

(No Model.)

A. TREMBLAY.  
BICYCLE.

No. 482,856.

Patented Sept. 20, 1892.

Fig. 1.

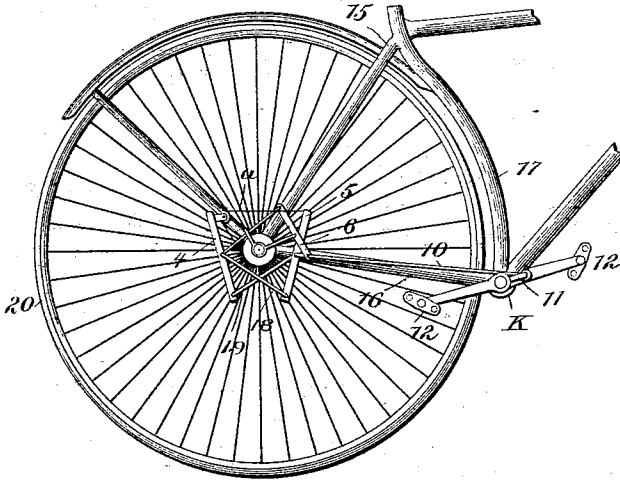


Fig. 2.

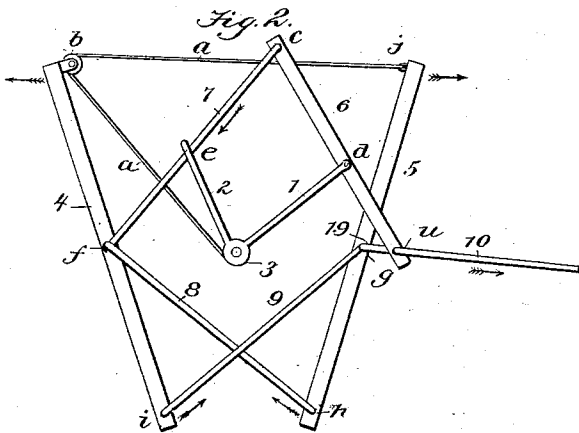


Fig. 3.

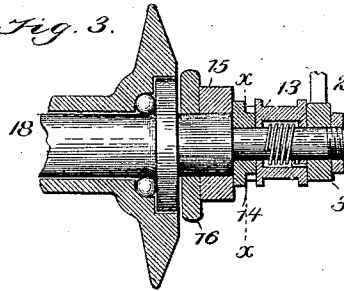


Fig. 4.

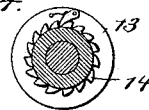
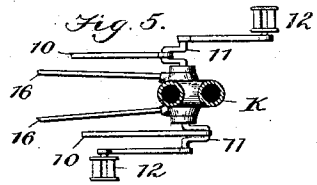


Fig. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

ALFRED TREMBLAY, OF HOLYOKE, MASSACHUSETTS.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 482,856, dated September 20, 1892.

Application filed February 10, 1892. Serial No. 420,946. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED TREMBLAY, a citizen of the United States of America, residing at Holyoke, in the county of Hampden and State of Massachusetts, 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 to bicycles; and it consists of an improved method of connecting the pedal-shaft and driving-wheel.

The object of my invention is to increase the speed of such vehicles without the use of additional force to propel them.

In the accompanying drawings, Figure 1 is a side view of an ordinary bicycle, showing my improved leverage system and crank connections attached. Fig. 2 is a side view of my improved system of leverage when disconnected from the wheel. Fig. 3 is a longitudinal section showing the manner of journaling the several parts on the axle of the driving-wheel. Fig. 4 is a side view taken on the line *x x* of Fig. 3, showing the ratchet-wheel on the side of the drum with engaging-pawl. Fig. 5 is a detail showing a part of the frame in section and the crank and pitman connections.

Like letters and figures indicate corresponding parts in the several views.

