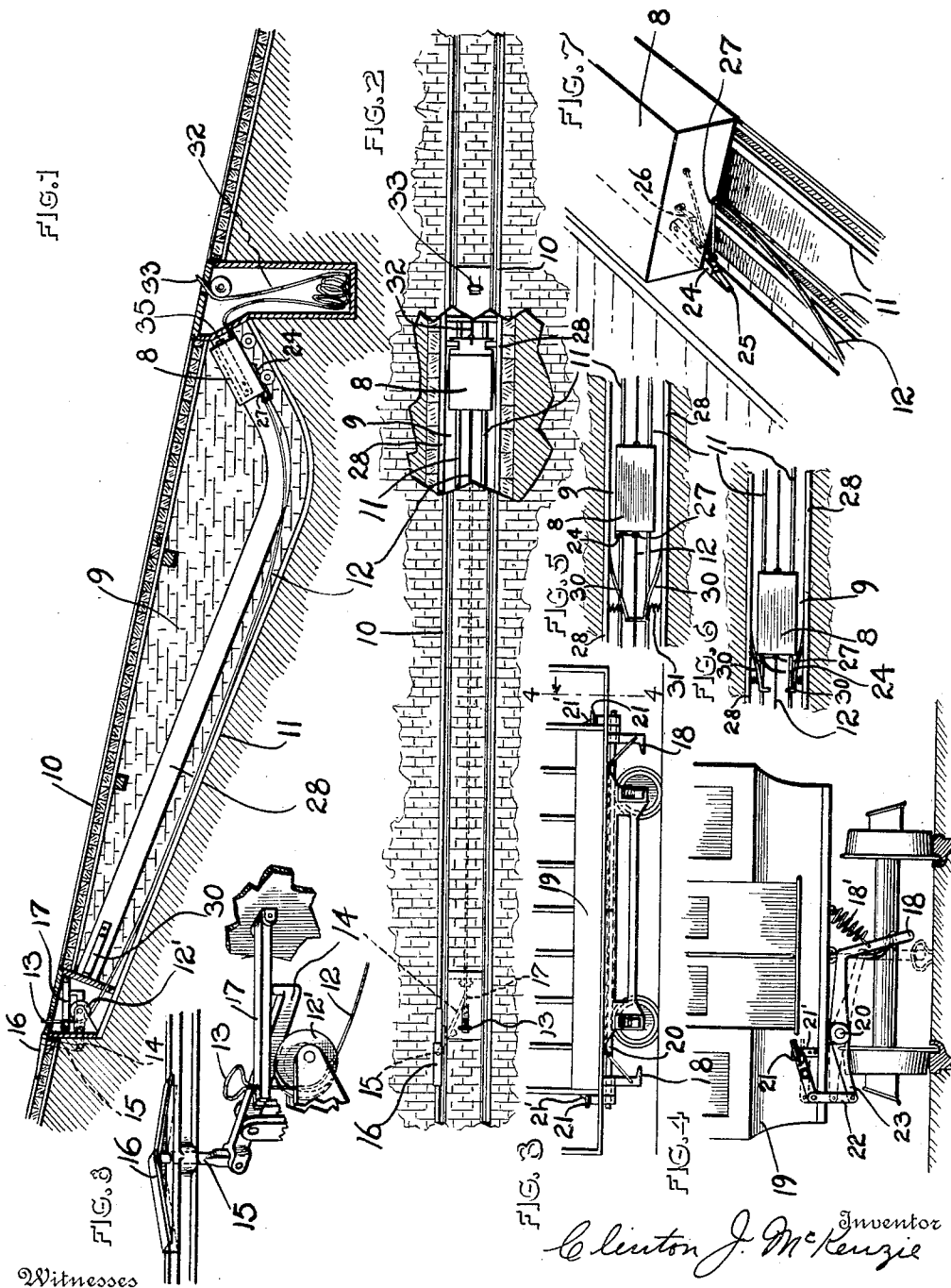


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SAFETY APPARATUS FOR STREET RAILWAYS.
APPLICATION FILED JAN. 15, 1912.

