

No. 746,279.

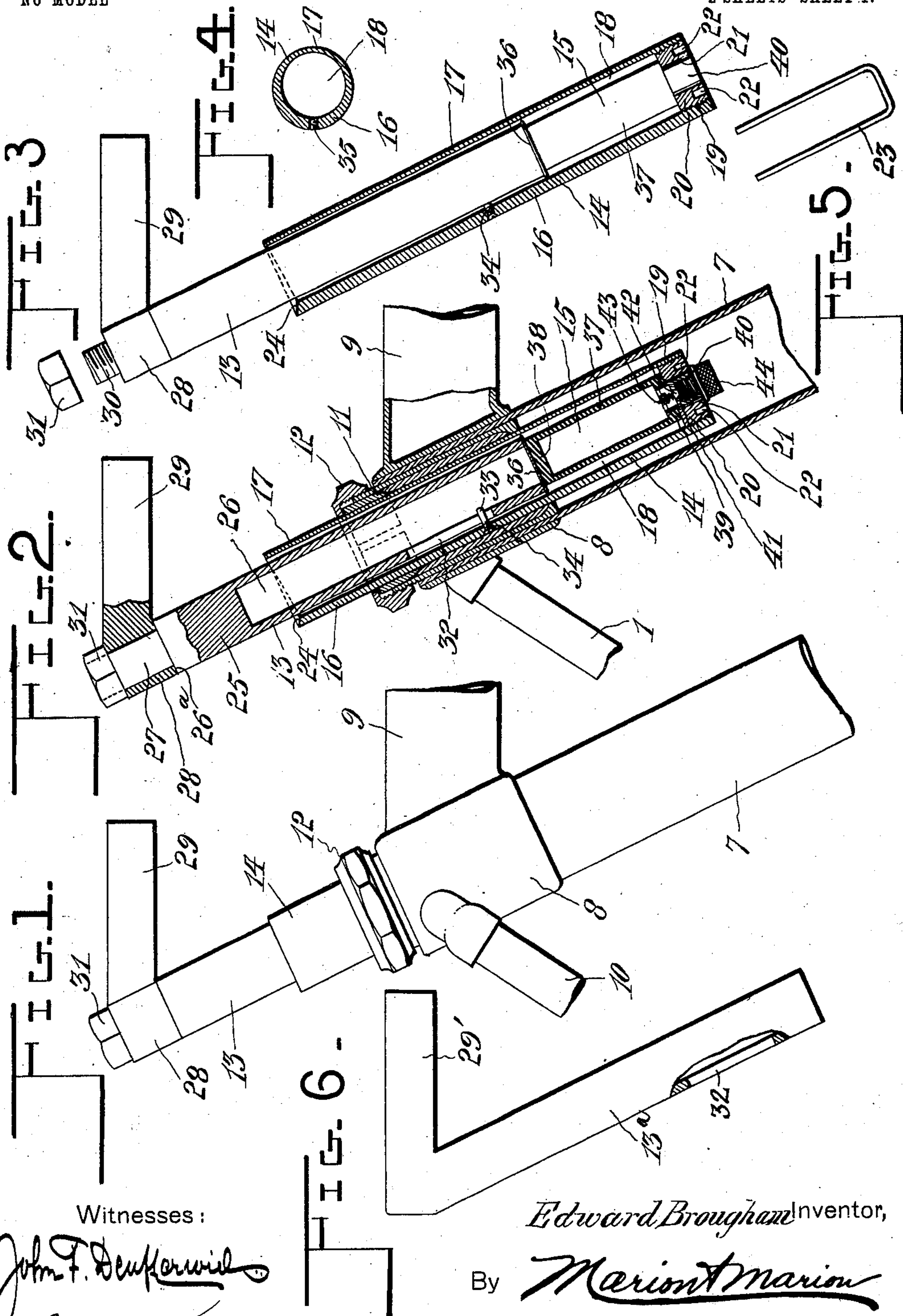
PATENTED DEC. 8, 1903.

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PNEUMATIC SEAT POST FOR BICYCLES.

