(No Model.) 2 Sheets—Sheet 1.

G. W. THOMAS.

MECHANICAL MOVEMENT.

No. 407,136. Patented July 16, 1889.

Fig. 1.

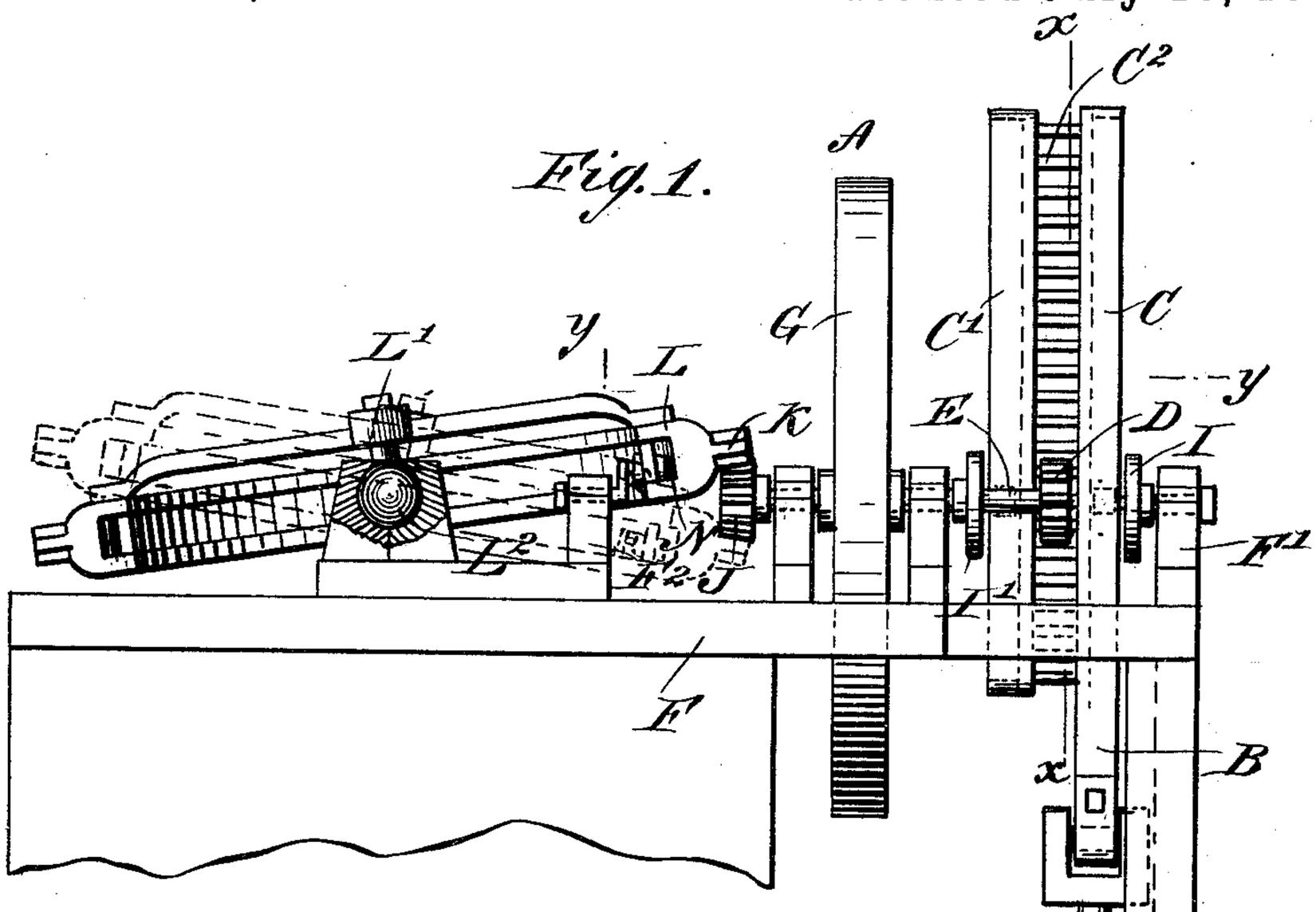


Fig. 2.

