(No Model.) 3 Sheets—Sheet 1

F. SHUMAN.

APPARATUS FOR REMOVING OBSTRUCTIONS FROM CAR TRACKS.

No. 542,539. Patented July 9, 1895.

FIG. 1.

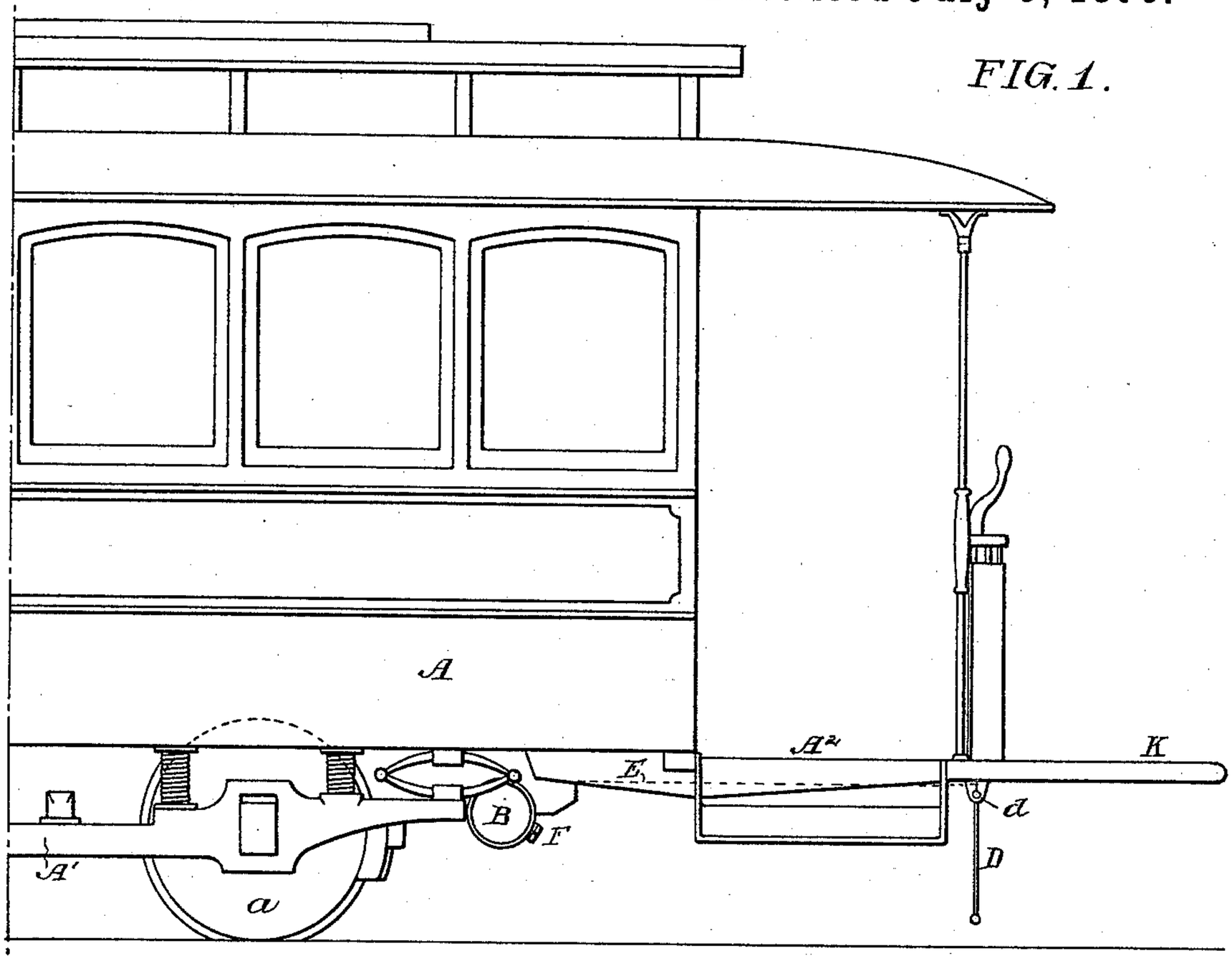


FIG. 2.

