(No Model.) 2 Sheets—Sheet 1.

# D. C. FRAZEUR.

## POWER TRANSMITTING MECHANISM.

No. 521,108. Patented June 5, 1894.

Fig. 1.

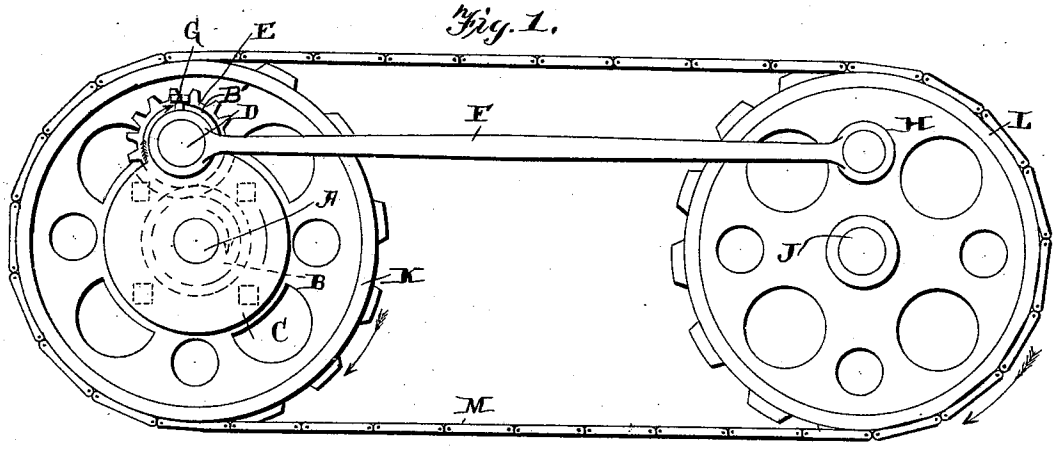



Fig. 2.

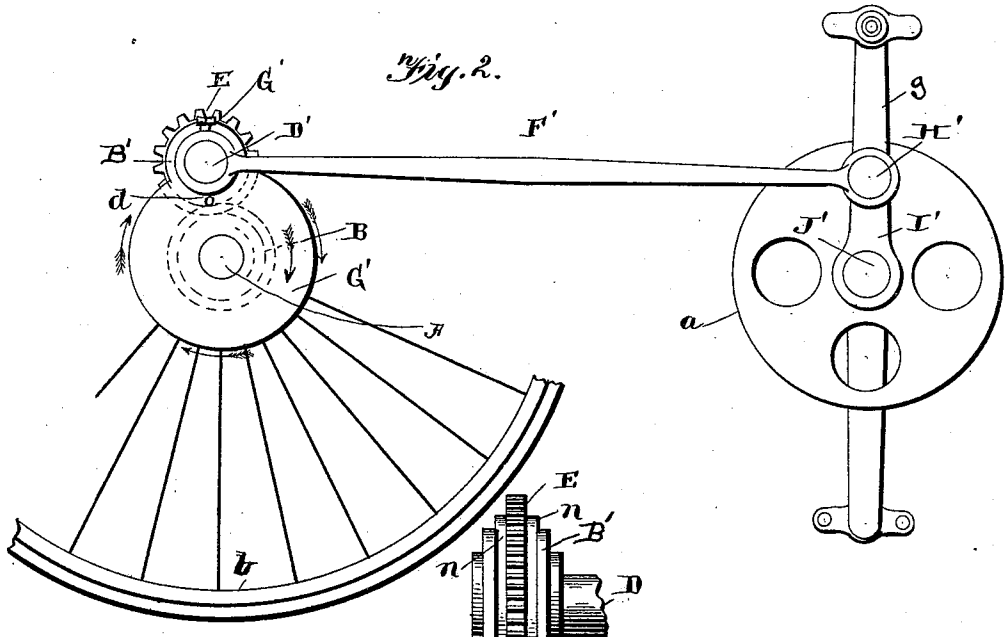



Fig. 3.

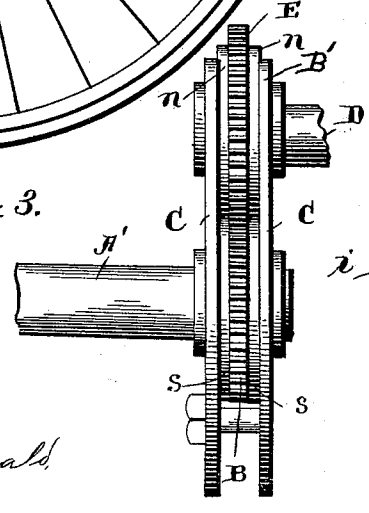
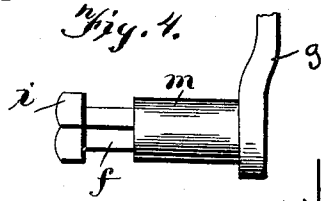



Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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## POWER TRANSMITTING MECHANISM.

