L. W. HORNE.

BRAKE.

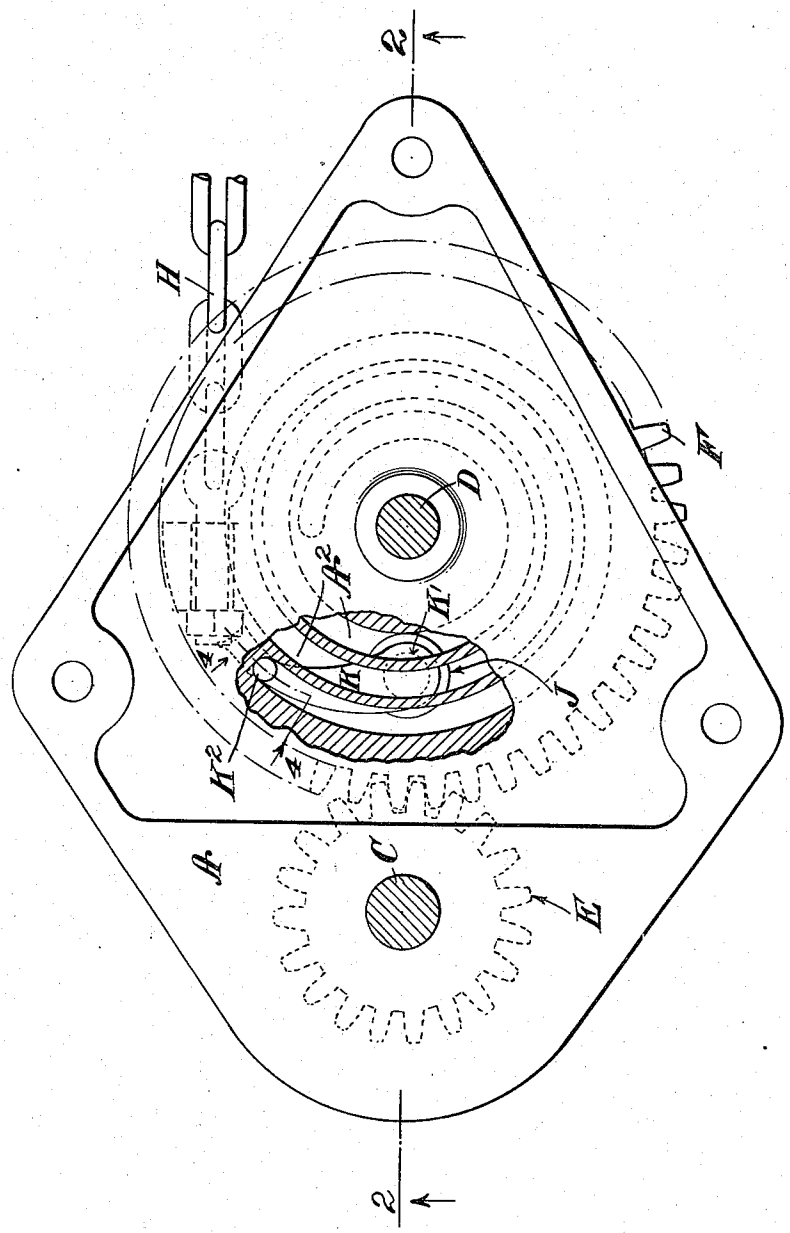
APPLICATION FILED SEPT. 17, 1914.

1,176,450.

Patented Mar. 21, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



Attest
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by

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2 SHEETS—SHEET 2.

Fig. 3.

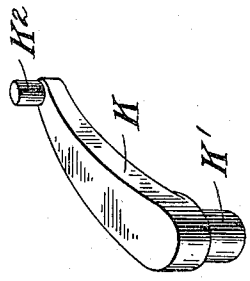


Fig. 4.

