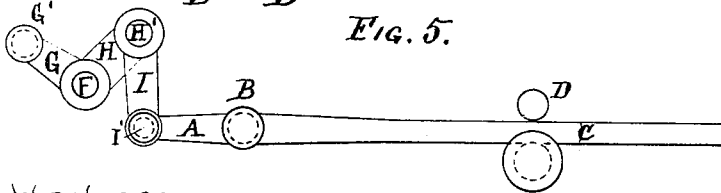
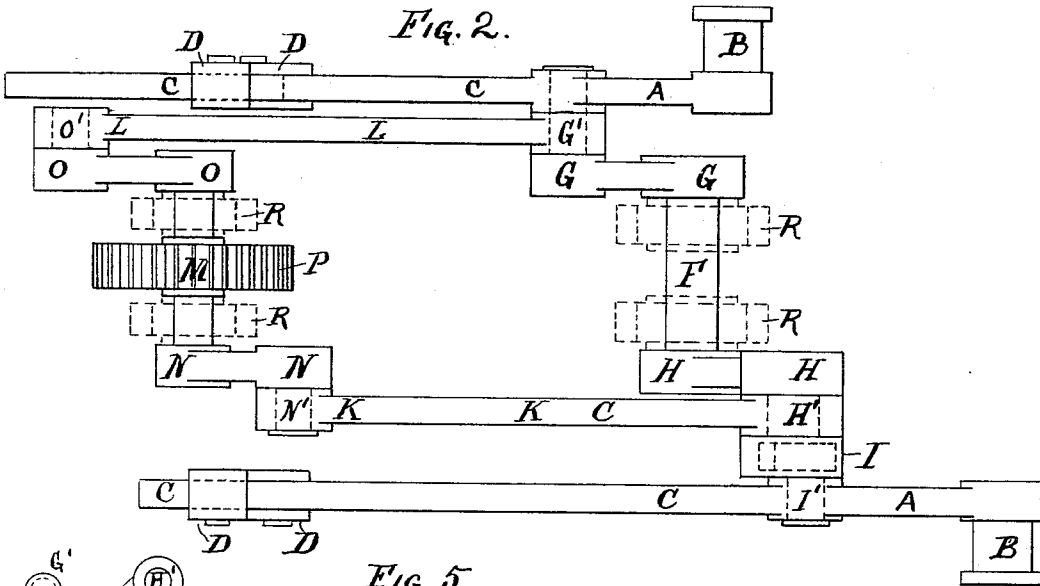
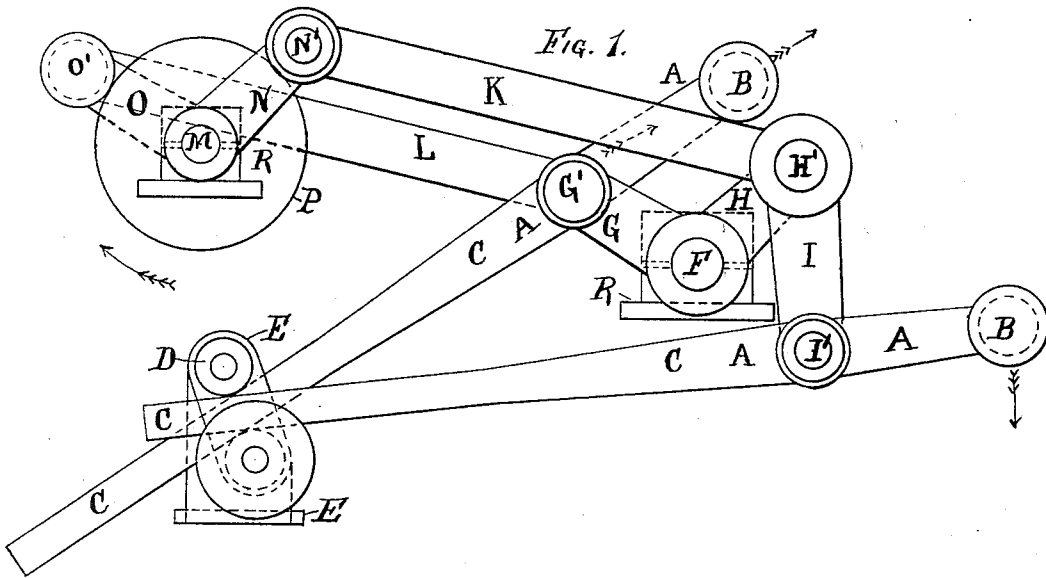


E. WINANS.
POWER TRANSMITTING MACHINERY.

(Application filed Feb. 10, 1898.)

