June 17, 1941. R. W. JONES, JR 2,245,592

WELL PIPE SUPPORT

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Fig. 1

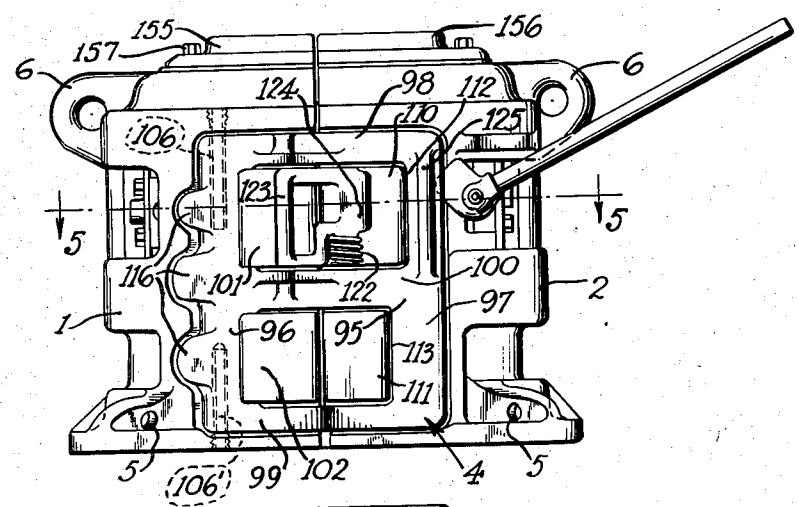


Fig. 2

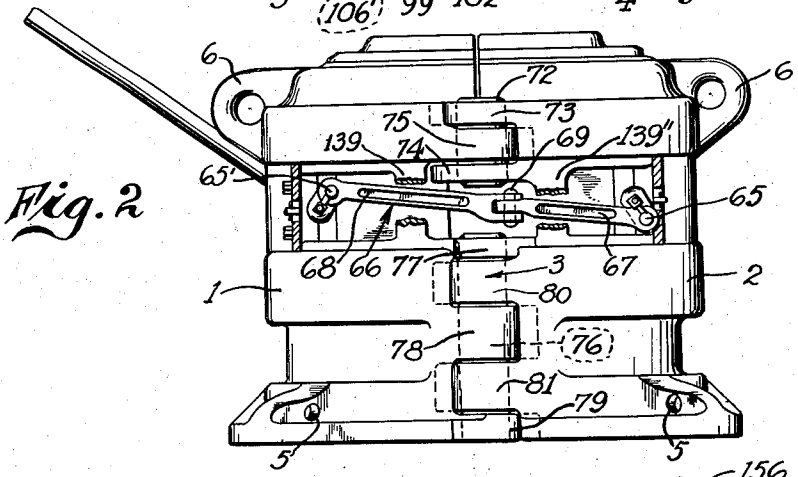


Fig. 3

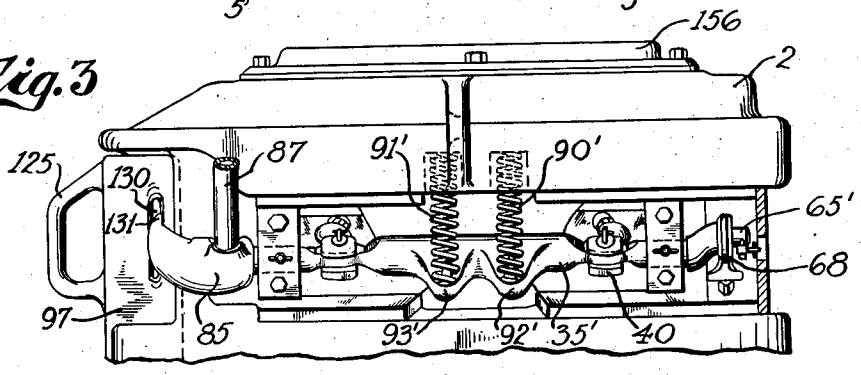
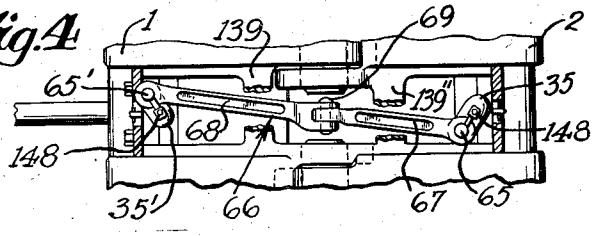


