

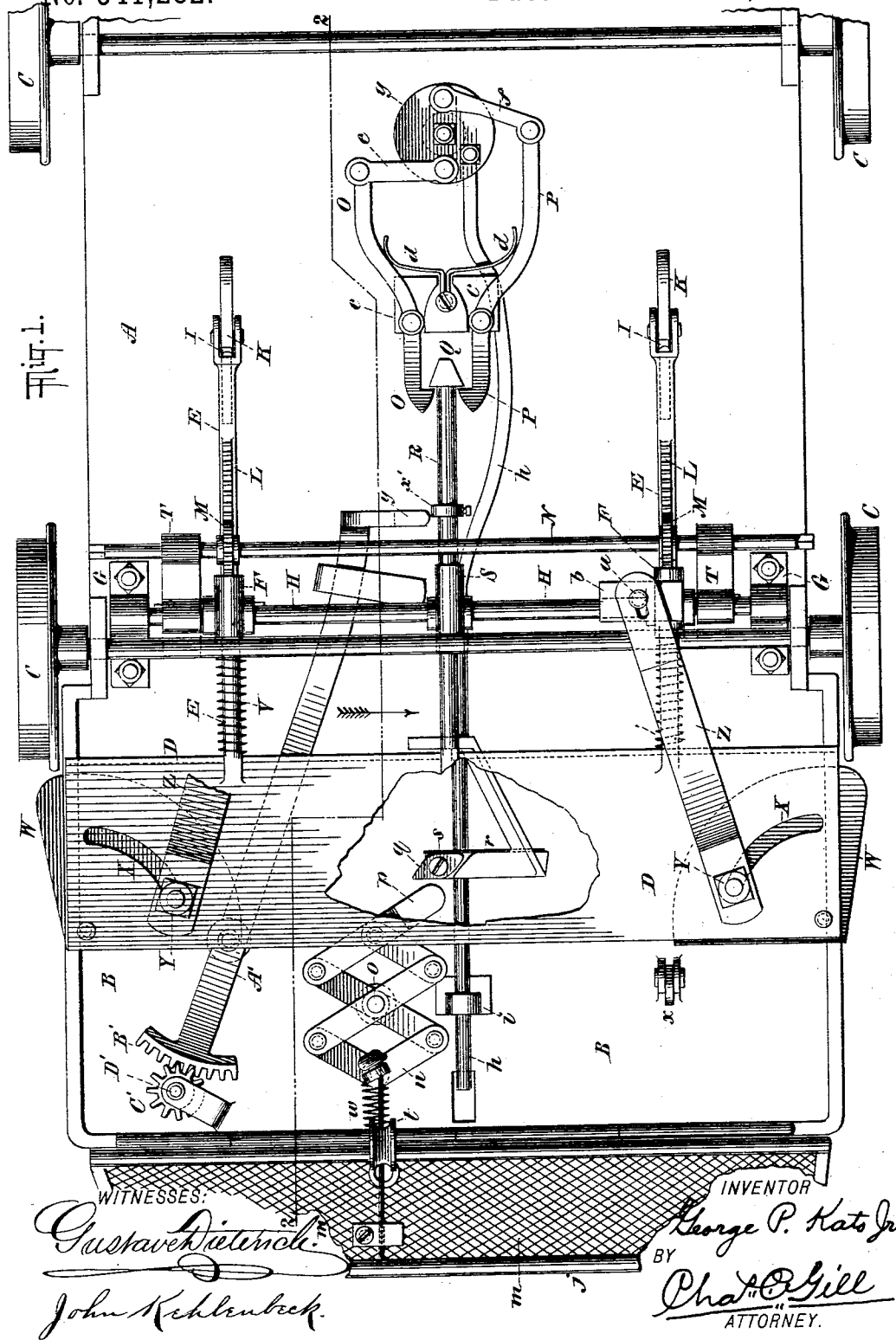
(No Model.)

2 Sheets—Sheet 1.

G. P. KATO, Jr.
SAFETY FENDER FOR CARS.

No. 541,282.

Patented June 18, 1895.



