Nov. 18, 1930. J. GRANT 1,781,922

WELL ELEVATOR

Original Filed Jan. 11, 1923 · 2 Sheets-Sheet 1

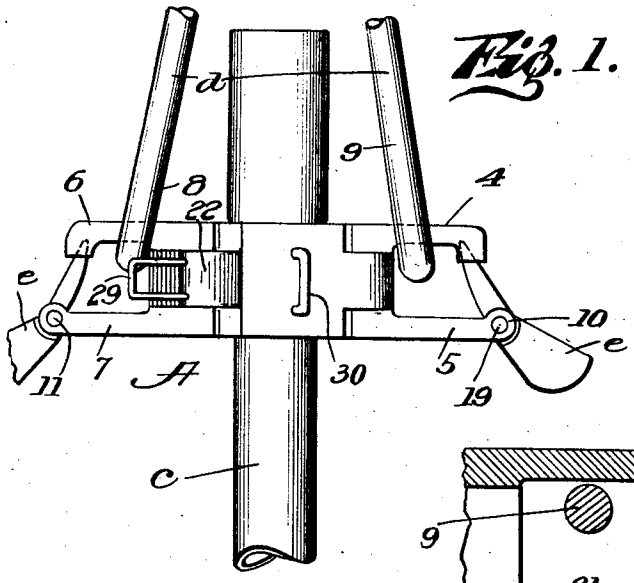


Fig. 1.

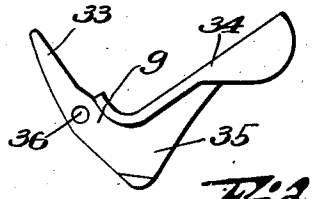


Fig. 4.

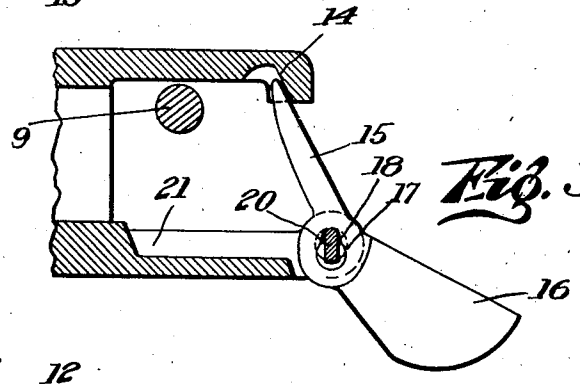


Fig. 3.

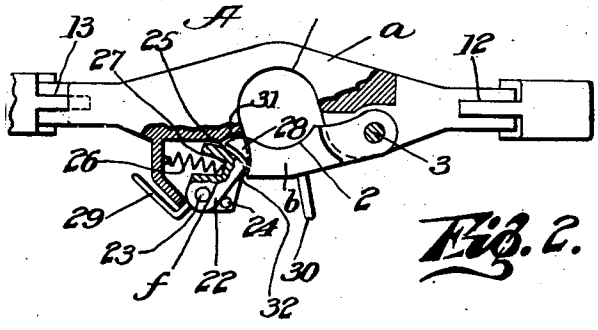


Fig. 2.

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WELL ELEVATOR

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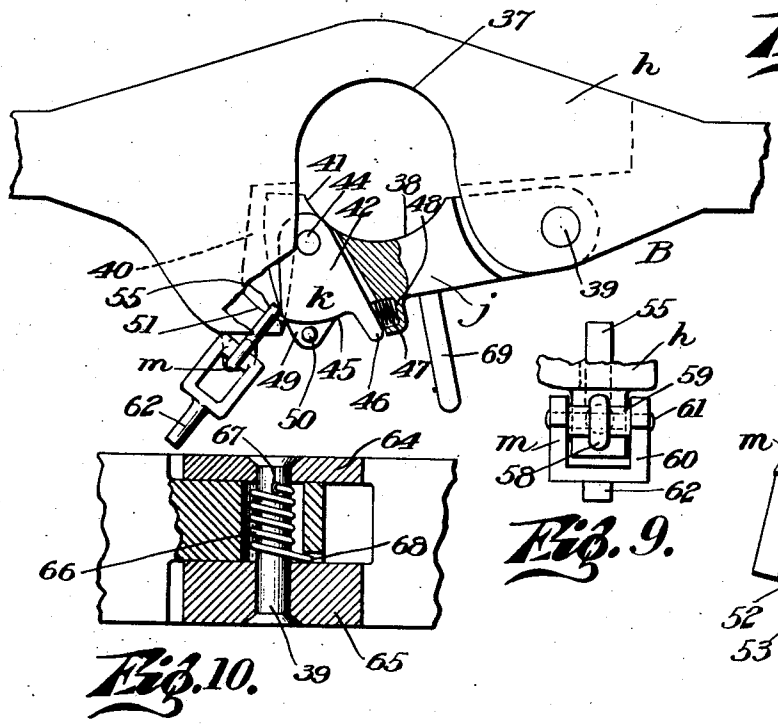


Fig. 5.

