No. 877,083. PATENTED JAN. 21, 1908.

J. C. B. INGLEBY.

DUST SHIELD FOR SELF MOVING ROAD VEHICLES.

APPLICATION FILED JUNE 10, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

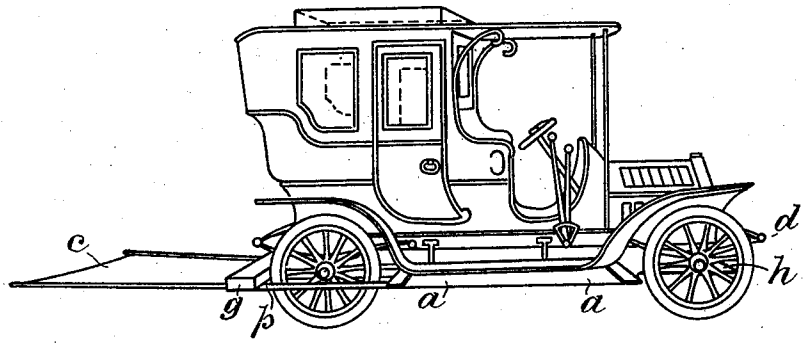


Fig. 2.

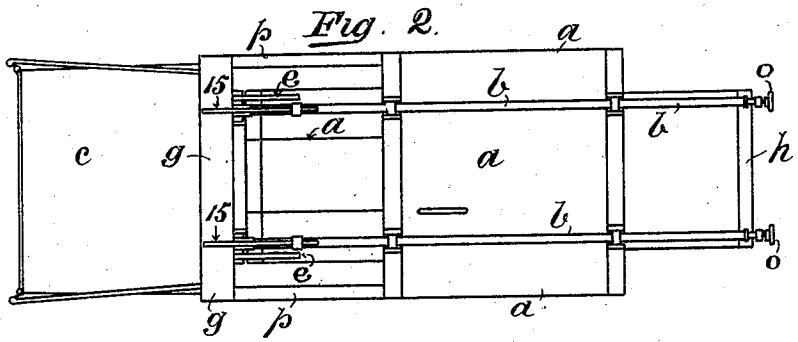


Fig. 3.

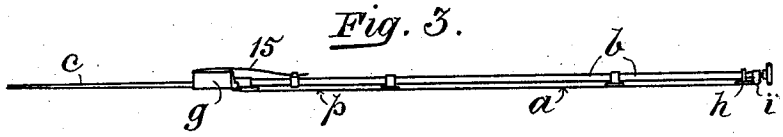
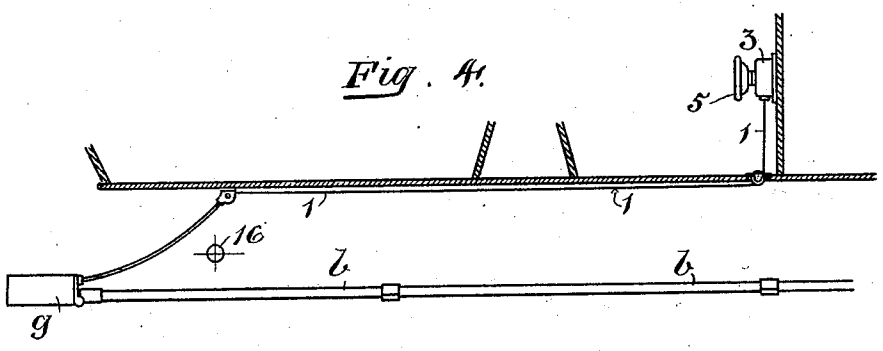


Fig. 4.



Joseph Hutt.
Charles Denison Ingleby } Witnesses

John Conrad Bedford Ingleby
Inventor

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3 SHEETS—SHEET 2.

Fig. 5.

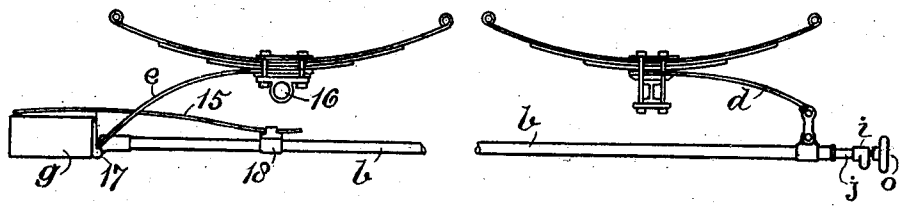


Fig. 6.

