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OVERSHOT

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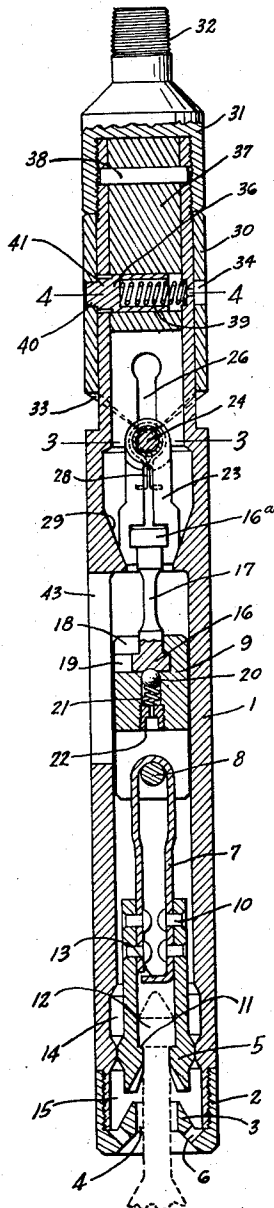


Fig. 1

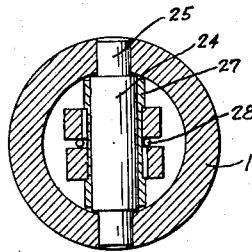


Fig. 3

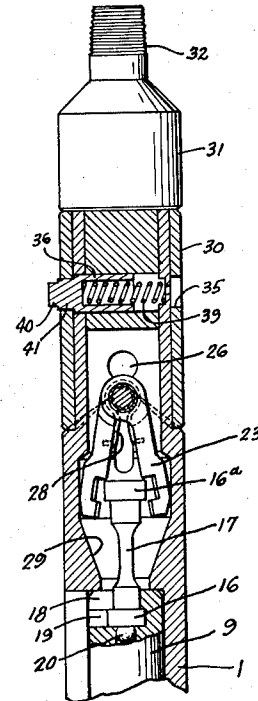


Fig. 2

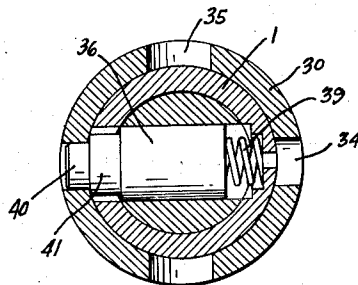


Fig. 4

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OVERSHOT

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8 Claims. (Cl. 294—99)

My invention relates to overshots for engage-
ment with devices positioned in the bore of a well.
It is adapted particularly to engage tools in the
well to withdraw them, where such tools are pro-
vided with means to be engaged by said overshot.

My invention is not confined to use in such situa-
tions, however, as will appear from the descrip-
tion which follows.

It is an object of the invention to provide an
overshot which is releasable from the object en-
gaged by it if the object is stuck and cannot be
moved.

I desire to provide, in connection with the grip-
ping means, a frangible tension means which will
break under a predetermined strain and release
the tool.

It is a further object of the invention to provide
means whereby the tool withdrawn by the over-
shot may be easily disengaged from the overshot
when the tool has been withdrawn from the well.

It is a further object to provide an overshot
which is easily engaged with the tool to be with-
drawn but which will not release the tool if it is
possible to pull the same. The invention also in-
cludes the particular structure of the releasing
mechanism which will release the tool with a
minimum of effort when it has been withdrawn.

In the drawing herewith Fig. 1 is a central
longitudinal section through an overshot em-
bodying my invention.

Fig. 2 is a broken longitudinal section showing
the releasing device in a position different from
that indicated in Fig. 1.

Fig. 3 is a transverse section on the plane 3—3
of Fig. 1, somewhat enlarged.

Fig. 4 is a similar enlarged transverse section
on the plane 4—4 of Fig. 1.

The body of my overshot includes a tubular
barrel or housing 1 the lower end of which has
threaded thereto a cap 2. Said cap has an axial
opening 4 and the wall about said opening is
tapered upwardly at 3 to provide an outer cam
surface which serves to spread the jaws 5 of the
gripping devices, as will be later noted. There
are fluid conducting openings 6 through the end
of said cap.

