June 7, 1932. J. E. HOFFOSS 1,861,473

CASING ELEVATOR

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Fig. 1.

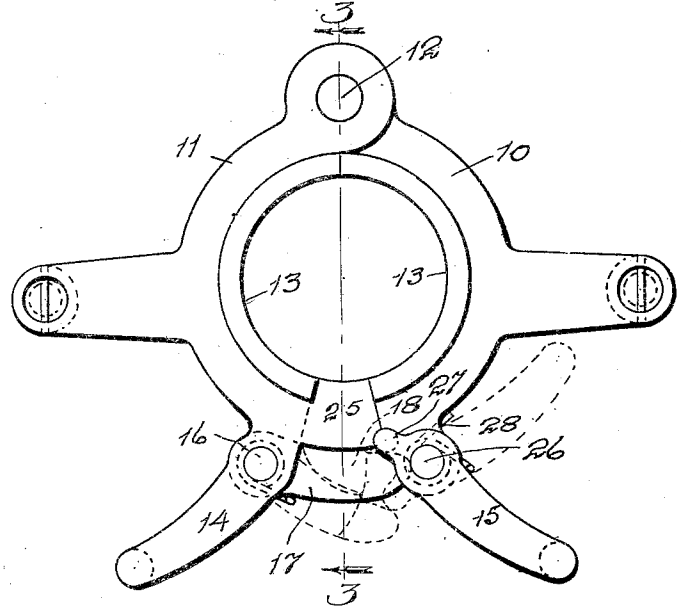
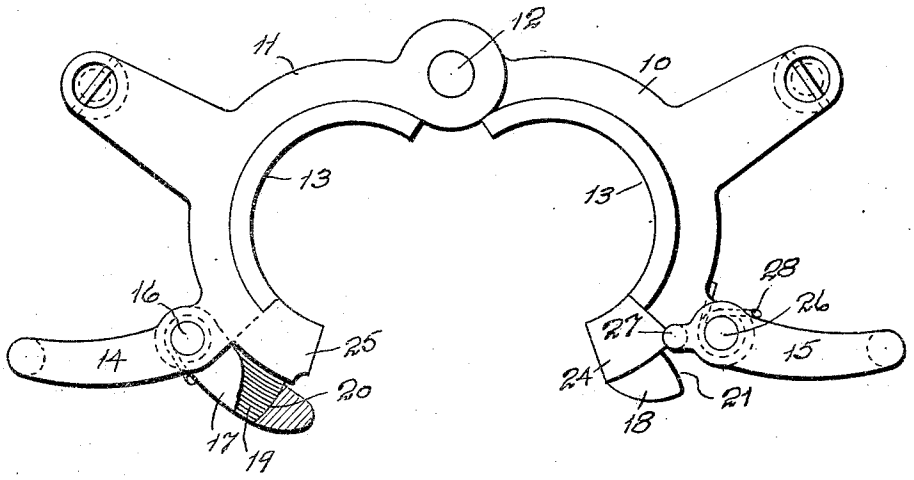


Fig. 2.



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Fig. 3.

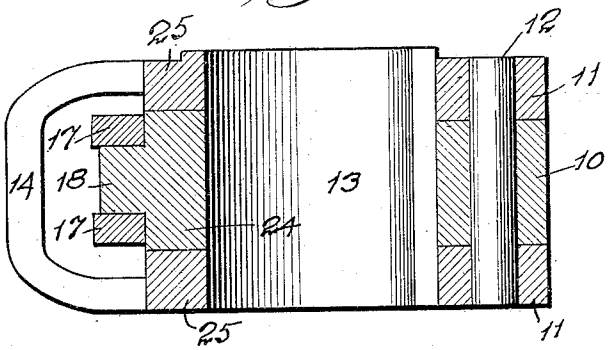
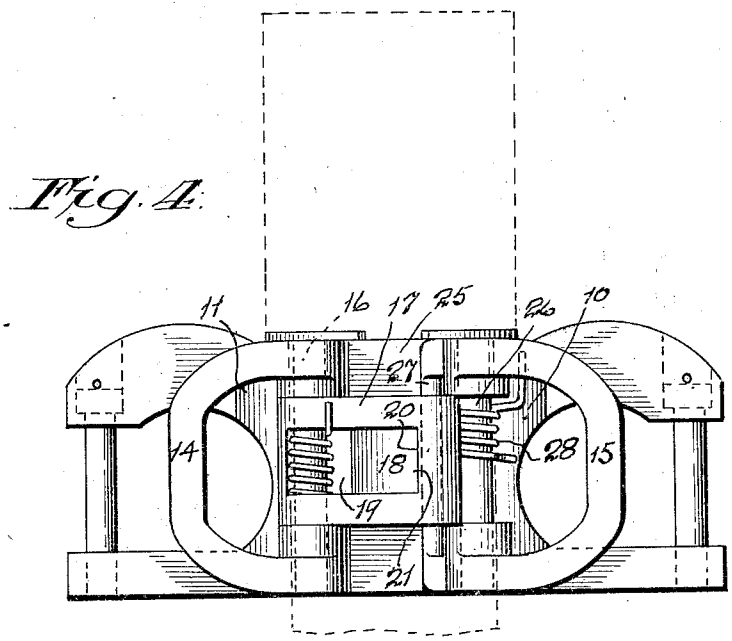


Fig. 4.



