

(No Model.)

2 Sheets—Sheet 1.

H. B. HICKS.

STEERING HEAD FOR BICYCLES.

No. 250,917.

Patented Dec. 13, 1881.

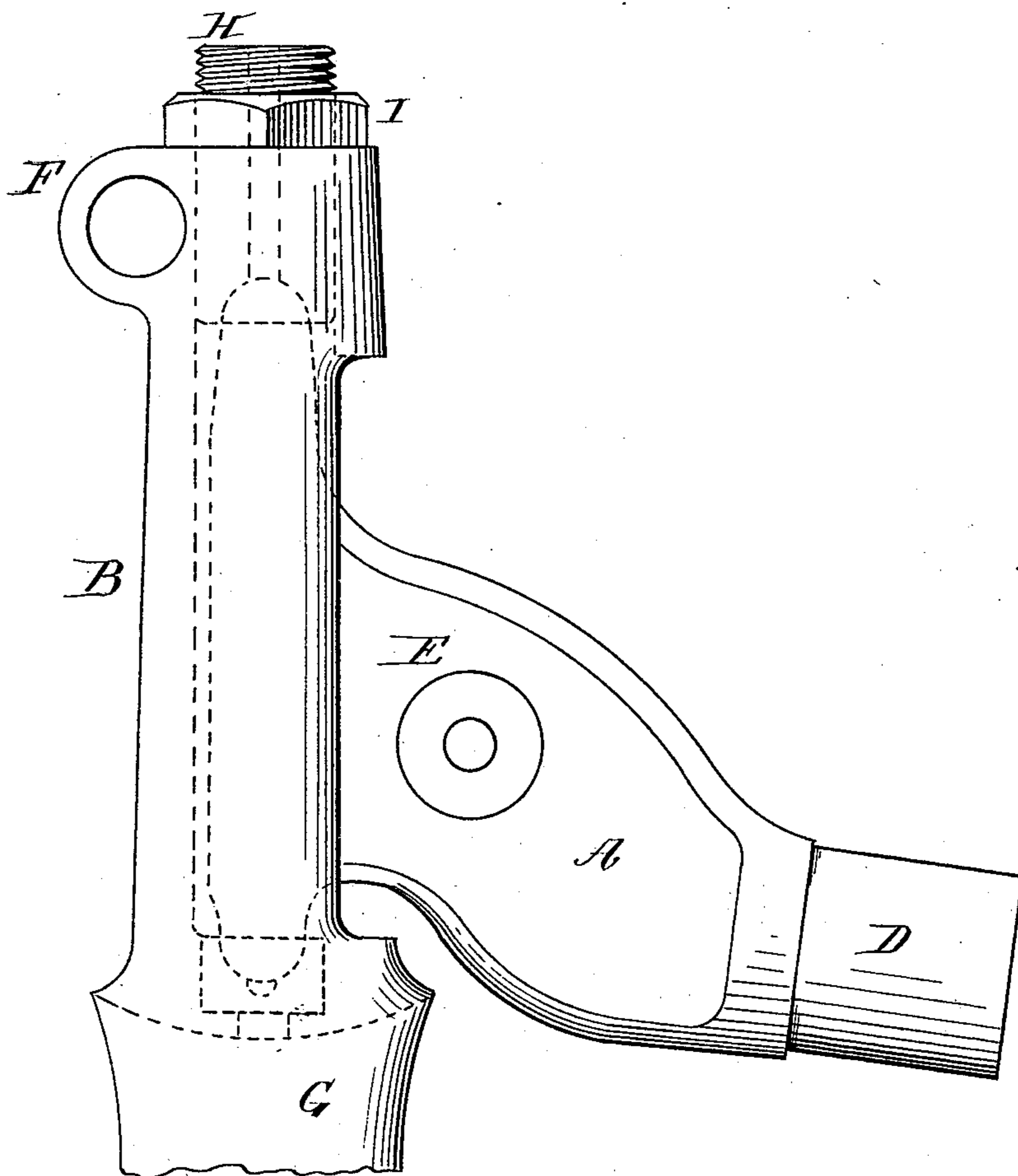


Fig. 1.

