

(No Model.)

2 Sheets—Sheet 1.

A. H. CLARK.  
BICYCLE.

No. 506,626.

Patented Oct. 10, 1893.

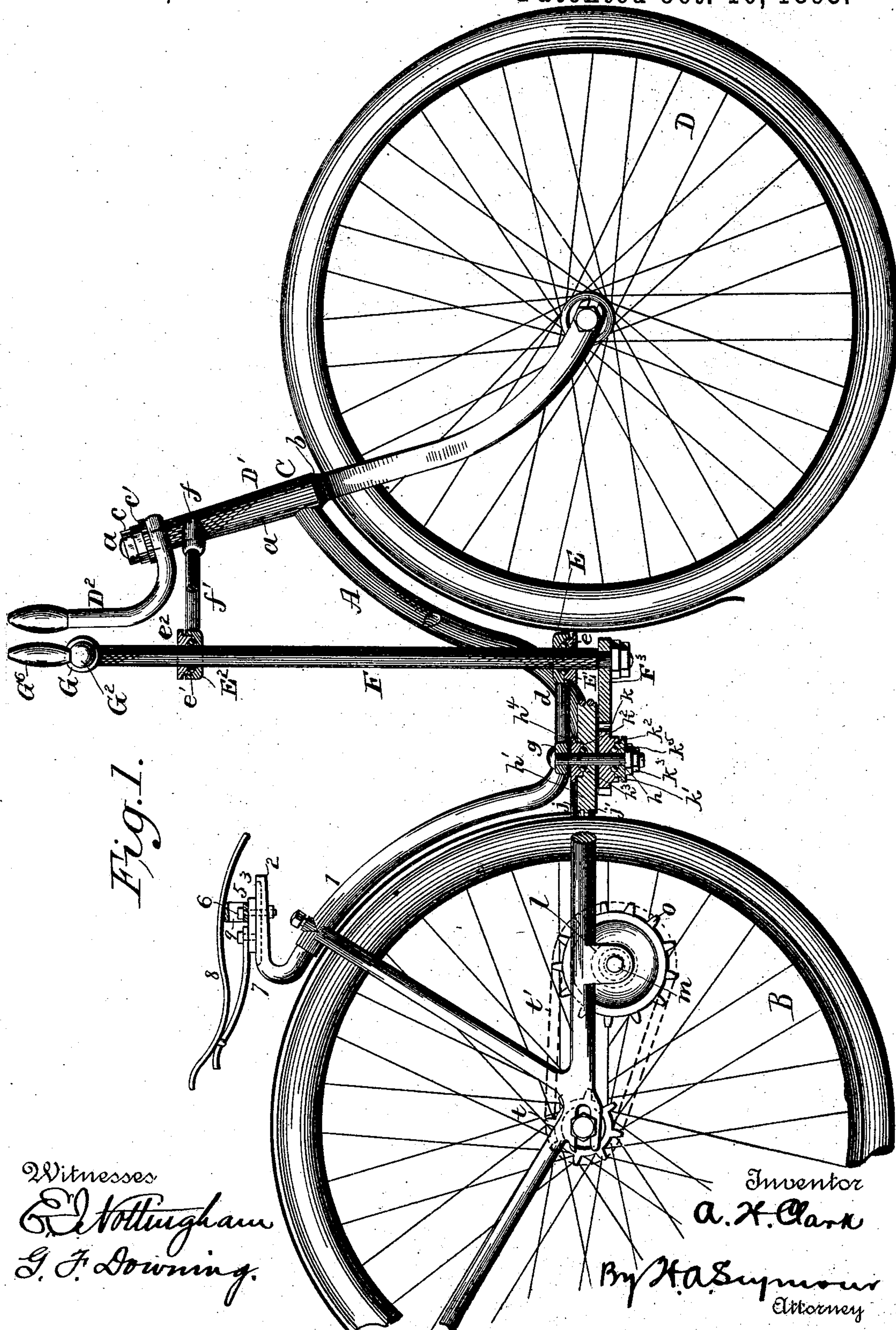


Fig. 1.

Witnesses  
G. H. Nottingham  
G. F. Downing.

