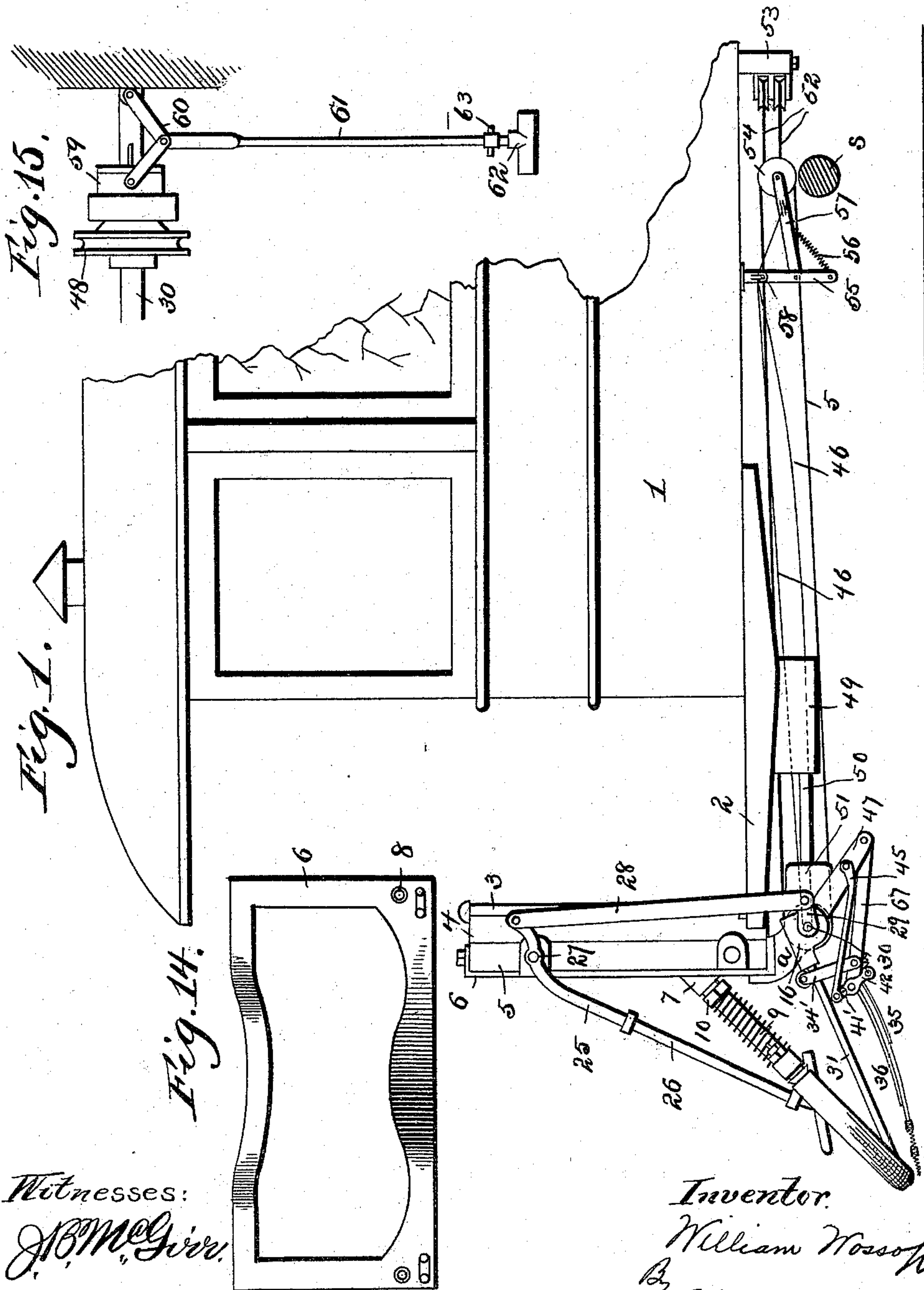


W. WOSSOFF.  
CAR FENDER.

No. 547,366.

Patented Oct. 1, 1895.



Witnesses:

J. B. McGirr.

K. E. Naumann

Inventor.

William Wossoff.

By Harrison & Harrison,  
Attys.

