

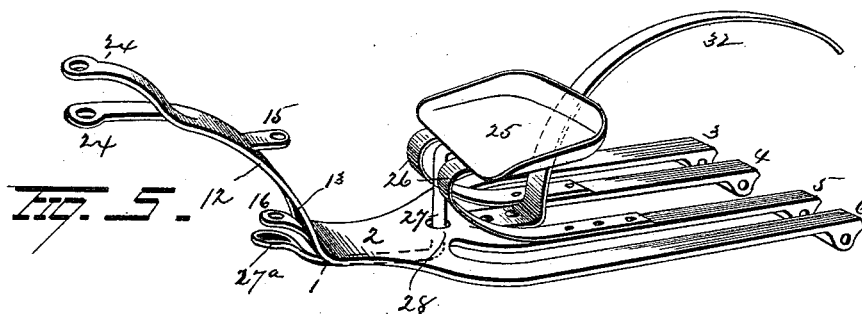
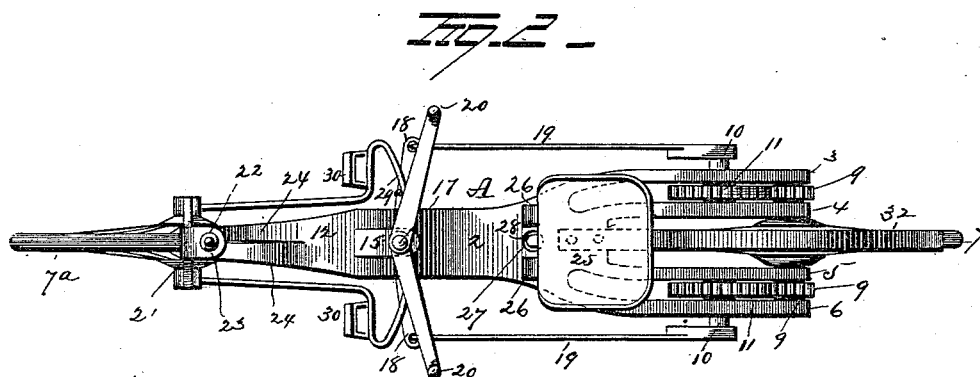
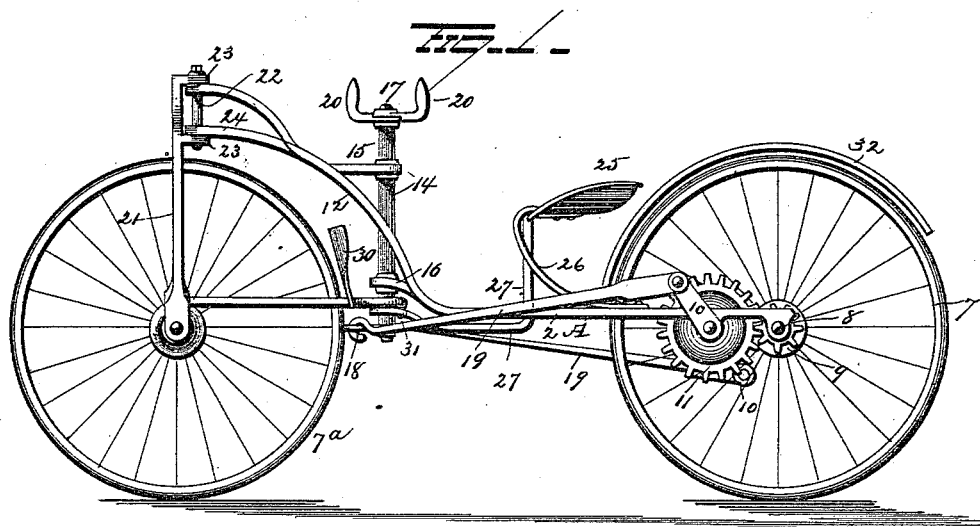
(No Model.)

2 Sheets—Sheet 1.

A. H. CLARK.
BICYCLE.

No. 420,036.

Patented Jan. 28, 1890.