Inventor  
A. H. Clark

By H. A. Seymour  
Attorney



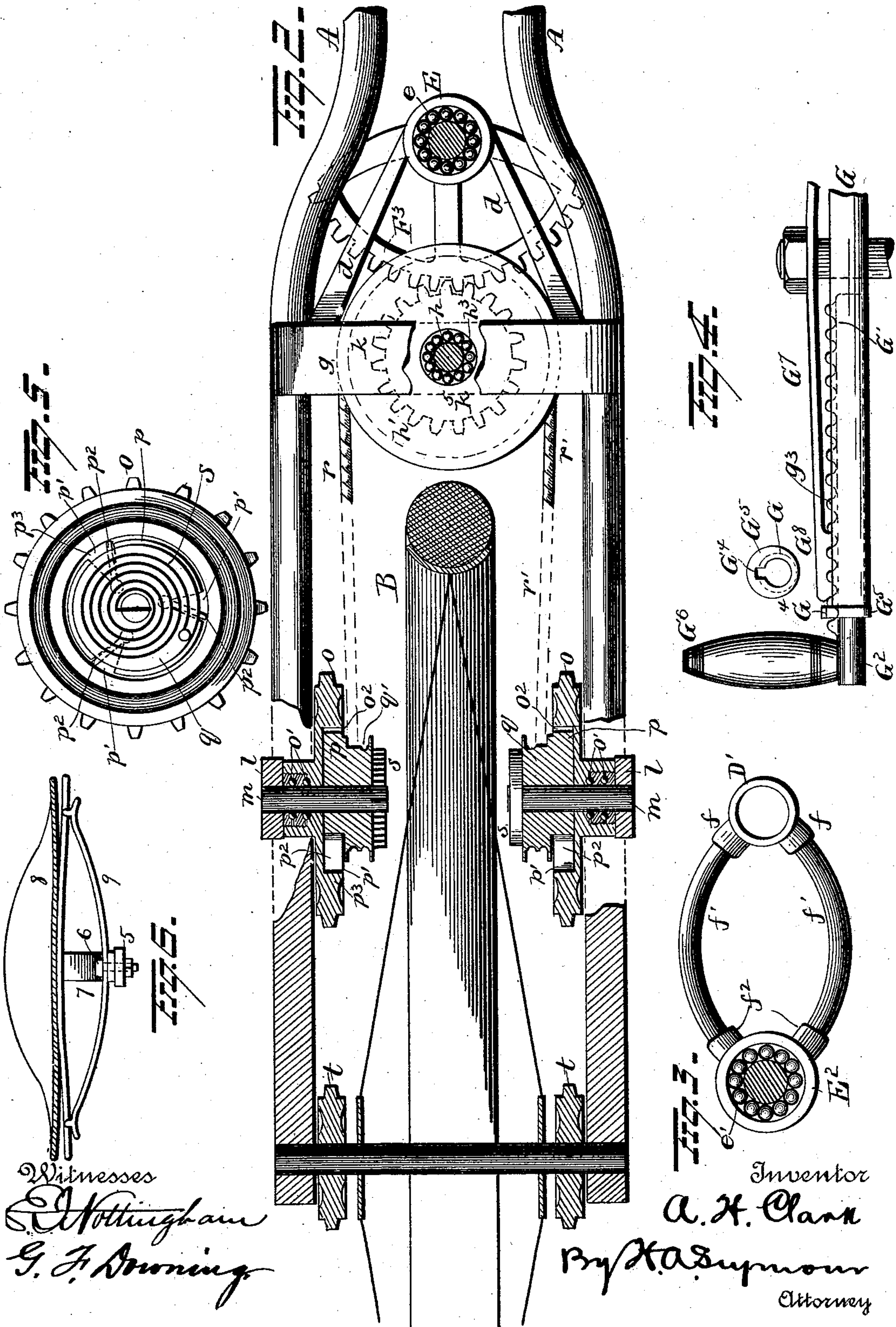
(No Model.)

2 Sheets—Sheet 2.

A. H. CLARK.  
BICYCLE.

No. 506,626.

Patented Oct. 10, 1893.



Witnesses  
J. Nottingham  
G. F. Downing

Inventor  
A. H. Clark  
By H. A. Seymour  
Attorney



# UNITED STATES PATENT OFFICE.

ALEXANDER H. CLARK, OF FOND DU LAC, WISCONSIN, ASSIGNOR OF ONE-HALF TO LOUIE H. CLARK, OF DENVER, COLORADO.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 506,626, dated October 10, 1893.

Application filed June 30, 1892. Serial No. 438,528. (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 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.

My invention relates to an improvement in bicycles,—the object being to provide simple and efficient means whereby to propel a bicycle by hand power.

A further object is to so construct and arrange the propelling devices that they may be readily started regardless of their relative positions to each other at the time of starting.