Fig. 4



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Fig. 5

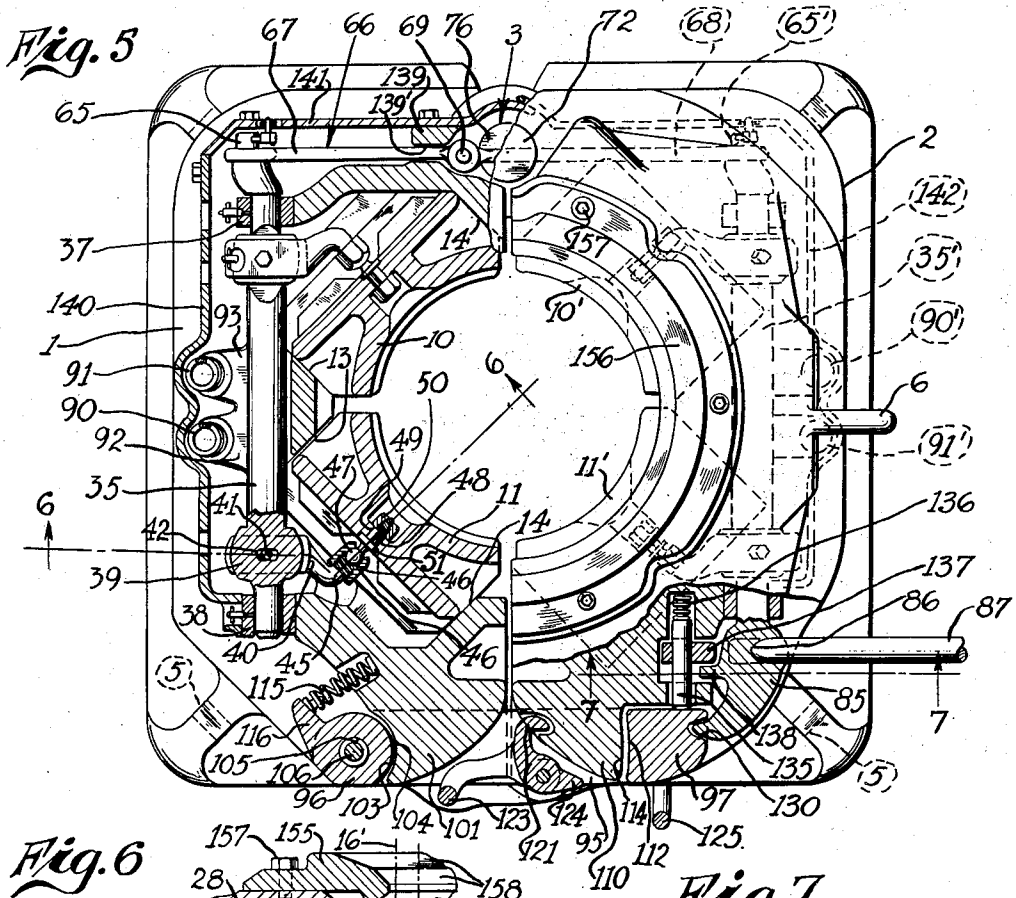


Fig. 6

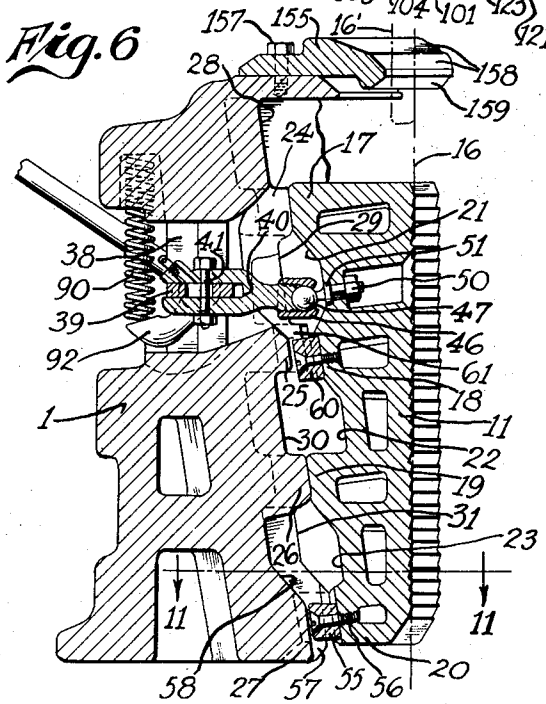
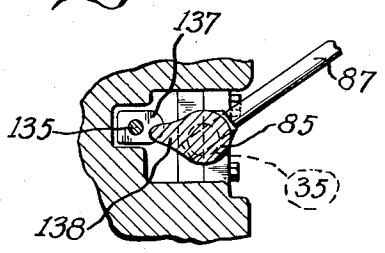


Fig. 7



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Fig. 8

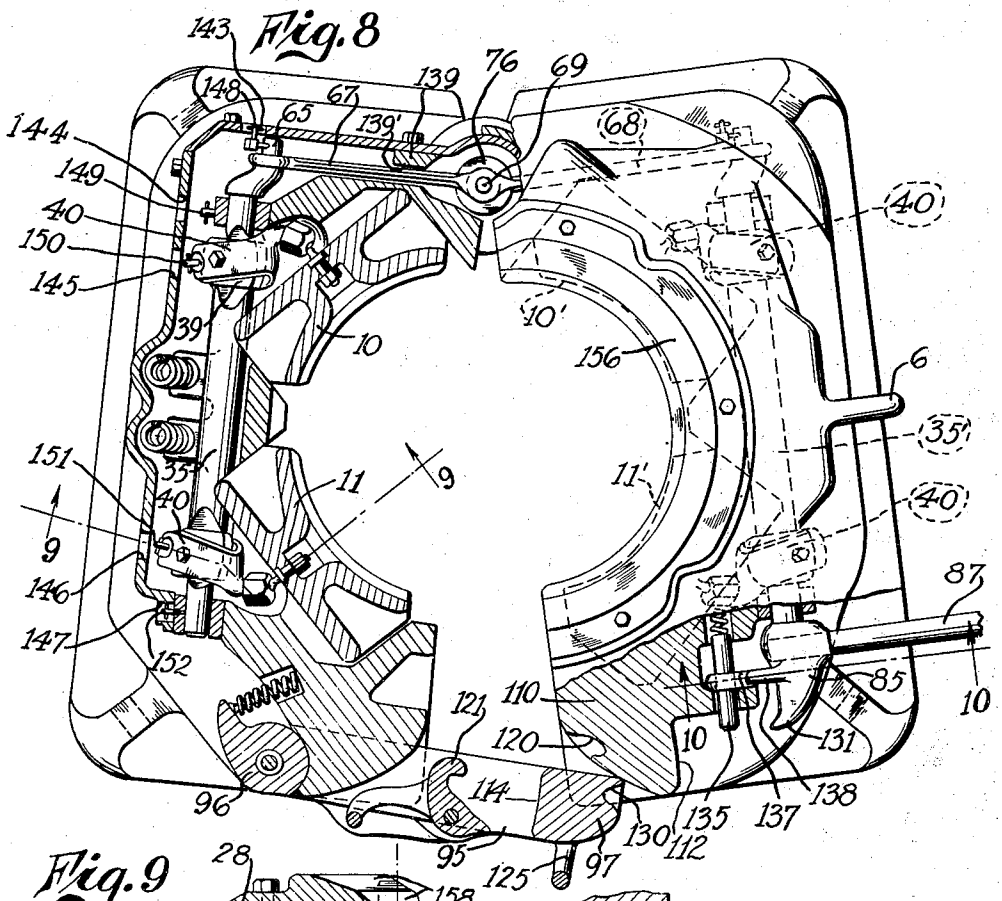
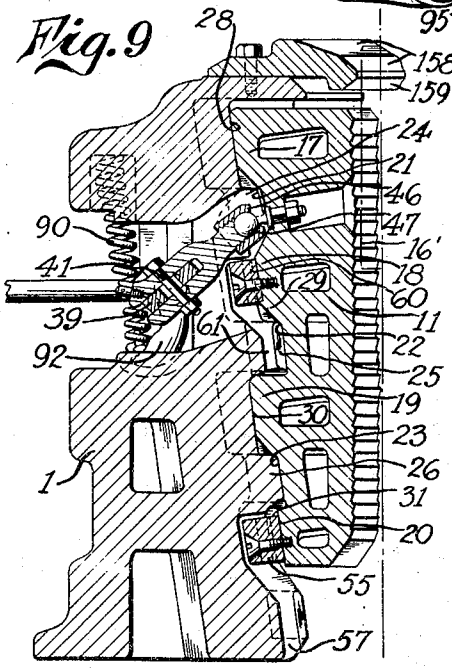


