Nov. 23, 1954 J. L. CHRISMAN ET AL 2,695,189

WELL PIPE ELEVATOR

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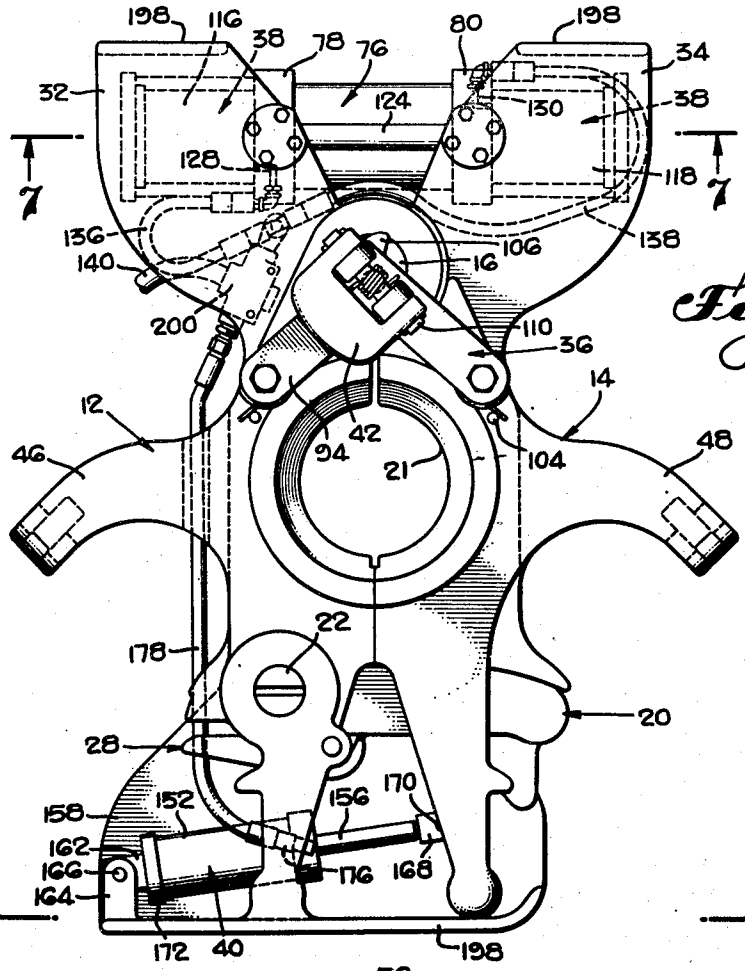


Fig. 1.

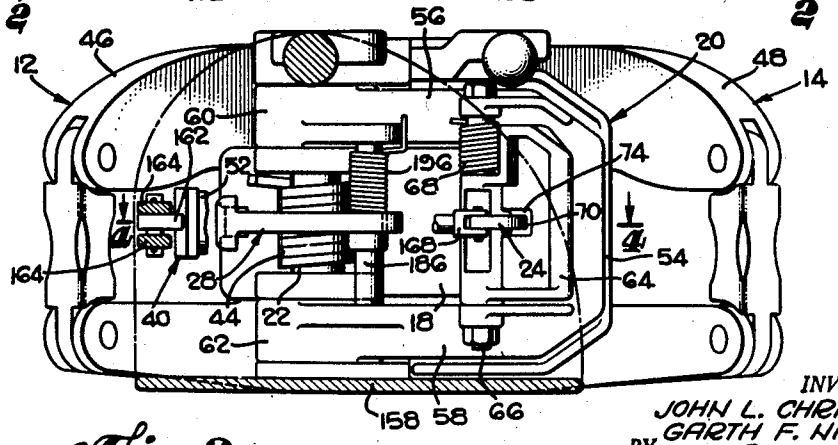


Fig. 2.

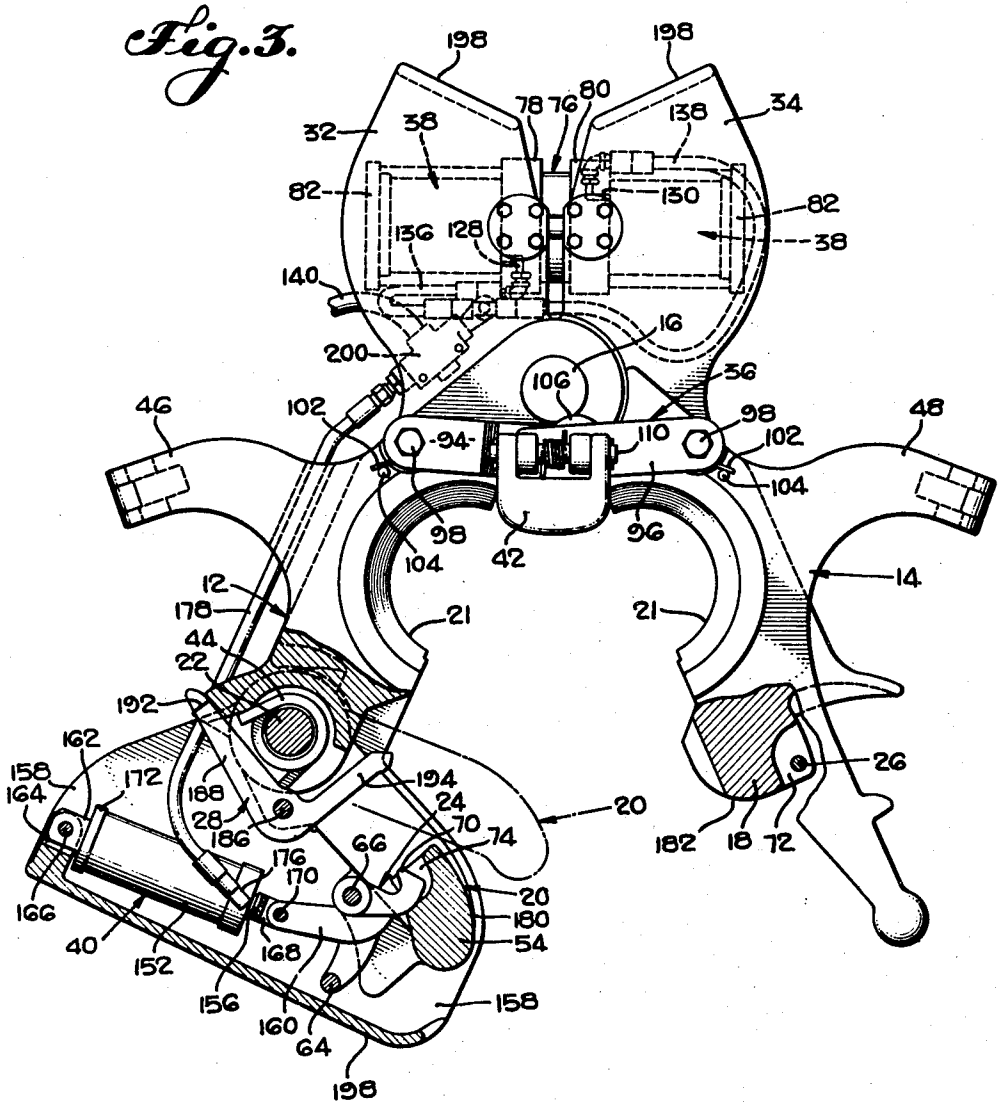
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WELL PIPE ELEVATOR

