June 10, 1930. A. ORLOFF 1,762,523

EXCAVATOR TRIP

Filed March 30, 1928

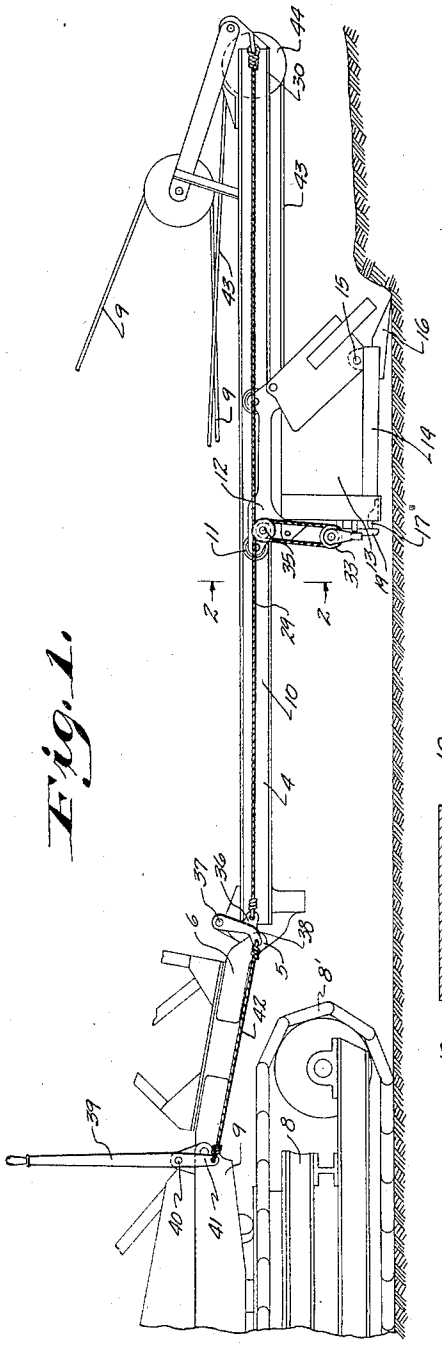


Fig. 1.

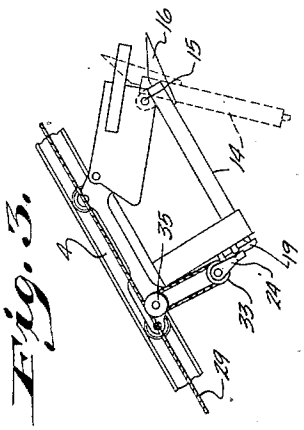


Fig. 3.

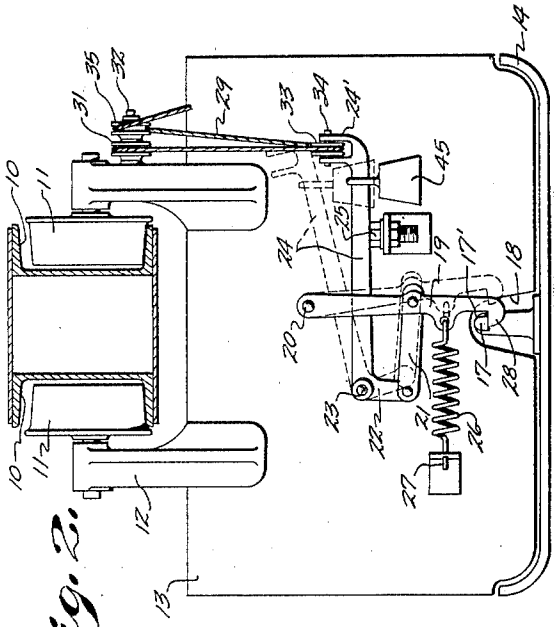


Fig. 2.

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UNITED STATES PATENT OFFICE

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EXCAVATOR TRIP

Application filed March 30, 1928. Serial No. 265,969.

The invention relates to dipper trips.

One object of the invention is to provide a dipper trip mechanism for that type of excavator in which the dipper is drawn through the material to be excavated while being guided on a boom, the trip mechanism embodying the invention being so constructed and arranged that the operator may effect the dumping of the dipper with a minimum of manual effort and independently of the position of the dipper in translation along the boom.

A further object of the invention is to provide dipper trip mechanism of simple construction.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings Fig. 1 is an elevation view of the trip mechanism embodying the invention;

Fig. 2 is a detail sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a detail elevation view showing the dipper in discharging position.

In the drawings the numeral 4 designates a boom, here shown as pivoted at 5 to a frame member 6 associated with the rotating base 7 of an excavator of known construction wherein said rotating base is supported on a travelling base 8 provided with endless propelling treads 8'. The boom is raised and lowered in any suitable manner through a hoisting cable 9 associated with the outer end of the boom and with a drum (not shown) on the machine.

The boom is provided with spaced trackways 10, receiving rollers 11 mounted on a carriage 12 carrying the dipper body 13. The dipper is equipped with a bottom dumping door 14 pivoted to the sides thereof at 15 and usually provided with digging teeth 16.