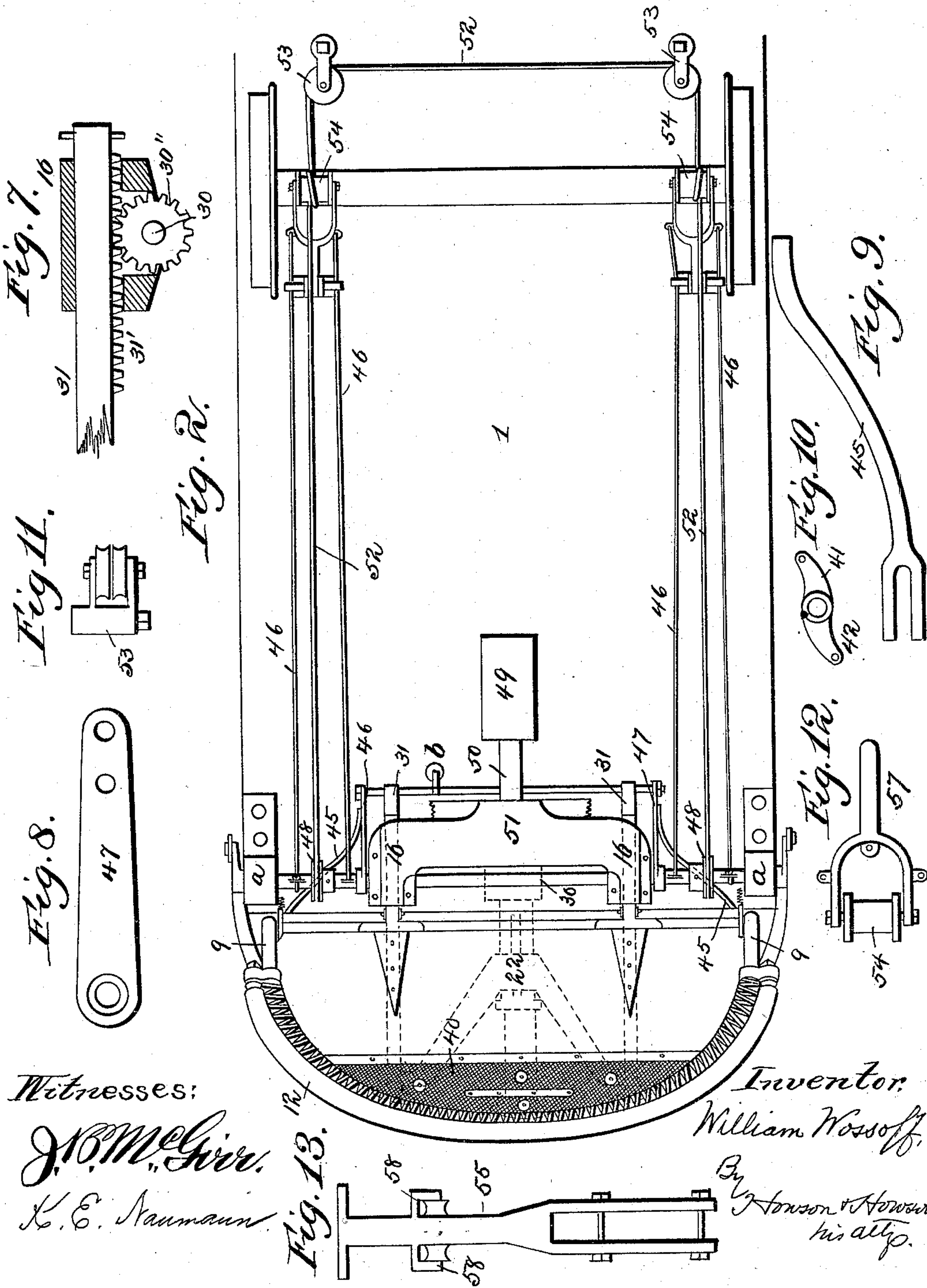
(No Model.)

3 Sheets—Sheet 2.

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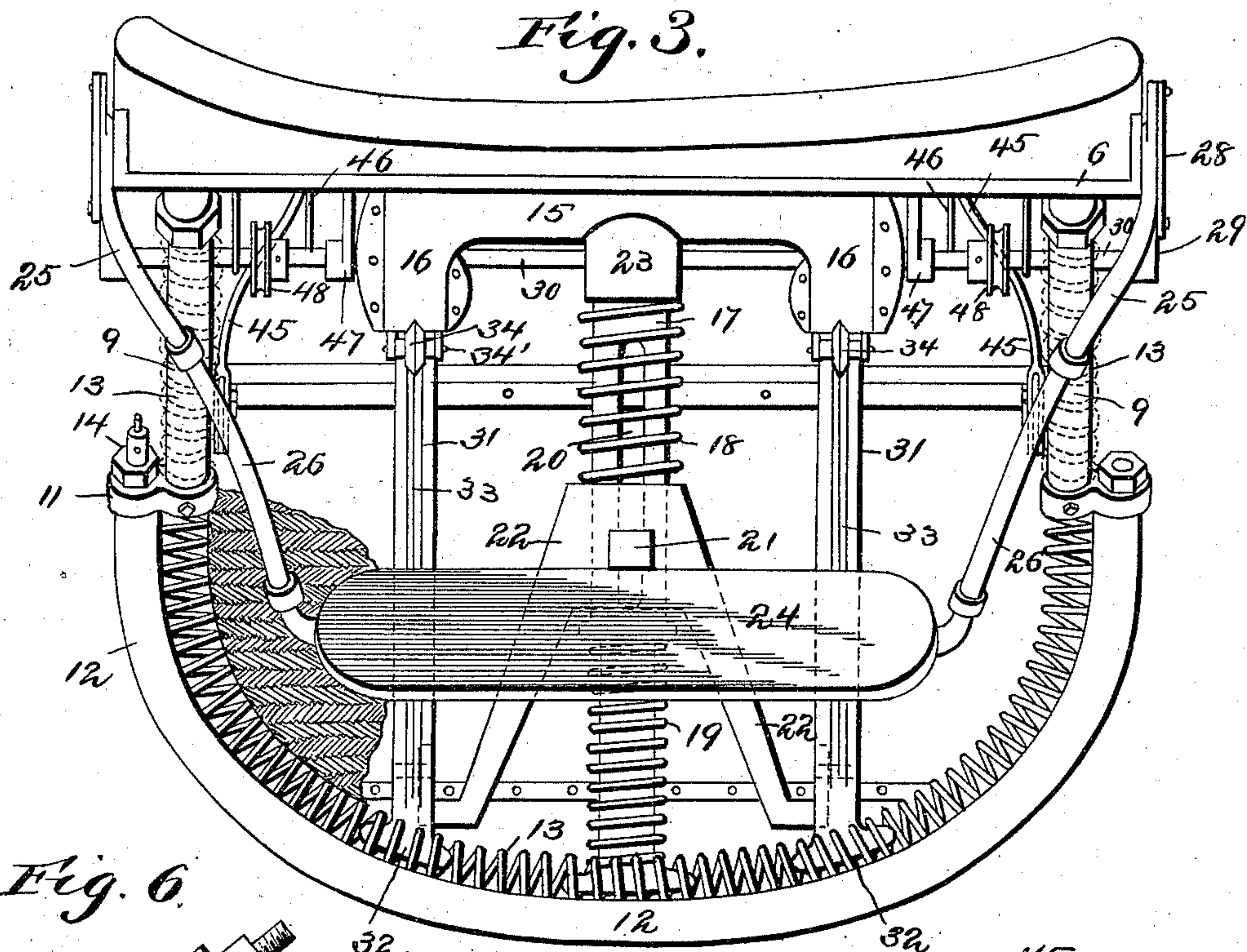
By J. Henson & Howson  
his attys.



