

April 8, 1952

H. C. OTIS
GRIPPING DEVICE

2,591,859

Filed Jan. 16, 1948

4 Sheets-Sheet 1

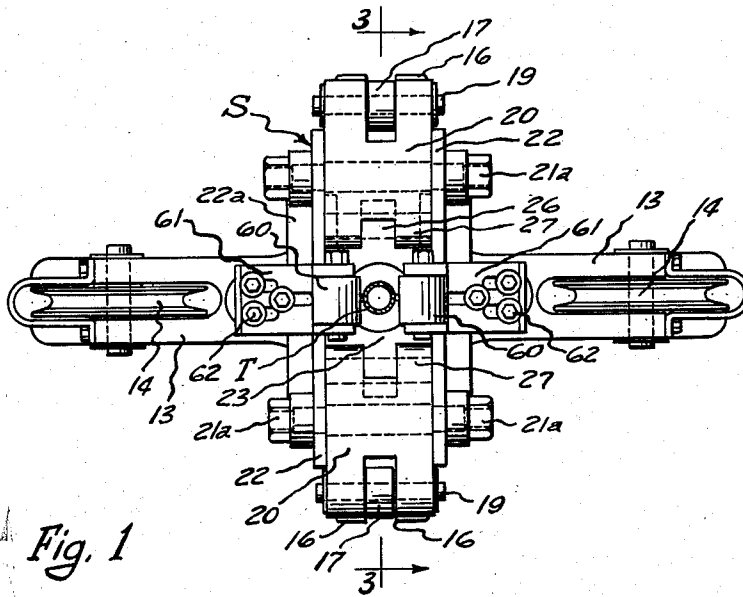


Fig. 1

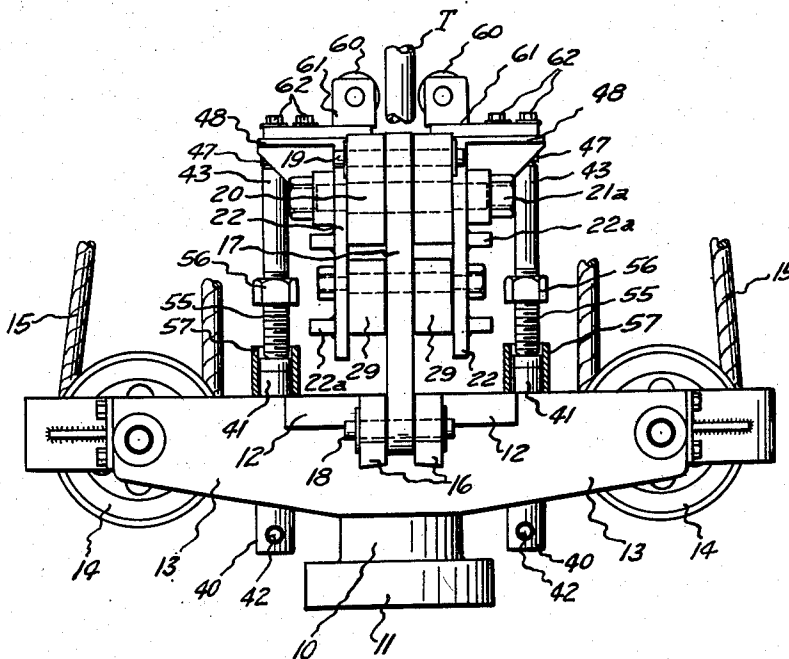


Fig. 2

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4 Sheets-Sheet 2

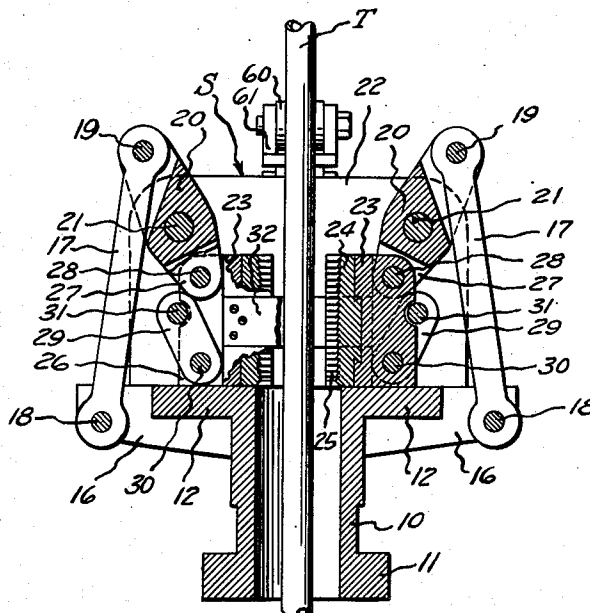
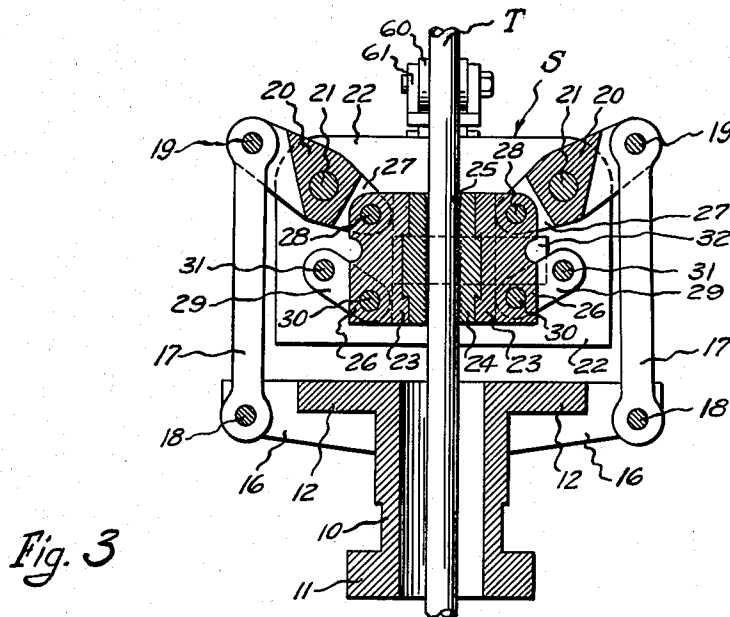