Fig. 9



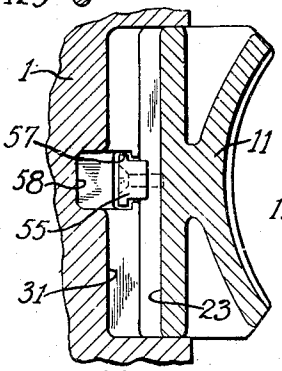


Fig. 11

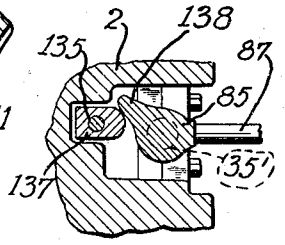


Fig. 10

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Patented June 17, 1941 2,245,592

UNITED STATES PATENT OFFICE

2,245,592

WELL PIPE SUPPORT

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Application November 21, 1939, Serial No. 305,501

18 Claims. (Cl. 24—263)

This invention relates generally to well drilling apparatus, and particularly to well pipe supports or spiders.

Well pipe spiders, and especially those adapted to support long and heavy strings of well casing, are usually equipped with slips for frictionally engaging and supporting the pipe. In order to distribute the load over a substantial area of the pipe and thereby avoid crushing or otherwise damaging the pipe, the slips are usually of considerable length (it is not an uncommon occurrence to provide slips up to 18 inches in length). The slips are consequently quite heavy and difficult to manipulate manually.

A principal object of this invention is to provide a well pipe spider having novel and improved means for setting and retracting the slips.

A further object of the invention is to provide, in a well pipe spider of the type comprising pivotally connected complementary segmental sections which may be opened up to enable the spider to be applied to or removed from the pipe in a lateral direction, a simple and effective slip-actuating mechanism for causing the slips in both segments to move in unison.

A still further object is to provide a sectional well pipe spider having means for positively locking the sections together when the slips are in operative position.

A still further object is to provide a sectional well pipe spider having means for locking the sections together, and having pipe-engaging slips which are normally in operative position unless manually held in retracted position, with means being provided for retaining the slips in retracted position when the locking means is released.

Other objects and advantages will be apparent from the following description of a preferred embodiment of the invention, reference being had to the accompanying drawings wherein:

Fig. 1 is a view in front elevation of a spider constructed in accordance with the invention;

Fig. 2 is a rear view of the spider, with a cover plate removed to disclose a portion of the slip-actuating mechanism;

Fig. 3 is a fragmentary view in side elevation, as viewed from the right side of Fig. 1, with a cover plate removed to disclose further details of the slip actuating mechanism;

Fig. 4 is a fragmentary elevational view showing the linkage mechanism of Fig. 2 in the position assumed when the slips are retracted;

Fig. 5 is a top plan view, with parts broken away to disclose one pair of slips and their actuating mechanism;

Fig. 6 is a vertical sectional view taken substantially on line 6—6 of Fig. 5, showing the slip in pipe-engaging position;

Fig. 7 is a fragmentary vertical sectional view taken on line 7—7 of Fig. 5;

Fig. 8 is a fragmentary view, partly in top plan and partly in horizontal section, showing the slips in retracted position and the body sections spread apart about their pivot;

Fig. 9 is a vertical section taken substantially on line 9—9 of Fig. 8 and corresponding to Fig. 6 but showing the slip in retracted position;

Fig. 10 is a fragmentary vertical sectional view taken on line 10—10 of Fig. 8; and

Fig. 11 is a sectional view taken on line 11—11 of Fig. 6.

In the preferred embodiment of the invention, illustrated in the accompanying drawings, the spider body comprises a pair of complementary sections 1 and 2 pivotally interconnected at one side at 3, and adapted to be releasably latched together at the opposite side by a latch generally indicated at 4. Complementary semi-circular recesses are formed in the sections, defining a pipe opening therebetween. The sectional body is provided with a flat base adapted to rest on the derrick floor or on the upper surface of the rotary table. Suitable eyes are provided at the corners of the base, as indicated at 5, and a pair of eyes 6 are also provided on the upper portion of each section.

