

R. S. MILLS.
SAFETY ATTACHMENT FOR CARS.
APPLICATION FILED JULY 25, 1910.

998,372.

Patented July 18, 1911.

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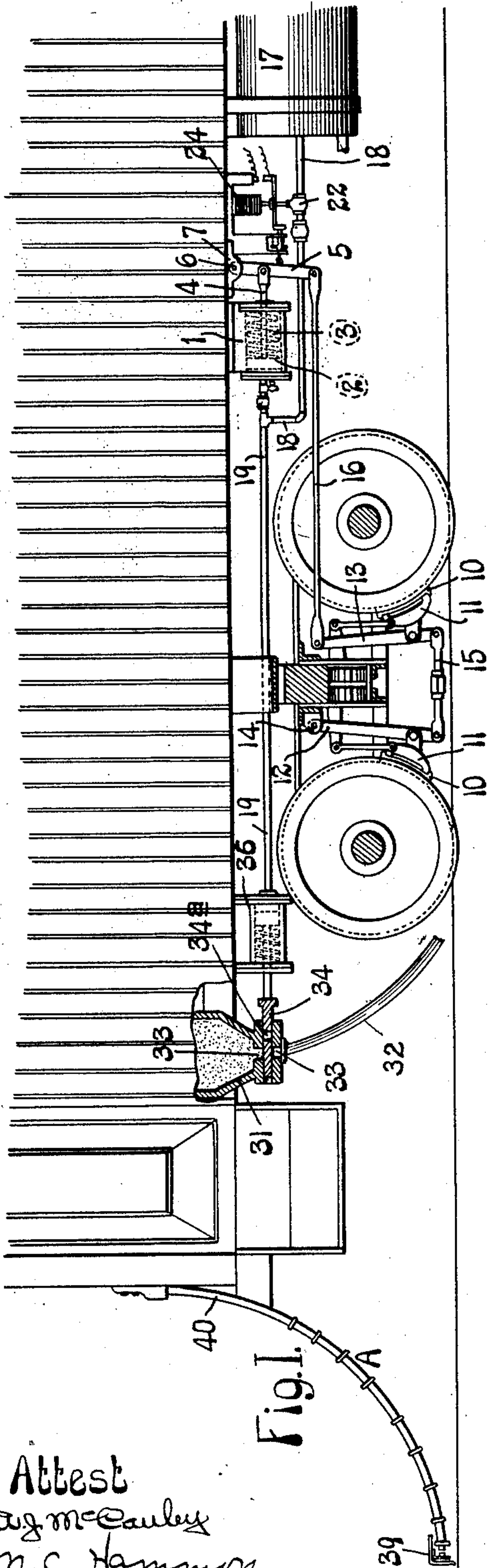


Fig. I.

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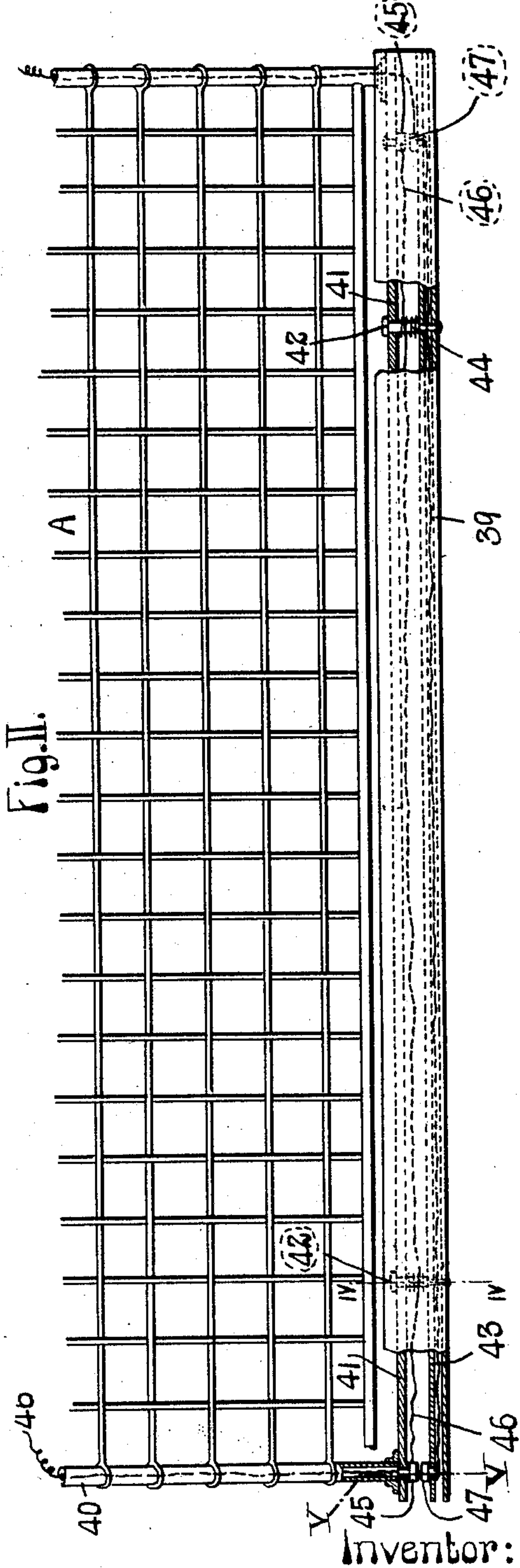