APPLICATION FILED SEPT. 2, 1902.

NO MODEL

2 SHEETS—SHEET 1.



Witnesses:

John F. Deffenhard
George W. Colles

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Edward Brougham Inventor,
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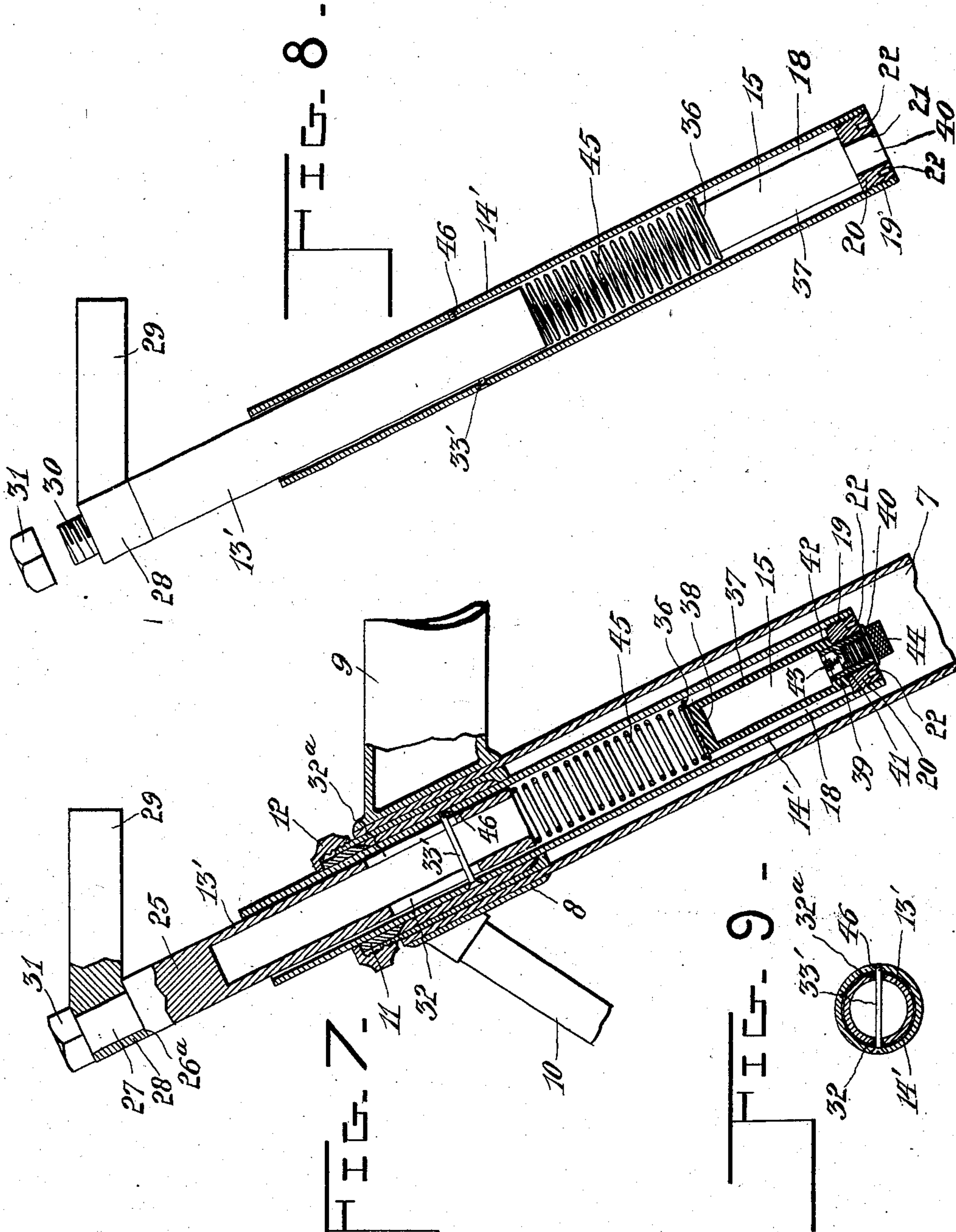
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UNITED STATES PATENT OFFICE.