A pair of pipe-engaging slips 10, 11 are mounted in the body section 1, and a pair of slips 10', 11' are similarly mounted in the body section 2. As shown most clearly in Figure 5, the slips are flat-backed and have arcuate inner surfaces, the inner surface of each slip embracing substantially a quadrant of a circle, extending from the diametric plane through the centre of the pipe opening and the body pivot 3, to a diametric plane at right angles thereto. The radial plane extending centrally through each slip is thus disposed at an angle of 45° to the diametric plane through the pivot 3. Each slip is constrained to move in a radial direction parallel to the latter plane by being guided within a recess in the body, each recess having parallel side walls 13, 14 extending parallel to the latter plane.

Referring now to Fig. 6, it will be observed that the slip 11 has a serrated inner face adapted to engage the pipe (indicated by the dot-and-dash line 16), and its outer wall is composed of a ver-

tical series of outwardly extending projections 17, 18, 19 and 20 alternating with recesses 21, 22 and 23. It will also be observed that the inner surface of the body 1 consists of a similar series of inwardly extending projections 24, 25, 26 and 27 alternating with a series of recesses 28, 29, 30 and 31. The corresponding projections on the body and slip have downwardly and inwardly inclined wedging surfaces thereon adapted to interengage when the slip is in pipe-engaging position, as shown in Fig. 6, whereby downward movement of the slip causes the latter to be wedged tightly between the body and the pipe.

It will be noted from reference to Fig. 9, wherein the slip 11 is shown in retracted position, that the slip has been moved upwardly to an extent to permit the projections 17, 18, 19 and 20 on the slip to enter the recesses 28, 29, 30 and 31, respectively, in the body, and in a like manner the projections 24, 25, and 26 on the body have entered the recesses 21, 22, and 23, respectively, in the slip. By reason of the foregoing construction, only a relatively slight vertical movement of the slip enables the latter to be moved radially outwardly a substantial distance, sufficient to dispose the inner, serrated edge of the slip outwardly of the path of the pipe collar, indicated at 16'.

Referring now to the novel mechanism for setting and retracting the slips, it will be observed from Fig. 5 that a shaft 35 is journaled in the body section 1 for oscillation about a horizontal axis extending parallel to the plane of the meeting faces on the two body sections. A similar shaft 35' is also journaled in the body section 2 for oscillation about an axis parallel to the axis of shaft 35. The slips 10 and 11 are connected to the shaft 35 by novel linkage mechanism enabling the slips to be moved upwardly and radially outwardly in a direction extending at an oblique angle, preferably of 45°, to the axis of the shaft. The slips 10' and 11' are similarly connected to the shaft 35', and inasmuch as the linkage mechanisms connecting the various slips to their respective shafts are substantially identical, a detailed description of one will suffice for all.

The shaft 35 is journaled adjacent its ends in bearings 37 and 38. Inwardly of each bearing the shaft is provided with flattened portions 39 having arcuate outer edges and parallel upper and lower plane bearing surfaces. A bifurcated link 40 is mounted on each flattened portion 39, with the bifurcations disposed on opposite sides of the latter, as shown most clearly in Figs. 6 and 9. A pin 41 extends transversely through aligned openings in the link and the flattened portion 39 and thus secures the link to the shaft for bodily movement therewith about the axis of the shaft and also for pivotal movement relative thereto about an axis at right angles to the axis of oscillation of the shaft. It will be observed from reference to Fig. 5 that the pin opening through the flattened portion 39 is elongated transversely of the shaft, as indicated at 42, thus permitting limited bodily movement of the link transversely of the shaft in addition to the aforesaid pivotal movement.

The bifurcations of the link 40 merge into a central arm 45 which is reversely curved so as to dispose its inner end portion extending at an angle of 45 degrees to the major dimension of the bifurcations. The end portion terminates in a spherical recess, and is externally threaded to receive an internally threaded nut 46 having an annular spherical seat therein disposed opposite the recess in the end of the arm 45 and defining therewith the spherical socket of a ball-and-socket joint. A ball 47 is clamped in the socket, and is formed integral with a stem having an intermediate squared portion 48 adapted to engage a square socket 49 in the slip, and a threaded end portion for engagement with a nut 50. A flange 51 is formed on the stem of the ball, and is adapted to be drawn tightly against the rear face of the slip when the nut 50 is tightened, thus rigidly securing the ball and its stem to the slip.

It will be observed from reference to Figs. 5 and 6 that when the slip is in its lower and inner pipe-engaging position the link 40 extends substantially horizontally inwardly from the shaft 35, and the bifurcated portions of the link extend substantially at right angles to the axis of the shaft. As the shaft is rotated in a counter-clockwise direction, as viewed in Fig. 6, the link 40 is constrained by the flattened portion 39 to pivot upwardly about the shaft axis. Also, inasmuch as the slip is constrained by the walls 13 and 14 to move radially outwardly at an oblique angle of 45° to the shaft axis, the link 40 is caused to swing transversely about the axis of the pivot pin 41 into the angularly related position shown in Fig. 8. The ball and socket joint 46, 47 permits the universal pivotal movement which necessarily occurs between the link 40 and the slip 11 as an incident to the above-mentioned pivotal movement of the link about two angularly related axes.

During the initial upward movement of the slip from the position shown in Fig. 6, the downwardly and inwardly inclined wedge faces on the projections 17, 18, 19 and 20 on the slip ride upwardly along the corresponding wedge faces on the body, and the slip accordingly moves in a rectilinear path at an angle of between 10 and 15 degrees from the vertical. The transversely elongated slot 42 in the flattened portion 39 of the shaft 35 enables the link 40 to adjust itself laterally of the shaft to coordinate the otherwise arcuate path of the inner end of the link to the rectilinear movement of the slip. When the wedge faces on the slip have moved upwardly past the wedge faces on the body, thereafter the more flatly inclined under surfaces of the projections on the slip ride upwardly and outwardly on the upper edges of the body projections, and the direction of movement of the slip is at an angle of approximately 45° from the vertical. When the slip is fully retracted the parts assume the positions shown in Figs. 8 and 9.