Witnesses

C. F. Downing
G. F. Downing

Inventor

Alexander H. Clark

By his Attorney

H. A. Seymour

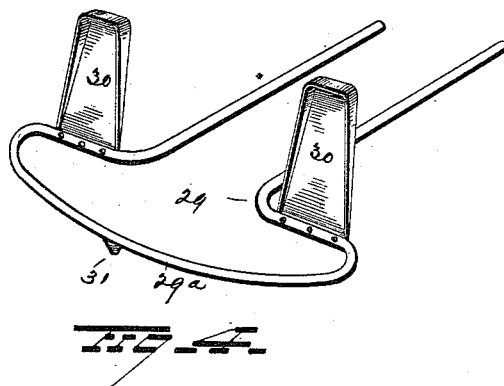
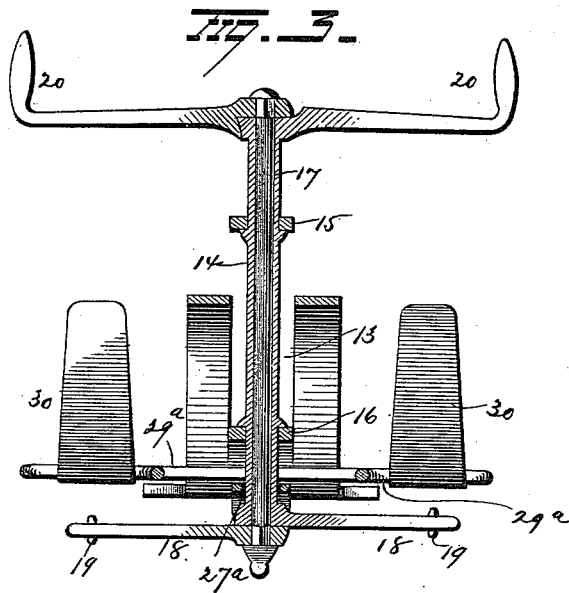
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UNITED STATES PATENT OFFICE.

ALEXANDER H. CLARK, OF FOND DU LAC, WISCONSIN.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 420,036, dated January 28, 1890.

Application filed July 20, 1889. Serial No. 318,145. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER H. CLARK, of Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain
5 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
10 the same.

My invention relates to an improvement in bicycles, the object being to provide an easy-running machine upon which greater speed can be attained with less effort and exertion on the part of the rider, at the same
15 time involving comparatively-simple machinery and few parts, and such as are not liable to get out of repair easily or require more than a reasonable amount of attention and
20 care to keep them in working order.

A further object is to construct such a machine as may be easily mounted and dismounted, and ridden by ladies as conveniently as by men, and without any liability
25 of the skirts becoming caught or entangled in the gearing, due largely to the fact that the feet are at rest and the propulsion is effected entirely by the hands and arms.

With these ends in view my invention consists in certain novel features of construction of parts, which will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a plan view. Fig.
35 3 is a vertical section through the propelling mechanism and the middle portion of the machine. Fig. 4 is a detached view of the front wheel and the steering apparatus, and Fig. 5 is a detached view of the main bar or
40 plate.

A represents the main bar or plate constituting the backbone of the machine. This consists, preferably, of a single plate of metal made a sufficient width and thickness to give
45 it the required strength and rigidity for the support of the rider. The plate is somewhat peculiar in shape, and therefore a general description will follow. From a point 1, near the middle, the plate extends backward horizontally, forming the platform 2 immediately
50 back of the bend, and to the rear of this por-

tion it is more or less increased in width to furnish a support for the hind wheel and the connected gearing. From the point 1 forward the plate is curved obliquely upward
55 and finally forward to the extreme forward end, where it is bifurcated and so bent that bearings are formed for the bolt which pivotally connects the front fork to the main bar or plate.
60

The rear or broadened end of the plate A is for convenience divided into four forks 3, 4, 5, and 6, and the rear ground-wheel 7 is journaled at the outer ends of these forks, so that it runs between the two inside forks 4
65 and 5. The axle 8 of this wheel has a pair of pinions 9 9 rigidly secured to it at points between the forks 3 and 4 and 5 and 6, respectively. A pair of cranks 10 10 are revolvably supported in the forks 3 and 4 and 5
70 6 just forward of the pinions, and each of these cranks carries a gear-wheel 11 between each outer pair of forks, which is meshed with the corresponding pinion, and, owing to its increased size, imparts a rapid motion
75 to the rear wheel 7. The cranks are so arranged relative to each other that dead-centers are absolutely avoided.

The upwardly-curved portion 12 of the plate A is provided with an elongated slot 13,
80 and a hollow rod 14, extending through this, slot is supported in bearings 15 and 16, which are conveniently formed by the portion which is cut out to form the slot. Another rod 17 extends through the hollow rod 14, wherein it
85 is free to rock back and forth. The arms 18 18 project outwardly from the lower end of the rods 14 and 17, and these arms are connected by pitmen 19 19 to the cranks 10 10, whereby the latter are rotated by the vibrating or swinging motions of the arms. These
90 rods 14 and 17 are provided at their upper ends with handles 20 20, by which one or both of the rods are rocked, accordingly as the rider uses one or both hands in propelling the
95 machine. The vertical fork 21, which spans the forward ground-wheel 7, and in the lower ends of which the axle of the latter is journaled, is pivotally connected by the bolt 22, which extends through the lugs 23 23 and the
100 ends 24 24 of the front forked end of the plate A. The seat 25 is held on the plate A

just back of the platform by means of springs 26 26 in position for the occupant to reach the handles. Rod 27, secured to the seat, extends loosely through the hole 28 in the platform, and thence forward around the hollow vertical rod 14. This connection may be effected by a bend in the rod, or the rod may be flattened and provided with an elongated slot 27^a, through which the hollow rod or shaft 14 extends. A guide-yoke 29 is secured at its ends to the vertical fork 21, and after reaching a point about opposite the periphery of the wheel it extends outward a short distance, and then around to form the semicircular portion 29^a, which extends loosely between the lower bearing 16 and the rod 27. The foot-pieces or pedals 30 30 are secured vertically to this yoke in position to receive the feet of the rider, and by pressing on one foot or the other the machine is guided. By applying equal pressure with both feet it is kept in a straight course.