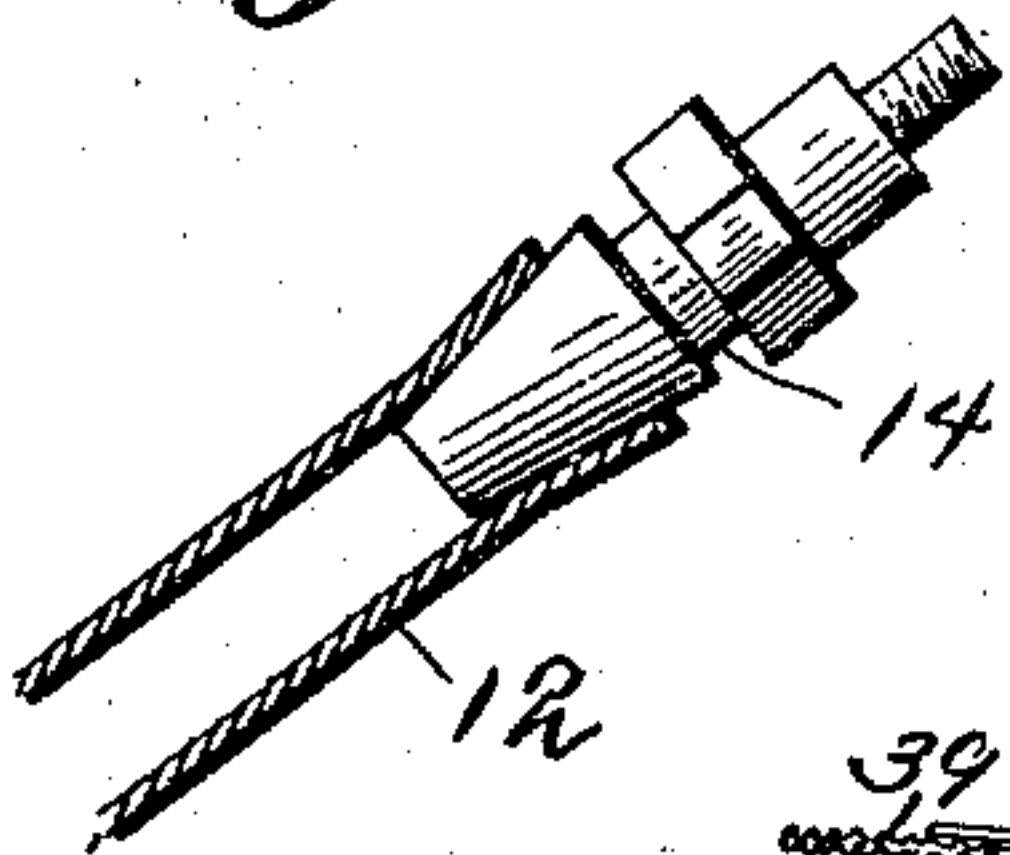
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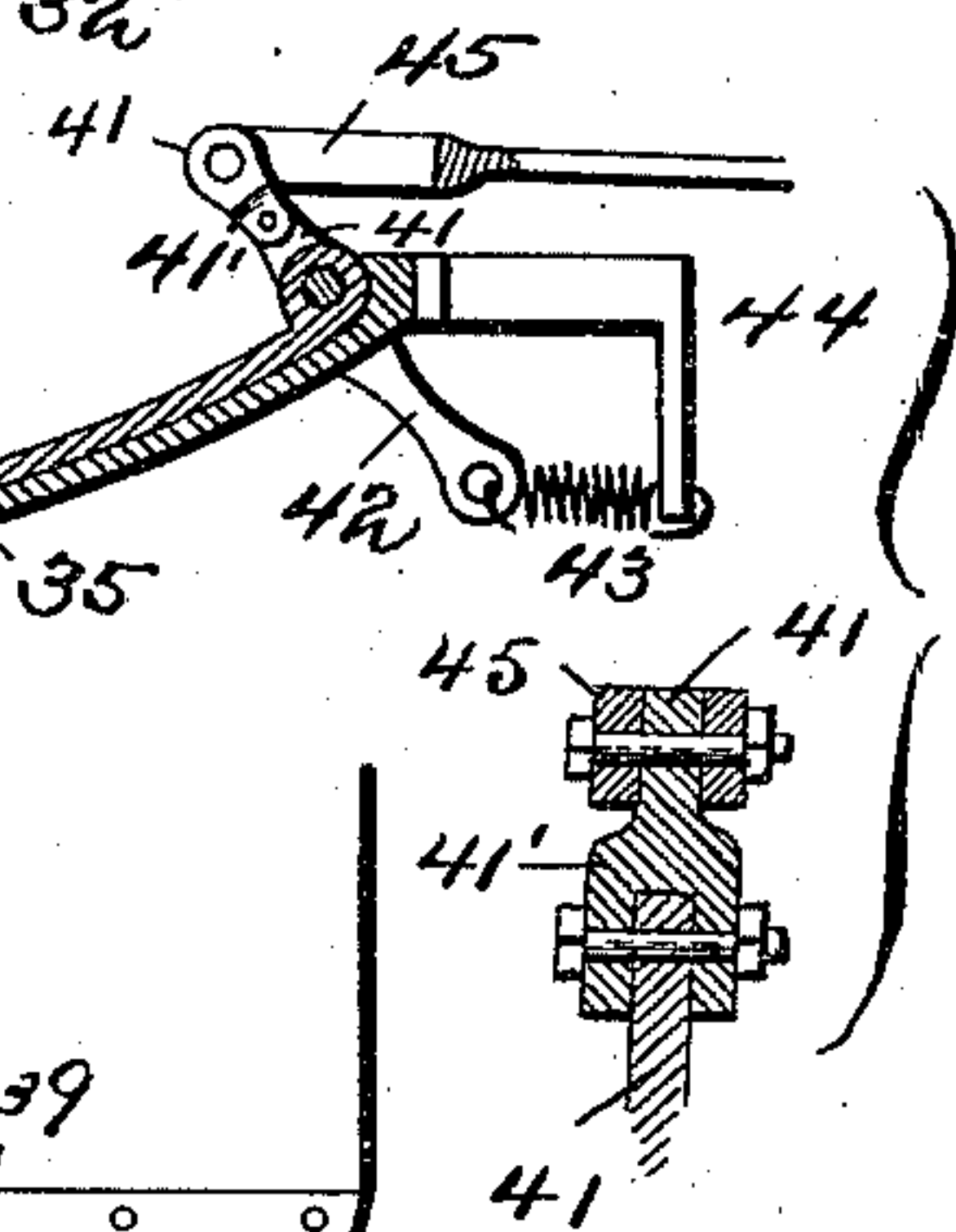