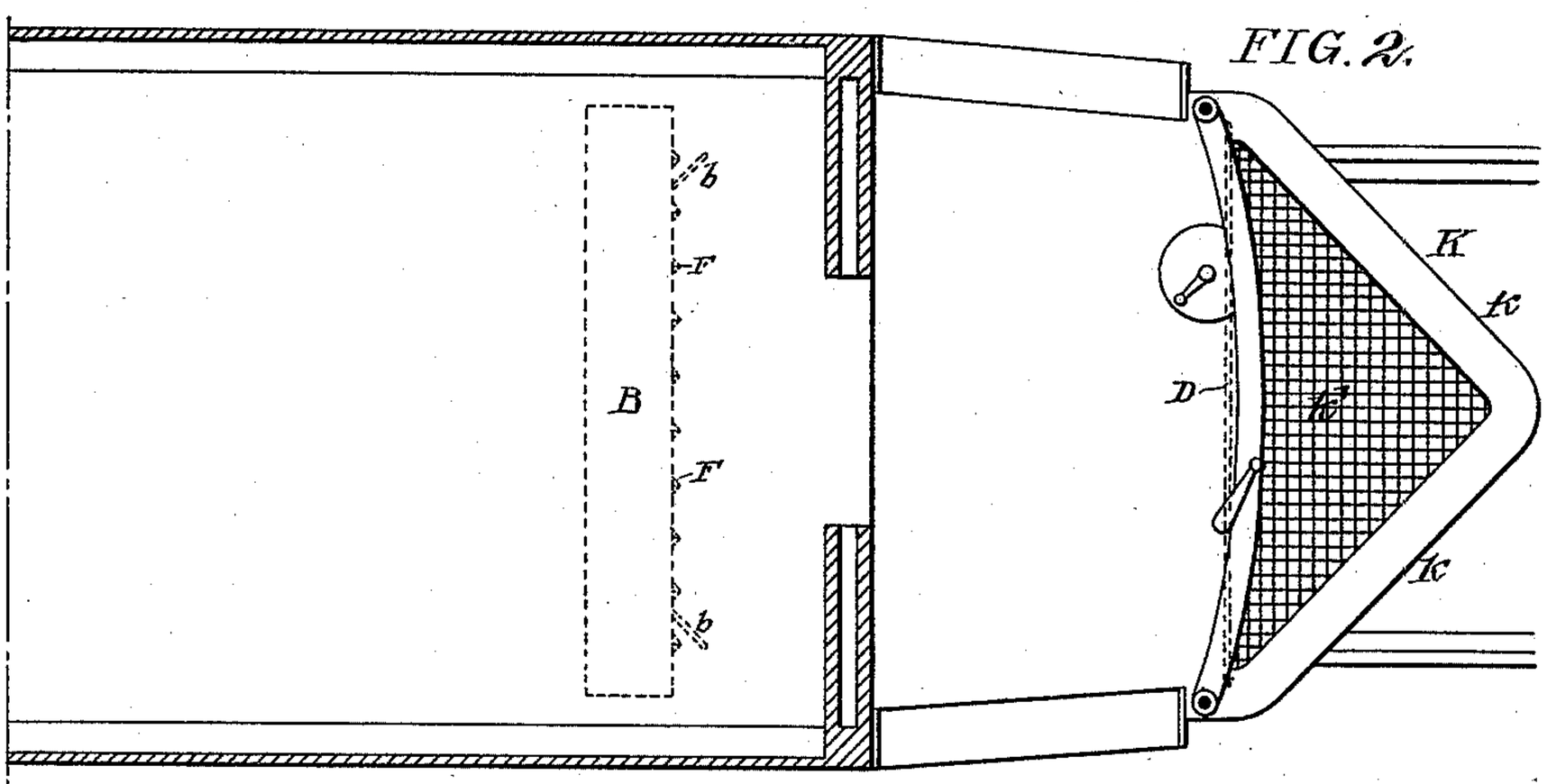
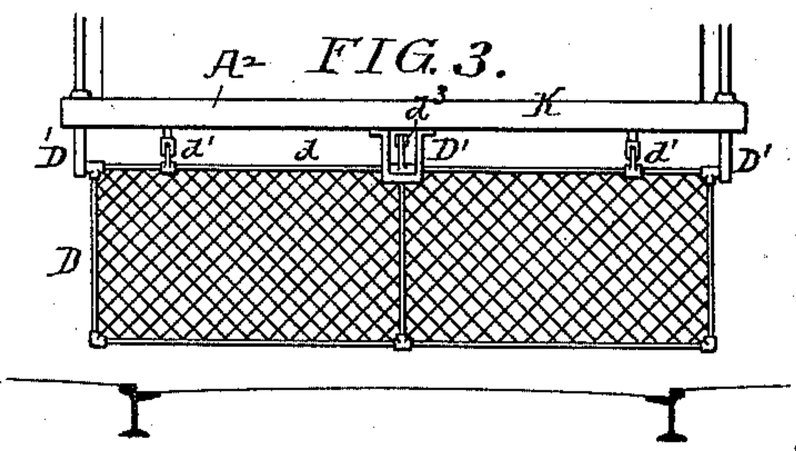


