May 9, 1944. H. C. OTIS 2,348,563

WELL TOOL

Filed Aug. 2, 1940 2 Sheets-Sheet 1

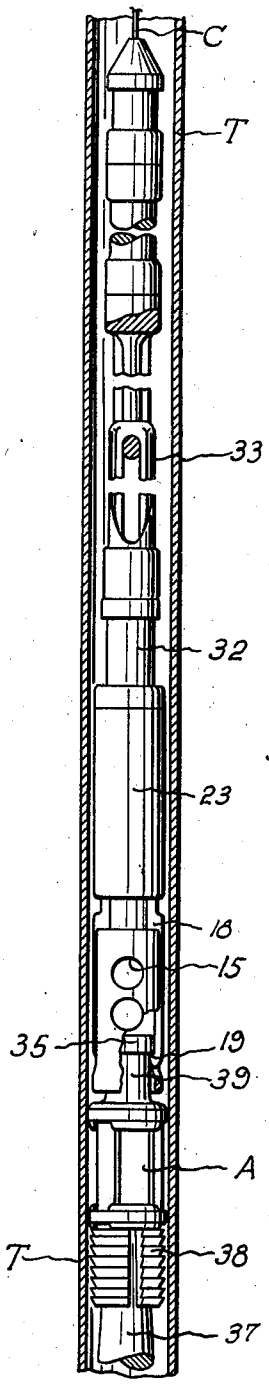


Fig. 1.

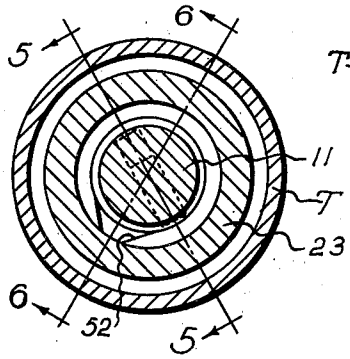


Fig. 4.

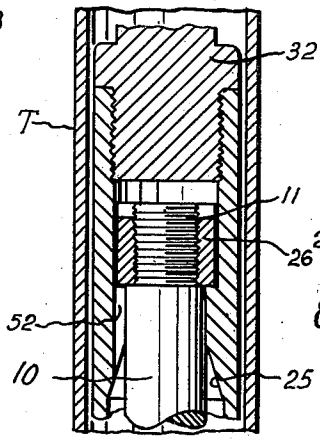


Fig. 6.

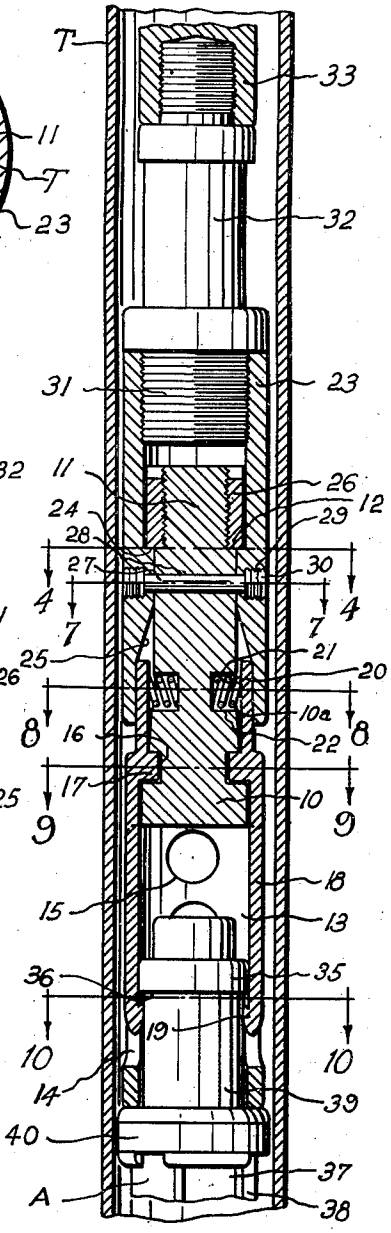


Fig. 2.