EDWARD BROUGHAM, OF BRANDON, CANADA.

PNEUMATIC SEAT-POST FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 746,279, dated December 8, 1903.

Application filed September 2, 1902. Serial No. 121,765. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BROUGHAM, a subject of the King of Great Britain, residing at Brandon, county of Brandon, Province of Manitoba, Canada, have invented certain new and useful Improvements in Pneumatic Seat-Posts for Bicycles; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved pneumatic-cushion saddle-post especially for bicycles, although of course it may find use on other like vehicles.

The object of my invention is to improve on the spring saddle-post heretofore in use by providing a device which is both independent of the weight of the user and also which cannot weaken and run down after a certain amount of use, as spring saddle-posts always do. In ordering a spring-post applicants must give their approximate weight in order that a suitable scale or spring may be supplied; but my pneumatic post herein described will never weaken or run down, and owing to the fact that it can be filled with any bicycle-pump it can be made to carry all weights of riders with equal buoyancy and may be adjusted to any degree of resiliency, according to the taste of the user.

A further object of my invention is to produce a construction of seat-post which without the use of complicated rollers is prevented from turning in its socket in the main post of the frame, while at the same time it is permitted to slide freely therein by means of a key or pin inserted laterally and interlocking the parts together, and thus to enable the saddle-post to be much easier and consequently more cheaply made.

Another object of my invention is to enable any bicycle having a rigid frame to be converted into one with a cushion-frame without substantial alteration thereof.

I accomplish these objects by the combination and construction of parts herein shown and described, and which will be particularly pointed out in the claims.

In the drawings accompanying this specification, Figure 1 is a side elevation of a portion of a bicycle-frame provided with my im-

proved saddle-post and comprising the saddle-post itself, the upper portion of the main post of the frame, and the ends of the upper cross-beam and rear fork. Fig. 2 is a longitudinal central section of the same parts as shown in Fig. 1. Fig. 3 is a side elevation of the inner member of the saddle-post shown *in situ* in the stationary sleeve, which is shown in vertical section. Fig. 4 is a transverse section through the sleeve. Fig. 5 is a side view of the wrench or tool used in setting up the saddle-post; and Fig. 6 is a side view of a modified form of saddle-post, shown partially in central longitudinal section. Figs. 7, 8, and 9 are views similar to Figs. 2, 3, and 4, respectively, but showing a modified and improved form of seat-post.

The same numerals of reference denote like parts in each of the several figures of the drawings.

The numeral 7 designates the main post of an ordinary bicycle-frame, having at its upper end, as usual, a brazed collar 8, to which are affixed the horizontal braces 9 and the bars of the rear fork 10. This post 7 is, as usual, tubular, and into its upper end is adapted to project the seat-post, which, as herein shown, is secured at any suitable height, according to the dimension of the rider, by means of a split clamping-collar 11, which is tightened up around the seat-post by a clamping-nut 12. The seat-post itself consists of two members 13 and 14, each of which is tubular and which slide one within the other and which are separated from each other at the bottom by a pneumatic cushion 15, which resiliently supports the member 13 on the member 14. The outer member is, as shown more particularly in Fig. 4, bored eccentrically, so that its rear side 16 is about twice as thick as its front side 17. In practice this seat member 14 will be cut to the ordinary external dimensions for a seat-post of the usual pattern—that is to say, five and one-half inches in length and one and five-sixteenths inches in diameter outside—while the bore 18 is three-fourths of an inch, leaving one-sixteenth of an inch for the front and one-eighth of an inch for the rear wall at 16. The member 14 is, moreover, open at both ends, and its lower end is threaded internally, as shown at 19, and has fitted thereinto a cylin-

drical plug 20, which has an external thread adapted to coact with the thread 19 and is ordinarily about five-sixteenths of an inch in thickness. This plug 20 is provided with a central bore 21 of five-sixteenths inch diameter, and at each side of the bore 21 are drilled two small holes 22. The purpose of these holes is to enable the nut to be manipulated for screwing up and unscrewing the same, which is done by means of a fork or staple-shaped tool 23, made of an ordinary piece of steel wire bent into U shape and which when inserted into the holes 22 enables the plug 20 to be turned by means of a wrench.

