(No Model.)

G. D. FERRIS.

BICYCLE.

No. 354,777. Patented Dec. 21, 1886.

Fig. 1.

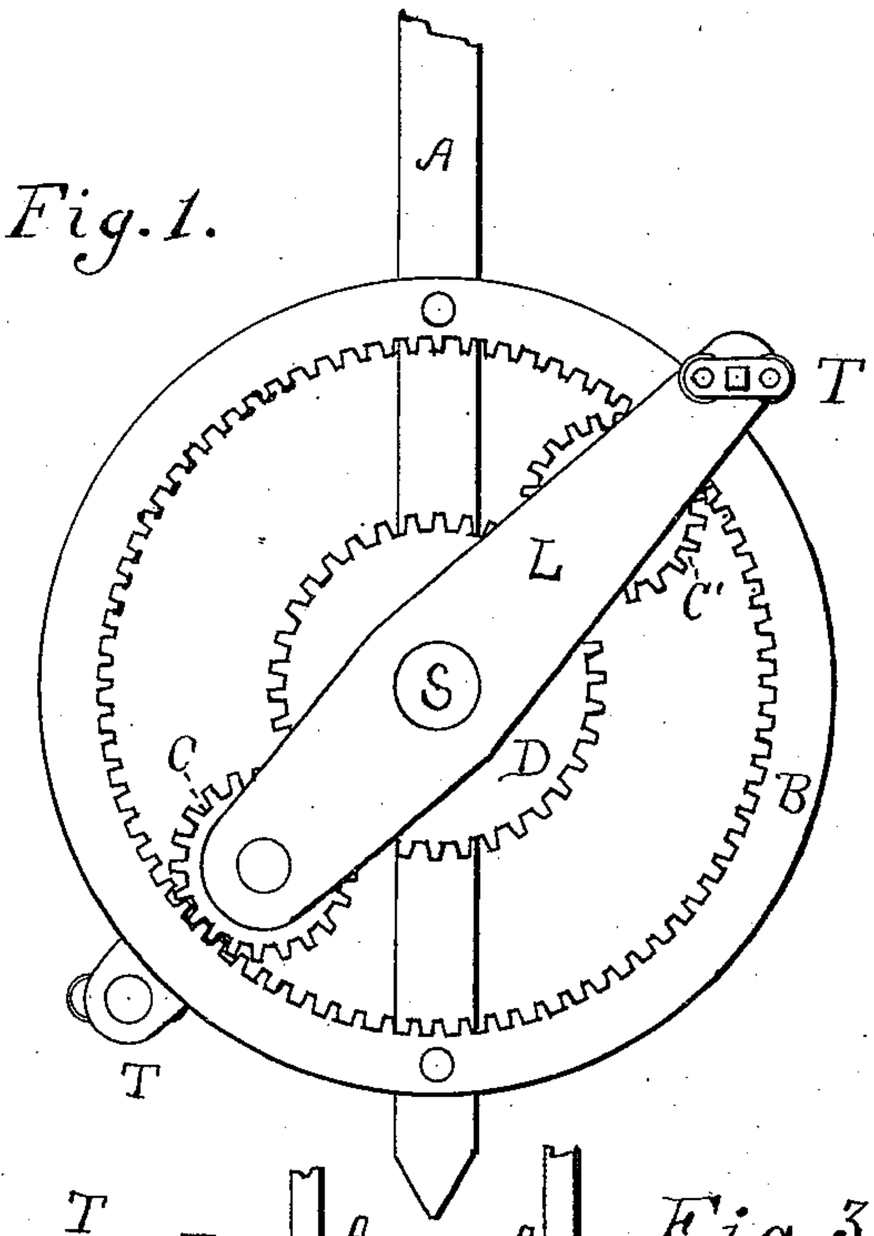


Fig. 2.