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Fig. 3.



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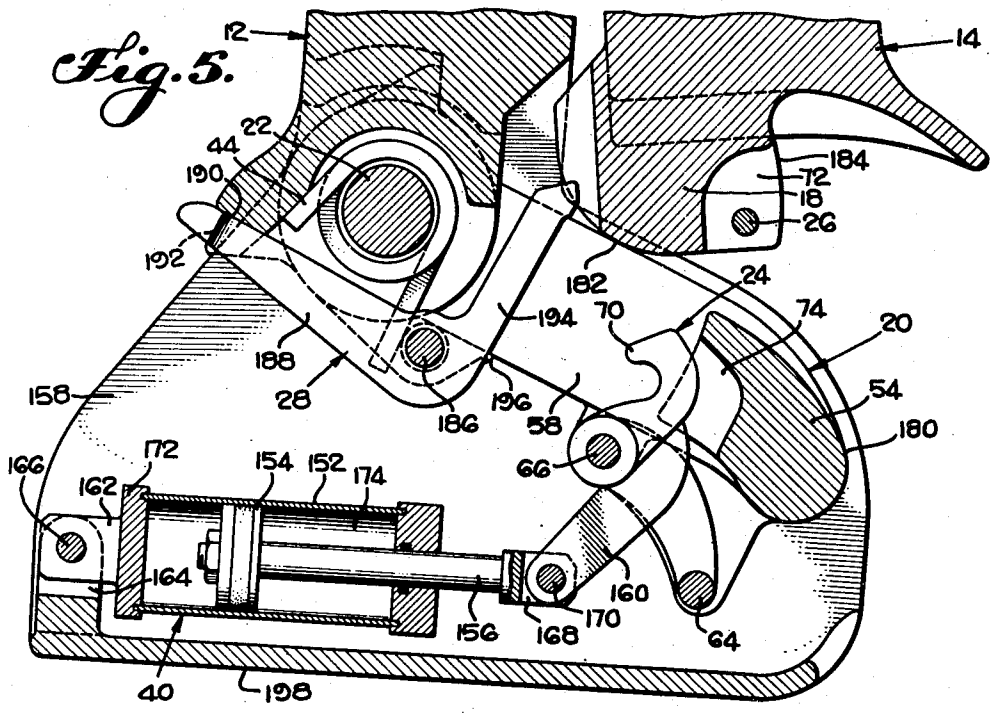
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WELL PIPE ELEVATOR

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Fig. 5.



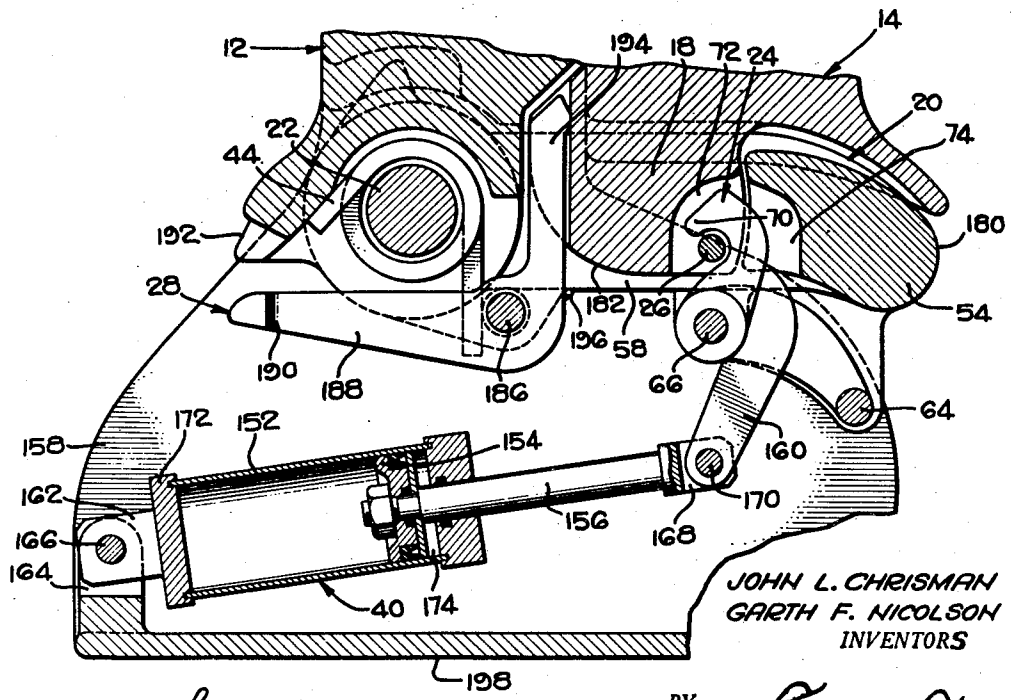


Fig. 4.

