May 25, 1937. C. A. LUNDEEN 2,081,591

CENTER LATCH ELEVATOR

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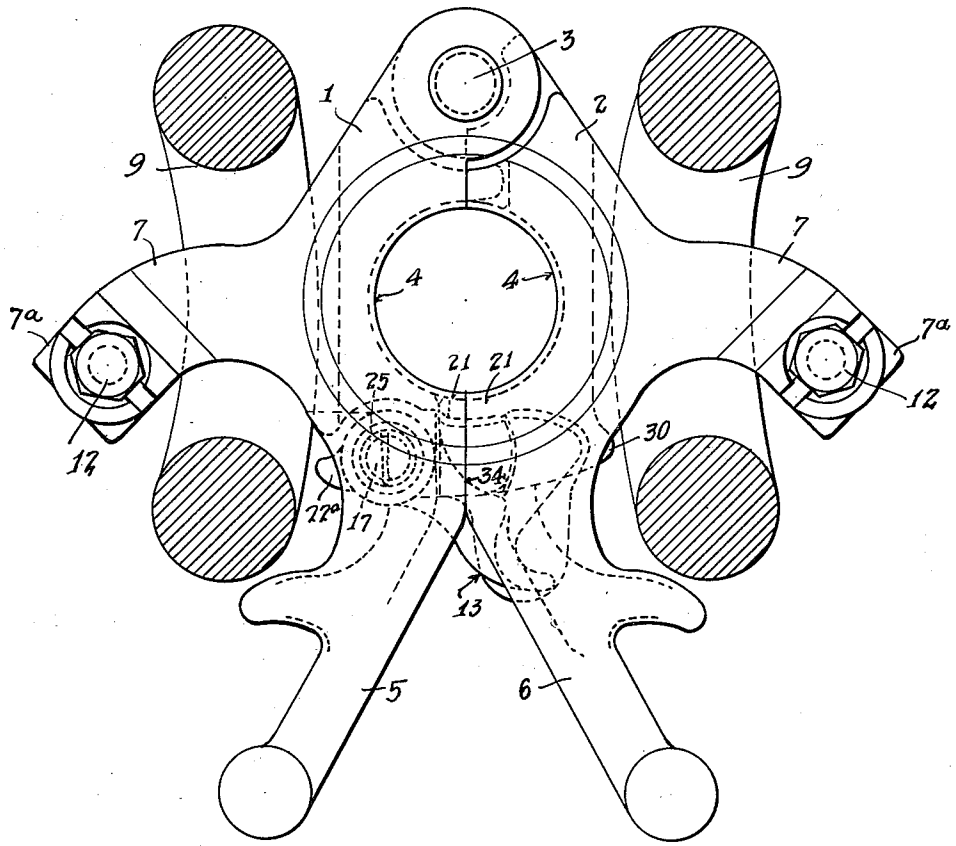


