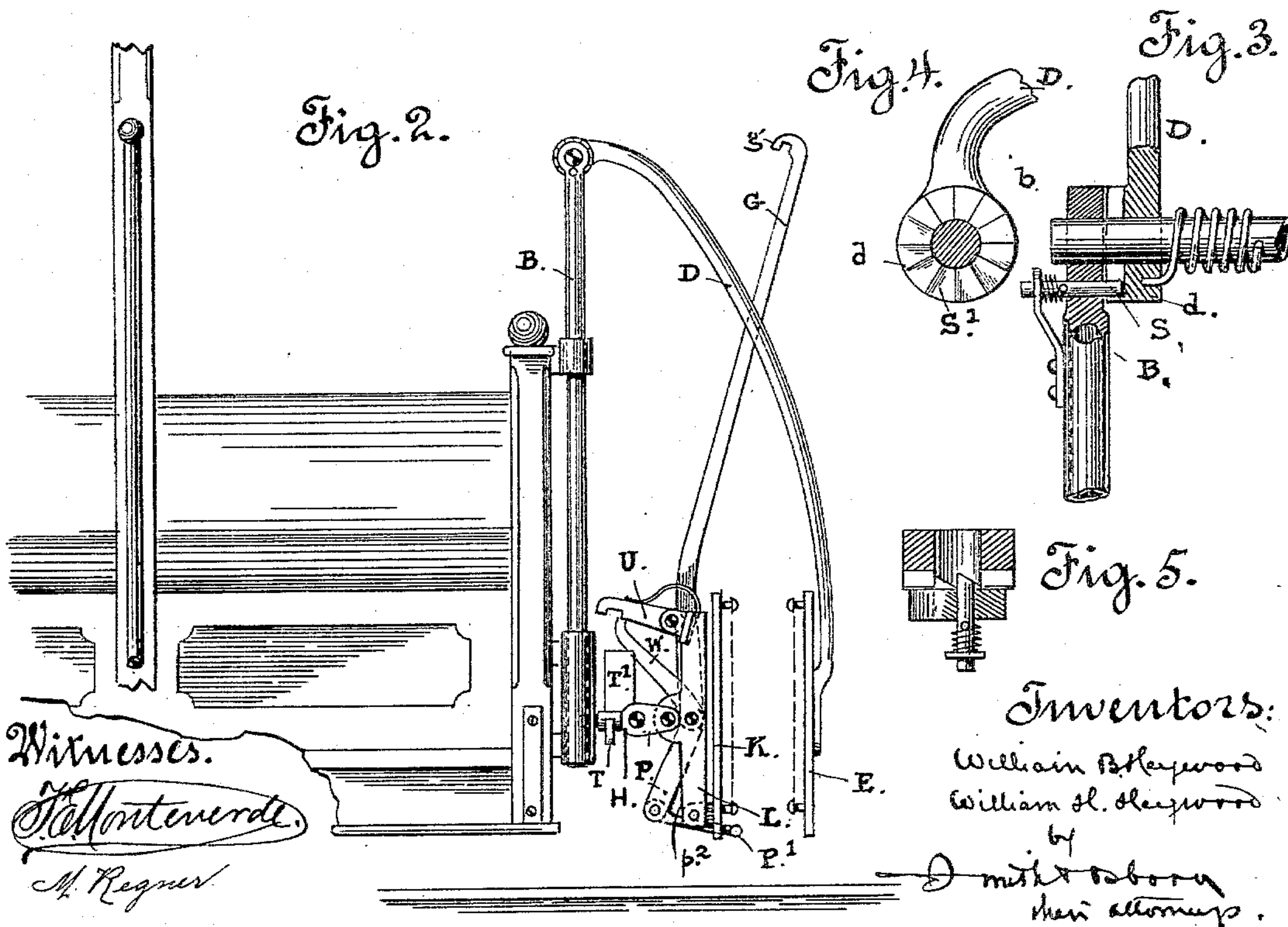


2 Sheets—Sheet 1.

No. 598,068.

