July 27, 1937. E. A. BØGVAD 2,088,285

APPARATUS FOR SPREADING SAND OR GRAVEL ON THE GROUND FROM AUTOMOBILES

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Fig. 1.

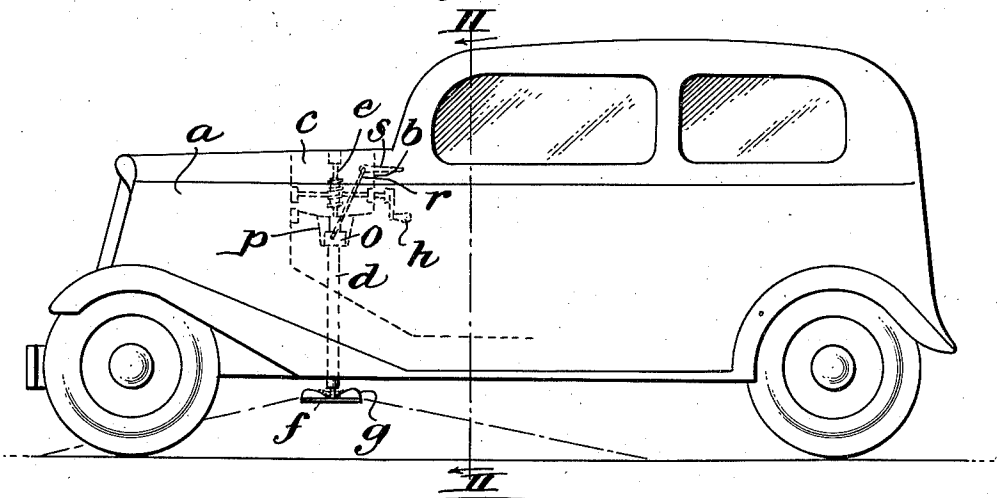


Fig. 2.

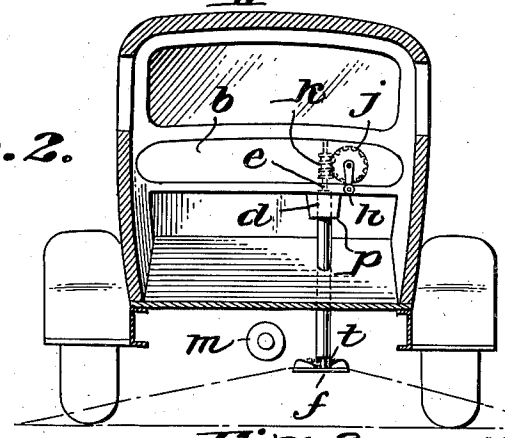
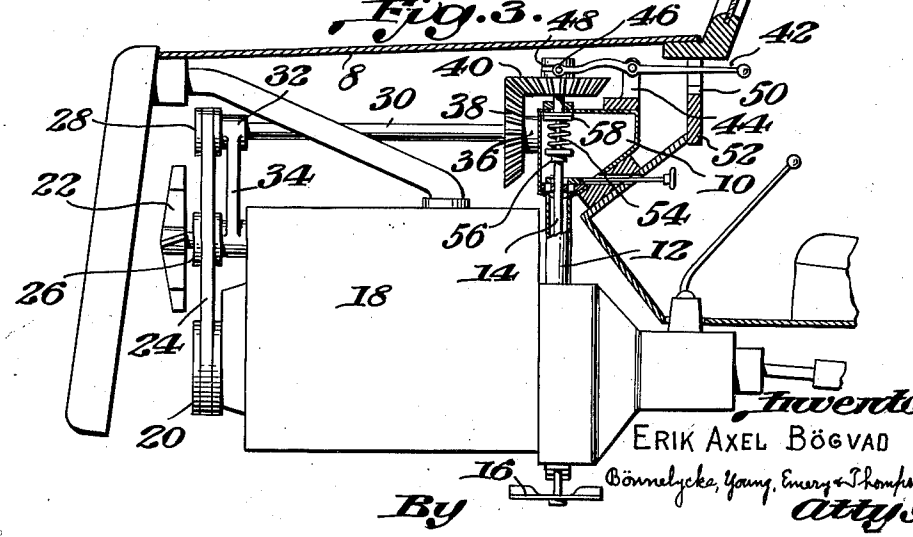


Fig. 3.