Fig. 10.

Fig. 9.

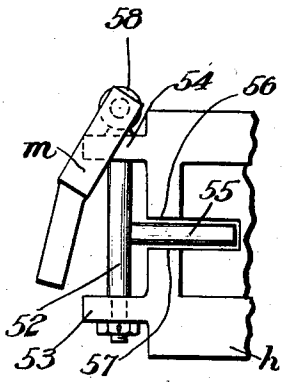


Fig. 8.

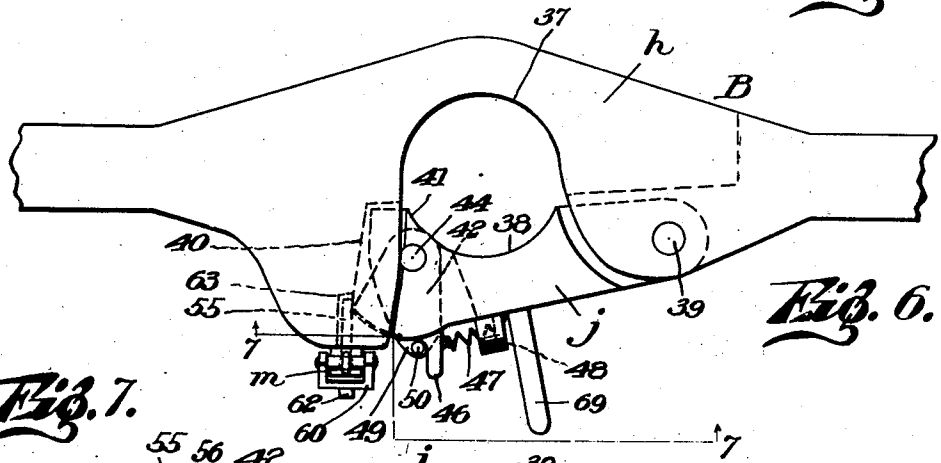
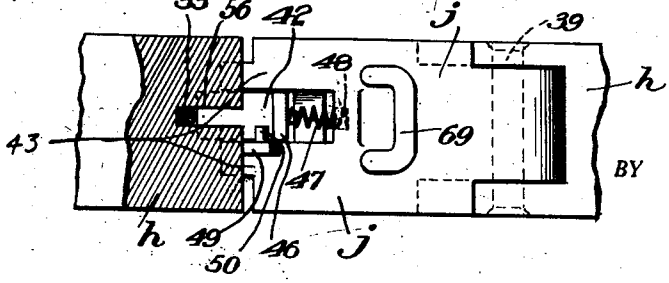


Fig. 6.

Fig. 7.



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Patented Nov. 18, 1930 1,781,922

UNITED STATES PATENT OFFICE

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

WELL ELEVATOR

Application filed January 11, 1923, Serial No. 611,978. Renewed July 17, 1926.

This invention relates to well elevators, broadly stated, whether or not said elevator is useful for lifting casing, tubing or rods. Said invention has for an object the provision of an elevator which ensures that the casing, tubing or rods, as the case may be, are securely locked within the elevator when the elevator is in operation. The invention has for a further object the provision of an elevator which will positively indicate if work to be carried by said elevator is not securely held within the elevator. A further object is the provision of a well elevator which may be automatically disengaged from the bail when the elevator is moved in a given direction, with full assurance that the bail will remain secure to the elevator when the elevator is sustaining a load.

The invention has for further objects the provision of a well elevator which is novel in construction, has few working parts, is positive in its operation, and fool-proof as to operation.

With the above and other objects in view, the invention consists in the provision, construction and arrangement of various parts, members and features, all as shown in the drawings, described generally, and finally pointed out in claims.

