No. 635,590. Patented Oct. 24, 1899.

M. QUINN.

BICYCLE.

(Application filed Apr. 7, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

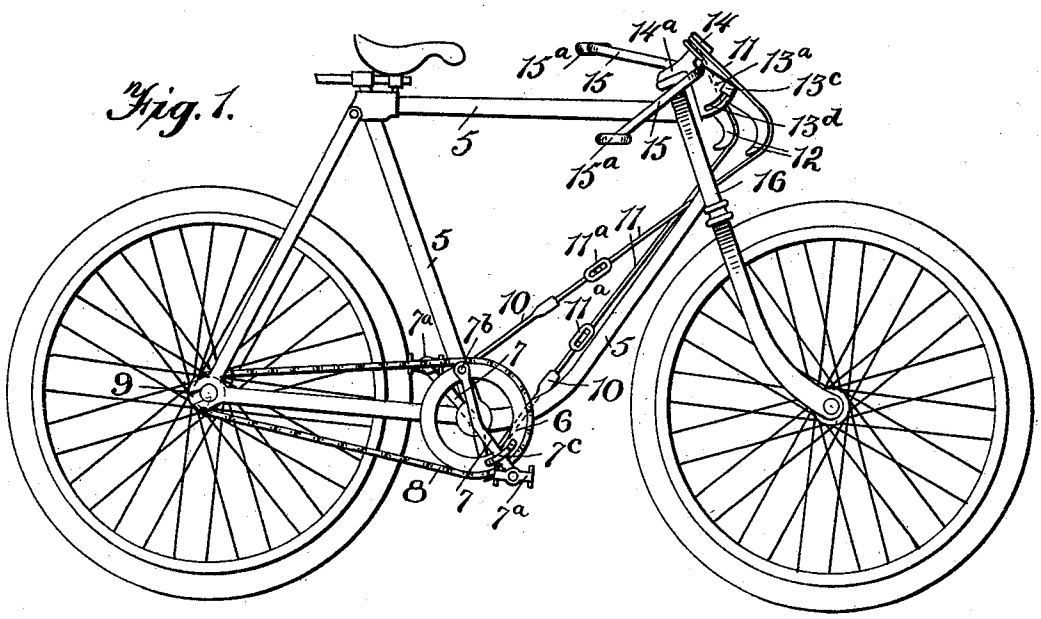
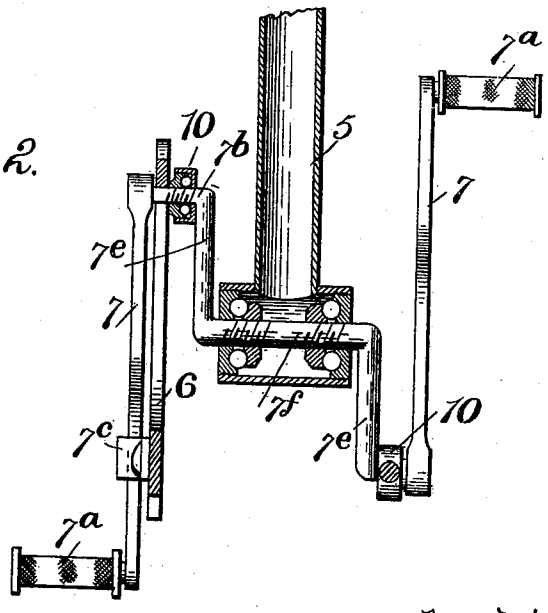


Fig. 2.



Witnesses:
Geo. E. Fuch.
Thos. R. Strath.