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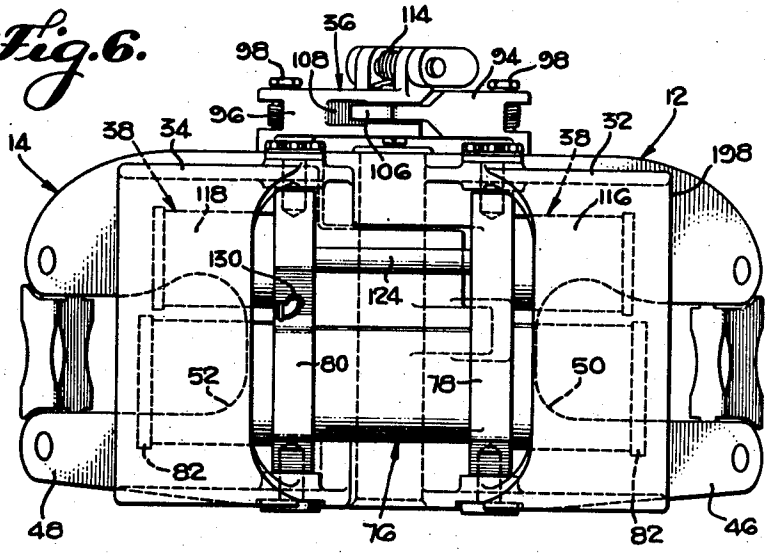
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Fig. 6.



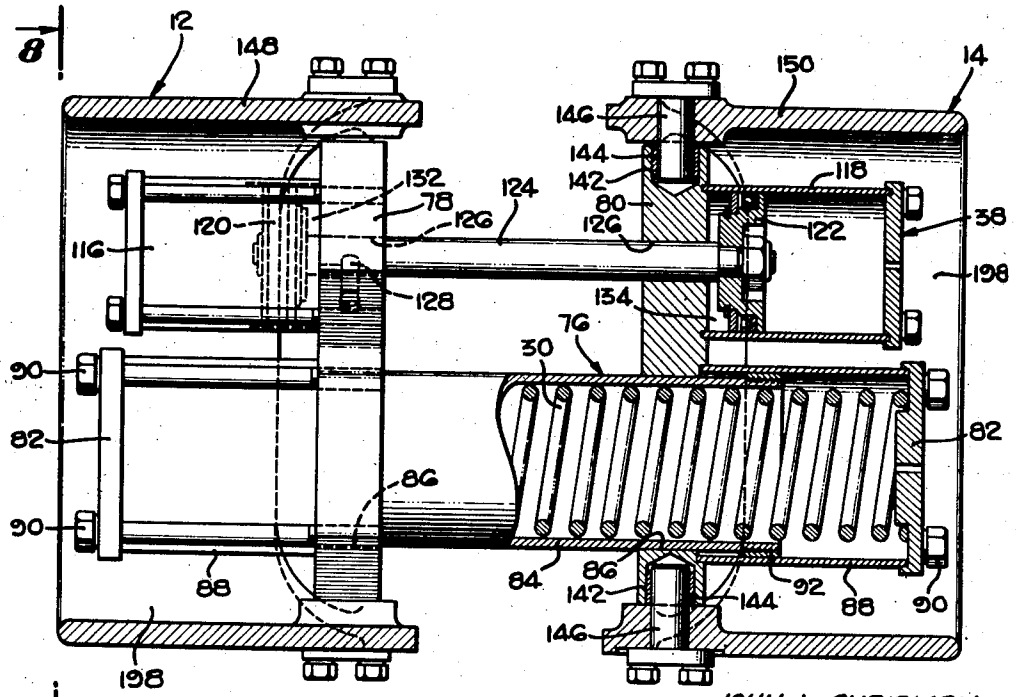


Fig. 7.

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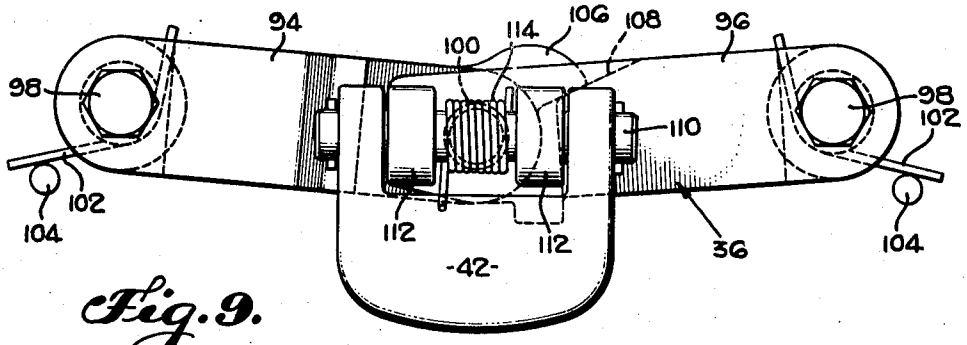


Fig. 9.

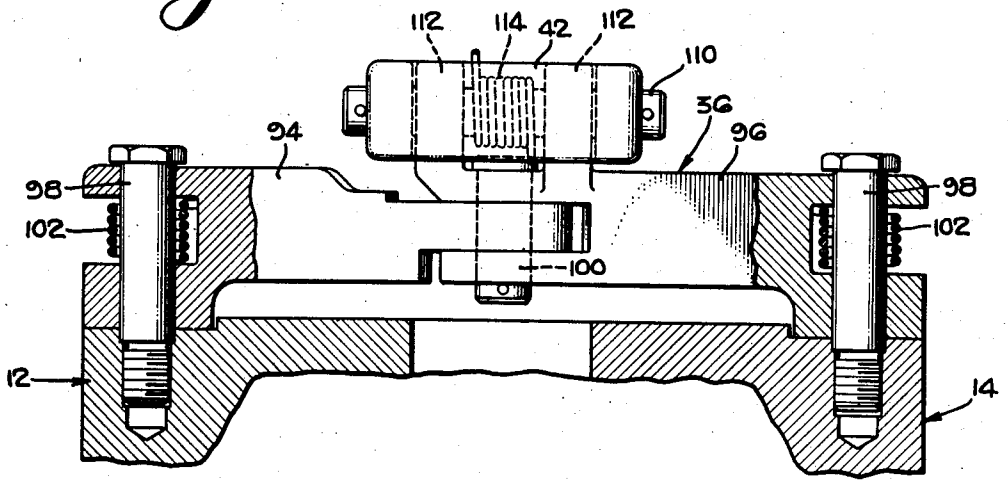


Fig. 10.

