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PATENTED MAY 1, 1906.

V. H. PODSTATA.
PNEUMATIC CUSHION.
APPLICATION FILED OCT. 13, 1905.

Fig. 1.

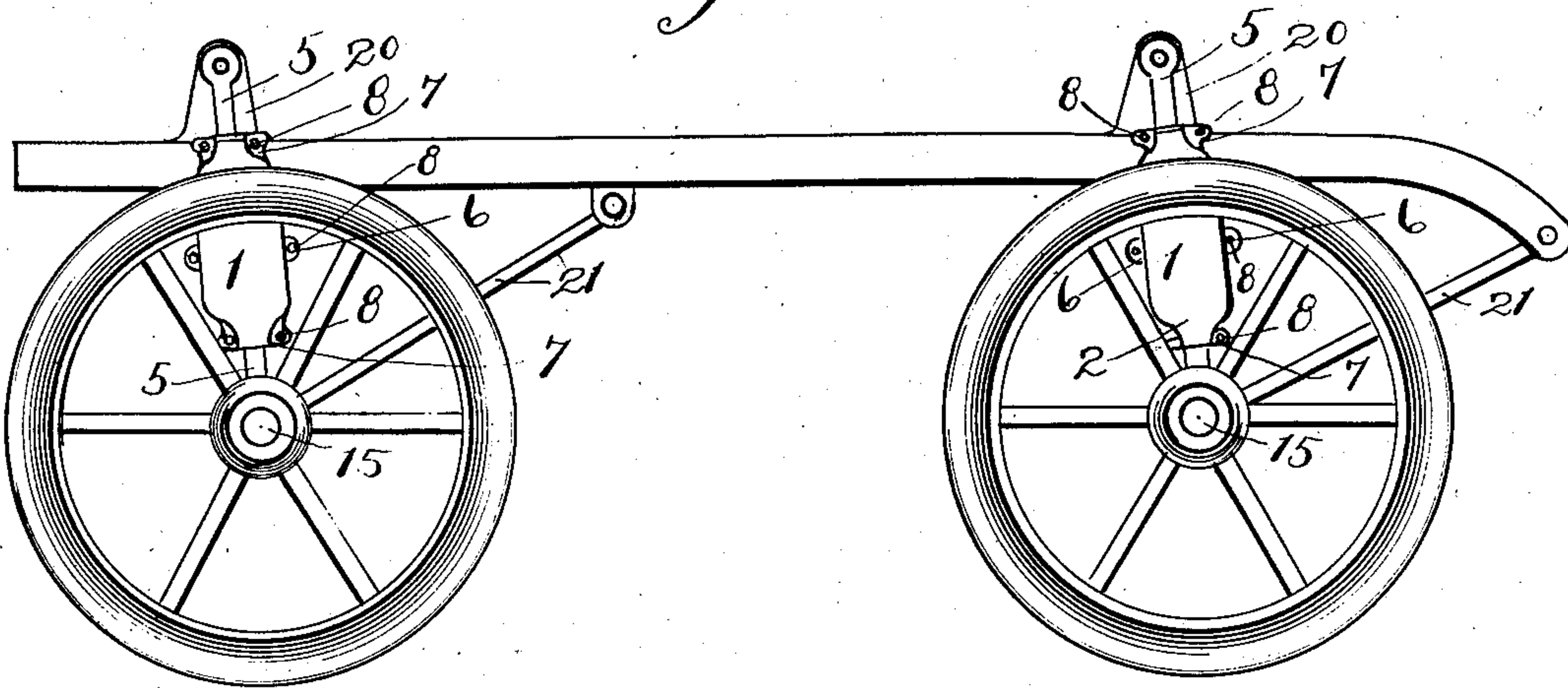
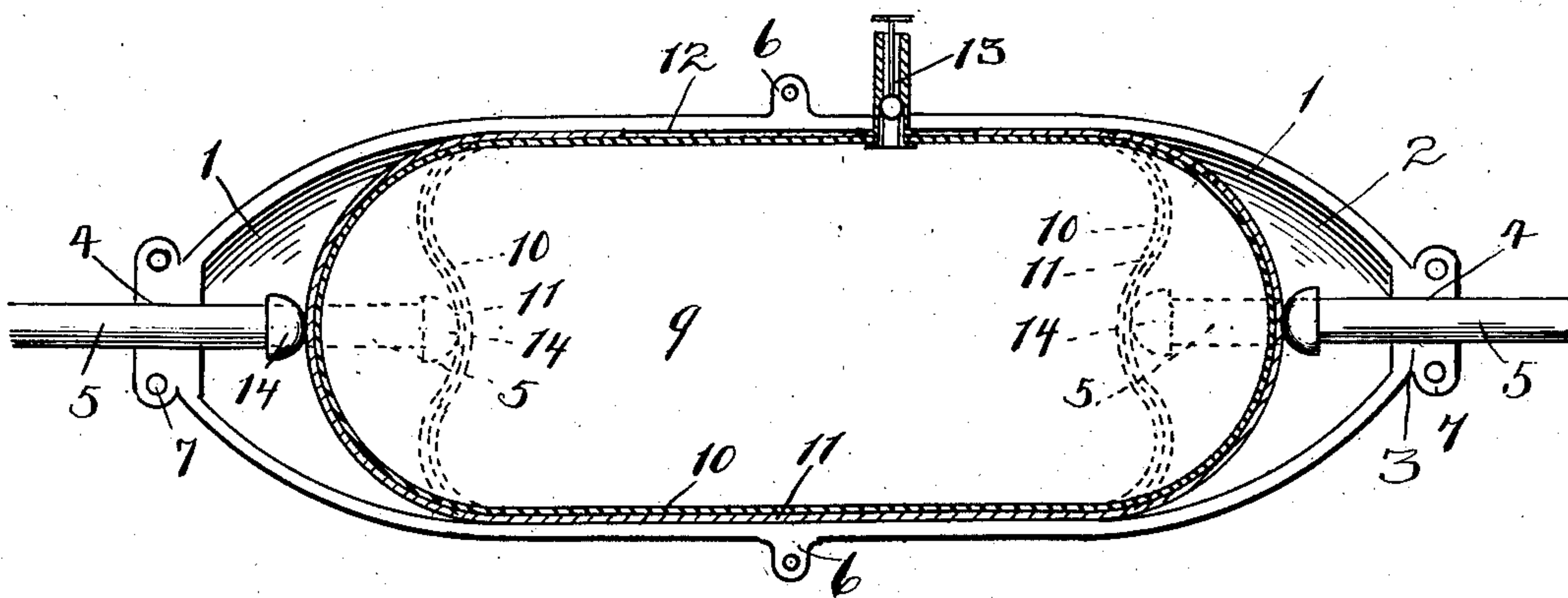