Referring now to Figs. 6 and 11, it will be observed that means have been provided for interlocking the slip and the body when the slip is in its lower position, to maintain the wedging surfaces in engagement. In the preferred embodiment, this means is in the form of a T-shaped lug 55 detachably secured to the projection 20 on the slip, as by a screw 56. The head of the lug engages an undercut recess 57 formed in the projection 27 on the body. It will be observed that the rear wall of the recess extends upwardly and outwardly at 58 in parallelism with the inner face of the body, to accommodate the lug 55 when the slip is raised and the projection 20 on the slip enters the recess 31 in the body. It will be noted from Fig. 6, however, that the recess 57 is undercut only within the vertical limits of the projection 27, and that the upward and

outward extension thereof at 58 is of the full width of the head on the lug. The assembly and removal of the slip is thereby facilitated, inasmuch as it may be moved bodily inwardly into the pipe opening when in raised position and when the nut 50 is removed from the stem of the ball 47.

A second T-headed lug 60 is also attached to an upper projection 18 on the slip, to cooperate with a similar undercut recess 61 in the projection 25 on the body.

It will be understood that the foregoing description of the slip 11 and the linkage mechanism connecting it to the rock shaft 35 applies equally well to the other slips 10, 10' and 11' and their linkage mechanisms.

It is essential that the two rock shafts 35 and 35' be actuated simultaneously in opposite directions to cause the slips to be set or retracted in unison. In the present instance a novel and simple means has been provided for interconnecting the shafts to effect simultaneous actuation of both shafts upon manual actuation of one of the shafts. In order not to interfere with the opening up of the body sections 1 and 2 about the pivot 3, the interconnection between the shafts is in the form of a pitman or connecting rod composed of two sections pivotally connected together, the axis of the pivotal connection between the sections being so disposed that it coincides with the body pivot 3 when the slips are in raised position.

Referring to Figs. 2 to 5, it will be observed that the ends of the shafts 35 and 35' adjacent the body pivot 3 have eccentric extensions 65 and 65' formed thereon, on which are journaled the ends of a sectional connecting rod generally designated 66. The connecting rod comprises two sections 67 and 68 connected respectively to the eccentrics 65 and 65', and pivotally interconnected by a vertically extending pivot pin 69. As shown most clearly in Figs. 2 and 4, the eccentric 65 is offset downwardly from the axis of the shaft 35, whereas the eccentric 65' is offset upwardly from the axis of the shaft 35', whereby the oscillation of the shafts is in opposite directions. In Fig. 2 the connecting rod is shown in the position it assumes when the slips are in pipe-engaging position, and it will be observed that the pivot pin 69 is disposed to the right of the axis of the body pivot 3. As the shaft 35' is rocked about its axis in a counter-clockwise direction, as viewed in Figs. 2 and 4, to retract the slips 10' and 11', the connecting rod 66 is shifted to the left and causes the shaft 35 to rock in a clockwise direction to retract the slips 10 and 11. When the slips are in fully retracted position the connecting rod assumes the position indicated in Figs. 4 and 8, and it will be observed that in this latter position the pivot pin 69 is in vertical alignment with the body pivot 3. It then becomes possible to open up the body sections 1 and 2 about their pivot 3, the sections 67 and 68 of the connecting rod simultaneously pivoting relative to each other about the pivot pin 69.

It will be noted from reference to Fig. 2 that the pivotal connection at 3 between the body sections 1 and 2 is by means of two separate, vertically spaced pivot pins. An upper, relatively short pin 72 extends through aligned bores in a pair of spaced lugs 73 and 74 on the body section 2 and an intervening lug 75 on the body section 1. The pin 72 terminates at the lower edge of the lug 74, and is spaced upwardly from the upper end of a lower pin 76, to enable the connecting rod 66 to extend transversely of the body through the axis of the pins 72 and 76, as is most clearly shown in Fig. 5. The pin 76 extends through aligned lugs 77, 78 and 79 on the body section 1 and intervening lugs 80 and 81 on the body section 2.

From the foregoing, it will be apparent that the two pairs of slips may be actuated simultaneously by oscillating either shaft 35 or 35' through an angle of approximately 45 degrees. In the present instance, means are provided for manually rocking the shaft 35', comprising a socket member 85 formed as an integral extension of the shaft and having a transverse socket 86 therein in which is inserted a hand lever 87.

It is considered desirable as a safety measure while in use when running well casing that the slips be normally urged downwardly to pipe-engaging position, requiring the constant application of downward pressure on the lever 87 by the operator to retain the slips in retracted position while the casing is being lowered. Thus in the event of a mishap on the rig causing the operator to release his hold on the lever, the slips will be automatically set. In the instant case the slips are urged downwardly by gravity, and, inasmuch as they are of considerable mass (a set of four slips weighing between 400 and 500 pounds) a portion of their weight is counterbalanced.

As shown most clearly in Figs. 3, 6 and 9, a pair of compression springs 90' and 91' are interposed between the body section 2 and lugs 92' and 93', respectively, formed on the shaft 35'. The shaft is thus urged in a counterclockwise direction about its axis, the springs being of insufficient strength, however, to completely counterbalance the weight of the slips 10' and 11', leaving an unbalanced weight sufficient to cause the slips to quickly set when the lever 87 is released. A similar pair of springs 90 and 91 are also interposed between the body section 1 and lugs 92 and 93 formed on the shaft 35 for partially counterbalancing the weight of the slips 10 and 11.