(Model.)

3 Sheets—Sheet 1.



WITNESSES:-

William J. Haubersoft,
James H. Logantz

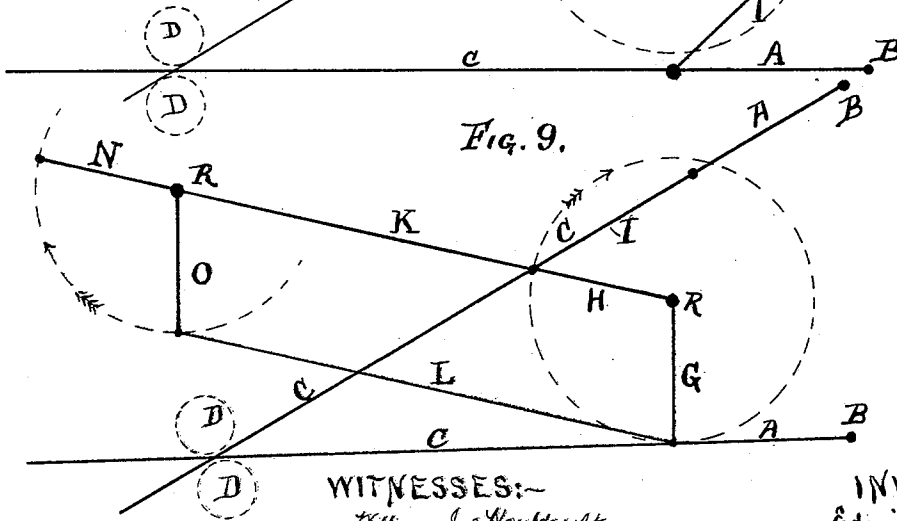
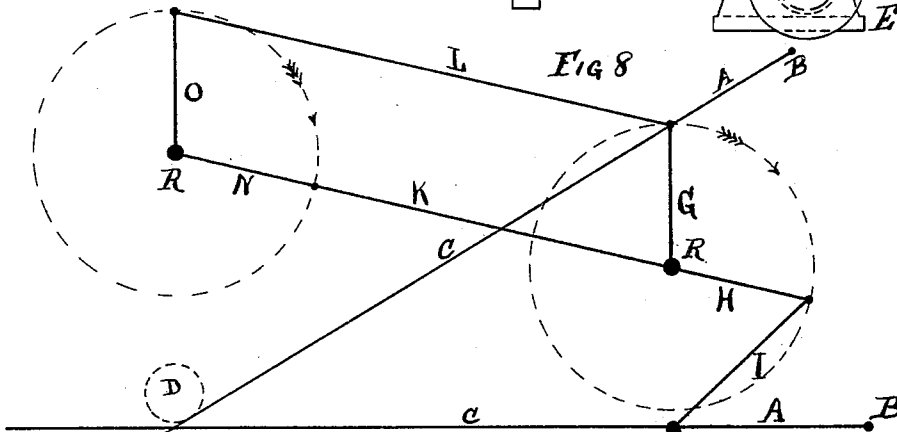
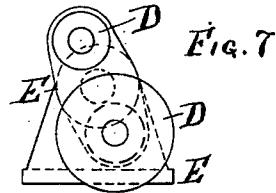
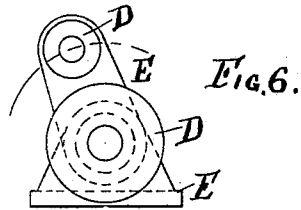
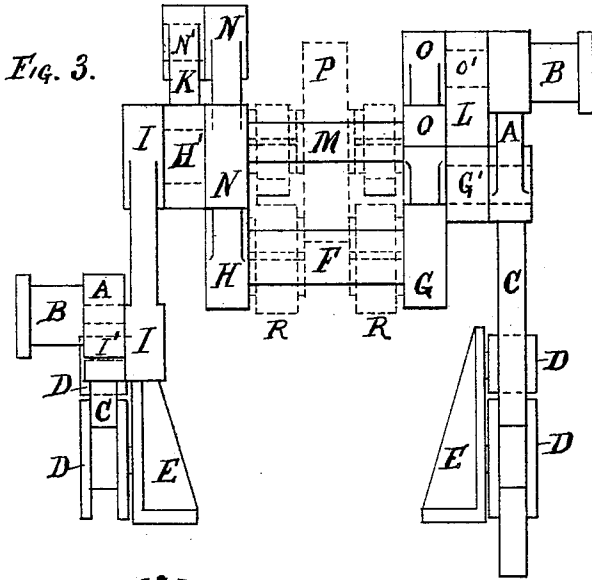
INVENTOR:-
Edwin Winans
by Wm. Weightman
attly.

