

May 3, 1932.

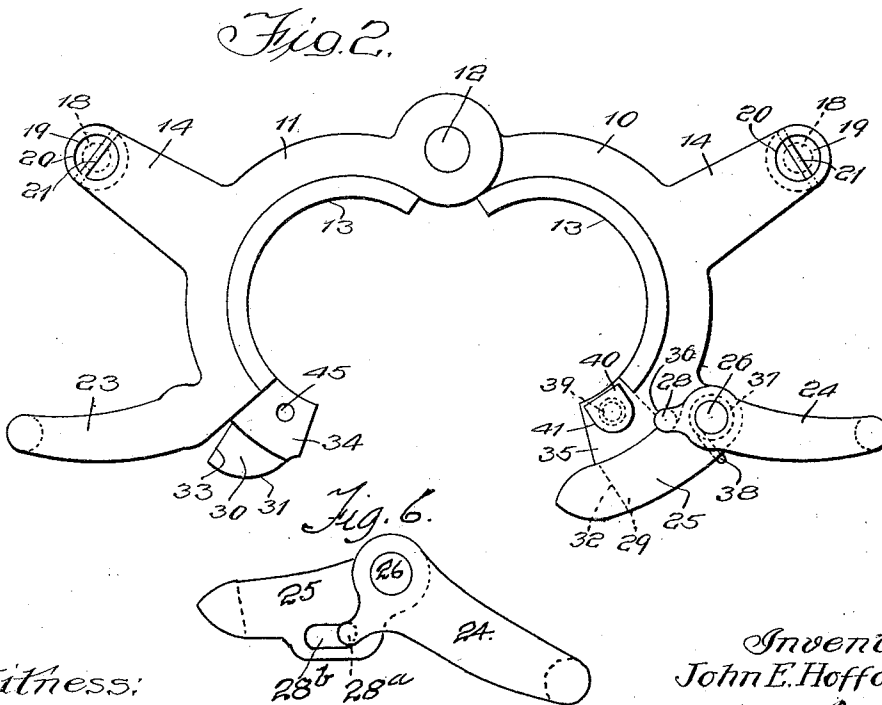
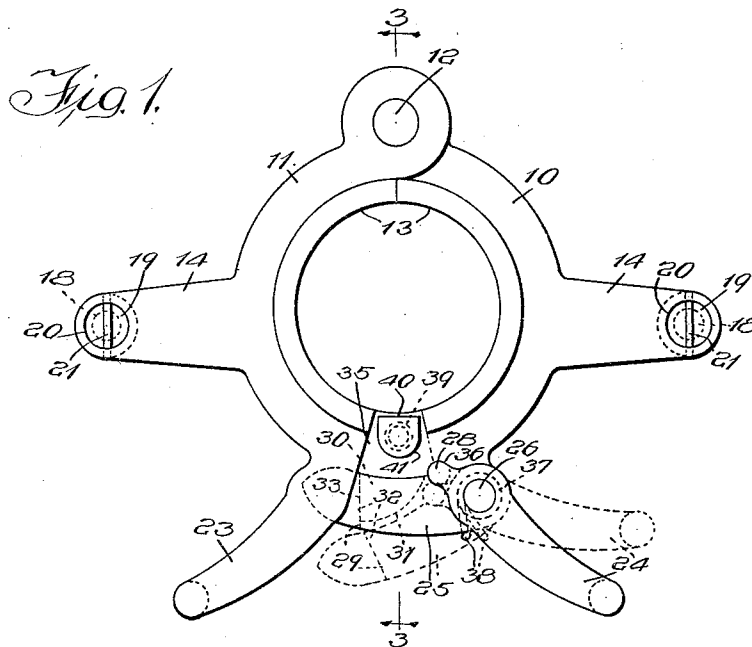
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1,856,636

CASING ELEVATOR

Filed Dec. 5, 1930

2 Sheets-Sheet 1



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Fig. 3.