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Witnesses

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SAFETY APPARATUS FOR STREET-RAILWAYS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLINTON J. MCKENZIE, citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Safety Apparatus for Street-Railways, of which the following is a specification.

This invention relates to car stopping apparatus and has for an object to produce an improved apparatus for stopping runaway street cars, or similar vehicles, in their descent down steep grades.

A further object of this invention is to produce apparatus for automatically stopping runaway rail traversing vehicles in which improved means are employed for gradually bringing the car to a stop and thereby eliminating the danger of wrecking it by subjecting it to a sudden shock.

This and other objects I attain by means of apparatus embodying the features herein described and illustrated.

In the drawings accompanying and forming a part of this application, Figure 1 is a transverse section of a street taken along the line of a car track and discloses a conduit, and apparatus mounted therein forming an embodiment of my invention. Fig. 2 is a plan view of a car track equipped with my invention, portions being broken away for convenience of illustration. Fig. 3 is a fragmental side elevation of a street car equipped with means for automatically coupling it to a counterbalancing car which forms a detail of my invention. Fig. 4 is an end elevation, on an enlarged scale, of the car shown in Fig. 3. Figs. 5 and 6 are fragmental plan views of the conduit shown in Fig. 1 and illustrate means employed for stopping the counterbalancing weight at the one end of its track or ways. Fig. 7 is a fragmental perspective view of a portion of the conduit and the counterbalancing car and illustrates a locking mechanism for the car, which forms a detail of my invention. Fig. 8 is a fragmental perspective view of the means employed for coupling the balancing device to the runaway car.

The apparatus, herein illustrated, as an

embodiment of my invention, includes a checking device or counterbalancing weight 8 which is located in a conduit 9 formed beneath the car track 10 and is adapted to be coupled to a moving or runaway street car, 55 moving down the track 10, so that it is moved from the lower to the upper end of the conduit along a way or track 11 provided for it and located in the conduit. Automatic means are provided for coupling the runaway car to the counterbalancing weight while the car is running at a high rate of speed and means are also employed for minimizing the shock to which the car is subjected at the time of coupling it to the stationary checking device or counterbalancing weight. 65

All automatic car stopping apparatus, known to me, which are in any way similar to apparatus embodying my invention, are objectionable because the counterbalancing weights or cars, are so located and arranged that they will exert the greatest resistance to motion, when they are first coupled to the rapidly moving runaway car, and consequently will either wreck the runaway car or be rendered ineffective by wrecking their own operating mechanisms. This is due to the fact that the counterbalancing weights employed are either located on level or inclined tracks while they are inoperative so that the runaway car will have to overcome their inertia, their friction of rest, and start them at a high velocity along the level or upwardly inclined tracks on which they operate. Such an arrangement of apparatus is almost sure to wreck the runaway car even though it is moving at a relatively low velocity since the counterbalancing weight of each apparatus must weigh at least as much as the street car and its inertia, or quality of resisting a change of state will be as great or greater than that of the street car. In addition to this the friction of rest and the resistance to motion of all the parts will operate to hold the counterbalancing weight stationary and consequently the runaway car will be subjected to violent shock at the instant the coupling is made and it will be thrown off its trucks or will be wrecked 100

in some other way. My invention eliminates these objectionable features by so arranging the counterbalancing weight that it will produce little resistance to motion at the time of coupling it to the runaway car, but will quickly attain the speed of the moving car and will then gradually decrease in speed and thereby gradually decrease the speed of the runaway car and finally bring it to a stop. This is accomplished, in the apparatus illustrated, by so constructing the way or track 11, on which the counterbalancing weight 8 is mounted, that it is inclined upwardly at the lower end, as well as the upper end of the conduit, so that the counterbalancing weight will first move by its own weight along a down grade and will then move along an up grade which is preferably steeper than the grade down which the runaway car is moving.

