

N. M. HOPKINS.
ANTISKID DEVICE.
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1,380,964.

Patented June 7, 1921.

Fig. 1.

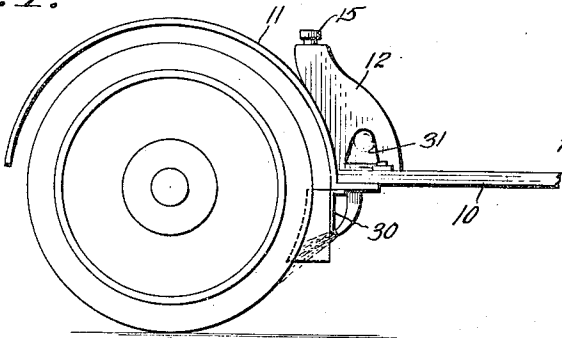


Fig. 7.

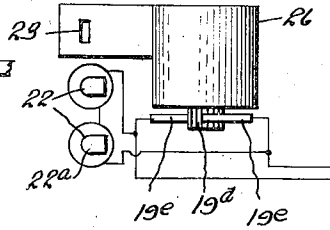


Fig. 3.

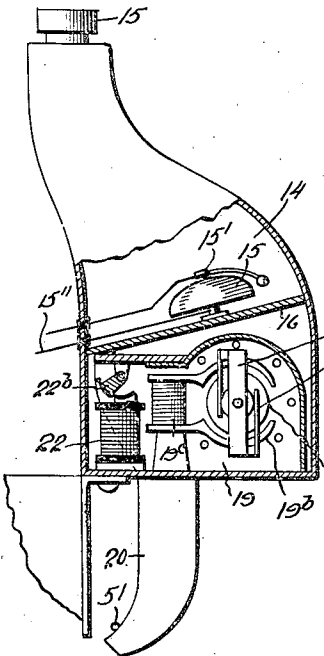


Fig. 2.

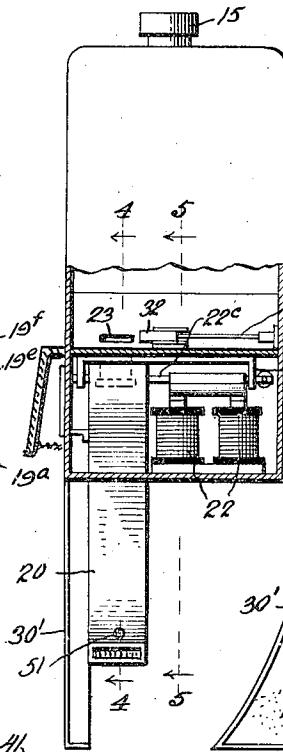


Fig. 4.

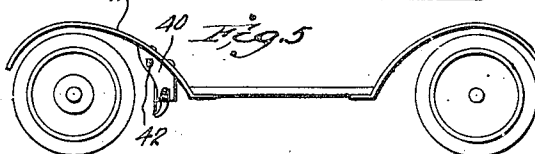
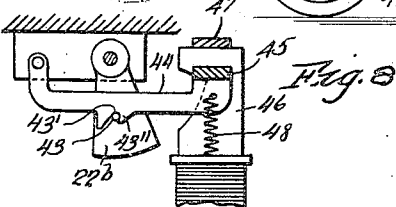
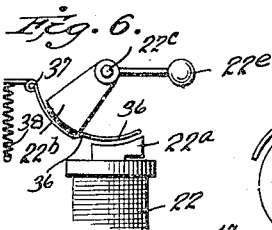
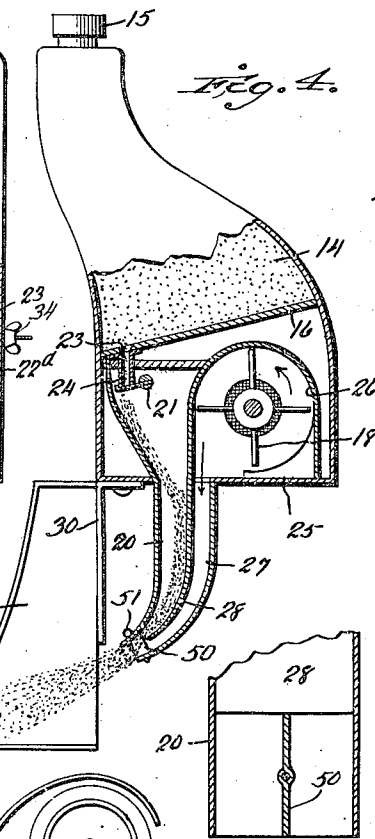
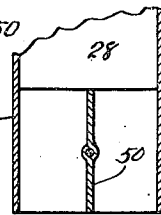


Fig. 9.