In the drawings:

Figure 1 is a fragmentary side elevation of one form of the well elevator;

Figure 2 is a fragmentary top plan view of the well elevator shown in Figure 1, certain parts being in section to show the construction thereof, and with the tubing removed from between the gate and the body of the elevator;

Figure 3 is a fragmentary cross sectional view on an enlarged scale, of certain means for cooperation with the elevator shown in Figures 1 and 2 for maintaining the bail or suspension means in engagement with said elevator;

Figure 4 is a modified form of the means shown in Figure 3;

Figure 5 is a fragmentary view, certain parts being in section, of a slightly modified form of well elevator and showing the latch mechanism inoperative;

Figure 6 is a fragmentary view of the well elevator shown in Figure 5, the latch mechanism being shown in part in dotted lines to show the locking of the gate to the body of the elevator;

Figure 7 is a fragmentary edge view of the elevator shown in Figure 6, and taken on the line 7—7 of Figure 6, and looking in the direction of the appended arrows;

Figure 8 is a fragmentary view upon an enlarged scale of the mechanism shown in Figures 5 and 6 for locking the latch mechanism closed;

Figure 9 is a fragmentary top plan view of the means shown in Figure 8; and,

Figure 10 is a fragmentary view partly in section of additional means between the body of the well elevator and the gate for swinging the gate from the body when the latch mechanism fails to function.

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

Referring with particularity to the drawings and particularly to Figures 1 to 4 inclusive, the well elevator is designated as an entirety by A and as one embodiment thereof, of which *a* is the body and *b* the gate. The body, as is customary, is curvedly recessed as at 1 and the gate is likewise slightly concave as shown at 2, with the gate hingedly connected as at 3 to the body, said gate and body within the curved portion being adapted to confine work such as tubing, casing or rods, as shown at *c* in Figure 1. The body in the embodiment shown is provided with diametrically opposed spaced arms 4, 5, 6 and 7, and the suspension means or bails *d* are associated with the arms 4 and 6, as shown at 8 and 9. Ordinarily the well elevator A might be described by saying that the same comprises two wings or jaws which are adapted to latch around said casing, tubing or rods with the bails fitting over the casing hooks. One feature of the present invention resides in the method by which the bail *d* is retained upon and held to the body of the well elevator. If the arms 4 and 5, and 6 and 7 are left spaced apart the suspension means or bail might slip from said arms with disastrous results. I there-

fore provide movably mounted means *e* which is adapted to close the gap that exists between each pair of spaced arms. In particular the means *e*, of which two are provided, are carried by the arms 5 and 7 by being pivoted thereto, as shown at 10 and 11. In this respect it is to be noted that the arms 5 and 7 are bifurcated as shown at 12 and 13 and that the movably mounted means *e* is carried between said bifurcations. The arms 4 and 6 are each recessed, as shown at 14, and the means *e* includes a finger 15, an end portion of which is adapted to be received within the recessed portion 14. The means *e* likewise is provided with an enlargement 16 and is bored as at 17 at the zone of juncture of the enlargement 16 and the finger 15. The means *e* is also provided with an eccentric portion or groove 18 opening outwardly from the bore 17. A pivot pin 19 is in part rectangular in configuration as shown at 20, and when the finger 15 is within the recess 14 the angular portion 20 is in part receivable within the groove 18. It will thus follow that the finger 15 is locked within the recessed portion 14 and that said finger cannot be moved from the recess 14 until the means *e* is lifted upwardly so that the member 20 may be relieved from the groove 18 whereupon the means may be pivoted and swung downwardly to where the finger is received within a channel or groove 21 the respective one of the arms 5 and 7. The part 16 of the means *e* is of much heavier construction or weighted so as to be drawn downwardly under influence of gravity to swing the means *e* about its pivot point so that the finger 15 may normally lock and close the gap between the arms 4 and 5, or 6 and 7, as the case may be. If the elevator is moved downwardly to a position where the same would contact with the floor, the parts 16 of the means *e* would be hit and this would first lift the means *e* and free the rectangular portion 20 from the groove 18 and then pivot the finger 15 downwardly so that the bail or suspension means *d* might be disengaged from the arms 4 or 6. It will thus be seen that this disengagement of the bail is in a measure automatic upon moving the elevator in a given direction so that means *e* of the elevator may contact with some object, such as the floor or the derrick. It is obvious that the means *e* may be operated manually or otherwise.

