No. 631,208. Patented Aug. 15, 1899.

D. C. FRAZEUR.

GEARING.

(Application filed Jan. 24, 1898.)

(No Model.)

Fig. 1.

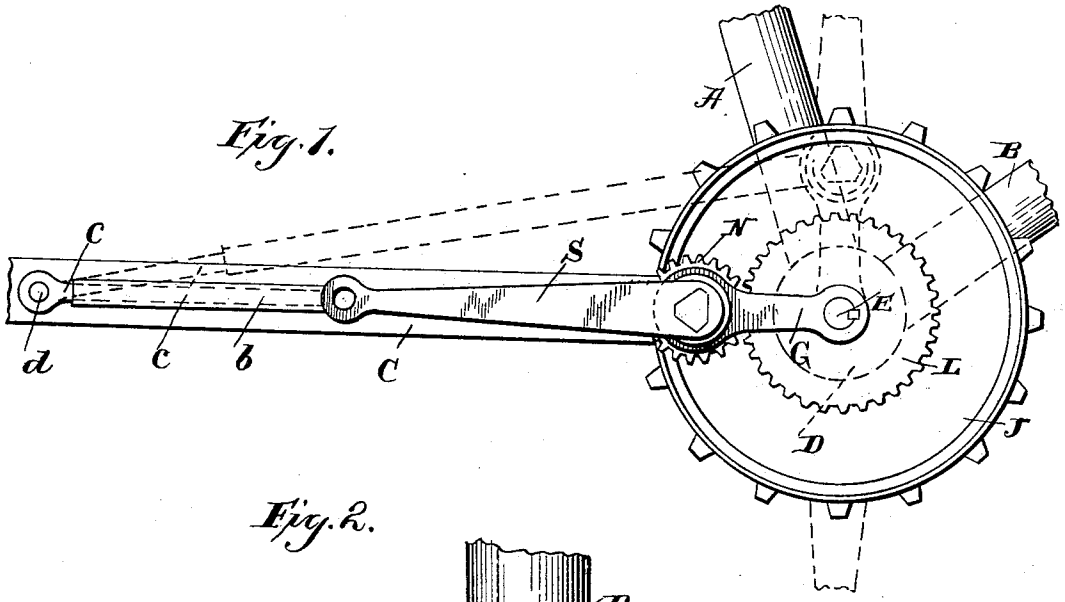


Fig. 2.

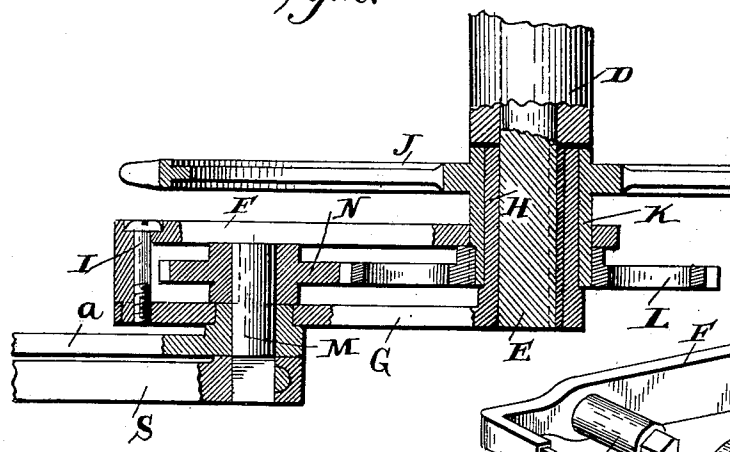
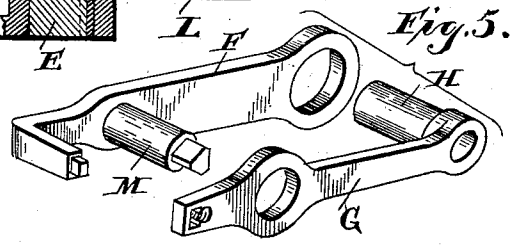


Fig. 5.



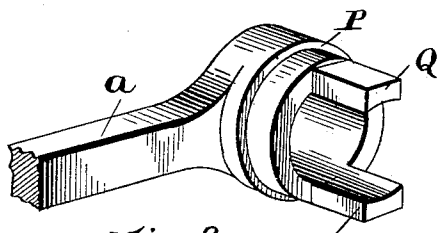


Fig. 3.

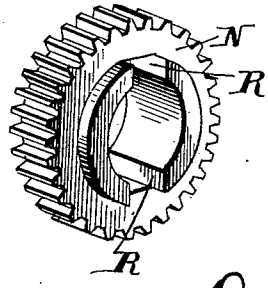


Fig. 4.