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WELL TOOL

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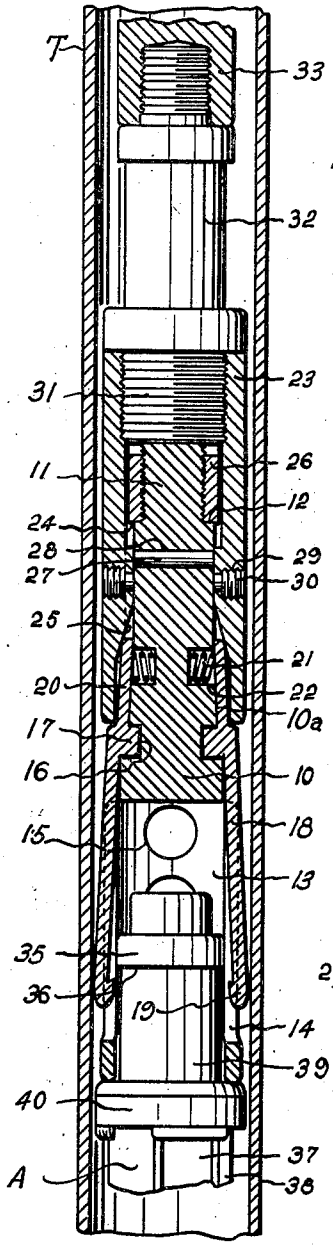


Fig. 3.

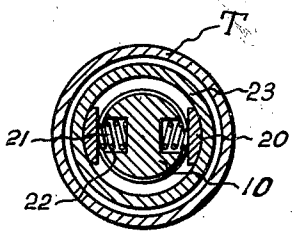


Fig. 8.

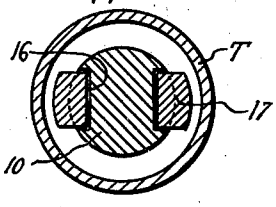


Fig. 9.

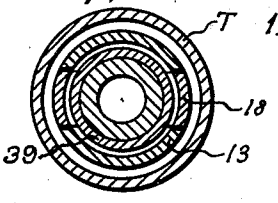


Fig. 10.

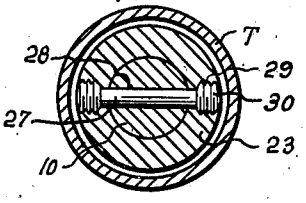


Fig. 7.

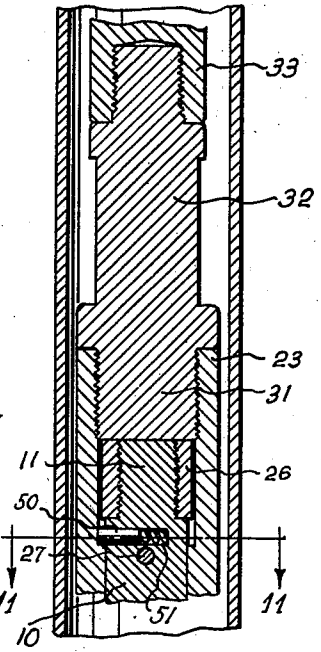


Fig. 5.

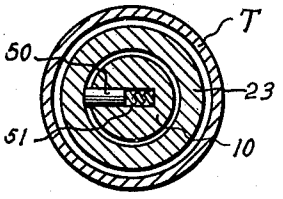


Fig. 11.

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Patented May 9, 1944 2,348,563

UNITED STATES PATENT OFFICE

2,348,563

WELL TOOL

Herbert C. Otis, Dallas, Tex.

Application August 2, 1940, Serial No. 349,772

17 Claims. (Cl. 294—116)

This invention relates to new and useful improvements in well tools.

One object of the invention is to provide an improved well tool which is arranged to be releasably connected with a well device, whereby said tool may be utilized to run said device into a well bore or remove the same therefrom, the tool being particularly adapted for use with removable bottom hole chokes, regulators, valves, or other bottom hole devices.

An important object of the invention is to provide an improved running tool having movable dogs or gripping elements which are adapted to engage the well device being run into the well, whereby the use of a frangible connection between the running tool and well device is eliminated; the arrangement of the dogs or elements preventing the well device from breaking loose during lowering and also obviating other disadvantages incidental to the use of a shear pin or rivet for connecting the running tool and well device.

Another object of the invention is to provide an improved running tool wherein the dogs are normally and yieldably held in their engaged position and wherein said dogs are adapted to be moved to a disengaged position by an actuating member which is slidable relative to said elements; the actuating member being normally restrained from movement by a releasable means which is so mounted that said means is not subjected to the load carried by the tool, whereby danger of the releasable means breaking or releasing during the lowering operation is eliminated.