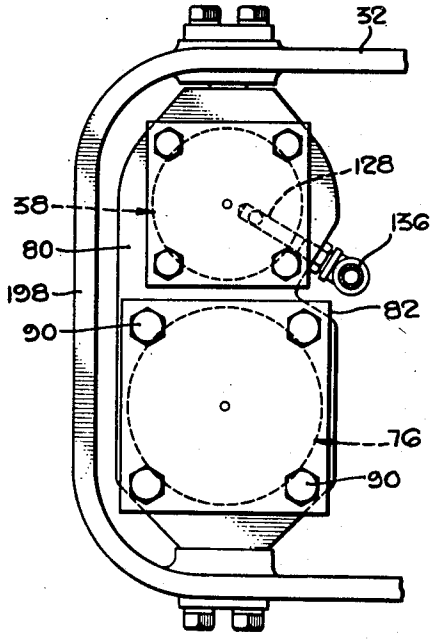


Fig. 8.

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Patented Nov. 23, 1954

2,695,189

WELL PIPE ELEVATOR

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Application June 10, 1950, Serial No. 167,466

17 Claims. (Cl. 294—90)

This invention relates generally to oil well tools and is directed particularly to well pipe elevators.

As is well known to those familiar with oil well drilling operations, it is necessary to periodically remove the string of drill pipe from the well bore in order to replace worn drilling bits and for various other other purposes relating to the drilling operation. The drill string is separated into sections, or stands normally of from 60 to 90 feet in length, which are racked in an upright position in the derrick. A member of the drilling crew, usually termed the derrickman, is stationed on a narrow platform high in the derrick, to manually unlatch the elevator from the upper end of each stand of pipe as it is disconnected from the drill string and racked in the derrick, and to manually latch the elevator about each successive stand as the pipe is run back into the well bore. Inasmuch as well pipe elevators must withstand very great loads they are necessarily of considerable weight. Hence, the task of the derrickman when running a string of pipe in or out of the well bore is most arduous and dangerous.

Conventional well pipe elevators of the pivotally interconnected body section type for use in the above operations are normally provided with a latch adapted when engaged to maintain the body sections in closed position. Such a latch is generally provided with spring means yieldingly urging the latch into engagement, and in order to move the body sections to a closed position it is necessary to overcome the force of such spring means. Inasmuch as the latch in the larger sizes of elevators is of considerable weight, the spring means yieldably urging it into engagement must be capable of exerting appreciable force upon the latch. Accordingly, considerable force is needed to move the body sections to a closed position, as is considerable force needed to open the elevator. The necessity of exerting such considerable force in the handling of the elevators adds to the dangerous and fatiguing nature of the work.

In the above-described conventional method of racking the disconnected stands of drill pipe, the stands are supported by the main elevator while being moved laterally in the derrick to and from racked position. The elevator is necessarily moved laterally into close proximity to the derrick-man and is within his reach, thus permitting manual closing or opening of the elevator. However, remotely controlled power-operated racking equipment such as is now in use, and having an auxiliary transfer elevator and hoist, requires that the elevator be latched about and disengaged from the stands of pipe while they are disposed at the derrick center-line. The elevator is in this case far out of reach of the derirckman, and hence remotely controlled, powered-actuated means for engaging it and disengaging it from the pipe are required.

The principal object of this invention is to provide a well pipe elevator adaptable for use in conventional drilling operations but particularly useful in operations utilizing power operated racking equipment, wherein the elevator must be latched about and disengaged from the stands of pipe while they are disposed at the derrick center line.

A further object of this invention is to provide a well pipe elevator wherein the fatigue and danger factors present with conventional elevators are greatly minimized.

A further object of this invention is to provide a well pipe elevator which is faster and safer in operation than existing tools of this type.

Another object of the present invention is to provide a well pipe elevator with novel means for latching and unlatching it with respect to the pipe whereby the derrickman is not required to perform these operations manually.

Yet another object of this invention is to provide a well pipe elevator which may be latched and unlatched from a point remotely poistioned with respect to the elevator.

A further object of this invention is to provide a novel lock means for maintaining a well pipe elevator in open position until the lock means is released by engagement with the well pipe.

Yet another object of the invention is to provide an elevator latching means wherein the elevator latch is maintained in disengaged position until the body sections in closing have reached a substantially closed position whereby it is not necessary to overcome the force of the spring means, which urges the latch into engagement, when closing the elevator.

Other objects and advantages of the present invention will be apparent from the following detailed description, reference being made to the accompanying drawings, wherein:

Figure 1 is a top view of a well pipe elevator embodying the present invention in a closed position.

Figure 2 is an end view partly in section taken substantially on the line 2—2 as shown in Figure 1.

Figure 3 is a top view of the elevator while in an open position, a portion thereof being shown in horizontal section.

Figure 4 is a fragmentary horizontal sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a fragmentary horizontal sectional view showing the elements of Figure 4 in a different operative position.

Figure 6 is a view of the end of the well pipe elevator opposite that illustrated in Fig. 2.

Figure 7 is an enlarged vertical sectional view taken on the line 7—7 of Figure 1.

Figure 8 is a side elevation taken in the direction of the line 8—8 as shown in Figure 7.

Figure 9 is a top plan view of a portion of the lock means for the elevator.

Figure 10 is a side elevational view, partly in section, of such means.

The instant invention is particularly adaptable for elevators wherein two body sections are pivotally attached to open and close in encompassing relationship about the pipe, ears being provided on the elevator to support the same by means of links and the like. Such elevators comprise two general types, the "center latch" type wherein the body sections are symmetrical, each having connected to it a supporting ear, and the "side-door" type, wherein both ears are carried upon one of the body sections, the ear carrying body section usually being larger than its mating section. In one of its broad aspects the invention consists in providing such elevators with power actuated means for unlatching such elevators and again in providing such elevators with power actuated means for opening the elevators after unlatching.

In the "center latch" type elevator embodiment disclosed in the present drawings, there are found two body sections 12 and 14 pivotally mounted about the hinge pin 16 to be movable to the open position shown in Figure 3, or to the closed, latched position shown in Figure 1, the two sections being latchable about the drill pipe by means of a latch lug 18 integral with the body section 14 and latch member 20 pivotally mounted on the body section 12 as by a pivot pin 22. A latch lock 24 pivotally mounted on the latch 20 is adapted to engage the lock pin 26, which extends from the latch lug for the purpose of preventing inadvertent or accidental opening, and a catch member 28 mounted on the latch member 20 prevents radially inward pivoting of the said latch member 20 when the body sections 12 and 14 are in the open position, as will be presently explained.

