

Dec. 22, 1936.

C. A. LUNDEEN

2,065,140

SLIP ELEVATOR CONSTRUCTION

Filed Jan. 24, 1936

4 Sheets-Sheet 1

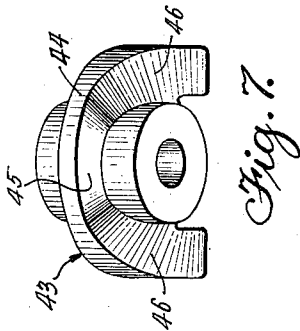


Fig. 7.

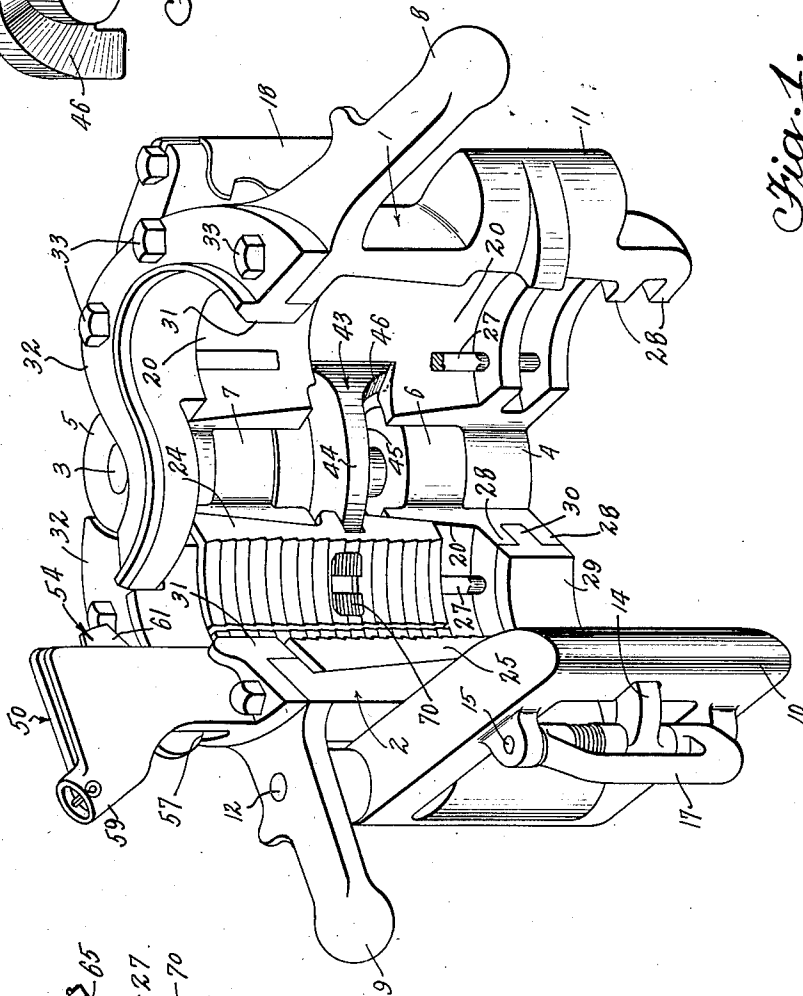
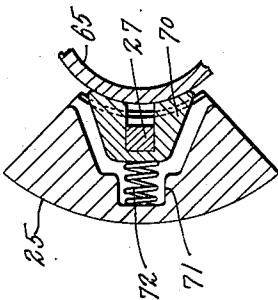


Fig. 1.

Fig. 10.



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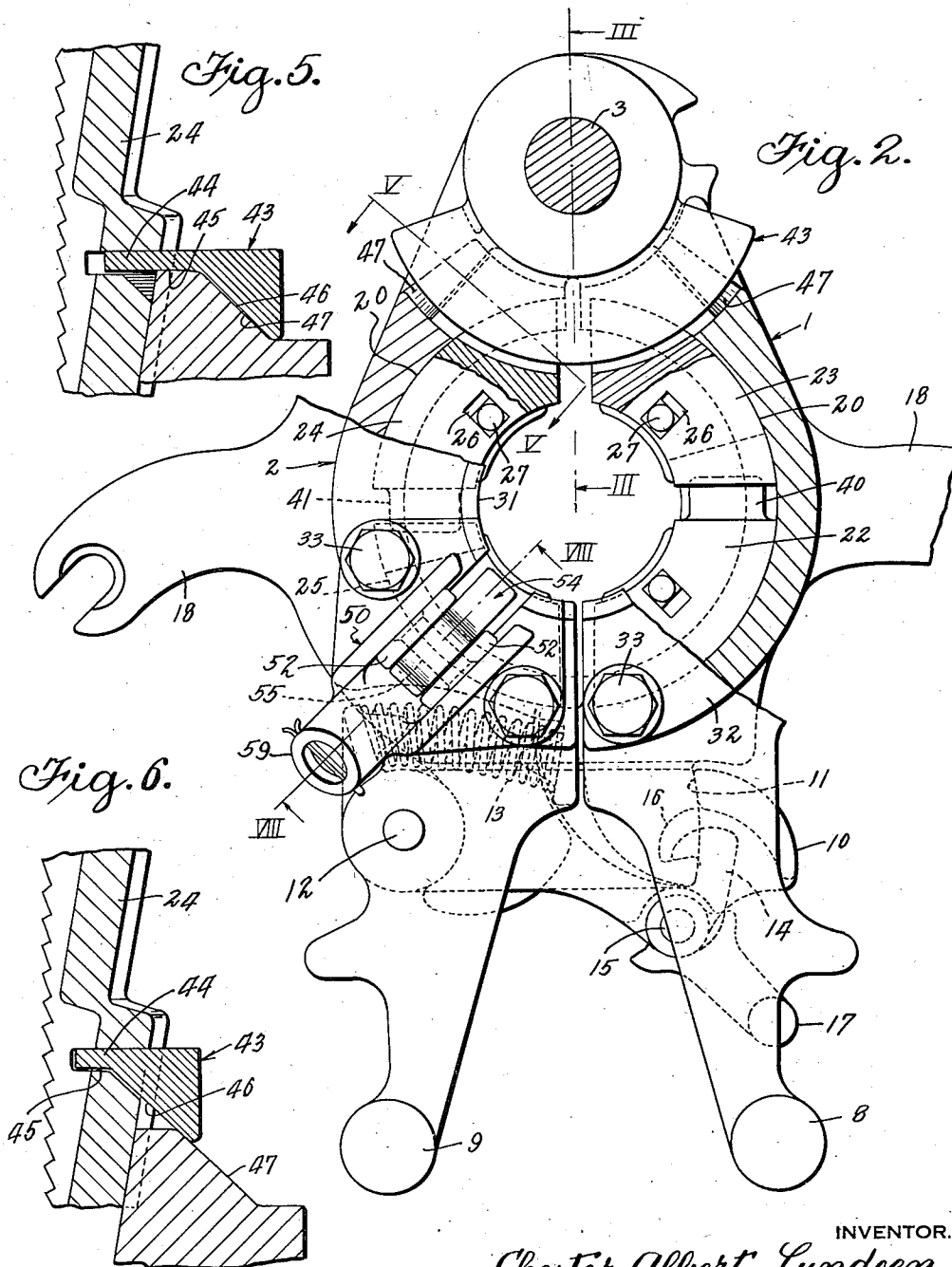
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