Referring now to the latching means 4 for releasably latching the free ends of the body sections 1 and 2 together, it will be observed with particular reference to Figs. 1, 5 and 8 that the latch mechanism comprises a main latch 95 of the so-called "stirrup" type having a vertically extending hinge lug portion 96 at one side and a latch lug portion 97 at the other side. The two lug portions are interconnected by upper and lower arm portions 98 and 99 and an intermediate rib 100. A pair of hinge lugs 101 and 102 are formed on the body section 1, having an arcuate bearing surface 103 engageable by a complementary arcuate bearing surface 104 on the latch hinge lug 96. The latter lug 96 is bored axially at each end at 105 to loosely receive retaining pins 106, 106' secured in the body 1, the loose fit enabling the load to be transferred from the lug 96 to the body entirely through the bearing surfaces 103 and 104, and not through the pins 106, 106'.

The body section 2 has a pair of latch lugs 110 and 111 transversely aligned with the lugs 101 and 102 on the body section 1. In the present instance the lugs 110 and 111 have arcuate latching faces 112 and 113 thereon, struck from the axis of the bore 105 as a center, and the latch lug 97 has a similar arcuate latching surface 114 engageable with the surfaces 112 and 113 to

maintain the body sections 1 and 2 in closed position. Spring means are provided for urging the latch toward closed position, and are shown herein as compression springs 115 interposed between the body 1 and lugs 116 formed on the latch.

Auxiliary locking means are provided for retaining the latch lug 97 in engagement with the body lugs 110 and 111, and comprises a locking recess 120 in the face of the body lug 110 (Fig. 8) and a locking finger 121 pivotally mounted on the latch 95. A torsion spring 122 urges the locking finger toward its locking position, and a handle 123 is formed integral with the locking finger to permit manual release of the finger from the recess 120, thereby permitting pivotal movement of the latch 95 to disengage the latching surfaces 112, 113 and 114. An opening cam 124 is also formed integral with the locking finger 121 and handle 123, and is adapted to engage the lug 110 and move the main latch 95 outwardly about its pivot 106 when the handle 123 is pulled outwardly. A handle 125 is also formed on the latch 95 to aid in the manipulation of the latter.

It will be observed from reference to Figs. 3 and 5 that the end surface of the latch lug 97 is provided with a vertically extending recess 130 adapted to receive a projection 131 on the socket member 85. The projection 131 is so shaped that it engages the recess 130 only when the operating lever 87 is in its upper position and the slips are set. A positive lock is thus provided which renders it impossible to release the latch 95 when the slips are in pipe-engaging position. It also prevents separation of the body sections about their pivot 3 except when the connecting rod pivot 69 is aligned with the pivot 3. When the operating lever is lowered to retract the slips, however, the projection is moved upwardly and outwardly into the position shown in Fig. 8, wherein it is clear of the path of the latch, and the latter may then be released.

It is preferable, although not absolutely necessary, that the slips be locked in retracted position when the body sections 1 and 2 are opened up, as when applying the spider to or removing it from around a string of casing. In the illustrated embodiment I have shown means for locking the slips in raised position, which means are operative only when the main latch 95 is disengaged from the body lugs 110, 111, and are rendered inoperative by closing of the latch so that the slips will remain in pipe-engaging position except when held retracted by the operator. Referring to Figs. 5 and 8, a spring-pressed plunger 135 is slidably mounted in a bore in the body section 2, and is urged outwardly by a compression spring 136. The outer end of the plunger is normally disposed in the path of closing movement of the latch lug 97 on the latch member 95, as shown in Fig. 8, and is engaged by the latch and forced inwardly against the action of the spring into the position shown in Fig. 5 when the latch is closed.

A stop member 137 is secured to the plunger 135, and, when the latter is forced inwardly by closing of the latch 95, the stop member is disposed inwardly of the path of a locking finger 138 formed on the socket member 85. Thus, as shown most clearly in Figs. 5 and 7, when the shaft 35' is rocked in a counter-clockwise direction the locking finger swings downwardly alongside the stop member 137 and does not interfere with the movement of the slips into pipe-engaging position when the main latch 95 is closed. When the latch is open, however, the plunger 135 is forced outwardly by its spring 136 into the position shown in Fig. 8, in which position the stop member 137 is disposed directly beneath the locking finger 138. Upon release of the operating lever 87 by the operator, the unbalanced weight of the slips 10' and 11' tends to rotate the shaft 35' in a counterclockwise direction, but such rotation is prevented by engagement of the locking finger 138 with the upper surface of the stop member 137, as shown in Fig. 10. It will be understood that when the body sections are swung apart about the pivot 3, the sections 67 and 68 of the connecting rod 66 pivot about the pivot pin 69 into angularly related positions, and when this occurs it is impossible for the connecting rod to move lengthwise. Hence the slips would be locked in retracted position by the connecting rod when the body sections are separated, even in the absence of the locking finger 138 and the stop member 137. However, the latter elements function whenever the latch 95 is open, irrespective of whether the body sections are closed together or swung apart, and they relieve the connecting rod of bending stresses which would be imposed thereon if the hinged connecting rod were relied on as the sole means for maintaining the slips in retracted position.

As shown in Figs. 2, 4, 5 and 8, an upstanding guide rib 139 is formed on the rear wall of the body section 1 to provide a guide slot 139' for laterally guiding the connecting rod section 67 and for bracing the latter against any lateral bending stresses which may be set up in the connecting rod when the body sections are opened up about the pivot 3. A similar guide rib 139'' may also be formed on the body section 2, if desired, to guide and brace the connecting rod section 68.

As shown most clearly in Figs. 5 and 8, the rock shafts 35 and 35' and the connecting linkage 66 are housed in recesses in the body sections 1 and 2 and are enclosed by cover plates 140, 141 and 142 detachably secured to the body sections, as by cap screws. Lubricant openings are provided in the cover plates, as at 143, 144, 145, 146 and 147 (Fig. 8) to afford access to lubricant fittings 148, 149, 150, 151 and 152. It will be observed that the fitting 148, leading to the bearing of the connecting rod 67 on the eccentric 65, is offset from the eccentric axis of the bearing and is aligned with the axis of the shaft 35, and is thereby always in alignment with the opening 143 in the cover plate irrespective of the position of the eccentric. It will also be observed that the cover plate openings 145 and 146 are aligned with the fittings 150 and 151 on the links 40 when the latter are in their angularly disposed positions assumed when the slips are in retracted position. It will be understood that similar lubricant fittings and cover plate openings are also provided on the body section 2.