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UNITED STATES PATENT OFFICE

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CASING ELEVATOR

Application filed December 26, 1930. Serial No. 504,702.

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 the 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; and

Fig. 4 is a side elevation of the elevator.

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 rod-like 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 means for receiving and holding the sections of the suspending bail, as is common in structures of this character, but these features constitute no portion of the present invention and need not be described in detail.

One of the halves of the sections of the elevator is provided near its free or unhinged edge with a fixed handle 14 which co-operates with a pivoted handle 15 on the other section in the manipulation of the device. Each of the handles, when the parts are in close relation, extends pivotally outward, and the handles stand in curvedly diverging 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 14 merges at its base directly into the wall of the elevator section 11, but the two arms of the handle serve as a mounting for a pintle 16 upon which is pivoted a latch 17 adapted to engage with a keeper 18 on the section 10 of the keeper.

The latch member is of open loop-shaped formation being cut away in its center to

afford a rectangular aperture 19 which affords on the latch an engaging face 20 adapted to engage the abrupt face 21 of the keeper.

The rear face 22 of the keeper is rounded or sloped to permit the latch member to ride up and over the keeper under the tension of a spring 23 which encircles the pintle 16, so that as the two sections are swung into closed relationship, the latch member will automatically yield and ride over the keeper, and thereafter snap in place with the engaging face 20 of the latch in contact with the abrupt face 21 of the keeper.

The two sections of the elevator are configured to interlock with one another when closed, the keeper being formed on a centrally disposed tongue 24 which is configured to fit between the forwardly projecting sides 25 of the section 11.

The side arms of the handle 15 are pivoted upon the ends of a pintle 26, and the side arms are inwardly projected and are connected together by a cross bridge 27, which is so disposed as to underlie the inner or free end of the latch member when closed, the handle being normally held in outstanding relation shown in Fig. 1, by the action of a coil spring 28, which surrounds the pintle 26 and which permits the free end of the handle to be swung backwardly against spring tension to lift the free end of the latch member also against spring tension in the unlatching operation.

In use, with the sections open and swung apart, the elevator may be easily brought into position to encircle or 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 and then swing inwardly to abut against the cross bridge of the pivoted handle.

When it is desired to open and disengage the elevator from the pipe, the operator will swing back the pivoted handle, which first of all will rock upon its pintle to cause the cross bridge to disengage the latch from the keeper, after which the two sections may be swung open to the required degree. The arrangement is one which obviates any necessity for manipulation of the latch by the thumb or fingers of the operator, which is a difficult and dangerous operation, resulting 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 latch will cam over the keeper and automatically latch the parts together without any manipulation on the part of the operator.

The device as a whole is 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 device has been referred to as an elevator, it may be mounted and used as tongs or the like in the manipulation of pipes, rods or similar material.

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 loop-shaped latch adapted to engage the keeper when closed, a U-shaped handle pivoted on the member which carries the keeper, said handle being provided on its inner end with a member normally underlying the free end of said loop-shaped latch and adapted when the handle is swung to swing the latch outwardly and disengage the same from the keeper, and a fixed U-shaped handle secured to the latch carrying member and between the legs of which said latch is pivoted, a spring for normally holding the free end of the latch inwardly, and a spring for normally holding the latch engaging member inwardly.

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 pintle and a latch pivotally mounted thereon, a spring surrounding said pintle and acting to normally hold the free end of the latch inwardly to engage the keeper, a pintle on the member which carries the keeper, a U-shaped handle pivoted upon the pintle and provided at its inner end with a cross bridge underlying the free end of the latch, and a spring for normally holding the cross bridge inwardly in position to underlie the free end of the latch when closed.

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 pintle and a latch pivotally mounted thereon, a spring surrounding said pintle and acting to normally hold the free end of the latch inwardly to engage the keeper, a pintle on the member which carries the keeper, a U-shaped handle pivoted upon the pintle and provided at its inner end with a cross bridge underlying the free end of the latch, and a spring for normally holding the cross bridge inwardly in position to underlie the free end of the latch when closed, and a U-shaped fixed handle on the

latch carrying member through the arms of which the latch pintle is entered.

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 forwardly projecting tongue having a keeper standing outwardly therefrom and the other member being provided with side extensions between which the tongue is adapted to enter in closing, and a loop-shaped latch adapted to engage with the keeper, said latch being pivoted to the member having the side extensions, a pintle on the member which carries the keeper, a U-shaped handle pivoted upon said pintle and provided with an inwardly extending member adapted to underlie the free end of the latch when closed, a spring acting to normally force the free end of the latch inwardly, and a spring normally acting to hold the latch engaging portion of the pivoted handle inwardly.

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 forwardly projecting tongue having a keeper standing outwardly therefrom and the other member being provided with side extensions between which the tongue is adapted to enter in closing, and a loop-shaped latch adapted to engage with the keeper, said latch being pivoted to the member having the side extensions, a pintle on the member which carries the keeper, a U-shaped handle pivoted upon said pintle and provided with a cross bridge carried by the inner ends of the side arms of the handle and adapted to underlie the free end of the latch member when closed, a spring acting to normally force the free end of the latch inwardly, and a spring normally acting to hold the latch engaging portion of the pivoted handle inwardly.

In witness that I claim the foregoing I have hereunto subscribed my name this 8th day of December, 1930.

JOHN E. HOFFOSS.