Dec. 16, 1958 L. BRÜTTING 2,864,200

TOYS WITH INDEPENDENT RELEASE MECHANISMS FOR EACH WINDING DRUM

Filed June 1, 1954

FIG. 1.

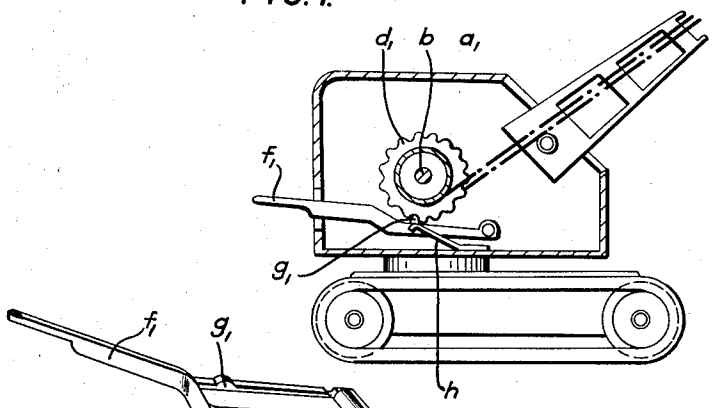


FIG. 4.

FIG. 5.

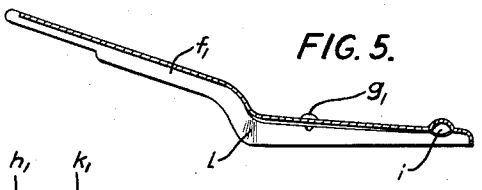


FIG. 2.

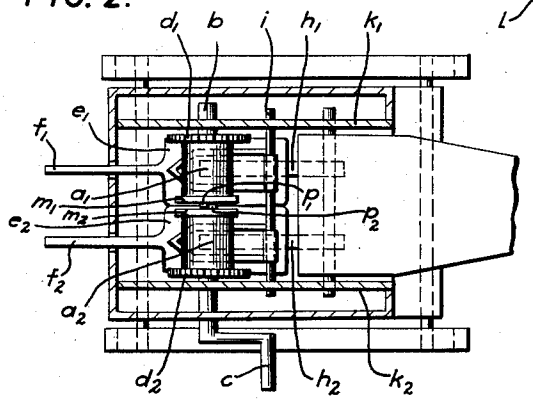


FIG. 3.

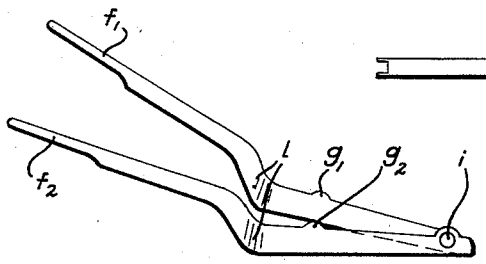
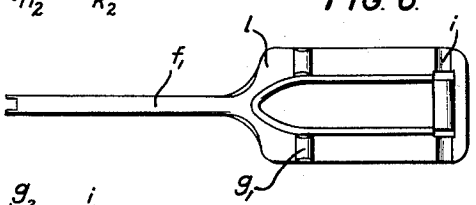


FIG. 6.



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United States Patent Office 2,864,200 Patented Dec. 16, 1958

2,864,200

TOYS WITH INDEPENDENT RELEASE MECHANISMS FOR EACH WINDING DRUM

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Application June 1, 1954, Serial No. 433,396

Claims priority, application Germany June 1, 1953

5 Claims. (Cl. 46—40)

The invention relates to a toy with overhanging beam or jib for carrying a tool such as a grab capable of being raised and lowered and opened and closed, the tool being suspended on a cable line, a second cable line serving for actuating the closing mechanism. The invention is therefore a toy in the form of a grab bucket conveyor, power shovel, crane, or the like.

A former toy is so constructed that each cable line has a separate winding drum and a braking and coupling arrangement is arranged between the two drums. According to this former toy, a locking and releasing device is coordinated to each drum. This, in the case of each drum, consists of a notched or toothed end edge with which a lever provided with a catch cooperates like a ratchet gear, the catch being, for example, a leaf spring which is movable into inoperative position by means of a hand lever.

The present invention consists of an improvement of this locking and releasing device and comprises a release lever with a catch held in its engaging position under spring action. According to the present invention, therefore, the lever acts as locking member, whereas the function of the spring is to guide the lever into its locking position and to secure it in that position.

The construction is preferably such that the release lever is an oscillatable lever which extends transversely to the drum axis, a transverse bead on this lever serves as catch or stop and a leaf spring acts on the under side of this lever and is mounted in the longitudinal direction thereof.

An embodiment of the invention is illustrated diagrammatically by way of example in the accompanying drawing, in which:

Fig. 1 is a longitudinal section thru the carriage of a toy crane;

Fig. 2 is a bottom plan view of Fig. 1;

Fig. 3 shows schematically in side elevation two juxtaposed release levers;

Figure 4 is a perspective view of one of the release levers;

Figure 5 is a longitudinal cross-sectional view of the release lever shown in Figure 4; and

Figure 6 is a top plan view of the release lever illustrated in Figure 5.

The two winding drums a_1 and a_2 are mounted on a common shaft b which is rotatable by means of a hand crank c. A known braking and coupling arrangement is located between the two neighboring, directly facing end sides of these drums. The braking and coupling arrangement may be of the type, for example, illustrated in French Patent 971,532 in which two winding drums are provided on the sides adjacent each other with mutually engaging teeth or pins constituting a braking and coupling arrangement.