Patented Jan. 25, 1898.



Witnesses.
St. Montenero.
M. Regnier.

Inventors:
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2 Sheets—Sheet 2.

No. 598,068.

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Fig. 6.

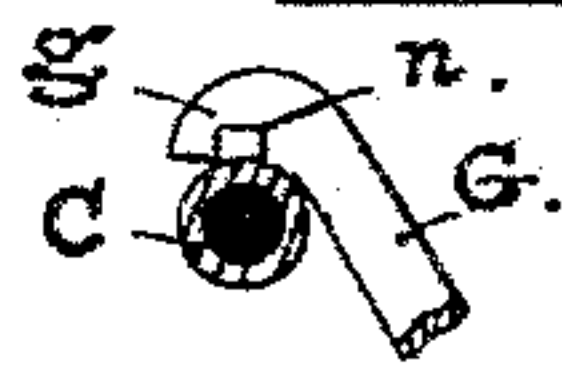
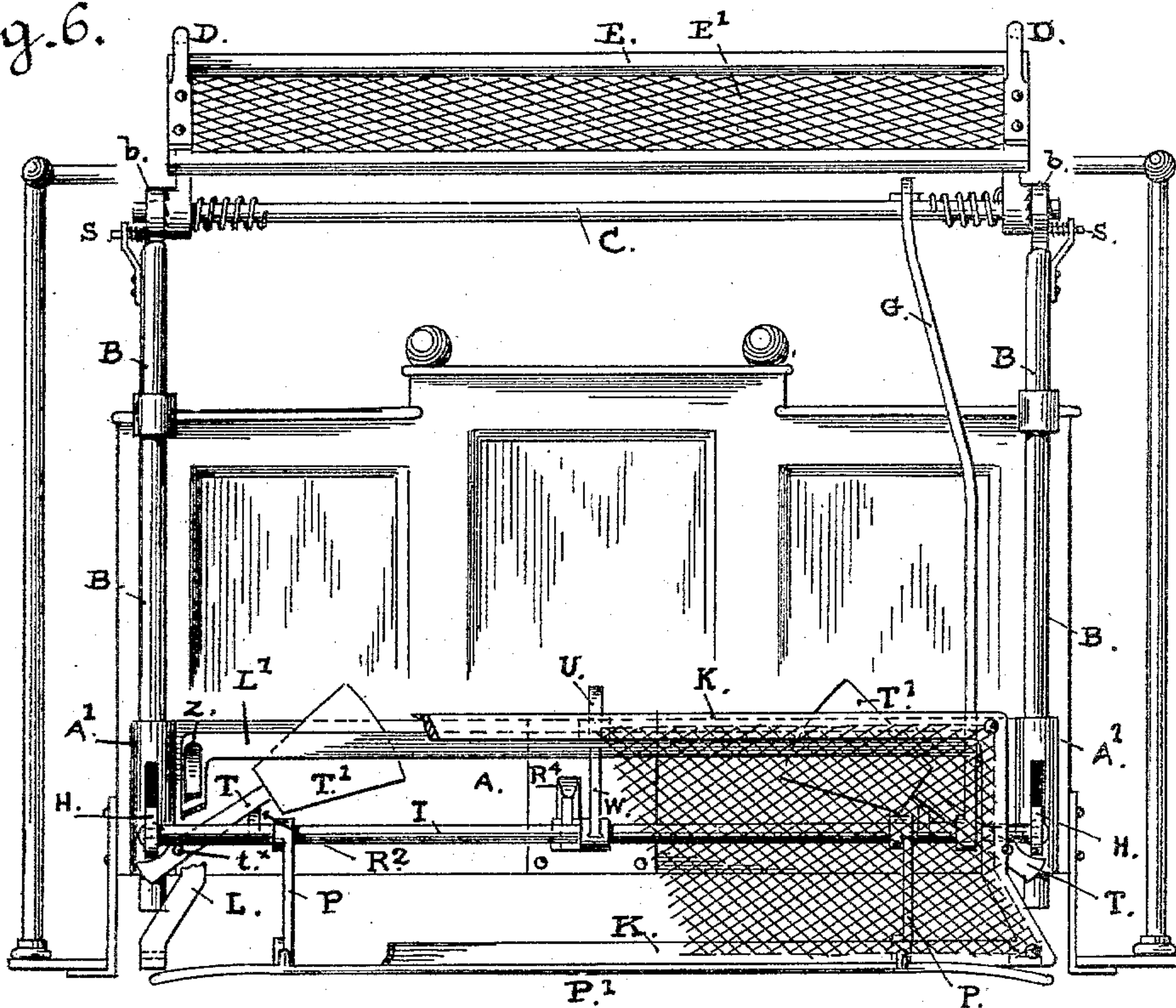
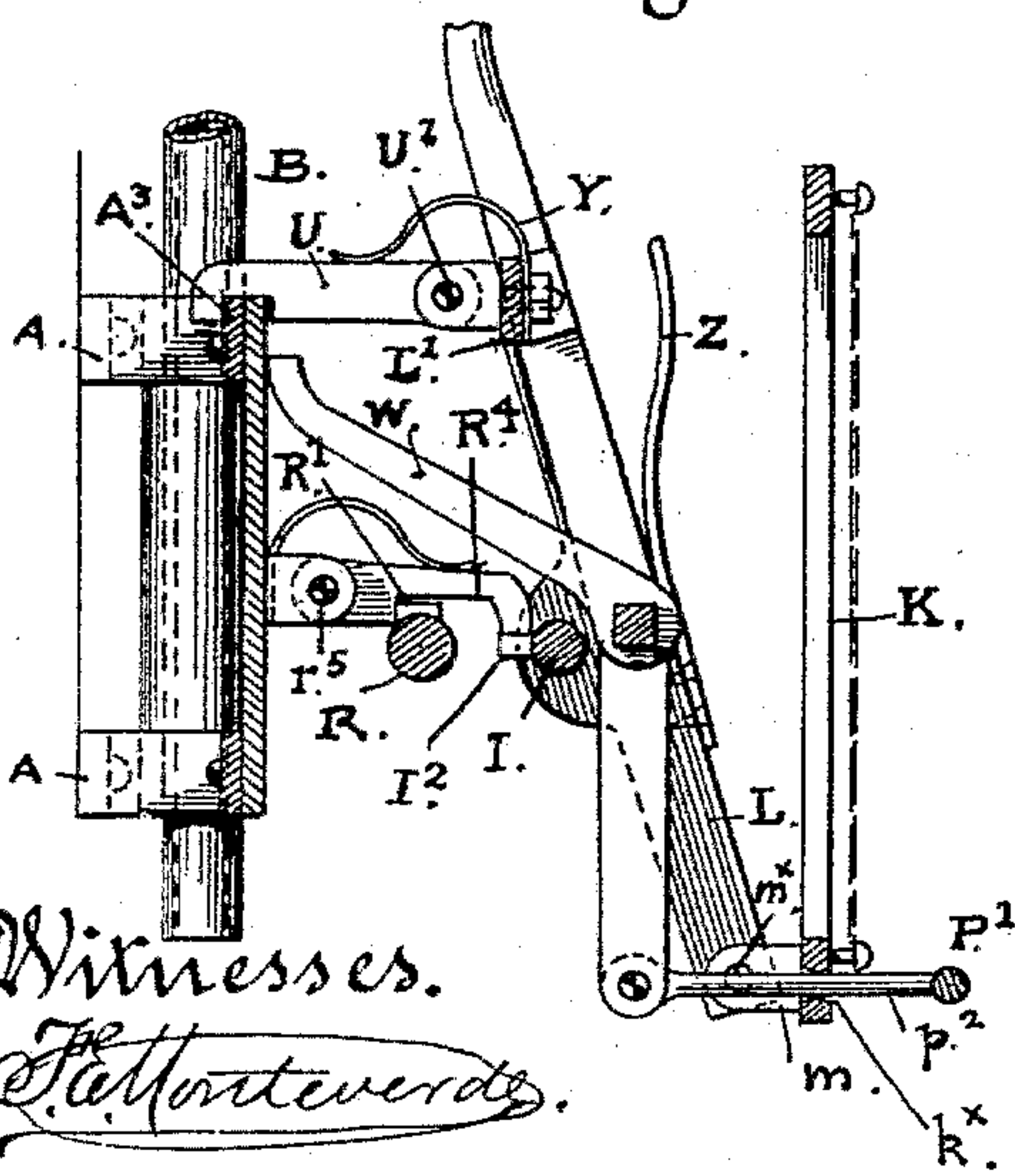