The body sections 12 and 14 are normally urged to the closed position by means of a compression spring 30

abutting each of the lateral extensions 32 and 34 of respectively body section 12 and body section 14, and an over-center locking means comprising a spring-lever system, generally designated 36, is provided connected to the said body sections 12 and 14 to lock the same in the fully opened position against closing. While the elevator could, of course, be manually opened to the position shown in Figure 3, a fluid actuated power means is provided for this purpose, such means comprising a fluid piston-cylinder system 38 supported on the lateral extensions 32 and 34 which will open the elevator, and a piston cylinder means 40 supported on the latch member 20 for releasing the latch lock 24 and pivotally opening the latch member 20.

In operation the elevator is opened by actuating the fluid power means to release the latch lock 24 and latch 20 and to swing open the body sections 12 and 14 to permit exit of the stand of pipe. The spring-lever system 36 locks the body sections 12 and 14 open. Upon the entrance of a new stand of pipe into the elevator, said pipe strikes the extension 42 of the spring-lever system 36, to release it from its locking relationship to the body sections, and permitting the body sections to be closed by means of the compression spring 30. Closing of the body sections 12 and 14 results in a latching of the latch element 20 about the lug 18 and in a locking of said latch element by the latch lock 24 and lock pin 26. As will be shown hereinafter, the catch member 28 performs the function of holding the latch member 20 pivoted radially outwardly against the torsion spring 44 to facilitate closing the elevator and to permit easy ingress of the pipe into the elevator.

It will be appreciated that the invention in another of its broad aspects comprises an elevator normally urged to a closed, latched position, but adapted to be held in the open position by locking means releasable to permit the closing of the elevator. Hence the broad invention is capable of varying embodiments, such as electromagnetic power actuating means and releasable locking means and, indeed, said invention is capable of expression in the absence of any power actuating means by manual operation. On the other hand, particularly desirable power actuating means and over-center locking means and other pertinent features of invention are incorporated in the particular elevator as hereinafter described.

In the elevator shown in the drawings and including the body sections 12 and 14 pivotable about the hinge pin 16, said body sections by their inner faces define a pipe receiving bore 21 when swung into the closed position, and each body section is provided with a pair of upper and lower lugs or ears 46 and 48, respectively, defining elevator-link receiving recesses 50 and 52, respectively, therebetween. As hereinbefore stated, the body section 12 is provided with a latch member 20 pivotally mounted on the free end of the body section 12 by a pivot pin 22 and urged pivotally radially inwardly by the torsion spring 44, such latch member 20 engaging the latch lug 18 of the body section 14. The latch member 20 is of the U-shaped or "stirrup" type adapted to fully embrace the latch lug 18, and comprises a vertically extending leg portion 54 and a pair of upper and lower horizontally extending arms 56 and 58 having hinge lugs 60 and 62 formed on their pivoted ends. The latch member 20 is provided with the aforesaid torsion spring 44 disposed upon the pivot pin 22 to urge it toward a closed position.

In order to hold the latch member 20 in a closed position, as previously stated, there is provided a latch lock, generally designated 24, movably mounted on the latch and provided with an operating handle 64 to release it manually, the further movement of this handle operating to open the latch. The latch lock 24 is preferably carried by a long pin or bolt 66 pivoted to the latch and provided with a torsion spring 68 that normally urges the lock in a direction to keep its hooked end 70 in engagement with the lock pin 26. The lock pin 26 is disposed within a recess 72 formed in the body section 14 and is rigidly secured to this section, a recess 74 being provided in the leg portion 54 of the latch 20 to accommodate the hooked end 70.

It will be understood that in a conventional well pipe elevator the aforedescribed body sections 12 and 14 are manually swung into opened and closed position, and that the latch 20 and latch lock 24 are likewise manually operated. It is, however, a principal feature of this invention that locking means may be provided to releasably restrain the body sections in open position, resilient means being provided to urge the body sections to the closed position. Additionally, it is a further feature of the invention to provide power actuated means for opening the body sections 12 and 14 and for opening the latch lock 24 and latch 20.

For swinging the body sections 12 and 14 to a closed position, there is provided the helical compression spring 30 disposed within a cylindrical housing, generally designated 76, carried by the mounting plates 78 and 80, said mounting plates being carried by the lateral extensions 32 and 34 of, respectively, the body sections 12 and 14. This spring 30 should have a free length somewhat greater than the distance between the cap members 82 of the housing 76 when the body sections are in a closed position. Accordingly, the spring will constantly exert a yieldable force upon these cap members tending to swing the body sections to a closed position about the axis of the hinge pin 16, which force will be greatest when the body sections are in the open position of Figure 3. As shown particularly in Figure 7, the preferred housing 76 comprises a center section 84, slidable within bores 86 formed in the mounting plates 78 and 80, and outer sections 88 having their base portions rigidly secured to the mounting plates; the cap members 82 being affixed to these outer sections, as by bolts 90. The center section 84 is shown provided with end rings 92 having a sliding fit with respect to the inner periphery of the outer sections 88. It will be realized that the means yieldingly urging the body sections to a closed position may assume other forms than the preferred form shown in the drawings and described herein.

Although the elevator as described may be manually unlatched and opened against the spring 30, from a practical standpoint some means must be provided to restrain the elevator in the open position inasmuch as it would be unfeasible to hold the elevator open during manual operation and, of course, impossible if automatic operation were desired. Consequently, the present invention contemplates the lock means or spring-lever system 36 adapted to maintain the body sections in open position until released by engagement with the well pipe. Such lock means, the preferred type suitable for the aforementioned purposes, comprises a novel over-center toggle lock as shown in the drawings. The preferred construction of this toggle lock essentially comprises a pair of levers 94 and 96, pivotally secured to the body sections 12 and 14, respectively, by mounting pins 98. These levers are pivotally interconnected at their adjacent ends by a center pin 100 and are provided with means yieldingly urging their pivotally interconnected ends toward the elevator bore and away from the vertical axis of the hinge pin 16 which pivotally interconnects the body sections. Preferably, such means will take the form of a pair of torsion springs 102 carried by the mounting pins 98 and which engage pins 104 on the body sections 12 and 14. The levers are also provided with means for restraining their pivotal movement inwardly toward the elevator bore beyond the point shown in Figure 3, which means may comprise a lug 106 formed on one lever 94 adapted to engage an abutment surface 108 formed upon the other lever 96.