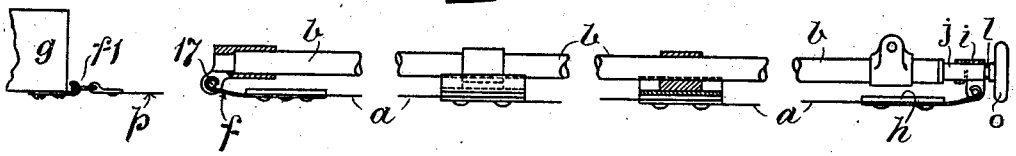


Fig. 7.

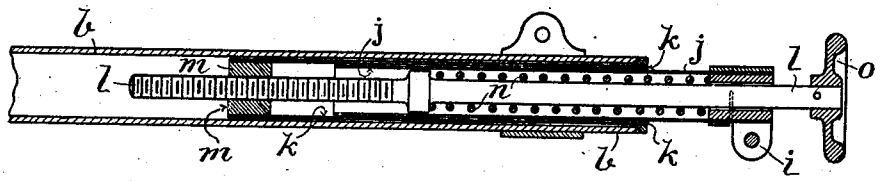


Fig. 8.

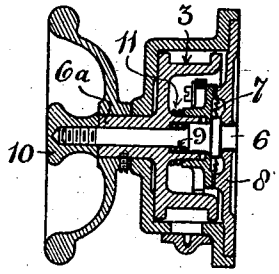
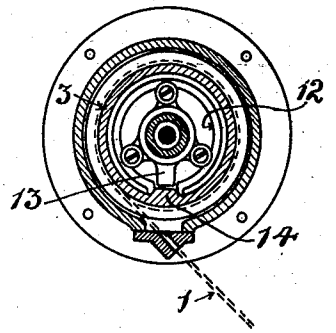


Fig. 9



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3 SHEETS—SHEET 3.

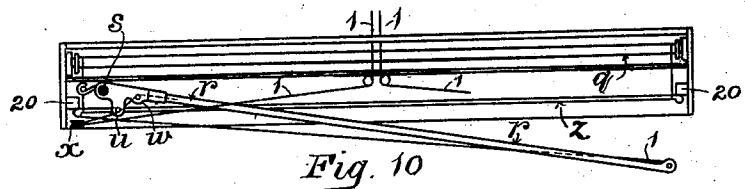


Fig. 10

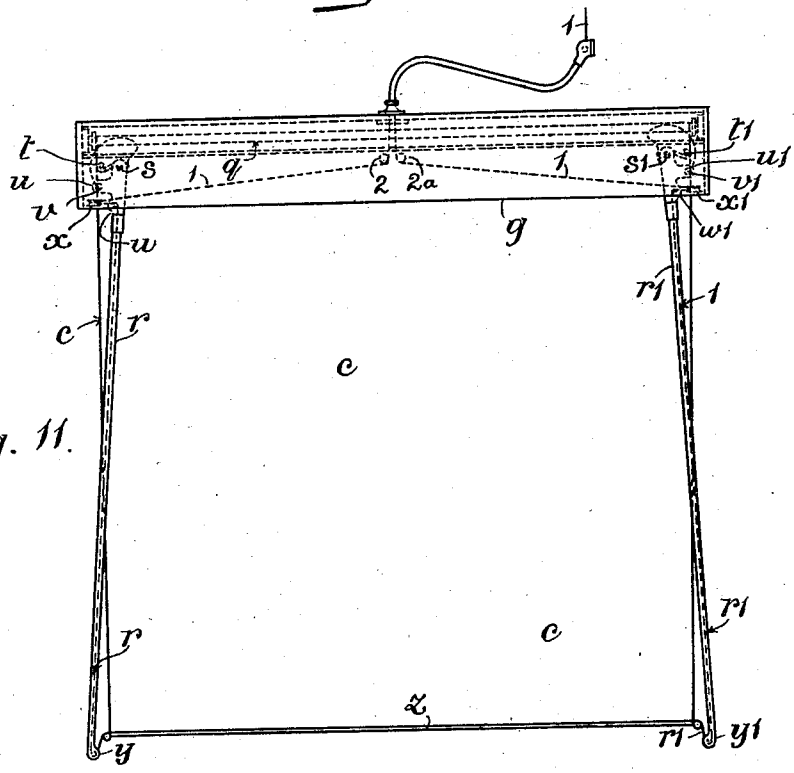


Fig. 11.

