Sept. 24, 1929. J. GRANT 1,728,930

WELL ELEVATOR

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Fig. 1.

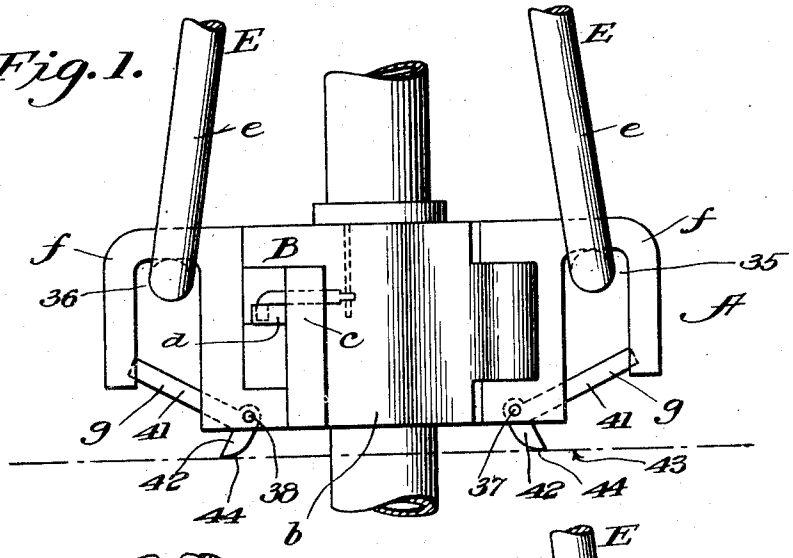


Fig. 2.

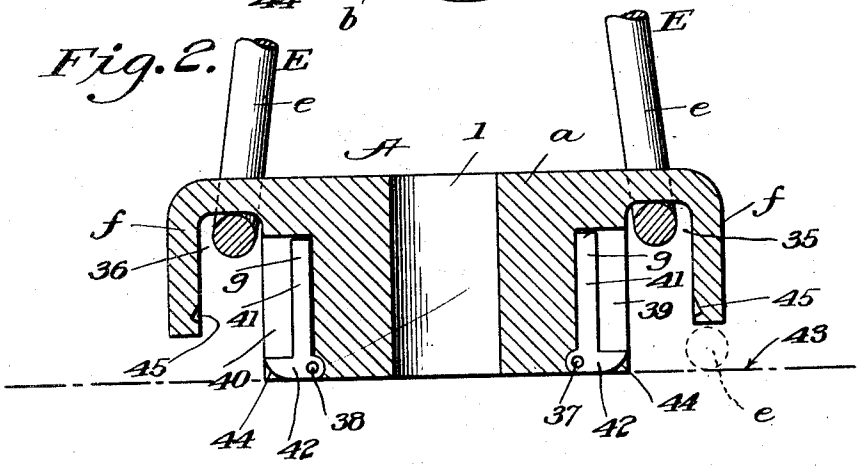
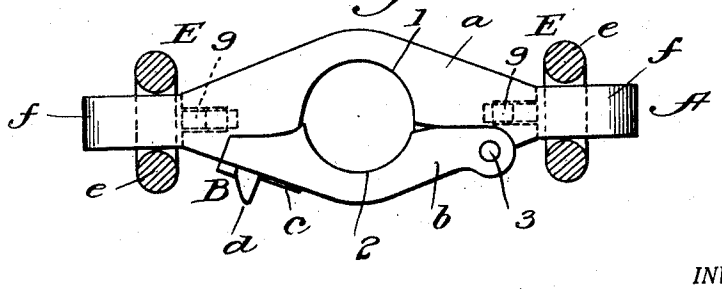


Fig. 3.



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Fig. 4.