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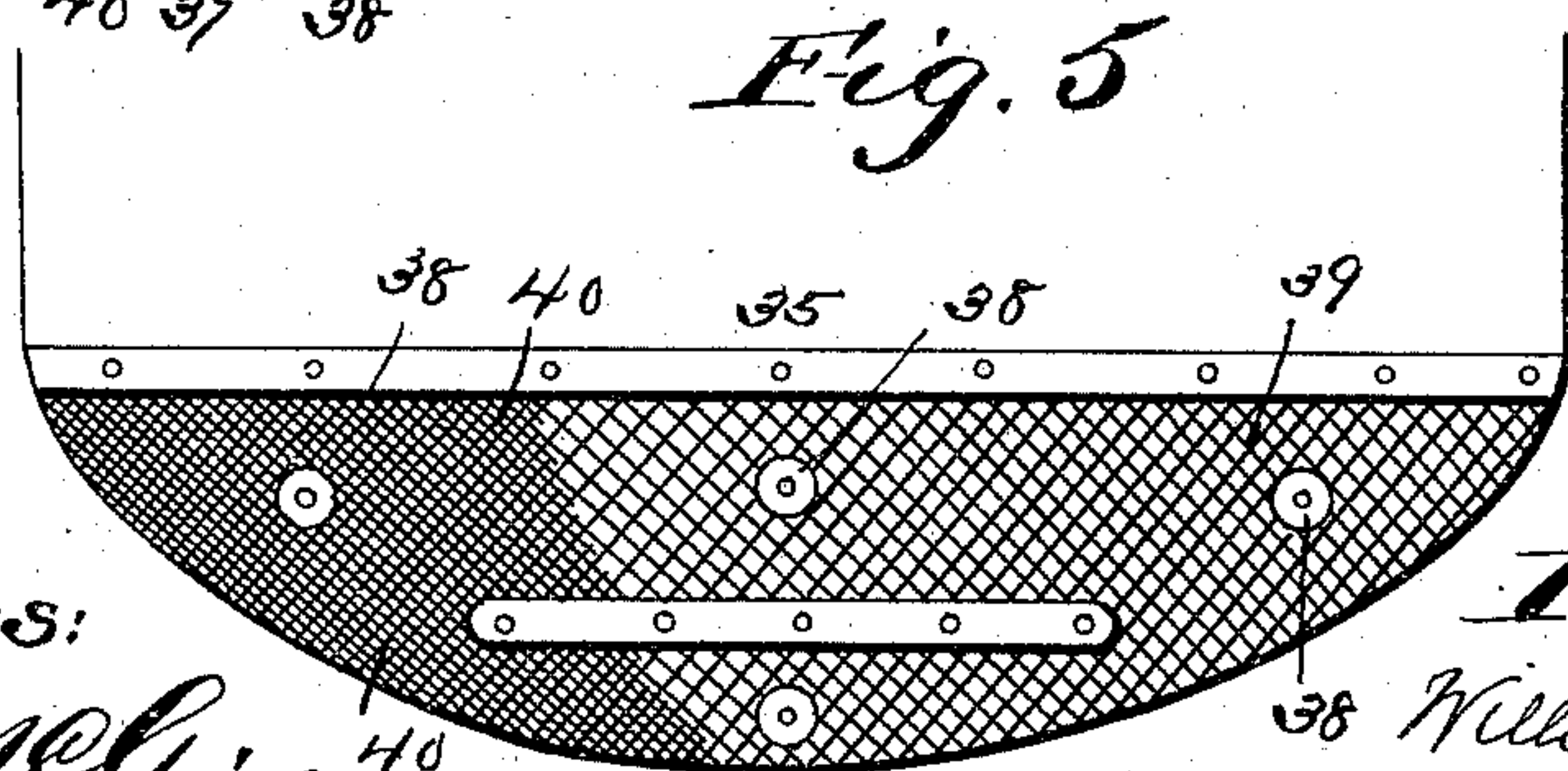
*Fig. 6.*