The counterbalancing weight 8 is illustrated in the form of a car, the wheels of which engage the rails forming the track 11. The car 8 is adapted to be coupled to the street car by means of a cable 12, which extends through the conduit 9 and around a pulley 12' located at the upper end of the conduit, and is provided with a loop 13 at its upper end, adapted to be moved to an operative position, by each passing car, so that it can be engaged by a hook, or similar device carried by the car, when the hook is moved to the operative or loop-engaging position.

The mechanisms illustrated for automatically raising the loop 13, consist of a lever 14, which is actuated through the agency of a link or strut 15, by a pedal 16 and in turn actuates a lever 17, which carries the loop 13. The pedal 16 is located on one rail of the street car track in such a position that the wheels of the car will pass over it and depress the strut 15 and thereby raise the loop 13 to such a position that it will be engaged by a hook or finger 18 mounted on the street car 19 in case the finger is moved to the operative, or loop-engaging position.

The car 19, illustrated, is provided with two fingers 18 which are located at opposite ends of the car and are mounted on a rod 20, which extends longitudinally of the car and is rotatively mounted beneath the floor of the car in any suitable manner. An actuating foot lever 21 is provided on the platform of the car for the rod 20 and is connected to it by means of a link 22 and a lever 23, which is rigidly mounted on the rod. If desired a foot lever 21 may be located on each platform of the car, as illustrated in Fig. 3 so that the fingers 18 may be moved to the operative position from either end of the car. Each lever 21 is preferably provided with means, such for example, as a catch 21' for holding it in the

set position after it has been depressed. In the drawing I have shown a coiled spring 18' for holding the fingers 18 in the inoperative position, but any suitable means may be employed.

The counterbalancing car 8 is held in position on the inclined portion of its track 11 located at the lower end of the conduit by means of a release lever 24 (shown in Fig. 7) which is so mounted on the bottom of the car 8 that it is adapted to engage a lug or stop 25 located on one side of the conduit 9. The lever 24 is held in the operative or lug-engaging position by means of a spring 26 and is adapted to be shifted out of engagement with the stop 25 by the first pull imparted to the cable by the runaway car after it is coupled to the balancing car. This is accomplished by running the lower end of the cable through a suitable screw-eye or link 27 mounted on the car 8 and connecting it to the lever 24 so that a pull on the cable will shift the lever laterally out of engagement with the stop 25. This will release the car and permit it to roll down the inclined end of the track, by its own weight and also in response to the pull of the runaway car.

The operation of stopping a runaway car is somewhat as follows. When the operator or motorman of the street car finds that it is beyond his control and is running away down a steep grade equipped with my invention he moves the finger 18 to the operative position by depressing the foot lever 21. As the car moves over and depresses the pedal 16 it raises the loop 13 so that it will be engaged by the finger 18 as the car moves past the loop. This couples the runaway car to the counterbalancing car 8 and consequently subjects the cable 12 to a sudden pull. This pull shifts the lever 24 and releases the car 8 before the cable is fully under tension and the car 8 rolls down the inclined portion of its track 11 in response to the pull of the runaway car as transmitted through the cable. As soon as the car 8 starts to ascend the upwardly inclined portion of its track it starts to decrease the speed of the runaway car since it is of such weight that it more than overbalances the weight of the car 19, and since the grade of the track 12 is steeper than the grade of the track 10.

I have provided means for steadying the car 8 in its travel along the conduit 9 which, as illustrated, consists of ways 28 mounted on the vertical walls of the conduit in such a position that they will engage the lateral faces of the car 8 and thereby prevent it from swaying. If desired the ways 28 may be so formed that they will increase the resistance of motion of the car 8 as it travels along the upwardly inclined portion of the

track 12 and in this way aid in stopping the runaway car. This may be accomplished by gradually decreasing the width of the ways toward the upper end of the conduit so that they are forced into more intimate engagement with the lateral faces of the car 8 as it moves up the incline. This will increase the friction between the car 8 and the ways and have an accumulative retarding effect on the car.