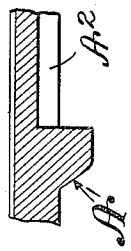
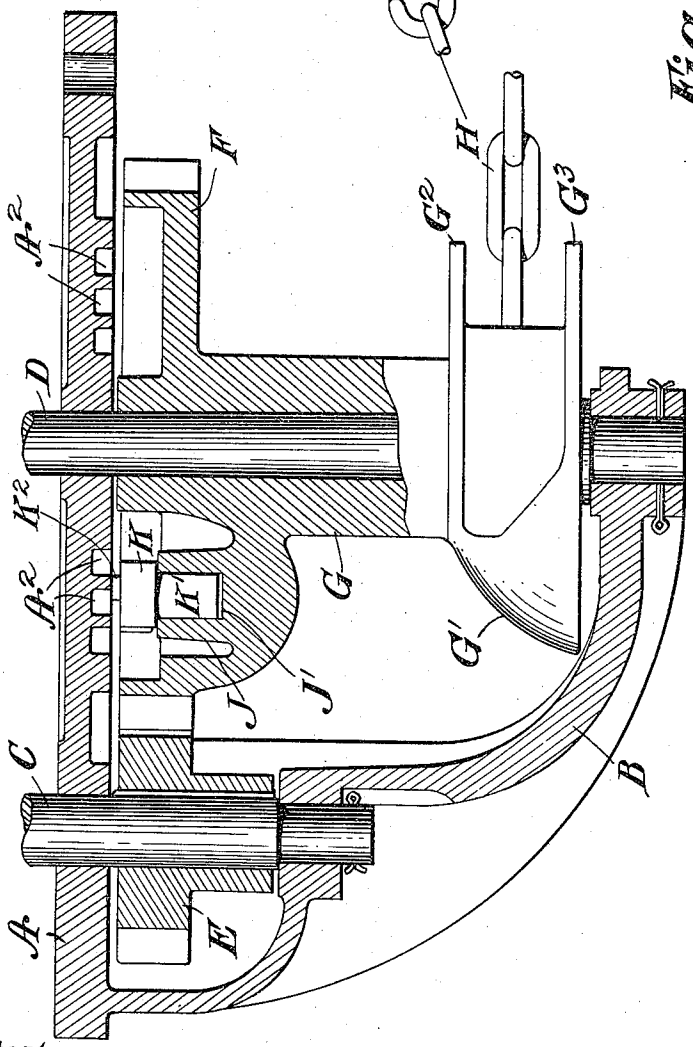


Fig. 2.



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UNITED STATES PATENT OFFICE.

LAWRENCE W. HORNE, OF WOODRIDGE, NEW JERSEY.

BRAKE.

1,176,450. Specification of Letters Patent. Patented Mar. 21, 1916.

Application filed September 17, 1914. Serial No. 862,140.

To all whom it may concern:

Be it known that I, LAWRENCE W. HORNE, a citizen of the United States, and a resident of Woodridge, in the county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Brakes, of which the following is a specification.

The improvements relate to brakes intended primarily for use on street cars and which are usually operated by hand. Their objects are, among others, to provide a simple and extremely strong, durable, and effective construction of the mechanism for winding the chain or analogous member on the drum, and adjusting and maintaining its relation to the handle or other power applying means and the brake shoe and intermediate connections.

Heretofore it has been the common practice to have the chain or like part secured to the drum upon which it is wound substantially in line with the portion of the intermediate mechanism to which the opposite end of the chain is secured, and to have the parts so constructed and arranged that the chain in winding downwardly on the drum moves away from that line or plane. With the present improvements the chain is secured below the line or level of the part to which its opposite end is connected and winds upwardly on the drum approaching that level. It will be evident to those familiar with mechanism of this character that in this manner undue friction as the chain tightens and other undesirable results are avoided. It has also been the practice to provide the pinion and gear by which the brake drum is rotated with suitable lugs or other devices which act at a certain time to check the unwinding of the brake chain at a certain point; but owing to the fact that the mechanism must be placed in various positions on the cars, and to other causes, the extent to which the chain unwinds before being checked by such device varies, and the resulting position of the chain on the drum at the end of the unwinding action is correspondingly changed. With the present construction provision is made for the positive and dependable checking of the unwinding action at a predetermined point, and also for an adjustment to compensate for inequalities in the length of the chain due to wear, variations in the position of the mechanism, or other causes.

The invention consists in the construction, combination and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings.

In the said drawings, Figure 1 is a plan of a brake mechanism embodying the improvements with a portion of the housing broken away to expose parts beneath it. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is an enlarged perspective of the pawl for checking the rotation of the gear and its drum. Fig. 4 is an enlarged vertical section on the line 4—4 of Fig. 1, showing the reinforcement at the end of the slot in which the pawl works.

The housing of the mechanism consists of the horizontal plate A and the curved depending bracket B. The pinion shaft C and the gear axle D are mounted to rotate in the housing and have the pinion E and gear F respectively keyed thereto. The gear and pinion are constantly in mesh, and are operated through the shaft C, which may be provided with a handle or other power mechanism. The drum G is made integral with the gear F and has at its lower end a helical faced enlargement G′ adapted to take up the slack of the chain H quickly, and guide it upwardly to the drum proper on which it winds as the chain tightens. It is also provided with annular flanges G^2 and G^3 at the bottom, which confine the chain in its proper position. The hollow lug J is cast in the gear F and provides a bearing J′ for the post K′ of the pawl K, and the plate A is provided on its under side with a spiral groove A^2 which receives the pin K^2 and permits it to travel therein. The object of this arrangement is to check the unwinding of the chain on the drum at the proper point so that it will not unwind too far or start to wind in the reverse direction. It also serves to check the winding rotation of the drum and gear.

