March 18, 1924. 1,487,183

A. W. RYBECK

LEVER CONSTRUCTION

Filed Jan. 19, 1923

Fig. 1

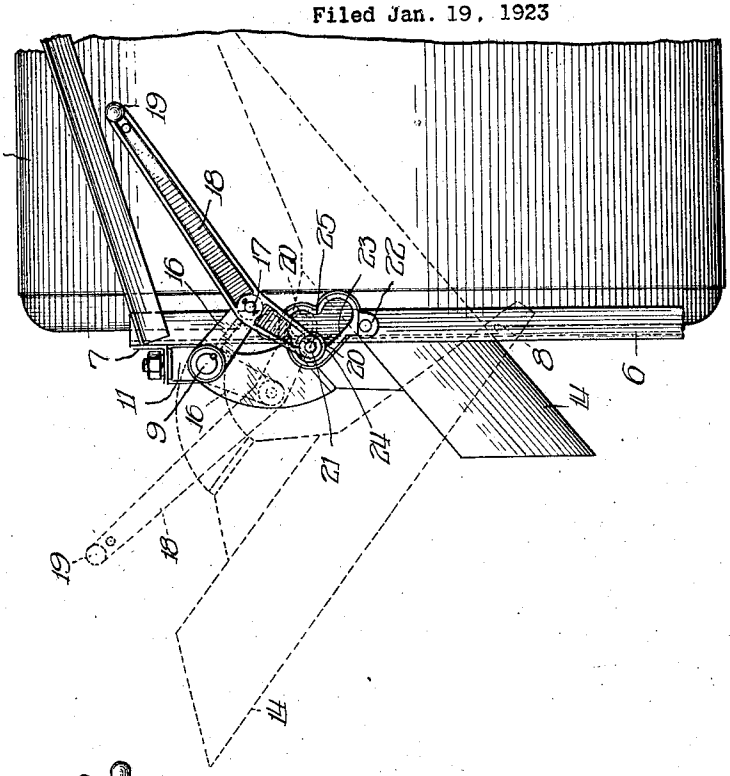
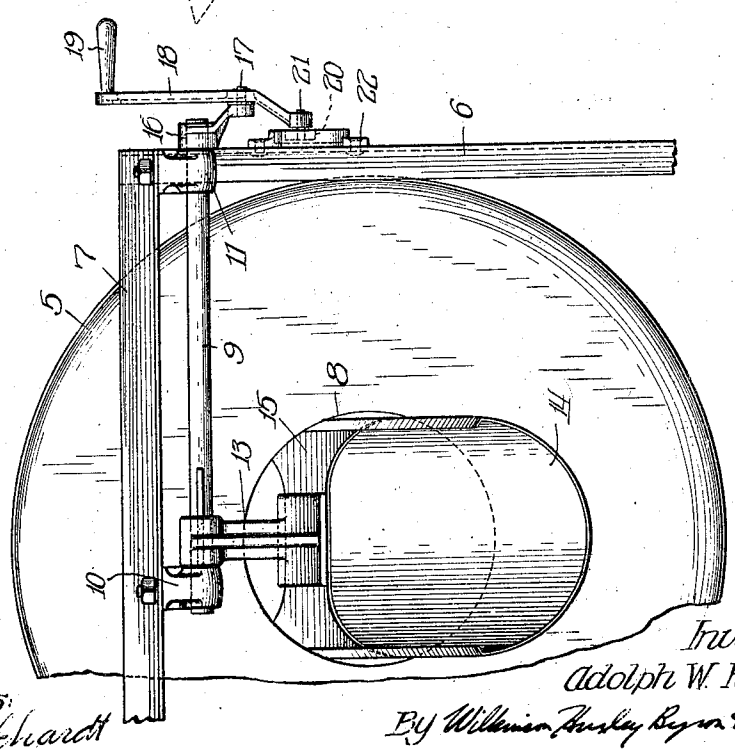


Fig. 2



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UNITED STATES PATENT OFFICE.

ADOLPH W. RYBECK, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE T. L. SMITH COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

LEVER CONSTRUCTION.