Fig. 4

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4 Sheets-Sheet 3

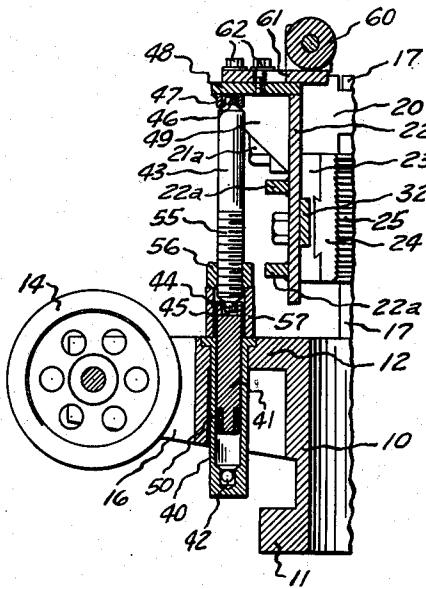


Fig. 5

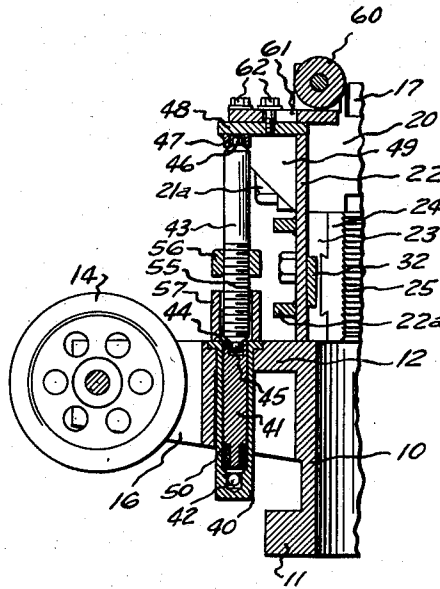


Fig. 6

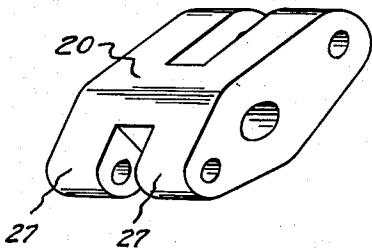


Fig. 9

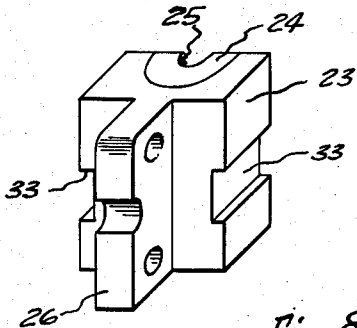


Fig. 8

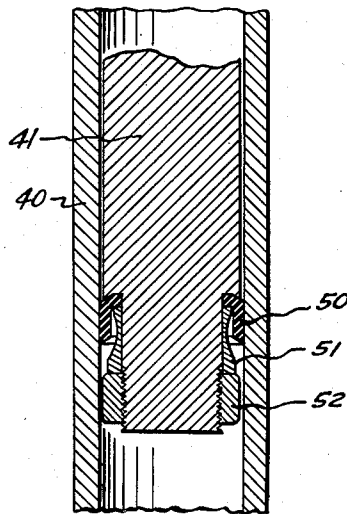


Fig. 7

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4 Sheets-Sheet 4

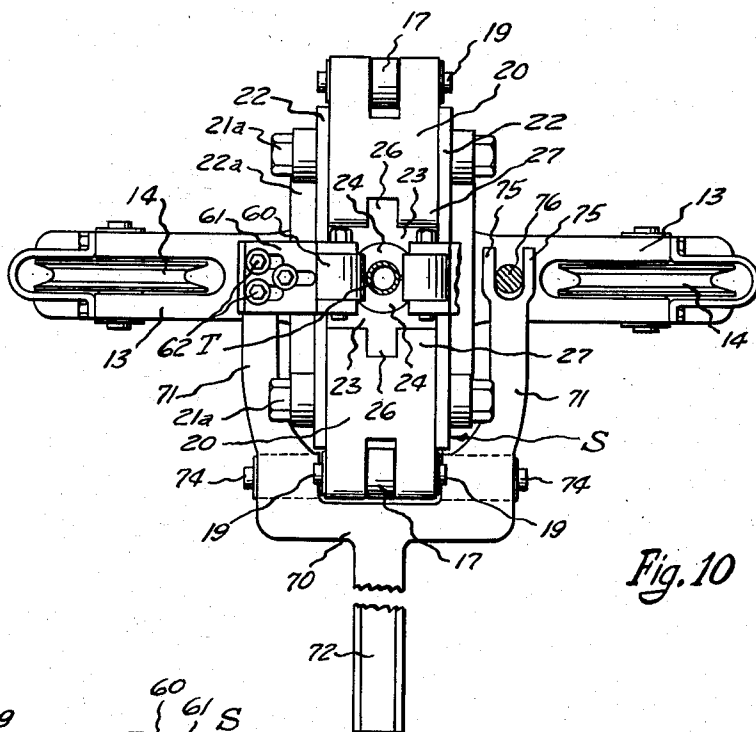


Fig. 10

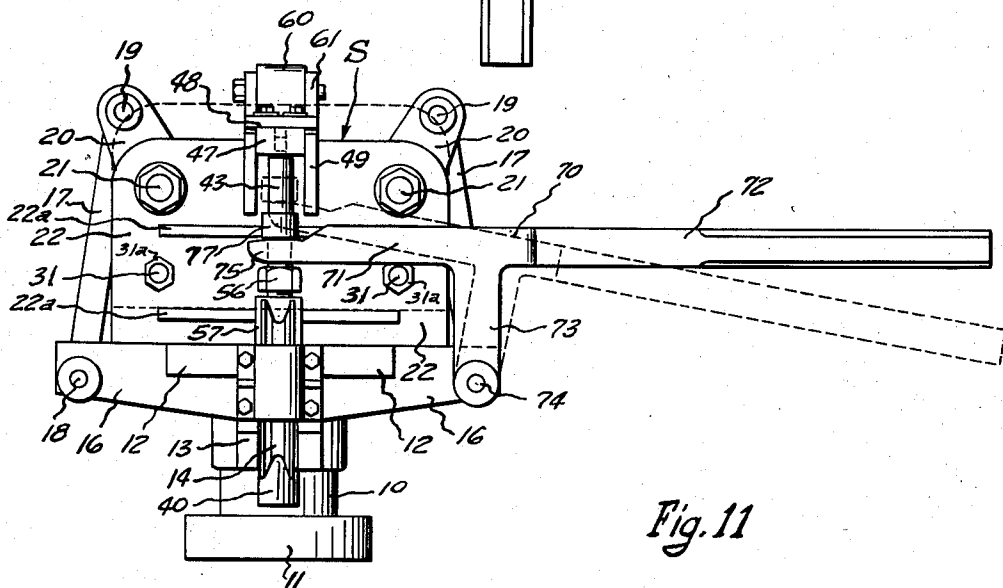


Fig. 11

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UNITED STATES PATENT OFFICE

2,591,859

GRIPPING DEVICE

Herbert C. Otis, Dallas, Tex.

Application January 16, 1948, Serial No. 2,532

7 Claims. (Cl. 24-249)

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This invention relates to new and useful improvements in actuating and locking mechanisms for gripping devices.

In running pipe or tubing into the bore of the wells against the fluid pressure therein, it is necessary to force or push the pipe downwardly into the well. To accomplish this, equipment generally referred to as snubbing equipment is employed. The snubbing equipment usually consists of a traveling snubber or gripping device, which grips the pipe and pulls the same downwardly into the well bore against the well pressure, and a stationary snubber or gripping device, which is employed to grip the pipe and prevent it from being blown from the well by the well pressure while the traveling snubber is being raised to take a new grip on the pipe. Thus, the traveling snubber grips the pipe and is moved downwardly to force the pipe into the well bore, during which time the stationary snubber is inactive, and, when the traveling snubber reaches the lower limit of its downward movement, the stationary snubber is engaged with the pipe to hold the same against upward displacement until the traveling snubber has been moved upwardly to take a new grip on the pipe. After the traveling snubber has again been engaged with the pipe, the stationary snubber is released and the snubbing or forcing operation is repeated.

Heretofore, the usual stationary snubber has employed pivoted gripping dogs which were adapted to be moved into gripping engagement with the pipe by manipulation of a handle or operating member which was relatively short in length, and which was pivoted on a pin secured in stationary frame side plates. The gripping dogs were held in engagement with the pipe while the traveling member was moved to engaged position by a man who held the handle in proper position to maintain such gripping engagement. To increase or amplify the force applied to the gripping dogs by manipulation of the short lever or handle, various lever or linkage mechanisms were used.

Furthermore, the force applied to the opposed gripping dogs was many times unequal, due to the fact that the gripping dogs were operated by application of force directly to only one of the pair of opposed lever arms pivoted in the snubber frame and carrying the gripping dogs, so that an unequal force was applied to the two lever arms, and, since the frame was relatively stationary the force applied through the lever arm was limited. In addition, the use of such a stationary snubber required the services of a man at the snubber at

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all times during the snubbing operation, thus not only requiring the services of an additional man but also occasionally requiring the man to remain in a position of some danger due to the hazard of blow-outs or the like.

It is, therefore, one object of this invention to provide an improved actuating and locking mechanism for gripping devices, such as well snubbers or the like, whereby operation of said gripping device is made easier and may be accomplished more rapidly and with greater safety.