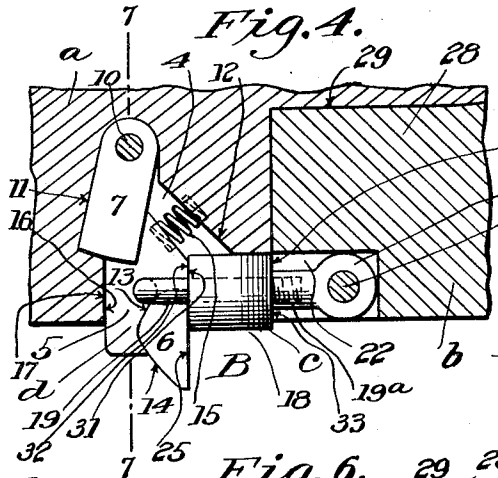


Fig. 5.

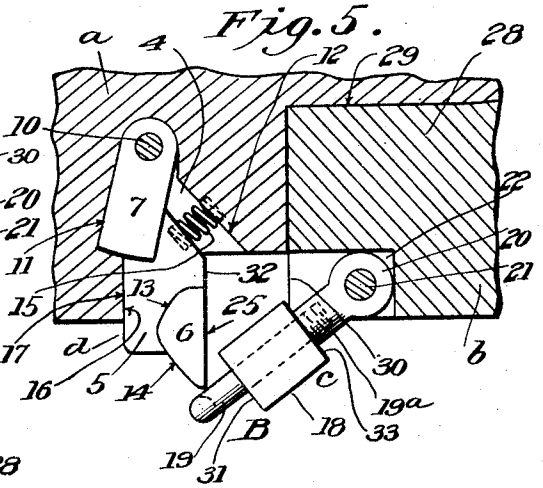


Fig. 6.

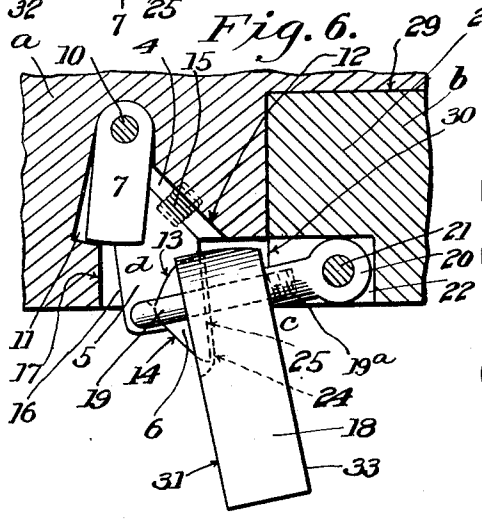


Fig. 7.

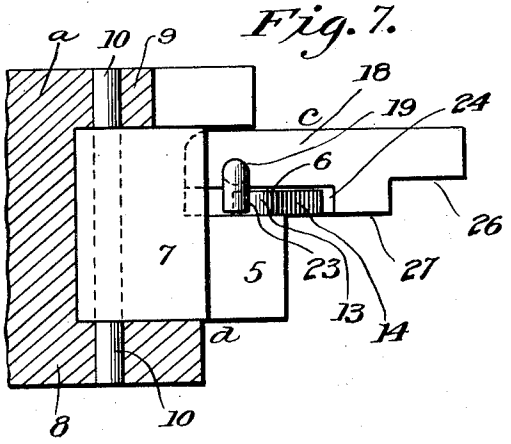
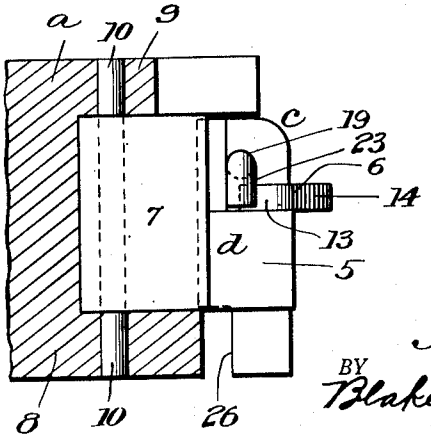


Fig. 8.



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Fig. 9.