Fig. 2.



Witnesses:
Wm. P. Bond
Pauline Beckman

Inventor
Vaclav H. Podstata
By Baunig & Baunig
Attys.

UNITED STATES PATENT OFFICE.

VACLAV H. PODSTATÁ, OF DUNNING, ILLINOIS.

PNEUMATIC CUSHION.

No. 819,452.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VACLAV H. PODSTATÁ, 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 located between the running-gear and the frame for the purpose of minimizing the effect of jolts or jars on the running-gear.

The object of the invention is to so construct the cushion that it may be regulated to exert a greater or less degree of resiliency by inflating the inner pneumatic receptacle to a greater or less extent. This enables the same cushion to be adapted for use under varying conditions, which is impossible in the case of steel springs or similar cushioning devices.

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

In the drawings illustrating the invention, Figure 1 is a side elevation of an automobile-frame employing the pneumatic cushion of the present invention, and Fig. 2 a longitudinal sectional view of the cushion as a whole.

Referring more especially to Fig. 2, the cushion consists of a metallic or other rigid casing 1, preferably, though not necessarily, of elongated cylindrical shape, having contracted ends 2 terminating in a plunger-mounting 3, provided with a hole 4 for the passage therethrough of a plunger 5, the plungers at opposite ends of the casing being longitudinally in line with one another. The casing preferably consists of two halves or sections forming a longitudinally-extending seam, and the two sections are each provided with side ears 6 and end ears 7, through which are passed bolts or screws 8 for uniting the two sections together. Within the casing is an elongated pneumatic sack or receptacle 9, which, as shown, has a cross-sectional diameter substantially equal to the cross-sectional diameter of the casing, but is of less length than the casing, so as to leave an open space at each end of the casing for the reciprocation of the oppositely-disposed plungers. The pneumatic sack or receptacle is preferably composed of an inner sack 10, of rubber or other air-tight elastic material, surround-

ed and inclosed by an outer layer of fabric 11, having a laced opening 12 in its side for the purpose of facilitating replacement of the inner sack. The air-tight sack is provided with an air-valve 13 for the purpose of inflation to any desired tension. Each of the plungers 5 is provided with a rounded head 14, which abuts against the center of the rounded end of the inner receptacle and is of substantially less diameter than the receptacle, so that the tension or resiliency of the cushioning device will be centered at the ends rather than distributed over a wide area. The upper and lower plungers 5 are secured, respectively, to the running-gear 15 and the vehicle-frame 20 in any suitable and convenient manner, and, as shown, the running-gear is held in place by means of a radius-rod 21, pivoted to a suitable portion of the vehicle-frame, which arrangement allows the running-gear to move with respect to the vehicle-frame and causes the cushion to minimize the effect of jolts and jars and prevent the vibration of the running-gear from being imparted to the vehicle-frame.

