Jan. 28, 1941. H. C. ANDERSON 2,229,629

GUIDE ROLLER DEVICE FOR TRACTOR OR CATERPILLAR TYPE SLUICE GATES

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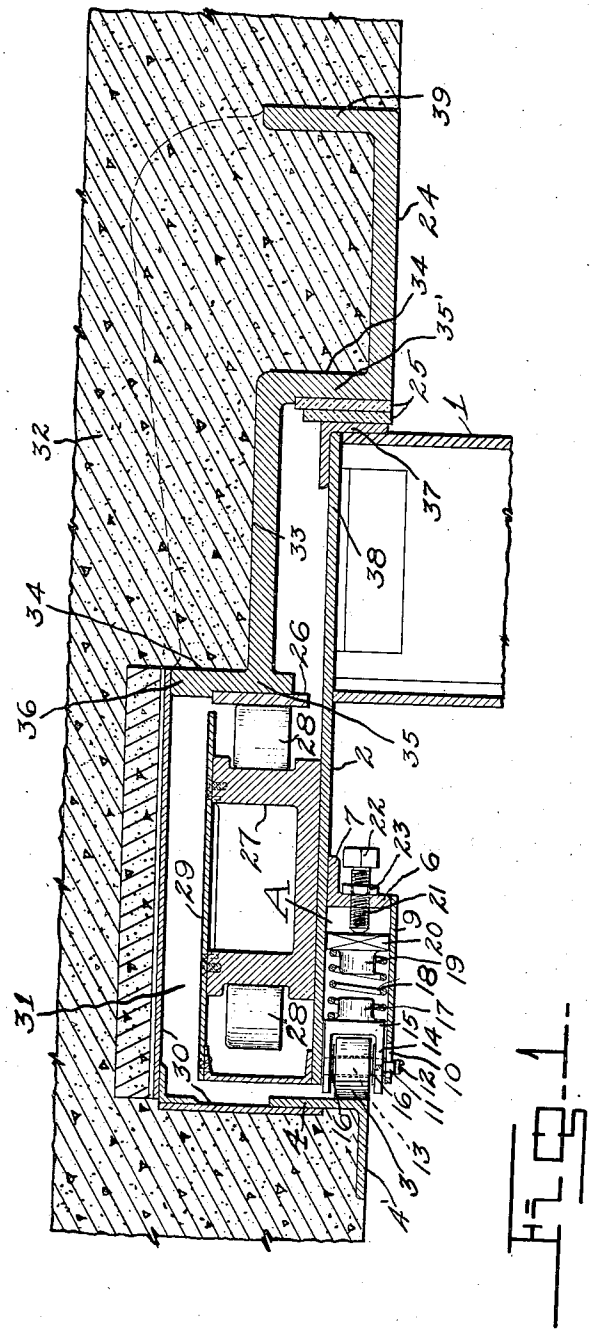


FIG. 1.

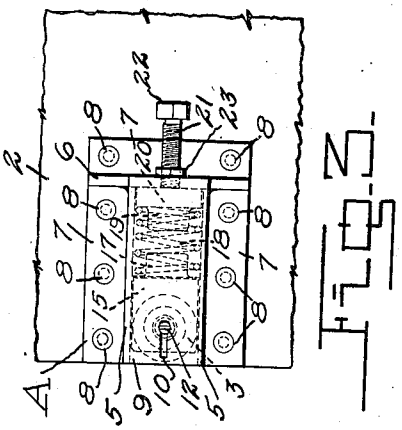


FIG. 3.

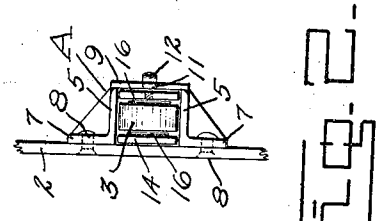


FIG. 2.

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2,229,629

GUIDE ROLLER DEVICE FOR TRACTOR OR CATERPILLAR TYPE SLUICE GATES

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3 Claims. (Cl. 61—28)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to sluice gates used in water control structures such as dams or the like; more particularly it is directed to an improved mounting for the guide rollers used on sluice gates of the tractor or caterpillar type.

One of the objects of the invention is to provide improved means for mounting guide rollers to sluice gates in such a manner that the rollers may be retracted to allow larger and more workable moving clearances between the gates and their frames, whereby the gates may be easily and quickly placed in position or removed, thus reducing the cost of installing or removing the gates.