Still another object of the invention is to provide an improved running tool, of the character described, wherein the releasable means includes a frangible element which is fully enclosed within the tool, whereby when said element is broken, the pieces thereof cannot fall into the bore around the device being lowered by the tool to interfere with the removal of said tool from the bore.

A further object of the invention is to provide an improved running tool having locking means for positively latching the gripping elements of the tool in an expanded or non-engaged position to assure disengagement of said tool from the well device which has been lowered by means of the tool.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is an elevation of a running tool, constructed in accordance with the invention, and showing the same connected with the upper end of a well device,

Figure 2 is an enlarged, transverse, vertical, sectional view of the tool in its engaged position,

Figure 3 is a similar view, with the dogs in their disengaged or released position,

Figure 4 is a horizontal, cross-sectional view, taken on the line 4—4 of Figure 2,

Figure 5 is an enlarged, partial, transverse, vertical, sectional view, taken on the line 5—5 of Figure 4,

Figure 6 is a view, similar to Figure 5, and taken on the line 6—6 of Figure 4,

Figures 7 to 10 are horizontal, cross-sectional views, taken on the lines 7—7, 8—8, 9—9 and 10—10, respectively, of Figure 2, and

Figure 11 is a horizontal, cross-sectional view, taken on the line 11—11 of Figure 5.

In the drawings, the numeral 10 designates a solid body or mandrel, which is substantially cylindrical in cross-section and which is provided with an upstanding, externally screw-threaded pin 11 at its upper end. The pin is reduced in diameter relative to the external diameter of the mandrel, whereby an external annular shoulder 12 is formed at the intersection of the body and the pin. An elongate sleeve 13 is preferably formed integral with the lower end of the mandrel or body 10 and extends downwardly therefrom, said sleeve having an external diameter which is greater than the external diameter of said body or mandrel. The sleeve 13 is provided with a pair of diametrically-opposed, vertical or longitudinal slots 14 which extend substantially throughout the length thereof. In addition, said sleeve has by-pass ports 15 formed in its wall.

The lower portion of the mandrel above the upper end of the sleeve 13 is formed with a pair of diametrically-opposed recesses 16, as is clearly shown in Figures 2 and 3, and immediately above the recesses, the mandrel is formed with a tapered portion 10a. The recesses are alined vertically with the vertical slots 14 within the sleeve 13. A pair of elongate dogs or elements 18 are disposed diametrically opposite each other and each dog is formed with an inwardly directed lug 17 which projects into the adjacent recess 16. The lower end of each dog extends downwardly and is normally disposed within one of the slots 14 of the

sleeve 13. Each dog has a hook 19 formed on its lower end, while its upper end is provided with an upwardly extending arm or extension 20, which is disposed adjacent to the tapered portion 10a of the mandrel 10. The arm of each dog is constantly urged radially outwardly from the mandrel by a coiled spring 21, which is confined within a recess 22 provided in the mandrel 10. It will be apparent that the lugs 17 of the dogs 18 confine said dogs from longitudinal movement on said mandrel, said dogs being capable of a swinging movement as will be explained. The coiled springs 21 constantly urge the upper end of the dogs outwardly, to urge the lower ends of said dogs inwardly toward the center of the sleeve 13.

The upper portions of the dogs 18 are normally restrained against outward displacement from the mandrel due to the force of the springs 21, by means of a cylinder or tubular member 23, which cylinder surrounds the upper portion of the mandrel 10. The bore of the cylinder 23 is enlarged at its upper end, whereby an internal annular shoulder 24 is provided within said cylinder. The extreme lower end of the cylinder surrounds the arms 20 of the dogs to limit the outward movement of the arms, and immediately above said arms the bore of the cylinder is formed with a tapered or inclined portion 25 for actuating the dogs, as will be hereinafter explained. The upstanding pin 11 which is formed on the upper end of the mandrel 10 is slidably disposed within the enlarged upper end of the bore of the cylinder 23 and this pin has a nut 26 threaded thereon, said nut being adapted to engage the internal shoulder 24 formed within said cylinder, as is clearly shown in Figure 2. The cylinder is releasably connected to the mandrel by means of a frangible pin 27 which extends to a diametrically disposed opening 28 formed in the mandrel and through radial openings 29 provided in the cylinder. For retaining the pin within the openings 28 and 29, the outer end of each opening 29 receives a plug 30 which is threaded into said opening.

