

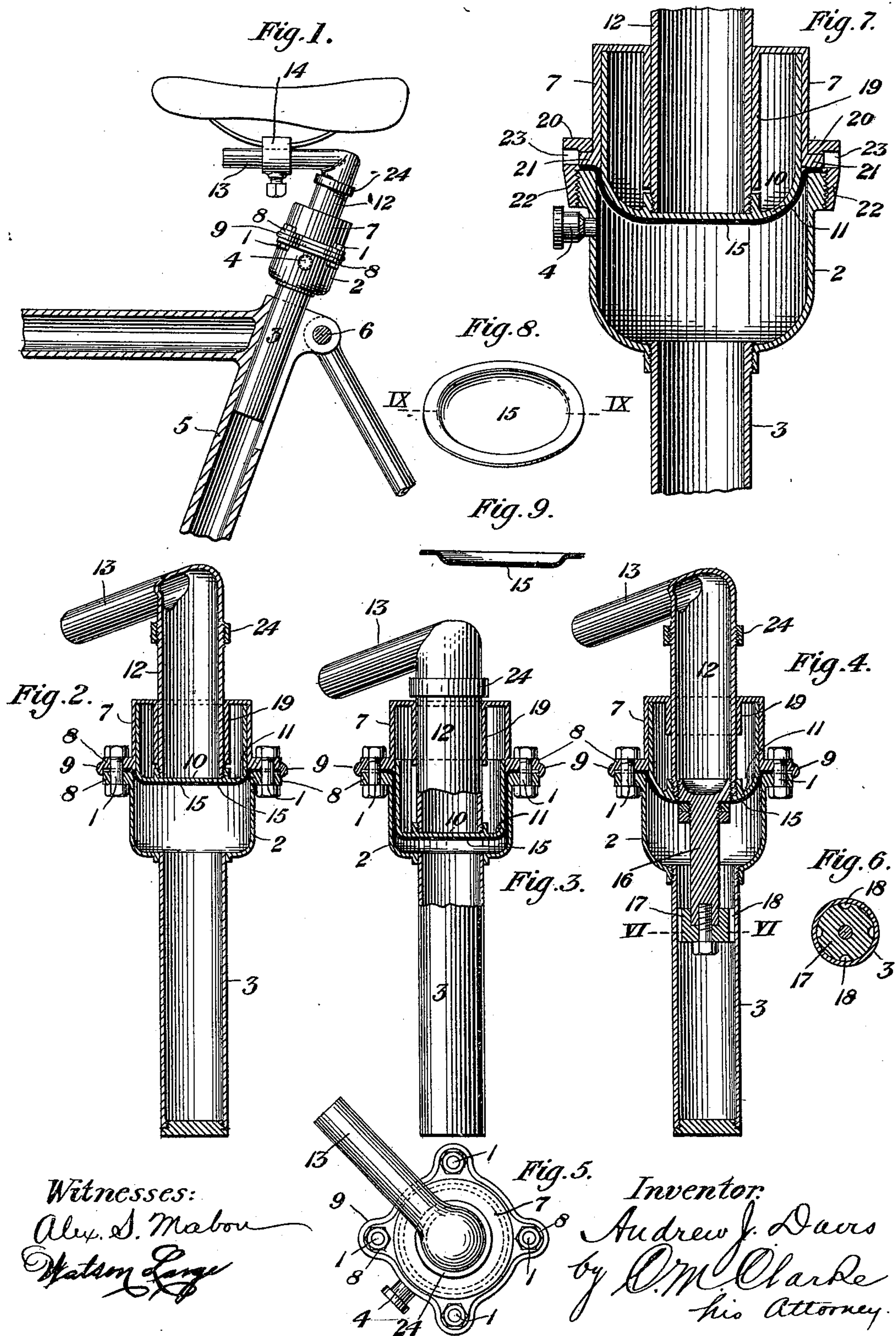
No. 622,179.