Means *f* are provided for releasably holding the body *a* and gate *b* in work-embracing relation. The means *f* is so constructed and operates in such a manner as to "kick" the gate open providing the gate is not securely latched to the elevator body. It frequently occurs when operating well elevators that the gate is not locked to the body with the result that upon hoisting, the gate swings open suddenly dropping the casing or tubing, causing disastrous results either to the operator or to the derrick floor. It has been found expedient to so arrange and relatively associate the moving members which comprise the gate and body, that an improper latching of said members will result in the gate immediately being thrown open so that no mistake as to the latching may be made on the part of the operator. In the embodiment shown in Figure 2 the means *f* comprises a pivoted latch member 22 which is associated with an enlargement upon the body *a* and within a recess in said enlargement and constitutes an abutment on the body at one side of and adjacent the mouth of the casing receiving recess 1 of the body. The pivot point is shown at 23 and a stop pin at 24 for limiting movement of the latch 22 in one direction. The latch 22 is provided with a curved portion 25, and a spring 26 within the recess of the enlargement is adapted to be received in part within a bore 27 in the latch and held to a wall of the enlargement at its opposite end, said spring acting to move the latch outwardly from said recess. The gate member *b* carries a nose 28 which is curved correspondingly with the curve 25 of the latch 22. When the parts are in the position shown in Figure 2 it will be observed that the curved portions of the nose and of the latch cooperate to effect a locking engagement between the body *a* through the medium of the latch and the gate *b*. To release the latch 22 from its locking engagement with the nose 28 means 29 are provided, said means being joined with the latch 22. An outward pull upon the means 29 will swing the latch inwardly against the spring 26 so that the nose 28 may be released from the latch. The gate *b* may then be swung open by pulling upon a handle 30 associated therewith. Assume now that it is desired to use the elevator A to carry the casing *c*. The elevator is brought into position so that the casing *c* is received within the body *a* at the part 1 and the gate is swung inwardly to lock the casing or work within the body. The gate, however, unless it is properly latched will be swung open in the construction shown, for the following reasons: The nose 28 is curved as shown at 31 and this curved portion will engage a marginal portion as 32 of the latch 22. The latch 22 at all times is urged to the limit of its movement by the spring 26, and a swinging of the gate *b* inwardly will cause the curved portion 31 of the nose 28 to slide along the marginal portion 32. If the tip of the nose 28 reaches a point where it would contact with the curved portion 25 of the latch 22 the latch will immediately be thrown into such a position as to engage the nose and lock the gate to the body. It will be obvious that the latch member will at all times contact with the curved portion 31 of the nose and "kick"

or swing the gate about its pivot point 3 to an open position.

A modified form of the means *e* is shown in Figure 4 and is designated as *g*, and said means includes a finger 33 and an enlargement 34. The enlargement 34 is provided with a webbing 35 which is adapted to contact with an object for swinging the device about a point at 36. The means *g* is not provided with the locking arrangement shown for the means *e*, but is adapted when used to hold the finger 33 within the recess 14 by action of gravity upon the enlargement 34. In other particulars the device is similar.