The inner member 13 of the seat-post is made of suitable dimensions to slide easily within the member 14, and the latter is preferably provided at its upper end with a slight chamfer or counterbore 24 to assist in the lubrication of the surfaces. This inner member 13 is forged or cast with a solid head 25; but its lower portion is preferably tubular, having a bore 26 for economizing unnecessary weight and metal. The upper or solid head 25 of the member 13 is shouldered, as shown at 26^a, so as to provide a stud 27 of squared or otherwise irregular section, over which fits the socket-lug 28 of the saddle-arm 29, and the upper end of the stud 27 is threaded, as shown at 30, to enable the nut 31 to be screwed thereover, so as to clamp the saddle-arm 29 in position on the stud 27. This construction is preferably used by me and constitutes a part of my invention, although it is not essential to the operation of the pneumatic feature, and I may consequently constitute a different form 13^a of the member 13, in which the saddle-arm 29' is formed integrally therewith. Near the lower end of the member 13 and opposite the recess 26 at the rear side it is provided with an axial slot 32, which receives the end of the pin 33, which is shouldered only close to its head, as shown at 34, and screwed into a threaded socket 35, formed in the rear thickened side of the member 14. The slot 32 is long enough to enable the member 13 to have a certain amount of reciprocation within the socket member 14, and especially to limit its upward movement and prevent it from coming out.

The lower end of the member 13 rests upon a circular metal cap or plate 36, which is secured to the head by a rubber capsule 37, having hardened or vulcanized ends 38 and 39. The capsule is adapted to be filled with compressed air, and to this end it has fitted into its lower end a valve-nipple 40, which projects slightly beyond the lower end of the capsule—that is to say, about five-sixteenths of an inch—so as to extend through the aperture 21 in the plug 20, being of about the same diameter as the latter. As shown, this nipple has formed interiorly thereof a valve-seat 41, with which coacts a pop-valve 42, having a stem 43, arranged to reciprocate in the valve, and the outer end of the valve may be interiorly screw-threaded, so as to permit the insertion of any form of valve-plug 44. The in-

ternal screw-thread of the nipple is of the same size as is customary for bicycle-pumps, so that by screwing on the nipple of a bicycle-pump the capsule may be pumped full of air, and being removed the pumping-nipple may be sealed by the plug 44.

It will be obvious that the above construction provides a pneumatic-cushion support for the member 13, which has a resilient reciprocation within the member 14, and the latter may be arranged at any suitable height by the clamping-screw 12. The device is inclosed within a small compass, is extremely simple in construction, does not involve the use of liquid, and is readily removed and pumped up at any time and may be adjusted to the weight of any user, and these are advantages which, so far as I know, are entirely novel in the art.

In Figs. 7, 8, and 9 I have shown a construction which is somewhat simpler than that shown in the previous figures of the drawings and preferable also in other respects. The parts are precisely the same in this modification as in the other figures with the exception of the inner and outer tubular members, designated in the said modification 13' and 14', respectively, and the interlocking pin, designated 33'. The outer tubular member 14' is in this modification not eccentrically but concentrically bored and is made an inch or two longer than that shown in Figs. 1, 2, and 3 in order to permit the insertion of a coiled spring 45 between the head of the capsule 37 and the lower end of the inner tubular member 13'. This is for the purpose of giving increased resiliency independent of that imparted by the capsule. The concentric boring of the outer member 14' is rendered possible by the different construction of the interlocking pin 33', which in this case, as shown, extends completely across the outer member and is secured in a threaded socket 46 in the front wall thereof, while its head is countersunk in the rear wall, as shown. The inner tubular member 13' has in addition to the slot 32 another slot 32^a, parallel thereto, but on the opposite side of the inner member, and the pin 33' passes through both. This gives increased resistance to torsion of the saddle-post, besides facilitating the construction by avoiding the necessity of boring the outer tubular member eccentrically.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

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

1. A pneumatic-cushion saddle-post comprising an outer tubular member closed at one end, a post telescoping within said outer member, and a cylindrical capsule interposed between the inner end of the inner member and said closed end of the outer member, and having a tubular air-valve projecting concentrically through a hole in the latter, whereby a pump may be externally applied, said capsule having a rigid head at its other end and resilient sides.