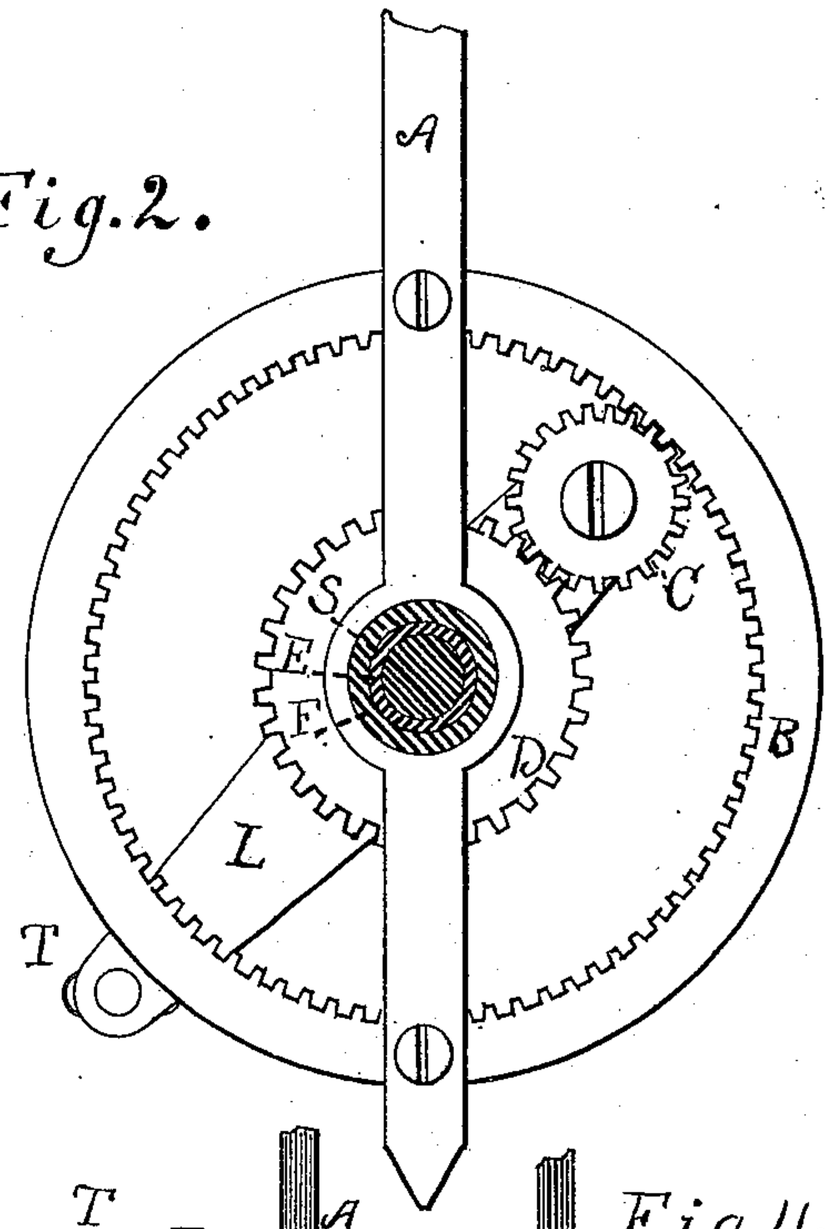


Fig. 3.