Another object of the invention is to provide an improved mounting including a yieldable member for use on guide rollers of sluice gates whereby the gates are yieldably held in operative position during their travel along a race, thus eliminating or minimizing the vibration of the gates and at the same time taking up slight inequalities which may exist in the surface of the race, the said mounting also including means for adjusting the amount of pressure of the guide rollers against the race.

With the above and other objects and advantages in view, the invention consists in certain features of construction and operation of parts which will hereinafter appear and in which—

Fig. 1 is a horizontal sectional view, partly in elevation through the gate and its adjacent structure including a guide roller in operative position against an upstream guard angle and having the invention applied thereto;

Fig. 2 is a front view of a housing for the guide roller and its operating mechanism mounted on the upstream edge of a portion of an end plate of the gate, and

Fig. 3 is a side view thereof showing the guide roller retracted into the housing.

Referring more particularly to the drawing 1 indicates a portion of a vertical movable sluice gate of the tractor or caterpillar type having an end plate 2 on the forward end of which is mounted the improved mechanism for yieldably holding the guide roller 3 in contact with a guide surface 4 of a stationary upstream guard angle 4', the said guide surface 4 of the upstream guard angle 4' being disposed at right angles to the end plate 2 of the gate.

Only one guide roller 3 and its improved operating mechanism is shown in the present illustration, but it is readily understood that a number of guide rollers and their operating mechanism are to be attached at spaced intervals along the forward end of the end plate 2 which constitutes the upstream edges of the gate.

The guide roller 3 and its operating mechanism are mounted in a housing indicated generally by A which comprises side walls 5 and a rear wall 6, provided with flanges 7 which are secured to the front surface of the end plate 2 by rivets 8, the front end of the housing being open and flush with the forward end of the end plate 2. The housing A is also provided with a cover plate 9 containing a longitudinal extending slot 10, at its forward end in which a retaining screw 11 having a head 12 is adapted to work, the said head 12 of the screw engaging with the outer portion of the cover plate 9 adjacent the longitudinal extending slot 10. The inner end of the screw 11 is adapted to threadedly engage with one end of a shaft or pin 13 which is mounted at its opposite ends in a yoke or U-shaped portion 14 of a combination guide roller holder and spring retainer 15, which provides a support for the guide roller 3, the said guide roller being rotatably mounted on the shaft 13 and adapted to bear against and run along the guide surface 4 of the upstream guard angle 4'. Suitable washers 16 are provided on the pin 13 between the inner surfaces of the yoke portion 14 of the combination guide roller holder and spring retainer 15 and the sides of the guide roller 3.

The combination guide roller holder and spring retainer 15 is slidably arranged within the housing A and is provided with an inwardly projecting tongue 17 which is embraced by the end turns of one end of a helical spring 18, which is adapted to project the combination guide roller holder and spring retainer 15 and guide roller 3 outwardly, so that the roller will engage the guide surface 4 of the upstream guard angle 4', the said end of the spring bearing against the inner surface surrounding the tongue 17 of the yoke portion 14 of the combination guide roller holder and spring retainer 15. The end turns at the other end of the helical spring 18 are adapted to embrace a tongue 19 provided on the inner end of an adjustable spring retainer 20, the end of the spring bearing against the surface of the spring retainer surrounding the tongue. The tongue 19 of the adjustable spring retainer 20 is in alignment with the tongue 17 of the combination guide roller holder and spring retainer 15 and projects inwardly in an opposite direction to the tongue 17.

The spring retainer 20 is slidably mounted in the housing A and is adapted to be adjusted therein against the spring by means of an adjusting screw 21 including a head 22 which is screw-threadably mounted through the rear wall 6 of the housing, with the inner end thereof bearing against the rear surface of the spring retainer. In order to hold the adjusting screw 21 in adjusted position on the housing A, a jam nut

23 is threadably mounted on the adjusting screw.

Other parts of the sluice gate include the frame 24, gate seals 25, tractor stationary roller race 26, tractor movable roller race 27, tractor rollers 28, tractor roller chain housing 29 and grouting plates 30.

The improved device is mounted in a recess 31 formed in a stationary wall structure 32, the said recess being provided with an enlarged cut-out portion 33 forming shoulders 34 which are in stepped formation.

The frame 24 is formed to provide outwardly extending portions 35 and 35' in stepped formation which are adapted to seat against the shoulders 34 on the recess 31 with the outer end 36 of the outwardly extending portion 35 of the frame projecting into the recess and abutting against one of the grouting plates 30. The tractor roller race 26 engages the outwardly extending portion 35 of the frame and the gate seals 25 engage the outwardly extending portion 35' of the frame. On the gate seals 25 is a guard angle 37 against which the end 38 of the plate 2 is adapted to abut. An outwardly bent portion 39 is provided on one end of the frame 24 which is embedded in the wall structure 32 for holding the frame thereon.