In order to aid in centering the pipe in the pipe passageway and to prevent the pipe collars from striking the upper surfaces of the slips as the pipe is lowered through the spider, semi-circular guide plates 155 and 156 are detachably secured to the upper surfaces of the body sections 1 and 2, as by cap screws 157. As most clearly shown in Figs. 6 and 9 the upper surface of each guide plate is beveled downwardly and inwardly at 158 to guide the pipe collars into the pipe opening. The inner periphery of the plates overhangs the serrated gripping surfaces of the

slips to prevent frictional contact of the pipe or its collars therewith as the pipe is lowered through the spider. If desired, the lower surface of the plates may also be bevelled upwardly and inwardly at 159 to avoid the possibility of a pipe collar catching on the plates in the event it became necessary to raise the pipe through the spider. It will be understood that slips of varying thicknesses may be substituted for the slips 10, 10', 11 and 11' to enable the spider to handle different sizes of casing, and it is contemplated that a pair of corresponding guide plates will be provided for each set of slips, having a bore of the proper size to overhang the inner faces of the slips.

Although I have illustrated and described in detail a preferred embodiment of the invention, it is to be understood that the invention is not limited to the specific detailed construction set forth herein, but is of the full scope of the appended claims.

I claim:

1. A well pipe gripping device comprising, in combination: a body having a pipe passageway therethrough; a pipe-gripping member mounted in the body for movement substantially radially of the pipe passageway into pipe-gripping and retracted positions, respectively; and means for actuating said pipe-gripping member between said positions, said means comprising an oscillatory member and mounting means on said body for supporting said oscillatory member for oscillation about an axis fixed with respect to said mounting means, said mounting means being positioned on said body with said axis extending at an oblique angle to the plane of movement of said pipe-gripping member, lever means mounted on said oscillatory member for oscillation therewith, and means operatively connecting said lever means to said pipe-gripping member.

2. In a well pipe gripping device, the combination of: a body having a pipe passageway therethrough; a pipe-gripping member mounted in the body and movable radially of said pipe passageway into pipe-gripping and retracted positions, respectively; means for moving said pipe-gripping member into the aforesaid positions, said means comprising an oscillatory member and mounting means in said body for supporting said oscillatory member for oscillation about an axis fixed with respect to said mounting means, said mounting means being positioned in said body with its said axis extending at an oblique angle to the direction of radial movement of said pipe-gripping member, a lever, means connecting said lever at one end to the pipe-gripping member, and means connecting the other end of said lever to said oscillatory member for oscillation therewith and for pivotal movement relative thereto about an axis transverse to said axis of oscillation.

3. In a well pipe gripping device, the combination of: a body having a pipe passageway therethrough; a pipe-gripping member mounted in the body and movable radially of said pipe passageway into pipe-gripping and retracted positions, respectively; and actuating means for said pipe-gripping member, said actuating means comprising: an oscillatory member and mounting means on said body for supporting said oscillatory member for oscillation about an axis fixed with respect to said mounting means, said mounting means being positioned in said body with its said axis extending at an oblique angle to the aforesaid direction of radial movement of the pipe-gripping member, and lever means operatively connecting the oscillatory member to the pipe-gripping member, said lever means having a universal pivotal connection at one end with the pipe-gripping member, and means connecting its other end to said oscillatory member for oscillation therewith and pivotal movement relative thereto about an axis transverse to said axis of said mounting means.

4. In a well pipe-gripping member, the combination of: a body having a pipe passageway therethrough; a plurality of groups of slips mounted in the body, each slip being movable radially of the pipe passageway into pipe-gripping and retracted positions, respectively; a rock shaft individual to each group of slips, mounting means in said body for supporting each rock shaft for rocking movement about an axis fixed with respect to said mounting means, the mounting means for each rock shaft being positioned in said body with its said axis extending at an oblique angle to the direction of radial movement of each of the slips associated therewith, and means operatively connecting the slips to their associated rock shaft.

5. A well pipe spider comprising a body having a pipe passageway extending vertically therethrough, said body comprising a pair of complementary sections having meeting faces lying substantially in a plane extending diametrically through the pipe passageway; a pair of pipe-gripping slips mounted in each body section, each of said slips being movable radially of the pipe passageway in a direction extending at an oblique angle to said diametric plane; and means for actuating said slips into pipe-gripping and retracted positions comprising a rock shaft for each body section, and mounting means on each body section for supporting the associated rock shaft for rocking movement about an axis fixed with respect to said mounting means, the mounting means on each body section being positioned thereon with its said axis extending substantially parallel to said diametric plane, and means operatively connecting each rock shaft to a pair of said slips.

6. In a well pipe spider, a body having a pipe passageway extending vertically therethrough, a pair of rock shafts on opposite sides of said pipe passageway and mounting means on said body for supporting said rock shafts for rocking movement about axes fixed with respect to said mounting means, said mounting means being positioned on said body with their axes parallel to each other, two pairs of pipe-gripping slips mounted in the body for movement in vertical planes extending at oblique angles to the said axes of said mounting means, and means operatively connecting each shaft with a pair of said slips.

7. In a well pipe spider of the type comprising a body having a pipe passageway therethrough and a plurality of segmental slips mounted therein for movement upwardly and outwardly into retracted positions and downwardly and inwardly into pipe-gripping positions: slip-actuating means comprising a rock shaft, and mounting means on said body for supporting said rock shaft for rocking movement about an axis fixed with respect to said mounting means, the latter being positioned on said body with its said axis extending at an oblique engle to the direction of movement of each of a pair of said slips; a pair of link elements interconnecting the said rock shaft with said slips, universal pivotal joint means connect-

ing one end of each link element with an associated slip, and means connecting the other end of each link element to said shaft for bodily movement therewith about said axis, and for pivotal movement relative thereto about an axis extending transversely of said first-mentioned axis.