Fig. 4.

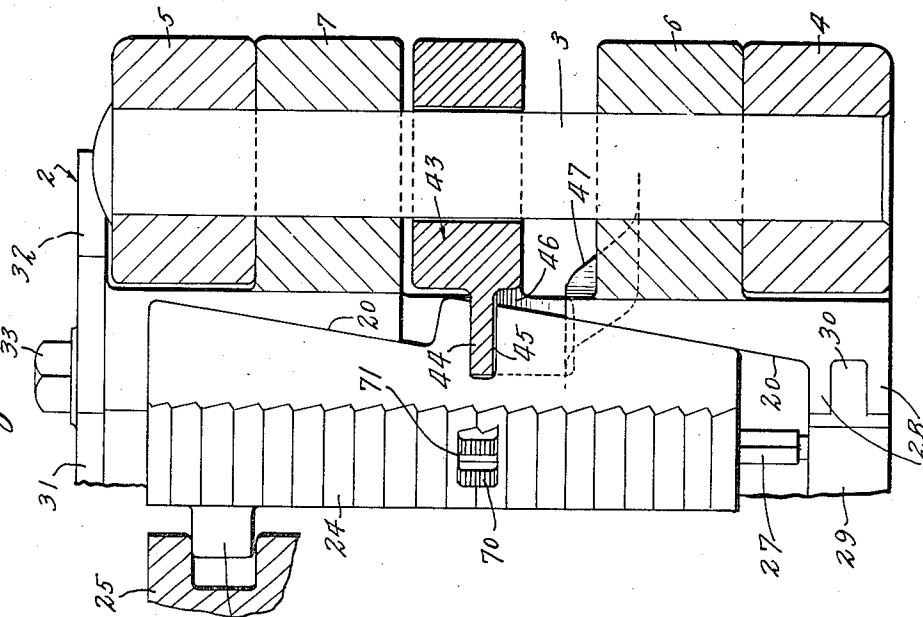
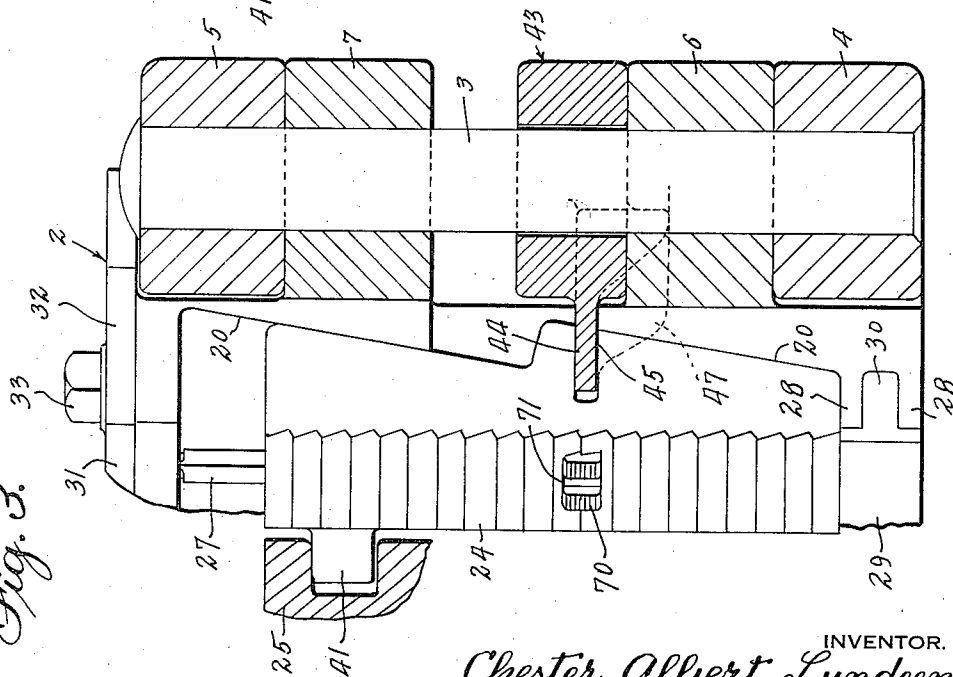


Fig. 3.



