

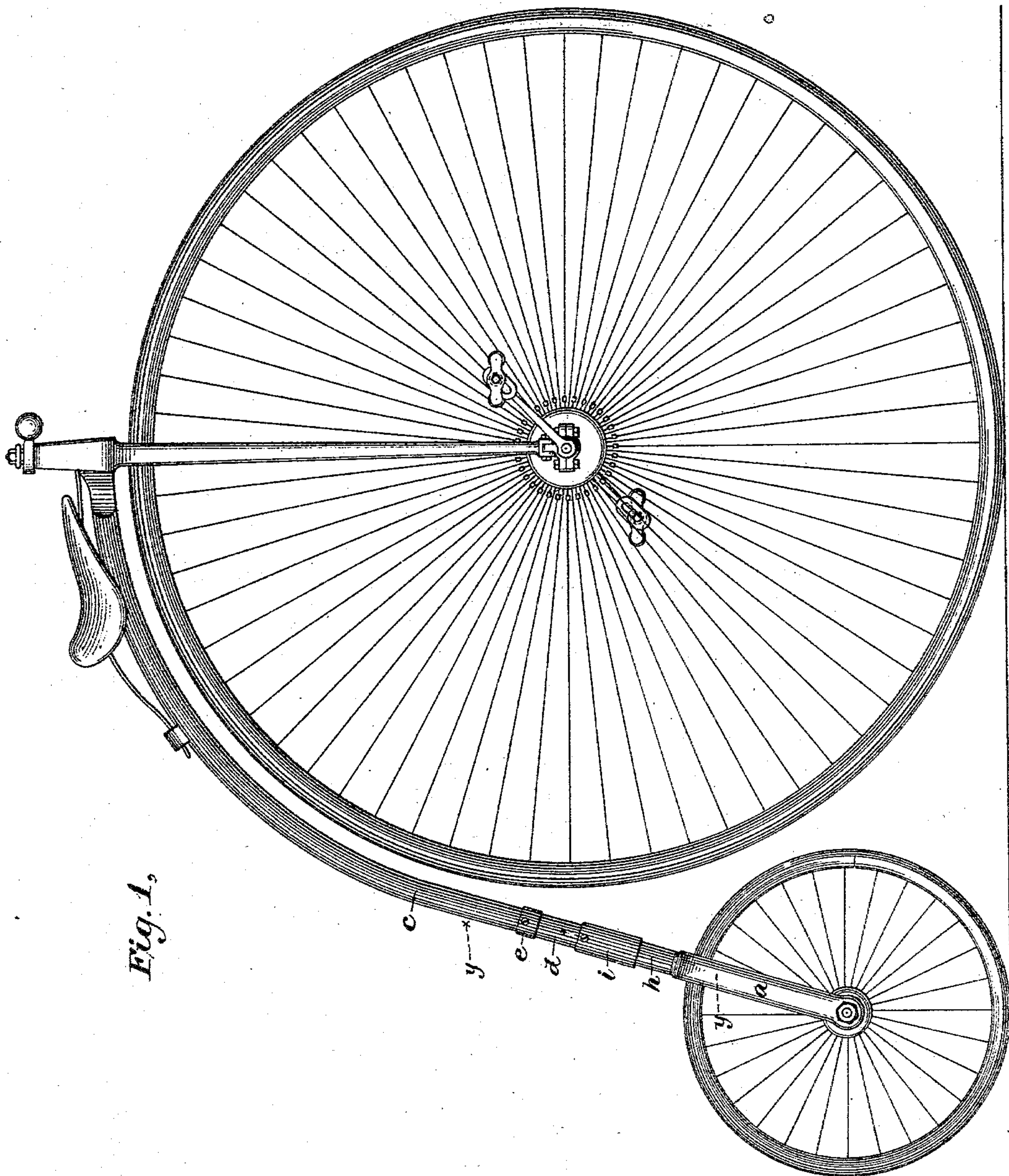
(No Model.)

2 Sheets—Sheet 1.

H. KELLOGG.
BICYCLE.

No. 283,612.