Fig. 1 shows the parts in their position when the chain is slack, and in this position the pin at the outer end of the pawl K is at the outer end of the spiral groove A^2. As the chain is wound the pin travels in involute direction toward the inner end of the slot, but will not reach the inner end of said slot, owing to the fact that the chain will tighten while it is still a considerable distance from that point. The reinforcing boss A′ at the outer end of the slot prevents the pin, when the brake is released and allowed to fly, from breaking through at that

point, and by giving it an abutment throughout its length provides an increased surface for the resistance of the shock when it comes in contact therewith.

The chain is secured to the drum by means of an apertured lug, through which a bolt on the end of the chain may be passed.

It will be seen that by removing the pawl K and substituting one of different length the point at which the unwinding motion will be stopped may be determined or adjusted with accuracy, and that a still wider adjustment may be obtained if desired by reversing the position of the pawl with respect to its bearing, so that it will travel ahead of the bearing while moving inwardly and behind the bearing when it moves outwardly.

Other advantages of the improvements will be apparent to those familiar with the construction and operation of mechanism of this character.

What I claim is:

1. In a brake mechanism, the combination with a gear and pinion and a power transmitting device for actuating the same of a drum fixed to the gear and extending axially therefrom, said drum having a helical enlargement at its outer part inclined inwardly toward the periphery of the drum in horizontal plane and toward the gear in vertical plane, a fixed plate adjacent to the said gear provided with a curved groove therein, and a member mounted on said gear engaging said groove and adapted to check the rotation of the gear by coming in contact with the end of said groove.

2. In a brake mechanism, the combination with a gear and pinion and a power transmitting device for actuating the same of a drum fixed to the gear and extending axially therefrom, said drum having a helical enlargement at its outer part inclined inwardly toward the periphery of the drum in horizontal plane and toward the gear in vertical plane, and a chain connected with said drum and connected with brake applying mechanism at a point within the plane of the enlargement, a fixed plate adjacent to the said gear provided with a curved groove therein, and a member mounted on said gear engaging said groove and adapted to check the rotation of the gear by coming in contact with the end of said groove.

3. In a brake mechanism, the combination with a gear and pinion and a power transmitting device for actuating the same of a drum fixed to the gear and extending axially below the same, and provided with a helical faced enlargement inclined upwardly to the periphery of the drum, and a chain adapted to be connected with and wound thereon, a fixed plate adjacent to the said gear provided with a curved groove therein, and a member mounted on said gear engaging said groove and adapted to check the rotation of the gear by coming in contact with the end of said groove.

4. In a device of the character described, the combination of a gear, a drum fixed thereto and a chain connected and adapted to be wound thereon, a fixed plate adjacent to the said gear provided with a curved groove therein, and a member mounted on said gear engaging said groove and adapted to check the rotation of the gear by coming in contact with the end of said groove, said member consisting of an arm, an extending portion loosely and removably engaging the gear and another extending portion loosely and removably engaging said groove, whereby the said member may be disengaged from the said gear or groove or both and reversed without changing its position with respect to the plane of the gear or another member substituted therefor.

5. In a device of the character described, the combination of a gear, a drum fixed thereto and a chain connected and adapted to be wound thereon, a fixed plate adjacent to the said gear provided with a volute groove therein, and a member mounted to rotate with said gear engaging said groove and arranged to have mean radial movement with respect thereto, said member consisting of an arm, an extending portion loosely and removably engaging the gear and another extending portion loosely and removably engaging said groove, whereby the said member may be disengaged from the said gear or groove or both and reversed without changing its position with respect to the plane of the gear or another member substituted therefor.

6. In a device of the character described, the combination of a gear, a drum fixed thereto and a chain connected and adapted to be wound thereon, a fixed plate adjacent to the said gear provided with a volute groove therein, an enlargement at one end of said groove and a member mounted to rotate with said gear engaging said groove and arranged to have mean radial movement with respect thereto.

Witness my hand this 27th day of June, 1914.

LAWRENCE W. HORNE.

Witnesses:
MARY H. LEWIS,
HELEN V. FITZPATRICK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."