Witnesses
Geo. E. Fuch.
B. E. Seitz

Inventor
David C. Frazeur,
by A. S. Pattison,
Attorney.

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

UNITED STATES PATENT OFFICE.

DAVID C. FRAZEUR, OF NEW MARKET, NEW JERSEY.

GEARING.

SPECIFICATION forming part of Letters Patent No. 631,208, dated August 15, 1899.

Application filed January 24, 1898. Serial No. 667,694. (No model.)

To all whom it may concern:

Be it known that I, DAVID C. FRAZEUR, of New Market, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Gearing; 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 pertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in gearing, and pertains to an improved gearing more especially intended for use in connection with bicycles, though it may be used in other connections to which it is adapted, all of which will be described hereinafter and particularly referred to in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my invention, showing a portion of a bicycle-frame to which it is applied. Fig. 2 is an enlarged longitudinal sectional view of the gearing. Fig. 3 is a detached perspective view of the inner end of the pitman which coacts with the pinion. Fig. 4 is a detached perspective view of the pinion. Fig. 5 is a detached perspective view of the U-shaped frame.

Referring now to the drawings, A indicates the saddle-post of a bicycle-frame, B the front reach-bar, C the rear fork, and D the crank-hanger, all of which are of the ordinary construction, though they may vary without affecting in any manner my invention.

E is the crank-shaft, which is journaled in any desired manner in the crank-hanger. Attached to one end of the crank-shaft E in any suitable manner and made fast thereon is a U-shaped frame or housing F, the outer portion G thereof being preferably detachable and provided with an inwardly-extending sleeve H, which is keyed to the shaft, its outer end being connected with the inner portion of the frame through the medium of a bolt or screw I, for a purpose to be presently described. The sprocket J is journaled in any suitable way upon the sleeve H of the said U-shaped frame, and this sprocket is provided with an outwardly-projecting sleeve or flange K, which passes loosely through the inner end of the inner side of the U-shaped frame F and has attached to its extremity through the medium of a key or otherwise a gear-wheel L. This gear-wheel L is thus supported and rotates with the U-shaped frame, as clearly illustrated, and being made fast to the sprocket-wheel through the medium of its flange K causes the sprocket to rotate when the wheel is rotated, as will be readily understood. The U-shaped frame is provided with a journal or bearing pin M, projecting, preferably, from the inner side of the frame and through its outer side, as shown. Upon this pin between the sides of the U-shaped frame is journaled a pin N. Also placed upon this pin or journal M is a sleeve P, provided with inwardly-projecting arms Q, which extend into recesses R of the pinion N, thus locking the pinion and the sleeve together against relative rotation. The bearing or pin M is made rigid with the U-shaped frame and, as before explained, passes through the pinion and through the sleeve P and projecting outward beyond the sleeve P, to which the crank S is keyed in the usual or any desired manner, whereby the crank and the U-shaped frame are made rigid, causing the U-shaped frame to form a part practically of the crank from the action of the shaft E as a lever, so that in practice the leverage obtained is from the center or axis of the shaft E to the outer end of the crank S, which will carry the usual pedal-pin and pedal. Rigidly connected with the sleeve P is a pitman *a*, extending rearward and carrying a hollow bar or tube *b*. A rod *c* extends within this tube *b* of the pitman *a* and is pivoted or swiveled to the rear part C of the bicycle-frame at the point *d* in any suitable manner. This rod *c* is made of a length not less than and preferably greater than twice the distance from the center of the bearing or pin M (which is the axis of the sleeve P) to the center or axis of the shaft B. In operation as the U-shaped frame is carried around through the medium of the crank S the pitman is held against a corresponding revolution through the medium of this rod *c*, which travels back and forth in the tube *b* of the pitman *a*, as will be readily understood, and,

as will also be readily understood, through the medium of this arrangement the pinion N is held against rotation. By this construction the sprocket-wheel J is given one and a half revolutions to every revolution of the crank-shaft, owing to the fact that the diameter of the pinion N is one-half the diameter of the gear L, which is attached to and rotates the sprocket. This relative movement, however, may be varied at will, as will be readily understood, by a relative increase or decrease of the diameters of the pinion N and the gear L. For instance, instead of having the pinion N one-half the diameter of the gear-wheel L the gear-wheel L and pinion N may be made of the same diameter, and in this case the gear-wheel, and consequently the sprocket J, will be given two revolutions to every one revolution of the crank-shaft.