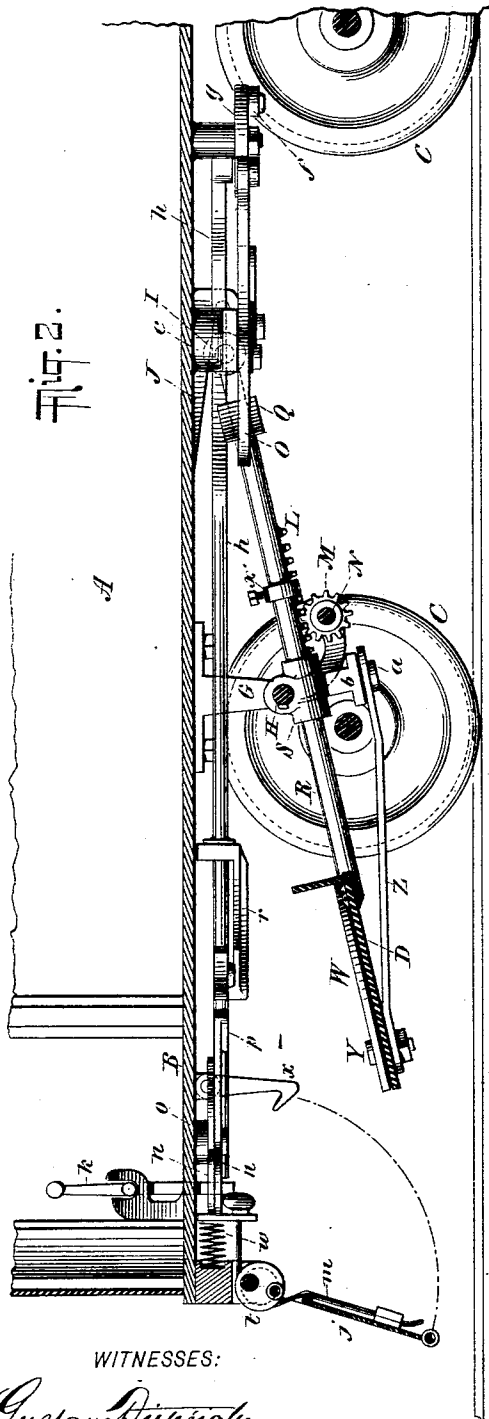
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WITNESSES:

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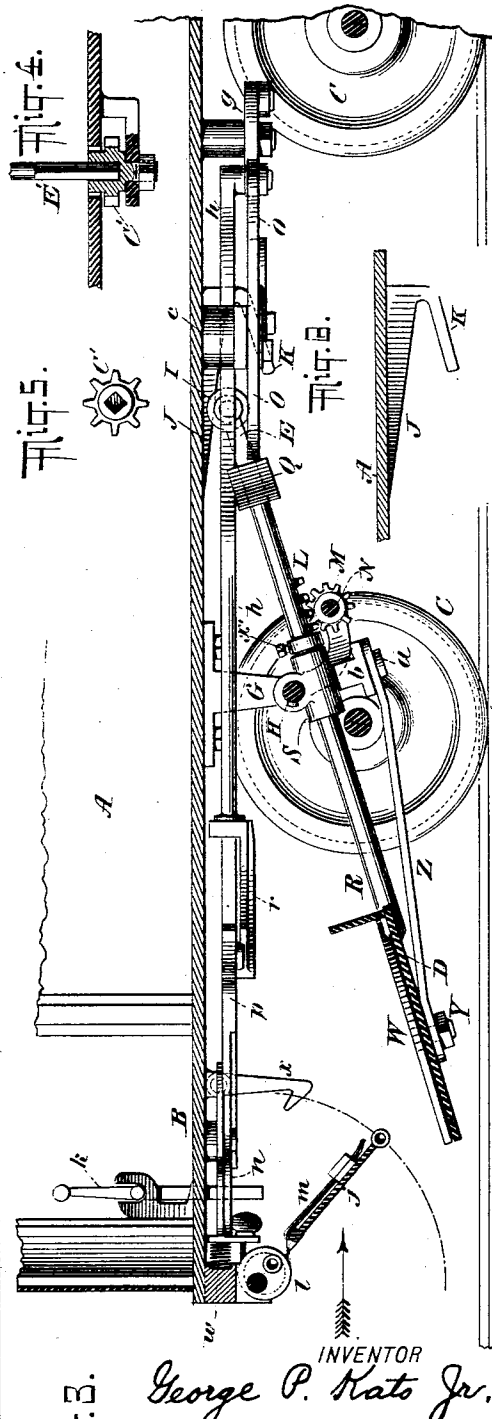


Fig. 3.

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SAFETY-FENDER FOR CARS.