The upper end of the bore of the cylinder 23 is internally screw-threaded to receive a depending pin 31 which is formed on a sub or connecting element 32. It is pointed out that when the pin 31 is within the cylinder, and the cylinder is connected to the mandrel by the frangible pin 27, the lower end of the pin 31 is spaced from the upper end of the upstanding pin 11 on the mandrel. The upper end of the sub is connected to a suitable raising and lowering mechanism, which may consist of stroke jars 33, of the usual construction, carried by a flexible line or cable C.

In the operation of the device, the parts are assembled as shown in Figure 2, with the cylinder 23 connected to the mandrel by means of the frangible pin 27. In this position, the lower end of the cylinder surrounds the arms 20 of the dogs and serves to restrain said dogs from outward displacement from the mandrel 10. However, the diameter of the lower end of the bore of the cylinder is such that the springs 21 urge the arms 20 outwardly a sufficient distance to move the lower or hook ends of the dogs inwardly within the slots 14 and into the bore of the sleeve 13 to maintain said dogs in their engaging position. The sleeve 13 and the lower portions of the dogs 18 may be passed downwardly over the flange 35 of a well device A which is to be run into the well tubing T. The flange 35 is moved upwardly between the dogs so that the undercut annular shoulder 36 formed by the underside of said flange is moved above the hooks 19 of said dogs, whereby the well device A is suspended from the tool. Any suitable well device may be lowered by means of the tool herein described and the type shown includes a mandrel 37 having a slip assembly 38 slidably mounted thereon. The slip assembly includes a slip carrier 39 which is in the form of a sleeve slidable on the mandrel 37. The flange 35 is formed integral with the upper end of the slip carrier 39, whereby when the dogs 18 are engaged with said flange and the well device is suspended from the dogs, the slips are moved upwardly on the tapered portion of the mandrel and are therefore in a retracted position to permit lowering through the well tubing T. The coiled springs 22 which constantly urge the upper ends of the dogs outwardly assure that the lower or hook ends of said dogs remain in engagement with the flange to prevent accidental or unintentional disconnection. It is pointed out that when the hooks are engaged with the shoulder 36, the lower end of the sleeve 13 is spaced from an enlarged collar 40 formed on the slip carrier 39.

It sometimes occurs during the lowering operation that the well device A may encounter a tight or restricted space or portion within the tubing T which might temporarily arrest or impede the downward movement of the well device. As the well device moves through this restricted space, the flexible line and upper portion of the jars 33 may continue moving downwardly at a faster rate than the rest of the assembly. When the well device passes through the tight space in the tubing, said device, together with the mandrel, cylinder and sub, may drop the full stroke of the jars 33 and such dropping might in some instances create sufficient force to shear the pin 27. However, to prevent the shearing of the pin 27, the shoulder 24 coacts with the nut 26 to take the thrust or load under this condition. Obviously, as the well device and mandrel tend to fall quickly, the nut 26 engages the shoulder 24 and carries the cylinder 23 with the mandrel, whereby the load is not imposed upon the pin 27. Therefore, the construction prevents the shearing of the frangible pin 27 before the well device is set in its proper position.

It is apparent that if the well device were connected to the running tool by means of rivets or shear pins, dropping of the well device, as above described, might result in a breaking or shearing of said rivets or pins, with the result that the well device would be disconnected from the running tool.

After lowering has been completed and the device A disposed in its proper position, the slips 38 of said device are set by upward movement of the mandrel 37 relative to the slips. The setting of the slips may be accomplished in any suitable manner but in the particular device shown, the line C is suddenly slacked to permit the running tool and slip assembly to move downwardly relative to the mandrel, whereby the slips are expanded into engagement with the tubing. After the slips 38 of the device A are set to lock the device against upward movement within the tubing T, the cylinder 23, together with the mandrel 10, is moved downwardly to the position shown in Figure 2, at which time the lower end of the sleeve 13 engages the collar 40 of the slip carrier. It is noted that the sleeve is of sufficient length so that when its lower end engages the collar 40, the upper end of the tool does not contact the solid bottom of the mandrel 10. After the sleeve engages the collar 40, the jars 33 are then utilized to exert a downward force on the sub 32 and cylinder 23

as well as on the mandrel 10 through the frangible pin 27. A sufficient jarring downwardly on the sub and cylinder will shear the pin 27, since the mandrel 10 is held stationary by the engagement of its sleeve 13 with the slip carrier. Any jarring is transmitted to the slip carrier to move the slips 38 into a tighter engagement with the wall of the well tubing T.