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4 Sheets-Sheet 4

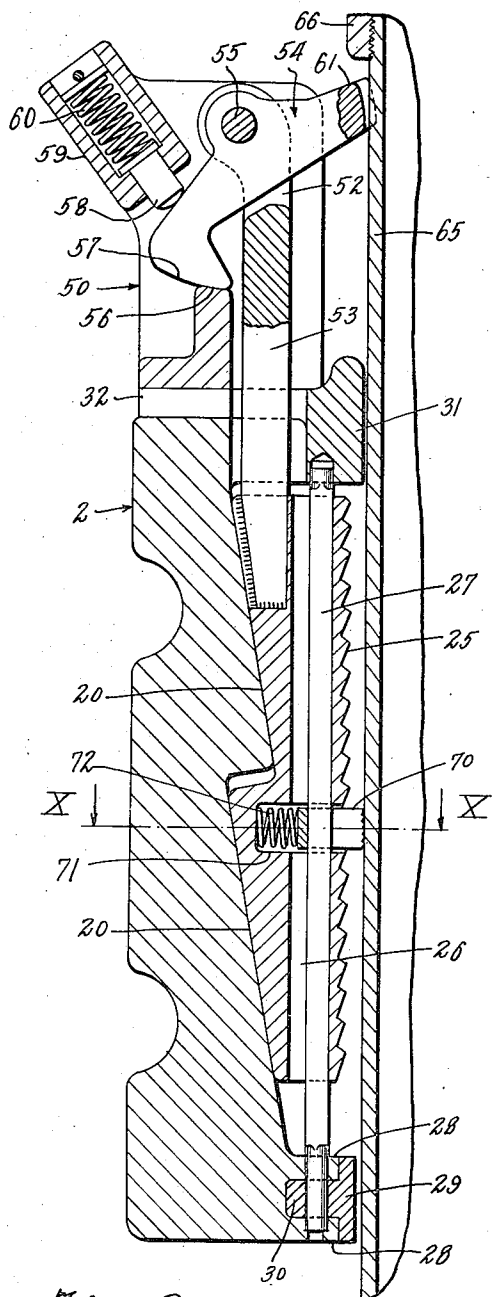


Fig. 8.

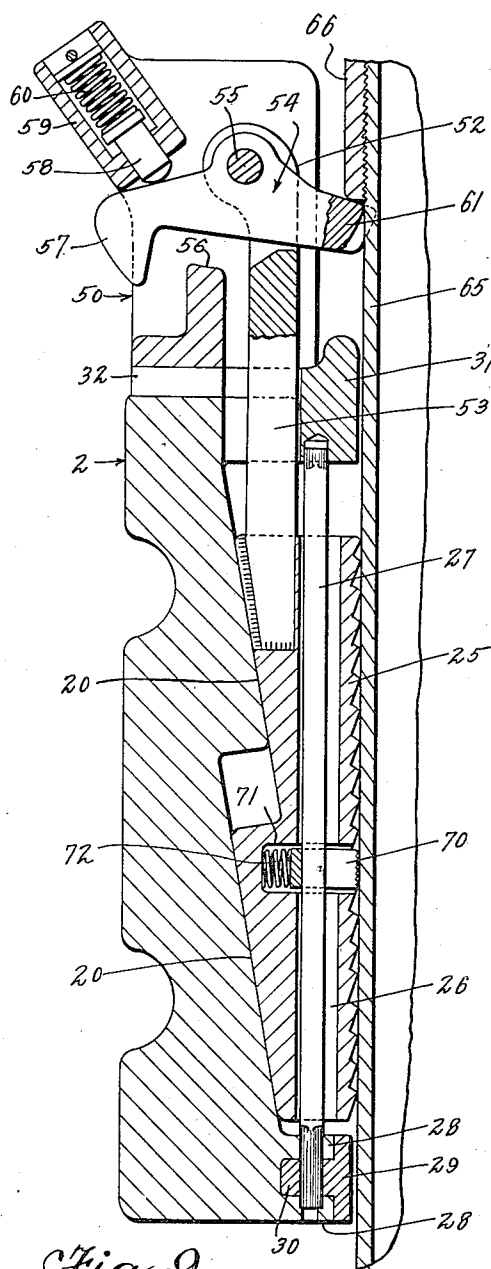


Fig. 9.

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SLIP ELEVATOR CONSTRUCTION

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Application January 24, 1936, Serial No. 60,603

11 Claims. (Cl. 24—263)

This invention relates to elevators for raising and lowering pipe, rods and the like in wells and particularly to slip type elevators which grip the pipe or rod instead of merely engaging the under side of a collar or coupling on the pipe.

An object of the invention is to provide a simple and effective construction of slip elevator whereby all the slips are automatically retracted in response to opening of the elevator, are retained in retracted position during and following closing movement of the elevator and later released at a desired time.

Another object is to effectively guide the slips on their seats without restricting free vertical movement of the slips along the seats.

Another object is to provide a particularly effective construction for maintaining the pipe gripping faces of a slip elevator out of contact with a pipe on which the elevator is mounted during adjusting movements of the elevator along the pipe prior to setting of the slips, thereby avoiding wear of the teeth on the faces of the slips.

Another object is to provide a particularly effective and simple tripping mechanism for releasably retaining the slips in retracted position until it is desired to set them, and which, when actuated, positively sets the slips.