SPECIFICATION forming part of Letters Patent No. 541,282, dated June 18, 1895.

Application filed July 28, 1894. Serial No. 518,853. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. KATO, JR., a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Safety-Fenders for Cars, of which the following is a specification.

The invention relates to improvements in safety fenders for cars, and consists in the novel features of construction and combinations of parts hereinafter described and particularly pointed out in the claims.

Referring to the accompanying drawings, forming a part of this application, Figure 1 is a bottom view, partly broken away, of a portion of a street-car employing the fender and operative devices constructed in accordance with and embodying the invention. Fig. 2 is a vertical section of same on the dotted line 2 2 of Fig. 1 and showing the fender in its elevated or running position. Fig. 3 is a like view of same, showing the fender in its lower position, which is the position it will instantly assume upon an object on the track being struck by that portion of the mechanism which will actuate the fender to descend to its lower position. Fig. 4 is a detached vertical section through a portion of the means employed for locking the fender in its upper or running position. Fig. 5 is a top view of same; and Fig. 6 is a detached side elevation of a tramway which is used in connection with the fender, as hereinafter explained.

In the drawings A designates the usual car, B the platform thereof, and C the usual wheels. Below the car is suspended the fender D, which extends transversely across the car track and is supported at its opposite ends upon the ends of the rods E, E, which have a bearing in the sleeves F mounted upon the rock-shaft H, the latter being supported in the lower ends of the hangers G, secured to the lower surface of the car, as illustrated more clearly in Figs. 1 and 2. The rods E extend inward below the body of the car and are provided at their inner extremities with the grooved wheels I, which ride upon the inclines or tramways J, and are, when in their inward position, shown in Fig. 2, practically housed by the lower arms K

connected with said inclines. Upon the rods E are provided toothed racks L, which are in engagement with the pinion wheels M, secured upon the shaft N, whose ends are squared in cross section, as illustrated more clearly in Fig. 1, and are adapted to receive an ordinary key by which the shaft may be rotated by hand, the object of rotating the shaft N being to cause the wheels M through the medium of the teeth L to force the rods E and the fender D inward to the position illustrated in Figs. 1 and 2, at which time the said rods E and fender D will be locked in their running position, illustrated in Fig. 2, by means of the hooked arms O, P, engaging the head Q on the rod R, the latter rod being parallel with the rods E and extending inward from the fender D and through the sleeve S secured upon the shaft H. The rod R furnishes support for the fender D but its primary object is to afford means in connection with the hooked arms O, P, for securing the fender D in its inward or running position, as shown in Fig. 2.

The shaft N carrying the wheels M in order to preserve the engagement of the latter with the racks L must have a movement corresponding with that of the rods E, and hence said shaft N is mounted in the arms T which are secured to and have a rocking movement with the shaft H, corresponding with that of the sleeves F also secured upon said shaft. Between the fender D and sleeves F are provided the coiled springs V, which encircle the rods E and create an outward tension against the fender, whereby the said fender when the head Q is released from the hooked arms O, P, will be instantly shot forward, while at the same time it is permitted to descend to the position illustrated in Fig. 3, owing to the fact that the wheels I will at such time ride up the inclines or tramway J.

It will be understood from the above description that the hooked arms O, P acting on the head Q of the rod R will serve to retain the fender at its inward or running position, illustrated in Fig. 2, and that upon the release of said hooked arms from said head Q, the springs V will shoot the fender D outward, while at the same time the rods E being unrestrained the weight of the fender will cause

it to descend, the rock-shaft H and sleeves F permitting this movement and enabling the wheels I to travel upward along the inclines J.

The inward movement of the fender D to secure the engagement of the head Q with the hooked arms O P may, as above described, be effected by the rotation of the shaft N and wheels M, the latter engaging the racks L and forcing the rods E and rod R inward to the position shown in Fig. 1.

The fender D is provided at opposite ends with the pivoted segmental wings W and said ends are slotted, as at X, to receive the pins Y connecting said wings W with the rods Z, the latter being secured at their inner ends upon the pins a connected with the plates b mounted upon the shaft H. While the fender D is at its inward position, shown in Fig. 2, the wings W will be substantially concealed upon the said fender, and when the latter is at its lower or outer position, illustrated in Fig. 3, the wings W will be extended outward beyond the outer line of the wheels C in order to prevent the object on the track from passing beneath said wheels. The wings W are regulated in their movement by the movement of the fender D, the length of the arms Z and the form of the slots X being such that when the fender D is elevated, the arms Z will draw the wings W inward to the position shown in Fig. 1 and that when said fender is depressed, as illustrated in Fig. 3, the said arms will cause the wings W to extend or turn outward.