Inventor.
Martin Quinn,
by
Collamer & Gaines
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

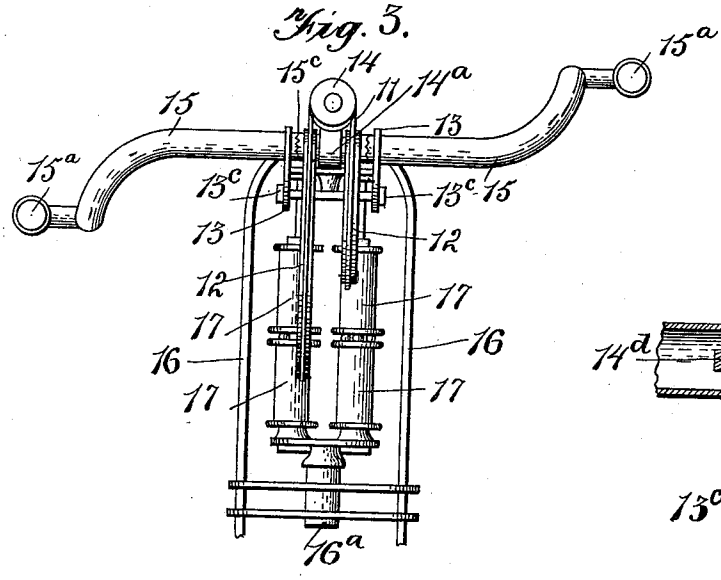


Fig. 4.

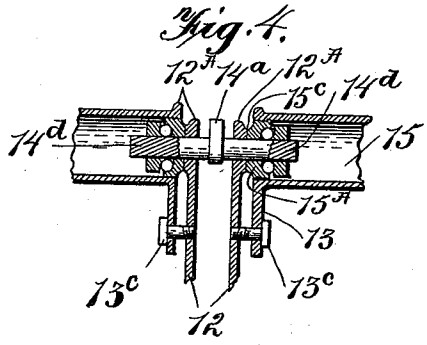


Fig. 5.

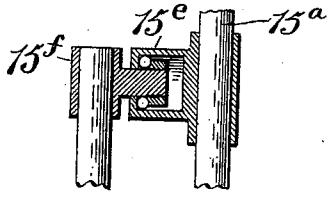


Fig. 6.

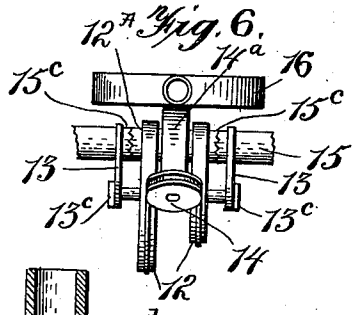


Fig. 7.

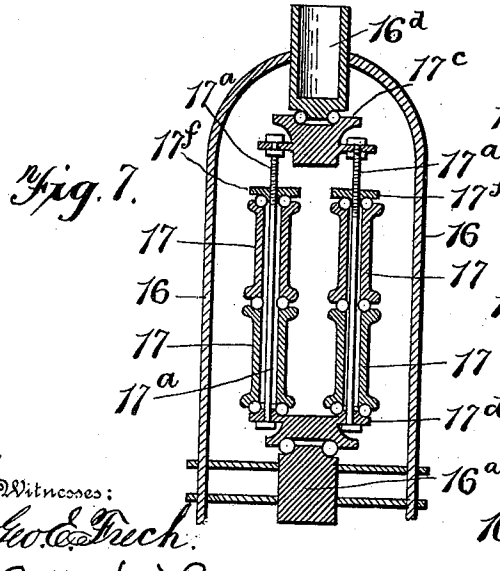
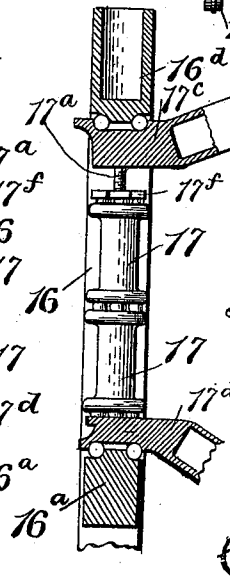


Fig. 7a.



Witnesses:
Geo. E. Tuck.
Thos. P. Heath.

Inventor
Martin Quinn,
by
Collamer & Co.
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MARTIN QUINN, OF DENVER, COLORADO.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 635,590, dated October 24, 1899.

Application filed April 7, 1899. Serial No. 712,148. (No model.)

To all whom it may concern:

Be it known that I, MARTIN QUINN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Bicycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to bicycles, and more especially to that class therein which embody mechanism whereby the arms of the handle-bar can be moved to assist in propulsion; and the object of the same is to effect certain improvements in the details of the mechanism for accomplishing this.

