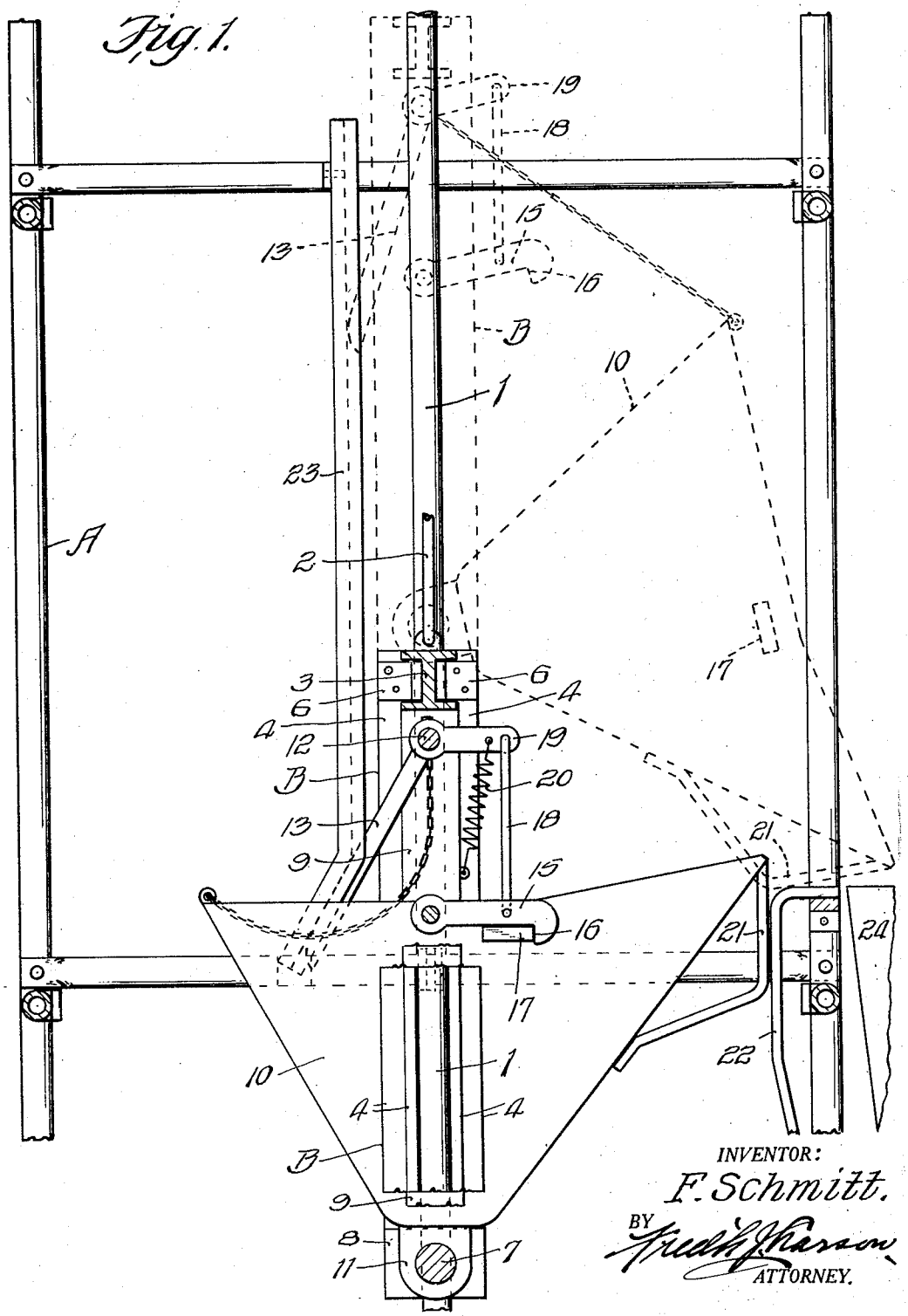
Dec. 1, 1931. F. SCHMITT 1,833,915

TRIPPING MECHANISM FOR HOISTING BUCKETS

Filed March 31, 1930 2 Sheets-Sheet 1

Fig. 1.