The hooked arms O, P, are pivoted to a bearing c and have at their outer or hooked ends a tension toward each other owing to the interposition of the springs d; and at the inner ends of said hooked arms O, P, are pivotally secured the links e, f, by which said arms are connected with the revoluble disk g mounted upon a vertical pivot and provided with the actuating rod h which, as illustrated in Fig. 1, extends outward toward the end of the car and passes through a suitable supporting bearing i. When the rod h is pressed inward, it will cause the rotation of the disk g and through the links e, f, the separation of the outer or hooked ends of the arms O, P, whereby the latter are released from the head Q preparatory to the springs V shooting the fender D outward. The rod h may be caused to move inward to effect as above described, the separation of the hooked arms O, P, from the head Q, either by the motorman on the platform or by the contact of the obstruction on the track with the hinged frame j, which is connected with operative devices adapted to act on the rod h. Upon the platform of the car will be provided the lever k whose lower end is in near relation to the outer end of the rod h, the said lever being conveniently arranged, as illustrated, to enable the motorman to press against the same and thereby force the lower end of the lever against the rod h sufficiently to turn the disk g and free the head Q from the hooked arms O, P. The hinged frame j is connected by a chain or

other ligament m with the lazy-tongs levers n, as illustrated more clearly in Fig. 1, the said levers being secured upon the pivot o, and having an extension p in line with the pivoted button q secured upon the bracket r which is rigidly connected with the rod h and carries a leaf spring s in contact with the flat side of said button q. In Fig. 1 the rod h is shown in its inward position with the frame j projecting forward, and under this condition the extension p on the lazy tongs levers n will be removed from contact with the button q and said button will be in line with the main arm of the bracket r as illustrated. Upon the hinged frame j coming into contact with an obstruction on the track, it will be caused to turn inward below the car to the position illustrated in Fig. 3, and this movement of the frame j will cause the latter through the chain m to draw on the outer end of the lazy tongs levers n and thereby cause the extension p on the inner end of said levers to come into contact with the button q and force the said button with the bracket r and rod h inward and thereby effect through the disk g the freeing of the head Q from the hooked arms O, P. During the inward movement of the extension p on the lazy tongs levers n, the button q will remain stationary on its pivot, and the end of said extension moving in the arc of a circle will after sufficiently moving the rod h pass to the rear of said button; and during the forward movement of the extension p the end of the latter will strike the button q and while passing the same will turn the button slightly on its pivot, after which the extension p being then at the outer side of the button, the spring will restore the latter to its normal position. Shown. The chain or ligament m connected with the frame j passes over the eccentric pulley t by which it is caused to pull on the lazy tongs levers n when said frame j is turned inward, and to release said levers when said frame is turned outward. The lazy tongs levers n are at their outer end connected with a spring w which exerts a pressure against said levers when the frame j is folded inward and serves to cause said levers to resume their normal position as soon as the obstruction passes or is removed from the frame j. The restoring to their normal position of the lazy tongs levers n operates through the chain m to draw the frame j outward to its normal position. Shown in Fig. 2.

When the fender D and connecting devices are at the rear end of the car and it is not desired that they shall be put into use, the frame j will be turned entirely inward below the car platform and caught upon the hook x which will retain it in place, and by means of the shaft N the fender D and rods E, R, will be moved inward and locked by means of the hooked arms O, P. As a means of securely locking the rod R to prevent the fender D from moving forward I have provided on said rod a collar x' adapted to be engaged by

the arm *y* formed on the inner end of the pivoted lever *A'*, whose outer end carries the segmental rack *B'* in engagement with the pinion *C'* held upon the bracket *D'*. The pinion *C'* at its upper exposed side, is adapted to be turned by a key *E'* to effect through it and the rack *B'* the movement of the lever *A'*, whereby the arm *y* may be either thrown outward from the collar *x'* or inward against said collar according to the direction of the movement given to the pinion. When the arm *y* is thrown inward against the outside of the collar *x'* it will be obvious that the rod *R* will be immovable, and that when the arm *y* is thrown outward from said collar *x'* the rod *R* may, when released by the hooked arms *O*, *P* move forward as before. During the time that the rod *R* is held by means of the arm *y* and collar *x'* any movement of the arms *O*, *P* will fail to release said rod *R*. It will be desirable to lock the fender and its connecting rods inward by means of the lever *A'*, when said parts are at the then rear end of the car; and after the fall of snow and before the tracks are clear it may be desirable to lock the frame *j* inward on the hook *x* at the front end of the car, at which time the fender will be temporarily operated when necessary by the motorman, who by pressing on the lever *k* may drive the rod *h* inward and thereby cause the fender *D* to advance and lower to position.