A further object is to construct and arrange the propelling mechanism in such manner that the machine can be propelled at various lengths of strokes of the operating handle bars or levers.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a bicycle having my improvements applied thereto. Fig. 2 is a detached view of the propelling mechanism partly in section. Fig. 3 is a plan view illustrating the brace which supports the vertical oscillatory shaft. Fig. 4 is a detail view of the extensible handle bars or operating levers. Fig. 5 is a detail view illustrating the clutch devices of the propelling mechanism. Fig. 6 is an end view of the seat.

A represents the spines of the machine, which carry the rear wheel B at their rear ends, and C is the front fork which carries the front wheel D. The front fork terminates at its top in a shank *a*, at the base of which a shoulder *b* is made for the support of a sleeve *D'*, which encircles the shank *a*. To this sleeve the upper, forward ends of the spines are secured.

To the upper end of the shank *a* an arm or handle *D<sup>2</sup>* is secured, whereby to guide the machine, said arm or handle being retained

in place by means of a nut *c* and washer *c'*, located at the upper extremity of said shank.

Plates or arms *d* are located between the spines A in proximity to the horizontal portion thereof and supports a journal box E, through which the lower end of a vertical shaft F passes and in which a number of balls *e* are located and adapted to encircle said shaft. The interior wall of the journal box E is screw-threaded for the reception of a similarly threaded annular cap *E'* adapted to retain the balls *e* in place in the box. The vertical shaft F extends upwardly to a point within easy reach of the rider, where it is provided with handle bars or levers G, the details of construction of which will be explained farther on.

Projecting from the sleeve *D'* are socketed bosses *f* in which two curved brace arms *f'* are secured, the other ends of said brace arms being inserted in socket bosses *f<sup>2</sup>* projecting from a journal box *E<sup>2</sup>*, through which the vertical shaft F passes. By this means the upper end of the vertical shaft will be supported.

In the box *E<sup>2</sup>*, antifriction balls *e'* are inserted and their escape is prevented by means of an annular cap *e<sup>2</sup>* adapted to screw into the box *E<sup>2</sup>* as shown in Fig. 1.

Secured to and extending across the spines A at a point in rear of the vertical shaft F, is a cross bar *g*, to which a depending spindle *h* is secured, and on the spindle *h* a pulley or wheel *h'* is loosely mounted and provided with grooves *j, j'*. The pulley or wheel *h'* is provided in one face with a recess *h<sup>2</sup>*, in which balls *h<sup>3</sup>* are located, being retained in place by an annular cap *h<sup>4</sup>* adapted to screw into the recess in the pulley.

Mounted loosely on the spindle *h* below the wheel or pulley *h'* and adapted to oscillate with said wheel or pulley, is a pinion or gear wheel *k* which is supported on the shaft by means of a cap *k'* which is screwthreaded to screw into the recess *k<sup>2</sup>* in the lower face of the gear wheel or pinion *k*, and beneath the latter a nut *k<sup>3</sup>* is screwed on the spindle,—motion being imparted to said pinion from a segment *k<sup>4</sup>* carried by the lower end of the shaft F, balls *k<sup>5</sup>* being inserted in the recess *k<sup>2</sup>*.

Depending from the spines A at points located forwardly from the axle of the rear



wheel of the machine, are brackets  $l$  which support fixed shafts or spindles  $m$ . On the spindles  $m$ , sprocket wheels  $o$  are loosely mounted and provided with recesses for the accommodation of balls  $o'$ . The inner faces of the sprocket wheels  $o$  are made with recesses  $o^2$  for the reception of disks  $p$ , which latter are loosely mounted on the spindle  $m$ . The disks  $p$  are made with V-shaped sockets  $p'$  in which dogs  $p^2$  are loosely inserted, said dogs being adapted to have frictional contact with the annular walls  $p^3$  of the recesses  $o^2$  when the disks  $p$  are oscillated in one direction and to be free from contact with said walls when the disks are oscillated in the reverse direction. Thus when the disks  $p$  are made to turn in one direction the sprocket wheels  $o$  will be made to rotate in one direction.

Loosely mounted on the spindles  $m$  and secured to or made integral with the disks  $p$ , are pulleys  $q$ , each having a spiral groove  $q'$ , in which one end of ropes or chains  $r, r'$  are secured and adapted to work. The ropes or chains are passed over the wheel or pulley  $h'$ , and secured and adapted to work in the grooves  $j, j'$ , thereof. To the inner face of each pulley  $q$ , is a coiled spring  $s$  which encircles the spindle  $m$  and at its other end is secured to said spindle. When the disks  $p$  are turned to propel the sprocket wheels  $o$ , these springs serve to assist in returning them to their starting point. The sprocket wheels  $o$  are adapted to transmit motion to sprocket wheels  $t$  carried by the rear wheel of the machine, through the medium of a sprocket chain  $t'$ . From this construction and arrangement of parts it will be seen that when the vertical shaft  $F$  is oscillated by the manipulation of the handle bars or levers  $G$  the same motion will be imparted to the segment  $F^3$ , and from it to the pinion  $k$  and pulley or wheel  $h'$ , from which motion is imparted to the clutches through the medium of the ropes or chains  $r, r'$ .