Fig. II.

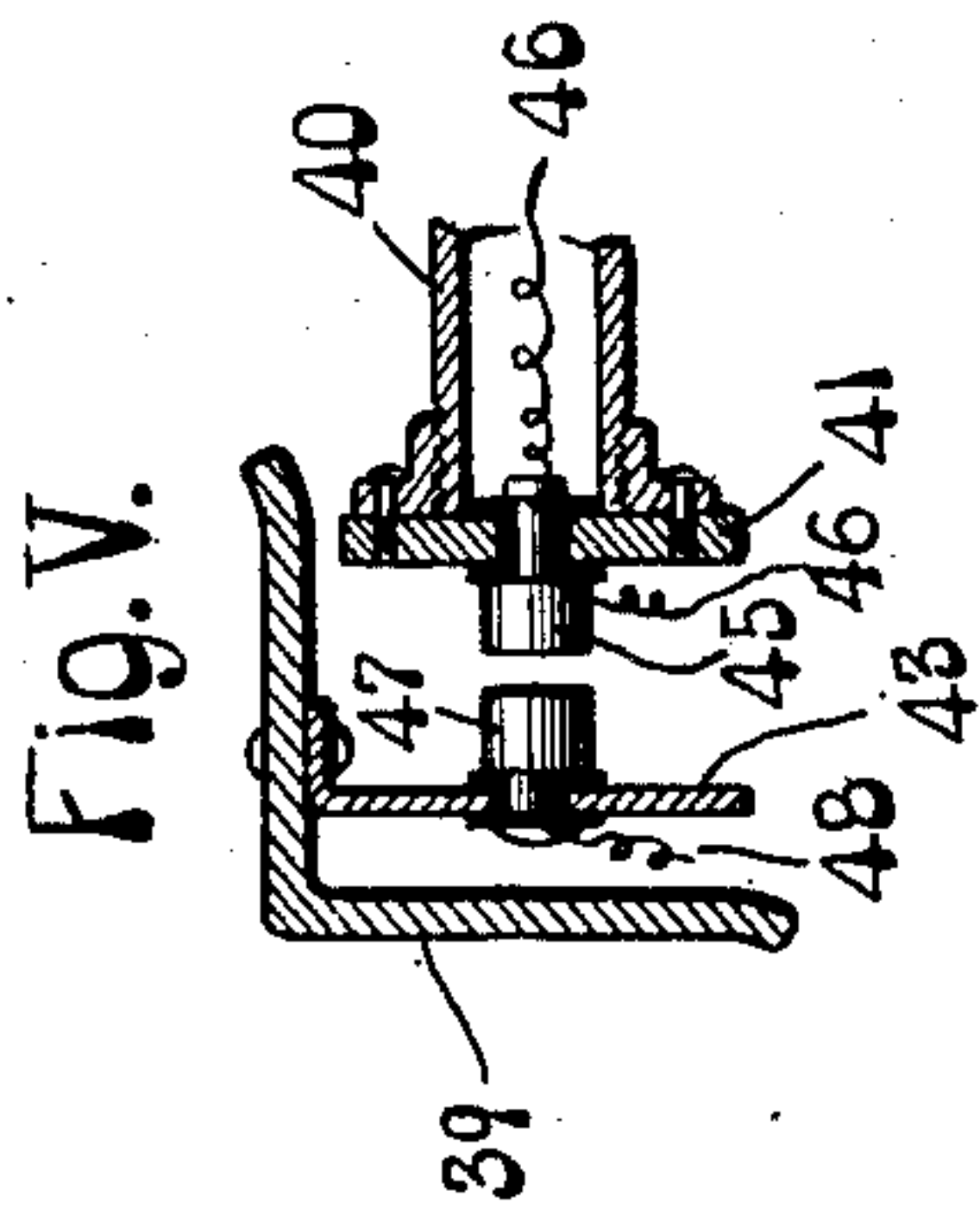
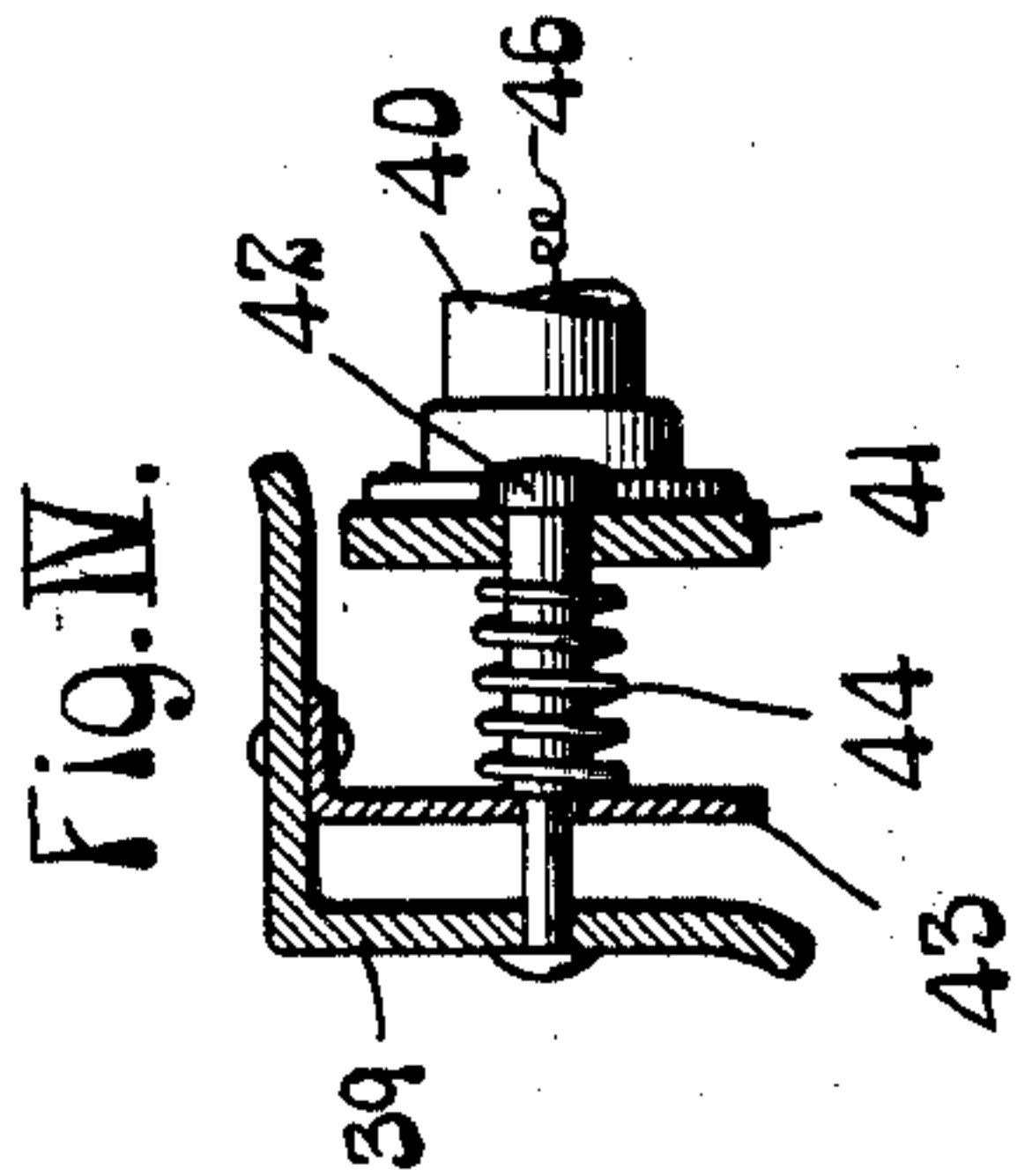
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