An important object of the invention is to provide an improved actuating and locking mechanism for gripping devices of the character described which is so constructed that fluid pressure may be used for actuating the gripping elements of the device, and which is provided with means for positively locking the mechanism in a position holding the dogs in gripping engagement with the pipe.

Another object of the invention is to provide an actuating and locking mechanism for well snubbers or the like which is so constructed that it may be controlled and operated from a point remote from the well, as, for example, by the operator of the winch used in moving the traveling snubber to force the pipe into the well bore.

A further object of the invention is to provide an improved actuating and locking mechanism for well snubbers which is so constructed and arranged that the snubbing device may move to accommodate mis-aligned pipe so that the gripping elements grip the pipe with an equal or balanced gripping force.

It is a particular object of this invention to provide an improved actuating and locking mechanism for gripping devices of the character described wherein said mechanism is so connected with the gripping elements that any tendency of the pipe being gripped thereby to move upwardly with relation to the gripping elements will effect a tighter gripping engagement of the gripping elements therewith.

A most important object of the invention is to provide a gripping device of the character described wherein the frame on which the lever arms and gripping dogs are pivoted is movable so that an amplification of leverage is obtained due to the movement of the lever arm pivot pin carrying frame, whereby the force applied to the gripping dogs for gripping the pipe is multiplied.

A particularly important object of the invention is to provide a gripping device of the character described having an improved gripping dog actuating mechanism which is so constructed

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and arranged that the force applied to each of the gripping dogs is equal to the force applied to the other dogs, whereby a balanced gripping action by the dogs is obtained.

A further object of the invention is to provide an improved gripping device of the character described having means for manual actuation of the gripping elements of the device, or having fluid pressure actuating means, or both, whereby the device may be operated manually or by fluid pressure.

Still another object of the invention is to provide an improved actuating and locking mechanism for gripping devices wherein locking means is provided to latch the actuating mechanism against movement from a position holding the gripping elements in gripping position, said locking means being so constructed and arranged that, when in locking position, it will not interfere with movement of the actuating means in a direction increasing the gripping engagement of the gripping elements.

A still further object of the invention is to provide an actuating and locking mechanism for gripping devices of the character described which is so constructed and arranged that a downward movement of the pipe gripped by said device will automatically effect a release of the gripping engagement of the gripping elements with the pipe, such downward movement being possible only when the fluid pressure used for actuating the gripping elements of the device is released and the locking means is ineffective.

Another object of the invention is to provide an improved mounting for the gripping dogs, whereby the dogs are positively maintained in proper untilted gripping position at all times and the full gripping face of each of the dogs is applied to and held in engagement with the pipe being gripped.

Additional objects and advantages of the invention will readily be apparent from the reading of the following description of a device constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

Figure 1 is a plan view of a gripping device having an actuating and locking mechanism constructed in accordance with the invention,

Figure 2 is a side elevation of the device, showing the gripping device in gripping position,

Figure 3 is a transverse, vertical sectional view taken on the line 3—3 of Figure 1, and showing the gripping device in gripping position,

Figure 4 is a view similar to Figure 3 showing the gripping device in released, non-gripping position,

Figure 5 is a fragmentary, vertical sectional view taken at right angles to Figure 3, and showing the fluid pressure operating mechanism for the gripping device, and illustrating the gripping device in gripping position,

Figure 6 is a view similar to Figure 5 showing the gripping mechanism in released, non-gripping position,

Figure 7 is an enlarged transverse, vertical sectional view of one of the fluid pressure operating cylinders and pistons,

Figure 8 is an enlarged isometric view of the back of one of the gripping dogs,

Figure 9 is an enlarged isometric view of one of the lever arms for the gripping dogs,

Figure 10 is a plan view, partly in section, of a modified form of the gripping device, showing means for manual actuation of the device, and

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Figure 11 is a side elevation of the device of Figure 10.

In the drawings, the numeral 10 designates a tubular base member having a flange 11 at its lower end by means of which the base member may be attached to the upper end of the well casing in place in the well. A flange plate or platform 12 is formed integral with the upper end of the base member and extends horizontally outwardly therearound. A pair of radially extending, opposed, elongated bifurcated arms 13 are formed integral with the base member and have sheave wheels 14 mounted in the bifurcated outer ends thereof. The sheave wheels 14 are adapted to have a cable 15 extend therearound for operating the traveling snubber or gripping device (not shown) which is used for forcing the pipe into the bore of the well.

A pair of short parallel ears or lugs 16 are formed integral with and extend radially outwardly from opposite sides of the upper end of the base member 10, and are disposed at right angles to the elongate sheave arms 13. Each of a pair of elongate tie-links 17 has its lower end pivotally secured by means of a bolt or pin 18 between the short arms 16 on one side of the base member, and has its upper end also pivotally secured by a bolt or pin 19 to the outer end of one of a pair of lever arms 20 which are, in turn, pivotally mounted on pins 21 extending between spaced frame side plates 22 of the frame of a gripping or snubbing device S. Nuts 21a retain the pins 21 in place in the frame.

The frame side plates 22 are spaced sufficiently far apart to permit the elongate pipe, tubing or other element T being forced into the well to extend downwardly therebetween. Spaced longitudinally extending ribs 22a, formed integral with or welded to each side plate, stiffen and strengthen said side plates. Gripping dogs 23 are mounted between the side plates at the central portion thereof and have inner arcuate faces in which are mounted arcuate gripping inserts 24 formed with gripping teeth 25 corresponding substantially in curvature to the external diameter of the pipe being forced into the well.