After the pin 27 is sheared, the cylinder 23 moves downwardly to the position shown in Figure 3, the lower end of said cylinder moving downwardly relative to the arms 20 at the upper ends of the gripping dogs 18. As the cylinder moves downwardly over these arms, the inclined or tapered portion 25 of the bore of the cylinder 23 moves into engagement with the arms 20 and forces the same inwardly toward the mandrel against the force of the springs 22 (Fig. 3). Such inward movement of the arms causes the arms to move into engagement with the tapered portion 10a of the mandrel, and the dogs fulcrum on the base of said tapered portion, whereby the lower or hook ends of said dogs are moved radially outwardly through the slots 14 of the sleeve 13. Such outward movement of the lower ends of the dogs swings said dogs outwardly beyond the shoulder 36 of the flange 35, whereby when the device is raised, said hooks will not engage said shoulder.

The jarring action imposed on the cylinder 23 may ordinarily be sufficient to move the tapered portion 25 of the sleeve 23 into a frictional engagement with the upper ends of the arms 20, whereby the lower ends of the dogs may be held in an expanded position by this frictional engagement. However, to assure that the dogs are maintained in a non-engaging position to permit upward removal of the assembly, the mandrel 10 is provided with a spring-pressed plunger 50 which is mounted within an opening 51 formed in the upper portion of said mandrel immediately below the upstanding pin 11 (Fig. 5). When the parts are in the position shown in Figure 2 during the lowering operation, the outer end of the plunger 50 is engaging the wall of the bore of the cylinder 23 below the internal shoulder 24. When the pin 27 is sheared and the cylinder 23 is moved downwardly with relation to the mandrel, the shoulder 24 is moved downwardly relative to the plunger 50, whereby said plunger may move to the position shown in Figure 5, above the shoulder 24. When the plunger extends over the shoulder, it will be manifest that an upward movement of the sleeve or cylinder 23 will result in an upward movement of the mandrel 10, such movement being transmitted through the engagement of the shoulder with the plunger 50. Therefore, an upward movement of the cylinder 23 relative to the mandrel, after the dogs have been moved to a non-engaging position, is prevented and it is impossible for said dogs to move into their engaging position until such time as the plunger 50 is disengaged from the shoulder 24. This provides a positive latch for maintaining or locking the dogs in a non-engaging or released position.

When the running tool has been removed from the tubing and it is desired to replace the sheared pin 27, it is necessary only to rotate the cylinder 23 with respect to the mandrel until the extended plunger 50 moves into alinement with a vertical slot 52 which is provided in the bore of the cylinder 23 and which extends downwardly from the shoulder 24. When the plunger 50 is alined with the vertical groove or slot 52, the cylinder may then be moved upwardly relative to the mandrel until the nut 26 engages the shoulder 24 and the openings 29 in said cylinder are in horizontal alinement with the opening 28 in the mandrel. It is noted that the disposition of the vertical groove or recess 52 is such that when the pin or plunger 50 is engaged therein, the openings 29 in the cylinder are offset radially from the opening 28 in the mandrel. Therefore, in order to radially aline the openings 29 and 28, it is necessary to impart a rotation to the cylinder 23 and such rotation will cause the plunger 50 to ride out of the vertical groove or recess 52. The movement of the plunger from the groove 52 upon rotation of the sleeve is facilitated by the inclined or bevelled side-walls 53 of said groove. After the openings 28 and 29 are alined, the plugs 30 are removed and the sheared pin 27 is replaced by a new pin. At this time, the end of the plunger 50 has been reengaged with the wall of the cylinder bore and the device is again ready for use.

It is noted that when it is desired to remove a device by means of the tool, the parts are lowered with the cylinder and mandrel in the position shown in Figure 2. As the device moves into engagement with a flange at the upper end of the well device, said flange automatically expands the lower ends of the dogs 18 to permit the dogs to pass over the flange and engage the undercut shoulder therebeneath, such expansion being permitted by the coiled springs 22. After being engaged, an upward pull on the cylinder 23 will be transmitted to the mandrel through the shoulder 24 and nut 26.