The inner walls of the housing 1 are recessed to
cooperate with the jaws 5 which are mounted on
an inverted U-shaped spring 7 the upper loop of
which is engaged about a transverse pin 8 in a
supporting block 9 fitting slidably within the
housing. Said dogs are secured to the arms of
spring 7 by rivets 10 or by equivalent means and
their lower ends have inwardly projecting
shoulders presented upwardly to engage below the

head 12 of a tool in the well. Below said
shoulders the inner faces of said dogs are flared
downwardly to engage the projection 3 on the cap
2. One of the spring arms has its lower end
bent inwardly to form a stop 13 to be engaged by
the head 12 and limit the relative downward
movement of the overshot over said head 12. The
outer faces of the dogs at their lower ends are
enlarged to engage the inner wall of the housing.
Above the normal position of the dogs, as seen in
Fig. 1, the inner wall of the housing is recessed at
14 to allow said dogs to move outwardly. The
interior is also recessed at 15 below the dogs to
also allow separation of the dogs when they are
moved downwardly from normal position.

The block 9 upon which the supporting spring is
engaged has its upper end formed to receive the
lower head 16 of a tension link 17. Said head 16
is slidable laterally in a slot 18 into an axial
position in said block. The head 16 moves in an
undercut recess 19 and is latched in axial position
by a ball 20 engaging in a lower recess in the
head 16. Said ball is held resiliently upwardly
by a spring 21 resting upon a removable plug
22 in the block.

The tension link 17 has a head 16a at its upper
end adapted to be engaged by the lower ends of
a pair of dogs 23. Said dogs are hinged at their
upper ends to a transverse pin 24, the outer re-
duced ends 25 of which are movable in slots 26 in
the wall of the housing. There is a sleeve bushing
27 on the shaft, as will be noted from Fig. 3, upon
which the dogs are mounted. A spring 28 on said
bushing engages said dogs and tends to move the
lower ends outwardly against the inner wall of
the housing.

Adjacent the lower ends of the dogs the inner
wall of the housing is tapered inwardly and down-
wardly at 29 to be contacted by the beveled lower
ends of said dogs, and hold them inwardly engag-
ing about the head 16a of the tension link 17 and
hold the link firmly supported.

The upper end of housing 1 is reduced in diam-
eter and a locking sleeve 30 is fitted thereon.
Above the sleeve is a cap or nipple 31 which closes
the end of the housing and has a threaded shank
32 to couple with the operating string which may
include a wire cable.

The sleeve 30 has its lower end cut away on op-
posite sides thus forming two opposite cam sur-
faces 33 to cooperate to move the pin 24 in the
slot 26. The sleeve has a pair of opposite openings
34 therein and a pair of larger openings 35 there-
in spaced 90° from the smaller openings.

A latch bolt 36 is housed within a transverse

opening in a block 37 fitting within the upper end of the housing and held in position by a retaining pin 38. Said bolt is recessed at one end to receive a compression spring 39 which tends to hold said bolt 36 radially outwardly to engage within one of the openings 34 and 35 in the sleeve 30. The outer latching end of the bolt has a small diameter 40 to engage the openings 34 and a larger diameter 41 to engage the larger opening 35. It will be seen that, when latched in the smaller opening 34 as shown in Fig. 1, the lower cam surface of the sleeve will hold the pin 24 of the latching mechanism downwardly. When the larger diameter 41 engages in one of the openings 35, the sleeve 30 will permit the upward movement of the pin 24 in the slot 26.

When this overshot is employed to remove from within the drill stem a tool, such as a retractible core barrel, for example, the overshot is lowered at the end of a wire line. When thus lowered the ports are set as shown in Fig. 1. When the retractible barrel has been reached, the knob 12 thereon will pass upwardly through the opening 4 in the overshot and by engaging the lower ends of dogs 5, will move them upwardly into the recess 14 where said dogs will be spread apart and when the knob 12 is in position against the stop 13 the dogs will snap inwardly below the same and an upward pull on the overshot will move the dogs downwardly to locked position, as shown.

An upward pull on the overshot will lift the core barrel.

If the core barrel should be lodged too tightly so that it could not be pulled, the stem of the tension link 17 will break, when a certain predetermined tension has been exceeded, and allow the dogs to drop into the recess 15 where the projection 3 will spread the dogs apart and release the knob 12. The overshot may then be withdrawn from the drill pipe.