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To all whom it may concern:

Be it known that I, ADOLPH W. RYBECK, a subject of the Kingdom of Sweden, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Lever Constructions, of which the following is a specification.

This invention relates to a new and improved lever construction and more specifically to an arrangement of levers adapted to rock a shaft.

In the specific form shown, this rock shaft carries the discharge chute at a non-tilting type of concrete mixer, but obviously the construction is capable of numerous other uses where a similar rocking movement is desired.

In certain types of concrete mixers commonly denominated the non-tilting type, the mixing drum is not tilted to receive or discharge material but the material is discharged by a chute inserted into the drum through an axial opening, the chute receiving and discharging the material which is thrown upon it by the mixing elements in the drum. In order to stand the wear incident to such service, the chute must be formed of comparatively heavy material and it is moreover subject to considerable load when in the discharging position. It must be moved into and out of the discharging position for every batch of concrete mixed and consequently mechanism easily handling the chute is essential to efficient mixer operation.

It has been common in the past to swing the chute from the mixer frame and to operate it with the assistance of a toggle connected counterweight carried by a shaft capable of being rocked or rotated. Such constructions are heavy and cumbersome and involve considerable additions to the mixer supporting structure.

It is an object of the present invention to provide shaft rocking mechanism adapted for handling comparatively heavy weights and for manual operation without requiring the application of excessive force.

It is an additional object to provide such a lever which automatically locks the shaft in either limiting position of its motion.

It is also an object to provide a construction of the character described which is simple in design, composed of but few parts and which may be readily and cheaply applied to existing installations.

Other and further objects will appear as the description proceeds.

I have illustrated a preferred embodiment of my invention in the accompanying drawings, in which—

Figure 1 is a side view illustrating my invention applied to a mixer chute; and

Figure 2 is a face view of Figure 1.

The rotating mixer drum 5 is supported and rotated by suitable mechanism which forms no part of the present invention and has not been shown. The frame comprising members 6 and 7, is located upon the side of the drum provided with the discharge opening 8. A rock shaft 9 is carried in hangers 10 and 11 suspended from frame member 6. The chute supporting arm 13 is keyed to shaft 9 and supports the chute 14 by means of the cross-member 15.

The arm 16 is keyed to the end of the shaft 9. The free end of the arm 16 is pivotally connected at 17 to the operating lever 18 at a point between the ends of the latter lever. The lever 18 is provided with an operating handle 19 of usual type. The opposite end of the lever 18 carries the thrust roller 20 which is pivotally supported on the stud 21 secured to the lever 18. The bearing member 22 is secured to the upright 6 of the frame and is provided with the irregular inner bearing surface 23 which receives the thrust roller 20. This surface is provided with the inwardly extending portions 24 and 25, the purpose of which will appear hereafter.

The chute has been shown in the figures in full lines in the dumping position. The weight of the chute and of the material it carries tends to swing the chute toward the horizontal position and consequently to swing the arm 16 in the clockwise direction. This tendency is resisted by the portion of the lever 18 between pivot 17 and the thrust member 20. This thrust member 20 engages the upper portion of the forward side of the bearing surface above the portion 24, as shown in Figure 1. This engagement positively prevents swinging of the chute.

In order to swing the chute to the mixing position shown in broken lines in Figure 1, the lever 18 is swung by means of handle 19

in the counterclockwise direction. At the start of this motion, the roller 20 rides up over the portion 24 of the bearing guide 23. At this time, the chute is swung a slight distance in the counterclockwise direction. As the roller passes down the surface 23 to its lowermost position, the chute swings towards the horizontal and when the roller 20 reaches the lowermost position, the arm 16 and lower section of the lever 17 are in alignment. Continued counterclockwise movement of lever 18 swings the arm 16 beyond this position, the roller 20 moving up the inner side of the guide 23, up around and beyond the portion 24. As the roller 20 reaches its dotted line position, the chute drops back sligthly from its uppermost position as the roller passes above the portion 24, its engagement with which causes the chute to be locked by its own weight in the dotted line or mixing position.