Fig. 1

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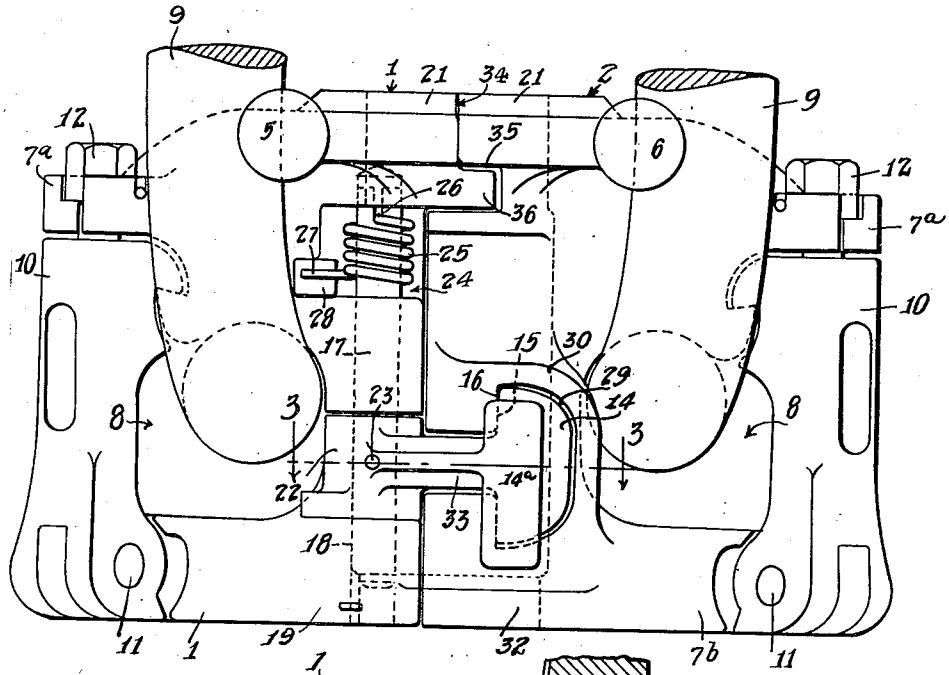
Attorneys

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Fig. 2



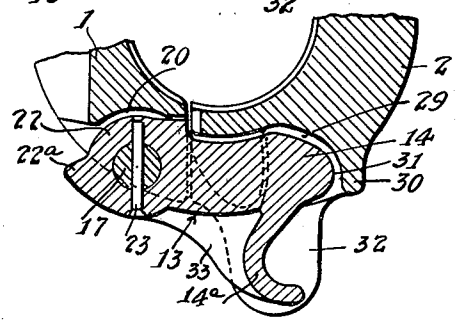


Fig. 3

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UNITED STATES PATENT OFFICE

2,081,591

CENTER LATCH ELEVATOR

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Application August 25, 1934, Serial No. 741,403

5 Claims. (Cl. 294—90)

This invention relates to elevators of the type usually supported on elevator links, and employed for engaging the upper end of well casing, drill pipe, tubing and the like for raising or lowering the same in well-drilling operations, and for engaging drill tubing in maintaining the well in production after it is drilled; the invention particularly concerns that class of elevators commonly called "center latch" elevators, so called because they comprise a pair of pipe-encircling gates or doors adapted to be clamped around the pipe, being hinged together at their rear ends and provided with a latch across their open ends adjacent the front and center of the elevator.

A principal object of the present invention is to provide a latch construction which cannot become unlatched accidentally during certain well operations.

A further object of the invention is to provide a construction which will prevent the supporting links from accidentally opening the latch.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce efficient center latch elevators.

A preferred embodiment of the invention is described in the following specifications, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Figure 1 is a top plan of an elevator embodying my invention and showing the elevator links in cross section on a plane located just above the elevator.

Figure 2 is a front elevation of the elevator illustrated in Figure 1, showing the lower portion of the links broken away.

Figure 3 is a horizontal section taken on the line 3—3 of Figure 2.

Referring to Figure 1, the numerals 1 and 2 indicate a pair of pipe encircling gates or doors hinged together at their rear ends by any suitable means, such as the hinge pin 3. The doors have opposed arcuate faces 4 that come together and conform closely to the outside circumference of the well pipe (not shown). The front ends of the door abut together at the center of the elevator and are provided with suitable handles 5 and 6, which, in the present instance, are in the form of forwardly extending horns at the top and front of each door. The handles illustrated are covered by Patent No. 2,025,047, to Herbert E. Grau.