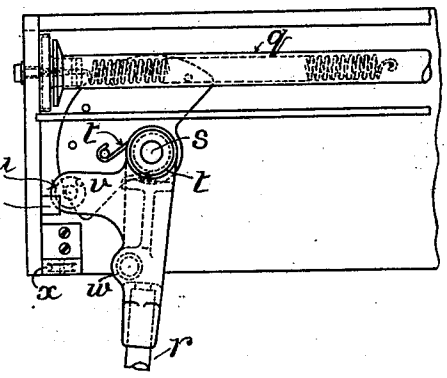


Fig. 12.

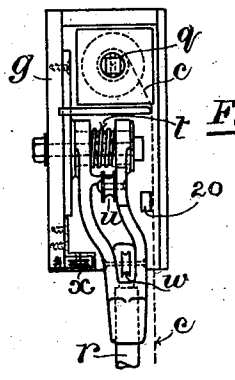


Fig 13.

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Charles Denison Ingleby } Witnesses.

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THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN CONRAD BEDFORD INGLEBY, OF LEEDS, ENGLAND.

DUST-SHIELD FOR SELF-MOVING ROAD-VEHICLES.

No. 877,083. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed June 10, 1907. Serial No. 378,322.

To all whom it may concern:

Be it known that I, JOHN CONRAD BEDFORD INGLEBY, a subject of the King of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented a certain new and useful Dust-Shield for Self-Moving Road-Vehicles, and for which I have applied for Letters Patent in Great Britain, under No. 13,891 and date 18th June, 1906, and of which the following is a specification.

The object of my invention is to prevent or minimize the raising of dust by motor cars and the like, by isolating the layer of dust and air next the ground from the disturbing action of the car in passing over it; by means of an isolating screen or screens, which cut off the layer of air next the ground from the layer of air above which is compressed in front by the oncoming car; the spaces between such screen and the under side of the car forming ducts or passages for such disturbed air to pass to the back of the car. Also by isolating the layer of air next the ground from the disturbing eddies formed immediately at the back of the car, the screen being continued beyond the back of the car. As subsidiary, coöperating and more or less essential objects, this invention provides means for carrying and stretching the screen beneath the body of the car, for opening out and automatically closing up the rear extension or tail screen, for the purpose of avoiding coming in contact with stationary or passing objects; and for carrying the rear end of the tail screen in a floating manner, to obtain equilibrium of pressure between the layers of air above and below the screen, as the screen leaves these and they meet.

Referring to the drawings which form part of this specification:—Figure 1 is a side elevation of a motor car to which my invention has been applied. Fig. 2 is a plan of the isolating screen. Fig. 3 is a side elevation of the screen. Fig. 4 is a side elevation showing the wire connections for drawing out or spreading out the tail screen. Fig. 5 is a side elevation showing the means for carrying the tail screen box, and indirectly of carrying the tail screen in a floating manner. Fig. 6 is an enlarged and more detailed drawing of Fig. 3. Fig. 7 is a longitudinal section of the front end of a carrying tube, showing the means for stretching or racking the screen. Figs. 8 and 9 are sections of the box carrying the drum for drawing out the screen, and the device for releasing the automatic mechanism for suddenly closing up the tail screen. Fig. 10 is a sectional plan of the tail screen box showing, the tail screen rolled up. Fig. 11 is a plan showing the tail screen spread or drawn out. Fig. 12 is a plan to a larger scale of one end of the tail box. Fig. 13 is an end elevation corresponding to Fig. 12.

a indicates the main dust screen, which is carried by the tubular rods *b;* the latter being carried at the front and rear ends by springs *d* and *e* Fig. 5, secured to the axles. The rear end of the screen *a* is attached by a detachable hook connection *f* Fig. 6 to the tail screen box *g* at 17 Fig. 5. The front end of the said screen is drawn and kept tightly stretched, having a spring compensation device to keep it tight in all weathers; by the following mechanism. Each end of the front board *h* of the screen is attached by hook connection to a bracket *i*, Figs. 6 and 7 secured to the outer front end of a tube *j*, which fits capable of sliding within a second tube *k*, and this latter fits in and abuts by means of a collar or flange against the front end of one of the main carrying tubes *b*. The tube *j* carries within it a spindle *l*, the inner end of which is screwed, the screwed part engaging with a nut *m* secured to a tube *k*. A spiral spring *n* fits in the space between the spindle *l* and the tube *j*, and bears with one end against the collar of the spindle *l* and with the other end against the inside flange or bush piece at the end of the tube *j*. On rotating the screw spindle *l* in one direction by means of the hand wheel *o*, the spring *n* is compressed and the front end of the screen pushed forward, drawing it tight. By turning the screw spindle in the opposite direction, the dust screen may be slackened sufficiently to be unhooked and removed.