The wheels *I* being grooved will not leave the inclines or tramways *J*, and the latter owing to their position and inclination will regulate the extent of the descent of the fender *D* toward the track. The relation of the lower edge of the fender *D* to the track may vary according to special conditions and circumstances, and hence the tramways *J* will be so arranged and given such inclination that the desired ascent and descent of the fender may be readily and accurately attained.

From the foregoing description, it will be noticed that the fender *D* and connecting devices are moved inward by means of the shaft *N*, pinions *M* and racks *L*; that when said parts are thus moved inward they may be held or "set" by means of the automatically operating hooked arms *O*, *P*, and that said fender is adapted to be shot forward and lowered to operative position either by the motorman pressing forward on the upper end of the lever *k* or by the contact of the obstruction on the track with the pivoted frame *j*.

It will be observed that the head *Q* on the rod *R* is wedge shaped and that the facing edges of the front ends of the arms *O*, *P*, are curved, whereby the entrance of said head between said arms is facilitated.

The invention is not limited to any special position of the fender *D* with respect to the end of the car, but when located as shown it will be out of the way and effectually catch the obstruction and prevent the same from passing beneath the wheels.

Without confining the invention to the pre-

cise details of construction and arrangement shown and described, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the car, the fender having the rods *E*, the sleeves *F* receiving said rods and adapted to have a rocking movement therewith, the inclines *J* engaging the ends of said rods *E* and extending downward and inward, and means for releasing said fender from its inward position when an obstruction is on the track; substantially as set forth.

2. In combination with the car, the fender, the rod having a head and connected with the fender, the hooked arms automatically engaging said head when the fender is moved inward, the links connecting said arms to a revoluble disk, and a rod extending from said disk and adapted when actuated to rotate the same and free said hooked arms from said head, allowing the fender to descend; substantially as and for the purposes set forth.

3. In combination with the car, the fender *D* having the segmental slots *X*, means for moving said fender upward and inward, means for moving the same downward and outward, the automatically operating wings *W* pivoted upon opposite ends of said fender and at all times parallel therewith, and the rods *Z* at their inner ends secured to rocking bearings and at their outer ends connected by pins *Y* passing through said slots with the said wings; substantially as set forth.

4. In combination with the car, the fender having the rods *E* provided with teeth, the shaft having pinions engaging said teeth, the springs giving said fender an outward tension, the rod *R* having a head and secured to said fender, and means for automatically engaging said head when the fender is moved inward, and means for effecting the release of said head when an obstruction is upon the track; substantially as set forth.

5. In combination with the car, the fender having the rods *E*, the inclines *J* engaging the said rods and consisting of vertical plates whose edges incline downward and inward and which have the lower arms *K*, and means for releasing said fender from its inward position when an obstruction is on the track; substantially as set forth.

6. In combination with the car, the fender having the rods supported in rocking bearings, the inclines engaging said rods, the hooked arms adapted to automatically catch the fender when at its inward position, the revoluble disk connected with said arms, and the operating rod also connected with said disk; substantially as set forth.

7. In combination with the car, the fender adapted to be moved inward and to move outward and downward, the hooked arms adapted to catch the fender when at its inward position the hinged frame *j*, the levers *n* connected with said frame by a chain or ligament, the rod *h* having the button *q*, and means intermediate said rod and arms whereby the latter will release the fender on the move-

ment of said rod by said levers; substantially as set forth.

8. In combination with the car, the fender adapted to be moved inward and to move out-
5 ward and downward, means for automatically catching the fender when the latter is moved inward, means for effecting the release of the fender when an obstruction is on the track, the lever A' adapted at one end to engage the
10 fender and having at its opposite end a seg-

mental rack, and the pinion C' engaging said rack and adapted to receive a key; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 26th day 15 of July, A. D. 1894.

GEORGE P. KATO, JR.

Witnesses:

CHAS. C. GILL,

WILLIAM B. ELLISON.