Still another object is to provide a slip elevator assembly in which the slips and pipe-guiding bushings may be easily and rapidly changed to adapt the elevator for different sizes of pipe or to replace worn parts.

Other more specific objects and features of the invention will become apparent from the detailed description with reference to the drawings which follow.

Elevators of the general type to which this invention relates comprise a pair of hinged body members adapted, when in closed position, to encircle a pipe to be supported and adapted to swing apart to permit placing on or removal from a pipe. The body members have mounted therein pipe-engaging slips slidable on seats in the body members which are inclined inwardly at the bottom so that as the slips move downwardly therealong they are urged inwardly against the pipe. To facilitate operation, it is desirable that mechanism be employed for automatically lifting the slips out of pipe-engaging position in response to opening of the elevator and for retaining the slips in retracted position following closing of the elevator about another pipe and for then positively setting the slips

against the pipe after the body members have been closed and locked about the pipe.

In accordance with the present invention I employ, as a mechanism for elevating the slips in response to opening movement of the elevator, a floating cam on the hinge pin of the elevator, which cam has a flange engaging grooves on slips in the two members of the elevator and having cam surfaces adapted to bear against cooperating surfaces on the two body members. By virtue of the fact that the two slips have grooves engaging a flange on the cam, the slips and cam are constrained to move upwardly and downwardly together so that if one slip is supported in retracted position the slip on the other body member is likewise maintained in retracted position. The cam surfaces are so inclined with respect to the cooperating surfaces on the body members that opening movement of the body members applies lifting force to the cam at symmetrically spaced points thereon, thereby effecting a smooth positive lifting action.

Heretofore it has been common practice to slidably support the slips of a slip elevator against their seats by means of round pins extending longitudinally through cylindrical openings provided therefor in the slips. Because of the difficulty of positioning the pins exactly parallel to the path of movement of the slips along their seats, it has been the practice to make the pins of substantially smaller diameter than the holes in the slips through which they extended, thereby permitting sufficient lateral movement to prevent binding of the slips against their seats in any longitudinal position therealong.

In accordance with the present invention I insure free movement of the slips along their seats, without permitting excessive lateral or circumferential movement of the slips, by making the holes in the slips which receive the guide pins of rectangular cross section instead of round and making the openings considerably wider than the pins in the direction of a radius from the axis of the elevator so that the slips are not retained by their guide pins against movement normal to the slip face. However, the holes are made only slightly wider than the pins in the other direction so that there is little free movement of the slips circumferentially with respect to the axis of the elevator. In my construction it is desirable, although not necessary, to make the pins of rectangular cross section so that they expose a substantial bearing surface to the side walls of the holes for receiving them, thereby preventing ex-

cessive play from developing quickly as a result of wear.

In all slip type elevators in which the slips are mounted loosely upon retaining pins as described, it is desirable to provide spring means on the slip adapted to contact the pipe and maintain the slip teeth out of contact with the pipe until the slips are positively seated against the pipe, the springs being compressed out of the way when the slips are seated. In accordance with the present invention, I provide a particularly effective mechanism for resiliently retaining the slips against their seat, which mechanism consists of a detent on each slip, the outer end of which is urged away from the face of the slip by a helical spring positioned back of the detent. The exposed surface of the detent is relatively small and its operation is not readily interfered with by deposits of paraffin and the like.

The specific manner in which the objects of the invention are obtained will now be described with reference to the drawings, in which

Fig. 1 is a perspective view of an elevator in accordance with the invention, the elevator being shown in open position with the slips removed from one side to better illustrate the cam construction for lifting the slips;

Fig. 2 is a view of the elevator in closed position shown partly in plan and partly in section, the section being taken just above the cam ring;

Fig. 3 is a detail vertical sectional view with the elevator in closed position, the section being taken in the plane III—III of Fig. 2;

Fig. 4 is a view similar to that of Fig. 3 but with the elevator in open position (in which position the cam ring is raised);

Fig. 5 is a detail sectional view taken in the plane V—V of Fig. 2 with the parts shown in the position they occupy when the elevator is in closed position;

Fig. 6 is a similar view of Fig. 5, showing the parts in the positions they occupy when the elevator is in open position;

Fig. 7 is a perspective view of the cam ring looking at it from the under side;

Fig. 8 is a detail vertical sectional view showing the construction of the latch for retaining the slips in retracted position, the view being taken in the plane VIII—VIII of Fig. 2, and the slip being shown in retracted position;

Fig. 9 is a view similar to Fig. 8 showing the slips set against the pipe; and

Fig. 10 is a detail cross sectional view taken in the plane X—X of Fig. 8, showing the construction of the spring detent for resiliently urging each slip away from a pipe in the elevator.

The drawings disclose a slip elevator of center latch construction embodying my invention. Referring to Fig. 1, the elevator shown comprises a pair of body members 1 and 2, respectively, hingedly connected together at one end by a hinge pin 3. Thus the body member 1 is provided with hinge lugs or eyes 4 and 5 and the body member 2 is provided with hinge eyes 6 and 7 through which the hinge pin 3 extends. To facilitate opening and closing of the elevator, the handle 8 is provided on the body member 1 and a handle 9 is provided on the body member 2. To releasably retain the members 1 and 2 in closed position about a pipe, a latch 10 is provided on the member 2 which hooks over a shoulder 11 on the body member 1. The construction of the locking mechanism does not constitute a part of the present invention and there-

fore need not be described in detail. Suffice it to say that the latch 10 is hingedly mounted upon the outer end of the body member 2 by a pin 12 and is constantly urged into latching position by a compressed helical spring 13 (Fig. 2). When once closed the latch pin is maintained in closed position by an auxiliary latch 14 pivotally secured thereto by a pin 15, the end of the auxiliary latch 14 snapping into a recess 16 in the shoulder 11 when latch 10 is in closed position. A handle 17 on the auxiliary latch 14 permits ready release of the auxiliary latch and opening of the main latch. Thus by pulling on the handle 17 the auxiliary latch is simultaneously released and the main latch pulled clear of the shoulder 11.