If the core barrel can be withdrawn the overshot must then be disengaged from the knob 12 of the barrel. To do this the dogs 5 which hold the knob 12 must be moved down from locking position as seen in Fig. 1. To do this, I unlatch the upper end of the tension link from the holding dogs 23. A rod or tool will be used to shove the bolt 36 inwardly so that sleeve 30 may be rotated through 90° and thus allow the pin 24 to move upwardly in the slot 26. The bolt 36 will then latch in opening 35 as seen in Fig. 2. The tension of spring 28 will tend to urge the dogs outwardly so that, when the dogs have been moved upwardly along the tapered surface 29, they will release the head 16a of the tension link. This upward movement of the link 17 is accomplished by shoving the tool and knob 12 upwardly relative to the overshot; the supporting block 9 being thereby moved to the position shown in Fig. 2. The link 17 is thereby released and the block 9 and dogs 5 will drop down so as to release the knob 12 on the core barrel. The overshot could then be reset for further use.

The tension link 17 is arranged so that it may be examined to determine whether it has been stretched or cracked. An opening 43 is slotted in the side of the housing adjacent said link so as to provide a clear view of said link for observation and replacement.

My overshot has the advantage of being easily engaged and disengaged from the tool which is to be removed. Also it is releasable by the breaking of the link under strain too great for the tool to withstand. After the device has been

withdrawn, it is quickly released from the core barrel by simply unlatching and rotating the sleeve 30 and then collapsing the overshot toward the core barrel as described.

What I claim as new is:

1. In an overshot, a tubular housing, tool gripping dogs enclosed within the lower end of said housing, means to support said dogs in said housing in position with said dogs latched on said tool, said means being rendered ineffective to retain said dogs in latched position in response to a predetermined pulling force applied thereto and wedging means in said housing below said dogs to unlatch said dogs when they are moved from latched position.

2. In an overshot, a tubular housing, tool gripping dogs enclosed within said housing, said dogs being held together in gripping position by the wall of said housing, said wall being recessed above and below the said gripping position, means to support said dogs in gripping position but allowing a limited upward movement thereof, said supporting means being rendered ineffective to support said dogs in response to a predetermined strain exerted thereon.

3. In an overshot, a tubular housing, tool gripping dogs enclosed within said housing, said dogs being held together in gripping position by the wall of said housing, said wall being recessed above and below the said gripping position, means to support said dogs in gripping position, said supporting means being rendered ineffective to support said dogs in response to a predetermined strain exerted thereon.

4. In an overshot, a tubular housing, tool gripping dogs enclosed within said housing, said dogs being held together in gripping position by the wall of said housing, said wall being recessed above and below the said gripping position, means to support said dogs in gripping position but allowing a limited upward movement thereof, said supporting means being of frangible material adapted to break under a predetermined strain to allow the said dogs to drop downward into releasing position.

5. In an overshot, a tubular housing, tool gripping dogs enclosed within said housing, said dogs being held together in gripping position by the wall of said housing, said wall being recessed above and below the said gripping position, means to support said dogs in gripping position but allowing a limited upward movement thereof, said supporting means being of frangible material adapted to break under a predetermined strain to allow the said dogs to drop downward into releasing position and means to then spread said dogs apart to release the tool.

6. An overshot including a tubular housing, tool gripping dogs therein, means to support said dogs in tool gripping position, detachable means in said housing to latch said supporting means against movement to tool-releasing position in said housing, means to release said latching means, said latching means operated responsive to an upward thrust on the tool gripping dogs to move to open position.

7. In an overshot, a tubular housing, tool engaging dogs therein, means to support said dogs in tool-engaging position including a frangible link, means to grip and hold the upper end of said link, releasable on the upward movement of said gripping means in said housing, means to prevent the upward movement of said gripping means releasable manually when desired to allow

said link and dogs to move downward to disengage said dogs from said tool.

8. In an overshot, a tubular housing, tool engaging dogs therein, means to support said dogs in tool-engaging position including a frangible link, means to grip and hold the upper end of said link, including a pair of link engaging jaws fitting within a downwardly tapered recess in

said housing, a pin to which said jaws are connected, a sleeve on said housing adapted to engage and hold said pin and dogs downwardly when said sleeve is in one position, but adapted to release said pin and dogs when said sleeve is rotated to another position.

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