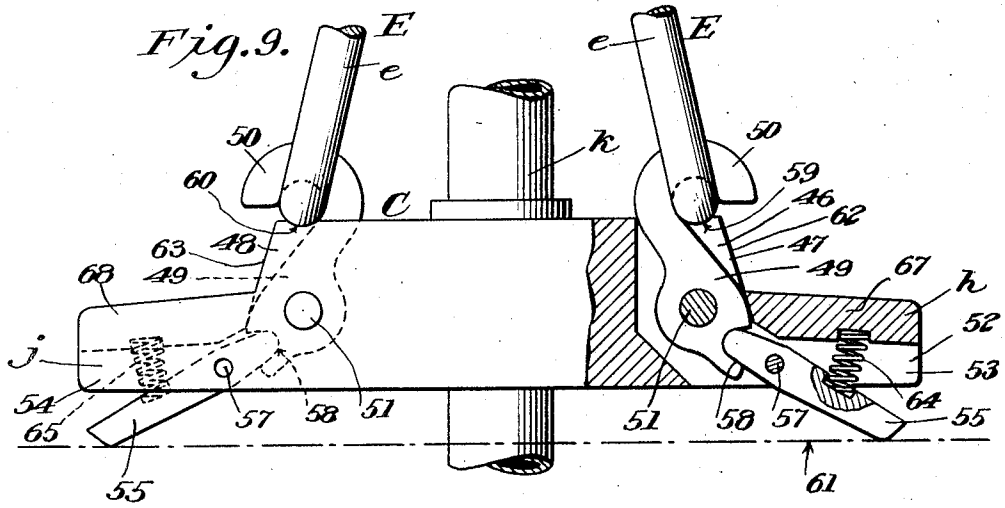
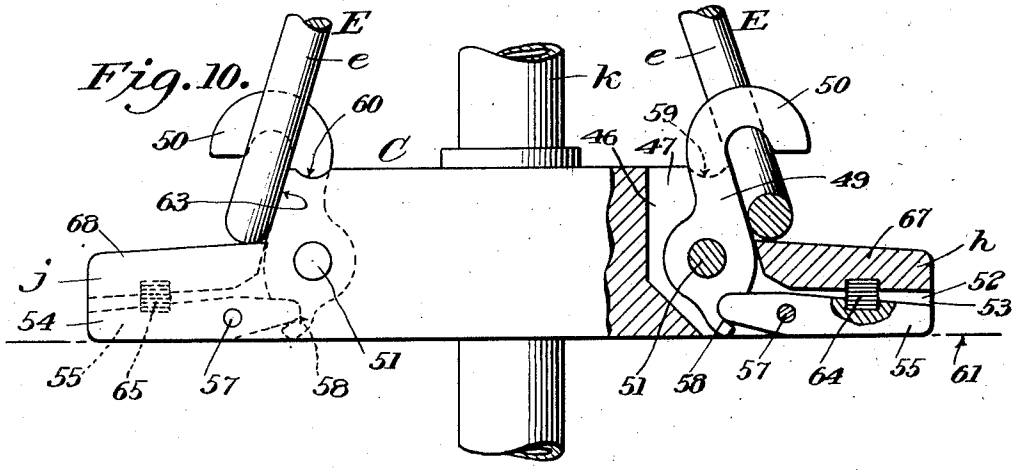


Fig. 10.



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Patented Sept. 24, 1929

1,728,930

UNITED STATES PATENT OFFICE

JOHN GRANT, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BYRON JACKSON PUMP CO., OF WEST BERKELEY, CALIFORNIA, A CORPORATION OF DELAWARE

WELL ELEVATOR

Application filed February 14, 1923. Serial No. 619,000.

This invention relates to well elevators such as used for lifting tubing and the like, and this invention has for an object the provision of an elevator which is so constructed as to provide for positive latching of the gate to the body. Another object is the provision of an improved elevator which will directly signify if a proper latching of the gate to the body has not taken place.

A further and important object is the provision of an elevator which will on proper movement of said elevator provide for or permit disengagement from said elevator of its suspension means.

With the above and other objects in view, the invention consists in the novel and useful provision of a well elevator which is simple in construction, fool-proof and positive in action, which is inexpensive of construction and will perform the function required of it in a positive manner.