From the foregoing, it will be seen that a simple and efficient running tool is provided. By employing the dogs 18 for positively engaging the device which is being lowered, the necessity of riveting or frangibly connecting the running tool to the device being lowered is eliminated. The shear pin 27 which is employed in releasing the tool is mounted wholly within the body of said tool and is fully enclosed, whereby the pieces of the sheared pin cannot enter the bore of the tubing. Further, during the lowering operation, the load which might be imposed on the pin due to a sudden drop of the well device is carried by the shoulder 24 so as to relieve the pin of such load and prevent its being sheared prior to the time the device is set. A positive latch arrangement locks the dogs in their released position and assures that the running tool may be readily disengaged from the well device and removed from the tubing after the well device is located in its proper position. The construction facilitates the replacement of the pin 27 after each run, whereby the tool may be quickly reset for the next use. Although the tool has been described in conjunction with a particular type of well device, it is apparent that it may be employed for running or removing many types of bottom hole well devices.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A well tool including, a support, movable elements mounted on said support adapted to engage a device to be lowered or raised in a well bore and yieldably urged toward an engaging po-

sition, and means on the support mounted to coact with the elements to move said elements to a non-engaging position, said last named means being actuated to disengage the elements from the device upon the application of a downward force on said support.

2. A well tool including, a support, movable elements mounted on said support adapted to engage a device to be raised or lowered in a well bore, and yieldably urged toward an engaging position, means on the support mounted to coact with the elements to move said elements to a non-engaging position, and means for positively holding the gripping elements in their non-engaging position.

3. A well tool including, a support adapted to be attached to a flexible line and lowered within a well bore, movable elements mounted on the support adapted to engage a well device and yieldably urged toward an engaging position, a sleeve surrounding the upper ends of the movable elements and the support and adapted to coact with the elements to move said elements to a non-engaging position upon downward movement of the sleeve, and means for releasably connecting said sleeve in a raised position on the support.

4. A well tool including, a support adapted to be attached to a flexible line and lowered within a well bore, movable elements mounted on the support adapted to engage a well device and yieldably urged toward an engaging position, a sleeve surrounding the support and detachably connected thereto, said sleeve being arranged to coact with the movable elements to move them to a non-engaging position, means for disconnecting said sleeve from the support and for moving it downwardly relative to the movable elements to move said elements to a non-engaging position, and means for latching the sleeve in its lowered position holding the elements in a non-engaging position.

5. A well tool including, a support, dogs adapted to engage a well device to be lowered in a well bore and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with the well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the dogs to move the same to a non-engaging position, and means for connecting the tubular member with a raising and lowering mechanism whereby the assembly may be lowered within a well bore.

6. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with the well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the dogs to move the same to a non-engaging position, means for connecting the tubular member with a flexible line whereby the assembly may be lowered within a well bore, and means for detaching the tubular member by a downward force thereagainst to move the same downwardly to effect disengagement of the dogs from the well device.

7. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with the well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the movable dogs to move the same to a non-engaging position, means for connecting the tubular member with a flexible line whereby the assembly may be lowered within a well bore, means for detaching the tubular member by a downward jar thereagainst to move the same downwardly to effect disengagement of the dogs from the well device, and coacting means on the support and tubular member for latching the member in a position holding the dogs in their non-engaging position.

8. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with the well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the movable dogs to move the same to a non-engaging position, means for connecting the tubular member with a flexible line whereby the assembly may be lowered within a well bore, means for detaching the tubular member by a downward force thereagainst to move the same downwardly to effect disengagement of the dogs from the well device, and means for transmitting a further downward force directly to the support and to the well device below said support after the tubular member is disconnected.

9. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with a well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the movable dogs to move the same to a non-engaging position, means for connecting the tubular member with a flexible line whereby the assembly may be lowered and raised within a well bore, means for detaching the tubular member by a downward jar thereagainst to move the same downwardly to effect disengagement of the dogs from the well device, and a spring-pressed latch carried by the tubular member and coacting with the support for latching the member in a position maintaining the dogs in their non-engaging position.