Each gripping dog 23 is formed with a vertical rib 26 on its outer end, and this rib is disposed between ears or lugs 27 provided on the inner ends of each of the pivoted lever arms 20, being pivotally secured to the upper portion thereof by a transverse pin 28 extending through the lugs and the rib. Each of a pair of spaced leveling links 29 has one end pivotally secured by means of a pin 30 to the lower portion of the rib 26 at the rear of the dog, and has its other end pivotally mounted on a transverse bolt or pin 31 extending between the side plates 22 of the snubbing device and held in place by nuts 31a on its outer ends. These leveling links are so connected between the side plates and the rib at the rear of the gripping dog that they extend parallel to the lever arms 20, and the distance between the pin 31 and the pin 30 is equal to the distance between the pin 21 and the pin 28 extending through the lever arm 20, whereby the movement of the leveling links is equal to, and the links are always parallel with, the lever arms 20 as said lever arms are moved. This arrangement causes the gripping teeth 25 of the inserts 24 carried by each of the gripping dogs 23 to always be maintained in a vertical

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untilted position parallel to the teeth of the opposite dog.

For maintaining the gripping dogs at the same elevation and assuring that they move upwardly or downwardly together, an elongate guide bar 32 is secured by bolts to the side of one of the gripping dogs 23 and extends parallel to the side plates 22 through a central lateral groove 33 formed in the side of the opposite gripping dog, and is slidable in said groove. Thus, when one of the gripping dogs is moved upwardly, it is manifest that the engagement of the bar 32 in the slot 33 causes the opposite gripping dog to move simultaneously therewith. While it is preferable that the guide bars 32 be provided on each side of the gripping dogs, as shown in the drawings, it is obvious that only a single bar may be used if desired.

It will be seen, therefore, that when the snubber frame side plates 22 are lifted, the elongate pull links 17 cause the lever arms 20 to pivot about the pins 21 and swing the inner ends of said lever arms upwardly and inwardly in an arc about said pins. Such upward movement of the inner ends of the lever arms lifts the gripping dogs 23, which are pivotally connected to the inner ends of said arms by the pins 28, to swing the gripping dogs toward each other to the position shown in Figure 3 and cause the gripping teeth 25 to engage and securely grip the pipe T.

To cause the gripping dogs to release their gripping engagement with the pipe, the snubber side plates 22 are moved downwardly, whereupon the pull links 17 cause the lever arms 20 to swing in the opposite direction, downwardly and outwardly away from each other, to retract the gripping dogs from engagement with the pipe.

For moving the side plates 22 of the snubber upwardly in order to cause the lever arms 20 to move the gripping dogs into gripping position, fluid pressure cylinders 40 are mounted in a vertical position in the elongate sheave arms 13 on each side of the snubber 5, and have longitudinally movable elongate pistons 41 slidable therein and adapted to be moved upwardly by fluid pressure directed into the lower end of the cylinder bore through an opening 42 to which a fluid pressure line may be connected.

Each piston 41 is operatively connected with the adjacent side plate of the snubber by means of an elongate push rod 43 having a reduced lower end 44 fitting in a socket 45 in the upper end of the piston. The reduced upper end 46 of the push rod fits in an annular socket 47 formed on the underside of a laterally extending push plate 48 secured to or formed integral with each side plate 22 of the snubbing device. Angular brace members 49 extend between each push plate and the adjacent side plate for strengthening and bracing the push plates.

The piston has its lower end reduced, and an inverted pump cup or similar sealing or packing ring 50 is mounted thereon and held in place by a thimble 51 and packing nut 52 threaded onto the lower end of the reduced portion of the piston. Fluid pressure entering the bore of the cylinder through the opening 42 thus acts upwardly against the pump cup or sealing ring 50 to urge the piston longitudinally upward in the cylinder and force the push rod 43 upwardly. This upward movement of the push rod causes the push rod to act against the push plate 48 to lift the side plate 22 of the snubber. Lifting of the side plates of the snubber causes the pull links 17 to swing the lever arms 20 through an

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arc, moving the gripping dogs 23 into gripping engagement with the pipe T, as has already been explained.

Therefore, when fluid pressure is supplied to the bore of the cylinders, the pistons will be moved upwardly and move the side plates to cause the gripping dogs 23 to be moved into gripping engagement with the pipe. The grip on the pipe may be released by releasing the pressure in the cylinders 40 to permit the pistons 41 to move downwardly in the cylinders. Downward movement of the pistons permits the push rods to be moved downwardly by the weight of the snubber device to return the side plates to the lower position shown in Figures 4 and 6, wherein the gripping dogs are in retracted non-gripping position.

When the fluid pressure in the cylinder 40 is released, downward movement of the pipe T by means of the traveling snubbers (not shown) will cause the stationary snubber S to start downwardly, thus giving initial downward movement to the gripping dogs 23 and side plates 22 of the snubber to cause the snubbing device to move to retracted non-gripping position.