*Fig. 4.*



*Fig. 5.*

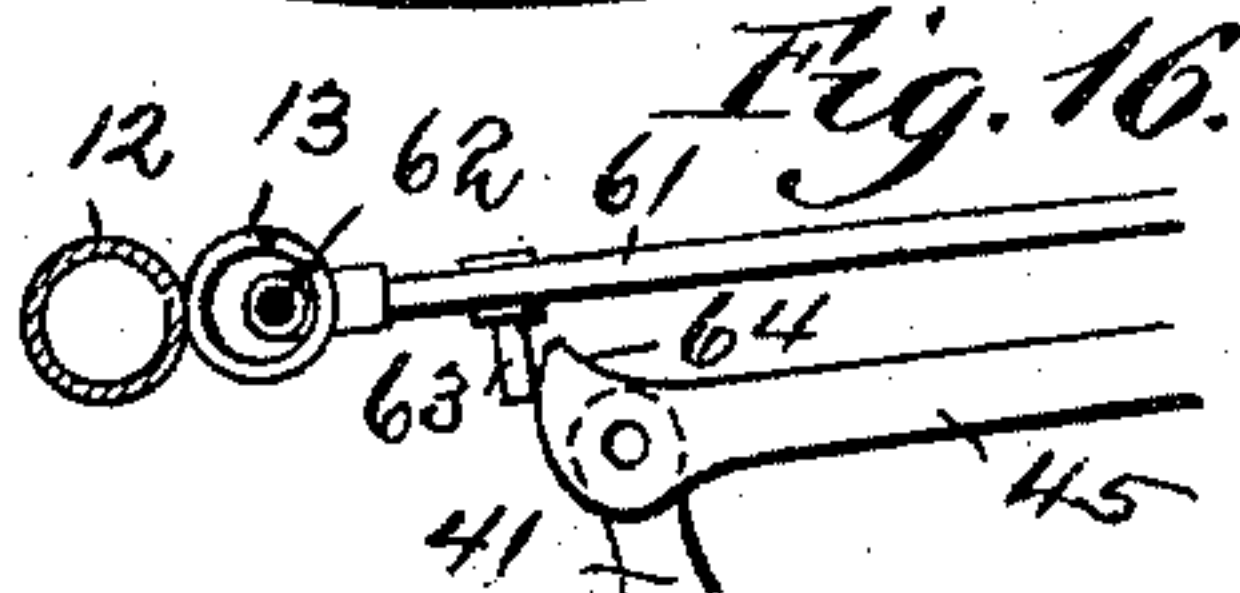


Witnesses:

*J. B. McGirr.*  
*K. E. Naumann.*

Inventor.

*William Wossoff.*  
*By Andrew V. Anderson*  
*his Atty.*





# UNITED STATES PATENT OFFICE.

WILLIAM WOSSOFF, OF PHILADELPHIA, PENNSYLVANIA.

## CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 547,366, dated October 1, 1895.

Application filed January 18, 1895. Serial No. 535,424. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WOSSOFF, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Car-Fenders, of which the following is a specification.

My invention relates to car-fenders applicable to street-cars, locomotives, and the like; and my main object is to provide a car-fender which shall be particularly adapted for use upon street-railways which will automatically and unvaryingly operate to pick up persons who happen to be upon the track in front of and in danger of being struck and run over by the moving car and safely deposit them upon the fender without injury.

To provide such a fender as will not fail in its operation at the critical moment, it is necessary to so construct the pick-up mechanism and its operating parts as to make its operation wholly independent of the position of the body or obstruction with which the fender may come in contact, and to so construct this mechanism that it will be positively operated from the driving-shaft or some other positively-operated part of the motor independent of the action of the body or obstruction itself. It is also necessary, when this mechanism is operated from the axle or driving-shaft of the car, to so construct it that a slight movement of the shaft—as, for example, in the present instance a movement of about one hundred and thirty-five degrees—will positively and effectively operate the pick-up mechanism as well to pick up the body or obstruction and place it into the fender and to return said mechanism to its normal position. The purpose of my construction is to avoid the possibility, which occurs frequently in fenders now known in the art, of a failure of the operation of the machine, which is due to the sudden application of the brakes, whereby the car-wheels are so quickly braked that the shaft soon ceases turning and the car slides bodily on the track. In such case it will readily be seen that where the operation of any portion of the pick-up mechanism is dependent upon the further revolution of the shaft or axle after the brakes are applied to any great extent it will and does frequently stop short of a perfect operation, because of the

stoppage of the wheels. It is the purpose of my invention to effectually obviate this serious objection by providing a pick-up mechanism whose operation depends upon a very slight movement of the shaft, which in no event can be instantaneously stopped. By such a mechanism a great and serious defect in many of the present fenders is overcome, for it is well known that the first impulse of the motorman when he sees a human being upon the track in front of him is to apply the brakes with all his power, whereby the car-wheels are caused to slide and the axle stop from turning very soon after such application of the brakes.

My object is also to provide a fender whose operation will depend solely upon the first impact of the smallest force exerted by the body which comes in contact with the fender, which impact puts in operation instantly the pick-up mechanism heretofore referred to.

With these objects in view my invention consists, first, in the novel construction of the fender to accomplish the purposes defined; second, in mechanism for picking up the body instantly upon its impact with the fender the operation of which is wholly independent of any further action or movement of the body after the first impact; third, in the details of construction which enter into these mechanisms.

Referring to the drawings, Figure 1 is a side elevation of so much of the car as necessary to show the application of my invention thereto. Fig. 2 is a top plan view with the body of the car removed. Fig. 3 is a front elevation of my invention. Figs. 4 and 5 are details of the scoops. Figs. 6 to 14 are details of the clutch mechanism used in connection with the pick-up mechanism.