In use the pneumatic receptacle can be inflated to any desired degree; but the expansion of the elastic inner sack will be prevented by the inclosing sack of fabric, which should be of such strength as to prevent undue expansion and at the same time permit of continued reciprocation of the plungers without wear or breakage. By centering the cushioning action at two oppositely-disposed points the plungers will act in opposition to each other to compress the pneumatic receptacle; as shown by dotted lines, and this method of compression provides a very sensitive cushion which will respond readily to the vibrations of the running-gear and prevent such vibrations from being transmitted to the vehicle-body. The pneumatic receptacle can be inflated to any desired degree, which enables the user to regulate the degree of resiliency exerted by the cushion, since the pneumatic receptacle under continued inflation will become hard or rigid without being expanded, so that its resilient properties will be proportionately increased by the simple method of inflating the cushion. The rigid outer casing serves to reinforce the outer fabric of the pneumatic receptacle at the sides, so that the entire compression of the receptacle will be from the opposite ends, which further serves to center the resilient qualities of the cushion at the most de-

5 sirable points. By forming the outer casing in two longitudinal halves or sections immediate access can be had to the interior of the cushion for the purpose of repair or other-
 10 wise, and at the same time the halves or sections of the casing can be formed from sheet metal, which can be bent or died into the proper shape.

15 It will be seen from the foregoing description that the device of the present invention possesses extreme sensitiveness of the cushion, as it permits an inflation up to any desired tension, and its range is limited only by the volume of air within and the size of the
 20 head of the plunger in accordance with the object to be obtained. The larger the volume of air and the smaller the head of the plunger the greater the sensitiveness, and vice versa. The second advantage is the
 25 practically perfect protection of the elastic sack or receptacle from the effect of dust, moisture, or injury from the outside, and the third advantage is the great ease of repair or replacement of the parts in that either the
 30 outer sack of strong fabric or the inner sack of air-tight material can be removed and replaced in a very few minutes, if necessary.

Although the invention has been described as a cushion for automobiles or similar vehicles, it is obvious that it is not limited to such use, since it can be used under other circumstances in which it is desirable to employ a cushion having the properties above referred to, and it is further apparent that although
 35 the cushion, as shown, is of elongated cylindrical shape that its shape can be modified considerably without departing from the spirit of the invention.

I claim—

40 1. A cushion consisting of a rigid outer casing, a pneumatic receptacle inside the casing of sufficient cross-sectional diameter to bear against the inner side walls of the casing and be supported thereby and two oppositely-
 45 disposed pistons slidably mounted in the casing and adapted to contact with the pneumatic receptacle to compress the same under tension, substantially as described.

50 2. In a cushion, the combination of an outer rigid casing, a pneumatic receptacle inside the casing having a cross-sectional diameter substantially equal to the interior diameter of the casing and having a less length than the interior length of the casing and two
 55 pistons slidably mounted in opposite ends of the casing and of less diameter than the pneumatic receptacle and adapted to contact with

the opposite ends of the pneumatic receptacle to inwardly compress the ends under tension, substantially as described. 60

3. In a cushion, the combination of a rigid casing a pneumatic receptacle inside the casing consisting of an outer non-elastic supporting fabric, an inner elastic sack or receptacle, an air-valve for inflating the elastic receptacle to any desired tension, and two oppositely-disposed plungers of lesser diameter than the pneumatic receptacle and slidably mounted in the casing and adapted to contact with the ends of the receptacle and compress
 65 the same under tension, substantially as described. 70

4. In a cushion, the combination of a rigid elongated cylindrical casing contracted at its ends and having at its ends plunger-mountings, oppositely-disposed plungers reciprocally held within the mountings, a pneumatic receptacle within the casing of substantially equal width with the casing and of less length and adapted to be inflated and to have
 75 its ends inwardly compressed by the oppositely-disposed plungers, substantially as described. 80

5. In a cushion, the combination of a rigid elongated cylindrical casing contracted at its ends and having at its ends plunger-mountings, oppositely-disposed plungers reciprocally held within the mountings, a pneumatic receptacle within the casing of substantially equal width with the casing and of less length and adapted to be inflated and to have its ends inwardly compressed by the oppositely-disposed plungers, said pneumatic receptacle consisting of an inner elastic sack and an outer covering of non-elastic
 85 fabric, and a valve for admitting pressure to the interior of the elastic sack, substantially as described. 90 95

6. In combination with a vehicle-axle and body, a cushion consisting of a rigid elongated outer shell or casing having slidably mounted therein oppositely-arranged plungers one of the plungers being secured to the axle and the other plunger to the vehicle-body, and a pneumatic receptacle within the casing adapted to be compressed from either direction by the oppositely-disposed plungers for providing a cushioning action between the vehicle-body and the axle, substantially as described. 100 105

VACLAV H. PODSTATA.

Witnesses:

SAMUEL W. BANNING,
 WILLIAM P. BOND.