Inventor,
ERIK AXEL BÖGVAD
By Bönnelycke, Young, Emery & Thompson
Attys.

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APPARATUS FOR SPREADING SAND OR GRAVEL ON THE GROUND FROM AUTOMOBILES

Erik Axel Bøgvad, Copenhagen, Denmark, assignor to Holger Ohrt, Copenhagen, Denmark

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1 Claim. (Cl. 291—32)

It has been proposed to provide automobiles with apparatus for spreading gravel on the ground to prevent slipping or skidding of the automobile when the road is slippery.

In the apparatus forming the subject matter of the present invention a spreading device positioned at the front of the car discharges sand or gravel over a considerable width of the road, and the charge of sand or gravel is warmed by heat from the engine. The sand or gravel container is arranged inside the bonnet of the engine, whilst the spreading device delivering the gravel in a manner known per se between the front wheels and the rear wheels of the automobile is so arranged as to distribute the gravel in proximity to the front wheels. When the engine is running the heat produced in the space surrounding the engine below the bonnet is more than sufficient to prevent the gravel from clogging, and within the bonnet there is ample space for accommodating a gravel receptacle, particularly because during recent years there has been a tendency to make the engine bonnet comparatively large for aesthetic reasons so that it affords more space than is necessary to accommodate the engine proper and the necessary auxiliary devices; besides, to minimize danger of fire, the petrol tank in modern cars is usually mounted at the extreme rear of the automobile.

If the gravel from the container is carried downwards to a spreading device positioned substantially in the same traverse plane as that in which the container is found, no difficulty is encountered in spreading the gravel in such manner that both the front wheels and the rear wheels may utilize the gravel.

Various forms of construction of the invention are shown in the accompanying drawing, in which:

Figure 1 is a side elevation of an automobile provided with one form of spreading device.

Figure 2 is a cross-sectional view along the line II—II of Figure 1.

Fig. 3 is a fragmentary cross-section of one form of the invention embodying a power driven spreading device.

In the form of construction shown in Figures 1 and 2 a gravel container *c* is placed inside the engine bonnet *a* and immediately in front of the dash board *b*. From this container a pipe *d* extends downwardly below the chassis frame, through which pipe extends a comparatively thin spindle *e* that does not fill up the cross-sectional area of the pipe. The spindle extends slightly beyond the lower end of the pipe and carries at its lower end a spreading or scattering device comprising a disc *f* provided on its upper surface with a plurality of radial fins *g*. The spindle *e* is journalled in suitable bearings and may be rotated from the driver's seat by a crank *h* of which the shaft carries a worm wheel *j* meshing with a steep-pitched worm *k* secured upon the spindle *e*.

At the bottom of the container *c* may be provided a damper or valve, which normally covers the inlet opening of the pipe *d*. In Figure 1 is shown a conventional valve *o* in the shape of an inverted cup-shaped member apertured at the bottom to receive the spindle *e* and surrounding with its free lower edge the upper end of a pipe *d* which debouches in a well *p* at the bottom of the container *c*. The bottom of the valve *o* is at diametrically opposed points connected by means of a forked member *r* to a lever *s* adapted to be operated by hand from the driver's seat. When the damper is opened the gravel will travel downwards through the pipe and be deposited as a small heap *t*, Figure 2 near the centre of the disc *f*, and this heap will prevent more gravel from flowing out through the pipe as long as the disc is not rotated. However, when the disc is turned rapidly by means of the crank handle *h* the gravel forming the pile will be hurled outwards by centrifugal force, being carried along with the fins, and thereby spread over a substantial width of the road, as indicated in dotted lines. The gravel thus distributed will reach points of the road in front of the position momentarily occupied by the front wheels, and the rear wheels will run on the gravelled surface. As shown in Figure 1, the spreading device is positioned near the front wheels. The apparatus thus described is most suitable for occasional use for spreading gravel on sloping road lengths and curves. If in the case of frost on the road the apparatus is adapted for continuous spreading over longer distances the spreading disc *f* instead of being actuated by hand may be driven by the automobile engine through a transmission including a clutch which may be engaged and disengaged at will through a manual control from the driver's seat. Such a power driven contrivance is the preferred one in all cases and will be described later on in connection with Figure 3.