The operation of the lock means 36 may best be understood by reference to Figures 1 and 3. As the two body sections are moved from the closed position of Figure 1 to the open position of Figure 3, the levers 94 and 96 will be swung about their mounting pins 98 to move their interconnected inner extremities toward alignment with the mounting pins 98. When the axis of the center pin 100 reaches such midposition or dead center the levers 94 and 96 are aligned with each other, further opening movement of the elevator body sections is prevented by the levers. The torsion springs 102 urge the levers past the dead center and hence the elevator body sections move slightly in closing direction and the levers assume the over-center position shown in Figure 3. This position is determined by engagement of the stop lug 106 with the abutment surface 108. It will be apparent that in order to close the body sections the levers 94 and 96 must first be shifted back to the opposite side of the dead center positioning against the action of the springs 102.

To effect release of the locking means a force of

greater magnitude than that exerted by the springs 102 must be applied to the levers 94 and 96 whereby they will be moved toward their original position. It is contemplated that such force be provided by lateral engagement of the open elevator with the well pipe. Although the levers could be so arranged that their pivotally interconnected ends would extend into the pipe-receiving bore 21 when the body sections are in open position whereby the well pipe could directly exert a reelasing force thereon, it is preferable that a separate means such as the extension or flapper element 42 be provided for this purpose. This flapper 42 is shown secured to the lever 96 by a horizontal pin 110 supported by upstanding lugs 112 formed on the lever 96. It will be seen that when the body sections are in closed position the flapper 42 is disposed to one side of the pipe-receiving bore 21. When the body sections are swung to an open position, however, the major portion of the flapper will be moved to a position within this bore, as shown in Figure 3, so that upon lateral application of the elevator to a well pipe, the pipe will engage the flapper and force it toward the hinge pin 16. This lateral movement of the flapper will in turn be transferred to the levers whereby they will be shifted to the opposite side of the center-line passing through the mounting pins 98 and the body sections will be freed for closing movement.

The flapper element 42 will preferably be free to pivot upwardly about the axis of the horizontal pin 110 to prevent possible damage in the event the open elevator should be accidently dropped upon an upstanding length of pipe secured in the rotary table or upon a similar obstruction. A torsion spring 114 is shown carried by the pin 110, which spring is adapted to yieldingly urge the flapper downwardly about the axis of the pin. The flapper may be restrained against downward pivotal movement by the abutment of its lower surface with one of the levers.

Referring now to the automatic means for opening the elevator against the compression spring 30, such means in the preferred embodiment shown take the form of the fluid piston-cylinder system 38 disposed between the lateral extensions 32 and 34 of the body sections 12 and 14, although it will be appreciated that another actuating means such as an electrically actuated rack and pinion device could be used in the place of the fluid piston-cylinder system 38.

The preferred construction of the fluid piston-cylinder system 38 comprises a pair of cylinders 116 and 118 having their respective bases secured to the mounting plates 78 and 80, respectively. Disposed in these cylinders 116 and 118 are pistons 120 and 122, respectively interconnected by a piston rod 124 which is slidable in bores 126 formed in the mounting plates 78 and 80. These mounting plates are respectively formed with passages 128 and 130 by means of which a pressure fluid, preferably air, is adapted to be introduced into pressure chambers 132 and 134 of the cylinders, which pressure chambers are defined by the inner surface of each piston and the base portion of their respective cylinders.

In order to swing the body sections from the closed position of Figure 1 to the open position of Figure 3, fluid pressure may be admitted to the pressure chambers 132 and 134 from a suitable source of fluid pressure, not shown, by means of auxiliary conduits 136 and 138 interconnecting the passages 128 and 130 with a main conduit 140 in communication with such source. Inasmuch as the pistons will be restrained from moving outwardly with respect to each other by the piston rod 124, the portion of each mounting plate encompassed by the cylinders will constitute reactive surfaces which will be forced away from the pistons by the admission of fluid pressure to the pressure chambers 132 and 134. In this manner the lateral extensions 32 and 34 will be urged toward each other so as to spread the body sections 12 and 14 laterally apart. It should be noted at this time that it is preferable that the mounting plates 78 and 80 be so arranged as to be able to continually remain in parallel disposition during swinging movement of the body sections and their lateral extensions 32 and 34; hence they must be free to rotate about their vertical axes with respect to the lateral extensions. Accordingly, as shown in Figure 7, the mounting plates may be provided with sockets 142 wherein are disposed collar bearings 144, each of which bearings is adapted to receive the lower portion of pivot pins 146 secured to the upper and lower walls 148 and 150, respectively, of the lateral extensions.

In addition to the aforedescribed means for moving the body sections to an open position, the elevator of the present invention is also provided with a second power-actuated means for disengaging the latch 20 from the latch lug 18. Preferably, this second power-actuated means will take the form of the piston-cylinder means 40 shown in the drawings. It will be understood, however, that this power-actuated means could assume a different form; for example, one or more electro-magnets could be arranged so as to disengage the latch.