WITNESSES

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INVENTOR

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*By Charles E. Pratt,*  
*att'y.*

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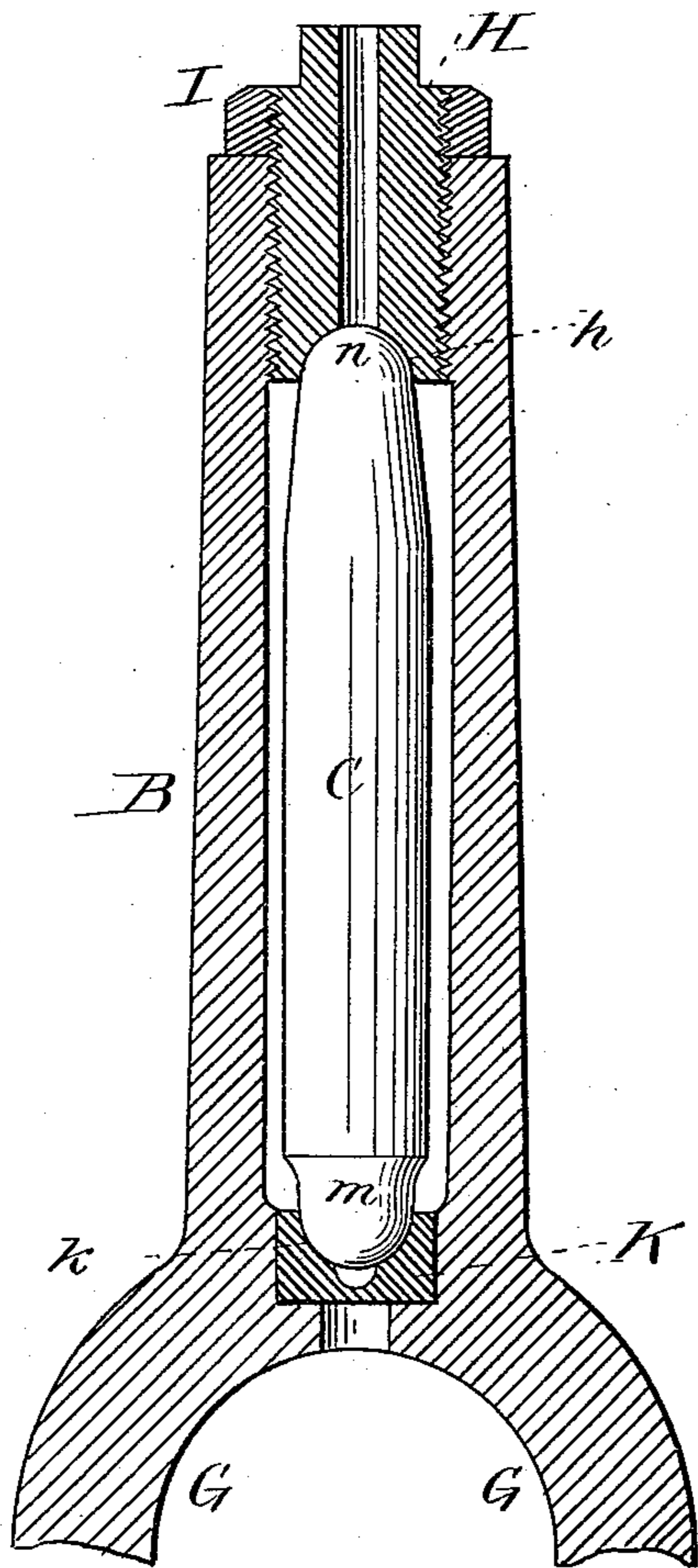


Fig. 2.