E. WINANS.
POWER TRANSMITTING MACHINERY.

(Application filed Feb. 10, 1898.)

(Model.)

3 Sheets—Sheet 2.



WITNESSES:-
 William J. Shoulders
 James H. Lapsley

INVENTOR:-
 Edwin Winans
 by Wm. H. Weightman
 atty

No. 618,156.

Patented Jan. 24, 1899.

E. WINANS.
POWER TRANSMITTING MACHINERY.

(Application filed Feb. 10, 1898.)

(Model.)

3 Sheets—Sheet 3.

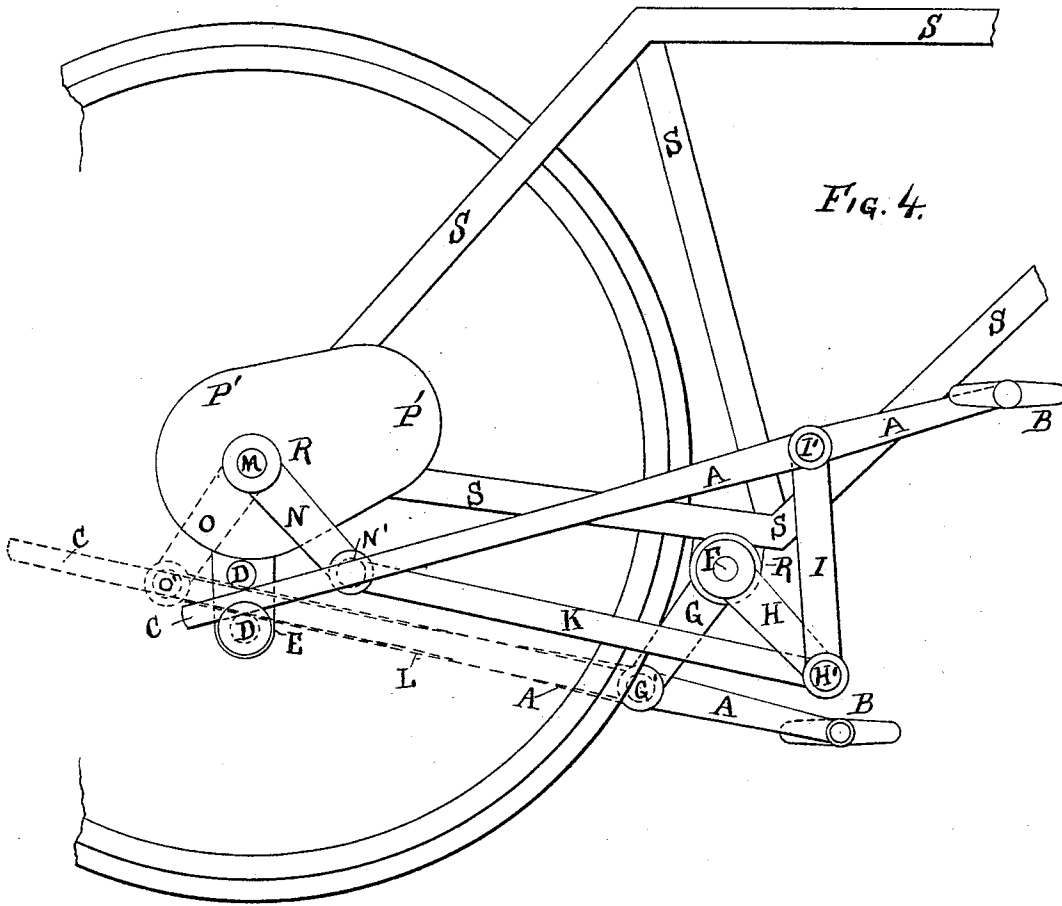


Fig. 4.

WITNESSES:-
William J. Healdcroft.
James H. Legant

INVENTOR:-
Edwin Winans
by Wm H. Wightman
att'y.

UNITED STATES PATENT OFFICE.

EDWIN WINANS, OF NEW YORK, N. Y.

POWER-TRANSMITTING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 618,156, dated January 24, 1899.

Application filed February 10, 1898. Serial No. 669,742. (Model.)