The preferred construction of this second power-actuated means comprises a cylinder 152, a piston 154 and piston rod 156 slidably mounted therein, which members are disposed between a lateral extension 158 formed upon the free end of body section 12 and an arm 160 formed integrally with the latch lock 24. The cylinder 152 includes a lug 162 shown secured between spaced ears 164 formed on the lateral extension 158 by a pin 166, and the piston rod 156 includes bifurcations 168 between which the end of the lock arm 160 is secured by a pin 170. The piston 154 is adapted to be moved to the closed end 172 of the cylinder upon the introduction of fluid pressure within the pressure chamber 174. Fluid pressure for this purpose reaches this pressure chamber by means of a fitting 176 and an auxiliary conduit 178 in communication with the main conduit 140. As the piston initially moves toward the closed end of the cylinder, the latch lock 24 will be pivoted about the pin 66 so as to disengage its hooked end 70 from the lock pin 26. Continued movement of the piston will then serve to urge the latch 20 to pivot about its pivot pin 22 so as to become disengaged from the latch lug 18, as shown in Figure 3. It will be understood that once the latch has been disengaged from its latch lug, the body sections 12 and 14 may be swung into open position by the aforedescribed fluid piston-cylinder system 38. It will be appreciated that the cylinder 152 is preferably considerably smaller than are the cylinders 116 and 118. For this reason the latch 20 will be released before sufficient pressure is built up in the cylinders 116 and 118 to overcome the compression spring 30. To insure this sequence more positively, the flow of fluid to cylinders 116 and 118 may be restricted by inserting small diameter orifices in the auxiliary conduits 136 and 138, or by the use of otherwise restricted conduits.

It will be seen that in the aforementioned preferred embodiment of the invention, release of the latch mechanism is brought about by actuating the piston cylinder means 40 and subsequently the elevator is opened by operation of the fluid piston-cylinder system 38. Locking of the elevator in the open position occurs by virtue of the spring-lever system 36. Engagement of the flapper 42 of said spring-lever system 36 by a stand of pipe releases such over-center lock and permits closing of the elevator due to the compression spring 30. However, such spring 30 would ordinarily have to be of sufficient size and strength to overcome the effect of the torsion spring 44 when moving the body sections to a closed position. Referring to Figures 4 and 5, this spring 44 is seen to be biased so as to cause the free end of the latch to pivot in a counter-clockwise direction about the pivot pin 22. Hence, if conventional latching means were employed the latch would be maintained with its free end in the path of the latch lug 18, as shown in dotted outline in Figure 3, whereby as the body sections were moved to a closed position the curved surface 180 of the latch would be engaged by the curved surface 182 of the latch lug so as to cam the latch outwardly against the force of the spring 44. The free end of the latch would then ride along the curved surface 182 as the body sections moved to a completely closed position until the leg 54 of the latch dropped into the latch lug recess 72. The elevator embodying the present invention, however, is provided with novel means for maintaining the free end of the latch disposed in a position radially outwardly of the latch lug until the body sections have been moved to a substantially closed position whereby the compression spring 30 need not overcome the force of the torsion spring 44.

Preferably, such novel means will comprise the catch

member 28, best shown in Figures 3, 4 and 5, pivotally carried by the latch 20 upon a pin 186 and having a first arm 188 whereon are formed abutment means 190, adapted to be releasably disposed upon a lug 192 formed upon the body section 12 so as to retain the latch in a disengaged position. The catch member 28 is also provided with an integral second arm 194 which extends into the opening between the two body sections and is adapted to effect release of the first arm 188 from the lug 192 when contacted by the body section 14 as the body sections move to a closed position. Preferably, the catch member 28 will be provided with a torsion spring 196 serving to bias the catch member in a clockwise direction whereby upon movement of the latch to the position shown in Figure 3 by the piston-cylinder means 40, the abutment means 190 will be engaged with the lug 192. When the second arm 194 is contacted by the body section 14 the catch member will be pivoted about the pin 186 in a counter-clockwise direction against the force of the spring 196 so as to disengage the abutment means 190 from the lug 192. Thus the catch member 28 acts to allow the latch 20 to be moved to an engaged position with the latch lug 18 under the influence of the spring 44.

In addition to eliminating the necessity of working against the spring 44 during closing of the elevator, the catch member 28 also performs another important function. In the absence of this device or other equivalent means, upon release of the fluid pressure from the piston-cylinder means 40 the spring 44 would return the latch 20 to the position shown in dotted outline in Figure 3. In this position the latch would materially reduce the width of the lateral opening through which the pipe is inserted into the pipe recess 21 and thus render the application of the elevator to the pipe more difficult. As shown in solid lines in Figure 3, the catch member 28 retains the latch 20 retracted within the confines of the lateral extension 158, thus presenting a wide, streamlined entrance to the pipe recess 21. The importance of this will be appreciated when it is considered that one of the principal features of this elevator is to permit it to be remotely controlled out of the reach of the derrickman.

It will be noted in connection with the invention in its general aspect that the rearward lateral extensions 32 and 34 and the forward extension 158 will preferably be formed with vertical end walls 198. Hence, these lateral extensions will serve to protect the operating elements enclosed therein from damage. It should also be noted that a quick-release valve 200 may be disposed between the main conduit 140 and the auxiliary conduits 136, 138 and 178 whereby fluid pressure may be quickly discharged from the cylinders 116, 118 and 152 when the main conduit is disconnected from the fluid pressure source.

From the foregoing description of one embodiment of the invention it will be apparent that for automatic operation the elevator may be released from the pipe by remote control, simply by manipulation of a control valve to admit pressure fluid to the piston-cylinder means 40 and to the body spreading cylinders 116 and 118. Both the body sections and the main latch automatically become locked in open position, thus rendering it unnecessary to maintain pressure in the cylinders to maintain the parts in this position. It will also be apparent that closing of the body sections about the pipe is effected by the energy stored in the spring 30 during the opening movement, this energy being released by engagement of the pipe with the flapper 42 of the spring-lever system 36. Similarly, the latch 20 is automatically released from its retracted position when the body sections approach closed position. Hence, no manual manipulation of the elevator is required, either to apply it to the pipe or to remove it therefrom.

The disengagement of the elevator from the pipe by power means under remote control and its automatic closing and latching upon lateral insertion of a pipe into the pipe recess 21 renders an elevator embodying this invention particularly adaptable to use in conjunction with power-operated, remotely controlled pipe racking equipment of the type wherein the disconnected stands are supported and manipulated by auxiliary equipment wholly independently of the main hoisting equipment. When used in connection with such racking equipment, the main elevator is disposed at the center-line of the derrick at the times it is engaged with or disengaged from the upper portion of a stand of pipe, and it is thus out of reach of the derrickman. Unlatching and opening of the elevator by power means under remote control and automatic closing and latching in response to insertion of a pipe in the elevator pipe recess provide a practical solution to this problem.