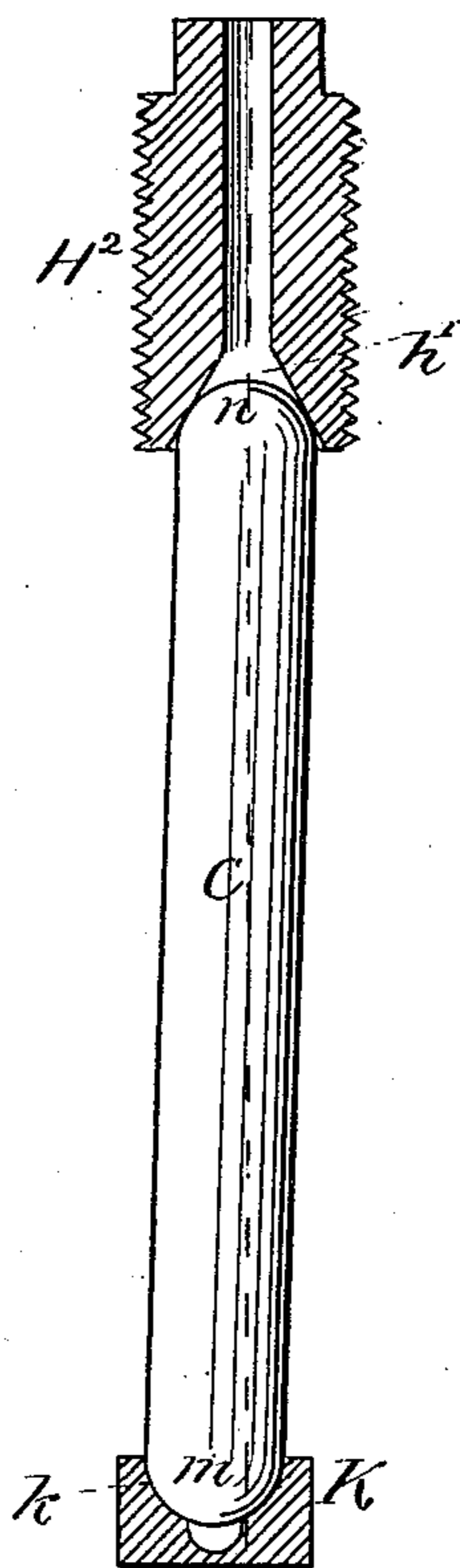


Fig. 3.

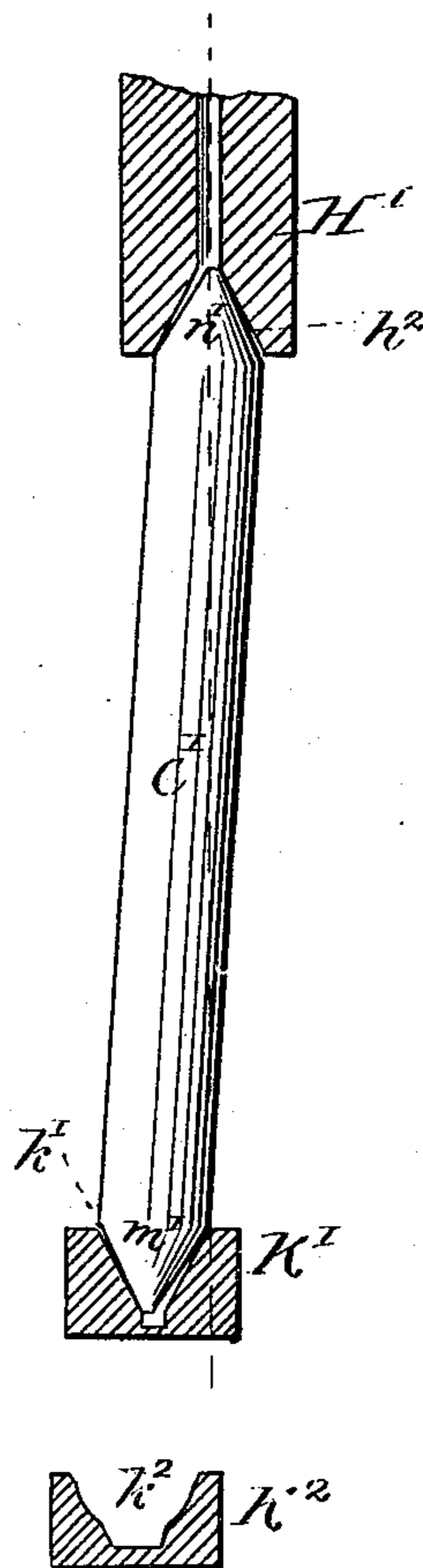


Fig. 4.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

HORACE B. HICKS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE POPE MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS.

## STEERING-HEAD FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 250,917, dated December 13, 1881.

Application filed September 27, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HORACE B. HICKS, of the city of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Construction of Steering-Heads for Bicycles, of which the following is a specification.

My improvements relate to that class of steering-heads known as "center-steering" ones, as distinguished from socket-heads, and are equally applicable to open heads or to cylindrical heads.

In the accompanying drawings, Figure 1 shows in side elevation one form of a cylindrical bicycle-head and the neck of the perch, the internal construction being indicated by dotted lines. Fig. 2 shows the same cylindrical head, in vertical section, at right angles to the plane of Fig. 1, the section being through the middle of the head, while the spindle attached to the neck of the backbone appears in elevation. Fig. 3 shows a part of the same with a different bearing for the upper center; and Fig. 4 shows the corresponding parts of Fig. 3, as heretofore constructed, the loose block at the bottom of Fig. 4 showing a part after considerable use.

A is the neck, and D the part by which it is connected to the perch or backbone of the bicycle.

E is the lug, to which the forward end of the spring may be attached.

