No. 636,726. Patented Nov. 7, 1899.

P. J. HINDMARSH.

SEAT POST.

(Application filed Mar. 4, 1898.)

(No Model.)

Fig. 1.

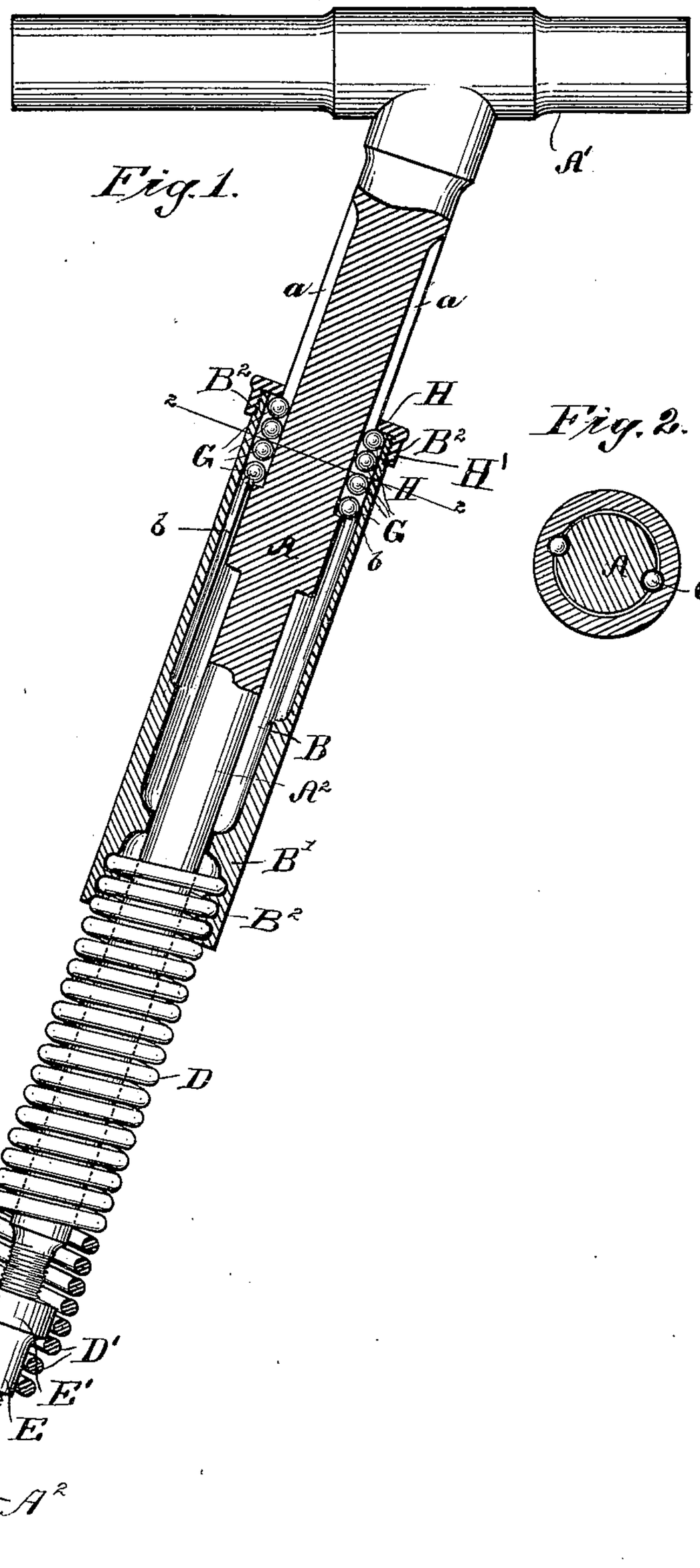

Fig. 2.

WITNESSES:

R. H. Newman.

M. F. Boyle.

INVENTOR

Percy J. Hindmarsh

BY

Thomas Dyer Stetson

ATTORNEY.

UNITED STATES PATENT OFFICE.

PERCY J. HINDMARSH, OF TOPEKA, KANSAS.

SEAT-POST.

SPECIFICATION forming part of Letters Patent No. 636,726, dated November 7, 1899.

Application filed March 4, 1898. Serial No. 672,536. (No model.)