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UNITED STATES PATENT OFFICE.

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ANTISKID DEVICE.

1,380,964.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NEVIL MONROE HOPKINS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Antiskid Devices, of which the following is a specification.

The present invention relates to devices for preventing the skidding of motor propelled vehicles having rubber tires and more particularly to devices such as disclosed in my Patents No. 1,328,739, dated Jan. 20, 1920, and No. 1,330,115, dated Feb. 10, 1920.

It is the object of this invention to provide a device of the character referred to which is exceedingly simple in construction and operation, which may be quickly attached to cars of any type and make and which may be sold at a low price.

It is another object to provide a device of such form that it may be cheaply and conveniently attached.

It is still another object to provide a device which may be easily and conveniently controlled, kept in repair and replenished.

Various other objects will be pointed out in the specification.

In order to more clearly explain the invention and its characteristic features, reference is had to the accompanying drawings in which—

Figure 1 is a side elevation of the rear portion of a vehicle showing the preferred application of the invention;

Fig. 2 is a sectional view through the rear part of the casing to show part of the operating mechanism;

Fig. 3 is a sectional view through the casing along line 3—3;

Fig. 4 is a sectional view along line 4—4;

Fig. 5 is a side elevation similar to Fig. 1, showing a modified form of the invention;

Fig. 6 is a fragmentary view in side elevation of a detail;

Fig. 7 is a plan view of certain details.

Fig. 8 is a sectional view of an arrangement which may take the place of the arrangement shown in Fig. 6; and

Fig. 9 is a sectional view of another detail.

In Fig. 1 the device 12 embodying the invention is disposed in the angle between the running board 10 and the mud guard 11. The device 12 essentially comprises an up-

wardly elongated casing 13 having in its upper part a reservoir 14 which has a filling cap 15 and an inclined bottom 16.

Below the bottom 16 is a chamber 17, containing the principal part of the operating mechanism.

The operating mechanism includes a fan 18, and electric motor 19 for driving it, a gravity feed pipe 20, a valve 21 for controlling the feed and an electro-magnet 22 for operating the valve.

The bottom 16 has at its lower end an aperture 23 below which is mounted a short spout 24. Adjacent the lower end of the spout 24 is hinged the gate or valve 21 to control the flow of material through the spout.

The spout 24 opens into the substantially vertical feed pipe 20 which extends through the bottom 25 of the chamber 17 and projects a short distance below it.

The fan 18 is housed in casing 26 which is disposed in alinement with the feed pipe 20 and directly in back of it. The outlet 27 from the fan casing is also in alinement with the feed pipe 20 and projects from the bottom 25 downwardly and forms together with the projecting part of the feed pipe 20 a single tubular element. In fact the arrangement is preferably such, as indicated in Fig. 4, that the wall 28 is common to both the feed pipe 20 and the outlet 26. This tubular element terminates in a curved nozzle 29.

The motor 19 may be of course of a suitable design. In the drawing it is represented by the armature 19^a, the field poles 19^b, the field winding 19^c, the commutator 19^d, the brushes 19^e and brush holder 19^f.

The valve 21 is operated at a distance in a separate compartment by means of the electromagnets 22 having iron cores 22^a projecting from the top in proximity to an armature 22^b pivotally mounted by means of a rod 22^c on the frame 22^d. The armature is counterbalanced by means of a weight 22^e, the weight and the relation of the parts being such that the valve is normally pressed against the end of the spout 24 and closes it. When the electromagnets 22^a are energized, the armature is attracted which causes swinging motion thereof about the rod 22^c and the opening of the valve 21. When the magnets are made inoperative, the counterweight 22^e causes the valve to close again. The bearings of the sand valve are also at

a distance in a separate compartment to avoid catching wedged shaped grains of sand and binding.

In order to guard against accidental opening of the valve due to vibrations or other causes, I provide means for locking the valve in closed position. In Fig. 6 I have shown a simple arrangement for this purpose. A blade 36 of magnetic material is hinged on a pivot 37 and is actuated by a spring 38 to bear against the armature 22^b to brake its movement. I preferably slightly bend the blade to define a shoulder 36' adapted to more positively hold the armature in position. When the magnets are energized, the blade 36 is drawn downwardly against the core 22^a thereby releasing the armature and the armature is then swung about its pivot.

