the body limiting movement of the said means so that the string of pipe may be moved with the body.

4. A tool of the character described for operation on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass over the string, packing in the body adapted to pack with a coupling, means movably carried in the body for engaging the coupling upon upward movement of the body, an operative connection between the said means and the packing whereby the packing is actuated to pack between the body and the coupling upon movement of the said means, and a shoulder on the body for limiting movement of the said means and for supporting the string on the body through said means.

5. A tool of the character described for operating on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass downwardly over the string, packing in the body operable to seal with a coupling on the string, means slidably carried by the body for engaging a coupling including a resilient finger to engage the coupling upon upward movement of the body, an operative connection between the finger and the packing whereby the packing is actuated upon movement of said means relative to the body through engagement with the coupling, and means for supporting the string on the body through the said means.

6. A tool of the character described for operating on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass downwardly over the string, packing in the body operable to seal with a coupling, means shiftable in the body and operable to connect with a coupling upon upward movement of the body including a ring slidable in the body, a resilient finger on the ring to engage the coupling, an operative connection between the ring and the packing whereby the packing is actuated upon movement of the ring, and means limiting the movement of the ring and for supporting the string of pipe on the body through said means.

7. A tool of the character described for operating on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass downwardly over the string, packing in the body operable to seal with a coupling, means in the body for engaging a coupling upon the body being moved upwardly including a ring slidable in the body, a resilient finger on the ring to engage the coupling, an operative connection between the ring and the packing whereby the packing is actuated upon movement of the ring, including a member slidable in the body and engaging the packing, and a part connecting the ring and member, and means limiting the movement of the ring and adapted for supporting the string of pipe on the body through said means.

8. A tool of the character described for operating on a string of pipe including, sections of pipe joined by couplings, which tool comprises a body adapted to pass downwardly over the string, packing in the body operable to seal with a coupling, means in the body for engaging a coupling upon the body being moved upwardly including a ring slidable in the body, a resilient finger on the ring to engage a coupling, an operative connection between the ring and the packing whereby the packing is actuated upon movement of the ring, and means for supporting the string of pipe on the body through said means, including a shoulder in the body to receive the ring.

9. A tool of the character described adapted to operate on a string of pipe including sections of pipe joined by couplings which includes a body adapted to pass over the string of pipe, packing in the body operable to seal with a coupling, means movable in the body and adapted to engage a coupling to connect the string of pipe with the body including a ring slidable in the body, and a resilient finger on the ring to engage a coupling, an operative connection between the ring and the packing whereby the packing is actuated upon movement of the ring, and means limiting movement of the ring in the body.

10. A tool of the character described adapted to operate on a string of pipe including sections of pipe joined by couplings which includes a body adapted to pass over the string of pipe, packing in the body operable to seal with a coupling, means movable in the body and adapted to engage a coupling to connect the string of pipe with

the body including a ring slidable in the body, and a resilient finger on the ring to engage a coupling, an operative connection between the ring and the packing whereby the packing is actuated upon movement of the ring, including a member slidable in the body and engaging the packing, and a part connecting the ring and the member, and means limiting movement of the ring in the body.

11. A well tool of the character described for operation on a string of drill pipe including, a tubular body adapted to pass over the pipe, expansible packing removably mounted in the body, and means in the body for engaging a pipe whereby the pipe may be moved with the body to actuate the packing into sealing engagement with the pipe, the said means and packing being removable from the body as a single unit.

12. A well tool of the character described for operation on a string of drill pipe including, a tubular body adapted to pass over the pipe, expansible packing removably mounted in the body, means in the body for engaging a pipe whereby the pipe may be moved with the body and operable to actuate the packing, and a member operatively connecting the packing and means, the assembly of the packing and said means being removable from the body as a unit.

13. In a well tool of the character described, a tubular body adapted to be passed downwardly over a string of pipe formed of sections joined by couplings, and an assembly in the body replaceable as a single unit, the assembly including means movable relative to the body and adapted to connect with a coupling upon the body being moved upward relative to the string, expansible packing for packing with a coupling, and an operative connection between the said means and the packing whereby the packing is expanded to pack with a coupling upon movement of the means relative to the body.

14. In a well tool of the character described, a tubular body adapted to be passed downwardly over a string of pipe, the string consisting of sections joined by couplings, there being an upwardly facing shoulder in the body, a ring movable in the body above said shoulder, means carried by the ring for connecting the ring with a coupling upon upward movement of the body relative to the pipe to cause the ring to be moved onto the shoulder, packing in the body operable to expand into sealing engagement with a coupling, the packing being positioned relative to the ring and means to seal with the coupling connected with the ring, and an operative connection between the ring and packing.

15. In a well tool of the character described, a tubular body adapted to be passed downwardly over a string of pipe, the string consisting of sections joined by couplings, there being an upwardly facing shoulder in the body, a ring movable in the body above said shoulder, means carried by the ring for connecting the ring with a coupling upon upward movement of the body relative to the pipe to cause the ring to be moved onto the shoulder, packing in the body operable to expand into sealing engagement with a coupling, the packing being positioned relative to the ring and means to seal with the coupling connected with the ring, and an operative connection between the ring and packing, the operative connection normally suspending the ring from the packing so that it is spaced above the shoulder.

In witness that we claim the foregoing we have hereunto subscribed our names this 9th day of June, 1930.

MILLARD SUMTER BLACK.
FREDERICK M. BRAMBLEY.