Patented Mar. 28, 1899.

A. J. DAVIS.
PNEUMATIC CUSHION SEAT POST.

(Application filed Feb. 10, 1898.)

(No Model.)



UNITED STATES PATENT OFFICE.

ANDREW J. DAVIS, OF CHICAGO, ILLINOIS.

PNEUMATIC-CUSHION SEAT-POST.

SPECIFICATION forming part of Letters Patent No. 622,179, dated March 28, 1899.

Application filed February 10, 1898. Serial No. 669,842. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. DAVIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented or discovered a new and useful Improvement in Pneumatic-Cushion Seat-Posts, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in side elevation of my pneumatic-cushion seat-post set in a bicycle-frame. Fig. 2 is a central vertical section on an enlarged scale. Fig. 3 is a similar view, partly in elevation, showing the plunger depressed. Fig. 4 is a view similar to Fig. 2, showing a modified construction. Fig. 5 is a plan view of Fig. 3. Fig. 6 is a cross-section taken on the line VI VI of Fig. 4. Fig. 7 is a partial sectional view on a further enlarged scale, showing the parts joined by a threaded ring. Fig. 8 is a perspective view of the diaphragm. Fig. 9 is a cross-section therethrough on the line IX IX.

My invention relates to pneumatic cushion-supports for bicycle and other seats, and is designed for the purpose of absorbing shock and vibration, thereby obviating the injurious effects of riding on rough roads.

It consists of a plunger mounted in a suitable receiving-shell and capable of a limited movement therein, the plunger in its movement acting to still further compress a contained body of compressed air or other fluid.

The details of construction by which the device is made operative and the parts packed to prevent leakage shall now be fully described.

Referring to the drawings, 2 is the main cylindrical shell forming the upper part of the air-reservoir and provided with a downward extension 3 of reduced diameter, which serves, with the shell 2, to contain the body of air under such pressure as is necessary to give a proper resistance to the weight of the rider. Air is pumped into this reservoir up to such pressure through a check-valve 4, placed in the side of the cylinder 2 and made in a manner similar to the well-known check-valves in use on bicycle-rims.

The reduced extension 3 is of a diameter to fit neatly within the hollow seat-post tube

5 of a bicycle-frame, within which it is tightly clamped by bolt 6 or other means and in which it is adjustable to the proper height. The bottom of the reduced extension, which I shall denominate the "stem," is closed and made air-tight in any desired manner.

Upon the top of the shell 2 is secured an upper cylindrical coping 7, the parts being tightly clamped together by means of bolts 1, passing through lugs 8 8, the upper lugs and base of coping having a downwardly-projecting peripheral bead 9, overlapping and covering the joint.

Within the coping 7 is a plunger 10, making a neat fit, having a rounded smooth bottom 11, and a central tube 12 of reduced diameter secured to the bottom projects upwardly through the top of the coping with a sliding fit and constitutes the seat-post proper, having a laterally-projecting reach 13, to which the saddle is secured by clip 14 in the well-known manner.

15 is a cup-shaped diaphragm of rubber, the edge of which is tightly clamped between the shell 2 and coping 7 by bolts 1 with such force as to insure a close air-tight joint, and when in the position shown in Fig. 2 and air is pumped into the reservoir the diaphragm 15 will be pressed up tightly against the bottom 11, forcing the top of plunger 10 up against the top of coping 7. When, however, sufficient weight is imposed upon the tube 12 to overcome the air-pressure, the plunger will be forced down to such an extent as to compress the air sufficiently to form an equalizing resistance, at which point the plunger and superimposed weight will be balanced and cushioned upon the compressed air. In the downward travel of the plunger the diaphragm 15 will be stretched over its bottom end and forms a tight packing, preventing escape of air, and by reason of the construction of the bottom 11 offers a hard unyielding resistance to the pressure of the air.