Fig. 7.

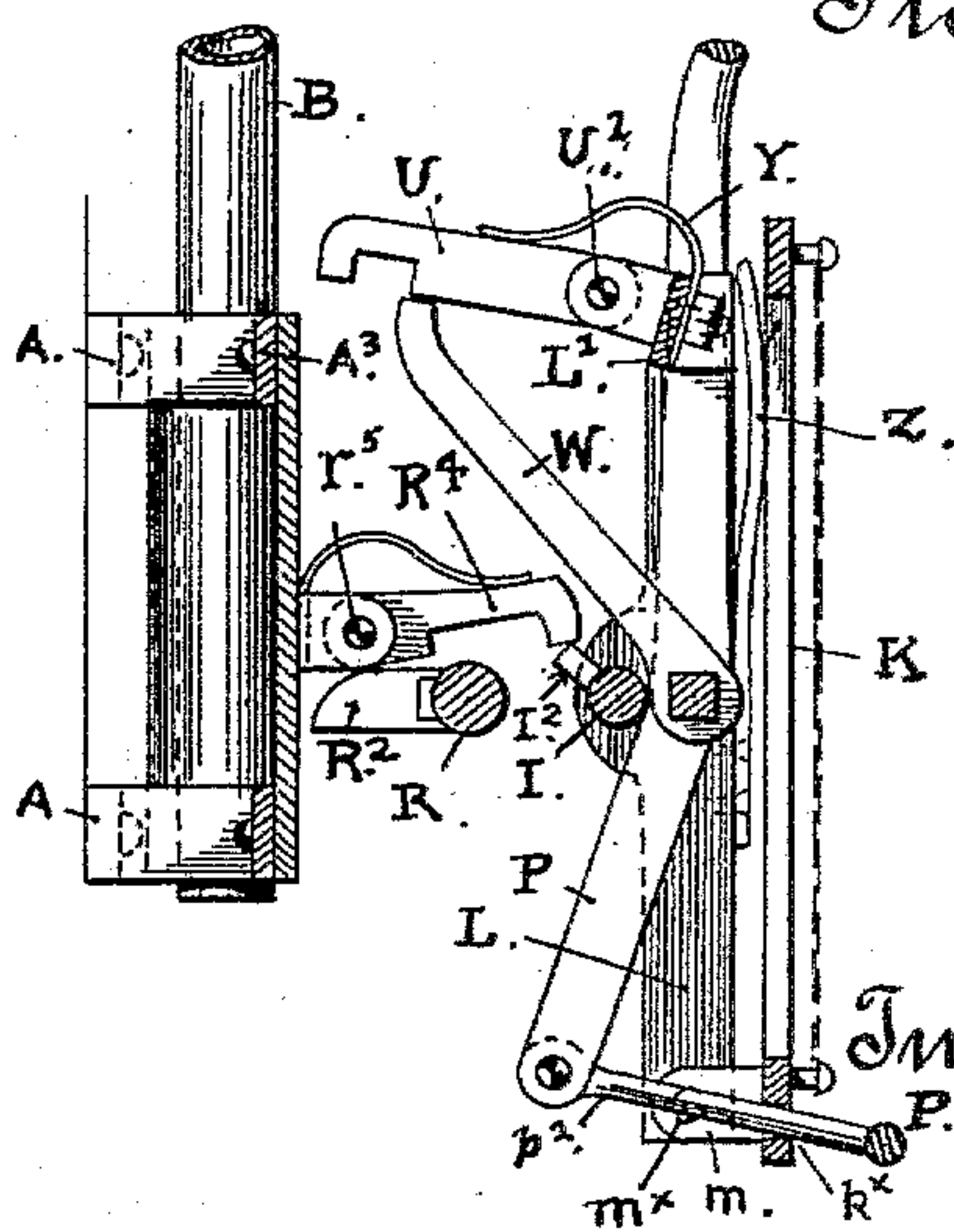


Witnesses.