Patented Aug. 21, 1883.



WITNESSES

Wm A. Skink
Jos. S. Latimer

INVENTOR

By his Attorneys

Henry Kellogg
Lippard & Lippard

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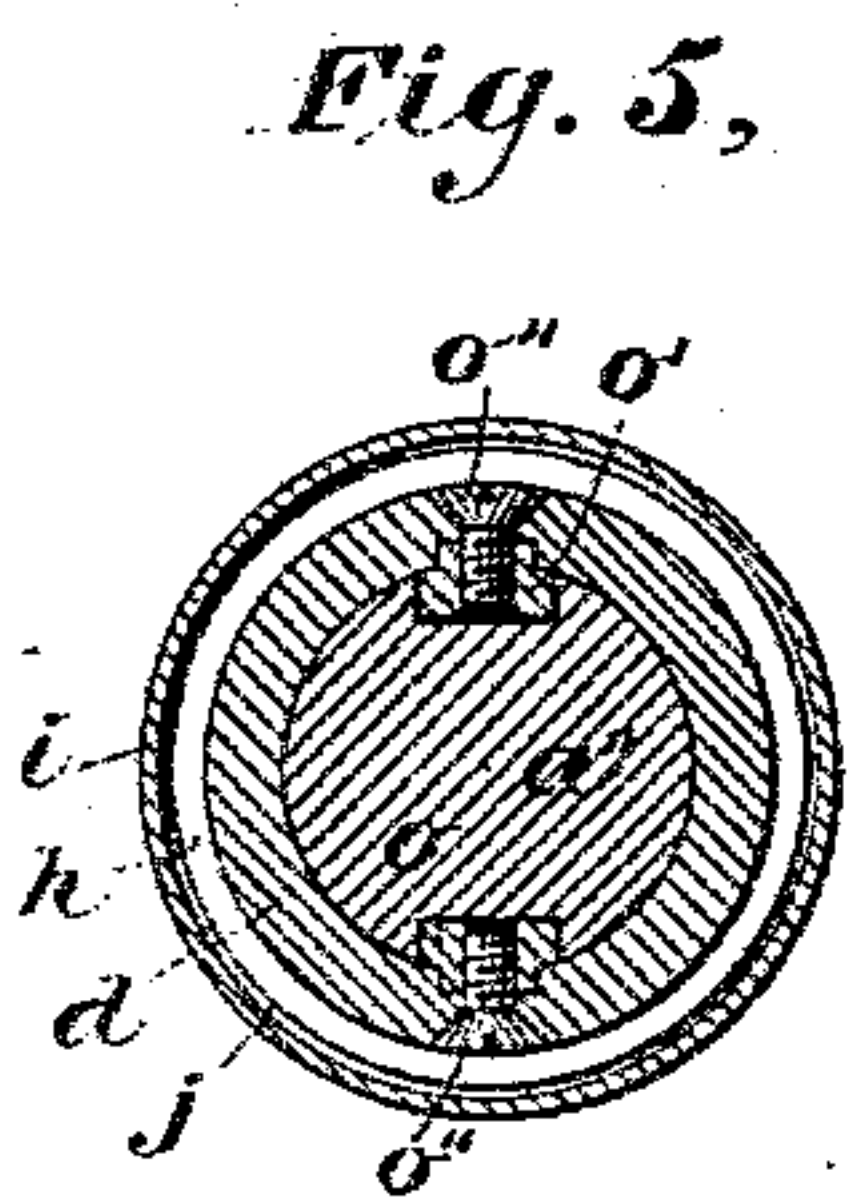
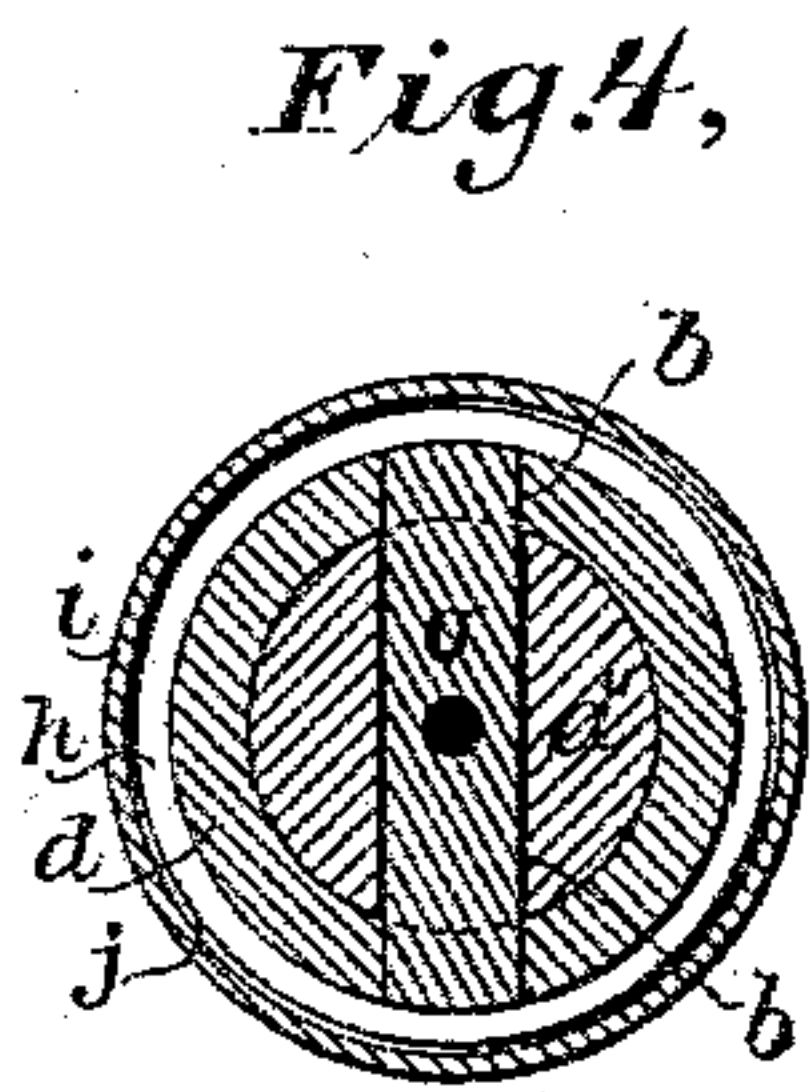