The drum a_2 of the instant application is connected with the shaft b in any conventional manner for common rotation therewith whereas the drum a_1 is freely rotatable on the shaft b. The shaft b is rotatably supported in

the frame parts k_1 and k_2. As mentioned before, the braking and coupling arrangement which may be of the type illustrated in the aforementioned French Patent 971,532 is arranged at the mutually opposite faces m_1 and m_2 of the drums a_1 and a_2 and includes two pins p_1 and p_2 projecting from respective faces m_1 and m_2 toward each other so as to abut against each other when the drums a_1 and a_2 are in the corresponding angular position. On the opposite sides or faces, the winding drums a_1 and a_2 are each provided with a notched or toothed rim d_1 and d_2 respectively. The two levers e_1 and e_2, the rearward extensions of which are constructed as handles f_1 and f_2, cooperate with the rims or gears d_1 and d_2 respectively. Each of these levers e_1 and e_2 has a raised bead g_1 and g_2 which, in the locking position shown in Fig. 1, engages in a notch or tooth gap in its coordinated rim d_1 or d_2. The levers e_1 and e_2 are held in locking position by leaf springs h_1, h_2 which press against the under side of their respective levers.

The levers e_1 and e_2 are oscillatable about the shaft or pin i which is mounted in a rigid part of the toy crane.

It is advisable to make the operative portions of the levers e_1 and e_2 within the region effective against the toothed rims d_1 and d_2 of such width that they fill the entire space between frame parts k_1 and k_2 and are guided thereby. As they are moved alternately up and down, it might happen, in the event of lateral play, that they obstruct each other, so that it is preferable to provide them with lateral cheeks 1 (Figures 3 to 6) bent out at an angle to prevent the levers from continually sliding against each other and overlaying or catching.

Operation

The operation of the toy crane in accordance with the present invention is as follows:

By rotating the hand crank c the shaft b is rotated whereby the drum a_2 rigidly mounted thereon is also rotated. The drum a_1 which is mounted freely rotatably on the shaft b is taken along by the coupling arrangement p_1, p_2 located between mutually opposite sides m_1 and m_2 of the drums a_1 and a_2 upon rotation of the drum a_2. At the same time, the toothed rims d_1 and d_2 slip over the raised beads g_1 and g_2. In that manner, the bucket or scoop (not shown) which is connected to the end of the cables or chains wound on the drums a_1 and a_2 may be lowered and raised whereby during lowering the bucket is always open whereas during raising or lifting it is always closed since the pins p_1 and p_2 will always assume the same position during such movement.

If instead of rotating the crank c, the lever f_2 is depressed, then the bucket or scoop is opened because the toothed rim d_2 and therewith the drum a_2 become freely rotatable until the pin p_2 abuts against pin p_1.

If both levers f_1 and f_2 are then simultaneously depressed, the bucket or scoop drops in the opened condition down on the object to be grabbed since the ratchets g_1, d_1 and g_2, d_2 are disengaged.

If only the lever f_1 is depressed, then the bucket or scoop is closed if it has been opened previously since the pin p_1 will abut against pin p_2 in the corresponding position. It is evident that the invention is not restricted to the form of construction illustrated and described. For example, it is possible to use instead of a leaf spring, a spring of some other shape or arrangement.

In addition to the advantages mentioned, the invention, by the wide construction of the levers e_1 and e_2, constitutes an improvement in that the cable lines, which are frequently in the form of chains, do not, when hanging loosely, get tangled underneath the winding drums or wrap themselves around the operating levers, thereby

blocking the mechanism, as in the constructions hitherto known.

I claim:

1. In a toy with a jib for carrying a tool to be moved up and down and to be opened and closed, the combination comprising two separate winding drums, means for mounting said drums on a single shaft, means for securing one of said drums for rotation in unison with said shaft, the other of said drums being freely rotatable on said shaft, a cable line anchored to each of said drums and adapted to be wound thereon, one of said cable lines carrying said tool to raise and lower the same and the other of said cable lines being adapted to open and close said tool, a toothed rim mounted on each drum, a separate locking and releasing device for each drum with spring means urging the same into operative engagement with a respective toothed rim, each device being provided with an operating arm lying outside the entire path of movement of the other operating arm, means provided along mutually facing sides of said drums and constituting a coupling and braking arrangement to selectively entrain the freely rotatably mounted drum by the other drum and to alternately brake each drum by the other upon predetermined relative rotation, and crank means for manually rotating said shaft, said locking and releasing devices as well as said toothed rims being so constructed as to enable rotation of said shaft upon actuation of said crank means in either direction with said locking and releasing devices in the engaging positions thereof.

2. A toy as set forth in claim 1, wherein each locking and releasing device includes an oscillatable releasing lever provided with a bead constituting an engaging element for engaging a respective toothed rim.

3. A toy as set forth in claim 1, wherein each locking and releasing device includes a releasing lever and wherein said spring means includes a leaf spring for each releasing lever acting on the underside of the respective releasing lever to hold it in the locking position.

4. A toy as set forth in claim 1, wherein each locking and releasing device includes an oscillatable releasing lever provided with a bead constituting an engaging element for engagement with a respective toothed rim, and wherein said spring means includes a leaf spring for each releasing lever arranged in the longitudinal direction of the lever and acting on the underside thereof for maintaining the lever in a locking position.

5. A toy as set forth in claim 1, wherein said locking and releasing devices consist of two releasing levers, one for each drum, oscillatably mounted side by side about a common axis, and wherein each of said releasing levers is provided with lateral cheeks bent outwardly at an angle for preventing overlay of one of said releasing levers with respect to the other in the event of lateral play.

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