The principle parts of my invention are illustrated in Fig. 2, in which a system of levers are pivoted in the manner hereinafter described and adapted to be attached to the axle of the driving-wheel of a bicycle, as shown in Figs. 1 and 3, each side of the wheel being provided with a similar outfit. The arms 1 and 2 are connected at 3, where they form a journal-bearing for attaching the system of levers to the axle of the driving-wheel. These arms may be formed of or cast in an integral piece, as shown in the drawings, or they may be made separately and attached to the part 3 by means of screws or in any suitable manner. To the arm 1 there is pivoted a lever 6 at *d*. This lever connects with the rod 7, which passes freely through an opening in the end of arm 2 at *e* and connects with lever 4 at *f*, at which point there is also connected one end of a rod 8, the other end connecting to lever 5 at *h*, a similar rod 9 being pivoted to levers 4 and 5 at *i* and *g*. To

the upper end of lever 5 is fastened a strap *a* at *j*. This strap passes back and over a pulley at *b*, located in a bifurcated bearing on the end of lever 4, passing thence down to the axle, where it connects with a drum 13, as shown in Fig. 3, upon which it is wound by the action of a spring, the drum connecting by means of a pawl and ratchet with the axle 18 of the driving-wheel.

Numbers 15 and 16 indicate the journaling of the ordinary framework of a bicycle, its pedal-shaft being journaled in the frame at *k* and provided with cranks 11, as shown in Fig. 5, to which pitman-rods 10 on both sides of the wheel are attached, the other ends of said rods connecting with the lower end of levers 6.

The operation of the device is as follows: When one of the cranks 11 is given a forward movement by the pedal 12, the corresponding one on the opposite side will be given a reverse movement. The movements of the cranks 11 will be imparted to their respective pitmen 10 and will be communicated by them to levers 5 in the following manner: The pitmen 10 connect first with levers 6 at *u*, and then pass on to levers 5 through the connecting-links 19, so that the forward movement of either of the cranks 11 will be imparted directly to levers 5 and cause them to pivot on the end of rods 8 at *h*, which will give their ends at *j* a forward movement. At the same time the connections of the pitmen 10 with levers 6 will cause these levers to pivot on their connections with arms 1 at *d*, depressing the ends at *c* and communicating their movement to rods 7, which will cause the levers 4 to move outward at *b* and to pivot on the ends of rods 9 at *i*. The pivot-points *h* and *i* also have a movement inwardly, as indicated by the arrows. This movement causes levers 4 and 5 to pivot on rods 8 and 9 at *f* and *g*, thus giving additional movement to the ends *j d* of said levers, drawing the straps *a* off the drums and imparting a rotary movement to the wheel by means of the connecting ratchets and pawls. The opposite movement of the pedals will reverse the movements of the levers, and the springs in barrels 13 will cause them to take up the straps as the levers are closed by the action of the pitman-rods 10. It will be observed that the cranks 11 are set so that when the wheel is

being propelled from one side the strap can be taken up upon the opposite side, and vice versa. It is proposed to adjust the levers so that a half-turn forward of the pedal-crank will give two rotations to the driving-wheel, so that the joint action of both will impart to said wheel four rotations; but this ratio may be changed and a greater or less number of rotations be given by each turn of the pedal-crank by adjusting the lever-fulcrums to correspond to the required speed, the object being to get the greatest speed with the least expenditure of force and without increasing the manual work of operating the pedals.

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

1. In a system of leverage for imparting a rapid rotary movement to bicycles and other

20 vehicles propelled by manual force, the com-

25 bination of the levers 4 and 5, connecting-rods 7, 8, and 9, with the pitman-levers 6, pitmen 10, and arms 1 and 2, having central bearings, substantially as described.

2. In a manually-operated vehicle, the pedal 12, cranks 11, and pitmen 10, in combination with levers 4, 5, and 6, arms 1 and 2, and the connecting-rods 7, 8, and 9, substantially as described, and for the purpose specified.

3. In a manually-operated vehicle, levers 4 5 6, pitmen 10, cranks 11, pedals 12, with the drums 13 and connecting mechanism, substantially as described.

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

ALFRED TREMBLAY.

Witnesses:

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JOSEPH TREMBLAY, Jr.