I have provided means, at the upper end of the conduit, for bringing the car 8 to a stop in the manner described. The means illustrated consists of metal strips 30 which are located on each side of the conduit and in effect form a continuation or a part of the ways 28. These metal strips are preferably flexible and are held together at their upper ends by means of coiled springs 31, which are located between them and the walls of the conduit. With this arrangement the car 8 gradually forces the metal strips 30 apart as it moves between them and consequently increases the pressure of the springs 31 and the friction between the lateral faces of the car and the strips. This friction increases as the car proceeds and consequently exerts an accumulative retarding force on the car. The upper end of the strips 30 are turned at an angle so that they form a positive bumper for the car 8. If desired, these strips may be of such length that they will gradually increase the retarding force on the car 8 from the time it starts up the upwardly inclined portion of the track 12. This accumulative retarding effect may be obtained in various other ways and still fall within the spirit of my invention; for example, the track 11 may be arranged so that it continually increases the grade, from the end of the downwardly inclined portion toward the upper end of the conduit, and so that the car 8 encounters a continually increasing grade as it runs along the conduit in response to the pull of the runaway car.

It will be understood that the inclination of the downwardly inclined portion of the tracks 12 may be varied and that it may be made substantially perpendicular if desired. It will also be understood that the means herein shown for moving the loop 13 up and down as cars pass along the track 10, is more or less illustrative and that it may be varied without departing from the spirit of this invention. The mechanism is preferably so arranged that the loop will be located below the surface of street while in the inoperative position and will be raised above the surface of the street a sufficient amount to insure its being engaged by the finger 18, of a passing car when the finger is moved to the loop-engaging or set position.

In the drawings I have illustrated means for returning the car 8 to the lower end of the conduit after it has been moved to the upper end. The means illustrated consists of a cable 32 which is secured to the car 8 and is preferably coiled in a pocket or receptacle provided for it at the lower end of the conduit when the car 8 is held in place by the lever 24. This cable presents a loop 33 which may be engaged by a car on the track 10 and may thereby be employed in drawing the car 8 back to its normal position at the lower end of the conduit. When the car 8 is moved to this position the lever 24 will automatically engage the stop 25, and thereby lock the car on the downwardly inclined portion of the track 12, until it is disengaged by being coupled to a car on the track 10. Any suitable bumper 35 may be provided for stopping the car 8 at the lower end of the conduit.

It will be understood that while I have illustrated and described the preferred form of my invention and its principles of operation, that various changes, substitutions and modifications may be made without departing from the spirit and scope of my invention as set forth in the appended claims.

What I claim is:

1. An apparatus of the character described comprising a counterbalancing device for street cars, a way inclined upwardly at both ends, over which said device operates and means for coupling the device to the car to be stopped.
2. An apparatus of the character described comprising a counterbalancing device for street cars, a way inclined upwardly at both ends over which said device operates, means for locking said device in position on an inclined portion of the way, and means for coupling the device to a car to be stopped and for actuating the locking means to release the device.
3. An apparatus of the character described, comprising a counterbalancing device for street cars, a way inclined upwardly at both ends over which the device operates, a cable for coupling the device to a street car to be stopped and means actuated by the car for moving the end of the cable into an operative position with relation to the car.
4. An apparatus of the character described, comprising, a counterbalancing device for street cars, a way inclined upwardly at both ends over which the device operates, a locking mechanism for securing the device in position on an inclined portion of the way, a cable for coupling the device to a car to be stopped and for actuating the locking mechanism to release the device, and provided at one end with a loop for engaging the car, and means automatically

actuated by the car for raising the loop to an operative position relatively thereto, substantially as described.