To all whom it may concern:

Be it known that I, PERCY J. HINDMARSH, a citizen of the United States, residing at Topeka, Shawnee county, in the State of Kansas, have invented a certain new and useful Improvement in Seat-Posts, of which the following is a specification.

My improvement is adapted for use in any situation where a seat is required to be supported yieldingly and adjustably. It is more particularly intended for bicycles and will be described as applied thereto.

I support the post by a helical spring arranged to exert its force tensionally. Provision is made for adjusting its tension so that it may yield with the proper elasticity when required to support a light or a heavy rider. I provide for subjecting the spring to initial tension. The saddle will not be lifted by the spring above a certain point. It will not commence to be depressed below that point until the load thereon has exceeded the initial tension of the spring. Means are provided for also adjusting the initial tension. I groove longitudinally the exterior of the saddle-post and the interior of the sleeve in which it is inclosed and put a series of balls in the grooves, which hold the post and the attached saddle in the true line and assist the ease of movement up and down. These balls also serve as a stop to hold the saddle down to a certain level, and thereby subject the spring to the required initial tension. Adding or subtracting balls varies the height to which the saddle may rise, and consequently the initial tension on the spring. The balls roll freely in both grooves until the uppermost strikes the cap, which serves as the stop.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation, partly in vertical section. Fig. 2 is a transverse section on the line 2 2 in Fig. 1.

The drawings show the novel parts with so much of the ordinary parts as is necessary to indicate their relation thereto.

Similar letters of reference indicate corresponding parts in both the figures.

Referring to the drawings, A is the cylindrical part or main body of the saddle-post, and A′ the ordinary horizontal bar which is carried thereby and on which the saddle (not shown) is mounted with capacity for adjustment forward and backward thereon in the ordinary and long-approved manner.

B is a hollow casing loosely embracing the saddle-post with liberty for the latter to move up and down therein. The interior of the lower end of this casing B is coarsely screw-threaded—helically grooved, the grooves being deep, and D is a helical spring screwed into such groove and extending a sufficient length below, its lower end being contracted, as indicated by D′. An internal annulus B′ in the casing B serves as a bearing for the spring D, against which the latter may be forcibly set and held, and also as a guide for an extension A^2 of the saddle-post A. This extension is of less diameter than the main body and extends axially through the spring D and beyond the contracted end thereof. A nut E, having a collar or flange E′, is adjustably set on the screw-threaded lower portion of the extension A^2 and takes hold by its collar E′ above the contraction D′ of the spring D, so as to exert a tensile strain on the spring when the saddle, and consequently the saddle-post, is depressed.

The interior of the case B is grooved longitudinally along two lines, as indicated by *b b*. The exterior of the cylindrical main body A of the saddle-post is correspondingly grooved longitudinally, as indicated by *a*. These grooves receive antifriction-balls G, which serve as roller-bearings to hold the saddle-post and its attachments in the proper line and avoid friction in the vertical dancing movement when the bicycle is ridden over rough places.

The upper portion of the exterior of the casing B is finely screw-threaded, as indicated by B^2, and receives a sufficiently-stout correspondingly-threaded collar H, having an internal lip H′ extending inward. This lip forms a stop for the balls G, and when the saddle-post and its connections move upward under the contractile force of the spring D the balls G, being compelled to rise therewith to half the extent, cause the uppermost ball in each series to strike the under face of the lip H′, and thus prevent the saddle-post A from rising above a certain point; but the ar-

rangement allows the saddle-post and its connections to be depressed as far and to vibrate up and down as much as can be ever required with the heaviest rider and the most uneven road.

By turning the collared nut E E′ in one direction or the other, and thus changing its position upward or downward on the threaded extension A^2 of the saddle-post, the force which the spring D will exert to raise the saddle-post and its attachments, and consequently the initial tension of the spring and its pressure against the series of balls and through them against the under face of the collar H′, may be varied within wide limits. The extent to which the spring will be depressed when the load is sufficient to move the saddle-post downward below the initial position will depend on the size and number of the coils and the thickness, quality, and temper of the spring D. With any ordinary size and with medium spring temper it will allow a motion of an inch, more or less, and the spring thus conditioned will very agreeably relieve the saddle from concussions.