From this description it will be seen that I am enabled to provide a relative increase in the rotation of the sprocket J as compared to the rotation of the crank S as may be desired. The construction is a simple and yet exceedingly effective way of increasing the relative rotation of the sprocket and the crank-shaft.

While I have described and shown my invention as especially applicable and intended for use in connection with a bicycle, it will be readily understood that it may be used in other connections to which it may be adapted without varying or departing from the spirit or scope of my invention.

While I here show a crank S attached to the journal or pin M, carried and made fast to the frame F, for increasing the leverage, it will be readily understood that a pedal or handle may be connected directly with the sleeve P of the pitman. In this event, however, should the pinion and gear remain of the size here shown the leverage of course would not be as great as the attachment of a pedal or handle to the crank S. However, in order to provide for this the diameters of the pinion and gear L may be increased and thus increase the length of the frame F, and in this event the connection of the pedal or handle directly to the sleeve P of the pitman will give the desired leverage according to the length of the frame F, as will be readily understood. In this construction as in the other construction here shown and before fully described the relative size of the pinion and gear may be varied at will for the purpose of increasing or decreasing the relative rotation of the frame and the sprocket-wheel.

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

1. An improved gearing comprising a sprocket or drive-wheel having a laterally-extending sleeve, a gear made fast to said sleeve, a rotating frame or arm concentric with the drive-wheel or sprocket and rotating independent thereof, a pinion journaled upon the said frame or arm, the journal of the pinion extending through the frame or arm, a sleeve upon the pinion-journal engaging the pinion and holding it against rotation, a pitman connected with the sleeve at one end and having its other end held against rotation, and means connected with the pinion-journal or frame for rotating the said frame, substantially as described.

2. An improved gearing comprising a sprocket or drive-wheel, having a laterally-extending sleeve, a U-shaped frame having its outer side provided with an oppositely-extending sleeve projecting within the sleeve of the sprocket, a drive-shaft made fast to the frame-sleeve, a gear made fast to the sprocket-sleeve at a point between the sides of the U-shaped frame, the inner ends of the inner sides of the frame rotating loosely around the sleeve of the sprocket, a pinion carried by and loosely journaled upon the U-shaped frame and meshing with the gear, a pitman holding the pinion against rotation, and means for revolving the frame around the said gear, substantially as described.

3. A gearing comprising a drive-shaft, a frame made fast to said drive-shaft, a sprocket loose in relation to the drive-shaft and having a laterally-projecting sleeve, a gear rigidly connected with the said sprocket-sleeve, a pinion loosely mounted upon and carried by said frame, the pinion having a rigid shaft projecting through the frame, a sleeve upon the pinion-shaft independent of but interlocking with the said pinion, a pitman connected rigidly to said sleeve and having a pivotal and sliding connection at its opposite end, and an operating member rigidly connected with the pinion-shaft at a point outside of said sleeve, substantially as described.

4. A gearing comprising a drive-shaft, a U-shaped frame having its outer wall provided with an inwardly-projecting sleeve rigidly connected with said drive-shaft and passing through the inner wall of said frame, a sprocket loose upon said frame-sleeve and having an outwardly-projecting sleeve passing through the inner wall of the U-shaped frame, a gear connected with the sprocket-sleeve between the walls of the said frame, a pinion loosely journaled upon and carried by said frame, said pinion having a shaft passed therethrough and extending through the outer wall of the said frame, a sleeve loose upon the projecting portion of the pinion-shaft, the abutting faces of the sleeve and the pinion having interlocking members, and an operating member rigidly connected to the projecting ends of the pinion-shaft outside of said sleeve, a pitman rigidly connected with the sleeve at one end and its opposite end having a pivotal and longitudinal connection, substantially as described.

5. A gearing comprising a drive-shaft, a U-shaped frame having a removable outer wall, the end of said removable outer wall having an inwardly-projecting sleeve passing

through the inner wall of the frame, a sprocket loose upon the inner projecting end of said sleeve and itself provided with an outwardly-projecting sleeve passed through the inner wall of said frame, a gear fast upon the sprocket-sleeve at a point between the inner and outer walls of the frame, a pinion journaled upon and carried by the said frame, the pinion having a rigid shaft projecting through the outer removable wall of said U-shaped frame, a pitman having one end loose upon the projecting end of the pinion-shaft, and having an inwardly-projecting member interlocking with said pinion, the opposite end of the pitman having a pivotal and longitudinal supporting connection, and an operating member rigidly secured to the projecting end of the pinion-shaft at a point outside of said pitman, substantially as described.

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

DAVID C. FRAZEUR.

Witnesses:
A. S. PATTISON,
GEO. E. FRECH.