The elevator shown in Figures 5 to 10 inclusive does not differ essentially in principle from the elevator shown in Figures 1 to 4 inclusive, although certain features are incorporated in a slightly different manner for effecting the locking operation. The elevator shown in Figures 5 to 10 inclusive is designated as an entirety by B, the body by *h* and the gate by *j* and the latch mechanism as an entirety by *k*. The body, as in the case of the elevator A is recessed as shown at 37 and the gate *j* is slightly recessed in part as shown at 38 to cooperate with the recessed portion 37 so that the gate and the body may confine work when the gate is closed. The gate *j* is pivotally carried upon a body by suitable means such as shown at 39. The usual extension arms are associated with the body *h* and may be of a form such as shown for the elevator A, the bail being omitted for purposes of clearness. The body *h* is recessed as shown by the dotted lines at 40 and the gate member *j* has its normal free end 41 receivable within said recess when the gate is closed. The gate carries part of the latch mechanism; that is to say, the member 42. Reference to Figure 7 shows that the gate *j* is furcated as shown at 43 with the latch 42 pivotally carried as shown at 44 between said furcations 43. Said latch 42 is curved along it free marginal portion 45 and likewise provided with an arm 46, there being a spring 47 bearing against said arm and having a portion thereof confined within a recess or bore in the gate, as shown at 48. To limit the inward movement or pivot movement of the latch 42 under pressure exerted by the spring the gate is provided with a slight extension 49 carrying a pin 50 adapted to contact with the arm 46. The recess within the body *h* shown at 40 has an abutment portion 51 curved to correspond to the curve 45 of the latch so that when the latch swings outwardly and under urgency of the spring, the gate being closed, the curved portion of said latch will slide along the correspondingly curved portion 51 of the body *h*, as illustrated in Figure 6, and effect a locking relation between the gate and the body. Releasing means *m* are provided for disengaging the latch carried by the gate from the body and said releasing means includes a turnable bolt 52 carried between two spaced studs 53 and 54 projecting from the body *h* and said bolt carries a laterally extending member 55 which is received between two furcated portions 56 and 57 of the body, the said member 55 projecting within the recess 40, as shown in Figs. 5 and 6. The top portion of the member 52 carries an eye 58, there being a sleeve member 59 confined and carried within said eye and a yoke member 60 joined to said sleeve member as by means of a pin 61 joined with the yoke and passed through said sleeve as indicated in Figure 9 in dotted lines. The yoke 60 carries a projecting arm 62. Two positions of the yoke and arm are illustrated in Figures 5, 6 and 8, and it will be observed that the yoke in Figure 8 may be dropped so as to receive within said yoke the projection or stud 54, when the yoke is turned sufficiently so the arm or projecting member 55 will permit the latch 42 to be entirely received within the recess 40. This of course will allow for a locking relation between the gate and body, and likewise ensure that the gate will not be freed from the body unless the yoke member is lifted by its handle 62 to such a position that the yoke may be swung to the left which will move the member 55 so that the same may engage a portion of the latch 42 and force it against the spring in order to free the latch from the body,—all as illustrated in Figure 5. In Figure 6 it will be observed that the recess 40 is likewise provided with a stepped recess 63 which may receive the member 55.

The operation of the elevator B is very similar to that of elevator A, in that unless the gate and body are properly latched the tendency will be to swing the gate free from the body, for the latch contacting with the body will tend to swing the gate from the body due to the pressure exerted by the spring 47 against the arm 46 of the latch. Furthermore, the latch has a certain leverage to effect this opening relation, due to the placement of the hinge point of the body and gate.

As an added precaution, it may be desirable in certain instances to provide an arrangement substantially as shown in Figure 10 and wherein the gate as in Figures 5 to 9 is received between two furcated portions 64 and 65 with the hinge connection which constitutes a pin 39 having a surrounding coil spring 66, one end of which is attached to the pin as at 67 and the other end of which is associated as shown at 68 with the gate, the gate to this end being bored slightly larger than the diameter of the pin and the thickness of the spring. The spring is so arranged that the closing of the gate is resisted, the closing tending to tighten the spring, with the consequence that the gate is at all times swung open unless it is properly latched. As before, the gate may be

provided with the usual hand grasp 69 for swinging the gate open or shutting the gate.

It is believed that the operation of this device is entirely clear from the description, and that no further details are necessary.

It is obvious that various changes and modifications and variations may be made in departure from the foregoing description and disclosure, 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 device of the character disclosed including suspension means, a member adapted to be applied to work and provided with spaced arms adapted to receive said suspension means; in combination with movably mounted means normally closing the space between said arms and adapted to move to open said space upon engagement by said retaining means with an object on the movement of said device in one direction; said last named means comprising a finger mounted upon one of said arms and provided with a projection for causing movement of the finger; further means being provided for releasably locking said finger in one position.

2. A device of the character disclosed including suspension means, a member adapted to be applied to work and provided with spaced arms adapted to receive said suspension means; in combination with movably mounted means normally closing the space between said arms and adapted to move to open said space upon engagement by said retaining means with an object on the movement of said device in one direction; further means being provided for releasably locking said last named means in one position.

3. A device of the character disclosed, comprising a member adapted to be applied to work and provided with spaced projections; in combination with suspension means adapted to be applied in part between said projections, and means for retaining said suspension means in position and adapted to release said suspension means upon engagement by said retaining means with an object on the movement of the device in one direction; means being provided for releasably locking said last named means in one position.

4. In a device of the character disclosed, the combination of a member adapted to be applied to the work and suspension means therefor, of a movable member associated with said first named member and adapted in one position to retain said suspension means in position in the first named member, and means for releasably holding said movable member in one position.

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

JOHN GRANT.