The movement in either direction is accomplished by a simple continuous movement of the lever 18 by means of its operating handle 19. It is necessary to apply a certain amount of force to cause the roller to ride over the locking rise of the cam guide, but as soon as the roller clears the rise, the weight of the chute causes it to swing rapidly towards the opposite position when a relatively slight force applied to the lever carries the roller 20 over the locking rise at that end of the movement.

The lever construction is simple in design, composed of but few parts and may be readily operated to swing a comparatively heavy chute without any excessive manual exertion. It is also efficient in automatically locking the chute in either one of its limiting positions.

I have illustrated one specific embodiment of my invention by way of example, but it is my intention to cover all such modifications as come within the scope of the appended claims.

I claim:

1. Shaft rocking means comprising an arm keyed to the shaft, a lever pivotally connected at a point intermediate its ends, to the end of the shaft arm, a thrust member carried by one end of said lever and a bearing adapted to receive the thrust member.

2. Shaft rocking means comprising an arm keyed to the shaft, a lever pivotally connected at a point intermediate its ends, to the end of the shaft arm, a thrust member carried by one end of said lever and a bearing adapted to receive the thrust member, said bearing being adapted to permit limited movement of the thrust member relative to the bearing.

3. Shaft rocking means comprising an arm keyed to the shaft, a lever pivotally connected at a point intermediate its ends, to the end of the shaft arm, a thrust member carried by one end of said lever and a bearing adapted to receive the thrust member, said bearing presenting against the thrust member a closed cam surface permitting movement of the member in an irregular path guided by said surface.

4. Shaft rocking means comprising an arm keyed to the shaft, a lever pivotally connected at a point intermediate its ends, to the end of the shaft arm, a thrust member carried by one end of said lever and a bearing adapted to receive the thrust member, said bearing being adapted to permit limited movement of the thrust member relative to the bearing, and being provided with means adapted to resist movement of the member at certain points in its range of movement.

5. In combination, a shaft adapted to support a discharge chute, and means for rocking said shaft comprising an arm keyed to the shaft, a lever having an intermediate point thereof pivotally connected to the end of said arm, and means associated with one end of said lever adapted to permit a limited movement of the lever.

6. In combination, a shaft adapted to support a discharge chute, and means for rocking said shaft comprising an arm keyed to the shaft, a lever having an intermediate point thereof pivotally connected to the end of said arm, and means associated with one end of said lever adapted to permit a limited movement of the lever, the movement of said lever end being restricted to an irregular path by said means, and movement of the lever by force applied to the free end thereof serving by means of the shaft arm to rock the shaft.

7. In combination, a shaft adapted to support a discharge chute, and means for rocking said shaft comprising an arm keyed to the shaft, a lever having an intermediate point thereof pivotally connected to the end of said arm, and means associated with one end of said lever adapted to permit a limited movement of the lever, said means being provided with portions adapted to restrain movement of the lever at the limits of its range of movement.

8. In combination, a shaft, a discharge chute suspended therefrom and adapted to be swung into and out of operative position by rocking movement of the shaft, an arm keyed to the shaft, a lever having an intermediate point thereof pivotally connected to the end of said arm, a thrust roller carried by one end of said lever, and a bearing having a closed cam surface permitting movement of the cam roller in a closed irregular path, the shaft arm, lever and cam surface being so related that at one point in the range of movement of the cam roller the discharge chute is in operative position, and at another point is in the inoperative position.

9. In combination, a shaft, a discharge chute suspended therefrom and adapted to be swung into and out of operative position by rocking movement of the shaft, an arm keyed to the shaft, a lever having an intermediate point thereof pivotally connected to the end of said arm, a thrust roller carried by one end of said lever, and a bearing having a closed cam surface permitting movement of the cam roller in a closed irregular path, the shaft arm, lever and cam surface being so related that at one point in the range of movement of the cam roller the discharge chute is in operative position, and at another point is in the inoperative position, the cam surface being provided with portions adapted to restrain the cam roller at the limiting positions, the weight of the chute aiding in holding the roller in such positions.

Signed at Milwaukee, Wisconsin, this 9th day of January, 1923.

ADOLPH W. RYBECK.