To all whom it may concern:

Be it known that I, EDWIN WINANS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Power-Transmitting Machinery, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to and has for its object the improvement of machinery by and through which power or force is transmitted from the place of development to that of its applied usefulness. It is applicable to all swing and crank motions, especially to all of the treadle class—namely, the bicycle, the sewing-machine, the lathe, the jig-saw, and similar apparatus. It is applicable to the transmission of the higher powers and forces of the steam and pressure class, especially where even and steady crank revolutions are desired, accompanied by a prompt and reliable passing of crank-centers at extreme throw. It is applicable to coupled engines, having necessarily their cranks at opposite strokes, likewise to duplex pump and cylinder practice, as also to twin-screw marine practice, where a single central engine or motor reaching in opposite directions may operate both screws without the aid of gearing. It is likewise applicable to high duty in bicycle practice, the essential features of which are presented in the specification and drawings.

A general aim and object of my invention is to ease the labor and motion of an operator in treadling by providing a full, free, and unhindered up-and-down swing and sway to the whole leg and foot while at work.

A particular aim and object is to overcome the well-known centering in crank practice at extreme throw, as well as the tendency of the cranks under such circumstances to revolve or move in either direction—to go ahead or to back.

Certain of my improvements consist in the adaptation, combination, and location of an assistant or auxiliary crank with a first or power and force receiving shaft to assist and act with it in the passing of centers.

Other improvements consist in the adaptation, location, and combination, with a two-crank shaft, of a third or auxiliary crank se-

curally attached to either crank-pin of the two cranks to assist and act with them in passing centers.

Other improvements consist in the adaptation and combination of an assistant or auxiliary crank with a power-shaft whereby the several cranks are brought to an angle with each other and not at opposite centers, doing away with the troublesome centering in crank practice at extreme throw.

Other improvements consist in the combination of a power or force receiving lever, a connecting crank-shaft and pin, and a plurality of fulcrum guide-rollers, some one of which is perfectly grooved to receive and control the said power or force receiving lever in such manner that the applied force is increased at advantageous points with an increase of shaft-operating leverage.

My improvements also consist in the construction, arrangement, and combination of the several parts, portions, and details, as hereinafter shown and described.

Referring to the accompanying drawings, Figure 1 represents an elevation of power-transmitting cranks, connections, bearings, &c., embodying my improvements. Figs. 2 and 3 represent plan and side elevation of the same. Fig. 4 represents a partial elevation of a bicycle embodying my improvements. Figs. 5, 6, and 7 represent views of special details hereinafter described. Figs. 8 and 9 are diagrams illustrating the general relationship of the details of operation independent of position for service.

In the several figures of the drawings the letter A designates a power or force receiving lever, such power or force being applied at pin B through the use of a treadle, connecting-rod, piston-rod, or like power or force connections.

Letter C designates an extension or guide-roller portion of the lever A.

Letter D designates a plurality of fulcrum guide-rollers, whereby the lever A is kept under control and an extended leverage force made available. The fulcrum guide-rollers D are held within a frame, bracket, or lug E, applied, located, or fixed in suitable position to permit the extension portion C of power-receiving lever A a reciprocating motion there-

in or therethrough. Either one or all of these rollers may be grooved, as desired, upon its periphery, such grooving being preferred to secure the force-receiving lever A and its extension portion C against all side or lateral movement.

The centers of any one or all of the rollers D may be fixed, as shown in Figs. 1, 2, and 3, or the center of either may swing on the center of another, as shown in Fig. 6, or, again, the rollers as a whole may swing upon an individual center apart from those of the rollers themselves, as illustrated in Fig. 7, any and all of the arrangements being readily suitable to a successful control and guidance of the lever A through its extension portion C. As specially illustrated in Fig. 5, the extension portions C may be carried in an opposite direction to that shown in Figs. 1 and 2. Greater compactness is, however, obtained by locating as originally shown.

Letter F designates a shaft to which are secured cranks G and H, and letter I designates an auxiliary or assisting crank secured to one of the cranks H on pin H' at an angle, as shown. This auxiliary crank I may be attached to crank G instead of crank H, after the same manner.

In general shaft practice, where cranks are used for shaft revolution, there are, as is well known, periods in such revolution when the crank of necessity is in direct line with the center of pitman or connection moving it. Under such circumstances no amount of pressure brought to bear through such pitman will cause a revolution of crank and shaft. The crank has to be forced from the right-line position by outside pressure to a position at which the pitman or connection can act. To obviate this well-recognized trouble, I insert the auxiliary crank I, attaching it, as shown, to the pin H' of crank H, so that pin I' of the crank I is about opposite to the pin G' of crank G, while pin H' is about midway between the two. The three positions of the crank-pins are governed by the relative positions of the two shafts F and M. For ordinary treadle-service the positions of the cranks and connecting-pitmen are preferably laid as shown in Fig. 1. For power-service the positions may vary to suit cylinder and operating details.