Referring now particularly to the drawings, in which the same characters represent the same parts throughout all the views, 1 indicates the car-body, from which projects the usual platform 2, having the dashboard 3 extending upwardly therefrom. To secure the fender proper to the dashboard I preferably provide a backing, consisting of a wooden piece 4, against which rests a casting of suitable material 5, through which parts suitable securing-bolts are passed. To the front of the



casting 5 is attached a metal frame 6, provided on each side with a stud 8, to which is attached a forty-five degree sleeve 7, having a screw-threaded socket, in which is secured another stud that is connected to a short pipe 9 by a union. Upon the lower ends of each of these pipes is fitted a casting 11, having an ear projecting outwardly therefrom. Secured in these ears at each end is a flexible tube, of rubber or other suitable material, closed at one end and provided with a closable air-valve 14 at the other end for filling the tube with air or any suitable fluid, so as to form a cushion against which the body strikes. Extending around the inside of this pneumatic tube is a coil-spring 13, which may terminate at the casting 11 on each side, or at the unions 10, by which the pipes 9 are secured to the supporting-frame.

Mounted in hangers *a*, underneath the supporting structure, is a horizontal rock-shaft 30, upon which is a casting 15, having two arms 16, through which pass slide-bars 31, having heads 32 at their lower ends, placed within the coil-spring 13. This casting is supported centrally by a socket 51, adapted to fit the draw-bar 50, centrally secured to the car-body at 49. Between the two arms of the casting 15 is cast a boss 23, centrally bored to receive the upper end of the central bar 17, to which it is fixed. This central bar 17 is made in two parts, overlapping each other within the yoke-frame 22 through which the bar loosely passes, and they are slidably connected together by a slot 20 and a pin 21 passing through the yoke and the slot in the two parts of the bar 17. A coil-spring 18 is confined between the boss 23, to which the upper end of the bar 17 is secured, and the yoke, while a second spring 19 is confined between the lower head 32 and the lower end of the upper part of the two-part bar, by which springs the sliding part of the bar 17 is normally held in the position shown in Fig. 3. The slide-bar 31 and the bar 17 with the connecting-yoke 22 thus serve to keep the cushion-tube and the coil-spring back of the same distended, forming the curved lower end of the fender, which latter is of course covered with suitable wire-netting. When the body strikes the fender, the springs 18 and 19 will be compressed by the movement of the yoke and the lower part of the bar 17, and these springs will return the parts to their normal position the moment the pick-up mechanism operates, as more fully described hereinafter.

Secured to the shaft 30, within the arms 16 of the casting, are two small spur-gears about three inches in diameter, which mesh with a rack 31' upon either the lower or upper side of the bars 31, as desired.

By the construction thus far described it will be seen that as the fender meets an obstruction, which is a body or person in whatever position, the impact thereof against the cushion-tube will move the bars 31, so that

the rack 31' will turn the gears 30'', thereby turning the shaft 30.

I will next describe the pick-up mechanism, which is set into operation by the turning of this shaft 30, as just described. Upon the shaft 30 are two arms 47, of the form shown in Fig. 8, which are preferably connected together by a transversely-extending tie-rod, upon which a bell *b* may be mounted, or to which any other suitable alarm may be connected, in order that the motorman may be informed that the scoop mechanism is operating. From the lower ends of these arms forwardly project two rods or pitmen 67, which support between their outer ends the scoops or shovels. These pitmen, by which the scoops are carried, are held up by small wheels or rollers 34, journaled in the upper ends of bars 34', attached to each side of the pitmen and extending above the slide-rods 31, in the upper face of which are grooves 33 in which the wheels travel. By this means the inner ends of the scoop are confined to travel in a path parallel to the slide-rods 31.

The scoop consists of two parts, an upper shovel 36 and a lower shovel 35, the latter of which is carried by the outer ends of the pitmen 67, and the former is hinged to the lower shovel in any suitable manner, preferably as shown in the drawings, by means of a pintle passing through ears upon the lower shovel and a socket formed on the upper shovel by rolling the flange over, the upper shovel being rigidly secured to the said pintle by suitable pins passing through the joint into the pintle. The pintle thus forms a rock-shaft journaled upon the lower shovel, and has on each end two arms 41 projecting upwardly therefrom, and an arm 42 extending downwardly, which is tied, by a suitable spring 43 to the bracket 44 upon the lower shovel, thus normally tending to keep the upper shovel closed down upon the lower shovel, as shown in Fig. 4. The arm 41 is connected by a yoke 41' to a bifurcated arm 45 and to the arm 47, carried by the shaft 30, the connection being made at a suitable point between said shaft and the outer end of the arm. Any movement therefore of the rock-shaft 30 will throw the arm 47 forward, thus causing the pitmen 67 to thrust the scoop outwardly beyond the front of the fender, the distance of such outward thrust of the scoop being dependent upon the proportion between the radii of the spur-gears 30' and the length of the arms 47, which, in the present instance, should be about one to eight, so that the outer end of the arm 47 will move through an arc eight times the corresponding arc of the gear 30'. The yoke connection between the arm 45 and the arm 41 permits sufficient lost motion of the arm 41 as the scoop is thrust forward to prevent the upper shovel from being raised before it clears the front of the fender, and of course any means for providing sufficient lost motion for this purpose may be substituted for that shown. I have adopted these



proportions as being sufficient for the purpose, but of course it is to be understood that they may be varied as found necessary in practice. At the same time that the scoop is thrust forward by the arm 47 the bifurcated arm 45 will pull the rock-shaft arm 41 backward, thereby raising the upper shovel of the scoop quickly and gently placing the body up into the fender. I prefer to make the shovels forming the scoop of a strong and light material, such as aluminium, so that I may secure the greatest strength with the least weight.

The outer end of the lower shovel is made yielding, so that its contact with the body may not cause any injury, and yet it must be made sufficiently strong to resist the impact of the body, and for this purpose I have shown a desirable construction in Figs. 4 and 5, where it will be seen that I secure two wire-nettings 39 and 40 upon the forward ends of the lower shovel, so as to readily spring in the direction of the length of the shovel, the distance between these two nettings being the thickness of the shovel; and in order to maintain these two nettings in such relation to each other, I pass, at suitable points through the two nettings, copper rivets or studs 38, which prevent the nettings from being spread apart by impact of the body.