FIG. 3.



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Wm. A. Barr.

Inventor:
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by his Attorneys
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(No Model.) 3 Sheets—Sheet 2.

F. SHUMAN.

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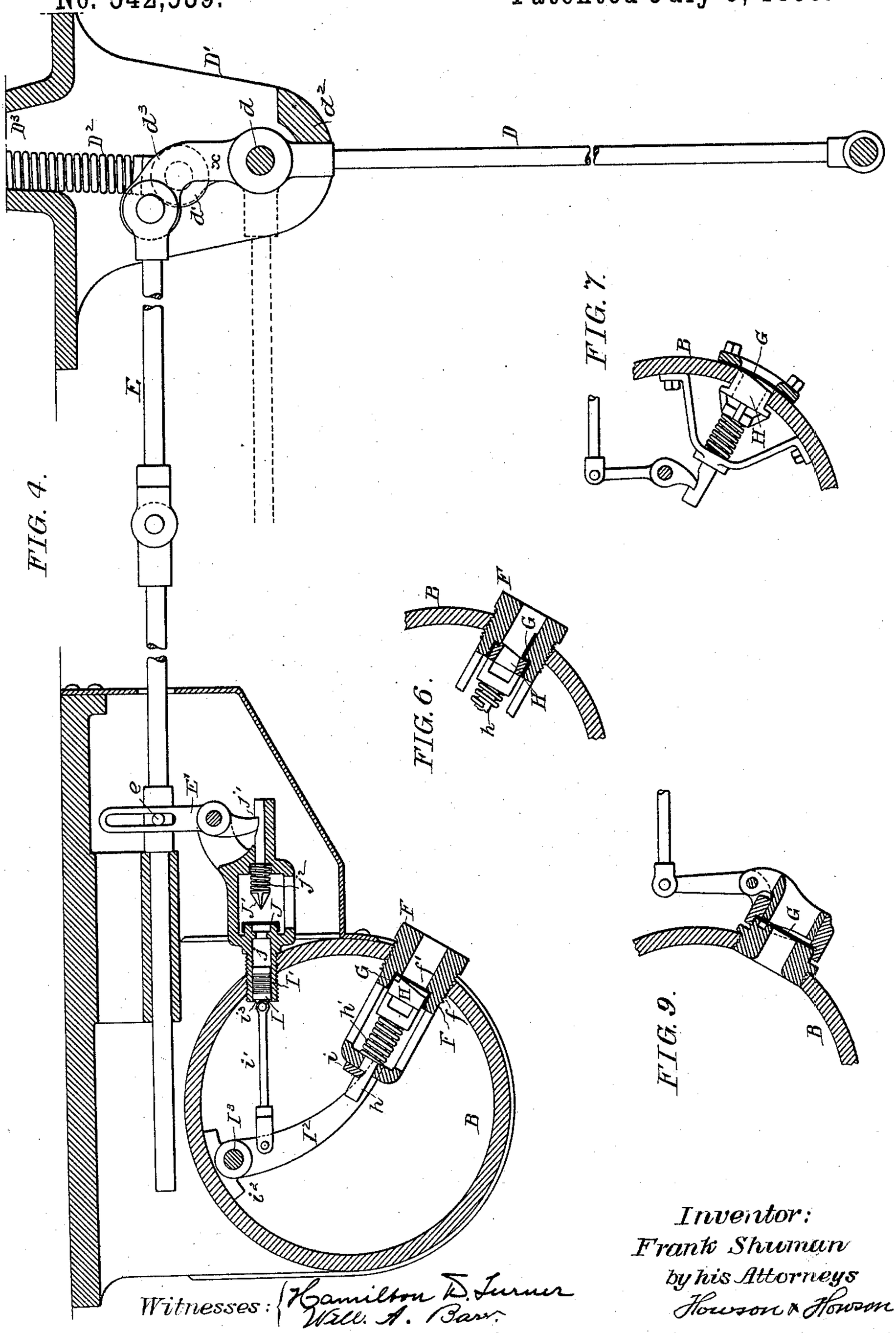