10. A running tool for lowering a well device into a well bore including, a mandrel having a depending sleeve, said sleeve having vertical

slots therein, dogs adapted to engage a well device and mounted to swing on said mandrel and having their lower ends disposed within the slots of the sleeve, yieldable means for urging the lower ends of the dogs inwardly to an engaging position whereby said dogs may be engaged with the well device, a tubular member slidable on the upper portion of the mandrel and adapted to coact with the dogs to move the dogs outwardly when said member is moved downwardly, frangible means normally connecting the member and mandrel to maintain the member raised with respect to the dogs, and a sub in the upper end of the tubular member and spaced from the upper end of the mandrel when the tubular member is connected with the mandrel, said sub moving downwardly into engagement with the mandrel when the tubular member is slid downwardly, whereby a downward force on said sub is transmitted directly to the mandrel.

11. A running tool for lowering a well device into a well bore including, a mandrel having a depending sleeve, said sleeve having vertical slots therein, dogs adapted to engage a well device and mounted to swing on said mandrel and having their lower ends disposed within the slots of the sleeve, yieldable means for urging the lower ends of the dogs inwardly to an engaging position whereby said dogs may be engaged with the well device, a tubular member slidable on the upper portion of the mandrel and adapted to coact with the dogs to move the dogs outwardly when said member is moved downwardly, a frangible pin normally connecting the member and mandrel to maintain the member raised with respect to the dogs, coacting means on the tubular member and mandrel for latching the tubular member in a lowered position after the frangible pin is sheared and the member is moved downwardly, whereby the dogs are latched in a non-engaging position, and a sub in the upper end of the tubular member and spaced from the upper end of the mandrel when the tubular member is connected with the mandrel, said sub moving downwardly into engagement with the mandrel when the tubular member is slid downwardly, whereby a downward force on said sub is transmitted directly to the mandrel.

12. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with the well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the movable dogs to move the same to a non-engaging position, raising and lowering mechanism connected to the tubular member whereby the assembly may be lowered within a well bore, means for detaching the tubular member by a downward jar thereagainst to move the same downwardly to effect disengagement of the dogs from the well device, and coacting means on the support and tubular member for latching the member in a position holding the dogs in their non-engaging position.

13. A well tool including, a support, dogs adapted to engage a well device and mounted on the support with their lower ends movable radially of said support, means for yieldably maintaining the lower ends of the dogs inwardly in an engaging position, whereby said dogs may be engaged with a well device to suspend the same therefrom, a tubular member surrounding the upper end of the support and detachably connected thereto, said member being movable downwardly on the support when detached and arranged to coact with the movable dogs to move the same to a non-engaging position, raising and lowering mechanism connected to the tubular member whereby the assembly may be lowered and raised within a well bore, means for detaching the tubular member by a downward jar thereagainst to move the same downwardly to effect disengagement of the dogs from the well device, and a spring-pressed latch carried by the tubular member and coacting with the support for latching the member in a position maintaining the dogs in their non-engaging position.

14. In a device of the character described, a body, a mandrel carried by the body and arranged for limited longitudinal movement relative thereto, said mandrel extending below the body and forming a bowl, open at the bottom, adapted to be placed over a device in a well, means carried by the mandrel below the body for engaging said device, and normally urged to engaging position, means operative upon relative movement between the body and the mandrel to move the engaging means to disengaging position, and a releasable connection between the body and the mandrel to prevent such relative movement.

15. In a device of the character described, a body member having a bore, a mandrel having a portion slidable in the bore, as well as a portion below the body forming a bowl, open at the bottom, adapted to be placed over a device in a well, means forming a lost motion connection between the mandrel and the body, members carried by the mandrel below the body for engaging said device, means urging said members to engaging position, means adapted to retract the members from engaging position, said means being operative upon relative movement between the mandrel and the body, and a releasable connection securing the mandrel in the body.

16. In a device of the character described, a mandrel, means forming a frangible support for said mandrel, jaw members pivotally secured to the mandrel, means urging the jaw members to active position, a member movable with respect to the mandrel upon fracture of said support, said member being adapted to move the jaw members to inactive position, and means adapted to form a second support for the mandrel upon fracture of the frangible support.

17. In a running tool for well devices, the combination of an elongate support, a supporting element movably mounted on said support in position for engaging over a projection on a well device to be lowered or raised in a well bore, said element being normally resiliently positioned so as to yield outwardly and to automatically move inwardly into engaging position when moved onto such a well tool, means carried by the support adjacent said element and extending below said element for engaging such a well device for supporting the tool in engaging position thereon, and means on the support mounted to co-act with said resiliently positioned element to positively move said element to release it from a well tool, upon the application of a downward force on said support.

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