2. A pneumatic-cushion saddle-post comprising an outer tubular member closed at one end, a post telescoping within said outer member, and a cylindrical capsule interposed between the inner end of the inner member and said closed end of the outer member, and having a tubular air-valve projecting concentrically through a hole in the latter, whereby a pump may be externally applied, said capsule having a rigid head at its other end, and a resilient cylindrical covering normally of less diameter than the inner diameter of said outer member.

3. A pneumatic-cushion saddle-post for bicycles, comprising an outer member adapted to be clamped at varying heights in the main post of a bicycle-frame, and having a closed lower end with a hole bored concentrically therethrough, an inner member supporting the saddle at its upper end and telescoping within said outer member, an elongated capsule having rigid heads at its ends and expansible sides normally of less diameter than the interior diameter of the outer member, and a tubular air-valve secured in the lower head of said capsule and projecting through the hole at the lower end of said outer member, whereby an air-pump may be applied to inflate said capsule from the exterior.

4. A pneumatic-cushion saddle-post for bicycles, comprising an outer member adapted to be clamped at varying heights in the main post of a bicycle-frame, and having a closed lower end with a hole bored concentrically therethrough, an inner member supporting the saddle at its upper end and telescoping within said outer member, an elongated capsule having rigid heads at its ends and expansible sides normally of less diameter than the interior diameter of the outer member, a tubular air-valve secured in the lower head of said capsule and projecting through the hole at the lower end of said outer member, whereby an air-pump may be applied to inflate said capsule from the exterior, and a pin secured in the wall of said outer member projecting radially inwardly through a slot in said inner member, whereby rotation of the latter is prevented.

5. A pneumatic-cushion saddle-post for bi-

cycles and other vehicles comprising a stationary tubular member having a bore from end to end thereof, a cylindrical plug threaded into the lower end of said bore and having a central axial bore therethrough, a resilient capsule adapted to contain compressed air and resting on said plug, an air-valve communicating with the interior of said capsule and fixed thereto and projecting through the bore of said plug, an inner member sliding freely within said bore and having a limited reciprocation therein, a pin projecting through the wall of said tubular member into a slot formed in said inner member, whereby to limit the reciprocation of the latter and prevent the same from turning about its axis, and a saddle-arm carried by the upper end of said inner member.

6. A pneumatic-cushion saddle-post for bicycles, comprising an outer tubular member open at both ends, a concentrically-bored screw-plug fitted into the lower end of said outer member, an inner member telescoping within said outer member, and an inflatable air vessel interposed between the end of said inner member and said screw-plug and having a tubular air-valve projecting through the latter.

7. A pneumatic-cushion saddle-post for bicycles, comprising an outer tubular member open at both ends, a concentrically-bored screw-plug fitted into the lower end of said outer member, an inner member telescoping within said outer member, and an inflatable air vessel interposed between the end of said inner member and said screw-plug and having a tubular air-valve projecting through the latter, said air vessel having a rigid head substantially filling the bore of said outer member.

8. A pneumatic-cushion saddle-post for bicycles, comprising an outer tubular member open at both ends, a concentrically-bored screw-plug fitted into the lower end of said outer member, an inner member telescoping within said outer member, an inflatable air vessel interposed between the end of said inner member and said screw-plug and having a tubular air-valve projecting through the latter, said air vessel having a rigid head substantially filling the bore of said outer member, and a coiled spring interposed between said head and the end of said inner member, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

EDWARD BROUGHAM.

Witnesses:

S. C. ATKINSON,
B. HARTNEY.