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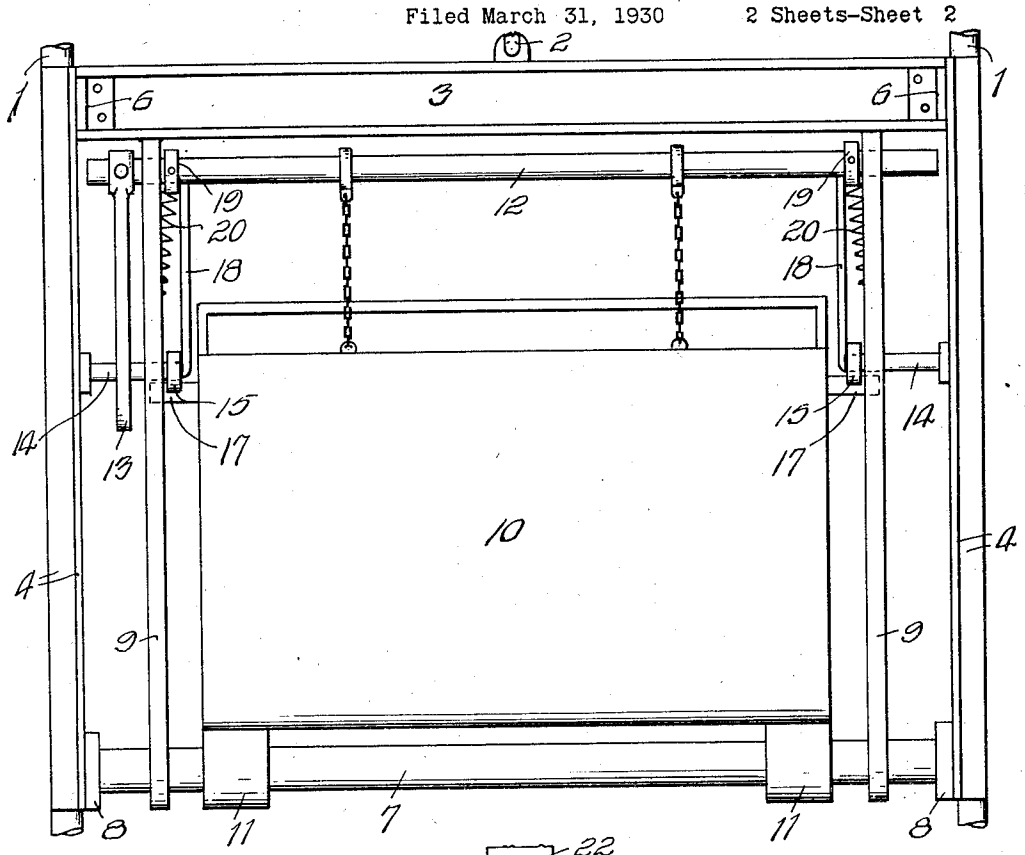


Fig. 2.