No. 521,108. Patented June 5, 1894.

Fig. 5.

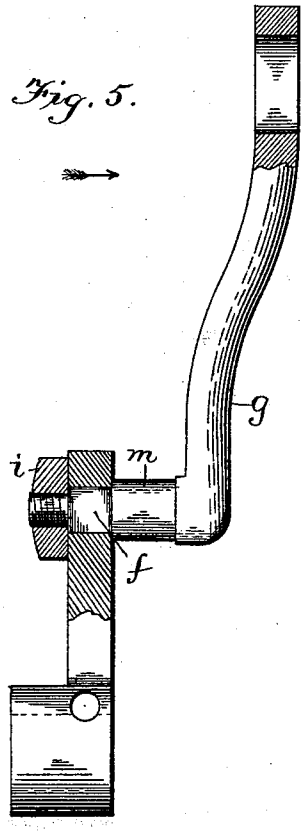
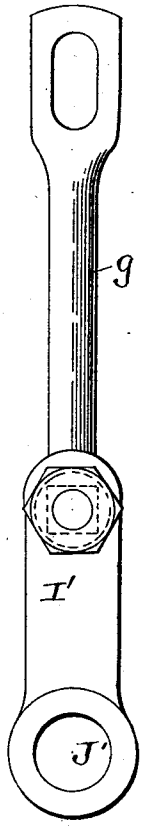



Fig. 6.

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# UNITED STATES PATENT OFFICE.

DAVID C. FRAZEUR, OF NEW MARKET, ASSIGNOR OF ONE-HALF TO JOHN A. FRECH, OF SOMERVILLE, NEW JERSEY.

## POWER-TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 521,108, dated June 5, 1894.

Application filed April 15, 1893. Serial No. 470,528. (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 Power-Transmitting Mechanisms; 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 it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in power transmitting mechanisms, which will be fully described hereinafter and particularly pointed out in the claims.

The objects of my invention are to provide a power transmitting mechanism for increasing speed, and to construct the same so that the speed increasing gear can be disconnected from the driving crank to decrease the speed and thereby obtain greater leverage; and to so construct the said mechanism that the pitman will not be caught on a center.

In the accompanying drawings Figure 1 is a side elevation of a mechanism embodying my invention, showing it adapted to be used in connection with any kind of machinery. Fig. 2 is a side elevation showing it especially adapted to be used in connection with the driving gear of a bicycle. Fig. 3 is an end view of the casing which contains the gearing. Fig. 4 is a detached view of the crank and its pin. Fig. 5 is a detached enlarged view of the crank, partly in section. Fig. 6 is a detached side view of the same.

The construction of my invention whereby the above described results are carried out consists of the driving shaft A, to which is connected a pinion or gear B, by means of a key or other well known mechanical device. Loosely journaled upon this shaft A is a casing C, which preferably though not necessarily consists of two parallel plates, as clearly shown in Fig. 3, one of said plates being at either side of the said pinion B. The casing C is provided at one edge with laterally extending ears B′, in which is loosely journaled a shaft D. Attached to this shaft D and rigidly held thereon by means of a key is a gear or pinion E which meshes with the gear or pinion B. The shaft D has one end to extend out a suitable distance beyond the outer side of the casing, and rigidly connected to this extending end is a pitman F, so that as the casing is revolved, the pitman F will prevent the wheel E from revolving, in a manner to be fully described presently. The opposite end of this pitman F is loosely placed upon a pin or journal H which extends outward from the crank or wheel I, which is rigidly attached to the shaft J. A set screw or other suitable device G is used for firmly connecting the adjacent end of the pitman F to the shaft D which is journaled in the casing C as herein mentioned. As here shown the pinions B and E are of the same diameter, from which it will be readily understood that if the casing C which is freely journaled upon the shaft A be held stationary, and the shaft D carrying the pinion E revolved, the pinion B will be given one revolution to every revolution of the pinion E.

Now the object of my invention is to increase the revolution of the pinion B once to every revolution of the casing C. This is accomplished by rigidly connecting the adjacent end of the pitman F to the shaft D as above stated, and have the pitman F revolve the casing C, while the wheel E has no revolution whatever, but is simply carried around by the casing C. I find that by carrying the casing around the pinion B which is rigidly attached to the driving shaft A, and holding the pinion E against revolution the pinion B instead of being given a single revolution as would otherwise be the case is given two revolutions to every revolution of the casing C, thus adding one revolution to that which would be given the wheel B if the gear E was merely connected to the casing C so that it would not revolve, and the casing C revolved. It will be noticed that while the pinion or wheel E has no revolution, it is constantly changing its relative position to the position of the casing C as it is being revolved, and owing to this, one revolution is added to that which would otherwise be given the wheel B, thus increasing the speed thereof as before stated to make two revolutions to each revolution of the casing C.