The rear end of the dipper door carries a locking lug or catch 17 which extends up into an opening 18 in the back end of the dipper and is engageable with a latch 19 pivoted to the back end of the dipper at 20 and operatively connected intermediate its ends by a link 21 to the short arm of a bell crank lever 22. The lever 22 is pivotally mounted on the rear side of the dipper at 23 and its longer arm 24 is adapted to engage an adjustable stop screw 25 mounted on the back of the dipper. A latch-closing spring 26 is secured at one end to the latch beyond its pivot and at the other end 27 to the back of the dipper. With this construction, when the arm 24 of the lever 22 is raised the latch 19 is moved to the dotted line position shown in Fig. 2 against the tension of the spring 26 and the door is free to swing out under the influence of gravity and its load to the dotted line position shown in Fig. 3, the boom 4 having been raised and moved to a desired position. After the discharge of the load the boom is manipulated to cause the door of the dipper to move to a closing position and as the curved face 17' of the catch engages the curved face 28 of the latch 19 said latch is swung out against the tension of the spring 26 until it can snap in under the catch 17 where it is held by the spring 26.

In order to trip the dipper at any position along the boom, I have provided a cable 29 dead-ended at 30 at the outer end of the boom, extending rearwardly over a pulley 31 journalled on a shaft 32 projecting from the carriage, thence downwardly and around a pulley 33 carried on a shaft 34 supported in the outer forked end 24' of the arm 24 of the lever 22, thence extending upwardly over a pulley 35 journalled on shaft 32 and rearwardly to a lever 36 pivoted at 37 adjacent the hinge point of the boom which is just behind the lower end of an arm 38 of said lever. The arm 38 is adapted to be connected in any suitable manner to a manually-controlled lever 39, here shown as a hand-lever pivoted intermediate its ends at 40 on the machine and connected at its lower end 41 by a cable 42 with the outer or lower end of the arm 38.

The dipper is moved out along the boom by means of a cable or dragline 43, connected to the dipper or its carriage and extending over a pulley 44 at the outer end of the machine and then in known manner to a drum (not shown) on the machine, by winding in the cable 43 on said drum.

During the digging operation, as the dip-

per moves out along the boom under the action of the cable 43, the cable 29 is free to run between the pulleys 31, 33 and 35 and hence when the parts are in the position shown in Fig. 1 the trip mechanism does not move, the hand-lever being then in an inoperative position.

When, however, the dipper has been filled, the boom elevated to the proper height for dumping, and the dipper moved over the spot where it is desired to discharge its contents, a forward swing of the upper end of the lever 39, will, through cable 42 and lever 38, put a tension on the trip cable 29 which in turn will cause that portion of the trip cable looped over the pulley 33 between the pulleys 31 and 35 to shorten, thus raising the outer end of the bell crank lever 22, causing latch 19 to move out to the right, outside of contact with the catch 17, thus leaving the dipper door 14 free to swing about its pivot 15 and dump the contents of the dipper.

A spring or weight 45 may be associated with the arm 24 to move the lever 24 to its inoperative position and resist any slight tension in the cable 29 during the movement of the dipper along the boom.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In an excavator, the combination with a boom, a dipper mounted to traverse said boom and provided with a dumping door, of locking mechanism for said door, a trip cable extending lengthwise of the boom, means connecting said cable with said locking mechanism, permitting free translation of said dipper along the boom with a free movement of said dipper along said cable, and means under the control of the operator to tension said trip cable to release said locking mechanism.

2. In an excavator, the combination with a boom, a dipper mounted to traverse said boom and provided with a dumping door, of locking mechanism for said door, a trip cable extending lengthwise of the boom and having a loop connection with said mechanism permitting free translation of said dipper along the boom without operating said locking mechanism, and means for tensioning said cable to shorten said loop connection to release said locking mechanism.

3. In an excavator, the combination with a boom, a dipper mounted to traverse said boom and provided with a dumping door, of locking mechanism for said door including a latch and an actuating member for said latch, a trip cable extending along the boom and having a free running portion associated with said actuating member, and means for tensioning said cable to move said actuating member to release said latch.

4. In an excavator, the combination with a boom, a dipper mounted to traverse said boom and provided with a dumping door, of locking mechanism for said door including a latch, a lever for releasing said latch, means providing a loop in said cable between said dipper and said lever, and means for tensioning said cable to shorten said loop to move said lever and release said latch.

5. In an excavator, the combination with a pivoted boom, a dipper mounted to traverse the boom and provided with a dumping door, of locking mechanism for said door, a trip cable extending from the outer end of said boom to the pivot point thereof, means connecting said cable with said locking mechanism permitting free translation of said dipper along the boom with a free movement of said dipper along said cable, and operator-controlled means associated with the boom pivot end of said cable for tensioning the same to actuate said locking mechanism.

6. In an excavator, the combination with a pivoted boom, a dipper mounted to traverse the boom and provided with a dumping door, of locking mechanism for said door, a trip cable extending lengthwise of the boom from its outer end to its pivot point and having a loop connection with said mechanism permitting free translation of said dipper along the boom without operating said locking mechanism, a lever secured to the inner end of said trip cable, and a manually-controlled lever on the machine operatively connected to said lever to swing the same to tension said cable and shorten said loop connection to actuate said locking mechanism.

In testimony whereof I affix my signature.

ARTHUR ORLOFF.