In frequent instances, it is desirable or necessary to positively lock the gripping dogs 23 in gripping engagement with the pipe T. For positively locking the snubber side plates 22 in an elevated position, wherein the lever arms 20 are swung to move the gripping dogs 23 into tight gripping engagement with the pipe T, the lower portion of each push rod 43 has external screw threads 55 formed thereon and a locking nut 56 is threaded onto said push rod and is adapted to be screwed downwardly thereon to engage a locking sleeve 57 which surrounds the upper portion of the piston 41 and the lower portion of the push rod. By screwing the nuts 56 downwardly into engagement with the sleeves 57, the push rods 43 are moved upwardly to cause the snubber side plates 22 to be moved to an elevated position, which moves the gripping dogs 23 into tight gripping engagement with the pipe. Thus, by so adjusting the locking nuts into engagement with the sleeves 57, the push rods 43 are prevented from moving downwardly when fluid pressure is released from within the pistons 40, whereby the push rods and the frame side plates supported thereby are maintained in an elevated position and the gripping dogs 23 are held securely in gripping engagement with the pipe T.

Obviously, should the pipe T tend to move upwardly, due to an increase in fluid pressure acting against the lower end thereof tending to eject the pipe from the well bore, the gripping engagement of the gripping dogs 23 with the pipe will cause said dogs to move upwardly with the pipe and swing the lever arms 20 further inwardly about the pivot pins 21 to increase the gripping engagement of the dogs with the pipe. Furthermore, since the locking nuts 56 and sleeves 57 do not prevent upward movement of the push rods, it is believed manifest that the locking nuts and sleeves will not interfere with such upward movement of the snubber device S.

Guide rollers 60, mounted on brackets 61 adjustably secured by means of bolts 62 to the push plates 48, provide for maintaining the snubber in axial alignment with the pipe T extending there-through. The rollers limit lateral movement of the pipe when the gripping dogs are in the retracted position, whereby the pipe is substantially centered with respect to the gripping dogs.

and may be readily gripped by said dogs when they are moved to gripping position. If desired, the peripheral surface of each roller may be concave to further limit movement of the pipe in substantially any lateral direction.

Since each lever arm 20 is positively swung about the pivot pin 21 by the pull link 17 connected at the outer end of each lever arm, when the snubber frame side plates are moved upwardly in the manner just described, it will be seen that the gripping dog 23 pivotally connected to the inner end of each lever arm 20 will be positively moved toward and into gripping engagement with the pipe, and that each dog will have a balanced substantially equal force applied to it, whereby an equal or balanced grip on the pipe is obtained with each gripping dog.

Since the pistons 41 are actuated by fluid pressure introduced into the cylinders 40 by fluid pressure lines communicating with said cylinders through the ports 42, it is believed manifest that the fluid conductor may extend to a remote point, such as the point at which the operator of the winch which is used in moving the traveling snubber to force the pipe into the well bore is located. The fluid pressure supplied to the cylinders through the ports 42 for acting upon the pistons 41 may be supplied from any desired suitable source; for example, from a pump, or from a fluid flow line from the well carrying well fluid pressure, or any other suitable source. Thus, the actuating and locking mechanism for the snubber is so constructed and arranged that it is operated by a fluid pressure, and may be controlled and operated from a point remote from the well.

Manifestly, the gripping device may be equipped for manual actuation, if desired. One means providing for manual actuation is illustrated in Figures 10 and 11, wherein a substantially Y-shaped actuating lever 70 is pivotally mounted on the base member 10 and is arranged to lift the side plates 22 of the gripping device to cause movement of the gripping dogs 23 into gripping engagement with the well flow conductor.

The Y-shaped lever arm 70 includes a pair of spaced arms 71 and an elongate operating handle 72. A pair of spaced legs 73 are formed on the lever at substantially the point of junction of the arms 71 with the handle, and said legs extend downwardly at right angles therefrom and are pivotally mounted on a pin 74 which extends through the short parallel ears or lugs 16 of the base member 10. The pin 74 also extends through the lower end of the tie link 17 at that end of the base plate, whereby the pin 74 serves to replace the pin 18 of the form previously described and also serves as a pivot for the lever 70. Each arm 71 of the lever is provided with a pair of spaced fingers 75 at its outer end, and these fingers extend around or past the push rods 76 on each side of the snubber, and engage against the under surface of an external annular flange 77, preferably formed integral with the push rods 76, and preferably located substantially centrally of said push rods. Other parts of the gripping device are the same as those of the form previously described and are given the same identifying numerals.

A downward force applied to the outer end of the handle 72 of the lever 70 will cause the lever to swing to the position shown in dotted lines in Figure 11, whereby the fingers 75 at the outer ends of the arms 71 of the lever act against the flange 77 on the push rod 76 to lift the push rod.

Lifting of the push rod will, of course, lift the side plates of the frame of the gripping device S and cause actuation of the gripping dogs 23 into gripping position in the same manner as when the dogs are moved by fluid pressure actuation of the push rods.

The push rods may be locked in elevated position by screwing the nut 56 downwardly on the push rod until it engages the sleeve 57 surrounding the push rod, whereupon downward movement of the rod is prevented and the snubbing device is held in an elevated gripping position.

Thus, the gripping device or snubber S may be actuated into gripping position manually by swinging the lever 70 about the pivot pin 74. Manual operation of the gripping device is desirable in the event there is no source of fluid pressure for operation of such device; otherwise, there is no change in the function and operation of the gripping device.