The front and back ends of the screen are narrowed to give room for the car wheels, and loose strips *p* may extend on the outside of the rear wheels, with hook and eye connection f^1 at their rear ends to the tail box *g*, so that they can be readily disconnected and pushed to one side to get at the wheel or tire.

The front end of the dust screen is carried forwards sufficiently to cut off the layer of air next the ground from that above it, before the oncoming car produces any sufficient difference of pressure between them to cause a disturbance of the lower layer of air. All the space between the upper side of the dust

screen and the under side of the car forms a passage, along which the air compressed in front of the car can escape to the rear, without disturbing the layer of air next the ground, and from which it is separated by the dust screen. The tail dust screen *c*, when not drawn or spread out, is carried rolled up on the spring roller *q*, Figs. 11 and 12, of any usual construction.

The mechanism for carrying the tail dust screen, and for spreading out and folding up the screen is as follows:—Two spreading arms *r* and r^1 are pivoted on short spindles or axles *s* and s^1, fitted respectively at each end of the tail box *g*. These tend to automatically close up to the tail box as shown in Fig. 10, under the influence of the springs *t* and t^1 coiled round the axles *s* and s^1 respectively. A small pulley *u* (u^1) is carried by a lug piece *v* (v^1) attached to or formed on each arm *r* r^1, near its hinged end; and a second small pulley *w* (w^1) is carried by the arm *r* (r^1) at a somewhat greater distance from its hinge. A third small pulley *x* (x^1), herein termed the guide pulley, is carried in fixed bearings near each of the outer front ends of the tail box. The outer free end of each arm also carries a guide pulley *y* (y^1).

z is a tube to which the free end of the tail dust screen is attached. A long cord 1 passes from the winding drum 3, to be directly referred to, round one of the guide pulleys 2 at the center of the tail box, round the guide pulley *x*, then past the outer side of the pulley *u*, and the inner side of the pulley *w*, to the pulley *y* carried at the free end of the hinged arm *r*; then through the tube *z* to the pulley y^1 at the end of the other pivoted spreading arm r^1; and back in a reverse order round the corresponding pulleys w^1, u^1, x^1 and 2^a to the winding drum 3. The winding drum 3, see Figs. 8 and 9, winds up both ends of the cord simultaneously, and lets them out simultaneously.

It will be seen Fig. 10 that when the winding drum commences to wind in the cord or wire 1, a pressure is exerted first on the axis of the pulley *u* and afterwards on the pulley *w*, thus turning the arm *r* round on its pivot, to open it against the closing tendency of the spring *t*; the arm finally taking the position shown in Fig. 11. On pulling or winding up the cord or wire 1 still further, the tube *z* and with it the free end of the tail dust screen are drawn forward from the stops 20, unrolling and drawing out the screen *c* from the spring roller *q*, against the closing tendency of the roller spring. The drawing out is continued until the tube *z* comes up to the free ends of the arms *r* r^1, or in other words, until the tail dust screen is drawn or spread out to its full extent.

On slackening back or uncoiling the wire or rope 1 from the winding drum 3 the tail dust screen is rolled up under the influence of the roller spring, and afterwards the arms *r* r^1 fold up under the influence of the springs *t* t^1. The strength of the roller spring and of the springs *t* t^1 are so proportioned, that a less pull is required to spread out the arms *r* r^1, than is required to draw out the tail dust screen *c*.

The winding up mechanism, see Figs. 8 and 9, consists of a drum 3, which is rotated in the winding up direction from the hand wheel 5, see Fig. 4, by means of the drum spindle 6^a, annular ratchet 7, actuated through the spindle 6, and fixed annular ratchet 8 attached to the winding drum case. Springs 9 and 11 keep the spindle 6 and rack 7 pressed towards the rack 8. By means of a release button 10 on the end of the spindle 6, the rack 7 can be drawn forward against the pressure of the spring 9 and out of contact of the rack 8, thus releasing the winding drum; so that the tensions of the roller spring and of the pivot springs *t*, t^1, of the arms *r* r^1, are free to act, and instantaneously roll up the tail screen *c*, and fold in the arms *r* r^1 out of the way of any stationary or passing object. It will be noticed that when the release button 10 is pulled forward to release the folding up mechanism, that the springs 9 and 11 are compressed and force the winding drum 3 against the end of the casing, and acting as a brake prevents the folding up taking place too violently. A C-spring 12, the ends of which press against the lugs 13 and 14 on the catch plate 7 and drum 3 respectively, acts as a cushion to prevent breakage of the teeth of the annular ratchets 7 and 8.