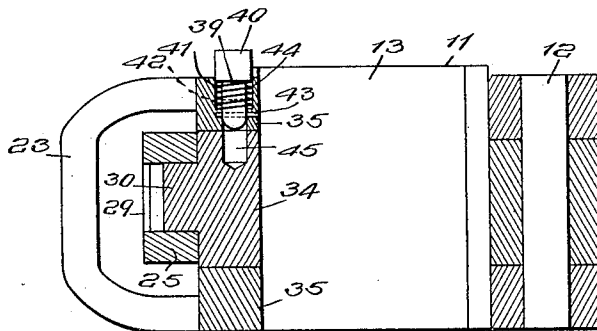


Fig. 4.

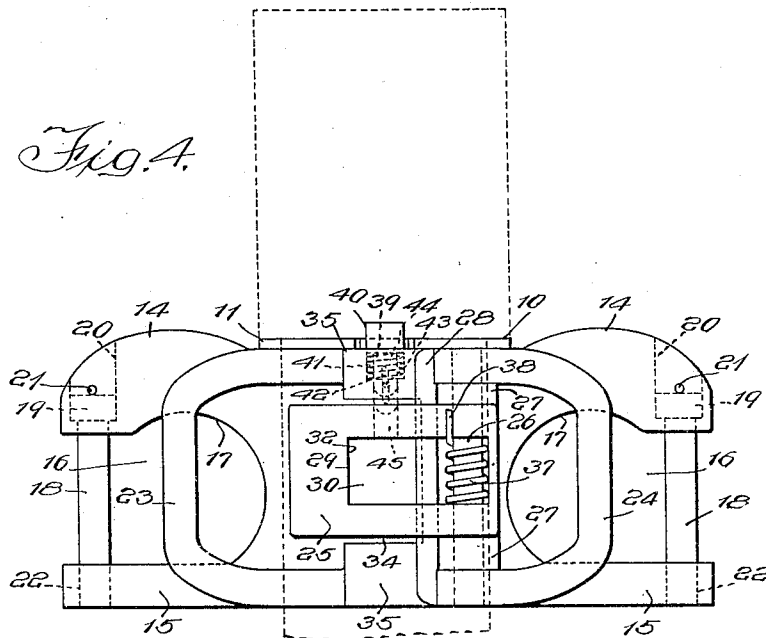
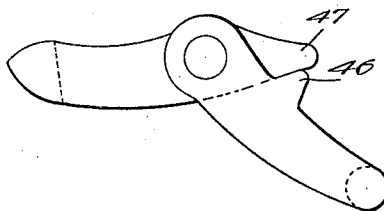


Fig. 5.



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CASING ELEVATOR

Application filed December 5, 1930. Serial No. 500,203.

This invention relates to casing elevators.

The elevator of the present invention is designed primarily for use in the handling of drill stems or pipes for well holes, which are usually removed in four sections at a time, or what is known in the field as fourbles.

In the operation of either withdrawing or lowering the drill pipe into the hole, it is essential that this work be performed as speedily as possible, since of necessity the drilling operation must be suspended while the pipe is being raised or lowered. This raising and lowering of the pipe is a hazardous operation, which must be performed with the least amount of manual exertion, since the operator must work from an elevated position some eighty feet above the ground, and grasp the upper end of the pipe from his position on the "fourble board" and swing the end of the pipe in position to lean against the fourble board while the lower end of the pipe rests upon the floor of the derrick. It is thus essential that provision be made for the easy and expeditious unlatching of the elevator, so that it may be readily removed from the pipe without difficulty or manual exertion, and the removal must be effected in a manner which will guard the hands of the operator against injury which sometimes attends such operations and which is occasioned by the operator's thumb or fingers becoming caught in the elevator during his efforts to unlatch the same.

The elevator of the present invention is designed primarily to meet the conditions stated, and to afford easy and convenient means of unlatching and thereafter opening the elevator by the continued movement of one of the handles in the same direction, with adequate provision for the automatic latching of the sections of the elevator when brought into closing position.