The arrangement of the spring to receive the strain and exert its elastic force tensionally is of advantage in two ways. First, the spring is self-guided, and it does not bend or buckle like a compression-spring when subjected to any strain, and therefore does not require an external casing to make contact with its exterior under any conditions and does not touch by its inner surfaces against the considerably smaller extension A^2 of the saddle-post, which moves upward and downward in its interior, and thus avoids the friction and the liability of a creaking sound, which is a serious objection to the ordinary spiral springs used compressionwise, and, second, it allows a continuous yielding quality in the resistance to the descending motion of the saddle, whether it has attained a great or a small amount of depression. This latter effect is so marked that it seems to the rider as if the action of the spring were more yielding when subjected to great strains and the saddle is more depressed than when it is up near its ordinary position. When, on the contrary, springs of this helical form are subjected to compression, they seem to the rider to become more rigid as the saddle is depressed, and under great strains they "hammer" by the contact of the several convolutions of the spring, making the whole temporarily serve as a solid mass of metal.

The balls G, in addition to their functions of preventing lateral rotation and limiting the upward movement of the saddle by rolling freely in the grooves *a* and *b*, relieve the saddle-post from much of the friction which would be otherwise encountered in its vertical movements. They also serve as a conveniently adjustable stop to limit the rise of the saddle-post. If it is to rise higher, take out some of the balls. If to dance at a lower level, put in some, in each case adjusting the nut E E′ accordingly.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. I can vary the thickness of the casing B. It will be understood that there may be any ordinary or suitable provisions for raising and lowering it, so as to adjust the height of the saddle within wide limits without necessarily varying the action of the spring. The long range of adjustment of the nut and the possible variation in the number of balls give extraordinary capacity in regard to the height and stiffness of the saddle-support. I have shown four of the balls G in each set of grooves to form a roller-bearing in each side of the longitudinal grooves *a b*. A greater or less number may be employed. I have shown two sets of grooves *a b* opposite to each other. They may be arranged quartering or in any other relations. One alone may serve or more than two may be employed.

The invention may apply to tricycles and other carriages and machines in which a saddle-post is required to yield and in which the initial tension is a desirable element.

I claim as my invention—

1. In a bicycle or analogous construction, the casing B, having internally the helical grooves, the combination therewith of a saddle-post longitudinally movable in said casing, a spring engaged with the saddle-post and at its upper end with the helical grooves in the casing, substantially as herein specified.

2. In a bicycle or analogous construction, the casing B having internally the helical grooves, the combination therewith of a saddle-post longitudinally movable in said casing, a spring adjustably engaged with the saddle-post and at its upper end with the helical grooves in the casing, substantially as herein specified.

3. In a bicycle or analogous structure, the combination with a saddle-post A allowed to move up and down in the casing B, of a spring D arranged to act by its contractile force between the casing and the saddle-post, anti-friction-balls located in grooves in the post and casing, and the adjusting-nut E having a collar E′ engaging with the contracted lower end of said spring, arranged to adjust the action substantially as herein specified.

4. In a bicycle or analogous construction, the casing B, having internally the annulus B′ and helical grooves below the same, the combination therewith of the saddle-post longitudinally movable within the casing, guided by the annulus and having a threaded extension below the same, a contractile spring engaged with the helical grooves of the casing, and with a nut on the threaded extension of the saddle-post, substantially as herein specified.

5. In a bicycle or analogous construction, the casing B having internally the upper vertical channels and lower helical grooves, the

combination therewith of a saddle-post longitudinally movable in said casing, having channels registering with those of the latter, antifriction-balls in said channels, a removable cap for the casing, and a spring D engaged with the helical grooves and adjustably connected with the post extension whereby the mean distention of the spring may be effected by introducing or removing the antifriction-balls, and the finer adjustments by varying the connection of the spring with the post, substantially as herein specified.

6. In a bicycle or analogous construction, the casing B having internally the upper vertical channels, lower annulus and helical grooves below the latter, the combination therewith of the saddle-post longitudinally movable in said casing, guided by the annulus and having a threaded extension below the same, said post having vertical channels registering with those of the casing, antifriction-balls in said channels, a removable cap for the casing and a spring D engaged with the helical grooves and connected with a nut on the post extension, substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

PERCY J. HINDMARSH.

Witnesses:
SAMUEL L. SMITH,
P. G. WALTON.