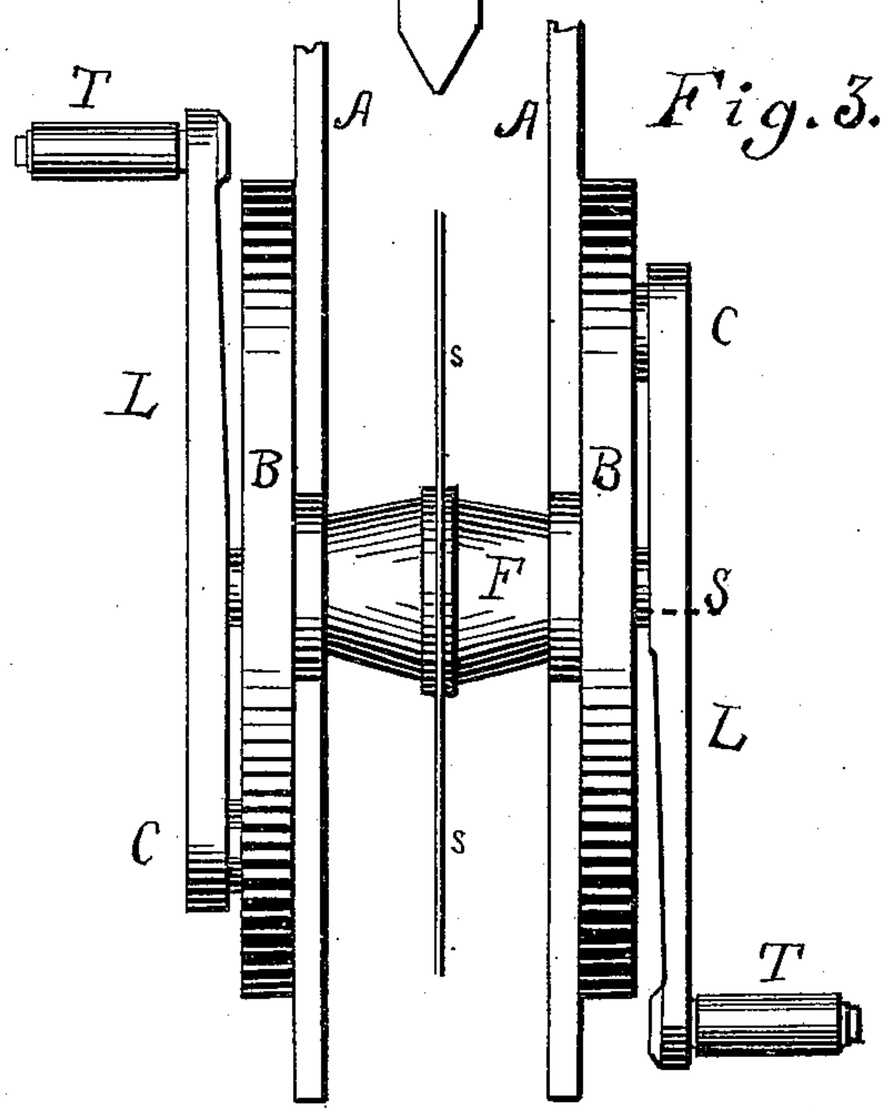
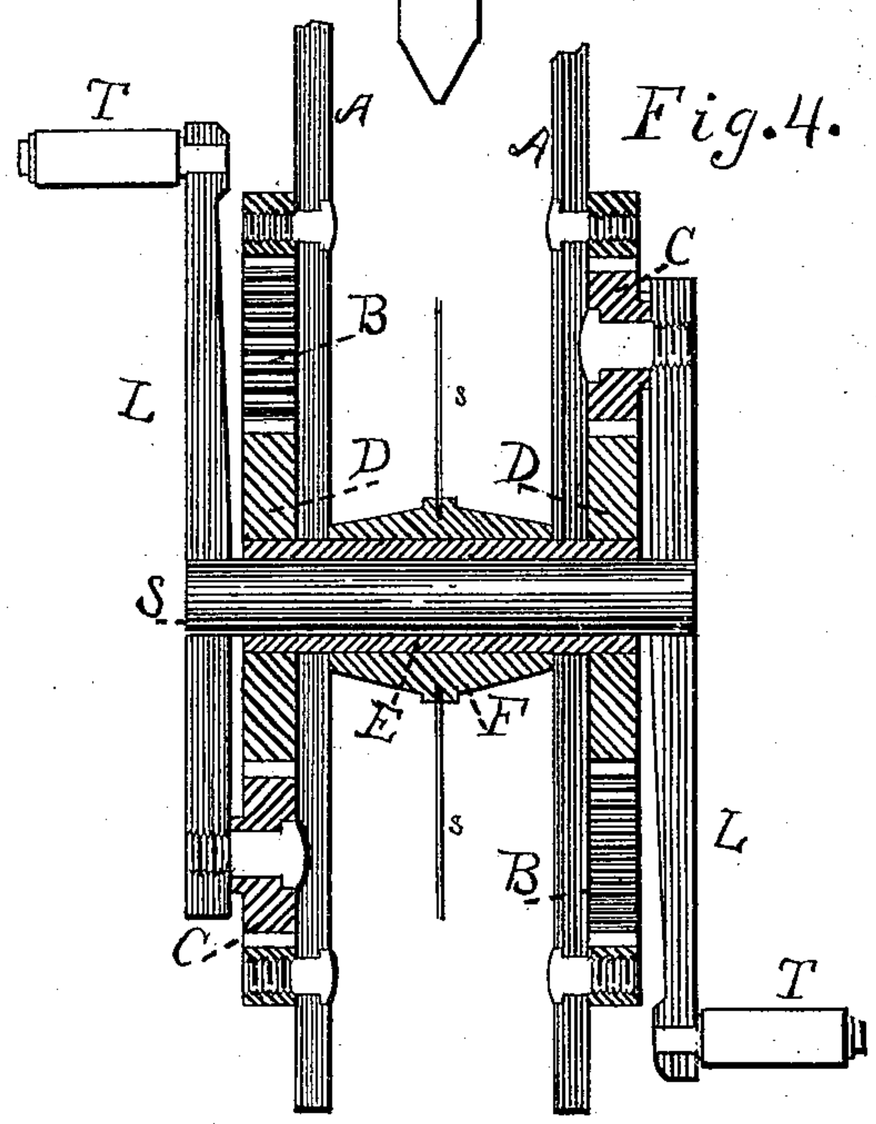


Fig. 4.