Further objects and details of the invention will appear from the description thereof in conjunction with the accompanying drawings, wherein,—

Figure 1 is a plan view of the elevator in closed position;

Fig. 2 is a similar view showing the sections of the elevator in open position;

Fig. 3 is a cross sectional elevation, taken on line 3—3 of Fig. 1;

Fig. 4 is a side elevation of the elevator;

Fig. 5 is a detail showing a modified arrangement of the latch and handle; and

Fig. 6 is a detail showing a second modification of the latch and handle.

The elevator, as shown, consists of two halves or sections 10 and 11 respectively, each of cylindrical formation, although the latch which more particularly forms the subject matter of the present invention might be applied to a structure divided into three sections, as is sometimes customary in the art to which the present invention relates.

The two half cylindrical sections are hinged together on a pintle 12, and when closed the inner faces 13 are configured to define a truly cylindrical opening through which the casing pipe or tube or other rodlike structure is entered in position to bring its collar, shown in dotted lines in Fig. 4, into contact with the upper face or rim of the elevator.

The two halves or sections of the elevator are provided with diametrically opposed upper suspending arms 14—14 and lower arms 15—15 which define openings 16—16 for the reception of the links constituting the bail from which the elevator is suspended in the usual manner. Each of the upper arms is curvedly configured on its lower face 17 to afford a semi-circular undercut or hook-like arrangement which is well fitted to engage with the associated link of the bail. The opening between the upper and lower arms on each side is guarded by means of a vertically disposed pin 18 provided with an enlarged head 19 fitting within a vertical bore 20 and held in place by means of a cross pin or key 21, or by the use of an ordinary nail. The lower end of the pin is socketed in a recess 22 in the upper face of the lower arm.

One of the halves or sections of the elevator is provided near its free or unhinged edge with a fixed handle 23 which co-operates with a pivoted handle 24 on the other section in the manipulation of the device.

Each of the handles, when the parts are in closed relation, extends curvedly outward, and the two handles stand in curvedly diverg-

ing relation to one another. Each of the handles is of U-shaped formation, which permits ready access for the fingers of the hand and enables the handles to be easily grasped in the palms of the hands to afford a firm and secure grip around the handles.

The fixed or rigid handle 23 merges at its base directly into the wall of the elevator section 11, but the pivoted handle is differently formed to control the operation of a latch member 25. The pivoted handle is similar in its outward formation to the rigid handle, but is pivoted at its base upon a pin or pintle 26 entered through ears or lugs 27—27 outstanding from the wall of the elevator section 10 in position to be closely embraced by the side arms of the handle at the base thereof. The handle is closed at its base and given a stirrup-like formation by the provision of a cross bridge 28 which rests beneath the latch member 25, which is also pivoted upon the pintle 26 and lies between the ears or lugs 27. The latch member is of open loop-shaped formation, being cut away in its center to afford a rectangular aperture 29 for the reception of a keeper 30, which is beveled or rounded on its forward face 31 to permit the latch to cam over said face and thereafter to permit the engaging face 32 of the latch to engage with the abrupt face 33 of the keeper.

The keeper stands outwardly from a tongue-like portion 34 of the section 11, which when the two sections are in closed relation lies between and is embraced by the forwardly projecting sides 35 of the section 10; that is to say, the closing of the sections causes the two engaging free edges to interfit with one another and at the same time causes the pivoted latch to ride up over the keeper in position to engage with the abrupt outer face thereof.

The cross bridge 28 on the pivoted handle, when the parts are closed, rests within a notch or recess 36 formed in the outer face of the section 10 at a point slightly distant from the pin or pintle 26. The latch is normally held in abutting contact with the cross bridge 28 by the action of a coil spring 37 which encircles the pintle 26 within the latch aperture and with the terminus of the spring 38 in overlying relation to the side of the latch, so that it will exert a spring tension thereon, tending to hold the free end of the latch inwardly, but permitting the latch to yield against the spring tension and cam over the keeper, without, however, imparting any movement to the pivoted handle. In short, while the latch and handle are so related that they will move in unison during a latch opening movement, the latch is afforded independence of outward swinging movement on the pintle during the latching operation.