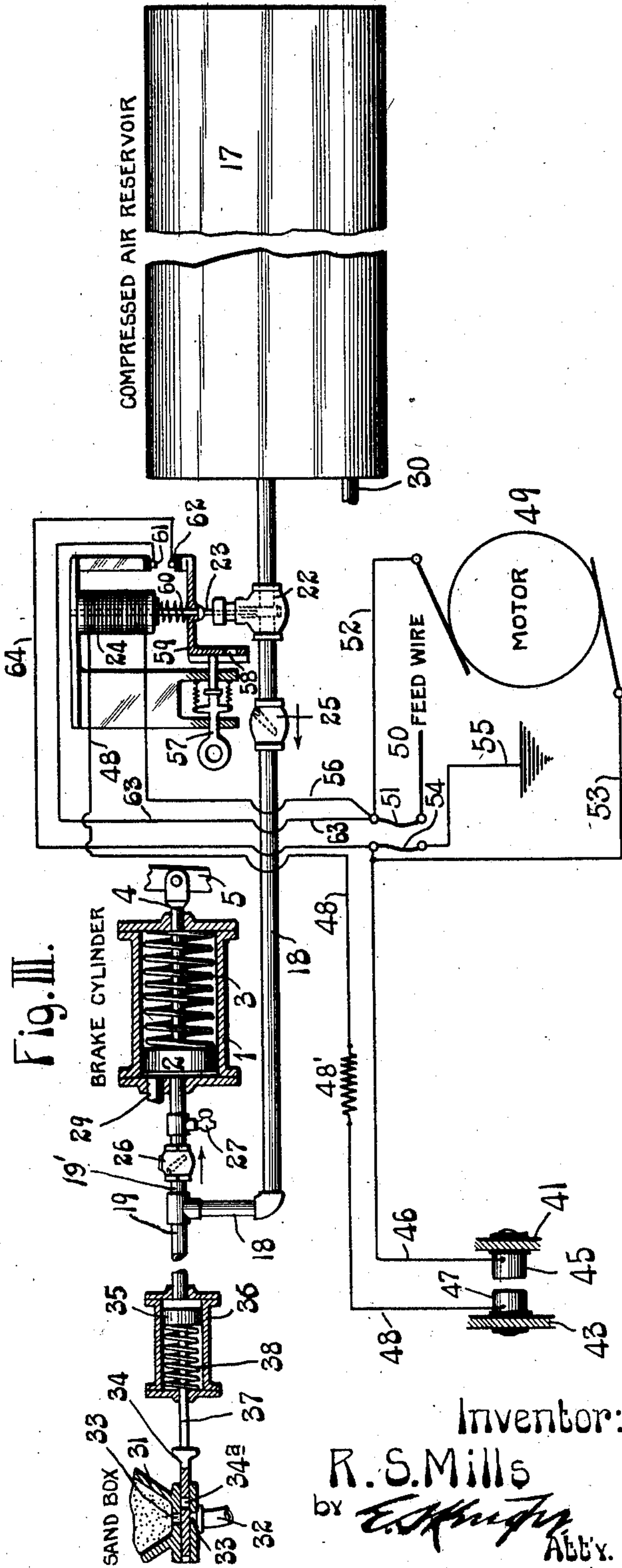
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2 SHEETS—SHEET 2.

