

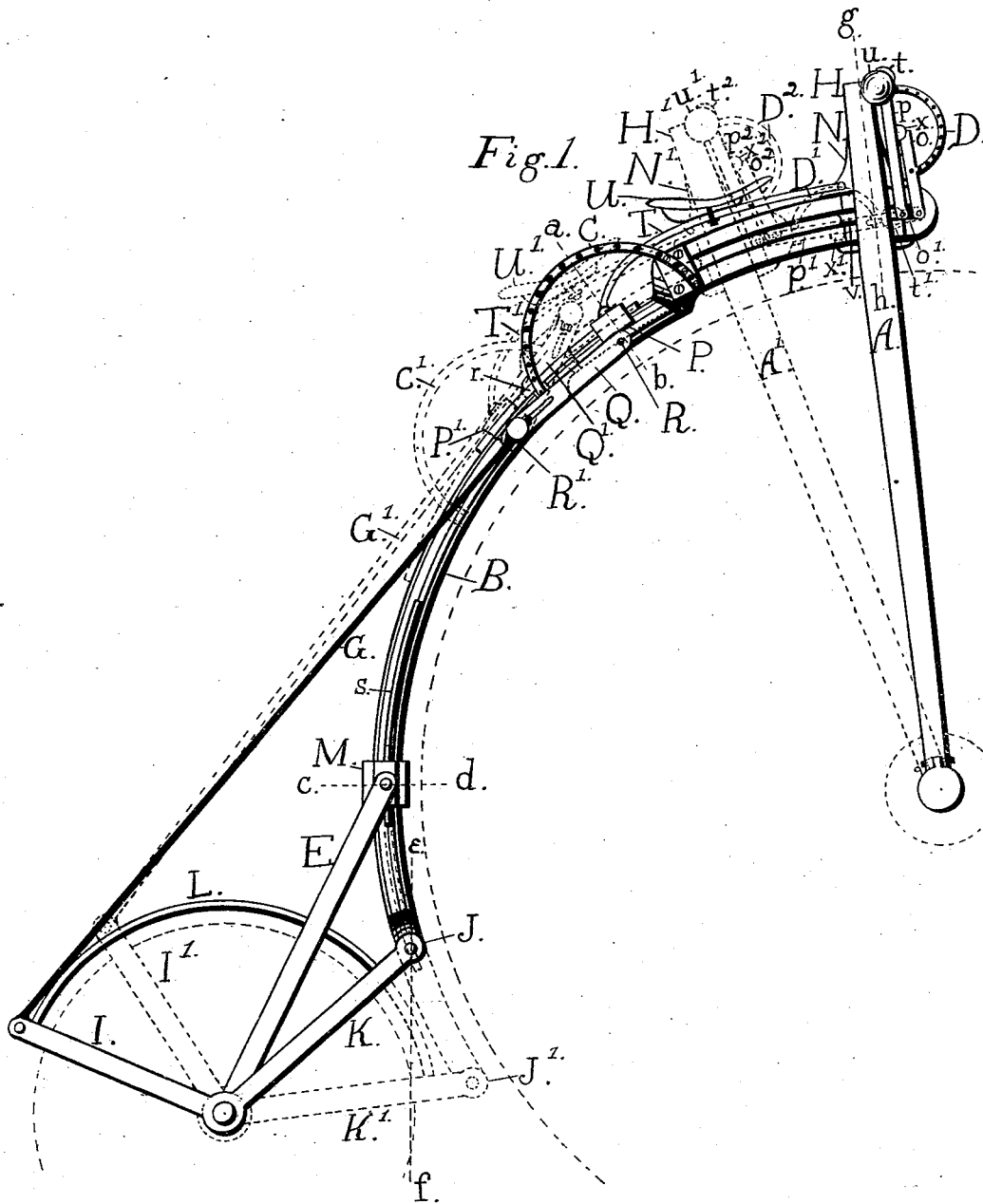
(No Model.)

2 Sheets—Sheet 1.

B. F. COOLEY.
BICYCLE.

No. 261,136.

Patented July 18, 1882.



Witnesses:
John H. Kingsbury
Morton Minott

Inventor:
B. Frank. Cooley.