In accordance with accepted practice, the elevator is adapted to be supported by a pair of links engaging trunnions 18 extending outwardly from the body members 1 and 2, respectively. The particular construction of the trunnions does not constitute a part of the present invention and will therefore not be described in detail.

Each of the body members 1 and 2 is provided with inwardly and downwardly inclined conical slip seats 20 against which two slips are slidably supported. Thus the member 1 carries two slips 22 and 23, respectively, and the member 2 carries two slips 24 and 25, respectively. As shown in Figs. 1, 8, and 9, the slip seats 20 are stepped to provide the desired inward taper without necessitating the use of slips which would be excessively thin at the lower end. The slips, of course, are correspondingly tapered to fit against the slip seats.

To retain the slips in proper position against their slip seats, each slip is provided with a passage 26 extending longitudinally therethrough a short distance back of the face of the slip. The passage 26 is rectangular in cross section and is of larger dimension in the direction of the thickness of the slip than in the direction of the width of the slip, the lateral walls of the passage constituting parallel guide walls which bear against the lateral faces of a square guide pin 27 which is anchored at opposite ends to the body member. The pin 27 as shown in the drawings is square in cross section and is dimensioned to fit snugly between the side walls of the passage 26 but loosely between the inner and outer walls, thereby permitting a limited amount of free movement of the slip toward and away from its seat while preventing any appreciable lateral movement of the slip. It is not essential that the pin 27 be square. It may be round or it may be oblong in cross section but I prefer to provide flat faces on the pin for engaging the parallel side walls of the passage 26 to increase the bearing area and reduce wear.

In the embodiment shown the pins 27 are provided with cylindrical ends for engaging the anchoring structure. The anchoring structure at the lower end of each pin 27 consists of a grooved flange 28 extending inwardly from the associated body member (body member 2 in Fig. 8), the flange being drilled to receive the lower end of the pin. However, the drilled hole of the dimensions of the pin does not extend clear through the flange 28, thereby preventing escape of the pin downwardly below the body member. In the construction shown, the lower end of each pin also functions to retain a pipe-contacting bushing 29 on the associated body member, the bushings 29 having outwardly extending flanges 30 thereon which fit into the annular grooves in the flanges 28 on the body members and have 75

apertures drilled therethrough to snugly receive the lower end of the pin 27. The upper ends of the pins 27 are anchored to their associated body members by pipe-contacting bushings 31, which bushings have outwardly extending flanges 32 thereon, each of which rests on the upper edges of its associated body member and is secured thereto by screws 33.

In assembling the elevator each pin 27 is first placed in the passage 26 in its associated slip and then the lower end of the pin seated in its proper aperture in the lower flange 28 on the associated body member. The upper pipe-contacting bushing 31 is then placed on that body member, the upper ends of the pins 27 being guided into their apertures in the bushing 31 at the same time.

The construction described has several important advantages. One advantage is that by seating the upper ends of the pins 27 in holes in the removable bushing 31 instead of in a flange on the body member itself the drilling of the holes for receiving the ends of the guide pins is greatly simplified. Another advantage is that no special locking means for securing the pins 27 is required. Another advantage is that the replacement of the slips and pipe-contacting bushings is simplified, the removal of the upper pipe-contacting bushings 31 permitting the removal of the pins 27 from their seats in the flange 28 and the removal of the pins in turn permitting the removal of the lower pipe-contacting bushings 29.

The two slips on each body member 1 and 2, respectively, are linked together for simultaneous upward and downward movement along their seats. Thus referring to Fig. 2 the slip 22 is provided on one edge with a tongue 40 which engages a recess provided therefor in the adjacent edge of the slip 23. Likewise the slip 24 is provided with a tongue 41 in one edge thereof which engages a recess in the adjacent edge of slip 25. Therefore, if either one of the slips on either body member is supported in retracted position the other slip on that body member will be also retained in retracted position.

To link the slips in the opposite body members together for simultaneous upward and downward movement and to lift the slips into retracted position in response to opening movement of the body members, a floating cam 43 is provided on the hinge pin 3 between the hinge eyes 6 and 7 on body member 2, these hinge eyes being spaced sufficiently far apart to permit a certain amount of free vertical movement of the cam member 43 on the hinge pin. Cam 43 has a flange 44 thereon which is substantially flat on its entire upper face but is shaped to define on its lower face a central flat surface 45 merging into downwardly extending surfaces 46 at each end thereof. The flange 44 extends into the adjacent corners of the slips 23 and 24, respectively, and each slip is recessed to receive the central portion of the flange coextensive with the flat surface 45, the cam recesses being only sufficiently wider than the narrow central part of the flange 44 to permit free sliding movement therealong. The slips 23 and 24 are therefore constrained to move vertically with each other and with the cam 43 and since the slip 25 is linked to slip 24 and the slip 23 it will be seen that all of the slips are constrained to move vertically in unison.