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UNITED STATES PATENT OFFICE.

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SAFETY ATTACHMENT FOR CARS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT S. MILLS, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Safety Attachments for Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a safety attachment for railway cars, and has for its object the production of means for automatically stopping a car when its front end meets with an obstruction.

This invention is more particularly adapted for use on cars operated by electricity although some of its features may be used on any car provided with air brakes.

In the preferred form of my invention, the car is provided with a fender carrying a movable member that extends across its front edge, this movable member being located so as to engage any obstruction in the path of the car. An electric switch is controlled by the member just referred to, and when the car strikes an obstruction, this member is moved to operate the switch, with the result of closing an electric circuit which energizes devices for simultaneously opening the motor circuit, applying the air brakes, and placing the track sander in service.

Figure I is a side elevation, partly in section, of a car equipped with my improved attachment. Fig. II is a top or plan view, partly in section, of the front portion of the car fender. Fig. III is a diagrammatical view of the elements employed in the use of my attachment. Fig. IV is a vertical section taken through the front portion of the fender on the line IV—IV, Fig. II. Fig. V is a vertical section on the line V—V, Fig. II, similar to Fig. IV, showing the automatically operable switch.

In the accompanying drawings: 1 designates a brake cylinder provided with a piston 2 and a spring 3 for restoring the piston to its normal position. The piston rod 4 is pivoted to a lever 5 having its upper end pivotally connected at 6 to a stationary support 7.