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Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM B. HEYWOOD AND WILLIAM H. HEYWOOD, OF GUALALA,
CALIFORNIA.

AUTOMATIC CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 598,068, dated January 25, 1898.

Application filed July 29, 1897. Serial No. 646,359. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. HEYWOOD and WILLIAM H. HEYWOOD, citizens of the United States, residing at Gualala, Mendocino county, State of California, have invented certain new and useful Improvements in Automatic Car-Fenders, of which the following is a specification.

Our invention relates to automatic car-fenders of that class or description which are adapted to pick up and carry the person struck by the device; and the invention comprises a certain novel construction and combination of fender and grapple mounted for operation on the front of the car and mechanism whereby the same is caused to first grasp the object struck by the fender and afterward to raise the fender and the object in the grapple from the surface of the track, the mechanism being tripped and set in motion directly by the contact with the fender of the person being struck by it.

The following description explains at length the nature of our said improvement in this class of safety devices for street-railway cars and the manner in which we proceed to construct, produce, and apply the same for operation, reference being had to the drawings that accompany and form part of this specification, in which—

Figure 1 is a view in side elevation of a safety-fender embodying our said invention mounted on the front of a street-car and set in position for operation; Fig. 2, a similar view of the device, showing the position assumed by the parts after the mechanism has been tripped and the parts are in a closed position and the device raised by the elevating mechanism. Figs. 3, 4, and 5 are details of the locking mechanism that holds the grapple from springing open after it is closed upon the object in its grasp. Fig. 6 is a front elevation of Fig. 1 with the front frame and guard partly broken away on one side of the vertical center. Figs. 7 and 8 are side views in detail and on an enlarged scale of the parts of the locking and tripping mechanism. Fig. 7 shows the parts set for action, and Fig. 8 the position of the same after being tripped.

A indicates a stationary frame bolted to the

front of the car, and A' upright tubular guides on the frame.

B B are upright rods fitted to slide in the guides and carrying on their upper ends a rod or bar C, fitted to turn in eyes *b* on the ends of the upright rods.

D D are curved arms having eyes *d* on their inner ends fixed on the rod C, and E is a frame secured to the outer ends of the curved arms and extending horizontally across the space between the two arms. This frame is covered with a light and strong netting E', stretched across the front of the frame, and, if found desirable, it may be padded or cushioned around the frame to prevent the hard unyielding surfaces from coming in direct contact with the body of the person being grappled.

The arms and the frame on their front ends, already described, form that part of the fender which we term the "grapple." When set for operation, it is supported by the uprights B in a forwardly-extended position at proper height above the surface of the roadway to clear the head of a person standing on the track in front of the car and is held in such position by the locking lever or arm G of a tripping mechanism on the front of the fender. The parts of this mechanism are carried by or from arms H H, rigidly fixed in the upright rods B B, and a rocking shaft I, fitted to turn in the eyes H' on the ends of the arms.

K is a guard-apron composed of a light frame of substantially a rectangular shape with a yielding or elastic cover of netting stretched across the opening from the four corners of the frame, and L L are lever-arms fast on the rocking shaft I, to the lower ends of which the guard-apron K is attached by ears *m* and pivots *m*^x. The levers L L extend both above and below the shaft I and are united at their upper ends by a horizontal bar L'. These parts L L L' form a light frame behind the apron K and by which the apron is supported from the shaft I, so as to stand in an upright position in front of the frame. In this position when the device is set ready for action the guard K covers all the parts of the operating mechanism and receives the impact of the person struck by the

car, while at the moment of the blow or pressure of the part of the body coming in contact with it the apron is adapted to yield or move backward a short distance and thereby reduce or weaken the force of the blow. This last-mentioned movement of the apron has the effect to bring the lever-arms L L to an upright position, and thus produce a partial rotation of the rocking shaft I.