From the foregoing, it will be seen that a gripping device has been provided which may be actuated manually to cause the gripping elements of the device to move into gripping position, or which may be operated by fluid pressure actuating means, or both. Furthermore, it will be seen that the gripping dogs pivotally connected to the inner end of each lever arm will be positively moved toward and into gripping engagement with the pipe extending through the device, and that each dog will have a balanced substantially equal force applied to it, whereby an equal or balanced grip on the pipe is obtained with each gripping dog, and, that these results are obtained regardless of what force is used for lifting the push rods and the side plates of the snubber frame.

It will also be seen that the actuating and locking mechanism for the gripping device is provided with means for positively locking the mechanism in a position holding the dogs in gripping engagement with the pipe, said locking means being so constructed and arranged that it will not interfere with movement of the actuating means in a direction increasing the gripping engagement of the gripping element.

It will particularly be seen that a gripping device has been provided wherein the frame side plates 22 of the gripping device are movable and provide a movable mount for the pivot pins 21 on which the lever arms 20 are swingable, whereby the leverage obtained by upward movement of the snubber frame side plates 22 is amplified due to the movement of the pivot pins 21 with the frame side plates, thus multiplying or amplifying the force applied to the gripping dogs for gripping the pipe.

It will also be readily apparent that the gripping device and actuating and locking mechanism is so constructed and arranged that a downward movement of the pipe gripped by said device will automatically effect a release of the gripping engagement of the gripping elements with the pipe, but that such downward movement is possible only when the fluid pressure used for actuating the gripping elements of the device is released and the locking means is ineffective.

Furthermore, means has been provided in the gripping device for positively maintaining the gripping dogs in vertical untitled gripping position at all times, whereby the full gripping face of the dogs is applied to and held in engagement with the pipe being gripped.

The foregoing description of the invention is explanatory only, and changes in the details of

the construction illustrated may be made by those skilled in the art, 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 gripping device adapted for use in inserting pipe into wells against pressures therein and including, a base member adapted to be connected to a well casing and having an opening therethrough for the passage of pipe, a snubber frame movable with respect to the base member and also having an opening permitting the passage of pipe therethrough, a pair of spaced opposed lever arms each pivoted intermediate its ends to said frame and swingable on said pivots, the inner ends of the lever arms extending inwardly and downwardly of the frame to a level below the central pivot point on which the arms are pivoted to the frame and the outer ends of said lever arms extending upwardly and projecting outwardly from the frame above said central pivot point, a pair of opposed gripping members each pivotally mounted on the inner end of one of said lever arms below the pivotal connection of the lever arms with the frame and having an arcuate gripping surface adapted to grip pipe extending through the frame when the outer ends of the lever arms are swung to move the gripping members toward each other, leveling links spaced from the lever arms and pivotally connected to the gripping members and the frame for positively maintaining the arcuate gripping faces of the members in parallel alignment with each other, a pair of pull links each hingedly connected at its upper end with the outer end of one of the lever arms above the pivotal connection of the lever arms with the frame and at its other end with the base member, whereby upward movement of the snubber frame with respect to the base member causes the lever arms to be swung downwardly at their outer ends and upwardly and inwardly toward each other at their inner ends to move the gripping members inwardly and into gripping engagement with the pipe extending through the frame, means for moving the snubber frame upwardly with respect to the base member to cause actuation of the gripping members into gripping position, and adjustable locking means normally inactive and constructed and arranged to be adjusted to maintain the snubber frame in an elevated position positively maintaining the gripping members in gripping engagement with the pipe, said locking means permitting movement of the frame to increase the gripping engagement of the gripping members with the pipe but preventing movement reducing such gripping engagement.

2. A gripping device of the character set forth in claim 1 wherein, the means for moving the snubber frame is fluid pressure operated and includes cylinders carried by the base member on opposite sides of the snubber frame, a piston movable in each cylinder, means loosely connecting each piston with the adjacent side of the frame whereby fluid pressure introduced into the cylinder will move the piston upwardly to lift the frame, means for conducting pressure fluid into the cylinders to act against the piston and to release said pressure fluid, the pistons on the opposite sides of the snubber frame providing for the application of a balanced force to lift said snubber frame.