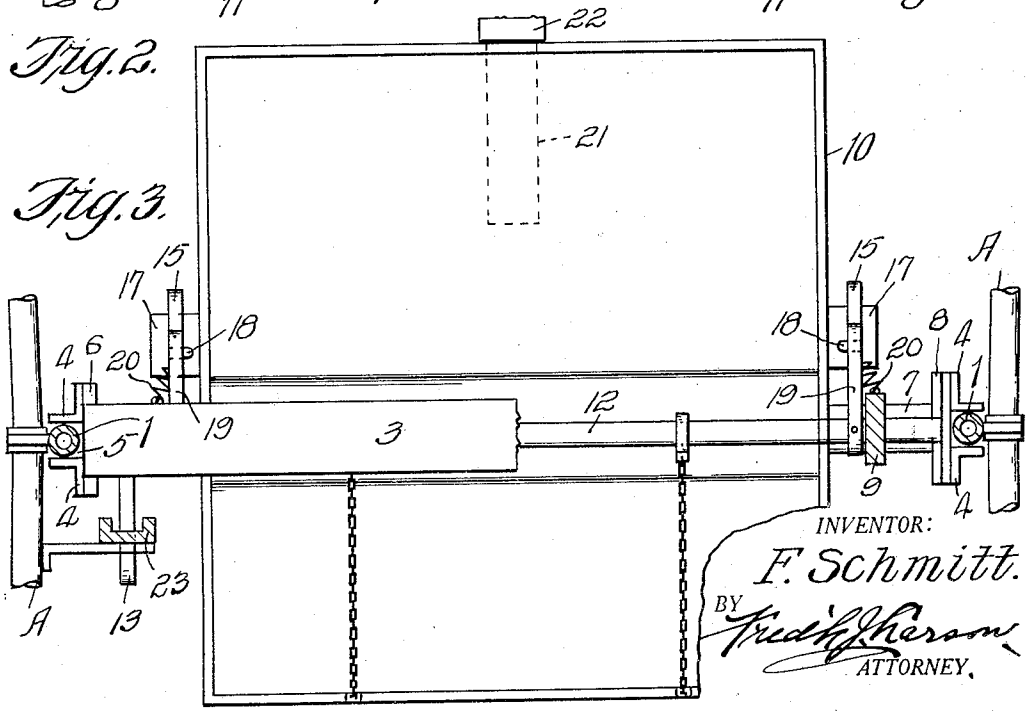


Fig. 3.

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TRIPPING MECHANISM FOR HOISTING BUCKETS

Application filed March 31, 1930. Serial No. 440,456.

My invention relates to hoisting mechanism and more particularly to tripping mechanism for releasing a skip bucket during its ascent to allow it to be tilted for dumping the contents thereof and guide means for returning the bucket to its normal upright position during descending movement thereof.

It is the object of my invention to provide a skip bucket with laterally directed ears adapted to be engaged by pivoted latch members carried by a hoisting frame for holding the bucket in its normal upright position and to provide means supported by a tower for moving an arm which is adapted to raise the lever dogs from contact with the bucket ears to release the bucket and permit it to tilt for discharging the contents thereof at any desired elevation from the ground or floor of the tower.

A still further object of my invention is the provision of a tripping mechanism for hoisting buckets which possesses advantages in points of simplicity and efficiency, and, at the same time proves itself comparatively inexpensive in cost of manufacture.

With the above and other objects in view, the invention consists in the novel features of construction, arrangement and combination of parts hereinafter more fully described and finally pointed out in the claims hereto appended.

Referring to the accompanying drawings forming a part of this specification, wherein like characters of reference denote similar parts throughout the several views:

Fig. 1 is a side elevation of the skip bucket tripping mechanism embodying the features of my invention.

Fig. 2 is a rear elevation thereof.

Fig. 3 is a top plan view of my invention.

Referring to the drawings, the reference numeral A designates a suitable tower provided with suitable opposed vertical track members or tubular guides 1 for guiding a hoisting frame B in its up and down movements of travel in the tower by means of a cable 2.

The hoisting frame consists of a top cross beam 3 to each end of which is secured the upper ends of a pair of spaced angle iron members 4 to provide a way 5 to receive the vertically disposed guides 1 and by which the frame is guided in its up and down movements. The angle iron members 4 are connected to the cross beam 3 by suitable angle plates or their equivalent 6. The lower end of the hoisting frame embodies a fixed cross shaft 7 which is connected to and supported by end plates 8 which are suitably secured to the lower ends of the angle iron members 4. Included in the hoisting frame structure are a pair of vertically disposed members 9 which are connected at their upper ends with the cross beam 3 and at their lower ends with the cross shaft 7, as shown in Fig. 2.