G is a long arm rigidly secured by the lower end to a rock-shaft I^x and extending from such shaft upward to the cross-shaft C of the arms of the grapple and terminating in a catch g, the opening of which is shaped to engage a tooth or pin n on the shaft, so as to keep the shaft from turning, and thus hold the grapple in the raised position represented in Figs. 1 and 6. The arm G is itself operated by a tripping mechanism composed of two arms P P, fast on the shaft I^x, and a cross-bar P', connected to the arms P by push-rods p² p² and extending across the front of the apron K.

The before-mentioned rods work through openings k^x in the bottom bar of the apron-frame and project a short distance beyond the front of the apron, so that the tripping-bar P', being held by them a little in advance of the front face of the apron K will be forced back by contact of the fender with the person struck by it, and the catch g will be acted on before the apron is pressed back.

When the grapple is raised and locked in open position and the tripping mechanism is set ready for action, the parts occupy the positions represented in Figs. 1 and 7, and whenever the tripping-bar P' is struck and pressed back the catch is disengaged from the pin on the shaft of the grapple and the parts take the position shown in Figs. 2 and 8. In this position the person struck by the fender in the forward movement of the car is designed to be caught and held between the upright fender-apron K and the grapple, which turns downward in an arc from the center of its movement located above the fender-apron. At the end or lowest point of such movement the grapple is automatically locked and held in closed position by a spring-bolt S, working through a hole in the upright rod B, and a series of ratchet-teeth or notches S' on the face of the hub d in the end of the grapple-arm fitted on the shaft C.

When the grapple is raised and set for action, the bolt S is drawn back to clear the notches. The parts of this locking device are represented in detail in Figs. 3, 4, and 5.

After the fender and grapple have struck and closed upon a person they are raised by elevating mechanism composed of the two weighted levers T T, carrying heavy blocks T' on the ends of their longer arms and having the ends of their shorter arms resting against studs H on the perpendicular slide-rods B of the fender.

The levers T T are held up in working position and the weight of the blocks T' is re-

moved from the rod B by a tappet-arm R² on a rock-shaft R, which projects under the longer arm of the lever between its fulcrum t^x and the weight, the rock-shaft R being supported at the outer ends in projecting arms or lugs on the sliding frame.

The tappet R', extending rearwardly under the lever T, is kept in a horizontal position by locking the rock-shaft R against turning under the pressure of the lever upon the tappet-arm. The locking device employed for this purpose consists of a tooth R', fixed in the rock-shaft R, and a latch R⁴, pivoted at r⁵ in a lug on the sliding frame, the latch having a square shoulder on the under side, against which the tooth bears when the latch is turned down into horizontal position over it. A spring holds down the latch when it is set to engage the tooth of the rock-shaft, and in that position, which is represented in Fig. 7, the forward end of the latch is made to rest upon a pin I², fixed in the cross bar or rod I on the back of the fender-frame and on which are fastened the lever-arms L L, hereinbefore described. These arms L, to the lower ends of which are pivoted the fender K, are set at an inclination backward, with the lower end standing forward when the device is arranged in position for action, and at such time, the latch I being turned down upon the tooth R' to lock the rock-shaft R, the pin I² of the rod I will stand horizontally backward beneath the forward end of the latch.

To the same rod or rock-shaft I on the fender is fixed the arm G, already described, which holds the grapple E, and thus by the backward movement of the lower ends of the lever-arms L L both the grapple is released and allowed to drop and the latch R⁴ is thrown off the tooth of the rock-shaft R. This operation of the tripping mechanism will be understood from Fig. 8 of the drawings, where the parts are represented as being thrown off by the contact of the lower part of the fender with an obstacle on the track. The weighted levers T T are not shown in these two views; but by referring to Figs. 1 and 6 the position of the tappet-fingers R² directly under the lever T will be understood.