In Fig. 4 I have shown a modified construction in which the plunger 10 is provided with a downward extension or stem 16, with a guiding-piston 17 at the end, having air-passages 18, while a downward extension 19 of the coping, preferably employed in both constructions, embraces the tube 12, and by these

means the moving parts are more accurately kept in alinement. A guiding key or feather is also used to prevent turning.

In Fig. 7 I have shown another means of securing the cylinder and coping together by a flanged collar 20, engaging a peripheral flange 21 at the base of the coping 7, the collar having an internally-threaded downward extension 22, screwed upon the reinforced top of the cylinder 2 by spanner-holes 23.

24 is a ring adjustably secured upon the tube 12, which serves to limit its downward motion by coming into contact with the upper end of the coping.

It will be seen that when thus constructed my seat-post constitutes a very compact and effective cushion for the saddle and that by reason of the perfect packing secured by the diaphragm its continuous resiliency is assured, while the evils arising from stuffing-boxes are entirely overcome.

It will be understood that the post may be made in various sizes and proportions to suit requirements of use and that various changes or modifications may be made by the skilled mechanic without departing from my invention.

What I claim is—

1. A pneumatic-cushion seat-post for bicycles comprising an air-reservoir, a plunger mounted therein provided with a seat-post, an intervening elastic diaphragm extending across the reservoir and confined therein at its edges against which the plunger abuts, and a reduced extension of the reservoir adapted to be mounted in the frame of the bicycle, substantially as set forth.

2. A pneumatic-cushion seat-post for bicycles comprising a cylindrical reservoir, a reduced cylindrical extension thereof constituting a stem adapted to be mounted in the frame of the bicycle, an upper cylindrical coping secured upon the cylindrical reservoir, a cup-shaped elastic diaphragm clamped between the reservoir and coping, a plunger within the coping and a reduced extension secured to the plunger having a saddle-reach, substantially as set forth.

3. In a pneumatic-cushion seat-post for bicycles; a cylindrical reservoir provided with a valve, a hollow extension thereof adapted to be inserted in the bicycle-frame, an upper cylindrical coping secured to the reservoir-

shell with an intervening diaphragm of elastic material, and a central tube of reduced diameter projecting from the plunger up through the coping and provided with a saddle-reach, substantially as set forth.

4. In a pneumatic-cushion seat-post for bicycles; a plunger provided with a saddle-reach, mounted in a guiding-coping and resting on a body of compressed air with an intervening diaphragm of elastic material secured at its edges, and a hollow extended stem of reduced diameter adapted to be mounted in the frame of a bicycle, substantially as set forth.

5. In a pneumatic-cushion seat-post for bicycles; a plunger provided with a saddle-reach, mounted in a guiding-coping and resting on a body of compressed air, with an intervening diaphragm of elastic material having its edges confined in the coping and means for limiting the downward movement of the plunger, and an extended stem of reduced diameter adapted to be mounted in the frame of a bicycle, substantially as set forth.

6. In a pneumatic-cushion seat-post for bicycles; a cylindrical air-reservoir provided with a valve, a cylindrical flanged coping secured thereon by a flanged collar screwed to the reservoir, an intervening diaphragm of elastic material having its edges confined between the reservoir and coping, and a plunger mounted in the coping adapted to bear upon the diaphragm, substantially as set forth.

7. In a pneumatic-cushion seat-post for bicycles; a cylindrical air-reservoir provided with a valve, a reduced downwardly-extending shell forming a part thereof, a cylindrical coping secured to the reservoir, an intervening cup-shaped diaphragm of elastic material making an air-tight joint, a plunger mounted in the coping provided with a downwardly-extending stem with a ventilated guiding-piston within the reduced reservoir-shell, and an upward tube projecting through a downward extension of the coping and provided with a saddle-reach, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ANDREW J. DAVIS.

Witnesses:

PETER J. EDWARDS,
C. M. CLARKE.