FIG. 4.

FIG. 7.

FIG. 6.

FIG. 9.

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(No Model.) 3 Sheets—Sheet 3.

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No. 542,539. Patented July 9, 1895.

FIG. 5.

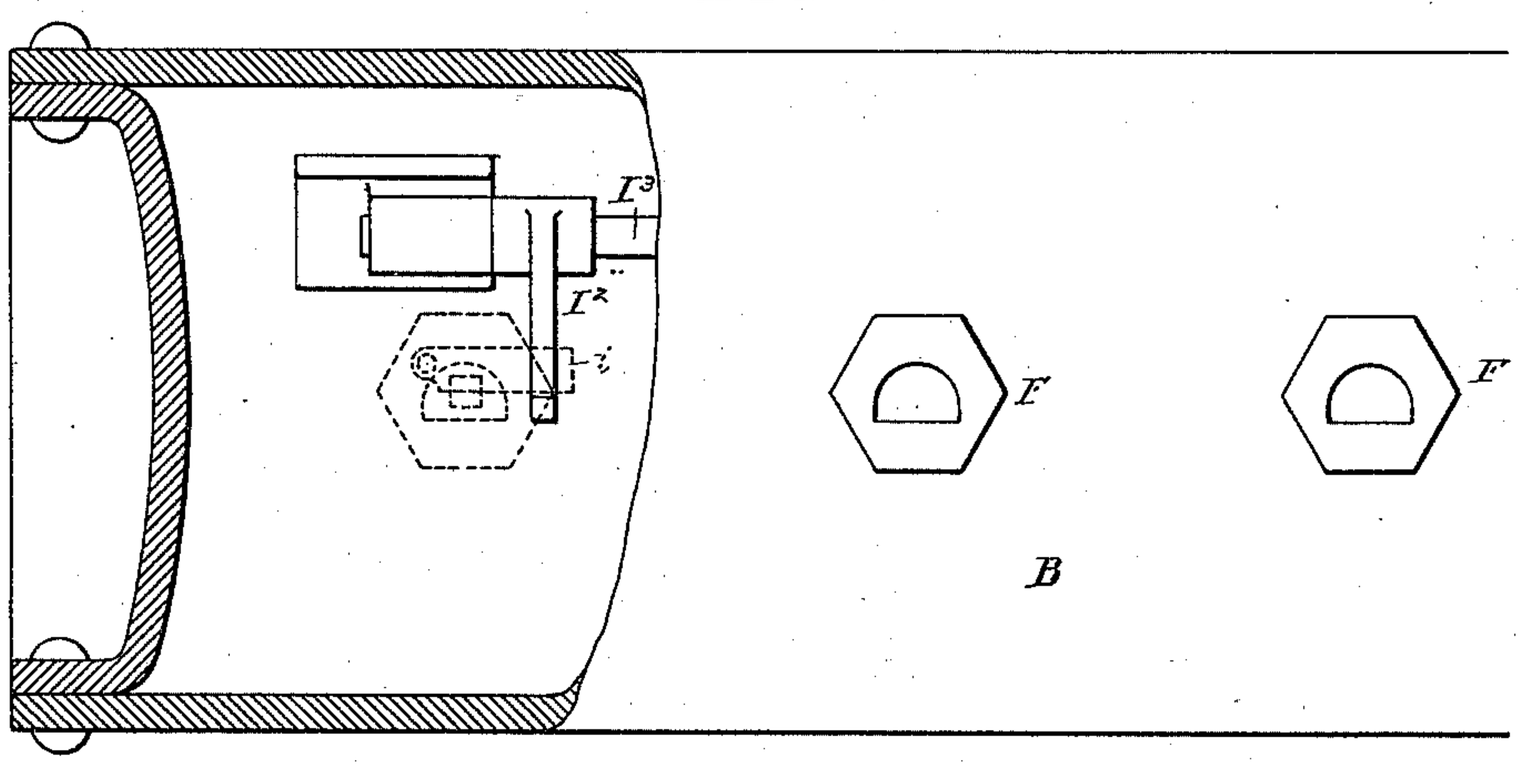


FIG. 10.

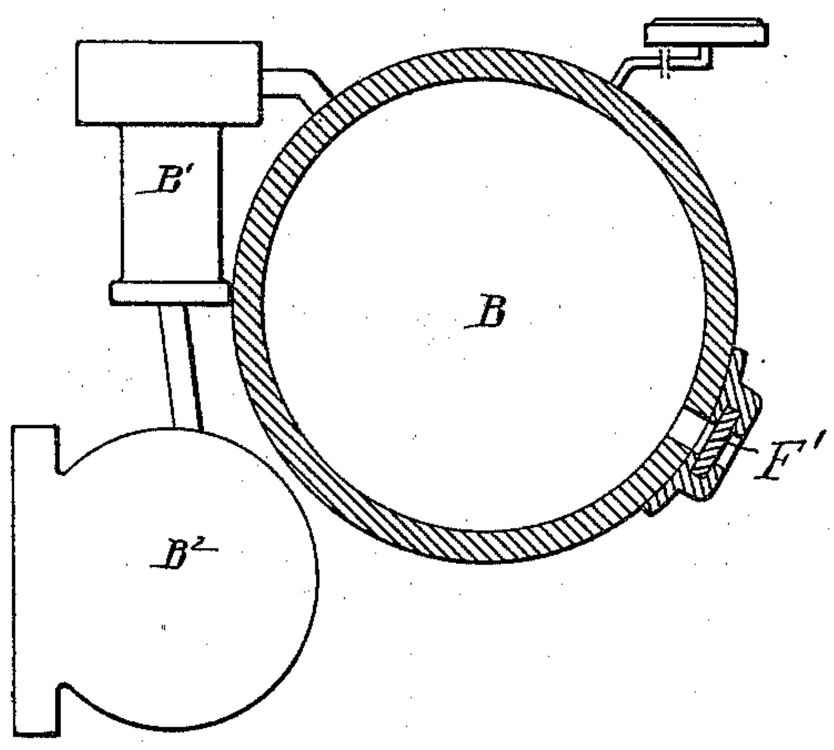
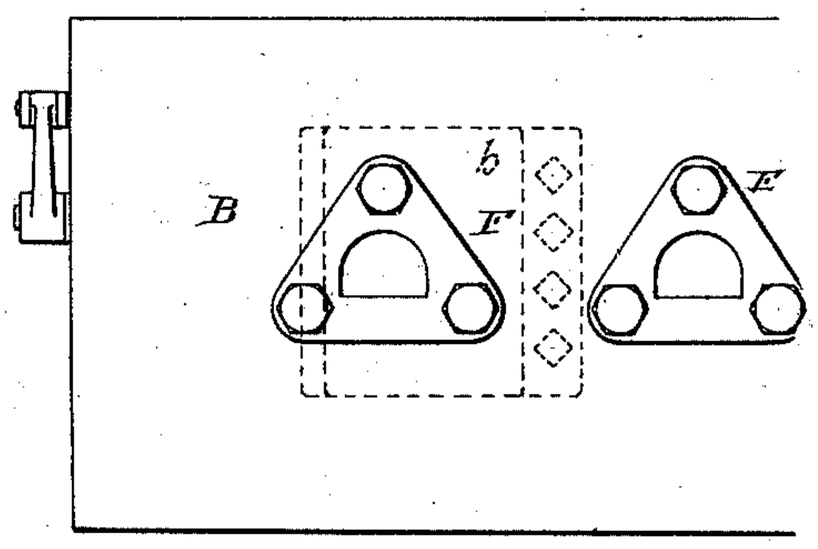


FIG. 8.