In the drawings:

Figure 1 is an elevation of an embodiment of the well elevator with a fragmentary showing of its application;

Figure 2 is a fragmentary vertical sectional view of the well elevator shown in Figure 1;

Figure 3 is a top plan view of the elevator shown in Figure 1;

Figures 4 to 8 inclusive are fragmentary cross sectional views on an enlarged scale of means for locking the gate to the body of the elevator; and

Figures 9 and 10 are views, certain parts being in section, of automatic releasing means associated with the elevator body and the suspension means for releasing the suspension means when the elevator is moved in a given direction, said releasing means being a modification of the releasing means shown in Figures 1, 2 and 3.

Corresponding parts in all the figures are shown by the same reference characters.

Referring with particularity to the drawings the improved elevator is designated as an entirety and in one embodiment by A, and includes two parts, a body *a* and a gate *b*, said parts *a* and *b* being called wings or jaws, and the body and jaws are concavedly recessed as shown at 1 and 2 so as to embrace work and hold the same within the elevator when the gate is closed to the body. In the embodiment shown in Figures 1 to 8 inclusive, I have provided a novel means for maintaining the gate *b* to the body *a*, in a simple and positive manner and in a manner which will ensure a proper locking of the gate to the body without the gate accidentally swinging open and dropping any work from the elevator. The body and gate are hingedly connected at the point 3 in the customary manner, and the free end or the end of the gate adapted to swing open or shut carries latch mechanism adapted to cooperate with locking parts associated with the body *a*. This locking mechanism is designated as an entirety by B, and is formed in two parts, namely, a latch *c* and a catch *d* carried by the body. Reference is now made to Figures 4 to 8 inclusive for an understanding of the lock. The catch *d* is pivotally mounted in a recessed portion 4 of the body *a*, and said catch includes an arm 5 provided with a nose 6. The arm 5 is formed in two parts integrally connected, one part, as 7, being received between bifurcations 8 and 9 of the body *a*, there being a pin 10 extending through said body and through a bore in the part 7, as illustrated in Figure 8. Furthermore, the part 7 is slightly off-set along its marginal edge from the part 5, as illustrated in Figures 4 to 6 inclusive, and the part 7 is adapted to swing within the recessed portion of the body as illustrated in Figures 4 and 6. In this connection it will be noted that the recessed portion is off-set at the point 11 to accommodate this swinging motion of the part 7. The arm 5 in the showing is not as high as the part 7, for the reason that the latch member *c* cooperates with the nose 6 carried thereon, and certain parts of the latch member makes up for the difference in height that exists between the part 5 and the part 7, as illustrated in Figure 8. The exact shape of the recess 4 in the body is arbitrary; however, that in the figures shows that one inner face of the wall surrounding said recess is angled as at 12 with respect to the other faces, and the arm 5 is correspondingly cut, space being provided so as to accommodate for swinging movement therebetween. The

nose 6 is on the top surface of the arm 5, and said nose is provided with cam edges 13 and 14. A coil spring 15 is interposed between the wall 12 and the arm 5 so that the catch *d* is at all times urged away from the wall 12 and in such a manner that the member 7 is normally received in the off-set recess 11, with one edge of the part 5 as shown at 16, in engagement with a wall 17 of the body, this feature being illustrated in Figures 4 and 6.

The latch mechanism *c* includes a latch release arm 18 which is carried upon an arm 19, which arm 19 in turn has a screw-threaded engagement with an extension thereof 19ª which has a part 20 adapted to receive a pin 21, which pin is carried by the gate *b*. In this connection the gate *b* is recessed as shown at 22 for reception of the arm extension 19ª The arm 19 has an angular extremity 23, and this angular extremity is adapted to cooperate at times with the nose 6. The arm 18 is cut away along one marginal edge as shown at 24 so as to cooperate with the edge 25 connecting the cam edges 13 and 14 of said nose 6 during certain movement of the catch and latch; this movement being shown in Figure 6. The handle or arm 18 on the surface 26 is provided with a projecting portion 27 which is accommodated in part within the recess 4 of the body.

