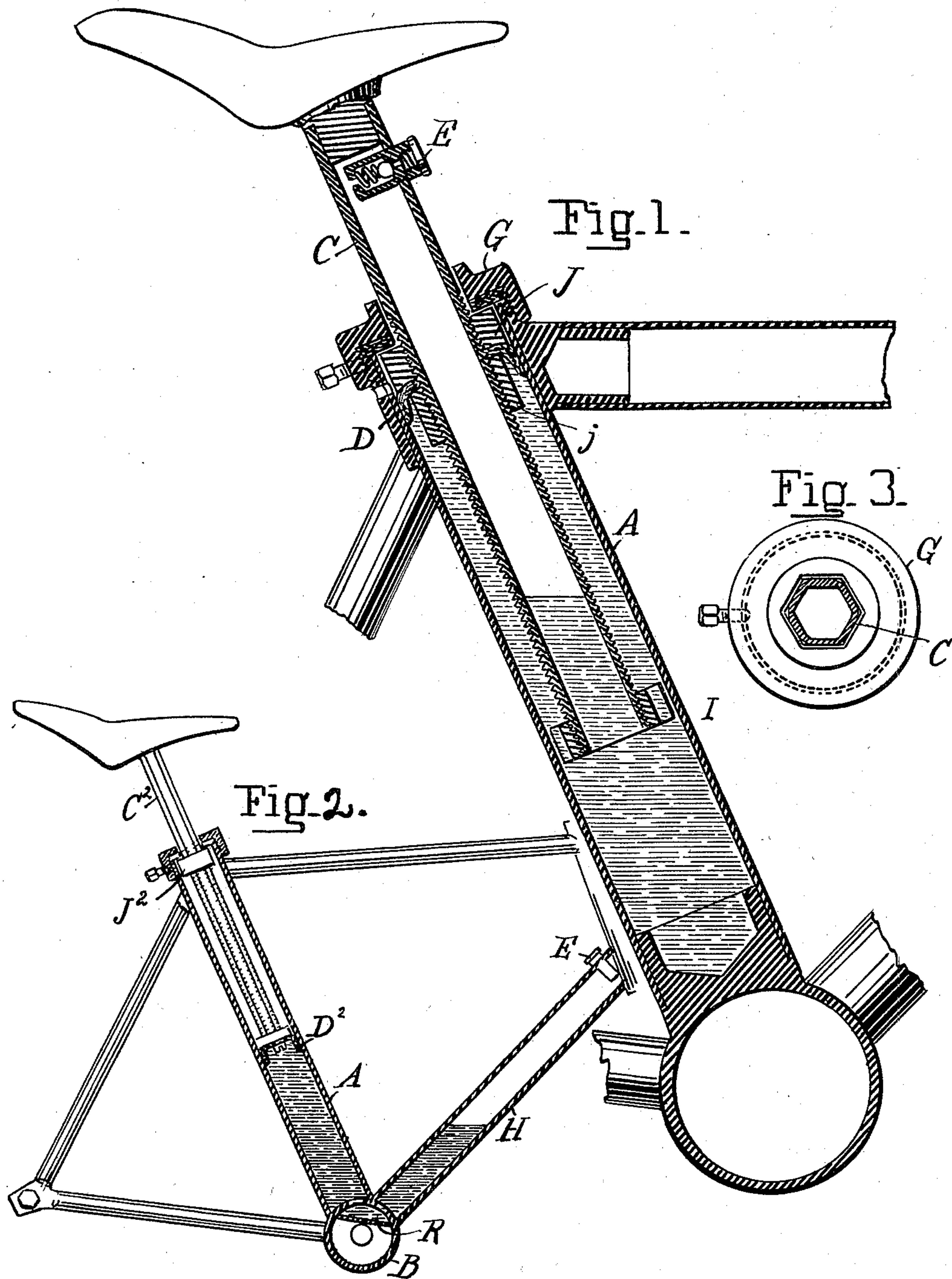


(No Model.)

E. D. THOMPSON.  
BICYCLE.

No. 598,186.

Patented Feb. 1, 1898.



Witnesses:

*Samuel W. Balch*  
*Wm. H. Whitman*

Inventor,

*Edward D. Thompson,*

*by*

*Thomas Ewing Jr.,*  
*Attorney.*



# UNITED STATES PATENT OFFICE.

EDWARD D. THOMPSON, OF LAWRENCE, KANSAS.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 598,186, dated February 1, 1898.

Application filed October 23, 1896. Serial No. 609,784. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD D. THOMPSON, a citizen of the United States of America, residing at Lawrence, county of Douglas, State of Kansas, have invented certain new and useful Improvements in Bicycles, of which the following is a specification.