In order to further lock the sections together, when in use, against accidental dis-

placement, a locking pin 39 is provided, having an enlarged head 40. The locking pin operates in a recess 41 in the upper side of the extension 35, and is afforded a limited sliding movement by the provision of a slot 42 through the pin, through which slot is entered a stop 43 which limits the upward projection of the head of the pin under the thrust of a spring 44. The lower end of the locking pin when lowered enters a socket 45 formed in the tongue of the section 11 in position to register with the locking pin when the elevator is closed.

The head of the pin will normally project upwardly in position to be engaged by the collar of the casing pipe or tube being elevated, and when thus engaged will be depressed in position to bring the lower or inner end of the pin into interlocking relation with the socket 45, so that, so long as the elevator is suspending the weight of the tube, the parts will be locked together by the pin in addition to being latched in the manner previously described.

In Fig. 5 is shown a modification of the latch and handle arrangement, in which, in place of the cross bridge 28 previously described, the handle is provided on its rear side with a lug 46 which engages a tail piece 47 outwardly extending from the latch, the relation of the parts being such that as the handle is moved backwardly, the engaging end of the latch will be lifted, while at the same time the latch itself may have independence of movement against spring tension during the latch operation, in the manner referred to in connection with the mechanism first described. In Fig. 6 is shown a second modification, in which the cross bridge 28^a of the handle is so located as to operate within an elongated slot 28^b in the latch, instead of operating beneath the latch as in the construction first described. The slot permits the latch to move freely in latching, but at the same time permits the latch to be lifted by a movement of the handle.

In use, with the sections open or swung apart, the elevator may be easily brought into position to encircle and embrace a pipe immediately below the collar, and when in proper position the sections will be closed by the handles and the latch will automatically slip over and engage the keeper without imparting any movement to the pivoted handle.

The latching of the parts together will bring the locking pin into register with the locking socket, so that, as soon as the elevator begins to lift against the pipe collar, the locking pin will be forced into position and held so long as the pipe is being suspended.

When it is desired to open and disengage the elevator from the pipe, the operator will merely swing the pivoted handle by a continuous movement, which will first have the effect of lifting the latch, and thereafter, by

continued movement, will swing open the section 10, the section 11 being meanwhile held against movement by the fixed handle on that section. This obviates any necessity for separate manipulation of the latch by the thumb or fingers of the operator, which is a difficult and dangerous operation and has resulted in frequent accidents and mutilations due to the difficulty of controlling the heavy pipe and tackle from the elevated position on the fourble board, upon which the operator must stand while the parts are being manipulated. At the same time, by operating the latch by the handle, adequate leverage is afforded to easily throw back the latch during the opening movement, while during the closing movement of the parts the handle will not be subjected to any reverse movement as the latch cams over the keeper, since the latch spring permits yielding of the latch without difficulty. In this way, in the closing of the elevator, the two handles can be forcibly drawn together without any interference in this movement, which would of necessity be occasioned if the latch were in rigid rather than yielding relation to the handle.

The device as a whole is simple and rugged in construction, and so conveniently arranged that it may be operated safely and expeditiously under conditions which render extensive manipulation of the parts difficult and dangerous.

Although the invention has been described as a casing elevator, it is not the intention to limit it strictly to such use, since it might be associated with tongs or like appliances intended for the lifting and manipulation of pipes, rods or tubes, without modification of the means provided for latching and unlatching the appliances.

I claim:

1. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, and a handle associated with the latch, the latch and handle being both pivotally mounted and operating in unison on the opening movement of the latch, and the latch having independent movement in closing and engaging the keeper.

2. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, and a handle associated with the latch, the latch and handle being both pivotally mounted to move on the same pivotal center, the handle positively engaging the latch to effect a positive movement of the latch by the swinging of the handle in opening, and the latch being

capable of movement independent of the handle in closing and engaging the keeper.

3. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, and a handle associated with the latch carrying member, the latch and handle being both pivotally mounted to move on the same pivotal center, the handle positively engaging the latch on its inner side to effect a positive movement of the latch by the swinging of the handle in opening, and the latch being capable of movement independent of the handle in closing and engaging the keeper.

4. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, a handle associated with the latch carrying member, the latch and handle being both pivotally mounted to move on the same pivotal center, the handle positively engaging the latch to effect a positive movement of the latch by the swinging of the handle in opening, and the latch being capable of movement independent of the handle in closing and engaging the keeper, and a spring acting upon the latch and normally holding the engaging end of the latch inwardly and adapted to yield during the latching operation.

5. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, a handle associated with the latch carrying member, the latch and handle being both pivotally mounted to move on the same pivotal center, the handle positively engaging the latch on its inner side to effect a positive movement of the latch by the swinging of the handle in opening, and the latch being capable of movement independent of the handle in closing and engaging the keeper, and a spring acting upon the latch and normally holding the engaging end of the latch inwardly and adapted to yield during the latching operation.

6. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, the first of said members being provided with a fixed handle and the second of said members being provided with a pivoted handle mounted upon a pivot for the latch, both of the handles being of U-shaped formation, and the pivoted

handle being provided with a cross bridge underlying the latch in position to swing the latch with the opening movement of the handle, and a spring bearing upon the latch and adapted normally to hold the latch in contact with the cross bridge, and adapted to yield to permit the latch to ride over and engage the keeper without imparting movement to the associated handle.

7. In a device of the class described, the combination of two half cylindrical sections hinged together and adapted when closed to afford a cylindrical opening for the reception of a pipe casing or the like, the free ends of the sections being configured to interfit when the sections are in closed relation, one of the sections being provided with an outstanding beveled keeper and the other section being provided with a loop-shaped latch adapted to ride over and engage the keeper, a pivot pin carried by the section which carries the latch and upon which the latch is pivoted, and a U-shaped handle having its arms embracing the pivoted end of the latch and mounted upon said pivot pin, said handle having a member engaging said latch and adapted to lift the latch when the handle is swung backwardly, and a spring for normally holding the latch and handle in engaging relation and adapted to yield to permit independent latching movement as the latch rides over and engages the keeper.

8. In a device of the class described, the combination of two half cylindrical sections hinged together and adapted when closed to afford a cylindrical opening for the reception of a pipe casing or the like, the free ends of the sections being configured to interfit when the sections are in closed relation, one of the sections being provided with an outstanding beveled keeper and the other section being provided with a loop-shaped latch adapted to ride over and engage the keeper, a pivot pin carried by the section which carries the latch and upon which the latch is pivoted, and a U-shaped handle having its arms embracing the pivoted end of the latch and mounted upon said pivot pin, said handle having a cross bridge connecting the arms of the handle and underlying the latch and adapted to lift the latch when the handle is moved backwardly, and a spring bearing against the latch and adapted to normally hold the latch in engagement with the cross bridge, and adapted to permit independent yielding of the latch as the same rides over and engages the keeper.

9. In a device of the class described, the combination of two half cylindrical members pivoted together and adapted when closed to embrace a casing pipe or the like, the free ends of the members being configured to interfit when closed, and one of the members being provided with an outstanding keeper having an easy face and an abrupt

face, a fixed U-shaped handle outstanding from the member which carries the keeper, a U-shaped handle mounted on a pivot pin carried by the other member, a loop-shaped latch mounted upon the same pivot pin intermediate the arms of the handle, a cross bridge connecting the inner ends of the arms on the pivoted handle and underlying the latch and adapted to lift the latch when the handle is swung backwardly, and a spring encircling the pivot pin and bearing upon the latch and adapted normally to hold the latch into contact with the cross bridge, and adapted to yield to permit the latch to ride over and engage the keeper without imparting movement to the pivoted handle.

10. In a device of the class described, the combination of a plurality of members pivotally connected, one of the members being provided with a keeper and the other member being provided with a latch adapted to engage the keeper when closed, and a handle associated with the latch, the latch and handle being both pivotally mounted on the same member, and the handle positively engaging the latch to effect a positive movement of the latch by the swinging movement of the handle in opening, and the latch being capable of movement independent of the handle in closing and engaging the keeper.

In witness that I claim the foregoing I have hereunto subscribed my name this 28th day of November, 1930.

JOHN E. HOFFOSS.