The arms L are set and held in a position inclined backward out of the vertical by a pivoted latch U, arranged to engage a stationary cross-bar A³ of the fixed frame and attached at U' to the back of the cross-bar L' of the frame of which the arms L L are a part. A tripping-arm W, carried by the rock-shaft I^x of the grapple-releasing mechanism and fast on that shaft, is arranged to throw up the latch U at the end of the backward movement of the tripping-bar P' and thus allow the frame to take an upright position, by virtue of which movement the weights are released and caused to act upon the slide-rods B. Spring-tongues Y are placed above the latches and prevent them from being accidentally thrown off by sudden movements or jolts of

the car, and springs Z are interposed between the apron K and the carrying-frame to check the force of the backward movement of the apron at its time of action. The parts of this locking and tripping mechanism are shown in Fig. 7 in position set for action, and in Fig. 8 the position of the same parts when the trip is sprung and the fender elevated. These views do not show the weighted levers, but the position and movements of those parts with relation to the fender and the tripping mechanism will be understood by reference to Figs. 12 and 6, in which the levers are shown in position elevated and ready for action.

As thus constructed the operation of the grappling and lifting mechanism will be as follows: The weighted ends of the lifting-levers T are raised and held up by setting the tappets R² under the longer arms and closing the latch R⁴ down upon the tooth of the rock-shaft R after the apron-carrying frame L has been set back on its inclined position to bring the tripping-tooth I² on the shaft directly beneath the end of the latch R⁴, this position of the frame being maintained by the latch U. Finally, the grapple is turned up into the open position until the tooth n on the shaft C slips into the notch or the end of the locking lever or arm G. Such positions and adjustment of the parts are shown in Figs. 1, 6, and 7, and thus set the apron K and the grapple are carried and extend in front of the car ready for action. At the time of contact with a person struck by the moving car the tripping-bar P' first striking the person is pressed in, and by virtue of its backward movement the locking-arm G is tripped and the grapple is released, after which the fender-apron is pressed back and the two latches R⁴ U are thrown off, one slightly in advance of the other, thereby releasing the frame L and afterward the weighted levers. These last-mentioned parts are so timed in their movements that the slide-rods B B are lifted by the weighted levers as the grapple has about completed its downward movement and the person is grasped between the grapple and the apron. The levers T are so arranged that the movement of their shorter members is sufficient to elevate the fender several inches vertically and thereby lift the person in its grasp clear of the surface, so as not to come into rough contact with the roadway in the forward movement of the car, due to its move-

ment after the power has been cut off and before the brakes have acted.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a car-fender, the combination of the vertically-movable frame, weighted levers adapted to raise said frame to an elevated position; a locking device holding said levers out of action; a tripping device adapted to release said levers from the lock and having a tripping-bar projecting in front of the fender; a guard frame or apron mounted on the movable frame in substantially an upright position across the opening below the car-body; standards on said movable frame extending upward to a point above the car-platform; swinging arms pivoted to the upper ends of said standards and extending horizontally forward over the track; a grapple-frame attached to the outer ends of said arms and extending across the open space between said arms; a locking device adapted to hold said arms in elevated position over the track; and a tripping device operated by or from the push-bar of the weight-releasing device to release the said arms and allow the same to swing downward and close upon the guard-apron.

2. The combination with the vertically-sliding frame mounted on the front of the car, and carrying a guard-apron and a swinging grapple-frame adapted by its movement downward in a vertical arc from a position above and in advance of the guard-apron to close upon said apron; of counterweights connected to said sliding frame and adapted by their weight to elevate said frame and raise the guard-apron and grapple into a higher position from the ground after they are closed upon each other, a locking device holding said weights out of action, and a releasing mechanism by which the said weights are set free and allowed to act.

In testimony that we claim the foregoing we have hereunto set our hands and seals.

WILLIAM B. HEYWOOD. [L. S.]

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