3. A gripping device including, a tubular base

member having a flange at its lower end adapted to be connected to a well casing, a platform at the upper end of the base member having an opening therein communicating with the bore of tubular base member and adapted to have pipe extend therethrough, a snubber frame having a pair of spaced parallel side plates movably supported on the platform and having an opening therebetween for the passage of pipe therethrough, a pair of opposed lever arms each pivoted intermediate its ends on a transverse pivot pin carried by the frame side plates and swingable therebetween, the inner ends of said lever arms extending inwardly toward each other and downwardly below the transverse pivot pins connecting said arms to the side frame plates, a pair of opposed gripping members each pivotally mounted on the inner end of one of said lever arms below the transverse pivot pin connecting the lever arm to the frame plates and provided with an arcuate gripping surface on its inner face adapted to grip pipe extending through the frame when the outer end of the lever is swung downwardly to swing the gripping members toward each other, leveling links spaced from the lever arms each pivotally connected at one end to one of the gripping members and at its other end to the frame side plates at equal distances vertically below the transverse pivot pin connecting the lever arm to the frame side plates and the pivotal connection of the inner end of the lever arm with the gripping member so as to be movable parallel to and through equal arcs with the lever arms for maintaining the arcuate gripping faces of the gripping members in parallel alignment, a pair of pull links each hingedly connected at its upper end with the outer end of each lever arm above the transverse pivot pin connecting the lever arm to the side plates and at its lower end with the platform of the base member, whereby upward movement of the snubber frame with respect to the base member causes the lever arms to be swung downwardly at their upper ends and upwardly and inwardly toward each other at their lower inner ends to move the gripping members toward each other into gripping engagement with pipe extending through the frame, a pair of opposed radially extending integral sheave arms on the base member, a fluid pressure cylinder open at its upper end mounted on each of the sheave arms adjacent to the side plates of the snubber frame, an elongate piston movable longitudinally in each cylinder, push rods each loosely connected with the upper end of one of the pistons and with the adjacent side plate of the snubber frame, means for conducting pressure fluid into each cylinder to act against the piston to move the same upwardly with respect to the cylinder to force the push rod upwardly to lift the snubber frame, whereby the pressure fluid operated pistons apply a balanced force to opposite plates of the snubber frame to lift the snubber frame uniformly to cause the gripping members to be swung into gripping position, said conducting means also providing for release of pressure fluid from within the cylinders to permit downward movement of the snubber frame for causing retraction of the gripping members from gripping position, sleeves removably supported on the base member and surrounding the lower end of each push rod, and a member adjustable on each push rod toward and from said sleeve and constructed and arranged to be moved downwardly with respect to said push rod to engage the upper end

of the sleeve to maintain the push rod and the frame supported thereby in an elevated position, whereby the gripping members are positively maintained in gripping position, said adjustable member being movable upwardly with the push rod away from the sleeve to permit upward movement of the frame to increase the gripping engagement of the gripping members with the pipe but preventing downward movement of said push rod to prevent reduction of the gripping force exerted by the gripping members.

4. A gripping device adapted for use in inserting pipe into wells or removing pipe from wells against pressures therein and including, a base member adapted to be connected to a well casing and having an opening therethrough to permit passage of pipe, a frame movable with respect to the base member and also having an opening permitting passage of pipe therethrough, opposed lever arms pivoted intermediate their ends to said frame, the inner ends of said lever arms extending inwardly toward each other and downwardly below their pivotal connection to the frame and the upper ends of said arms extending upwardly and outwardly beyond the frame above the point of pivotal connection to said frame, a gripping member pivotally mounted on the inner end of each lever arm below the pivotal connection of said lever arm with the frame and provided with an arcuate gripping surface opposed to the gripping surface of the gripping member on the opposite lever arm and adapted to grip the pipe when the outer end of the lever arm is swung downwardly, a pull link hingedly connected with the outer end of each lever arm above the pivotal connection of said lever arm with the frame and with the base member, whereby upward movement of the frame with respect to the base member causes the lever arms to be swung downwardly at their outer ends and upwardly and inwardly at their inner ends to move the opposed gripping members toward each other and into gripping engagement with the pipe extending therebetween through the frame, and means for moving the frame upwardly and downwardly with respect to the base member to cause actuation of the gripping members.

5. A gripping device of the character set forth in claim 4 wherein, the means for moving the frame is fluid pressure operated, and mechanical means independent of said fluid pressure operated means is provided for maintaining the frame in adjusted positions positively maintaining the gripping members in gripping engagement with the pipe but permitting movement of the frame to increase such gripping engagement.

6. A gripping device of the character set forth in claim 4 including, a pair of opposed leveling links each independent of the adjacent lever arm and pivotally connected to the gripping member carried at the inner end of each adjacent lever arm and to the frame for positively maintaining the arcuate gripping face of the gripping mem-

bers in a vertical untilted position at all times.

7. A gripping device adapted for use in inserting pipe into wells against fluid pressure therein and including, a base member adapted to be connected to a well casing and having an opening therethrough for the passage of pipe, a snubber frame movable with respect to the base member and also having an opening permitting the passage of pipe therethrough, a pair of spaced opposed lever arms each pivoted intermediate its ends to said frame and swingable on said pivots, a pair of opposed gripping members each pivotally mounted on the inner end of one of said lever arms in the opening in the snubber frame, the inner ends of the lever arms and the point of pivotal mounting of the gripping members on said lever arms being disposed below the pivotal connection of the lever arms with the frame, said gripping members each having an arcuate gripping surface adapted to grip pipe extending through the frame when the outer ends of the lever arms are swung downwardly to move the gripping members upwardly and inwardly toward each other, leveling links spaced from the lever arms and pivotally connected at their opposite ends to the gripping members and the frame for positively maintaining the arcuate gripping faces of the gripping members in parallel alignment with each other during swinging movements thereof, a pair of pull links each hingedly connected at its upper end with the outer end of one of the lever arms above the pivotal connection of said lever arm with the frame and at its lower end with the base member, whereby upward movement of the snubber frame with respect to the base member causes the outer ends of the lever arms to be swung downwardly and the inner ends of said lever arms to be swung upwardly to move the gripping members inwardly and upwardly into gripping engagement with pipe extending through the frame opening, and means for moving the snubber frame upwardly with respect to the base member to cause the lever arms to swing the gripping members into gripping position.

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