A skip bucket 10 adapted to carry wet concrete or any other desired material is pivotally supported at its lower end upon the cross shaft 7 through the medium of a pair of suitable bearings 11 carried by the bucket 10. The skip bucket 10 is disposed in the uprights 9 of the hoisting frame, as shown in Fig. 2.

A cross shaft 12 is journaled at its ends in the upper ends of the frame uprights 9 just below the cross beam 3. The shaft 12 is provided with a bucket trip lever 13 directed rearwardly and downwardly from the shaft 12. The trip lever 13 is adjustably fixed to the cross shaft 12 near one end thereof so as to impart rotation to the shaft 12 as will be apparent hereinafter.

Pivotally connected to a pair of rods 14 carried by the uprights 9 and the angle iron member 4 and disposed at opposite sides of the skip bucket 10 adjacent the upper edge thereof, are a pair of latch members 15 each having a shoulder 16 adapted to normally contact with the front faces of a pair of laterally directed ears 17 carried by the side walls of the bucket 10 for holding the bucket in its upright position relative to the hoisting frame, as will be apparent from Figs. 1 and 3. A suitable upright link 18 connects each latch member 15 with a pair of fixed lever arms 19 carried by and directed forwardly from the rotatable cross shaft 12 so that the latch members 15 will be raised and lowered in unison with the fixed lever arms

19. A coiled spring 20 connects each lever arm 19 with the uprights 9 of the hoisting frame so as to normally hold the lever arms 19 and the latch members 15 in their closed or lowermost positions. Should one of the springs 20 break during operations, the other spring will be sufficient to move the latch members 15 into their closed positions in contact with the bucket ears 17.

The bucket 10 is provided on its front wall with a fixed runner member or skid 21 adapted for contact with a vertically disposed guide member 22 carried by the frame work of the tower A during ascending movements of the bucket 10 just prior to tilting movement thereof and to move the bucket 10 to upright position from a tilted position during descending movement of the bucket 10.

The tower A is provided with a vertical channeled guide member 23 against which the free end portion of the trip lever 13 strikes during ascent of the bucket 10 for unlatching the latch members 15 from the laterally directed bucket ears 17 when the bucket 10 has reached a predetermined elevation in the tower, thereby unlocking the bucket 10 relative to the hoisting frame so that the bucket will tilt forward by gravity and discharge the contents thereof, such as wet concrete into a suitable hopper 24 located outside the tower A and from which it is carried by gravity to any place remote from the tower.

The latch members 15 remain in their elevated position during the period of time the bucket is discharging its contents and is again lowered for locking the bucket 10 in its upright position relative to the hoisting frame when the bucket 10 has descended sufficient to right the bucket, which position is shown in full lines in Fig. 1. The dotted line positions in Fig. 1 illustrate the bucket 10 in its dumping position and the tripping lever 13 and latch members 15 in the positions they assume while the bucket 10 is tilted for discharging its contents.

Tripping mechanisms heretofore employed have been very inefficient and undependable and have caused much grief to the hoisting engineer as the mechanism could not be depended upon to lock the bucket in its upright position at a predetermined elevation, or unlock the bucket when desired.

From the foregoing description taken with the drawings, it is apparent that I provide a mechanism that will positively hold the bucket 10 in an upright locked position relative to the hoisting frame until it has reached a predetermined elevation in a tower, that it will be unlocked at a predetermined elevation to permit tilting movement thereof and that it will be securely locked again in its upright position relative to the hoisting frame at a predetermined elevation during the descent of the bucket after it has been tilted and discharged its contents.

I have not illustrated the entire height of a tower, but merely enough to show its relation to the hoisting frame and bucket, the bucket closing guide and the bucket tripping lever and its guide member.

The many advantages of the herein described invention will readily suggest themselves to those skilled in the art to which it appertains.