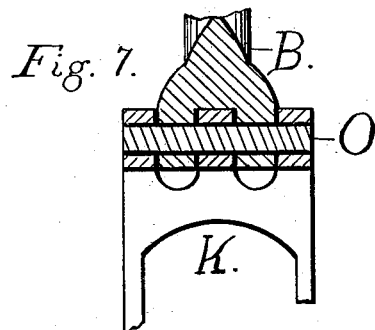
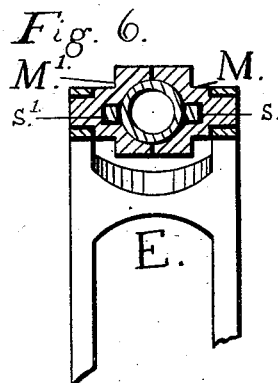
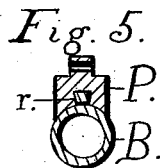
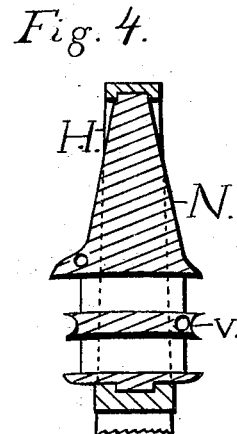
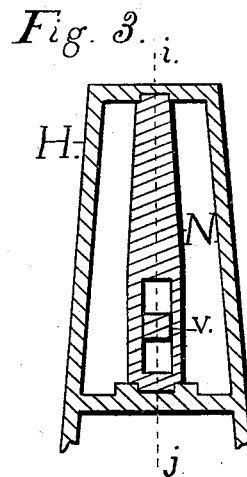
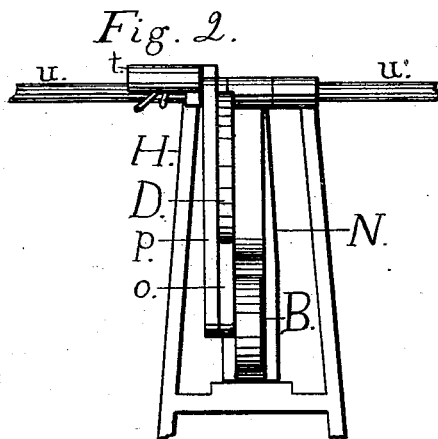
(No Model.)

B. F. COOLEY.
BICYCLE.

2 Sheets—Sheet 2.

No. 261,136.

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UNITED STATES PATENT OFFICE.

B. FRANK. COOLEY, OF BROCKPORT, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 261,136, dated July 18, 1882.

Application filed September 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, B. FRANK. COOLEY, a citizen of the United States, residing at Brockport, in the county of Monroe and State of New York, have invented an Improvement in Bicycles, of which the following is a specification.

The object of this invention is to render such machines capable of being used with greater ease and safety upon country roads or highways, or any road affording steep grades. I attain this object by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a side view of such portions of a bicycle as are essential to illustrate this invention. Fig. 1 shows also in dotted lines the positions assumed by different parts of the machine under an adjustment different from that represented in full lines, as will be explained. Figs. 2, 3, 4, 5, 6, and 7 are all enlarged views, as follows: Fig. 2 shows a front view of the head-piece with its appurtenances. Fig. 3 shows nearly a vertical section taken through the same along the dotted line *g h* in Fig. 1. Fig. 4 shows a vertical section taken at right angles to that shown in Fig. 3, and along the line *i j* in Fig. 3. Fig. 5 shows the backbone, together with the sliding block to which the rear end of the seat-spring is secured, in a sectional view taken along the line *a b* in Fig. 1. Fig. 6 shows, in a horizontal section taken through the line *c d* in Fig. 1, the backbone, together with the guide-blocks sliding on the same, and also a portion of the upper end of the guide-bar which is attached to these guide-blocks. Fig. 7 shows the joint at the lower end of the backbone in a section taken through the center thereof and along the line *e f* in Fig. 1.

Referring to Fig. 1 of the drawings, in my machine I employ a large drive-wheel in front, with a smaller rear wheel of substantially the usual construction and proportion. These wheels (shown partially in dotted lines in Fig. 1) I connect together by means of a backbone, B, near the lower end of which, and just above the fork K, which has in the lower ends thereof the bearings for the rear wheel, is formed a joint, J, whereby the backbone B may be lowered when desired, so that the joint J and the fork K shall occupy the positions represented in the dotted lines at J' and K', respectively; or any

adjustment between these two positions may be secured. This joint J is represented more fully in Fig. 7, which shows a vertical section through the same, taken along the line *e f* of Fig. 1, with all to the right of such line removed.

