V. H. PODSTATA.

PNEUMATIC CUSHION.

APPLICATION FILED MAY 28, 1906.

906,923. Patented Dec. 15, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

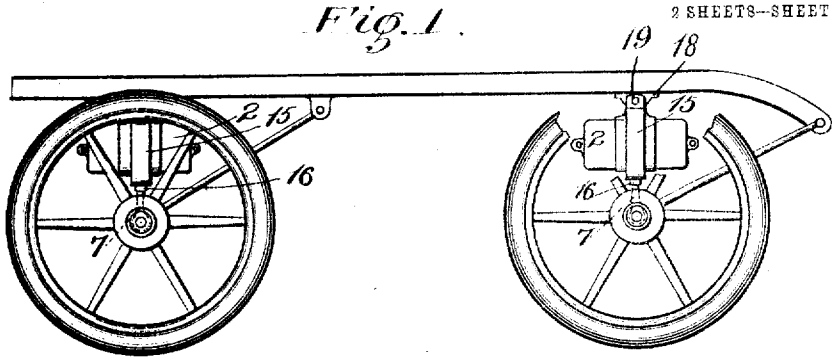


Fig. 2.

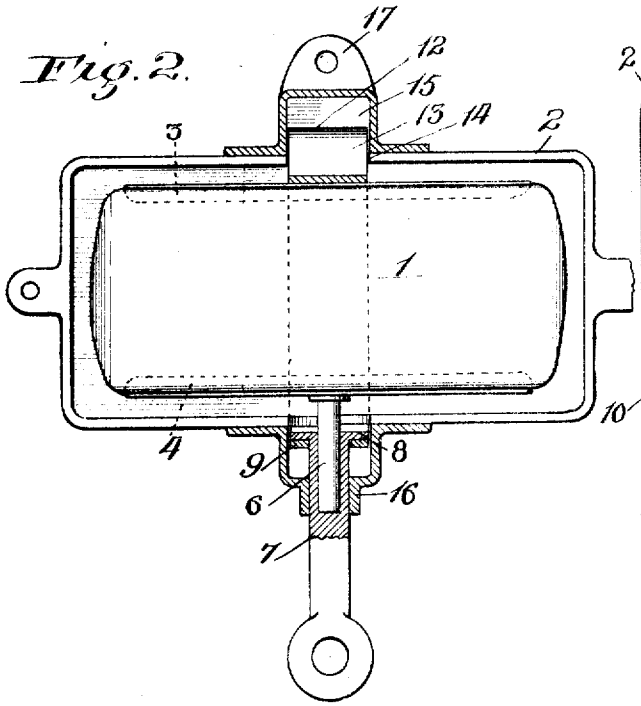
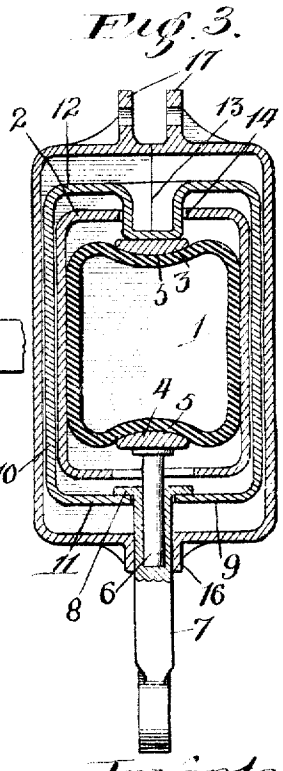


Fig. 3.



Witnesses:
Wm. P. Bond
Chas. F. Cooke

Inventor:
Vaclav H. Podstata
by Banning & Banning
Attys.

V. H. PODSTATA.

PNEUMATIC CUSHION.

APPLICATION FILED MAY 28, 1906.

906,923. Patented Dec. 15, 1908.

2 SHEETS—SHEET 2.

Fig. 4.

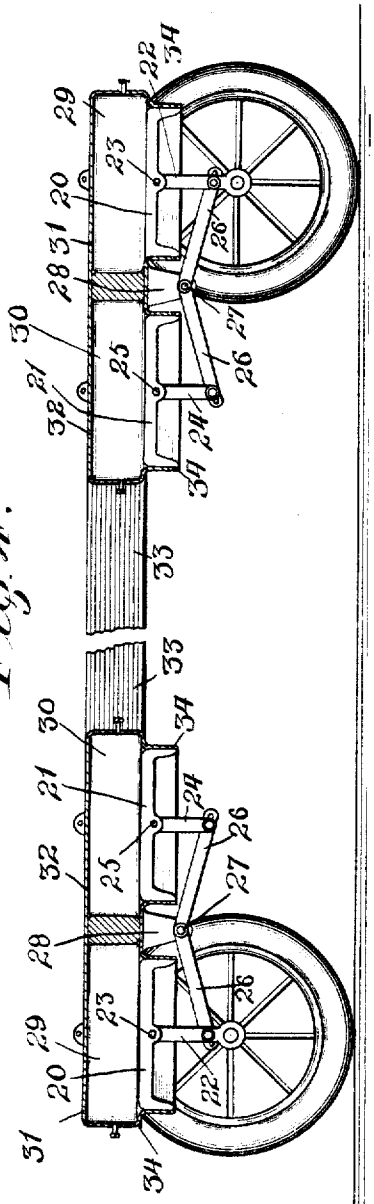


Fig. 6.