In Fig. 8 I have shown a modification. The armature 22^b carries a pin 43 projecting from its side and is normally held in a notch 43' in a lever 44 which is pivoted at one end and carries at its other end an armature 45. One of the cores 46 of the electromagnets has an overhanging pole piece 47 in the path of movement of the armature 45. The parts are so related that when the magnets are energized, the armature 45 is pulled upwardly to the pole piece 47 whereby the armature 22^b is set free from the locking action and is in turn swung about its pivot. When the magnets are made inoperative, both the lever 44 and the armature 22^b return to their normal position.

A spring 48 may be employed to exert force upon the lever 44. The lever 44 will thus be promptly returned to its normal position. The lever 44 may carry teeth 43'' defining the notch 43'. When the armature 22^b swings back, the pin 43 rides up the first of these teeth and settles in the notch and the spring securely holds it there.

It is understood that other means may be provided actuating the valve 21 and securely holding it locked against accidental opening.

The motor and the electro-magnets may be controlled by means of a push-button or other similar switch mechanism conveniently disposed on the steering wheel, side door of car or dash board. This feature is not shown, since it is a matter of common knowledge. The electromagnets are connected in parallel with the motor as indicated in Fig. 7, but of course may be connected in series with motor and battery.

The operation is obvious. When the push-button is pressed, the motor is started up and at the same time the armature 22^b is attracted by the core 22^a causing the valve 21 to open. The sand or other material drops by gravity and as it emerges from the lower end of the feed pipe the blast of air from the fan blows it with considerable force through the nozzle 29 against the tire.

In order to protect the nozzle 29 against mud and broken chain parts I mount a guard 30 on the running board. I also may provide a shield 30' at right angle to the guard 30 to prevent cross currents of air from diverting the sand away from the tire.

To protect the air inlet for the fan against ingress of water or dirt I preferably attach a shield 31. The mud guard *p* and the running board may thus be washed by directing a hose against them without danger of water entering the device.

The device may be adjusted for service on vehicles of various sizes. To this end the opening 23 and the spout 24 may be made of the largest cross-section required for large vehicles and a sliding gate 32 may be used to decrease the effective opening to the required degree for smaller vehicles. Such a sliding gate is indicated in Fig. 2. It may be operated by a rod 33 and screw mechanism 34 at its projecting end. Instead of a sliding gate various other devices may be applied to the same end.

A bell 35 may be mounted in the reservoir to indicate the approaching depletion thereof. The hammer of the bell, when freed of the sand is subjected to the vibrations incident to the movement of the vehicle and strikes the bell and thereby gives an audible signal to the driver.

In order to more distinctly indicate approaching depletion of the reservoir, I may electrically separate the bell 15 and its hammer by an insulating layer 15' and interconnect them by an electrical circuit including an indicating device. In the drawing only the wires 15'' are indicated as part of such electrical circuit. When the level of the sand has sunk sufficiently to set the hammer free and the hammer makes contact with the bell, the indicating device which may be a bell or any form of annunciator is actuated.

The nozzle 29 is preferably formed with an under-cut lip as indicated to prevent accumulation of mud. In the nozzle 29 may be pivotally mounted a blade 50 adapted to be turned by a handle 51 to direct the flow of sand.

It is understood that the relation of the parts in a device applied to one side of the vehicle will differ slightly from that as applied to the other side.

The form of the device shown in Fig. 5 differs from that shown in Fig. 1 only as to changes necessary due to the change of location. The device 40 is suspended from the mud guard 41. An opening 42 for filling the reservoir is provided at the side or top. The operating mechanism is essentially the same as in the first form.

The second form also has an upwardly elongated form. This feature common to

both forms offers particular advantages. It affords considerable reservoir capacity without encroaching upon otherwise useful space or interfering with the normal use of the vehicle.

I claim:—

1. In an anti-skid device, the combination of a casing containing a reservoir for abrasive material, and a fan, a feed pipe leading from the reservoir out of the casing, an air-outlet pipe for the fan positioned to direct the air against the material passing out of the feed tube, in the direction of flow.

2. Device according to claim 1 in which the feed tube and the air outlet pipe extend in contiguous relation and define a common nozzle.

3. Device according to claim 1 in which the feed tube and the air-outlet pipe constitute a single tubular element defining a nozzle and have a partition wall.

4. An anti-skid device comprising a casing for storing abrasive material, a feed tube extending out of the casing and means connected with one of said parts for adjustably regulating the flow of material from the reservoir through the feed tube.

5. An anti-skid device comprising a reservoir for storing abrasive material, said reservoir having an outlet opening, a feed tube extending from said outlet and means for adjustably constricting the outlet opening.