To elevate the cam 43 (and therefore elevate the slips connected thereto) the recesses in the body members 1 and 2 which are provided back of the

slips 23 and 24, respectively, to receive the flange 44 are shaped to bear against the inclined surfaces 46 on the cam and force the latter upwardly when the elevator is open. Thus the surface on the body member 1, which cooperates with the adjacent cam surface 46 on the cam 43, is shown at 47 in Figs. 5 and 6. In Fig. 5, which shows the mechanism with the elevator in closed position, it will be observed that the cam surface 46 rests flat against the cooperating surface 47 on the body member, the cam 43 being in lowermost position. In Fig. 6, however, the surface 47 has been rotated about the hinge pin whereas the cam 43 has not been subjected to rotation. Therefore, the cam surface 46 has been forced to ride up along and off of the surface 47, this movement lifting the cam 43 and the slips. It will be observed in Figs. 5 and 6 that one edge of the recess in the slip which is engaged by the flange 44 of the cam 43 has been cut away to permit additional movement of the cam 43 with respect to the slip. However, this cut does not extend clear across the width of the slip so that there is no appreciable amount of play in a vertical direction between the slip and the cam. The operation of the cam 43 in lifting the slips is also illustrated in the views of Figs. 3 and 4, Fig. 3 showing the structure with the elevator in closed position and the slips in lowermost or set position, and Fig. 4 showing the elevator open and the slips in elevated or retracted position. It will be observed from Fig. 7 that the cam 43 is symmetrical and acts alike on each of the body members 1 and 2 so that the rotating forces applied to the cam by the two body members as they open or close are equal and opposite in effect.

Following opening movement of the elevator which lifts the slips in the manner described, when the elevator is again closed the inclined surfaces 47 on the body members would permit the cam 43 and the slips to again drop into lowermost position if no means were provided for maintaining them in uppermost position. However, I provide a latch on the body member 2 for retaining the slip 25 in uppermost position. Slip 25 in turn supports slip 24 in uppermost position, and slip 24 supports the cam 43 in uppermost position despite closing movement of the elevator. The cam 43, of course, in turn supports the slip 23 in uppermost position and the latter in turn supports slip 22.

The latch for retaining the slips in uppermost position comprises a housing member 50 formed integrally with the pipe-contacting bushing 31 on the top of body member 2, this housing member having a slot extending therethrough in which there is slidably mounted the bifurcated upper end 52 (Fig. 2) of a link 53 which is secured to the upper end of slip 25. If desired, the link 53 may be formed integrally with the slip 25 but as shown in Fig. 8 the link has been made separately and then welded into a recess provided therefor in the slip. The bifurcated upper end 52 of link 53 straddles a latch 54 which is rotatably connected to the end 52 by a pin 55.

It will be observed from Fig. 8 that the upper end 52 of the link 53 is curved outwardly so that the axis of the pin 55 is positioned almost directly above a shoulder 56 on the housing 50 and one end 57 of the latch 54 is curved to slip over and rest against the shoulder 56 when the latch is rotated into the position shown in Fig. 8 and the slip 25 is in retracted position on its seat. The lever 54 is urged into the position shown in Fig. 8 by a detent 58 slidably supported in a housing 59

and urged outwardly by a helical spring 60. The end 61 of the latch 54 opposite to the end 57 extends inwardly toward the center axis of a pipe positioned in the elevator as shown in Fig. 2 and is of such length as to closely approach a pipe encircled by the elevator. The end 61 is also preferably convexly curved in a vertical direction, as shown in Fig. 8, to permit it to rotate about the pin 55 without binding against the surface of a pipe and is concavely curved horizontally to expose a substantial surface in close proximity to the pipe.

The latch structure described is adapted to be tripped automatically by moving the elevator, after it has been locked about a pipe, upwardly along the pipe until the end 61 of the latch 54 contacts the collar on the upper end of the pipe. For illustrative purposes a pipe 65 having a collar 66 on the upper end thereof has been shown in Figs. 8 and 9. In Fig. 8 it will be observed that the end 61 of the lever 54 is approaching the collar 66 on the pipe. As the movement is continued, the end 61 of the latch is engaged by the collar 66 and rotated in a clockwise direction about the pin 55. Initial movement carries the end 57 of the latch away from the shoulder 56, compressing the detent 58.

Once the end 57 of the latch slips off the shoulder 56, the weight of the slips and the link 53 carries the slip and link downwardly. If the elevator is clean, the weight of the slips alone is sufficient to carry them into engagement with the pipe whereupon they will automatically wedge against the pipe and seize it firmly. However, in some wells where there is a large amount of paraffin, pipes being elevated out of the well may be thickly coated with the paraffin and transfer it to the elevator, filling all the space within the elevator and restraining free movement of the slips. Under such conditions the slips may not drop into gripping position by their own weight. However, as the elevator continues to move upwardly along the pipe the collar 66 thereon will continue to force the end 61 of the latch 54 downwardly. At first the latch rotates about the pivot 55 but after the end 57 has been released from the shoulder 56 the end 57 of the latch then bears against the rigid housing 59 of the detent 58 preventing further upward movement of the end 57. Thereafter further downward movement of the end 61 by the pipe collar 66 carries the link 53 and the slip 25 positively downward until the slip engages the pipe. This condition is shown in Fig. 9. However, after the slip once engages the pipe and begins to bite into it, it is then carried further downwardly along its seat into full seating position by friction with the pipe itself. This final downward movement of the slip, of course, carries the link 53 downward and in turn carries the latch 54 clear of the pipe collar 66 so that when the elevator is fully set no weight of the pipe is resting upon the latch 54. This is important because the strength of the latch 54 is not sufficient to support any appreciable weight and if the whole weight of the pipe were applied to the elevator through the pipe coupling 66 and the lever 54 the latter would probably be broken.