Each of the doors is provided with a laterally and forwardly extending bifurcated ear 7 comprising an upper section or upper lug 7*a* and a lower section or lower lug 7*b*, between which a recess 8 is formed to receive the lower end of the corresponding lower link 9. The lower ends of the links are lodged in the recesses 8 by means of locking bars 10, which locking bars are mounted upon a pivot pin 11 attached to the lower lug 7*b* of the ear and detachably secured to the upper lug 7*a* by a bolt 12. The construction of this locking bar is disclosed in my copending application Serial No. 741,249, filed August 24th, 1934. When the gates or doors 1 and 2 come together the arcuate faces 4 cooperate to form a ring fitting closely around the periphery of the pipe or tubing supporting the elevator so as to fit under a collar at the upper end of the pipe or tubing.

By means of the handles 5 and 6 the doors 1 and 2 can be readily opened or closed in using the elevator. When the elevator is in its closed position it is held closed by the latch 13 which is in the form of a short horizontal bar, preferably having an enlarged head 14 which in the present instance is of T-form, said head presenting substantially vertical shoulders 15 which are adapted to seat against corresponding shoulders 16 which are formed in the opposite gate 2. The latch 13 is preferably mounted so that its middle is substantially in line with the front and rear central plane of the elevator, as this position enables its pivot bolt 17 to be located substantially within the wall of the gate, thereby avoiding the necessity of employing projecting lugs to carry the pin at the upper end of the gate, and bringing the latch as close as possible to the axis of the elevator. This brings the tensile strain on the latch directly in line with the tension forces developed in the gates, which is most advantageous.

The faces 15 and 16 are preferably struck on a radius from the center of a hinge pin 17 that pivotally mounts the latch 13 on the door 1. This pin 17 is a rocking pin which is stepped at its lower end in a socket 18 formed in a lug 19 integral with the gate or door 1 and which projects out below a recess 20 formed in the outer face of this door near its free end 21. This recess 20 forms a pocket to receive the hub 22 of the latch which hub is rigidly secured to the rocking pin preferably by means of a small cross pin 23. Above this point a recess 24 is countersunk into the forward end of the wall of this gate or door to operate as a chamber to receive a coil spring 25, the upper end of which is secured at 26 to the pin and the lower end 27 of which thrusts against

a face 28 at the side of this recess 24. This spring is of course a torsion spring and exerts its force in a direction to hold the latch head 14 in its socket 29 on the door 2. It is necessary to provide this latch 13 with a handle or grip for opening the same, and this grip is preferably formed as an integral rudimentary hook 14a projecting out from the latch at its head (see Fig. 3).

Referring to Fig. 3, it will be noted that when the latch 13 is in its closed position the head 14 is located in a depressed position in its socket 29 so that the outer face of the latch conforms substantially to the curved forward peripheral face of the elevator (see Fig. 3, and preferably with the pivot pin 17 located substantially within this curved peripheral line. In this way the latch is brought in closer to the central axis of the elevator.

In constructions heretofore employed, there is danger that the lower end of the adjacent link 9 at the right of the elevator, as viewed in Fig. 2, may come in contact with the end of this head 14 so as to open the latch accidentally. In order to overcome this objection, I provide the wall of the gate or door 2 with a projecting lip or rib 30 which extends all around the periphery of this head. That is to say, it extends across the space above the head and also extends down in a nearly vertical direction opposite the terminal face 31 of this head and preferably extends a short distance along the underside of the head. It will be evident that if in the operation of the elevator, the adjacent link should move toward the head 14 this rib or lip 30 will act as a guard to prevent the link from engaging the head 14 of the latch. In order to prevent any possibility of the latch 13 being opened accidentally when the elevator is being lowered, I prefer to provide the gate 2 with a projecting lug 32 (see Figs. 2 and 3). This lug is of considerable thickness and projects outwardly at the lower end of the door 2, preferably with the lower face of this lug flush with the lower face of the elevator.

The hook 14a may be stiffened at its middle point by a deep web 33, the end of which is integral with the hub 22.

The vertical meeting faces 15 and 16 operate to tie the two doors together in such a way as to greatly reduce the bending movement as compared with what this bending movement would be if these shoulders were merely lugs extending outwardly from the door, as has been the practice heretofore.