The invention consists in the construction hereinafter more fully set forth and claimed, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of this machine complete. Fig. 2 is an enlarged cross-section through the crank-hanger. Fig. 3 is a front elevation of the head. Fig. 4 is an enlarged section through the swiveled inner ends of the arms of the handle-bar. Fig. 5 is an enlarged sectional detail of one of the handles. Fig. 6 is a plan view of the head. Fig. 7 is a sectional view of the head. Fig. 7^a is a similar section at right angles to the sectional line of Fig. 7.

In the said drawings the numeral 5 designates, broadly, the frame of an ordinary rear-driving safety-bicycle having cranks 7, with pedals 7^a, a driving-sprocket 6, and a chain 8, connecting it with the sprocket 9 on the rear axle.

Fig. 2 shows the crank-hanger with its ball-bearings surrounding the crank-shaft 7^f, outside of which said shaft is bent into cranked ends, as at 7^c, and thence once again outward, as at 7^b, and secured to the inner ends of the cranks 7. The bodies of the latter preferably stand parallel with and over the cranked ends 7^c of the crank-shaft, as shown, and are preferably deflected in their length, as best seen in Fig. 1. The driving-sprocket 6 is connected with one of the cranks 7 by being mounted at one side on the portion 7^b and having a clip 7^c at its other side, by which it is attached to the crank near the pedal.

16 designates the head of the machine, carrying at its top a bracket 14^a, supporting a pulley 14, and at a proper point through this bracket is a stub-shaft 14^d, on whose ends are mounted, as by ball-bearings, (see Fig. 4,) the arms 15 of the handle-bar, which is thus made in two independent members. The outer end of each arm or member is surrounded by a collar 15^f, whereon is journaled, as by ball-bearings, a cup 15^e, carrying the handle or handhold 15^a, as best seen in Fig. 5. This permits the handles to retain their proper position relative to the operator's hands even while the arms 15 are rocked up and down, as hereinafter described.

In the inner end of each arm 15 is preferably located a nut 15^A, having a serrated outer end 15^c, and projecting radially from the arm is a segment 13, having a slot 13^d struck on a curve around the axis. 12 is a cam of the shape best seen in Fig. 1, whose inner end has a ring 12^A, serrated so as to engage the nut 15^A, and 13^c is a bolt or set-screw passing through the slot 13^d and engaging the body of the cam. These parts are in duplicate for the two arms of the handle-bar, and by their provision it will be clear that the cams can be set at the desired angles to the arms 15, and after having been so set the movement of the handles 15^a will cause the cams 12 to rise and fall, each arm 15 and each cam turning around its portion of the stub-shaft 14^d.

The head 16 of the machine is preferably of an open-work pattern as viewed from the front, and in its top and bottom are rigidly mounted plugs 16^d and 16^a, between whose inner ends is pivotally mounted, as by ball-bearings, an antifriction-frame. The same consists of two spiders 17^c and 17^d, forming the other parts of the ball-bearings just mentioned, and to which spiders the frame-tubes 5 are fixed, parallel rods or bolts 17^a connecting these spiders, two pulleys 17 on each rod, nuts or the like 17^f for holding the pulleys in place, and ball-bearings at each end of each pulley, all as best seen in Fig. 7.

I should have said that one of the cams 12 is slightly longer than the other; but in other respects they are duplicates.

11 is a flexible connection (such as a cord or chain) which is passed at its center over the pulley 14 and leads thence out over the cams 12, with one of its portions passing between the two upper pulleys 17 and its other portion between the two lower pulleys. Its ends are connected, as by turnbuckles 11^a, with the

shanks of two eyes 10, which are journaled, as by ball-bearings, (see Fig. 2,) on the outward portions 7^b of the crank-shaft.