The operation of this locking mechanism is as follows:

Assume the gate is closed to the body as shown in Figure 5; thus the gate will have its movable end 28 received in the cut-out portion 29 of the body, as is customary, with the latch open; that is to say, the arm 19 is not engaging any part of the catch *d*. It will be observed that the spring 15 has urged the catch *d* against the wall 17 in the body. Upon lifting the handle 18 upwardly as shown in Figures 6 and 7 the angular extremity 23 of the arm 19 will engage the nose 6 and particularly the point of jointure between the edge 25 and the cam face 14, and this angular extremity will slide along said cam edge 14 and draw the catch inwardly under compression of the spring 15, as illustrated in Figure 6. This will force the nose 6 into the recess 24 of the handle 18. An inward push upon the handle 18 will then force the end 23 over to the cam edge 13 and the spring 15 will be allowed to expand and move the end 23 and cam edge 13 over each other swinging the catch *d* into the position illustrated in Figure 4. When this occurs the handle member may be revolved downwardly so as to lie parallel with the front surface of the gate, as illustrated in Figure 8, and said handle member 18 will be received as between the edge 25 of the nose and the end 30 of the gate. It is obvious that there will be a locked relation between the gate and body through the medium of this lock B, inasmuch as the handle 18 will have face portion 31 bearing against the face 25 and the part 6 and the face 32 of the part 5, with the opposite face of said handle 33 bearing against the end 30 of the gate. This will of course hold the catch *d* against the face 17 of the body *a* and the end 23 will be unable to escape around the cam edge 13 of the nose 6, and consequently a locked relation between the gate and the body will exist assisted by the retention of the part 7 in the recess 11. A lifting of the handle 18 to an approximately horizontal position such as shown in Figure 7 and pulling on the same will cause the end 23 to force the catch *d* inwardly against the spring 15 by the end 23 traveling along the cam edge 13 to where it escapes over the cam edge 14 and releases the gate from the body.

A device of this character ensures that the gate will at times be properly locked to the body, in that an improper closing will swing the gate open, due to the fact that the angled end 23 must reach the cam edge 13 before the gate will lock. Up to this point the gate will not lock, but the spring member 15 will force the arm 19 from the cam edge 14 and tend to swing the gate open or at least swing the handle to an open position similar to that shown in Figure 5, and which position would be readily observed by any operator of the well elevator. The moment the arm 23 reaches the edge 13 it will be "cammed", as it were, into locked position.

Another feature of great importance in this invention resides in the means for disconnecting the suspension means E, shown as links or bails *e* from the well elevator proper. The well elevator body is provided with two outwardly and downwardly projecting arms *f* and the suspension means E is of the double bail or link type, having links *e*, one bail or link *e* being received by one of said arms *f*, as shown at 35 and the other bail or link *e* is received by the other arm, as shown at 36. Finger members *g* are provided for closing the space between the arms *f* and the body when in one working relation, and said fingers respectively are pivoted to the body as shown at 37 and 38, being received in suitable recesses 39 and 40 in said body. The fingers each include two angularly related portions, as 41 and 42, and at the point of jointure of the portions 41 and 42 is received a pivot pin constituting the pivot point for said finger *g*, as shown at 37 and 38 respectively. The part 41 is adapted to extend between the downwardly ranging part of the arm *f* and the body for the purpose of releasably confining the bail *e* to said elevator body. The parts 42 of said fingers are adapted to extend below the base of the body *a* so that the fingers may be revolved about their pivot points upon said members 42 contacting with some object as the floor of a well derrick, as shown at 43. In this connection the ends of said members 42 are curved as shown at 44

to accomplish this swinging of the fingers, and the fingers *g* will then be swung into the recesses 39 and 40 of the body so that the bails *e* may be removed from the elevator proper. In this connection the arms *f* are each provided with an angular recess 45 adapted to receive the end of such finger *g* in one working relation of the parts. The finger *g* may also be moved by hand or otherwise independently of operation by the parts 42.