From the foregoing description, it is evident that a simple device for this purpose has been disclosed, but it is to be understood that I do not desire to restrict, or limit myself to the very details of the construction shown and described, which is merely illustrative, it being obvious that changes, not involving the exercise of invention, may be made without conflicting or departing from the spirit of the invention within the scope of the appended claims.

What I claim is:

1. In combination with a tower structure including a vertical track extending the full height of the tower, a hoisting frame slidable up and down upon said track, a bucket pivoted to said frame and having its center of gravity so disposed relative to the frame as to cause the bucket to tip forwardly for discharging the contents thereof, locking means for holding the bucket in an upright position relative to the frame, means for unlocking the bucket from the frame to permit tilting movement thereof when it has ascended to a predetermined elevation within the tower, said means including a rockshaft carried by the hoisting frame transversely of and above the bucket, a latch pivoted to the hoisting frame to engage a bucket protrusion, means connecting the latch with the rockshaft, a trip lever extending from the rockshaft to slidably engage a trip bar carried by the hoisting frame, and means for righting the bucket to its upright position as it starts to descend in the tower to enable the locking means to again hold the bucket in its upright position until again unlocked for tilting movement relative to the frame.

2. In combination with a tower having a vertical track, a hoisting frame and a tiltable bucket for said frame, of a rockshaft carried by the hoisting frame above the bucket, a latch member pivotally carried by the hoisting frame below one end of the rockshaft, an arm fixed to the rockshaft, a link connection between the arm of the rockshaft and the latch member, an ear directed from one of the side walls of the bucket for the latch member to engage to hold the bucket in its upright position, a trip lever arm carried by the rockshaft, means carried by the tower upon which the trip lever rides when the bucket has ascended to a pre-

determined elevation in the tower for imparting movement to the rockshaft for raising the latch member to unlock the bucket relative to the frame and permit the bucket to tip forwardly and discharge its contents, and resilient means for lowering the latch member for locking the bucket in its upright position relative to the frame when the frame and bucket have reached a predetermined elevation in the tower during the descent of the bucket.

3. In combination with a tower structure including a vertical track upon which a hoisting frame is mounted for up and down movements, an off balanced skip bucket hingedly supported by said frame, an ear directed outwardly from one of the side walls of the bucket, a latch member pivoted to the frame adapted to engage said ear for holding the bucket in an upright position, a rockshaft carried by the hoisting frame, a trip lever fixed to the rockshaft, a connection between the rockshaft and the latch member, means carried by the tower along which the trip lever slides when the frame and bucket carried thereby reach a predetermined elevation in ascending the tower for imparting movement to the rockshaft to retract the latch member from the bucket ear thereby releasing the bucket to permit it to tip forwardly to discharge the contents thereof, and means carried by the tower and the bucket to return the bucket to its upright position relative to the frame during the initial part of the descent of the frame and bucket and resilient means to bring the latch member back into engagement with the bucket ear after the bucket has been returned to its upright position and the trip lever has released itself from sliding contact with the means carried by the tower to again lock the bucket relative to the frame.

4. In combination, a tower including a vertical track, a hoisting frame mounted for sliding movement upon said track, a bucket mounted in said frame having its center of gravity so disposed as to cause it to tip forwardly for discharging its contents, a rotatable cross shaft carried by the frame, a pair of spaced forwardly directed latch members pivoted to said frame, a pair of arms fixed to said shaft and disposed above said latch members, links connecting the latch members with the arms, coiled expansion springs connecting the arms with the frame for normally holding the arms and latch members in their lowermost positions, ears directed laterally from the side walls of the bucket to be engaged by the latch members for holding the bucket in a vertical position relative to the frame, a vertically disposed trip bar carried by the tower at a predetermined elevation, a trip arm directed downwardly and rearwardly from the aforesaid shaft adapted to be moved forwardly in an arcuate path when brought into sliding contact with the vertically disposed trip bar upon ascension of the frame and bucket to rotate the cross shaft and release the latch member from contact with the bucket ears to allow the bucket to tip forwardly and discharge its contents and means carried by the tower and the front wall of the bucket adapted for sliding engagement to swing the empty bucket from its tipped position into its upright position during descent of the bucket within the tower so that the bucket will again be held against tipping forwardly by the latch member upon disengagement of the trip arm with the trip bar.