In order to effect the positive operation of the pick-up mechanism, I preferably provide a clutch mechanism and friction-gear between the shaft 30 and the axle *s* of the car, which mechanism is operated by the first impact of the body upon the fender, so that the scoop or pick-up mechanism may be positively operated from the shaft or other driving part of the car. This mechanism is shown more clearly in Figs. 1, 2, and 3. Secured to the shaft 30 are two grooved pulleys 48, around which passes a belt 52, which leads from the said shaft on one side under and around a small wheel 54, carried in the outer end of a bifurcated arm 57, pivotally supported by a hanger 55, attached to the bottom of the car. Thence it passes around the upper one of two small pulleys supported by hangers 53 upon the bottom of the car, then across the bottom of the car to the lower one of a similar set of two pulleys and under the wheel 54, up around the pulley 48 on the other side of the car, and back around the wheel 54, in line therewith, through the upper one of the double set of pulleys on the same side of the car, and across the car again, around the lower of the first double set of pulleys, thence to the pulley 48, whence it started. The wheel 54 is normally held out of contact with the shaft *s* by cords 46, attached to ears on each side of the bifurcated arm 57, passing upwardly over small rollers 58 on each side of the hanger 55, and to the shaft 30 on each side of the pulley 48. One cord of each set, in the present instance the inner one, is secured directly to the shaft, while the outer cord passes under and around the shaft, taking about three-eighths of a turn

and secured to the shaft. When the mechanism is in its normal position, the outer cord of each set is normally taut, while the inner cord hangs slightly loose, as shown in Fig. 1, thus holding the wheel 54 normally out of contact with the wheel *s*. Now when the shaft 30 is turned by the small spur-gear 30', through the medium of the fender when it comes in contact with a body by the slightest touch, it will be seen that the tight cord 46 is immediately relaxed, thereby dropping the wheel 54 in frictional contact with the shaft *s* and held thereon by the spring 56. The wheel 54 will thus be turned by the shaft *s*, and through its belt-gear 52 the rock-shaft 30 will be rotated, thus operating the scoop or pick-up mechanism, as before described. By the further rotation of the shaft 30 the inner cord 46 will be wound around the shaft, thus tightening it and raising the wheel 54 out of contact with the main axle or shaft after the shaft has turned about one hundred and thirty-five degrees and the scoop mechanism has completed its work. As the shaft 30 turns to cause the scoop to be thrust forward under the fender and operated, as described, the gear 30' on the said shaft, meshing with its rack 31', moves the rods 31 and the frame 22, attached to said rods, thereby compressing the springs 18 and 19, which springs, when the friction-gear is relaxed, expand to their normal positions, thus rotating the shaft in the opposite direction and retracting the scoop to its normal position.

In order to provide a safeguard against the body rolling out of the fender after it has been placed therein by the scoop mechanism, I preferably provide a fender-guard, as shown in Figs. 1 and 3. Fulcrumed upon each side of the backing-frame, at 27, above the fender-support, is a lever 25, which supports the wooden guard 24 by an intervening flexible section 26, made of rubber pipe having a spring inside or of other suitable material. Upon the shaft 30 are arms 29, connected to the levers 25 by pitmen 28. As the scoop is thrust forward the arms 29 will pull the pitmen downward, thus quickly raising the guard out of the way, and when the scoop is returned to its position this guard will be lowered immediately in front of the body, forming a rest for the body and preventing it from falling out of the fender.

While I have described the cord-clutch mechanism as the preferable construction, in some cases I may use a cone friction-clutch, such as shown in Figs. 15 and 16. In this case the pulley 48 is loosely mounted upon the shaft 30 and is provided with a projecting cone, which is adapted to extend with a conical recess in the sliding collar 59, splined to the shaft so as to turn therewith. When this collar is in the position shown in Fig. 15, the clutch is out of action. Connected to said collar 59 is a toggle-joint 60, from which a rod 61, provided on its lower end with a stop-pin 63, extends downwardly to the spring 12 in



line with the arm 45. The lower end of this rod 61 is connected to the spring 12 by a T-coupling 62. Now when the fender receives the impact of the body the arm 61 will be thrown upward, thereby clutching the cone-collar 59 with the pulley 48, which is connected to the driving shaft or axle of the car by a common belt-cord passing over a pulley attached to said shaft. In order to release the gear-clutch, I provide on the rod 45 an upwardly-extending cam 64, which is adapted to engage with the stop-pin 63 in its forward movement, thus pulling the rod 61 downward and releasing the clutch.

It is to be particularly observed that in the operation of my device the scoop or pick-up mechanism does its work while the shaft turns through an arc of about one hundred and thirty-five degrees, and hence on an electric street-car, for example, whose motor-shaft makes about five hundred revolutions a minute, the complete work of the scoop or pick-up is accomplished in about three four-thousandths of a minute, an inappreciable interval of time; and among the many other advantages of my device appearing above is one which flows from the fact that the scoop mechanism thus does its work so quickly in many cases that the person hardly realizes danger before he is placed out of harm's way on the fender. It is to be noted, also, that the action is entirely automatic and that the pick-up is really operated in the first instance by the turning of the rock-shaft when the body comes in contact with the fender, and it does not depend for its operation upon the connection with the main shaft, the latter serving to positively and quickly lift the body into the fender after the scoop has been thrust under it.

I claim as my invention—

1. The combination with a fender having a yielding front, of a rock shaft supported in bearings below said fender, connections between the fender and said shaft for operating the latter when a body strikes the fender, a pick-up mechanism supported upon the car below the fender normally retracted, and connections between said rock shaft and pick-up mechanism for thrusting the same forward under the body to lift it into the fender when the fender comes in contact with such body, substantially as described.