With this construction of parts the rider mounts the machine and grasps the handles. His feet are applied to the pedals, and the sprocket-wheel 6 is rotated in the ordinary manner. By alternately raising and lowering the handles, however, he causes the cams 12 to rise and fall in opposition to each other, and this causes a reciprocating motion of the connection 11 around the idle pulley 14, so that the eyes 10 assist in the rotary movement of the sprocket-wheel 6. The clutch-teeth 15^c and the slotted segments 13 are obviously for the purpose of permitting the adjustment in position of the cams, which is desirable when it is necessary to raise or lower the handles 15^a to suit the rider. The machine is steered in the ordinary manner, the handle-bars swinging the head 16 bodily, while the antifriction-frame within this head is fast on the bicycle-frame and does not turn. The fact that one side of the connection 11 moves between the upper pair of pulleys and the other side between the lower pair prevents these oppositely-moving sides thereof from interfering with each other even though the eyes 10 rise and fall as the crank-shaft rotates. To offset said rise and fall and the consequent swinging of each side of the connection the pulleys are made of some considerable vertical height, and the fact that the connection, passes between the pulleys prevents it from wearing the interior of the head.

What I claim as new is—

1. In a bicycle the combination with a crank-hanger, the crank-shaft having its center journaled therethrough, its ends being cranked, and the extremities of the cranked ends turned outward, manual operating mechanism, and connections between the latter and said extremities; of the cranks secured to said outward ends and extending thence over the cranked portions of said shaft inward and across its central portion, the sprocket-wheel mounted at one side near its periphery on one of the outward portions of the crank-shaft, and a clip secured to the other side and engaging the outer end of the adjacent crank, substantially as described.

2. In a bicycle, the combination with the main frame, the cranked driving-shaft, the head having a bracket, and a handle-bar in two arms pivotally supported by said bracket; of a pulley journaled on the bracket, a flexible connection leading from the cranks of the driving-shaft forward of the machine and thence backward around said pulley, and cams on the arms of the handle-bars for alternately raising the opposite sides of this connection, as and for the purpose set forth.

3. In a bicycle, the combination with the head having a bracket, a stub-shaft therein, a handle-bar whose separate arms are journaled on the ends of this shaft, a segment on each arm having an arc-shaped slot, two cams each having a ring surrounding one end of the stub-shaft, and a set-screw connecting each cam with the slot in the adjacent segment; of the cranked driving-shaft, and flexible connections between its cranks and the cams, as and for the purpose set forth.

4. In a bicycle, the combination with a head having a bracket, a stub-shaft therein, a handle-bar in two separate arms, a nut in the inner end of each arm with a serrated face, and a bearing between this nut and its end of the stub-shaft; of a cam each side of the bracket having a ring surrounding the stub-shaft and serrated to coact with the nut, means for adjustably connecting the ring and nut, the cranked driving-shaft, and flexible connections between its cranks and the two cams, as and for the purpose set forth.

5. In a bicycle, the combination with a bracket supporting a transverse stub-shaft, a handle-bar in two arms each having a forwardly-projecting segment, a nut in the inner end of each arm, and a ball-bearing between each nut and its end of the stub-shaft; of a pair of cams each having a ring at its inner end surrounding one end of the stub-shaft adjacent the nut thereon, a set-screw adjustably connecting the segment and cam, a pulley on the bracket, a flexible connection passing around said pulley and over the two cams, and attaching means between the two ends of this connection and the cranks of the driving-shaft, as and for the purpose set forth.

6. In a bicycle, the combination with the framework having an open head, plugs at the upper and lower ends thereof, said framework being connected with one of such plugs, and an antifriction-frame located within said head and axially journaled on said plugs; of a handle-bar comprising two separate arms pivotally supported on the head, a cam on each arm, one cam being longer than the other, and flexible connections leading from these cams through said antifriction-frame to the cranks of the driving-shaft, as and for the purpose set forth.

7. In a bicycle, the combination with the framework having an open head, and an antifriction-frame therein comprising two spiders axially journaled in the head, two rods connecting the spiders, and two long pulleys journaled on each rod; of a handle-bar in two oscillating arms, cams on these arms one of which is longer than the other, and flexible connections leading from the cams to the cranks of the driving-shaft, one connection passing between the upper and the other between the lower pair of pulleys in said antifriction-frame, as and for the purpose set forth.

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

MARTIN QUINN.

Witnesses:
M. H. LLOYD,
F. R. BYRNS.