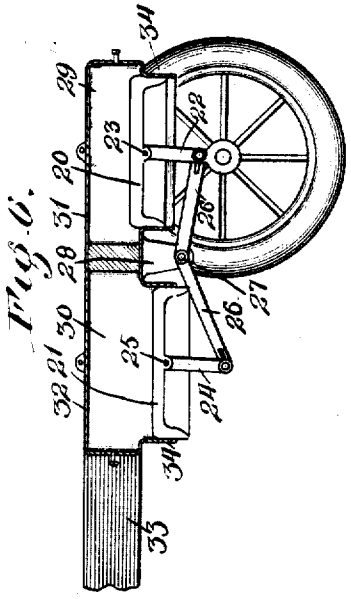
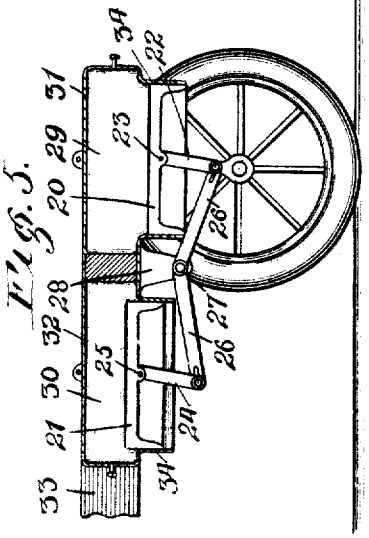


Fig. 5.



Witnesses:
Wm. P. Bond
Chas. F. Cooke

Inventor:
Vaclav N. Podstata
by Banning & Banning
Attys

UNITED STATES PATENT OFFICE.

VACLAV H. PODSTATA, OF DUNNING, ILLINOIS.

PNEUMATIC CUSHION.

No. 906,923. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed May 28, 1906. Serial No. 319,199.

To all whom it may concern:

Be it known that I, VACLAV H. PODSTATA, a citizen of the United States, residing at Dunning, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic Cushions, of which the following is a specification.

This invention is intended primarily for use with automobiles, although the device may be applied to carriages or other vehicles in which it is desirable to make use of a cushion between the running gear and the frame for the purpose of minimizing the effects of jolts or jars on the running gear.

The invention more particularly relates to the means employed for minimizing the effect of the rebound which ordinarily takes place as an after effect of jolts or jars where no provision is made to prevent it. The rebound is more especially noticeable in the use of sensitive springs or cushions, and, unless means be provided to prevent or minimize the rebound, the vehicle will continue to rock or bound for a considerable period after the initial shock or jar has been given to the vehicle.

The present invention is intended to provide means for preventing or limiting the rebound and holding the vehicle poised in a state of equilibrium, which, while preventing any excessive jars or shocks from being transmitted to the body of the vehicle, at the same time increases the steadiness of the vehicle body and thereby promotes the comfort and welfare of the occupants.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings Figure 1 is a vehicle body having secured thereto the cushioning device of the present invention; Fig. 2 is a longitudinal sectional view of the preferred form of cushion; Fig. 3 a cross sectional view of the same; Fig. 4 is a sectional view of the vehicle body showing a somewhat modified form of construction; and Figs. 5 and 6 similar views showing the cushioning mechanism in different positions of use.

The cushioning device of Figs. 1, 2 and 3 comprises a flexible bag or receptacle 1 which, as shown, is of elongated shape and inclosed within a rectangular casing 2 of substantially equal diameter in cross section to the pneumatic bag so as to provide a shield or reinforcement therefor; and within the casing and in contact with the upper and lower surfaces of the pneumatic bag are a pair of elongated upper and lower plungers 3 and 4 respectively. The plunger 4 may for convenience be termed the primary plunger and the plunger 3 the secondary plunger. The function of the primary plunger is to prevent the initial shock caused by the passage of the wheels over inequalities in the ground; and the function of the secondary plunger is to prevent the rebound or reaction which ordinarily takes place after a heavy shock or jar, unless positive means are provided to prevent it. The plungers are in the form of a pair of bars having rounded acting faces 5 which bear against the pneumatic bag or receptacle, and the primary plunger is provided with a depending stem 6 which is adapted to reciprocate or telescope within a shank 7 which, as shown in Fig. 1, is connected with the axle of the vehicle. The shank 7 is provided at its upper end with a flange 8 which bears against the inner face of a strap 9 which completely encircles the casing 2 and through which the shank 7 is inserted. The strap comprises side bars 10 which abut closely against the side walls of the shell or casing, a lower cross wall 11, which coacts with the shank flange 8, and an upper cross wall 12 provided with a depression 13 in its center, which depression passes through and acts within an opening 14 in the top of the shell or casing, and to the depressed portion 13, which is of U-shape, is secured the upper or secondary plunger which bears against the top of the pneumatic bag or receptacle. The strap 9 and coöperating parts are inclosed within a housing 15 which surrounds the casing and is rigidly secured thereto, and the housing at its lower side is provided with a sleeve or neck 16 for the passage therethrough of the shank 7 of the primary plunger. As shown, the casing is attached to a suitable part of the frame of the vehicle, although it will be understood that the particular method of attachment may be varied to suit the requirements of each individual case. In the present instance, ears 17 are shown on the top of the housing which embrace a tongue 18 on the side rail of the vehicle frame, and a pin 19 serves to secure the parts together.