The free ends 21 of the gates or doors 1 and 2 are provided with diametrically meeting faces 34 (see Figs. 1 and 2), and at a suitable point one of the doors is provided with a socket and the opposite door is provided with a tongue to extend into this socket when the gates come together, thereby locking the gates against relative vertical movement. This relieves the latch of any jarring strains which might be developed in the latch in a vertical plane. In the present instance, the door 2 is provided with a socket 35 and the door 1 is provided with a substantially horizontal tongue 36 which extends into this socket and fits fairly tight in the same.

The handles 5 and 6 project outwardly above the latch, as indicated in Fig. 1, and they prevent the latch from being accidentally struck and opened when the elevator is rising.

The hub 22 of the latch may be provided with a stop shoulder 22a, which may limit the swinging movement of the latch when opening the same.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, nor in the claims, to the paricular embodiment set forth.

What I claim is:

1. A well casing elevator adapted to be supported on elevator links, comprising a pair of semicircular doors hinged together at one end and adapted to encircle a well casing, an outwardly extending ear on each door adapted to receive one of the elevator links, a latch pivotally mounted on one door and adapted to swing in a substantially horizontal plane against the opposite door, said latch located so that its middle is substantially in line with the front and rear central plane of the elevator, the door lying opposite the door carrying the latch having an abutment with a socket extending inwardly in the wall of the door to a point relatively close to the pipe-receiving bore of the elevator, and receiving said latch with the outer face of the latch in its closed position substantially flush with the outer face of the elevator, said abutment also having a guard rib between the latch and the adjacent ear to prevent the adjacent elevator link from striking the latch.

2. A well casing elevator comprising a pair of semicircular doors hinged together at one end and adapted to encircle a well casing, an outwardly extending ear on each door adapted to receive an elevator supporting link, a latch pivotally mounted on one door and adapted to swing in a substantially horizontal plane, an abutment with a socket on the opposite door to receive the latch with the outer face of the latch substantially flush with the outer face of the elevator, a handle extending outwardly from said latch, and a guard rib on the door between the latch and ear to prevent the adjacent elevator link from striking the latch handle.

3. A well casing elevator adapted to be supported on elevator links, comprising a pair of semi-circular doors hinged together at one end and adapted to encircle a well casing, an outwardly extending ear on each door adapted to receive one of the elevator links, a latch pivotally mounted on one door and adapted to swing in a substantially horizontal plane against the opposite door, an abutment with a socket on the opposite door, said socket extending inwardly in the wall of the door to a point relatively close to the pipe-receiving bore of the elevator, and receiving the said latch with the outer face of the latch in the closed position of the latch substantially flush with the outer face of the elevator, and a guard rib on the door between the end of the latch and the ear to prevent the adjacent elevator link from striking the latch.

4. A well casing elevator to be supported on links, comprising a pair of doors hinged together at the rear, and having opposed arcuate faces for encircling a well casing, an outwardly extending ear on each door, a latch pivotally mounted on one door and adapted to swing inwardly to its latching position in a substantially horizontal plane, the opposite door having an abutment with a socket countersunk into the forward face of the same to receive the latch, a spring for urging the latch into the countersunk socket, and a rib projecting outwardly around the edge of the countersunk socket to prevent the lower end of the adjacent elevator link from engaging the latch.

5. A well casing elevator to be supported on links, comprising a pair of doors hinged together at the rear, and having opposed arcuate faces for encircling a well casing, an outwardly extending ear on each door, a latch pivotally mounted on one door and adapted to swing inwardly to its latching position in a substantially horizontal plane, the adjacent edges of said doors having sockets countersunk into the same for receiving the latch and thereby locating the latch so that it lies substantially in the peripheral wall of the elevator in its closed position, and a guard rib extending around the countersunk socket that receives the free end of the latch operating to prevent the lower end of the adjacent elevator link from engaging the end of the latch.

CHESTER A. LUNDEEN.