A second method of releasing the suspensions means E or bails *e* is illustrated in Figures 9 and 10, and as before, said means E consists of two bails or links *e*. The elevator is designated as an entirety by C, and the elevator body is formed with two diametric projections or extensions *h* and *j*, and each extension is recessed as shown at 46 to form two wall portions as 47 and 48 between which walls is received an arm 49 provided with a hook end 50. The wall portions 47 and 48 have pivot members extending therethrough and through the arms 49, said pivot members being designated by 51. Each extension *h* and *j* is likewise grooved as shown at 52, said grooves extending to the recessed portions of said extensions. The grooves 52 are each bounded by two spaced wall portions 53 and 54 between which, for each extension *h* and *j*, is pivoted a finger member 55 by means of a suitable pin 57 extending through the walls 53 and 54 and said fingers. The extremity of each member 49 is recessed as shown at 58 to receive an end of its respective finger 55. The top of the well elevator is provided with two depressions 59 and 60 adapted to confine in part the respective bails *e* when the bails are supporting the well elevator.

Referring to Figure 9 the elevator carries tubing *k* and the gate has been applied to the elevator body; the elevator, as well as the tubing being supported by the bail through the medium of the hooks 50, the bails engaging said hooked portions. Upon the elevator being lowered so as to contact with some surface, as 61, the fingers 55 will be revolved about their pivot points 57 and will force the arms 49 outwardly in the recesses 46 and will allow the bail members *e* to be released from the hook portions 50, such bails thus escaping the depressions 59 and 60. In this connection it is to be noted that the edges 62 and 63 are inclined downwardly with respect to the extensions *h* and *j* so as to aid in effecting the release of the bails *e* from the hooks. Spring members 64 and 65 are interposed between the fingers 55 and the parts 67 and 68 of the extensions *h* and *j*, and the spring members tend to at all times force the fingers outwardly in the portions 52 of said extensions. Thus upon raising the elevator the arms 49 are automatically thrown into the position shown in Figure 9 by the fingers 55 being urged outwardly from the grooved portions 52 under action of the springs 64 and 65, so that any bail member carried by the hooks would be locked as between said hooks and the depressed portions 59 and 60 on the elevator body. Furthermore, the construction shown ensures that the bail will not be released from the hooks 50, when the bail is supporting the elevator C and any load carried thereby, until the arms 55 are allowed to contact with some object.

It is obvious that the fingers *g* and the arms 49 with the hook ends 50 may be manually or otherwise operated.

It is obvious that various changes and modifications and variations may be made in practicing the invention, in departure from the particular showing of the drawings, without departing from the true spirit of the invention.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. A well elevator including a body having arms offset beyond the greatest width of the body and arranged to form unobstructed downwardly opening bail receiving spaces, said body also having countersunk recesses opening into said bail receiving spaces, and closure elements each comprising a keeper finger and a counter-weight pivoted in said recesses and adapted to lie wholly within the same when the body of the elevator rests on a supporting surface.

2. A well elevator including a body having arms offset beyond the greatest width of the body and extending downwardly substantially parallel to the body but terminating short of the bottom thereof to provide unobstructed entrance to the bail receiving space formed by said arms, recesses within the body opening into said space, and closure elements each comprising a finger and a counter-weight pivoted near the bottom ends of said recesses and said closure element adapted to engage with a support to throw the closure elements including the fingers and counter-weights wholly within the recesses when the elevator is resting on said support.

3. A well elevator including a body having hooks projecting entirely beyond the limits of the body to provide relatively unobstructed bail entrance mouths therefor, said body having recesses opposite the ends of the hooks, closure elements each comprising keeper fingers and a counter-weight pivoted in said recesses and adapted to engage with said hooks when the elevator is lifted and also adapted to lie wholly within said recesses when the elevator body rests on a support.

4. A well elevator including a body having laterally offset bail hooks projecting entirely beyond the greatest width of the body, said body also having recesses lying opposite the downturned portions of the hooks, bail retaining fingers including a main portion and an angularly disposed counter-weight ar-

ranged within said recesses, pivots for said fingers located at the junction of said main and angularly disposed counter-weight whereby when the elevator body is lifted the main portions of said fingers will fall into obstructing relation to the entrance of the hooks and the counter-weights will project below the bottom edge of the elevator body.

In testimony whereof, I have signed my name to this specification.

JOHN GRANT.