Witnesses:-
Benjamin H. Crouse.
Geo. W. Bullard.

Inventor:-
George D Ferris

UNITED STATES PATENT OFFICE.

GEORGE D. FERRIS, OF SPRINGFIELD, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 354,777, dated December 21, 1886.

Application filed August 28, 1886. Serial No. 212,067. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. FERRIS, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Improvement in Bicycle-Wheels, of which the following is a specification.

This invention has for its object to provide novel gearing for revolving the propelling-wheel of a bicycle; and it consists in the combination, with the arms comprising the yoke or fork of a bicycle, of two disks secured, respectively, to said arms, and each having an internal annular row of teeth, a sleeve journaled in the arms and carrying the propelling-wheel, which travels on the surface to be traversed, a gear-wheel attached to each end of the sleeve, a shaft extending through the sleeve, two levers mounted, respectively, intermediate their ends on the ends of the shaft, a crank at one end of each lever, and a pinion journaled on the other end of each lever, said pinions meshing with the gear-wheels on the sleeve and with the annular rows of teeth of the disks, whereby the rotation of the crank-levers with the shaft causes the pinions to be revolved by the toothed disks, and such pinions revolve the gear-wheels, sleeve, and driving-wheel for propelling the bicycle at great speed.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a side elevation of the driving-gear, showing the lower end portions of a bicycle fork or yoke and a part of the propelling-wheel; Fig. 2, a transverse sectional view through the shaft and sleeve at one side of the propelling-wheel; Fig. 3, a front elevation, and Fig. 4 a longitudinal sectional view through the fork or yoke.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, where—

The letters A indicate the arms comprising the fork or yoke of a bicycle, which in practice is usually provided with a post at its upper end journaled in the backbone or reach and connected with the steering-handles. These parts, however, being of well-known construction, it is not deemed necessary to illustrate them in the drawings.

To the outside of each arm A is rigidly secured, by screw-bolts or otherwise, a disk or ring, B, having an internal annular row of teeth, and in the arms is journaled a sleeve, E, carrying at each end a rigidly-attached gear-wheel, D, for which purpose the ends of the sleeve project beyond the outside of the arms. A shaft, S, extends through the sleeve and projects beyond the ends thereof, and on each projecting end is mounted a lever, L, such levers being secured to the shaft intermediate their ends, so that each lever comprises two parts extending in opposite directions from the shaft. To one end of each lever is journaled, by a suitable stud, a pinion, C, and to the opposite end of each lever is secured a crank, T, the pinions meshing, respectively, with the gear-wheels on the sleeve and with the internal annular rows of teeth of the disks. By revolving the levers through the medium of their cranks the pinions C are caused to traverse the teeth of the disks B, and are thereby revolved on their axes, and such revolving movement is directly transmitted to the gear-wheels D, thus revolving the sleeve E and the propelling-wheel *s*, the hub F of which is secured to the sleeve. The propelling-wheel is thus caused to rotate on the surface to be traversed and the bicycle propelled with considerable speed without undue exertion.

I am aware of Letters Patent No. 293,081, and do not wish to be understood as claiming what is therein disclosed, as such is not my invention.

Having thus described my invention, what I claim is—

1. The combination, with the arms comprising the fork or yoke of a bicycle, of two internally-toothed disks secured, respectively, to said arms, a sleeve journaled in the arms and carrying the propelling-wheel, which travels on the surface to be traversed, a gear-wheel attached to each end of the sleeve, to revolve therewith, a shaft extending through the sleeve, two levers mounted, respectively, intermediate their ends on the ends of the shaft, a crank at one end of each lever, and a

pinion journaled on the opposite end of each lever, said pinions engaging the gear-wheels and the internally-toothed disks to propel the bicycle by the revolution of the crank-levers, substantially as described.

2. The combination of the two stationary and internally-toothed disks, a sleeve carrying a propelling-wheel, a gear-wheel secured to each end of the sleeve, to revolve therewith, a shaft extending through the sleeve, two levers mounted, respectively, intermediate their ends on the ends of the shaft, a crank at one end of each shaft and a pinion at the opposite end of each shaft, said pinions engaging the internally-toothed disks and the gear-wheels to revolve the propelling-wheel by the revolution of the crank-levers, substantially as described.

In testimony whereof I have affixed my signature in the presence of two witnesses.

GEORGE D. FERRIS.

Witnesses:
G. B. THORNBERRY,
BENJAMIN F. CROUSE.