Fig. 2.

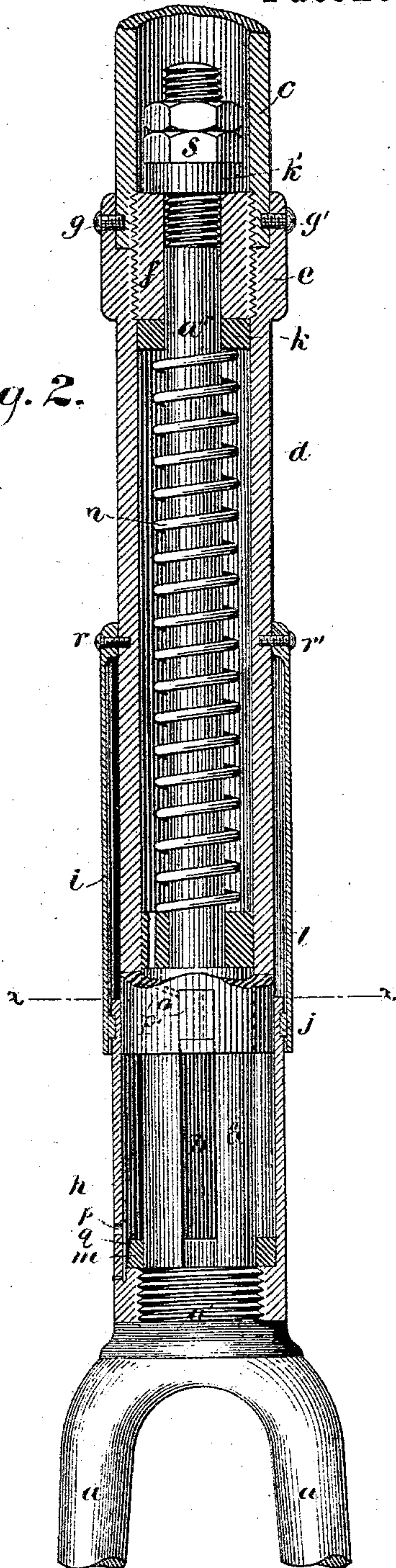
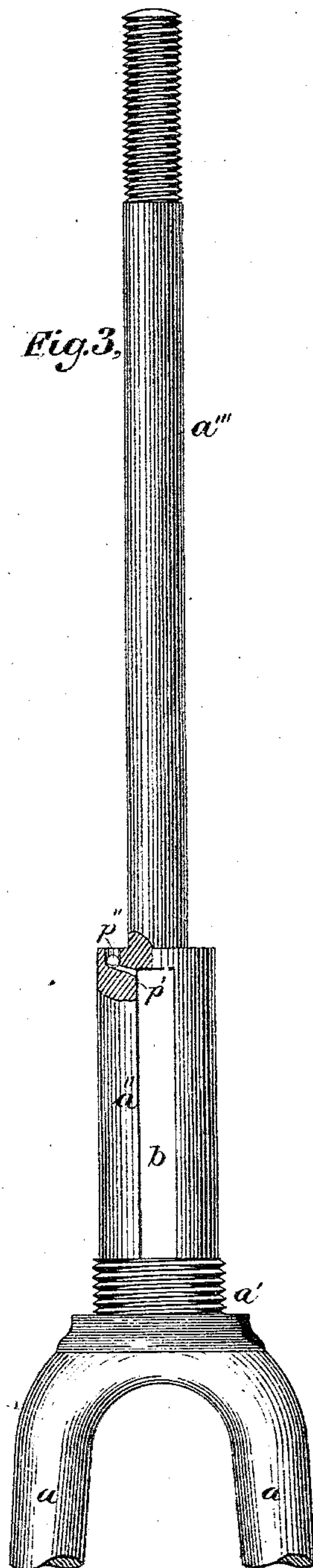


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY KELLOGG, OF NEW HAVEN, CONNECTICUT.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 283,612, dated August 21, 1883.

Application filed June 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY KELLOGG, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Bicycles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates particularly to the method of constructing what is known as the "backbone" of a bicycle, being the part which connects the front and rear wheels, in such manner that a mechanism is provided in such backbone which affords the spring necessary for easy-riding qualities, and which may, if desired, be adjusted to accommodate the varying weights of different individuals who may use the bicycle.

In the drawings, Figure 1 represents a side view of a bicycle as it appears with my improvement applied. Fig. 2 represents in detail the arrangement of the mechanism in the backbone of the velocipede by which my improvement is accomplished, said figure representing a view of the backbone between the parts *y y'*, Fig. 1, with part of the shell removed, so as to display the interior construction. Fig. 3 represents the portion of the backbone which is in one solid piece with the fork which surrounds the rear wheel, and which extends upward into the interior of the shell, forming the other portion of the backbone. Fig. 4 represents a cross-section of the backbone, taken through the line *x x*, Fig. 2. Fig. 5 represents a modification of the thing shown in Fig. 4.

a is a fork, which surrounds the rear wheel, as shown in Fig. 1, and in the lower ends of which the rear wheel has its bearings. In the same piece with this fork *a* are the parts *a' a'' a'''*. *a'* is a cylindrical portion at the neck of the fork *a*, upon which is screwed the shell *h*. *a''* is cylindrical and of a size to accurately fit into the shell *d*, and having a slot or mortise, *b*, cut through it, which extends from the screwed portion *a* nearly to the upper extremity of the portion *a''*. From the part *a''* extends the portion *a'''*, which is provided at its upper end with a screw-thread to receive the nut *s*.

c, Fig. 2, is the portion of the backbone upon which the seat or saddle rests, as shown in Fig.