If the petrol tank of the automobile is placed below the engine bonnet in proximity to the dash board, the sand or gravel container may be mounted immediately in front of or behind the

petrol tank. The gravel container need not be especially large since very often the driver will only spread gravel just before braking suddenly on inclines or curves. Also when it becomes more usual to provide automobiles with gravel spreading devices, then petrol filling stations may keep gravel in stock so that it can be bought there; thus a comparatively small supply on the automobile proper will suffice. Moreover in case of emergency the gravel container may be filled from heaps of gravel that are ordinarily laid out alongside the main roads by the road authorities for gravel spreading purposes or for repairing roads.

The bottom of the gravel container may be inclined at all four sides downwards toward the outlet pipe, whereby the exit of the gravel is facilitated.

In Figure 3 **8** is the bonnet, **10** the gravel container, **12** the vertical pipe extending downwardly from the same, **14** the spindle carrying at its lower end the spreading disc **16**. **18** is the cylinder block and crank housing, at the front end of which is arranged in the usual manner a pulley **20** for driving the fan **22**. The belt **24** driving the fan pulley **26** is carried over a third pulley **28** at the front end of a horizontal shaft **30** journalled in two ball bearings, one bearing **32** at the end of an oblique arm **34** projecting from the fan shaft bearing and another bearing **36** arranged at the front side of the container **10**. Near the rear end of the shaft **30** is secure to the latter a conical friction disc **38** adapted to co-operate with a similar disc **40** secured to the upper end of the spindle **14**.

Normally the discs **38** and **40** are held out of engagement by means of a hand lever **42** operated from the driver's seat, said lever being swingable at a point between its ends in a bracket **44** arranged at the top of the container **10** and being bifurcated at its inner end and connected by pivots **46** to a ring **48** freely rotatable in a circular groove in the hub of the disc **40**. When the free end of the lever **42** is depressed, the disc **40** will be lifted out of contact with the disc **38**. The hand lever may be secured in this position by its free end being carried horizontally into a notch **50** extending laterally from the slit in the dash board **52**, in which slit the lever moves. The shaft **30**, now, runs idle and the gravel spreading device is not in operation.

The bottom of the container **10** is provided with openings **57** through which the sand is discharged. A slide valve or damper **58** is mounted on the bottom of the container **10** and is provided with solid portions **59** which cover the openings **57** when the valve is in closed position. Upon shifting the valve by its control member **60** to the open position (i. e., to the right), the openings **57** are uncovered so that sand may flow therethrough.

When it is desired to spread gravel the hand lever **42** is released from the notch **50**. The spindle **14**, then, will be depressed slightly downwards by a spiral spring **54** surrounding the spindle and abutting at its lower end against a disc **56** fixed to the spindle and at its upper end against a thrust bearing **58** resting against the inner side of the upper wall of the container **10**. The discs **38** and **40**, hereby, will be brought in contact and the spreading disc **16** will be driven from the motor of the automobile. The valve **58** is opened to allow the sand to discharge from container **10**.

It is within the scope of the invention, instead of the automobile engine, to use a separate motor, e. g. an electric motor, for driving the gravel spreading apparatus.

Having thus fully described my invention I claim as new and desire to secure by Letters Patent:

An apparatus for spreading sand or gravel on the ground from automobiles, including a gravel container placed inside the engine bonnet positioned at the front of the car, a pipe, and a rotatable spreading disc for depositing the gravel on the road over a substantial area, said pipe extending downwards in substantially vertical direction from the bottom of the container below the chassis of the automobile to the spreading disc, which thus will be arranged in the proximity of the front wheels of the automobile, and power driven means for rotating said disc to spread the gravel over an area including the contact points of the front wheels.

ERIK AXEL BØGVAD.