10 designates brake shoes carried by suitable brake heads 11, the latter being connected to levers 12 and 13. The upper end of the lever 12 is pivoted to the car truck

at 14, and this lever has its lower end connected to the lever 13 by a rod 15. A connecting rod 16 has its opposite ends pivoted to the levers 5 and 13, respectively. It will now be understood that the operation of the piston 2 will impart movement to the brake rigging just described with the result of either applying or releasing the brakes.

17 designates a compressed air reservoir, connected to the brake cylinder by pipes 18 and 19'. Compressed air is normally confined in the reservoir 17 by a gate controller valve 22, said valve being connected to a rod 23 which forms the core of a solenoid 24. When this solenoid is energized, the rod 23 moves upwardly and opens the controller valve 22, thereby allowing compressed air to pass through the pipes 18 and 19' to the brake cylinder. These pipes are preferably provided with check valves 25 and 26 which allow air to pass in the direction indicated by the arrows. Upon the introduction of compressed air in the brake cylinder, the piston 2 is actuated to impart movement to the brake rigging and apply the brakes. To release the brakes, a pet-cock 27 may be opened to allow the compressed air to escape from the brake cylinder, thereby permitting the spring 3 to restore the piston and brake rigging to normal positions. The pipe 29 leading to the brake cylinder may be connected to the pipe 30 at the air reservoir by any suitable means including a manually operated valve for applying the brake under ordinary service conditions.

I will now describe the track sander which is automatically operated when the controller valve 22 is opened by the action of the solenoid 24. 31 designates a sand box, and 32 is a pipe leading from said sand box to a point adjacent the front wheels of the car. The upper end of the pipe 32 registers with openings 33 in the lower portion of the sand box, these openings being normally closed by a slide valve 34. A piston 35 found in a cylinder 36 is provided with a piston rod 37 having its outer end secured to the slide valve 34. When the pipe 19' is supplied with compressed air by the opening of the controller valve 22, the piston 35 is operated to slide the valve 34 and locate its opening 34^a in alinement with the discharge openings 33 in the sand box. This operation of the slide valve occurs at the time the brakes are applied and allows sand to pass from the sand

box through the pipe 32 to the track (see Fig. I). The piston 35 is restored to normal position by the action of a spring 38 when the pet-cock 27 is opened to release the
 5 brakes, the air being then free to pass from the cylinder 36 through the pipe 19' and check valve 26 to the pet-cock 27.

The means for automatically opening the controller valve 22 and thereby operating
 10 the brakes and sander when the car strikes an obstruction comprises an angle bar 39 extending across the front edge of the car fender A. The car fender may be of any suitable design, but it preferably includes a
 15 pair of hollow side members 40 and a bar 41 connecting the lower ends of said side members. Headed rods 42, loosely mounted in the bar 41, are rigidly secured to the angle bar 39, said rods passing through a bar 43
 20 carried by the angle bars, as shown in Fig. IV. The rods 42 form a loose connection between the angle bar 39 and the car fender, allowing said angle bar to move independently of the bar 41. The angle bar 39 and
 25 the bar 43 carried thereby are normally held some distance from the bar 41 by springs 44 mounted on the rods 42.

Switch contacts or contact pieces 45 secured to the bar 41 near its ends are connected to a wire 46 which passes through one
 30 of the hollow fender members 40. These switch contacts are located opposite a pair of contacts 47 carried by the bar 43, the contacts 47 being connected to a wire 48 passing through the other hollow fender member 40. It will be seen that the contacts 45
 35 and 47 form a pair of electric switches, and that if either of the contacts 47, connected to the movable bar 43, is moved to engage the corresponding contact 45, the wire 46 will be electrically connected to the wire 48. Connecting the wires 46 and 48 completes a circuit which energizes the solenoid 24, causing it to open the controller valve 22, as will
 40 be presently described.

The car is operated by an electric motor 49 (see Fig. III) which is supplied with energy through the medium of a feed wire 50. Current supplied by the feed wire
 50 passes through a fuse 51 and wire 52 to one of the brushes of the motor and flows to the ground through a wire 53, fuse 54, and return wire 55. When the switch formed by contacts 45 and 47 is closed, current supplied by the feed wire passes through fuse
 55 51, wire 56, solenoid 24, wire 48, resistance coil 48', contacts 47 and 45, wire 46, fuse 54 and wire 55, which leads to the ground. Energizing the solenoid causes its core 23 to rise, with the result of opening the controller valve 22, and this valve is then locked in its open position by a spring actuated bolt 57 which moves into an aperture 58 in a
 60 keeper 59. The keeper 59 is rigidly secured to the core 23 and its aperture 58 is nor-

mally located below the spring actuated bolt. A compression spring 60 arranged below the solenoid, tends to force the core 23 downwardly, and when the contact 45 and 47 are separated, the bolt 57 may be withdrawn
 70 from the aperture 58 to allow said spring 60 to restore the solenoid core to its normal position.