Power is preferably applied to the shaft J

or directly to the pin or journal H and transmitted through the pitman F to the shaft D to which the pitman is rigidly attached. However I do not limit myself to this application of the power for it may be applied directly to the journal or shaft D, the same results being accomplished as long as the pitman F has its opposite end traveling in a circle corresponding to the circle traveled by the pinion E. I also desire to attach to the casing C a sprocket K around which a sprocket chain or belt *m*, passes from the sprocket L upon the shaft J. One advantage of this construction is that when the sprocket L is being driven, the pitman F can never be caught upon a dead center as it might otherwise be if the sprocket and belt gearing were not used between the casing C and the sprocket F.

While I have described the wheels E and B as being of the same diameter, if desired the wheel E may be made as much larger than the wheel B, according to the desired increase of speed, and to this increase is added still another revolution owing to the construction hereinbefore described.

If it be desired to decrease the revolutions of the wheel B, and the shaft A in proportion to the revolutions of the wheel E, the wheel B can be made larger than the wheel E, thus decreasing the speed of the wheel B in proportion to the decrease of speed of the wheel E relative to the wheel B. However in this event as in the other described, to this decrease is added yet an increase of one revolution owing to the casing C revolving around the wheel D and carrying the wheel E which is held against revolution.

In order to prevent a jerking motion caused by the momentum and centrifugal force of the weight of the wheel E and its shaft when the casing is revolved at a high rate of speed, I will provide a counterweight at the opposite side of the casing C from the wheel E, and this may be applied directly to the casing or applied to the sprocket wheel K as may be found most desirable.

In Fig. 2 I show my invention especially applicable to bicycles. From this figure it will be seen that the shaft J′ which is the equivalent of the crank shaft in the ordinary bicycle, carries the crank I′ which is either separate or formed as a part of the wheel *a*, that is attached to the shaft J′, which causes a smoother revolution than would be the case if the crank alone was used. The rest of this mechanism is identically the same as that shown in Fig. 1, with the exception that the sprocket wheel K is omitted, for which there is no use when being applied to bicycles. So also the shaft A is rigidly attached to the hub of the wheel so that as the shaft A is revolved by its pinion which is attached thereto, the wheel is revolved therewith, and this wheel is given two revolutions to every revolution of the casing and shaft J′, when the pinions are of the same diameter. From this it will be seen that when applied to a bicycle I am enabled to do away with the sprocket chain which is thought by many to be objectionable, and yet by means of a pitman to give an increased motion. When applied to bicycles as just stated an increase of motion is given, but if it is desired to increase the power and thus decrease the motion for climbing hills, it is only necessary to loosen the set screw which holds the pitman to the shaft D′, and attach the wheel E′ to the casing C′, by means of a pin *d*, which passes through the casing and the wheel, or by any other mechanical device. In this event the pitman F instead of holding the wheel E, against revolution, allows a free revolution of the shaft D′, within the pitman so that as the casing is revolved the pinion B′, and the shaft A′, instead of being revolved two or more revolutions to every revolution of the casing C′, is only revolved one revolution, or in other words one revolution to every revolution of the crank shaft to which the power is applied through the medium of the pedals. Owing to this fact an increase of leverage is obtained for climbing hills or for riding over very rough or muddy roads at the will of the rider by simply loosening the pitman F′, upon the shaft D′, and attaching the wheel B′, to the casing C′. This will be found very advantageous in the construction of bicycles.

When my invention is applied to bicycles the shaft A′, which is rigidly attached to the hub of the wheel will be journaled in the frame of the machine instead of having the wheel *b*, journaled upon the shaft which is the ordinary construction.

The crank *g*, is provided with a wrist pin having a squared end *f*, fitting in a corresponding opening in the wheel *a*, and fastened by a nut *i*, as shown in Fig. 4. This wrist pin is provided with a rounded portion *m*, upon which is journaled the adjacent end of the pitman F′, whereby the pitman is allowed a free revolution upon the bearing *m*, without interfering in any manner as will be readily understood.

From this it will be seen that when applied to a bicycle I am enabled to do away with the sprocket chain, which is thought by many to be objectionable, and yet by means of a pitman to give an increased motion.

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

1. A power transmitting mechanism comprising a shaft carrying a pinion, a casing revolving around the pinion, a pinion supported by the casing and revolving around and engaging the shaft pinion, a pitman having a detachable connection with the casing pinion, and means for attaching the pinion to the casing.

2. A power transmitting mechanism comprising a shaft carrying a pinion, a casing revolving around the said pinion, a sprocket carried by the casing, a pinion supported and

carried by the casing and engaging the shaft pinion, a pitman rigidly connected at one end with the casing pinion, a shaft carrying a crank with which the opposite end of the pitman is connected, a sprocket wheel upon the crank shaft, and a driving belt or chain connecting the two sprockets.

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

DAVID C. FRAZEUR.

Witnesses:
A. S. PATTISON,
ROLAND A. FITZGERALD.