1, and which is provided on its interior, at its extremity, with a female screw, as shown in Fig. 2.

d is a continuation of the hollow cylindrical portion *c*, and is provided with an enlargement at *e*, so that the portion *c* and the portion *d* may be coupled together by means of the bushing *f* and the small screws *g g'*, which screws prevent the bushing from becoming loosened by preventing the parts *c* and *d* turning relatively to each other. The bushing *f* has a hole bored through it longitudinally, to fit closely around the part *a'''*.

h is a shell or sleeve, which is sufficiently larger than the part *d* to receive said part *d* within it, as shown in Fig. 2, the connection between the two being such that the part *d* is free to slide longitudinally within the part *h*. *h*, at its lower extremity, is also provided with an interior screw-thread, which is adapted to receive the male screw-thread *a'*.

i is another shell or sleeve, which is sufficiently larger than the shell or sleeve *h* to receive the latter within it and permit the latter to slide freely longitudinally between the shell or sleeve *i* and the part *d*, as shown in Fig. 2.

j is a leather packing to make the sliding joint between the shells *h* and *i* air-tight.

k k' are leather washers surrounding the part *a'''*, both above and below the bushing *f*, so that the space surrounding the part *a'''* within the part *d* is hermetically cut off against connection with the air from the space within the part *c*.

l is a washer, which prevents leakage from the chamber between *d* and *a'''*.

m is a washer composed of some elastic material, which acts as a packing at the bottom of the space between *a''* and *h*, and which also acts as a bumper in case part *d* should ever be forced down within part *h* farther than is expected.

n is a spiral spring surrounding the part *a'''*, and bearing at its upper end upon the washer *k* and at its lower end upon the washer *l*.

o is a piece of metal which passes through the slot *b*, and whose ends rest in slots cut near the lower extremity of the part *d*. When the slot *b* does not extend through the part *a''* entirely, but instead is cut out only a portion of

the distance on each side, I then use the arrangement shown in Fig. 5, in which o' are metallic feathers or studs secured to the interior of the part d by the screws o'' , and in such position that they fit within the slots b , cut in the part a'' on either side.

p is an air-hole bored into the side of the part h at its bottom, and covered by the interior spring-valve, q . (Shown in Fig. 2.) For the purpose of connecting the space between the parts h and a'' with the space between the parts d and a'' , I form an air-passage, as at p' , Figs. 2 and 3, and an air-passage through the pin o in Fig. 4, so that when the part d descends in the space between h and a'' the air within such space will be forced upward through the passages just referred to, which are constructed so as to connect with each other under all circumstances. The passage p' is enlarged at one point and provided with a ball-valve lifting upward, as shown at p'' , Fig. 3. When the modification shown in Fig. 5 is used, the air-passage may be cut in any convenient position through the part a'' , so as to connect the space surrounding a'' with the space above it. I have not shown this passage in Fig. 5, since the exact location of it is not material, and the construction of the other parts is more clearly represented without it.

When in position for use, the parts occupy the position shown in Fig. 2—that is to say, the part h is screwed onto the screw-thread a' , so as to occupy a position concentric with the part a'' , leaving a space between the two, at the bottom of which is located the bumper m . The part d is free to slide longitudinally on the part a'' , but is prevented from rotating on such part by the pin o in Fig. 4, which is fixed in the lower end of the part d and extends through the slot b in the part a'' , and by this means the small rear wheel is kept in its proper position in a direct line with the backbone c . This result may also be attained by the studs or feathers o' , (shown in Fig. 5,) which fit into slots b , terminating short of the end of a'' ; but I prefer to use the arrangement shown in Fig. 4, and to make the pin o square in section and of hardened steel. The spring n tends to keep the parts d and a'' in the same relative position shown, in which the piece o is at the top of the slot b . The sleeve i is arranged around the exterior of the part d in the position shown, leaving a sufficient space between the two to receive and make a sliding joint with the upper portion of the sleeve h . The tightness of this joint is insured by the interposition therein of the elastic packing j . The parts connected with the fork a and the parts connected with the portion d are held together longitudinally by the nut s , screwed tight on the part a'' , and bearing on top of the bushing f , and by loosening or tightening this nut the power of the spring n may be regulated in accordance with the weight of the rider.