Witnesses:
Hamilton D. Turner
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UNITED STATES PATENT OFFICE.

FRANK SHUMAN, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR REMOVING OBSTRUCTIONS FROM CAR-TRACKS.

SPECIFICATION forming part of Letters Patent No. 542,539, dated July 9, 1895.

Application filed November 14, 1894. Serial No. 528,746. (No model.)

To all whom it may concern:

Be it known that I, FRANK SHUMAN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented a certain Apparatus for Removing Obstructions from Car-Tracks, of which the following is a specification.

My invention relates to apparatus for preventing persons from being run over by railway-cars.

My invention is especially applicable to cars driven by electricity or by cable and used in street-railway service, but it will be understood that my invention can be applied to cars or locomotives used on either street or steam roads.

The object of my invention is to utilize a gaseous fluid, such as compressed air, for instance, to force in advance of or to one side of the car-wheels persons who, by accident, fall in front of the car, so that they will not be mangled by the wheels or the framing of the truck.

Referring to the accompanying drawings, Figure 1 is a side view of sufficient of a car to illustrate my invention. Fig. 2 is a sectional plan view of the car, shown in Fig. 1. Fig. 3 is a front view of the fender. Fig. 4 is an enlarged sectional view showing the cylinder and tripping mechanism. Fig. 5 is a front view of the cylinder. Fig. 6 is a detached view showing one of the valves cut and forced open. Figs. 7 and 8 are views of modifications of the valve shown in Fig. 4. Fig. 9 is a view showing still another modification of the valve in which the cutter is on the outside of the cylinder. Fig. 10 is a view illustrating the cylinder provided with an ordinary slide-valve operated by a lever, and in this view is also illustrated an air-compressor.

Referring in the first instance to Figs. 1 to 5, inclusive, A is a street-car of the ordinary type driven by an electric motor, A′ is the truck, and *a* are the wheels. The space in advance of the wheels under the car body and platform is usually clear and the body of the car is elevated sufficiently above the street to allow this portion of the car to pass over a person without injury.

I mount under the car, preferably in advance of the truck A′, a reservoir B, in the present instance in the form of a cylinder, which I charge with compressed air or other gaseous fluid, forming a source of gaseous fluid-supply. This cylinder I preferably charge at the terminal of the road to the pressure required, and I hermetically seal the cylinder to prevent leakage of air, so that when the cylinder is once charged the air in the cylinder will remain at the initial pressure for a considerable length of time. It will be understood, however, that a small air-compressor B′, Fig. 10, can be mounted on the car and connected to the cylinder, and this air-compressor can be driven either by an electric motor B^2 or from the axle of the car, and the motor can be controlled by the motorman through a switch or the compressor can be thrown into and out of gear with the axle by a clutch.

The cylinder is preferably provided with a gage, so as to indicate the pressure of air.

The switch or clutch may, in some instances, be controlled automatically by the air under pressure, so that the air in the cylinder will always be at a given pressure.

I control the valves of the cylinder by a suitable trigger or fender in advance of the cylinder. This trigger is so situated that any obstruction will first throw the trigger and open the valve before the car can have time to pass over the object. This trigger I preferably make as shown in Fig. 4, and consists of a light pivoted frame D, hung at *d* from bearings D′, secured to the bottom of the car, preferably directly under the dasher, so that it will extend to a point a short distance above the roadway, as indicated in Fig. 1. This frame extends preferably beyond the rails of the track, so that any object near or between the rails will operate the valve.

I preferably hang the frame D in such a manner that as soon as it strikes an obstruction it will be immediately thrown up under the car, as indicated in dotted lines, Fig. 4, and one method of accomplishing this object is to pivot a spring D^2 to an arm *d′*, projecting beyond the pivot *d*. This spring preferably extends up into a socket D^3 in the bearing-plate D′, and the arm *d′* is so formed that when the frame is in the position of rest, as shown in Figs. 1 and 4, the spring will be thrown off the center line *x*, Fig. 4, and will

tend to hold the frame against the stop d^2; but as soon as the frame strikes an object it will move the spring over the center and the spring will expand and force the frame up under the car until it comes in contact with the opposite side of the stop d^2. This arrangement can be modified in many ways without departing from my invention.