B is the cylindrical head of the bicycle; G G, the front forks extending downward and connecting with the front wheel.

C is the spindle on the forward part of the neck A.

F is the lug for handle-bars; H, a threaded bolt working in the upper part of the cylinder B.

I is a lock-nut intended to hold the bolt H in place after it is adjusted.

K is a step inserted in the bottom of the cylinder B, containing the bearing for the lower end of the spindle. The spindle C has at the lower end a rounded projection, *m*, forming a segment of a sphere, which may be case-hardened, and forms the lower steering-center. It rests in a recess, *k*, in the block K, the recess *k* corresponding with the contour of the lower

center, *m*. The upper end of the spindle C has a projection, *n*, rounded, or in the form of a segment of a sphere, and the bolt H has at its lower end a recess, *h*, corresponding with the contour of the upper steering-center, *n*.

H<sup>2</sup> is a bolt similar to that at H, but having a conically-concave recess, *h'*, for the upper steering-center.

H' is a bolt having a concave recess, *h*<sup>2</sup>, for the upper steering-center, and K' is a step having a concave conical recess, *k'*, for the lower steering-center.

C' is a spindle, as heretofore constructed, having the upper and lower conical steering-centers, *n'* *m'*.

K<sup>2</sup> is a step like that at K', but having a recess, *k*<sup>2</sup>, corresponding to the recess *k'* in K', after it has been worn by use.

Heretofore, in heads of the center-steering class, it has been customary to make the upper and lower steering-centers of conical form, as shown in Fig. 4. Sometimes the upper steering-center has been constructed with a convex conical projection on the bolt H', and a concave conical recess, *h*<sup>2</sup>, in the upper end of the spindle C'; but whether constructed as last mentioned, or as shown in Fig. 4, the strains which come upon the spindle C' tend to incline it, as shown in Fig. 4, at an angle to the perpendicular represented by the dotted line, and this tendency to inclination is both from side to side and fore and aft—that is, the strains are such as to cause a pull at *h*<sup>2</sup> and a push at *k'*, or a pull at *k'* and a push at *h*<sup>2</sup>, in two different planes. In any such case there is a leverage caused by the spindle, which results in a pressure, for instance, at the upper part of the cavity *k'* on the right-hand side, and a pressure at the bottom of the cavity *k'* on the left-hand side, one or the other of these points being a fulcrum, and the other at the short end of a lever; and this condition is repeated at the upper center. The result of this action upon the steering-centers is to rapidly wear the step *k'* into the form shown at *k*<sup>2</sup>, and to wear the conical projections *n'* and *m'* into corresponding irregular forms. The result is, that in use with the constructions heretofore prevailing, the steering-centers and their steps are worn rapidly into irregular form, causing

increase of friction, lateral looseness and rattle or shake of the machine, and a corresponding destruction of the parts.

It is the object of my improvements to obviate these difficulties and to produce a bearing for the steering-centers which shall better preserve its form and prevent destruction of the parts by use, prevent rattling or shaking, and allow of accurate adjustment at any time in the course of wear. This I accomplish by forming the bearing-surfaces, the step, adjusting-bolt, and spindle, as shown in Fig. 2—that is, with rounded contour or spherical concavities and convexities. The adjusting-bolt, instead of being made with a spherical concave seat for the upper center, as in Fig. 2, may be made, as shown in Fig. 3, of conical concavity, if desired, and still retain a large part of the advantage gained by my construction, and avoid the difficulties attending the old style shown in Fig. 4.

A steering-head constructed according to my improvements is more sensitive to control, and is more durable than in any other construction with which I am acquainted.

Although I have described only the application of these improvements to a cylindrical

head, they are equally applicable to what are known as open heads, whether on bicycles or tricycles, or other velocipedes, wherever a part of the frame is to be centered in another part, so as to allow these parts to turn at angles to each other.

I claim as new and of my invention—

1. The improvement in center-steering mechanism for a velocipede, consisting in making the bearing end of the spindle rounded or spherical, substantially as set forth.

2. The improvement in center-steering mechanism for a velocipede, consisting in making the bearing-seat for the spindle rounded or spherical, substantially as set forth.

3. In a velocipede-head, a spindle, C, connected with rounded or hemispherical centers *m n*, substantially as set forth.

4. In a velocipede-head, the combination of spindle C, centers *m n*, step R, with its concavity *k*, and bolt H, containing a concavity, *h*, all constructed and adapted substantially as set forth.

HORACE B. HICKS.

Witnesses:

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E. J. POST.