Letters K and L designate side rods or connections transmitting the motion or revolution of shaft F to the power-delivery shaft M through cranks O and N. Special attention is called to the connections K and L taking hold of the cranks H and G at their crank-pins H' and G', while the operating treadle-levers A take hold of crank-pin G' and of crank-pin I' of the auxiliary crank I, and that such variation in the taking hold effects a complete change in the positions of the several cranks. Instead of being opposite to each other, or at one hundred and eighty degrees, they are at about ninety degrees, or at right angles. Auxiliary crank I is perma-

mently and rigidly attached to crank-pin H' after a general adjustment of all the parts for ready operation.

In Fig. 1 the preferred positions of shaft-centers F and M are shown, in which bearing M is shown at a higher elevation than bearing F. If the center of bearing M be swung about the center F until center M is on a level with center F, the three crank-pin centers G', H', and I' would be at right angles on lines drawn through the shaft-center F and a line drawn through crank I or between pin-centers I' and H' would be at an angle of forty-five degrees to a line between bearing-centers F and M.

Letter P designates a power-transmitting pulley, gear-wheel, or equivalent means for further transmission, more particularly speed of revolution.

R designates a series of bearing-supports for the shafts in their several positions.

Figs. 8 and 9 are diagrams showing the relative positions of the several parts and details preferable and best suited to easy operation. Fig. 8 shows the auxiliary crank at its lowest throw, while Fig. 9 shows it at its highest. When the lever A and its continuation C forms a line with and an extended continuation of crank I or of crank G, it is working under the best conditions of leverage. When it buckles over and doubles up the same cranks, it is working under the shortest leverage and the least advantage.

Referring to Fig. 4, representing a bicycle-motor attachment, similar letters of reference designate like parts or portions in the other figures. The wheel is represented in disk form, with all spokes omitted, the connections at off side of wheel being dotted for purposes of distinction. Auxiliary crank I is shown at the same side of the apparatus as in the other figures, while letter P' designates a speed-gearing boxing.

S designates the supporting-framework suitable to bicycle practice, and operating-treadles are shown at B.

In the operation of the device as a motor power or force is applied to levers A at pins B and transmitted through the auxiliary crank I to crank H, also through crank G to shaft F. As one treadle moves down the other moves up and power is transmitted through shaft F and connections K and L to cranks N and O on shaft M.

In Fig. 4 the power is taken up directly by the bicycle—its axle and wheel—or it is transmitted through a chain of gears or sprockets providing for increased revolution.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a power-shaft and a crank of said shaft, an auxiliary crank permanently and rigidly attached to said shaft, substantially as and for the purposes set forth.

2. In combination with a power-shaft and associate cranks at an angle to each other, an auxiliary crank permanently and rigidly at-

tached to the pin and at an angle with one of said cranks, substantially as and for the purposes set forth.

3. In combination with a two-crank power-shaft, an auxiliary crank extending from and rigidly attached to the pin of one of said cranks, extended power-receiving levers connected with said auxiliary crank and with one of said shaft-cranks and a pair of fulcrum guide-rollers as and for the purposes set forth.

4. In combination with a power-shaft and associate cranks at an angle to each other, an auxiliary crank permanently and rigidly attached to the pin and at an angle to one of said cranks, a pair of power-receiving levers, a pair of fulcrum guide-rollers, a second power crank-shaft and pitmen or side rods connecting the cranks of the two said power-shafts as and for the purposes set forth.

5. In combination with a power-shaft, a crank on said shaft, an extended power-receiving lever connected with said crank, a pair of fixed fulcrum guide-rollers between which said lever extends, and a self-adjusting support for said guide-rollers, as and for the purposes set forth.

6. In combination with the framework of a bicycle or desired motor a power-shaft and associate cranks at an angle to each other, an auxiliary crank rigidly attached to the pin and at angle with one of said cranks, a second power-shaft and associate cranks, side rods connecting the cranks of both shafts, a pair of extended power-receiving levers, and a pair of fixed fulcrum guide-rollers, as and for the purposes set forth.

7. In combination with a gear-wheel, pulley or sprocket-wheel of a power-transmitting device, a two-crank power-transmitting shaft to which said gear-wheel, pulley or sprocket-wheel is attached, side rods attached to and operating said cranks, a two-crank power-shaft operating said side rods, an auxiliary crank extending from the crank-pin of one of said cranks, and a pair of extended power-receiving levers operating said cranks as and for the purposes set forth.

EDWIN WINANS.

Witnesses:

WM. H. WEIGHTMAN,
WILLIAM J. HOULDCROFT.