Connected to an arm d^3 is a rod E which extends rearward to a point adjacent to the reservoir, and through this rod the reservoir-valves are operated. The rod is mounted in suitable bearings, and may be protected by a casing if desired.

The valves within the reservoir (shown in Figs. 4 and 5) are constructed as follows: F is the valve-casing, having an external screw-thread f, so that the casing can be adjusted in position in the reservoir or cylinder from the outside. The casing has a seat f' for a soft-metal disk G, preferably provided with a flange, as shown, and fitting snugly in this flange is a cutter H, having a stem h, and mounted on the stem is a spring h'.

The cutter is held out of engagement with the soft-metal disk by a latch i. The spring is also held under compression, so that the moment the latch is withdrawn the spring is released, moving the cutter forward, which cuts the soft-metal disk. The air immediately forces the cut-out portion to one side, as indicated in Fig. 6.

I preferably form the cutter, as shown in Figs. 4 and 5, with a semicircular cutting-edge, so that only a portion of the disk will be cut, the air simply bending the cut portion instead of projecting it, thus obviating any danger from the cut pieces.

The valves can be operated directly by a rock-shaft projecting through the cylinder, as shown in Fig. 8, and having a lever connected directly to the operating-rod, or they may be operated, as shown in Fig. 4, by a plunger I, mounted in a casing I′ screwed into the cylinder.

The plunger is connected by a rod i' to one of a series of levers I^2, mounted on a rock-shaft I^3 adapted to bearings i^2 on the casing, the levers I^2 being so adjusted that on the movement of the piston I the latches i will will release the cutters H.

The chamber j in the casing I′ in front of the piston I is closed by a soft-metal disk J, which is punctured by a punch J′ when the pivoted frame D is tripped. The punch is held away from the disk by a lever E′ engaging with the projection j' on the punch. The lever is slotted, and in the slot is a pin e, carried by the rod E or an extension thereof. A spring j^2 forces the punch forward as soon as released from the control of the lever E′.

It will be seen by the foregoing that the moment the frame D strikes an obstruction it will be forced up under the car, the rod E will be operated, releasing the punch J′, which will cut the soft-metal cap J, the air in the cylinder will force the plunger I forward, and the several levers will trip the cutters H, which cut the disks G, and allow the air in the cylinder to escape through the series of nozzles in a direction toward the obstruction.

The discharge-openings of the reservoir or cylinder are so arranged that the air will strike the obstruction under the car with such force as to project it in advance of the wheels and will have a tendency to lift it off the ground as the air will force its way under the obstruction. These discharge-openings must, it will be observed, direct the jet or jets of air forwardly in advance of the wheels at such an angle as to throw the obstruction forward or away from the wheels and consequently they must strike the track at an acute angle, such as shown, or parallel to the track should the reservoir be nearer to the ground, and the air must not strike the track either at an obtuse angle or at a right angle, as in such case the body or obstruction would not be lifted, but would be bound to the track instead of being carried forward or removed therefrom. The roadway and the bottom of the car form to a certain extent a flue in which the air is confined. By this method the person is not struck a blow by a fender carried by the car, which, ordinarily, is enough to severely injure a person, and the wheels cannot possibly pass over the person, as the escaping air will always keep the body moving forward at a greater speed than the car until the air is exhausted, giving sufficient time for the motorman to stop the car.

The mechanism described may be connected to an automatic brake and to a circuit-breaker, so that the moment the frame strikes an object the valves will be opened, the brakes applied, and the current switched off from the motor.

I preferably arrange baffle-plates b at each side of the reservoir B, so as to direct the air towards each side of the car, as shown clearly in Fig. 2. In some instances a number of the valve-casings may be set at an angle to accomplish the same purpose.

After the reservoir has been discharged the valve-casings F can be moved from the reservoir and new disks G can be substituted for those cut, and a new disk or washer J can be soldered or otherwise secured on the casing I′.

I preferably make a very small port i^3 in the piston I, so that when the piston is at rest the pressure on the piston is equalized, but as soon as the disk J is punctured the air beyond the piston will escape, allowing the piston to move forward.

