J. Merlett.
Car Spring.

No. 51,956. Patented Jan. 9, 1866.

Fig. 1.

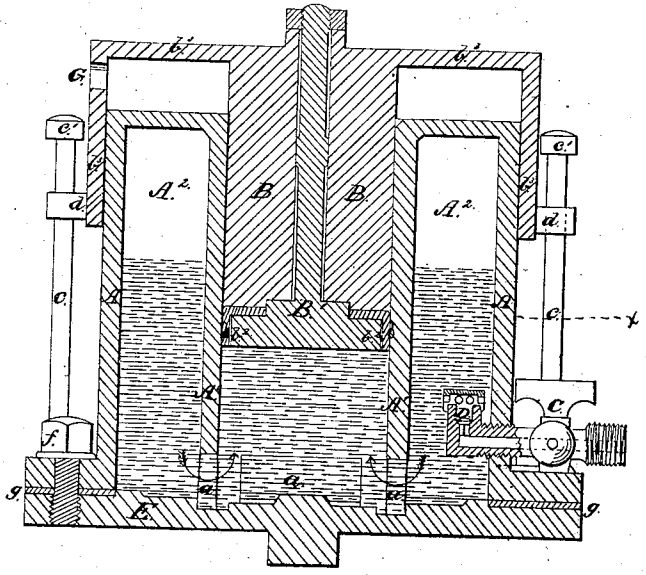
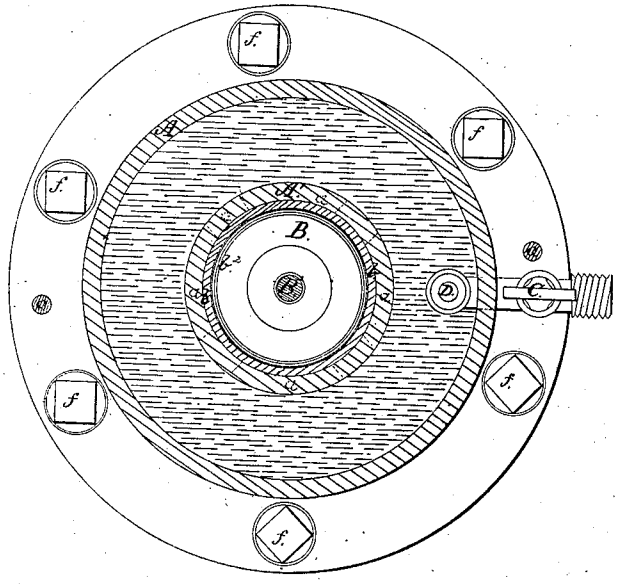


Fig. 2.



Witnesses:
J. H. Coombs
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Inventor:
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UNITED STATES PATENT OFFICE.

JOHN MERLETT, OF BOUNDBROOK, NEW JERSEY.

IMPROVEMENT IN PNEUMATIC SPRINGS FOR CARS.

Specification forming part of Letters Patent No. **51,956**, dated January 9, 1866; antedated December 28, 1865.

To all whom it may concern:

Be it known that I, JOHN MERLETT, of Boundbrook, in the county of Somerset and State of New Jersey, have invented a new and useful Improvement in Pneumatic Springs for Railway-Cars and other uses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical central section of my improved spring. Fig. 2 is a horizontal section of the same through the line *x*, Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in an improved construction of a pneumatic spring, whereby I prevent the escape of air by the interposition of a liquid between the cushion of air and the plunger or head of the spring.

To enable others to construct and apply my invention, I will proceed to describe it with reference to the drawings.

A and A′ are two cylinders, cast together or otherwise connected at the top, and firmly secured by bolts *f f* to a base-plate, E, with an interposed packing, *g*, which forms a perfectly tight joint. Communication is formed to and from the inner cylinder, A′, and the annular chamber A^2, between the inner and outer cylinders, by means of openings *a a* in the lower part of the inner cylinder. The inner cylinder is bored truly for the reception of a plunger, B, to the upper part of which is attached a cylindrical cap, b^3, which fits easily over the exterior of the cylinder A, to form a guide to the plunger and a bearing for the car-body or other body to be supported by the spring. This cap has two or more lugs, *d*, projecting from the lower part of its exterior, and bolts *c c* are inserted through holes in these lugs and screwed into the flange at the bottom of the cylinder A. The heads *c′ c′* of these bolts serve as guards to prevent the cap b^3 from being pushed off the cylinder A by the pressure of the air in the chamber A^2 acting against the bottom of the plunger when there is no load on the cap b^3. Holes G G are provided in the cap b^3, to prevent any cushioning of air between the head of the cylinders A A′ and the said cap.

The plunger B is fitted around its lower part with packing *b*, of any suitable character. The packing represented in this place is an ordinary water-packing, of leather, secured in place by a broad-headed bolt, B′, passing through the center of the plunger; and in order to keep this packing tight against the bore of the cylinder A′ while the plunger is moving upward, a coiled or volute spring, b^2, like a clock-spring, is placed between the said packing and the head of the bolt B.

A stop cock or nozzle, C, is inserted into the lower part of the cylinder A for the attachment of the eduction-pipe of a pump, by which air is forced into the annular chamber A^2 at a pressure greater than that of the atmosphere, such air rising above the water or other liquid contained in the lower part of the said chamber to form the elastic cushion or spring. This cock or nozzle is fitted inside the cylinder A with a check-valve, which retains the pressure within the chamber A^2 until the cock is closed or a cap put on the nozzle.

Before putting the plunger B into the cylinder A′ a sufficient quantity of water or other liquid is poured into the said cylinder to keep the said cylinder filled up to the plunger, and to allow enough to be retained in the annular chamber A^2 to cover the holes *a a* in the highest position to which the plunger is permitted to rise. After the plunger has been put in and secured to the guard-bolts *c c* the air is pumped into the chamber A^2 to a suitable pressure to enable it to sustain the weight to be supported by the spring.

In applying my spring to use the base-plate may be placed upon or against the axle-box or other support, and the truck, car, or other body to be supported is placed upon the cap b^3, or this position may be reversed. In the concussions to which the spring is subject the plunger works freely in the cylinder A and the water or liquid passes freely to and fro between the cylinder A and annular chamber A^2, keeping the air-cushion always separated from the plunger and from the point *g*, and sealing both the said joint and the plunger against leakage of air.

Air or liquid may be pumped into the chamber A^2 at any time, to increase the tension or resisting power of the spring whenever, from

any cause, such tension or resisting power is diminished or requires to be increased. The power of the spring is regulated by the degree to which the air is compressed in the chamber A^2.

In the application of my spring to railway-cars in winter-time, or in its application to any purpose in which it will be subject to a low atmospheric temperature, it is obvious that water cannot be employed in the cylinder A' and chamber A^2, and that some other liquid, as alcohol, which will not be liable to freeze, must be used.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The construction of a pneumatic spring with an annular air-chamber, A^2, surrounding and communicating at the bottom with the cylinder A, in which the plunger B or its equivalent works, and separated from the said plunger or its equivalent by an interposed column of liquid, substantially as and for the purpose herein specified.

2. The cap b^3, attached to the plunger B and combined with the external cylinder, A, of the annular air-chamber, to form a guide for the said plunger, substantially as herein specified.

JNO. MERLETT.

Witnesses:
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G. W. REED.