8. In a well pipe spider, a body comprising a pair of pivotally interconnected sections, a pipe slip mounted in each section, slip-actuating means mounted in each section and operatively connected to the slip therein, and means interconnecting said slip-actuating means for simultaneous operation thereof, said interconnecting means extending through the axis of pivotal connection of said body sections and maintaining said slip-actuating means in predetermined operative relation in all relative pivotal positions of said body sections.

9. In a well pipe spider, a body comprising a pair of pivotally interconnected sections, a pipe slip mounted in each section, a rock shaft mounted in each section and operatively connected to the slip therein, and means interconnecting said shafts in predetermined operative relation, said interconnecting means extending through the axis of pivotal connection of said body sections and maintaining said predetermined operative relation between said shafts in all relative pivotal positions of said body sections.

10. A well pipe spider as set forth in claim 9, in which said interconnecting means comprises eccentrics on the adjacent ends of said shafts, and link means interconnecting said eccentrics and reciprocable in a plane extending through the axis of pivotal connection of said body sections.

11. A well pipe spider as set forth in claim 9, in which said interconnecting means comprises link means interconnecting said shafts, said link means comprising pivotally interconnected sections, the axis of pivotal connection of said link sections being adapted to coincide with the axis of pivotal connection of said body sections in one operative position of said shafts.

12. In a well pipe spider, a body comprising a pair of pivotally interconnecting sections, a pipe slip mounted in each section, a rock shaft mounted in each section, said shafts being mounted for oscillation about parallel axes and each shaft being operatively connected to a respective slip, means for oscillating one of said shafts, and an operative connection between said shafts whereby the other of said shafts is oscillated by said first shaft to actuate said slips in unison, said connection comprising an eccentric on the end of one shaft, an eccentric on the adjacent end of the other shaft, and a connecting rod attached to each eccentric, the adjacent ends of said connecting rods being pivotally interconnected on an axis normally extending parallel to the axis of pivotal connection of said body section and adapted to coincide therewith in one operative position of said shafts.

13. A well pipe spider comprising a pair of body sections having a pipe-receiving opening therebetween, said sections being pivotally interconnected at one side of said opening and adapted to be releasably latched together at the opposite side of said opening, slips mounted in said sections for movement into pipe-gripping and retracted positions, slip-actuating means on said body sections and operatively connected to said slips, a latch member releasably latching said sections together, manually releasable locking means for locking said latch member in latching position, and auxiliary locking means actuated by said slip-actuating means and having interlocking engagement with said latch member when the latter is in latching position for maintaining the latch member locked against opening movement while the slips are in pipe-gripping position.

14. A well pipe spider comprising a pair of pivotally interconnected body sections having a pipe receiving opening therebetween, slips mounted in said body sections for movement into pipe-gripping and retracted positions, a rock shaft mounted in one body section and having operative connection with said slips, manually operated means for oscillating said shaft to move said slips into the aforesaid positions, a latch member releasably latching said body sections together, and a locking member associated with said shaft and movable into interlocking engagement with said latch member upon oscillation of said shaft in a direction to move said slips into pipe-gripping position, said locking member being automatically movable out of interlocking engagement with said latch member upon oscillation of said shaft in a direction to move said slips into their retracted positions.

15. In a well pipe gripping member, the combination of a pair of pivotally interconnected body sections, latch means for releasably latching said body sections together, pipe slips mounted in said sections for movement into pipe-gripping and retracted positions, slip-actuating means mounted in each body section and operatively connected with the slips therein, means interconnecting the slip-actuating means for operation in unison and comprising link elements connected respectively to said slip-actuating means, said link elements being pivotally interconnected for relative pivotal movement about an axis which coincides with the pivotal axis of said body sections in one operative position of said slip-actuating means and which is offset from the last-named axis in all other operative positions of said slip-actuating means, and auxiliary locking means associated with said slip-actuating means and cooperating with said latch means for locking the latter against opening movement except when the pivotal axis of said link elements coincides with the pivotal axis of said body sections.

16. A well pipe support comprising a pair of pivotally interconnected body sections having a pipe passageway therebetween, slips mounted in the sections for movement into pipe-gripping and retracted positions and being normally urged toward pipe-gripping position, means interconnecting said slips for operation in unison, manually operated means associated with said interconnecting means for applying manual force to said slips in opposition to the force normally urging the latter into pipe-gripping position, a latch member releasably latching said body sections together, and locking means controlled by said latch member for positively locking said slips in retracted position when said latch member is released, said locking means being rendered inoperative by said latch member upon movement of the latter into latching position.

17. In a well pipe support, the combination of a body having a downwardly tapered pipe opening therethrough, at least one wall of said opening being formed to provide a plurality of vertically spaced tapered wedging surfaces thereon, there being vertically spaced recesses

in the body formed outwardly of the wedging surface and interposed vertically between said surfaces, a pipe slip mounted in the pipe opening and having a corresponding plurality of tapered wedging surfaces adapted to engage said wedging surfaces on the body in one position of the slip, the slip also having a corresponding plurality of recesses spaced inwardly of said wedging surfaces and adapted to receive the wedging surfaces on the body in another position of the slip, and interengaging means on at least one pair of cooperating wedging surfaces on the body and slip for maintaining said surfaces in engagement with each other in said first-named position of the slip, said interengaging means being rendered inoperative upon movement of the slip to said second-named position.

18. A well pipe support as set forth in claim 17, in which said interengaging means comprises an undercut recess in one of said wedging surfaces and a headed projection on the complementary engaging wedging surface, said projection being adapted to be disengaged from said undercut recess upon movement of the slip into said second-named position.

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