When the elevator is opened to disengage it from the pipe the separating movement of the body members 1 and 2 lifts the slips in a manner previously described and as the slip 25 is lifted the link 53 carries the latch 54 upwardly. At the same time the latch is urged to rotate in a counter-clockwise direction by the spring detent

58 so that when the slip rises into full uppermost position the end 57 of the latch 54 is rotated into engagement with the shoulder 58. Thereafter when the elevator is closed the slip 25 is retained in uppermost position by the latch 54 and slip 25 in turn retains the other slips in retracted position in the manner previously described.

As previously stated, it is desirable, in order to insure free movement of the slips upwardly and downwardly along their seats, to provide some radial play between the slips and their supporting pins 27. However, this play may be sufficient in some instances to permit the slips to float away from their seats, when in retracted position, far enough to engage a pipe encircled by the elevator while the elevator is being moved upwardly or downwardly along the pipe. Such contact of the slips with a pipe is damaging to the teeth on the slips. If the slip teeth become dulled they may fail to properly grip a pipe when the elevator is set. It is desirable, therefore, to provide means for normally retaining the slips against their seats when in retracted position. To this end, I provide a spring actuated plunger 70 in each slip, recesses being provided in the slips to receive the plungers and the springs for urging them outwardly.

As shown in Fig. 8, the recess 71 extends backwardly some distance from the passage 29 in the thicker part of the slip to provide room for a spring 72 which urges the plunger 70 outwardly. Each plunger 70 is bifurcated, as shown to best advantage in Fig. 10, and straddles the slip pin 27 so that the latter functions as a lateral guide for the plunger 70. The plunger, however, is restrained from vertical movement by contact against the walls of the recess 71 in the slip provided therefor.

When the slips are in uppermost position as shown in Fig. 8, the plungers 70 are projected inwardly beyond the faces of the slips by the springs 72, thereby urging the slips back against their seats 20 in which position they are clear of the pipe 65. Thus it will be observed that relative radial movement between the pipe and elevator is limited by the pipe-contacting bushings 29 and 31. However, when the slips are released they drop into position against the pipe, as shown in Fig. 9, and the plungers 70 move back into the slips, compressing the springs 72, the tension of the springs being insufficient to prevent setting of the slips. As a matter of fact, the elevator is moving upwardly along the pipe at the time the slips are released and the friction of the plungers 70 against the pipe aids in setting the slips against the pipe. However, should the elevator be moved downwardly along a pipe while the slips are released, the friction of the plungers 70 against the pipe carries the slips upwardly along their seats out of engagement with the pipe, thereby preventing unnecessary wear on the slip teeth.

By employing springs 72 of different stiffness, two different modes of operation may be had. Thus assume that the elevator has been locked about a pipe, moved up against a collar on the upper end of the pipe thereby actuating the latch 54 to set the slips, and then moved down along the pipe. If the springs 72 are stiff enough, the friction between the pipe and the plunger 70 will carry the slips into full retracted position and will be locked up, so that the pipe will not be gripped until the latch 54 is again tripped. On the other hand, the stiffness of the springs 72

may be made such that the plunger 70 will not contact the pipe with sufficient friction to carry the slips completely into retracted position in response to downward movement of the elevator along the pipe, and the slips will then set immediately in response to the first upward movement of the elevator along the pipe.

Although for purposes of illustration my invention has been described as incorporated in a center latch type elevator of particular construction, it is to be understood that the various features of the invention may be employed in other types of elevators than that particularly shown in the drawing and the invention is to be limited only as set forth in the appended claims.

I claim:

1. A slip elevator of the type described comprising a pair of pipe-encircling body members, means including a hinge pin for hingedly connecting said members for relative swinging movement into closed and open positions, inwardly and downwardly inclined slip seats on said members, slips slidably supported on said slip seats for downward movement therealong into pipe-engaging position and upward movement into retracted position, a slip actuating member slidably mounted on said hinge pin for vertical movement therealong, said member engaging a slip on each of said body members whereby said slip actuating member and slips are constrained to move upwardly and downwardly in unison, said slip actuating member having an inclined cam surface thereon, means on one of said body members defining a cam follower adapted to ride over said cam surface in response to opening movement of said body members, said cam surface being so inclined as to raise said slip actuating member in response to opening movement of said body members, and means on the other of said body members for resisting rotation of said cam means about said hinge pin in response to friction between said cam surface and cam follower.

2. A slip elevator as described in claim 1, with latch means for releasably retaining one of said slips in retracted position following elevation of that slip into retracted position, said slip actuated member functioning to support the slip on the other member from the said one slip while the latter is supported by said latch means.

3. A slip elevator of the type described comprising a pair of pipe-encircling body members, means including a hinge pin for hingedly connecting said members for relative swinging movement into closed and open positions, inwardly and downwardly inclined slip seats on said members, slips slidably supported on said slip seats for downward movement therealong into pipe-engaging position and upward movement into retracted position, a slip actuating member slidably mounted on said hinge pin for vertical movement therealong, said member engaging a slip on each of said body members whereby said slip actuating member and slips are constrained to move upwardly and downwardly in unison, said slip actuating member having a pair of inclined cam surfaces thereon, means on one of said body members defining a cam follower adapted to ride over one of said cam surfaces in response to opening movement of said body members, means on the other body member defining a cam follower adapted to ride over the other cam surface on said slip actuating member in response to opening movement of said body members, said cam surfaces being so inclined as to

raise said slip actuating member in response to opening movement of said body members.