6. The combination of an anti-skid device comprising a reservoir for storing abrasive material and a feed tube projecting from the reservoir, said device being constructed and arranged to be mounted adjacent a mud guard and a shield mounted to protect the projecting feed tube.

7. The combination of an anti-skid device comprising a reservoir for storing abrasive material and a feed tube projecting downwardly therefrom and terminating in a portion curved to approach horizontal direction, and having an undercut free edge, said device being constructed and arranged to be mounted adjacent a mud guard and a shield mounted to protect the projecting feed tube.

8. The combination of an anti-skid device including a reservoir for storing abrasive material and means in the reservoir operative to indicate approaching depletion of the material.

9. An anti-skid device comprising a casing divided into two compartments, an upper compartment for storing abrasive material and a lower compartment for housing a fan and an electric motor for operating the fan, a feed tube connected with the upper compartment and projecting out of the casing, an air-outlet tube connected with the fan compartment and positioned to direct air upon the material in the direction of its flow, mechanism including electro-magnetic means

for controlling the flow of the material from the reservoir and means for simultaneously controlling the motor and the said controlling means.

10. An anti-skid device including a fan and housing therefor, an air inlet and means surrounding the air inlet for protecting the fan housing against ingress of water and dirt.

11. Device according to claim 1 in which the casing has an upwardly elongated form and follows the contour of the mud guard.

12. An anti-skid device comprising a casing having a compartment for storing abrasive material, a compartment containing a fan and motor means therefor, a tubular element defining a duct connected with the storing compartment and a duct connected with the fan compartment, said tubular element terminating in a nozzle portion common to both ducts, the tubular element extending in vertical direction and the nozzle portion being curved to approach horizontal direction.

13. An anti-skid device comprising a reservoir for storing abrasive material, a feed pipe connected to the reservoir, a valve mechanism for controlling the flow of material from the reservoir, means for normally locking the valve in closing position and means for opening the valve.

14. An anti-skid device comprising a reservoir for storing abrasive material, a feed pipe connected to the reservoir, a valve mechanism for controlling the flow of material from the reservoir, means for normally holding the valve in closing position, means for locking the valve in such position and electro-magnetic means operative to make the lock inoperative and to open the valve.

15. An anti-skid device comprising a reservoir for storing abrasive material, a feed pipe connected to the reservoir, a valve mechanism for controlling the flow of material from the reservoir, means for normally holding the valve in closing position, means for locking the valve in such position, and means for successively acting upon the said locking means and the valve mechanism to open the valve.

16. An anti-skid device comprising a reservoir for storing abrasive material, a feed pipe connected to the reservoir, a valve mechanism for controlling the flow of sand from the reservoir and means for actuating the valve mechanism, said means including an electro-magnet, having an armature connected to the valve mechanism and adapted to move therewith, means for locking the armature in valve-closing position and means connected with the locking means and forming a second armature of the electro-magnet for releasing the lock.

17. Device according to claim 16 in which

the actuating means comprise means for automatically closing the valve and electromagnetic means for opening it.

18. An anti-skid device comprising an upwardly elongated casing having surfaces adapted to take up the angular space intermediate the running board and the mud-guard, means in the casing serving as a reservoir for abrasive material, a fan compartment and a fan therein, a feed tube extending from the reservoir out of the casing and an air tube leading from the fan compartment in contiguous relation to the said feed tube to form therewith a single projecting element adapted to pass through one of the elements defining the angular space.

19. An anti-skid device comprising a reservoir for storing abrasive material, a tube for discharging material therefrom, a valve for controlling the flow of material from the tube, a hinge connection for the valve having a lateral extension, electromagnetic means connected with the said extension for turning the valve and a separating wall between the valve and the electromagnetic means.

20. An anti-skid device comprising a reservoir for storing abrasive material, a feed

tube for discharging material from the reservoir, a spout opening from the reservoir into the feed tube and valve mechanism for controlling the flow of material through the spout, said valve mechanism including a hinged element adapted to be swung into position to close the spout and into another position to open the spout, and bearings for the hinged element outside the feed pipe remote from the flow of material.

21. An anti-skid device comprising a reservoir for storing abrasive material, a feed tube for discharging material from the reservoir, a spout opening from the reservoir into the feed tube and valve mechanism for controlling the flow of material through the spout, said valve mechanism including a hinged element adapted to be swung into position to close the spout and into another position to open the spout, bearings for the hinged element outside the feed pipe remote from the flow of the material and means outside the feed pipe remote from the flow of the material for actuating the valve.

In testimony whereof, I affix my signature.

NEVIL MONROE HOPKINS.