2. The combination with a fender having a yielding front, of a rock shaft supported in bearings upon the car, a casting mounted on said shaft, spur gears secured to the shaft within the arms of said casting, bars secured to the front of the fender passing through said arms provided with racks meshing with said gears, a pick-up mechanism normally retracted below the fender, connections between the rock shaft and said pick-up mechanism, whereby it may be thrust forward upon impact of the fender with a body, substantially as described.

3. The combination with a fender having a yielding front, of a rock shaft journaled in

bearings upon the front of the car, connections between the fender and rock shaft for rotating the said shaft when a body comes in contact with the said fender, the driving shaft of the car, and clutch mechanism between the driving shaft and the rock shaft normally out of action and adapted to positively connect the driving shaft and rock shaft upon the first movement of the fender by impact of a body therewith, a pick-up mechanism below the fender and connections between said pick-up mechanism and rock shaft, whereby it may be thrust forward positively by the rock shaft while driven from the main driving shaft, substantially as described.

4. In a car fender, the combination with the dashboard, of the frame to which a backing is secured, a fender projecting downwardly therefrom having its front composed of a pneumatic tube with coil spring backing, the rock shaft supported in bearings below the dashboard, slide bars connected at the lower ends to the tube in the front of the fender having racks upon their upper ends, spur gears on said rock shaft meshing with said racks, a pick-up mechanism normally retracted below the fender, comprising a scoop composed of an upper and lower shovel hinged together, connections between the rock shaft and the scoop for thrusting it forward beyond the fender, and means for opening the upper shovel to raise the body into the fender, and connections between the rock shaft and the main driving shaft of the car for positively operating said rock shaft, substantially as described.

5. The combination with the fender, the pick-up mechanism, below the fender, consisting of two hinged shovels or scoops normally closed one upon the other, mechanism for thrusting said scoops forward beyond the front of the fender, and means for raising the top shovel when it is thrust forward, of a fender guard yieldingly supported by levers fulcrumed above the fender, and means for quickly raising said guard out of the way as a body is placed upon the fender by the pick-up mechanism, and immediately lowering it again to hold the body in the fender, substantially as described.

6. The combination with the fender, the pick-up mechanism below the fender, means for operating said pick-up mechanism to cause it to be thrust forward beyond the front of the fender as a body strikes the latter, of a fender guard normally resting against the fender near the front thereof, and mechanism for raising said guard out of the way as a body is placed in the fender by the pick-up mechanism, and for immediately returning it to its normal position to prevent the body from falling out of the fender, substantially as described.

7. The combination with dashboard of the car, of the fender supported thereby having a yielding front, a casting supported upon the draw bar of the car and provided with two



arms, a rock shaft journaled in bearings on the car and extending through the arms of said casting, sliding bars connected to the fender and having racks thereon passing  
 5 through the arms of the casting, gears upon the rock shaft meshing with said racks, a spring connection between the casting and the fender normally distending the latter, a pick-up, connections between the pick-up and  
 10 rock shaft for thrusting the said pick-up forward and causing it to raise the body and place it upon the fender, and connections between the rock shaft and driving axle of the car normally out of action and thrown into  
 15 action by the first movement of the fender upon impact with a body, substantially as described.

8. The combination with the car and the driving axle thereon, of the fender having a  
 20 yielding front, a rock shaft journaled upon the car below the fender support, connections between the fender and rock shaft for causing the latter to turn upon impact of a body with the fender, pick-up mechanism operated  
 25 by the rock shaft to pick up a body struck by the fender, friction gears carried by arms pivotally supported above the axle of the car, belt gearing connecting said friction wheels on each side of the car with the rock shaft,  
 30 tight and loose cords connecting the rock shaft with the arms of the friction gears normally holding the latter out of contact with the car axle, whereby as the fender is moved, the tight cord is relaxed and the friction gears  
 35 drawn in gear with the axle thus driving the rock shaft positively from the car axle to operate the pick-up, and the latter thrown out of gear with the rock shaft by the further rotation thereof as it tightens the loose cord,  
 40 substantially as described.

9. The combination with the fender having a movable front, of a transverse rock shaft journaled upon the car, connections between the fender and the rock shaft operating to  
 45 turn the said shaft, a yielding connection between a fixed part and the fender for returning the latter to its normal position, a

pick-up consisting of two shovels hinged together, arms on the rock shaft, and connection between these arms and the lower shovel,  
 50 means for confining the said shovel in a fixed path below the fender, connections between the arms and the upper shovel adapted to raise the same as the pick-up is moved forward beyond the front of the fender, connections between the rock shaft and the axle of  
 55 the car put in operation by the movement of the fender as a body strikes it and thrown out of action when the pick-up has completed its work, substantially as described. 60

10. The combination with the fender having a yielding front, of the pick-up mechanism, and intervening connections put into operation by the movement of the fender to positively operate said pick-up mechanism,  
 65 said pick-up comprising a bottom shovel confined to travel in a fixed path below and parallel to the fender, an upper shovel hinged to the bottom shovel and normally closed thereon, and connection between the operating mechanism of said pick-up and the upper  
 70 shovel, whereby the latter is raised as it is thrust beyond the front of the fender, substantially as described.

11. The combination with a car fender, of  
 75 a scoop for picking up and placing the body in the fender, consisting of a fixed shovel confined to travel in a path under the fender and having a yielding front composed of wire nettings secured to the upper and lower sides  
 80 of the said shovel with studs or rivets for preventing the spreading of said nettings upon impact of the body, and an upper shovel hinged to said lower shovel, with means for raising the upper shovel as it is projected be-  
 85 yond the front of the fender, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM WOSSOFF.

Witnesses:

R. T. FRAZIER,  
 HARRY D. GORDON.