It will be observed that a depending lug or projection 31, formed at the middle of the rounded portion 29^a, is in position to enter the slot 27^a when the seat 25 is empty. This keeps the machine in a straight course while the rider is mounting or dismounting, or at any time the pressure is removed from the seat; but the instant weight is applied the rod 27 is depressed or lowered out of position for the engagement of the projection 31 in the slot 27^a. Guard or fender 32 extends over the rear wheel in the usual manner to prevent the splashing of mud or water upon the rider.

The mechanism described may with slight changes be applied with equal advantage to a tricycle with very slight variations in the gearing, and in fact I consider this an important feature of my invention, resulting from the fact that the cranks are arranged to never stop upon centers, and the machines, even if quite heavy, are easily started by the handles.

By employing a four-foot (or less) front wheel and a five-foot drive-wheel and by gearing the machine up about two to one the machine will be propelled about thirty feet at each motion of the handles.

It is evident that slight changes might be resorted to in the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the particular construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

60 1. The combination, with the ground-wheels and backbone of the machine, of a steering-yoke and means whereby the latter is released and made operative by the weight of the rider, substantially as set forth.

65 2. The combination, with the ground-wheels and the backbone of the machine, of propelling mechanism, steering apparatus, and

means whereby the latter is released and made operative by the weight of the rider upon the seat, substantially as set forth. 70

3. The combination, with the ground-wheels and backbone of the machine, of propelling mechanism, steering apparatus, and a seat yieldingly supported on the backbone or frame and having a device connected therewith by which the steering apparatus is unlocked or locked, accordingly as the seat is depressed or not, substantially as set forth. 75

4. The combination, with the ground-wheels and backbone of the machine, of propelling mechanism loosely mounted in the backbone and geared to one of the wheels, a steering-yoke extending from the forward wheel to the propelling apparatus and having a projection thereon, and a latch or other device for engaging the projection, whereby the yoke is held in place until pressure is applied to the latch, substantially as set forth. 80

5. The combination, with ground-wheels, of a backbone consisting of a metal plate divided into four forks at the rear end, bent upward and slotted near the middle, forked at the forward end, and propelling apparatus, steering apparatus, and gearing, substantially as set forth. 85

6. The combination, with a backbone forked at each end, a fork having a wheel journaled therein pivoted to the forward end, a wheel journaled at the rear end, pinions on its axle, and gear-wheels meshed with the pinions, of propelling apparatus, pitmen extending therefrom, and cranks connected with the gear-wheels and to which the pitmen are connected, substantially as set forth. 90

7. The combination, with a backbone or main frame, drive ground-wheel journaled in its rear end, and steering ground-wheel pivoted to its forward end, of solid and hollow propelling-rods having handles and arms thereon, gearing connected with the drive-wheel, and pitmen extending from the arms on the solid and hollow rods to the gearing, whereby motion is imparted to the machine, substantially as set forth. 95

8. The combination, with the backbone or main frame, the rear drive-wheel journaled at the rear end, gearing connected therewith, and a fork pivotally connected with the forward end and having a wheel journaled therein, of the hollow and solid rods supported in the backbone and having handles on one end and arms on the opposite ends, pitmen extending from the arms to the gearing, and steering apparatus extending from the front fork into position to be operated upon by the feet of the rider, substantially as set forth. 100

9. The combination, with the backbone or main frame of the machine, the latter forked at the ends and bent and slotted near the middle and provided with bearings, and ground-wheels, of a hollow and solid rod arranged concentric and extending through the slot in the frame and supported in the bearings, said rods having handles on their upper 105

end and arms on the lower ends which are
connected by pitmen and gearing to the drive-
wheel, a seat yieldingly supported on the
backbone and having a rod which extends
5 through the latter and around the hollow rod,
and a steering-yoke extending from the front
wheel between the rod from the seat and the
bearing and having a projection in its mid-
dle adapted to have engagement with the
10 seat-rod when weight is removed from the lat-

ter or have free movement when weight is ap-
plied, substantially as set forth.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

ALEXANDER H. CLARK.

Witnesses:

EDWD. W. PHELPS,

EMMA BLARDEL.