In use jolts or jars imparted to the wheels of the vehicle will serve to upwardly project the shank 7 and with it the stem 6 carrying the lower or primary plunger. The con-

tact of the plunger with the pneumatic bag or receptacle serves to prevent the initial shock or jar from being imparted to the vehicle body; but immediately after the initial shock or jar the tendency will be for the running gear and vehicle frame to spring apart from one another, and this tendency will be counteracted by the secondary plunger. After the primary plunger has been initially actuated the shank 7 which is connected with the running gear will tend to spring back beyond its normal position by the rebound of the vehicle and the retraction of the shank draws down the strap 9 and with it the upper or secondary plunger 3 which acting against the upper side of the pneumatic bag prevents an excessive rebound and serves to very quickly bring the vehicle to a state of rest.

The device of Figs. 4, 5 and 6 differs somewhat as to its details of construction, but embodies a principle similar to that hitherto described. It employs primary and secondary pistons, but instead of operating in direct opposition to one another, employs a connecting link or lever as will be hereinafter explained. In Figs. 4, 5 and 6 primary and secondary pistons 20 and 21 respectively are employed, the former being directly connected to the running gear by means of a stem 22, which, as shown, is pivoted at its upper end 23, and the secondary piston is likewise provided with a stem 24 pivoted at its upper end 25. The stems are both connected by means of a lever 26 pivoted near its center 27 to a depending post 28 on the frame of the vehicle. The primary piston 20 abuts against a primary pneumatic bag 29, and the secondary piston abuts against a secondary pneumatic bag 30, which may be either separate, as shown, or two portions of the same pneumatic bag. The two bags, as shown, are mounted within recesses 31 and 32 formed in the side rails 33 of the vehicle frame for the purpose of receiving the pneumatic bags, and each of the recesses terminates in a neck or throat 34 which provides a guide for the reciprocation of the piston or plunger. As shown, the bag or receptacle is expansible to a degree which permits it to bear against the plunger at all times, whether during compression or expansion, which contact serves to hold the parts in a state of equilibrium, which is wholly desirable in the construction of automobiles or other vehicles intended for rough travel. The action of the cushioning mechanism of Figs. 4, 5 and 6 is similar in many ways to that hitherto described. As the running gear is brought into contact with inequalities in the road, the initial shock or jar will tend to actuate the primary piston and compress the primary pneumatic receptacle simultaneously retracting the secondary piston and allowing the secondary pneumatic receptacle to expand. The rebound causes a reversal of this action and compresses the secondary pneumatic receptacle, allowing the primary pneumatic receptacle simultaneously to expand. It will thus be apparent that both the bound and rebound of the vehicle body will involve a pneumatic cushioning which, while holding the vehicle delicately poised and in a state of equilibrium, at the same time serves to speedily bring the vehicle body to a state of rest in such manner as to promote the comfort and welfare of the occupants.

It will be noted that in both cases the cushioning action is the same, involving as it does the movement of primary and secondary pistons acting in opposition to one another for the purpose intended.

In the claim in which the pneumatic bag is referred to as an element it will be understood that the bag may be integrally formed as shown in Figs. 2 and 3 or formed in two sections as shown in Figs. 4, 5 and 6, the term bag referring to the container for the air as a whole whether the same be formed integrally or in sections.

What I regard as new and desire to secure by Letters Patent is:

A pneumatic cushion for vehicles comprising a rigid outer shell or casing, a pneumatic bag therein, a primary piston bearing against one side of the pneumatic bag, a secondary piston bearing against the opposite side of the bag, a shank provided in its end with a recess, a stem on the primary piston slidably mounted within the recess, a strap encircling the pneumatic receptacle, through the lower portion of which the shank is entered, the strap being connected with the secondary piston, an abutment on the end of the shank for retracting the strap on the rebound of the shank, substantially as described.

VACLAV H. PODSTATA.

Witnesses:
SAMUEL W. BANNING,
CHAS. F. COOKE.