5. A device for hoisting and discharging wet concrete from skip buckets at predetermined elevations during the construction of a building, comprising, in combination, a tower including opposed guide rails to provide a track, a carriage including a frame ridable up and down on said track and a bucket tiltably supported by said frame, a rockshaft mounted in said frame and disposed above the tiltable bucket, means connecting the bucket with the rockshaft for locking the bucket in an upright position relative to the frame, a vertically disposed trip bar fixed at a predetermined elevation to the tower, an inclined plane formed at the lower end of the trip bar, a trip lever arm fixed to and directed from the rockshaft for sliding contact with the trip bar to impart rotary movement in one direction to the rockshaft for releasing the bucket to permit tilting thereof to discharge its contents and resilient means for returning the trip lever arm to its normal position after descending below the trip bar fixed to the tower.

6. A device for hoisting and discharging wet concrete from skip buckets at predetermined elevations during the construction of a building, comprising, in combination, a tower including opposed guide rails to provide a track, a carriage including a frame ridable up and down on said track and a bucket tiltably supported by said frame, a rockshaft mounted in said frame and disposed above the tiltable bucket, means connecting the bucket with the rockshaft for locking the bucket in an upright position relative to the frame, a vertically disposed trip bar fixed at a predetermined elevation to the tower, an inclined plane formed at the lower end of the trip bar, a trip lever arm fixed to and directed from the rockshaft for sliding contact with the trip bar to impart rotary movement in one direction to the rockshaft for releasing the bucket to permit tilting thereof to discharge its contents, resilient means for returning the trip lever arm to its normal position after descending below the trip bar fixed to the tower and slidable contacting means for elevating the bucket from

its tilted position to its upright position during the initial movement of its descent.

7. In combination, a tower having a vertical track, a hoisting frame mounted for up and down travel on said frame, a tiltable wet concrete carrying bucket supported by said hoisting frame, a rockshaft carried by the hoisting frame above the bucket, a pair of laterally directed ears secured to the side walls of the bucket near the upper edges thereof, a pair of latch members pivotally connected to opposite sides of the hoisting frame below the rockshaft to normally engage said bucket ears, a pair of arms fixed to said rockshaft and disposed above the latch members, links connecting the arms with the latch members, resilient means for holding the latch members in contact with ears of the bucket, a trip lever arm fixed to and directed downwardly and rearwardly from the rockshaft and a fixed trip bar having an inclined lower end for initial engagement with the trip lever arm to move the trip lever arm and impart movement to the rockshaft for elevating the latch members from contact with the bucket ears just prior to dumping operation of the bucket.

8. In combination, a tower having a vertical track, a hoisting frame mounted for up and down travel on said frame, a tiltable wet concrete carrying bucket supported by said hoisting frame, a rockshaft carried by the hoisting frame above the bucket, a pair of laterally directed ears secured to the side walls of the bucket near the upper edges thereof, a pair of latch members pivotally connected to opposite sides of the hoisting frame below the rockshaft to normally engage said bucket ears, a pair of arms fixed to said rockshaft and disposed above the latch members, links connecting the arms with the latch members, resilient means for holding the latch members in contact with ears of the bucket, a trip lever arm fixed to and directed downwardly and rearwardly from the rockshaft, a fixed trip bar having an inclined lower end for initial engagement with the trip lever arm to move the trip lever arm and impart movement to the rockshaft for elevating the latch members from contact with the bucket ears just prior to dumping operation of the bucket and means carried by the tower and the bucket for righting the bucket from its tilted dumping position to its upright position upon descent of the bucket.

In testimony whereof, I have hereunto affixed my signature.

FRED SCHMITT.