The backbone B and the fork K are guided in their movements by means of the forked guide-bar E, articulating freely at its lower ends upon the projecting ends of the shaft on each side of the rear wheel, and at the upper end upon the turned tenons projecting laterally one from each side of the blocks M and M', as shown in horizontal section in Fig. 6, with all above the line *c d* on Fig. 1 removed, the block M only being seen in Fig. 1. These blocks M and M', as shown in Fig. 6, inclose the backbone B, and are secured together by means of rivets or screws. (Not shown.) They are prevented from turning upon the backbone by means of tongues, (seen at *s s'* in Fig. 6,) the tongue *s* only being seen in Fig. 1 projecting laterally upon either side of the backbone, and working in a groove formed therefor upon the inner face of each of blocks M and M'. Through these blocks M and M' the backbone is allowed to freely move or slide, and is guided in such motion by means of the guide-bar E and the guide-blocks M and M', attached thereto, as shown.

Fork K, as will be seen by referring to Fig. 1, is at its lower ends, on each side of the rear wheel, continued obliquely to the rear and upward, so as to form another similar fork, I, making an obtuse but rigid angle with the one K, the two forks being connected together near their upper and outer ends by the curved bar L, and articulating conjointly at such angle upon the projecting ends of the shaft upon either side of the rear wheel, the rigid angle between these forks forming the bearing for such shaft. The angle between these forks K I being rigid, it will be seen that they must move together. Hence when the fork K occupies the position represented by dotted lines at K' the fork I will take the position represented by dotted lines at I'.

Articulating upon a pin passing through the mortise in the upper end of this fork I, as shown, is a rod, G, the upper end of which is attached to and articulates upon the inner end of the handle to the lever Q, the fulcrum for which is a pin projecting through the upper

end of lever Q at R, and laterally from the side of the backbone, as shown in Fig. 1. This pin R also forms the center for a semicircular ratchet, C, formed with holes bored there-
 5 through at regular intervals, and having attached at each end a plate of iron or brass, by means of which it is secured to the backbone, as shown.

By means of a spring-pawl upon lever Q engaging the ratchet C the lever Q is held in
 10 any desired position; but it will be seen that as the lower end of lever Q is raised the motion thereof is communicated to the forks I and K by means of the rod G, whereby it will
 15 be seen that the backbone is carried backward and downward, and thereby causing the joint J to take the position indicated by dotted lines at J', and the forks K and I to assume the positions indicated by the dotted lines at K' and
 20 I', the rod G to assume the position indicated by dotted lines at G', and the lever Q and ratchet C to occupy the positions indicated by the dotted lines at Q' and C', respectively, whereby the seat, together with the head-piece
 25 and its attachments, is moved backward and downward without any change of distance between the seat and the center of the drive-wheel, the front fork, A, head-piece H, and seat U being caused to occupy the positions indicated by dotted lines at A', H', and U', re-
 30 spectively.

By means of the spring-pawl on lever Q any desired adjustment may be secured intermediate between the two extreme positions just
 35 described.

For very steep roads it is found impracticable to obtain all the necessary difference in adjustment by means of the devices already described, it requiring either too great power to
 40 operate them or the use of a lever Q of so great a length as to be cumbersome and in the way of the operator in mounting or riding.

To obtain a sufficient amplitude of adjustment, therefore, I make a sliding joint between
 45 the upper end of the backbone and the spindle, so that one may slide upon the other. To accomplish this I widen out vertically the upper end of the backbone, as shown in Fig. 1, forming also a longitudinal slot in such widened
 50 portion, which, together with the slot therein, is in the form of an arc of a circle of which the center of the drive-wheel is the center. This widened portion passes through a mortise in the lower end of the spindle N.
 55 (Seen more fully in Figs. 2, 3, and 4.) After this widened portion has been inserted in the mortise in the lower end of the spindle N the block v is inserted in the slot of the backbone and in the center of such mortise, as shown in
 60 Figs. 3 and 4, and securely held in this position by means of bolts or screws. (Not shown.) This mortise in the spindle N, together with the block v, is in the form of an arc of a circle to fit the widened portion of the backbone.

65 The head-piece H is revoluble upon this spindle in the usual manner, as shown in the drawings, so as to admit of steering by means

of the handles, only one of which is seen at u in Fig. 1, attached to the upper end of the head-piece H, which, together with the fork
 70 A, is turned in the act of steering, the bearings for the shaft to drive-wheel being located at the lower ends of the fork A.