4. A slip elevator of the type described comprising a pair of pipe-encircling body members, means including a hinge pin for hingedly connecting said members for relative swinging movement into closed and open positions, inwardly and downwardly inclined slip seats on said members, slips slidably supported on said slip seats for downward movement therealong into pipe-engaging position and upward movement into retracted position, a slip actuating member slidably mounted on said hinge pin for vertical movement therealong, said member engaging a slip on each of said body members whereby upward movement of said slip actuating member lifts said slips, said slip actuating member having an inclined cam surface thereon, means on one of said body members defining a cam follower adapted to ride over said cam surface in response to opening movement of said body members, said cam surface being so inclined as to raise said slip actuating member in response to opening movement of said body members, and means on the other of said body members for resisting rotation of said cam means about said hinge pin in response to friction between said cam surface and cam follower.

5. A slip elevator of the type described comprising a pair of pipe-encircling body members with means for releasably securing them in locked relation about a pipe, slip seats on said members inclined inwardly and downwardly, slips on said seats movable thereon from lower pipe-engaging positions into upper retracted positions, each of said slips having a passage extending longitudinally therethrough, pin means anchored in said body members extending through the passages in the slips in sliding relation thereto for guiding said slips along their seats, said pins fitting relatively close to the side walls of said passages to prevent lateral displacement of the slips on their seats and fitting loosely against the inner and outer walls of said passage whereby the slip is always freely slidable along its seat.

6. A slip elevator as described in claim 5 in which said passages in said slips are of rectangular cross section and in which said pins are of rectangular cross section whereby the lateral bearing surfaces between said pins and the side walls of said passages are of substantial area.

7. A slip elevator of the type described comprising a pair of pipe-encircling body members with means for releasably securing them in locked relation about a pipe, slip seats on said members inclined inwardly and downwardly, slips on said seats movable thereon from lower pipe-engaging positions into upper retracted positions, each of said slips having a passage extending longitudinally therethrough, guide pins extending through the passages in the slips for guiding the slips for longitudinal movement along their seats, said body members having inwardly extending apertured flanges below the slip seats thereon for receiving and supporting the lower ends of said guide pins, and means for anchoring the upper ends of said guide pins to said body members comprising bushings detachably secured to the top of said body members, said bushings extending inwardly from the body members and having cylindrical inner surfaces dimensioned to fit loosely about a pipe enclosed in the elevator and guide the elevator for movement along the pipe, said bushings having recesses in the under sides of their inwardly extending por-

tions for receiving and supporting the upper ends of said guide pins.

8. A slip elevator of the type described comprising a pair of pipe-encircling body members with means for releasably securing them in locked relation about a pipe, slip seats in said members inclined inwardly and downwardly, slips on said seats movable upwardly and downwardly therealong, each slip being provided with a recess in its pipe-engaging face and a pipe-contacting member for each slip mounted in the recess therein, said pipe-contacting members being retractable into said recesses to permit engagement of the slip faces with a pipe, and spring means interposed between each slip and the pipe-contacting member associated therewith for urging the latter away from the slip face, and cooperating guide surfaces on said slips and pipe-contacting members, respectively, for limiting relative motion therebetween to a radial direction with respect to the axis of the elevator.

9. A slip elevator of the type described comprising a pair of pipe-encircling body members with means for releasably securing them in locked relation about a pipe, slip seats in said members inclined inwardly and downwardly, slips on said seats movable upwardly and downwardly therealong, each slip having a longitudinal passage therethrough, guide pins anchored in said body members and extending through said longitudinal passages in said slips for limiting said slips to longitudinal movement along their seats, each slip also having a recess extending rearwardly therein from the face of the slip, each recess intercepting the longitudinal passage in that slip, a pipe-contacting member for each slip and retractable into the recess in that slip in response to movement of the slip against a pipe, helical spring means interposed between each slip and its pipe-contacting member for urging the latter away from the slip face, guide surfaces on said slip above and below said pipe-contacting member for restraining the latter against vertical movement with respect to its associated slip, each pipe-contacting member being bifurcated and straddling the guide pin associated with the slip, said guide pin limiting lateral motion of said pipe-contacting member with respect to said slip.

10. A slip elevator of the type described comprising a pair of hinged pipe-encircling members movable into closed and open positions, and means for locking said members in closed

position, the inner surfaces of said members having inwardly and downwardly inclined slip seats thereon, slips slidably supported on said seats for downward movement therealong into pipe-engaging position and upward movement therealong out of pipe-engaging position, and latch means mounted on one of said slips and cooperating with the member on which that slip is mounted for releasably retaining said slip in uppermost position, said latch means comprising a link secured to and extending upwardly from one of said slips, a lever member fulcrumed upon the upper end of said link for oscillation about its fulcrum between a first and a second position, said lever member comprising a pair of arms, one of which extends from the fulcrum inwardly toward the surface of a pipe engaged in the elevator into position to be engaged by a projection on the pipe when the elevator is moved up along the pipe to the projection, the other arm extending downwardly and outwardly from said fulcrum and having a contact face thereon positioned substantially below said fulcrum when said lever is in said first position, stationary means on one of said elevator members for engaging said contact face of said lever and supporting said lever member and the slip connected thereto in uppermost position when said lever member is in said first position, and a spring detent supported on said one elevator member and bearing against said other arm of said lever member for resiliently urging said lever into said first position while permitting oscillation of said lever into said second position in response to downward force applied to said one arm thereof by a projection on a pipe encircled by the elevator, said lever means being so mounted that oscillation of said lever from said first into said second position carries said contact face out of engagement with said stationary means whereby said slip is released to move downwardly along its seat into pipe-engaging position.

11. A slip elevator as described in claim 10 in which stationary stop means is provided adjacent said spring detent for engaging said other arm portion of said lever and positively preventing further upward and outward movement of said arm when the detent is fully depressed whereby continued downward movement of said one arm of the lever forces the fulcrum of the lever and the slip link connected thereto downwardly to positively set the slip.

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