It will be understood, however, that an elevator embodying this invention possesses many advantages when used in the conventional method of handling the disconnected stands of drill pipe in a derrick. The invention eliminates, to the extent desired, manual closing, latching, unlatching and opening of the elevator and thus saves time and energy, and by reduction of manual effort reduces the accident risk by lessening fatigue in the derrickman and floor crew.

Having fully described our invention, it is to be understood that we do not wish to be limited to the details set forth, but our invention is of the full scope of the appended claims.

We claim:

1. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; catch means to hold the latch in disengaged position, said catch means being releasable when said body sections approach a closed position to permit said latch to assume a position for engagement with said other body section; a lock adapted to maintain said body sections in open position; means to release said lock by engagement thereof with a well pipe; first power actuated means carried by one of said body sections for disengaging said latch, and second power actuated means carried by said body sections for swinging said sections into open position.

2. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; catch means to hold the latch in disengaged position, said catch means being releasable when said body sections approach a closed position to permit said latch to assume a position for engagement with said other body section; a lock adapted to maintain said body sections in open position; means to release said lock by engagement thereof with a well pipe; first power actuated means carried by one of said body sections for disengaging said latch, and second power actuated means carried by said body sections for swinging said sections into open position.

3. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; catch means to hold the latch in disengaged position, said catch means being releasable when said body sections approach a closed position to permit said latch to assume a position for engagement with said other body section; a lock adapted to maintain said body sections in open position; means to release said lock by engagement thereof with a well pipe; first fluid actuated piston and cylinder means carried by one of said body sections for disengaging said latch, and second fluid actuated piston and cylinder means carried by said body sections for swinging said sections into open position.

4. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; catch means to hold the latch in disengaged position, said catch means being releasable when said body sections approach a closed position to permit said latch to assume a position for engagement with said other body section; an overcenter toggle lock means adapted to maintain said body sections in open position and having means extending into

the elevator pipe receiving bore for release of said lock means upon engagement with the well pipe, said toggle lock means including a pair of levers each pivotally mounted at one of its ends to one of the body sections, the opposite ends of said levers being pivotally connected; first power actuated means carried by one of said body sections for disengaging said latch, and second power actuated means carried by said body sections for swinging said sections into open position.

5. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; catch means mounted on said latch and engageable with the latch carrying body section to hold the latch in disengaged position, said catch means including a member extending in a direction to be engaged by the other body section, said member being adapted to contact said other body section upon closing of said elevator to effect the release of said latch from its disengaged position; a lock adapted to maintain said body sections in open position until released by engagement with a well pipe; first power actuated means carried by one of said body sections for disengaging said latch, and second power actuated means carried by said body sections for swinging them into open position.

6. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; a lock adapted to maintain said body sections in open position until released by engagement with said well pipe; first power actuated means carried by one of said body sections for disengaging said latch; and second power actuated means carried by said body sections for swinging them into open position.

7. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; a lock adapted to maintain said body sections in open position until released by engagement with said well pipe; first power actuated means carried by one of said body sections for disengaging said latch; and second power actuated means carried by said body sections for swinging them into open position.

8. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; a lock adapted to maintain said body sections in open position until released by engagement with a pipe; first fluid actuated piston and cylinder means carried by one of said body sections for disengaging said latch; and second fluid actuated piston and cylinder means carried by said body sections for swinging them into open position.

9. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; an overcenter toggle lock means adapted to maintain said body sections in open position and having means extending into the elevator pipe receiving bore for release of said lock means upon engagement with a pipe, said toggle lock means including a pair of levers each pivotally mounted at one of its ends to one of the body sections, the opposite ends of said levers being pivotally connected; first power actuated means carried by one of said body sections for disengaging said latch; and second power actuated means carried by said body sections for swinging them into open position.

10. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; and fluid actuated piston and cylinder means carried by said body sections for pivotally moving said sections with respect to each other, said means including a pair of cylinders one each of which is fixed on one of said body sections, a piston in each of said cylinders, and a common connecting rod for said pistons for retaining said pistons in relatively fixed position with respect to each other whereby upon introduction of fluid into said cylinders said cylinders and the sections fixed thereto move to pivot said body sections.

11. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; first power actuated means carried by one of said body sections for disengaging said latch; and second power actuated means carried by said body sections for swinging them into open position.

12. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; first power actuated means carried by one of said body sections for disengaging said latch; and second power actuated means carried by said body sections for swinging them into open position.

13. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions, said body sections being resiliently urged to closed position; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; first fluid actuated piston and cylinder means carried by one of said body sections for disengaging said latch; and second fluid actuated piston and cylinder means carried by said body sections for swinging them into open position.

14. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; first fluid actuated piston and cylinder means carried by one of said body sections for disengaging said latch; and second fluid actuated piston and cylinder means carried by said body sections for swinging them into open position.

15. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position; first fluid actuated piston and cylinder means carried by one of said body sections for disengaging said latch, said means including a cylinder mounted on said body section carrying said latch, a piston in said cylinder, and a member connecting said piston and said latch; and second fluid-actuated piston and cylinder means carried by said body sections for swinging them into open position, said means including a pair of cylinders one each of which is fixed to one of said body sections, a piston in each of said cylinders, and a common connecting rod for said pistons for retaining said pistons in relatively fixed position with respect to each other; whereby upon introduction of fluid into said cylinders said cylinders and the sections fixed thereto move to pivot said body sections.

16. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position, said latch being resiliently urged to pivot with respect to its body section into engaging position; and catch means mounted on said latch and engageable with said latch carrying body portion to hold the latch in disengaged position, said catch means including a member extending into the opening between the body section mounting the latch and the adjacent body section, said member being in the path of said adjacent body portion whereby closing of said ele-

vator will effect the release of said latch from its disengaged position.

17. A well pipe elevator comprising: pipe encompassing body sections pivotally connected for relative swinging movement into open or closed positions; a latch mounted upon one of said body sections adapted to be releasably engaged with another body section so as to maintain said body sections in closed position, said latch being resiliently urged to pivot with respect to its body section into engaging position; and catch means mounted on said latch and engageable with said latch carrying body, said catch means including a first arm releasably connected to the body section mounting said latch to maintain said latch in a disengaged position, and a second arm extending into the opening between the body section mounting the latch and the adjacent body section, said second arm being in the path of said other body section whereby closing of said elevator will disconnect said first arm from said body portion to effect the release of said latch from its disengaged position.

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