The tail box *g* may be carried on spring hinges attached to its lower corner front edge, or by flat springs *e* Fig. 5; the springs *e* being secured to the rear axle 16, and to the lower front corner edge of the tail box *g* by means of a pivot 17. This pivot 17 also carries the tubular rods *b* and the main screen *a* by means of the hook *f*; while the springs 15 are secured to the upper side of the tail box and to the tubular rods *b* carrying the main screen *a*, by passing through an adjustable fulcrum 18 fixed on the tubes *b*. In this manner not only are the tail box *g* and the rear end of the main screen carried by a main spring suspension; but the free end of the tail screen is free to rise and fall according to the difference of air pressure on the two sides of the tail screen; so that these pressures become more or less balanced before the passage of the tail screen allows the layers of air above and below the screen to meet, thereby obviating or reducing the risk of the layer of air next the ground being disturbed by eddies or air currents at the back of the car.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A self-moving road vehicle, provided

with a dust-screen consisting of a frame and a covering of fabric which is suspended below the bottom of said vehicle and serves to cut off the air between said screen and the ground from the air between said screen and the bottom of the vehicle body, substantially as and for the purpose set forth.

2. A self moving road vehicle, provided with a dust screen which is suspended below the bottom of said vehicle and serves to cut off the air between said screen and the ground from the air between said screen and the bottom of the vehicle body, the said screen consisting of a frame and flexible fabric supported thereby and provided with means for drawing it taut substantially as set forth.

3. A self moving road vehicle provided with a dust screen which is suspended in horizontal position in the space between the bottom of said vehicle and the ground and extends horizontally out behind the said vehicle, the said screen consisting of a frame and flexible fabric thereon, the same being provided with means for making said fabric taut substantially as set forth.

4. A self moving vehicle provided with a dust guard suspended substantially in horizontal position between the bottom of said vehicle and the ground and extending beyond the rear of said vehicle.

5. A self-moving road vehicle provided with an expansible and contractible dust screen, below the body of the vehicle, in combination with means for expanding and contracting the same, a rearward extension of said screen beyond the vehicle body, forming a tail dust screen which is expansible and contractible and means for contracting or expanding at will the said tail dust screen, for the purpose set forth.

6. In motor cars and similar road vehicles, the combination of a main isolating screen, means for carrying the same tightly stretched beneath the car at a short height above the ground, a rear extension or tail screen extending rearwardly beyond the rear end of the main screen, means for spreading out said tail screen and means for automatically and instantaneously rolling and closing up said tail screen, for the purposes specified.

7. In a motor car or similar road vehicle; the combination of an isolating screen *a*, side rods *b*, carrying springs *d*, *e* and 15, and stretching and automatic compensating device at the front ends of said carrying rods for the purposes specified.

8. In a motor car or similar road vehicle; the combination of two fixed wheel axles, a main isolating screen *a*, side rods *b*, flat carrying springs *d*, *e* and 15, telescopic and screw stretching or racking mechanism and spring compensating device, all substantially as illustrated and for the purposes specified.

9. In a motor car or similar vehicle provided with an isolating screen below the body of the car; the combination of an inner tube *j*, to which the front end of the screen *a* is attached, stretching or racking screw *l* and compensating spring *n* within the tube *j*, an intermediate tube *k* with nut *m* engaging with said screw *l*, and fixed outer tube *b*, all substantially as and for the purposes specified.

10. In a motor car or similar vehicle; the combination of a tail screen, tail screen box, spring floating support, means for spreading or drawing out the screen, and for retaining the same in the spread or drawn out position, automatic folding or closing up mechanism and releasing mechanism, for the purpose or purposes set forth.

11. In a motor car or similar vehicle; the combination of a fixed axle 16, suspension springs *e* and 15, side carrying rods *b*, tail box *g*, and hinged levers *r* r^1, and tail screen *c*, for the purposes specified.

12. In a motor car or similar vehicle; the combination of a tail screen *c*, tail box *g*, spring roller *q*, pivoted spreading arms *r* r^1, side lugs *v* v^1, guide pulleys *u* u^1, *w* w^1, *x* x^1, and 2 and 2^a, and closing springs *t* and t^1, flexible wire or cord 1 and winding drum 3, all substantially as set forth.

13. In a motor car or similar vehicle; the combination of a winding drum 3, spindles 6 and 6^a, release button 10, hand wheel 5 springs 9 and 11 and annular racks or ratchets 7 and 8, substantially as set forth.

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

JOHN CONRAD BEDFORD INGLEBY.

Witnesses:

JOSEPH HUTT,

CHARLES DENISON INGLEBY.