The operation is as follows: Upon the installation of the gate 1 with the guide roller 3 retracted within the housing A, the adjusting screw 21 is turned or screwed inwardly by means of a wrench or the like engaging the head 22 thereof, whereby the inner end of the screw is forced against the spring retainer 20 causing the helical spring 18 to force the combination guide roller holder and spring retainer 15 carrying the guide roller 3 outwardly, whereby the retaining screw 12 which engages the pin 13 of the combination guide roller holder and spring retainer 15, is moved forwardly in the longitudinal slot 10 formed on the outer end of the cover plate 9 of the housing A. This action of the helical spring causes the combination guide roller holder and spring retainer 15 and the guide roller 3 to be forced outwardly from the housing A, whereby the guide roller 3 is caused to come into contacting engagement with the guide surface 4 of the upstream guard angle 4' and to be yieldably held by means of the spring against the guide surface 4 for taking up inequalities which may exist therein and to eliminate or minimize the vibration of the gate. The amount of pressure of the spring retainer against the spring 18 is controlled by the adjusting screw 21 which is locked in adjusted position by the jam nut 23 engaging the outer surface of the rear wall 6 of the housing A.

To remove the gate the adjusting screw 21 is unscrewed rearwardly, thus causing the spring retainer 20 to move rearwardly under the action of the helical spring, whereby the pressure of the spring is released from the combination guide roller holder and spring retainer 15, and thus the pressure of the guide roller 3 against the guide surface 4 of the upstream guard angle 4'. When the adjusting screw 21 is unscrewed a predetermined amount the guide roller 3 may be retracted into the housing A to allow larger and more workable moving clearances between the gate and its frame, whereby the gate may be easily and quickly removed or replaced in position.

It will thus be seen that there is provided a highly novel and efficient form of guide roller device for use on sluice gates of the tractor or caterpillar type which is well adapted for all the purposes indicated. Even though there has herein been described certain features of construction and operation of parts, it is nevertheless to be understood that various changes may be made therein without departing from the spirit or scope of the invention.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. In combination, a frame, a stationary guide surface, a movable end plate, a sluice gate mounted on a side of said end plate, a stationary roller race engaging said frame, a roller chain housing mounted on an opposite side of said end plate from said sluice gate, a movable roller race secured to said roller chain housing, rollers mounted on said movable roller race, said rollers adapted to engage the stationary roller race on said frame and a guide roller yieldably and adjustably supported on the same side of said end plate as said sluice gate, said guide roller adapted to yieldably engage said stationary guide surface.

2. In combination, a stationary wall structure having a recess formed therein, a frame provided on said stationary wall structure, said frame including outwardly projecting portions in stepped formation, a stationary roller race engaging one of said projecting portions of said frame, a stationary guide surface mounted on a lower side edge of said recess, a movable end plate, a sluice gate mounted on a side of said end plate, a roller chain housing mounted on an opposite side of said end plate from said sluice gate, a movable roller race mounted on said roller chain housing, rollers mounted on said movable roller race, said rollers adapted to engage said stationary roller race and a guide roller yieldably and adjustably mounted on the same side of said plate as said sluice gate, said guide roller adapted to yieldably engage said stationary guide surface on said recess.

3. In combination, a stationary wall structure having a recess formed therein, said recess having an enlarged cut-out portion providing shoulders in stepped formation thereon, a frame provided on said wall structure, said frame including outwardly extending portions in stepped formation engaging said shoulders on said recesses, gate seals engaging one of said outwardly extending portions of said frame, a guard angle including a guide surface engaging said gate seals, a stationary roller race engaging another of said outwardly extending portions of said frame, a stationary guide surface mounted on a lower side edge of said recess, a movable end plate, a sluice gate mounted on one side and at one end of said end plate, a roller chain housing mounted on an opposite side of said end plate from said sluice gate, a movable roller race mounted on said roller chain housing, rollers mounted on said movable roller race, said rollers adapted to engage the stationary roller race on said frame, a guide roller yieldably and adjustably mounted on the same side of said end plate as said sluice gate and at an opposite end of said plate from said sluice gate, the end of said plate on which said sluice gate is mounted movably engaging said guard angle on said seals and said guide roller on the opposite end of said plate from said sluice gate yieldably engaging said stationary guide surface on the lower side edge of said recess.

HARRY C. ANDERSON.