When the parts are in the position shown in Fig. 2, it is obvious that on the descent of the part d the air will be compressed in the

space between a'' and h , and will force the valve at p'' to rise and permit the air to flow into the space between a''' and d . When the part d descends, it will cause the valve q to open and permit the air to flow in through the opening p . The continued reciprocation of the part d will soon fill the compressed-air chamber between a'' and d , so that on the descent of the part d the air below it will not have sufficient force to unseat the valve at p'' , and thus the part d will contain compressed air, which will act as an elastic cushion to support the weight of the rider, and yet admit of sufficient longitudinal movement between the parts connected with the fork a and the parts connected with d for easy riding. The various packings and washers which I have described, besides making the joints in which they are used air-tight, act to prevent any rattling or noise.

The sleeves i and h act principally as dust-guards to prevent the dust or mud from entering the joints, and I prefer to use the two in combination; but it is practicable to omit the sleeve i , and in that case the packing j would be transferred from its position between the two to a position on the interior of the inner one, so as to pack the joint between the interior of the inner shell and the surface on which it bears.

The air-cushion, which is introduced into the space between a''' and b by the pumping action of the parts, is the primary factor in obtaining a yielding support for easy riding, the spring being auxiliary thereto. By the pumping action introducing the air into the air-chamber the parts adjust themselves automatically to the weight of the rider, as well as to maintain an equal amount of compressed air within the air-chamber and to supply any leakage that may have occurred in the operation of the bicycle. With the construction which I have shown, the arrangement of the nut s for adjusting the tension of the spring to correspond with the weight of the rider becomes of minor importance, since the pressure of the air within the air-chamber will automatically adjust itself to correspond with the weight which it is called upon to support.

Some of the advantages of my invention might be obtained by placing the hole p and valve q in the side of the wall d of the air-chamber, between a''' and d , instead of in the position shown in the drawings. Under this altered construction the air to supply the air-chamber would be drawn directly into the air-chamber through the hole thus arranged in the wall thereof. I however prefer the arrangement which I have shown in the drawings.

I claim—

1. As an improvement in the construction of the backbone of a bicycle, the combination of the air-tight shell d with the plunger a'' , whereby the air within said shell is made to act as an elastic cushion, substantially as and for the purpose set forth.

2. As an improvement in the construction

of the backbone of a bicycle, the combination, with an air-tight shell, *d*, of the plunger *a''* and the spring *n*, substantially as and for the purpose set forth.

5 3. In combination with the fork *a* and its extensions *a'* *a''* *a'''*, the backbone of a bicycle, the spring *n*, and the adjusting-nut *s*, whereby the tension of said spring may be regulated, substantially as described.

10 4. In combination with the plunger *a* and shell *d*, the sleeve *h*, projecting exteriorly around the joint between the said plunger and said shell, whereby the entrance of dust and other material into said joint is prevented.

15 5. In combination with the shell *d* and plunger *a''*, the sleeves *h* and *i*, arranged substantially as described.

6. In combination, the plunger *a''*, attached to the fork *a*, for receiving the wheel of the

bicycle, the shell *d*, connected with the backbone of the bicycle, the spring *n*, for producing a yielding connection between said portions, the slot *b*, and the piece *o*, moving therein, whereby any lateral motion of the small wheel from a direct line with the larger one is prevented.

7. As an improvement in the construction of the backbone of a bicycle, the combination, with the shell *d*, of the shell *h*, having air-inlet *p* and spring-valve *q*, and the plunger *a''*, having air-passage *p'* and valve *p''*, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY KELLOGG.

Witnesses:

A. P. FROST,
JAMES F. COLBY.