The purpose of my invention is to utilize the elastic pressure of compressed air as a spring that will yield when the wheels encounter an obstacle, and thereby save the rider from shock. This is accomplished by a piston working in a tube against the force of compressed air. In order to do this successfully, the leakage of air past the piston is prevented by the interposition of a liquid seal, which acts as a prolongation of the piston to the portion of the chamber wherein the compressed air is contained. It is immaterial whether the compressed air is in the same tube with the piston or in a communicating tube.

In the accompanying sheet of drawings, Figure 1 shows a view, partly in section, of a part of a bicycle furnished with one form of my invention, wherein the seat-post is utilized to contain the compressed air and the packing of the piston is carried by a collar on the seat-post. Fig. 2 shows a modification of the construction of Fig. 1, wherein the forward inclined tube is utilized to contain the compressed air. Fig. 3 shows the cap, which is screwed on the top of the main tube, and a section across the seat-post which is guided by the cap.

In the form shown in Fig. 1 the main tube A receives a hollow seat-supporting post C. This post can slide up and down in the main tube for a limited distance. It is necessary, however, to keep it from turning within the main tube in order to prevent the saddle which is carried by it from turning around. This is accomplished by making the post of hexagonal or other form suitable to prevent rotation, and providing a cap G at the top of the main tube with a hole of similar outline through which the post is guided. At its lower end it is also guided by a collar I, attached thereto, and thus kept in line. The collar I is notched, so as to allow the liquid to flow past it freely. A screw-thread is cut

on the corners of the seat-post and a threaded collar J is screwed thereon. This collar serves as an adjustable stop which determines the height to which the seat can rise and which can be set to adjust the height of the seat above the pedals according to the reach of the rider.

The main tube is filled with a suitable liquid to such a height that the lower end of the seat-post will be below its surface under all circumstances. A suitable packing D is provided between the seat-post and the main tube to prevent the escape of the liquid. In Fig. 1 the packing is a leather cup D with an opening through it to admit the seat-post. This packing-cup is clamped between the adjustable collar J and a second clamping-collar j. A valve E is placed near the upper end of the seat-post for the admission of air which may be pumped in until the desired pressure is obtained.

In the form shown in Fig. 2 the compressed air is contained in the forward-inclined tube H, and the valve E, through which the air is pumped in, is near the upper end of this tube. At the lower end of the seat-post C<sup>2</sup> a leather cup D<sup>2</sup> is attached and forms the piston. A collar J<sup>2</sup> screws on the seat-post and serves as an adjustable stop, as in the first-described form. The interiors of the main tube A and of the forward-inclined tube H are in communication at or near their lower ends. As shown, this communication is made through a trough R within the crank-hanger B. The liquid fills the tube A from the bottom of the piston downward and the lower part of the tube H and the connection between the tubes and forms a liquid extension of the piston. The quantity of this liquid must be sufficient to reach past the connection between the tubes and into the tube H in all positions of the piston when in use.

It will be seen that the packing D of Fig. 1 moves up and down with the seat-post C, the two forming a piston, and that the liquid in the tube is a liquid seal interposed between this piston and the air-chamber. In this respect Fig. 1 is identical with the arrangement shown in Fig. 2, the only difference being that the air-chamber is differently located. The construction shown in Fig. 1, however,



possesses certain advantages over that shown in Fig. 2, and one of them is that not only is the liquid forced into the air-chamber on the descent of the seat-post by the packing D, 5 but at the same time the closed end of the air-chamber is forced toward the liquid, thus increasing the air compression upon a given movement of the seat-post and arresting the latter in a correspondingly-shorter move- 10 ment.

The main object of this invention is to provide a pneumatic spring which may be applied to bicycles without altering the form or frame now generally in use.

15 While in this application I intend to cover, broadly, the form shown in Fig. 2, I do not claim that form specifically in this application, but claim it specifically in my other application, filed October 24, 1896, Serial No. 20 610,000.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the main tube, a seat-post, mounted to slide in the main tube and adapted to act as a piston, an air-cham- 25 ber, and a liquid seal in the main tube between the piston and the air-chamber, substantially as described.

2. The combination with a tube, of a post moving therein and having a cavity forming 30 an air-chamber, a liquid seal in the tube closing the said cavity, and a packing upon and moving with the seat-post and resting upon the liquid seal, substantially as described.

Signed by me, in New York city, this 22d 35 day of October, 1896.

EDWARD D. THOMPSON.

Witnesses:

SAMUEL W. BALCH,  
THOMAS EWING, Jr.