By means of the driving mechanism above described the rear or drive wheel will be made to revolve rapidly with a comparatively small amount of exertion on the part of the rider.

A seat post 1 projects upwardly in proximity to the rear wheel of the machine, to the upper end of which a hollow goose neck 2 is adjustably secured. The horizontal portion of the goose neck or support 2 is flattened and made with an elongated slot 3. A plate 5 is located on the flattened portion of the goose neck and adjustably secured thereto by means of a bolt 6 passing through the elongated slot 3. Secured at its forward end to the plate 5 is a curved spring 7, to the free end of which the rear end of the seat 8 is secured. Secured to the plate 5 at a point between its ends is a semi-elliptical spring 9, said spring being held by the bolt 6. To the ends of the semi-elliptical spring 9, the laterally projecting portions of the seat are secured.

The handle bar or lever  $G$  is preferably made tubular and is provided in its upper portion with elongated slots  $G'$ , which extend from points in proximity to the vertical shaft  $F$  to the extremities of the handle bars  $G$ . Within the hollow handle bars  $G$  are tubular bars  $G^2$ , on the top faces of which notched plates  $G^3$  are secured and adapted to project into or through the elongated slots  $G'$ . A ferrule  $G^5$  is placed on the outer extremity of each handle bar  $G$  and provided with a recess  $G^4$  for the accommodation of the notched plates  $G^3$ . On the outer ends of the bars  $G^2$ , handles  $G^6$  are secured. Secured to the vertical shaft  $F$  is a spring or springs  $G^7$ , having teeth  $G^8$  at their outer ends adapted to engage the notched plate  $G^3$ . By this means the handle bars are made extensible, and they can be readily made longer or shorter by the rider while riding. The bars  $G^2$  will be prevented from turning in the tubular bars  $G$  by the notched plate  $G^3$  entering the elongated slots  $G'$ .

The machine is very simple in construction, easy riding and effectual in the performance of all its functions.

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

1. In a bicycle, the combination with a frame, drive wheel having sprocket wheels on its axle, loosely mounted sprocket wheels, chains extending from the latter around the wheels on the axle, and clutch mechanism for alternately engaging the loosely mounted sprocket wheels, of an upwardly projecting oscillatory shaft having handles at the upper end and a segment at its lower end, a pulley or drum, a flexible connection extending from the latter to the clutches, and a gear wheel connected with the pulley or drum, its teeth adapted to be engaged by the teeth of the segment, substantially as set forth.

2. In a bicycle, the combination with the spines, of a journal box carried thereby, balls located within said journal box, a vertical shaft passing through said journal box, a journal box having balls therein through which the upper end of the vertical shaft passes, braces connecting the last mentioned journal box with the shank of the front fork of the machine, and means for transmitting motion from said shaft to the rear wheel of the machine, substantially as set forth.

3. In a bicycle, the combination with the spines and the front fork, of a vertical shaft, a journal box for said shaft located near its upper end and having balls therein, curved brace arms connecting said journal box with the shank of the front fork and means for transmitting motion from said vertical shaft to the rear wheel of the machine, substantially as set forth.

4. In a bicycle, the combination with a shaft or upright, of tubular horizontal bar at the upper end thereof, said bar having elongated slots therein, notched bars located with said



5 tubular bar, handles secured to said notched bars, and a spring secured to the shaft or upright and having teeth therein to engage the notched bar, substantially as and for the purpose set forth.

10 5. In a bicycle, the combination with a shaft or upright, of a tubular handle bar at the upper end thereof, said bar having elongated slots therein, bars located with said tubular bar and adapted to slide therein, handles secured to the sliding bars, a notched plate secured to said sliding bar and adapted to project into the slots in the handle bars, a spring

secured to the shaft or upright and having teeth to engage the notched plate, and ferrules 15 at the ends of the handle bars, said ferrules having recesses for the accommodation of the notched plates, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscrib- 20 ing witnesses.

ALEXANDER H. CLARK.

Witnesses:

PHILIP B. WAHL,  
B. B. CLAWSON.