In Figs. 7 and 8 I have shown the disks G mounted on the outside of the cylinder and a lever acting directly to trip each cutter, said levers projecting through one end of the cylinder and having an arm connected with the operating-rod.

In Fig. 9 I have shown the cutter mounted on the outside of the cylinder as well as the disk, so that a plain cylinder can be used having all the working parts on the outside.

In Fig. 10 I have shown a plain slide-valve F′ operated through a lever connected to the operating-rod, dispensing with the cutting mechanism.

It will be understood that any suitable air-valve may be used without departing from the main feature of my invention. As it is very difficult to prevent the ordinary air-valve from leaking, I prefer to use the sealed valve described above.

In some instances I may arrange a buffer K in front of the car, made in the shape of a pilot, having beveled sides and having inflated or padded edges *k k* and basket-work *k′*, so that if the car should strike a person in a standing position the car will not strike him near the feet, but near the knees, which will have a tendency to either force him to one side or catch him in the basket-work. This fender is of a sufficient height to clear a prostrated person.

I claim as my invention—

1. The means herein described of preventing accidents to or from obstructing bodies in the paths of traction vehicles, said means consisting of a source of gaseous fluid supply under pressure, in combination with means for projecting a blast or blasts of such fluid under pressure forwardly in advance of the front wheels of said vehicles and at such an angle to the track as will cause the body to be lifted and carried forward in advance of the wheels, substantially as described.

2. The combination of a car, with a reservoir under the car containing fluid under pressure, a nozzle or nozzles communicating with said reservoir and extending forwardly so as to discharge said fluid in advance of the wheels or running gear of the car and at such an angle to the track as will cause the body to be lifted and carried forward in advance of the wheels, substantially as described.

3. The combination of a car, a reservoir containing fluid under pressure, nozzles communicating with said reservoir and discharging in front of the wheels or running gear of the car, valves for closing said nozzles, and means for automatically opening the valves when the car passes over an obstruction so that a blast of gaseous fluid under pressure will be projected in advance of the wheels or running gear of the car, substantially as described.

4. The combination of a car, the reservoir mounted under the car and containing fluid under pressure, a series of discharge openings and means for closing said openings, a trigger in front of the reservoir, so situated that it will strike an obstruction and allow the fluid in the reservoir to discharge toward the obstruction, substantially as described.

5. The combination of a car, a reservoir mounted under the car and having a series of openings so arranged as to discharge in advance of the wheels or running gear, a seal for each opening, cutters for the seals and means for operating the cutters, substantially as described.

6. The combination of the car, the reservoir arranged transversely under the car and having a series of discharge openings, disks closing said openings, cutters mounted inside the cylinder for cutting the disks and means for operating the cutters, substantially as described.

7. The combination of the car, the transversely arranged reservoir under the car, a series of discharge openings, disks for closing said openings, spring cutters within the cylinder for the disks, latches for holding the cutters away from the disks, levers for releasing the cutters, a piston connected to the levers, a cap closing the space beyond the piston and a puncturing device controlled by a trigger in advance of the reservoir, substantially as described.

8. The combination of the reservoir having a series of discharge openings, said reservoir being so mounted under the car that the fluid under pressure will be projected therefrom in advance of the wheels, a pivoted frame forming a trigger, said frame being hung under the forward portion of the car in advance of the reservoir, and being connected to mechanism for opening the discharge passages of the cylinder, and means for lifting the frame clear of an obstruction after it strikes the same, substantially as described.

9. The combination of the car, the fluid pressure reservoir, valved openings therein, a pivoted frame hung to the car in advance of the cylinder, a rod extending from the frame to the valve operating mechanism of the cylinder and a spring for turning the frame under the car to clear an obstruction, substantially as described.

10. The combination of the car, a cushioned fender projecting in advance of the dasher of the car and of a sufficient height to strike a person above the knees, with a reservoir under the car charged with gaseous fluid under pressure, discharge openings in said reservoir, valves for said openings and a trigger arranged under the car back of the cushion fender and in advance of the reservoir, said trigger being connected to the valve operating mechanism of the reservoir, substantially as described.

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

FRANK SHUMAN.

Witnesses:
WILL. A. BARR,
JOSEPH H. KLEIN.