Referring to Figs. 1 and 2, it will be seen that lever p articulates at its lower end upon
 75 a pin projecting laterally to the right from the forward end of the block v. This lever p has at its upper end, and projecting at right angles therewith, the handle t. This lever p operates the toggle-joint x, the forward member
 80 of which, o, articulates upon a pin projecting laterally to the right from the forward end of the widened portion of the backbone, and at its upper end is formed a toggle-joint with a
 85 similar piece, (not shown,) being concealed by the lever p, upon the side of which it is firmly secured by means of screws or rivets, (not shown,) this member articulating at its lower
 90 end upon the same pin, together with the lever p, by which the toggle is operated, being straightened by the forward and downward
 95 motion of the lever p, which is held in any desired position by means of a spring-pawl thereon engaging the ratchet D, similar in construction to the one already described, and
 100 welded or otherwise securely attached to the forward member, o, of the toggle-joint in such a manner that the joint x shall be the center of the ratchet D.

The seat-spring T is secured at its forward
 100 and upper end to the rear side of the spindle N, as shown, and at its rear end to the block P, concaved upon its under surface to fit the backbone, and also having a dovetailed groove upon its under surface closely fitting the tongue
 105 r, projecting from the upper surface of the backbone, as shown in side view in Fig. 1, and in a sectional view in Fig. 5, taken at right angles to the backbone, along the line a b in Fig. 1, whereby it will be seen that the seat is
 110 carried backward and forward with the head-piece, thereby keeping the steering devices at a uniform distance from the rider.

When the lever p is pushed forward and downward, so as to straighten the toggle-joint
 115 x, it will be seen that the fork A, head-piece H, spindle N, handle u, lever p, handle t, joint x, bar o, ratchet D, and seat-spring T are caused to occupy the positions shown in dotted lines at A' H' N' u' p' t' x' o' D' T', re-
 120 spectively.

When the joint J only is operated and lowered to the position indicated by dotted lines at J' to vary the position of the rider, then
 125 the lever p, handle t, joint x, bar o, and ratchet D, remaining in the same position relative to the head-piece as shown in full lines in Fig. 1, will occupy the positions indicated respectively by dotted lines at p² t² x² o² D².

The operation of these devices is substantially as follows: In riding over roads pre-
 130 senting frequent short and moderately-steep inclinations the mechanism operated by the lever p is employed, being more immediately

under the eye and control of the rider, who, by means of the lever *p*, may throw himself backward or forward at will, so as to keep the center of gravity within the base-line, thereby preventing the accident termed "taking a header."

In passing up or down longer or steeper grades, the mechanism operated by the lever *Q* is employed, affording an increased range of adjustment, though somewhat less under the immediate control of the rider, whose position is changed while operating the lever *Q* in the manner already described.

By means of these devices the rider, in passing along over level roads or up an inclination, may occupy a position farther forward and more directly over the wheel than is possible when no opportunity is afforded for changing his position in passing down an inclination. Again, these different adjustments afford the rider an opportunity to rest himself somewhat by a change of position while riding.

Having thus described my invention, what I claim is—

1. Backbone *B*, constructed, as shown, with a widened and slotted upper end, spindle *N*, constructed with a mortise in the lower end thereof, together with the block *v*, secured therein, lever *p*, joint *x*, bar *o*, and ratchet *D*, all constructed, arranged, and operating substantially as and for the purpose set forth.

2. Seat-spring *T*, secured at its forward end to the rear side of the spindle and at its rear end to the block *P*, sliding upon the dovetailed tongue *r* upon the backbone *B*, whereby the position of the rider always remains the same relative to the spindle, all constructed substantially as and for the purpose set forth.

3. Forked guide-bar *E*, together with the blocks *M* and *M'*, sliding upon the tongues *s* and *s'* upon the backbone *B*, all constructed,

arranged, and operating substantially as and for the purpose set forth.

4. Joint *J*, the rigidly-connected forks *K* and *I*, bar *L*, connecting the same, rod *G*, lever *Q*, and ratchet *C*, all constructed, arranged and operating substantially as and for the purpose set forth.

5. In a bicycle, a head-piece and spindle movable upon the backbone, together with a seat and spring, also movable upon the backbone, and secured to and moved by such head-piece and spindle, whereby the position of the rider may be varied at pleasure, substantially as and for the purpose set forth.

6. In a bicycle, a joint in the backbone, whereby the distance between the head-piece and center of the rear wheel may be varied, and thereby the position of the rider changed at pleasure, substantially as and for the purpose set forth.

7. In a bicycle, the combination of a spindle and backbone united together by a sliding joint, substantially as and for the purpose set forth.

8. In a bicycle, the combination, with a joint in the backbone thereof, of a lever or combination of levers and ratchet or other equivalent devices, whereby such joint may be operated and held substantially as and for the purpose set forth.

9. In a bicycle, the combination, with a spindle and backbone united together by a sliding joint, of a lever or combination of levers and ratchet or other equivalent devices, whereby such joint between the backbone and spindle may be operated and held substantially as and for the purpose set forth.

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