5. An apparatus of the character described comprising a conduit located beneath a car track, a counterbalancing weight located within the conduit, a way, inclined upwardly at both ends and over which the weight travels and a cable extending through the conduit for coupling the weight to a car to be stopped, traversing the car track.

6. An apparatus of the character described comprising a conduit located beneath a street car track, a counterbalancing weight, located within the conduit, a way over which the weight travels inclined upwardly at both ends, a locking means for holding the weight in position on an inclined portion of the way and means extending through the conduit for coupling the weight to a car traversing the track and for actuating said locking means to release the weight.

7. In an apparatus of the character described, a counterbalancing weight for runaway cars, means for coupling the weight to a car to be stopped, a way along which said weight is impelled by the motion of the car, and means, extending along said way, and yieldingly held in engagement with said weight, for subjecting the weight to a yielding and accumulative retarding force as it moves along the way.

8. In an apparatus of the character described, a counterbalancing device for runaway cars, means for coupling the device to a moving car and means for causing the weight of the device to aid the car in imparting initial motion to the device.

9. In an apparatus of the class described, a checking device for runaway cars, means actuated by the wheels of the car to be stopped for coupling the device to a moving car and means, other than gravity, for applying an accumulative retarding force to said device as it moves in response to the pull of the car.

10. In an apparatus of the character described, a checking device for runaway cars, means for coupling the device to a car and retarding springs for engaging said device as it moves in response to the pull of the car, substantially as described.

11. In an apparatus of the character described, a checking device for runaway cars, means for coupling the device to a moving car, a way along which said device is impelled and springs for imparting an accumulative retarding force to the device as it moves along the way, substantially as described.

12. In an apparatus of the character described, a checking device for cars, a way inclined upwardly at both ends and along

which the device travels, means for coupling the device to a moving car and means for imparting an accumulative retarding force to the device as it moves along the way in response to the pull of the car.

13. In an apparatus of the character described, a checking device for runaway cars, a way inclined upwardly at both ends along which said device is adapted to move, a locking mechanism for holding the device on an inclined portion of the way, means for coupling the device to a moving car and for actuating the locking mechanism to release the device, and means imparting an accumulative retarding force to the device as it moves along the way in response to the pull of the car.

14. In an apparatus of the character described, a checking device for runaway cars, a way along which the device is adapted to move, means for coupling the device to a car to be stopped, and means, extending along the way and yieldingly pressed into engagement with the device, as it moves along the way, for subjecting the device and the car to an accumulative retarding force as the device moves along the way in response to motion of the car.

15. In an apparatus of the character described, a counterbalancing weight for runaway cars, a cable secured to the weight provided at one end with a loop for coupling the weight to a car, and means comprising a pedal engaged by the wheels of the car for raising the loop to an operative position relatively thereto.

16. In an apparatus of the character described, a conduit located beneath the car track, a counterbalancing weight for runaway cars located within said conduit, a way, inclined upwardly at both ends, along which said weight moves, means for locking the weight in position on an inclined portion of the way, a coupling having a loop for engaging a finger on a moving car and for releasing the locking means, and a pedal, actuated by the moving car, for raising the loop into an operative position relatively thereto.

17. A stop for runaway cars, comprising a device for subjecting the runaway car to a gradually increasing stopping force, a cable secured to the device, and provided at one end with a loop for coupling the device to a car to be stopped and means engaged by the wheels of the car for moving the loop to an operative position relatively to the car.

18. In an apparatus of the character described, a device for subjecting runaway cars to a gradually increasing retarding force, means secured to the device for coupling the device to a car to be stopped and means engaged by the wheels of the car for con-

trolling the coupling operation of the first mentioned means.

19. An automatic stop for cars comprising, a way located adjacent to a car track
5 and inclined upwardly at each end, a car counterbalancing weight located on the way, means for locking the weight in place on an

inclined portion of the way and means for releasing said locking means at the time of coupling the weight to the car.

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