The means for automatically opening the motor circuit when the car strikes an ob-
 75 struction includes a stationary contact 61 and a movable contact 62, the latter being carried by an extension on the keeper 59. When the solenoid core reaches its extreme upward position, the contact 62 engages the
 80 contact 61, and current is then free to pass from the feed wire through fuse 51, wire 63, contacts 61 and 62, wire 64, fuse 54, and wire 55 to the ground. When this short circuit is closed, the current is free to pass to the
 85 ground without flowing through the motor, and the fuses 51 and 54 are therefore blown out. In view of the fact that current from the feed wire must pass through the fuses to energize the motor, it will be readily un-
 90 derstood that the motor will be inoperative after the movable contact 62 engages the stationary contact 61.

From the foregoing description, it will be seen that when the fender of a car equipped
 95 with my improved safety attachments strikes a person or any obstacle in the roadway, the car motor will be rendered inoperative, and the brakes and track sander will be simultaneously brought into service.
 100

I claim:

1. The combination upon a railway car, of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a solenoid for
 105 operating said controller valve, a fender, contact devices carried by said fender, and circuit wires leading from said contact devices to said solenoid to energize it for the operation of said controller valve.
 110

2. The combination upon a railway car, of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a motor, a circuit connection leading thereto, a solenoid
 115 adapted to be energized by the motor circuit connection for operating said controller valve, a fender, contact devices carried by said fender, and circuit wires leading from said contact devices to said solenoid and mo-
 120 tor circuit connection.

3. The combination upon a railway car, of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a motor, a circuit connection leading thereto, a solenoid
 125 adapted to be energized by the motor circuit connection for operating said controller valve, a fender, contact devices carried by said fender, circuit wires leading from said
 130

contact devices to said solenoid and motor circuit connection, and means operable by said solenoid for breaking the circuit leading to said motor when said controller valve is operated.

4. The combination upon a railway car of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a solenoid for operating said controller valve, a fender, contact devices carried by said fender, circuit wires leading from said contact devices to said solenoid to energize it for operation of said controller valve, a circuit breaker operated by said solenoid, and means for locking said circuit breaker after it has been moved by the solenoid.

5. The combination upon a railway car of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a solenoid for operating said controller valve, a fender, contact devices carried by said fender, circuit wires leading from said contact devices to said solenoid to energize it for operation of said controller valve, a circuit breaking member carried by the core of said solenoid, and means for locking said circuit breaking member after it has been moved by the core of said solenoid.

6. The combination upon a railway car of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a solenoid for operating said controller valve, a fender, contact devices carried by said fender, circuit wires leading from said contact devices to said solenoid, to energize it for operation of said controller valve, a circuit breaking member carried by the core of said solenoid, and a spring actuated device for locking said

circuit breaking member after it has been moved by the core of said solenoid.

7. The combination upon a railway car of a brake, a brake cylinder, a pipe supplying compressed air to said brake cylinder, a controller valve in said pipe, a solenoid for operating said controller valve, a fender, contact devices carried by said fender, circuit wires leading from said contact devices to said solenoid to energize it for operation of said controller valve, a circuit breaking member carried by the core of said solenoid, and a spring actuated bolt engaging said circuit breaking member after it has been moved by the core of said solenoid.

8. In a car, the combination with a fender having relatively movable parts, said parts being provided with cooperating electrical contacts, braking means carried by said car, and rail sanding means carried by said car, said braking means and rail sanding means being in electrical connection with said moving contacts on the fender.

9. In a car, the combination with a pneumatic braking device, of a pneumatic sanding device, a compressed air reservoir operatively connected to both of said devices, a valve for controlling the flow of compressed air from said reservoir to said devices, a fender mounted at the end of the car and having relatively movable parts provided with cooperating electrical contacts, and means for operatively connecting said air control valve with said contacts.

In testimony whereof, I have hereunto affixed my signature.

ROBT. S. MILLS.

In the presence of—

M. C. HAMMON,

A. J. McCauley.