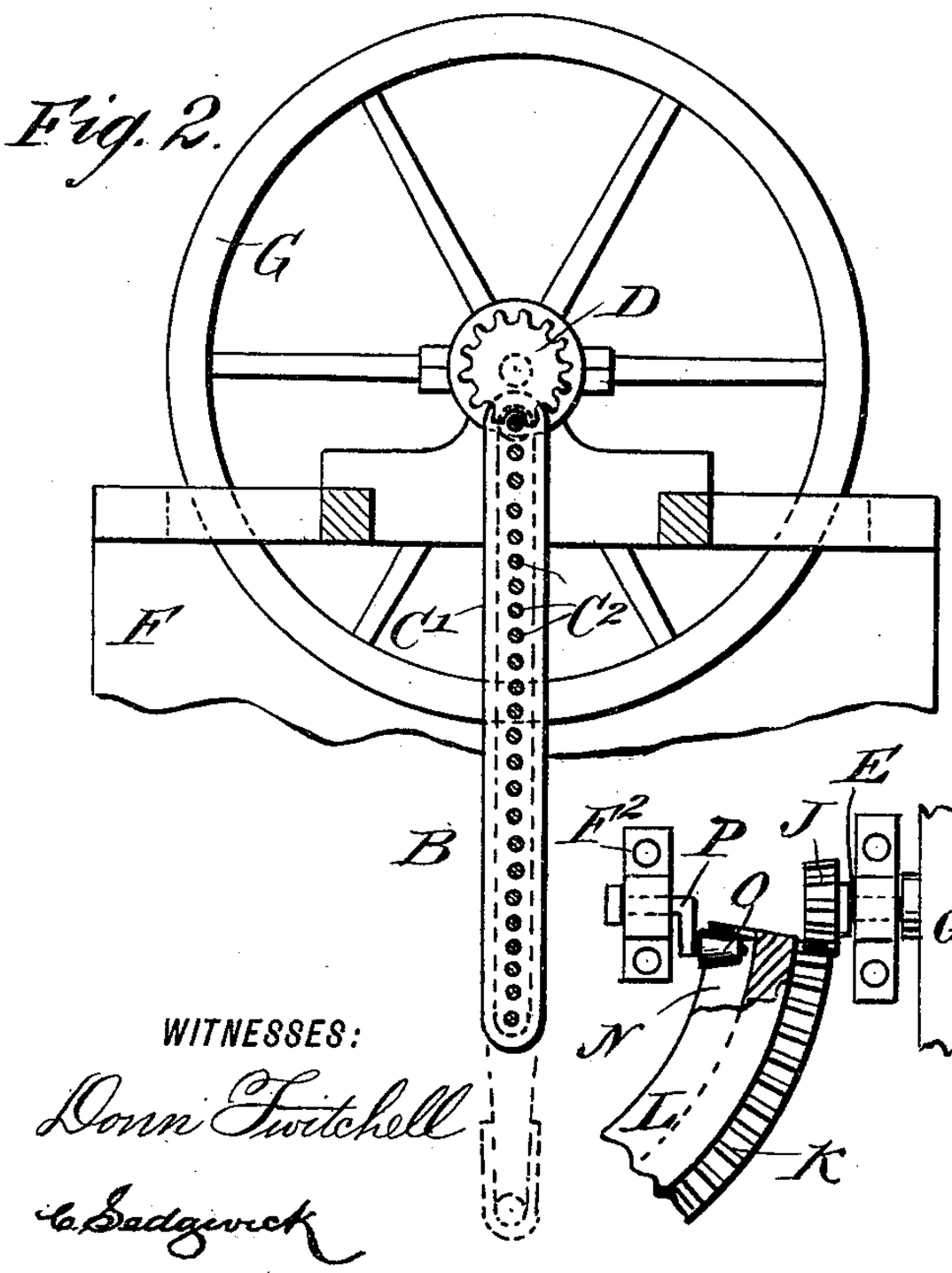
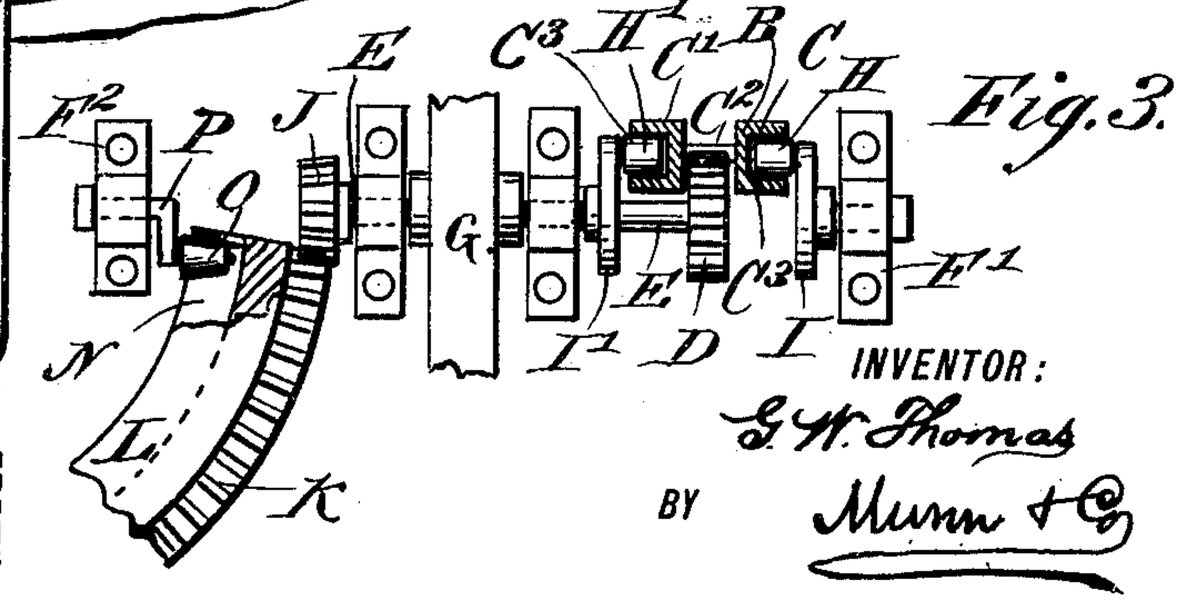


Fig. 3.



WITNESSES:

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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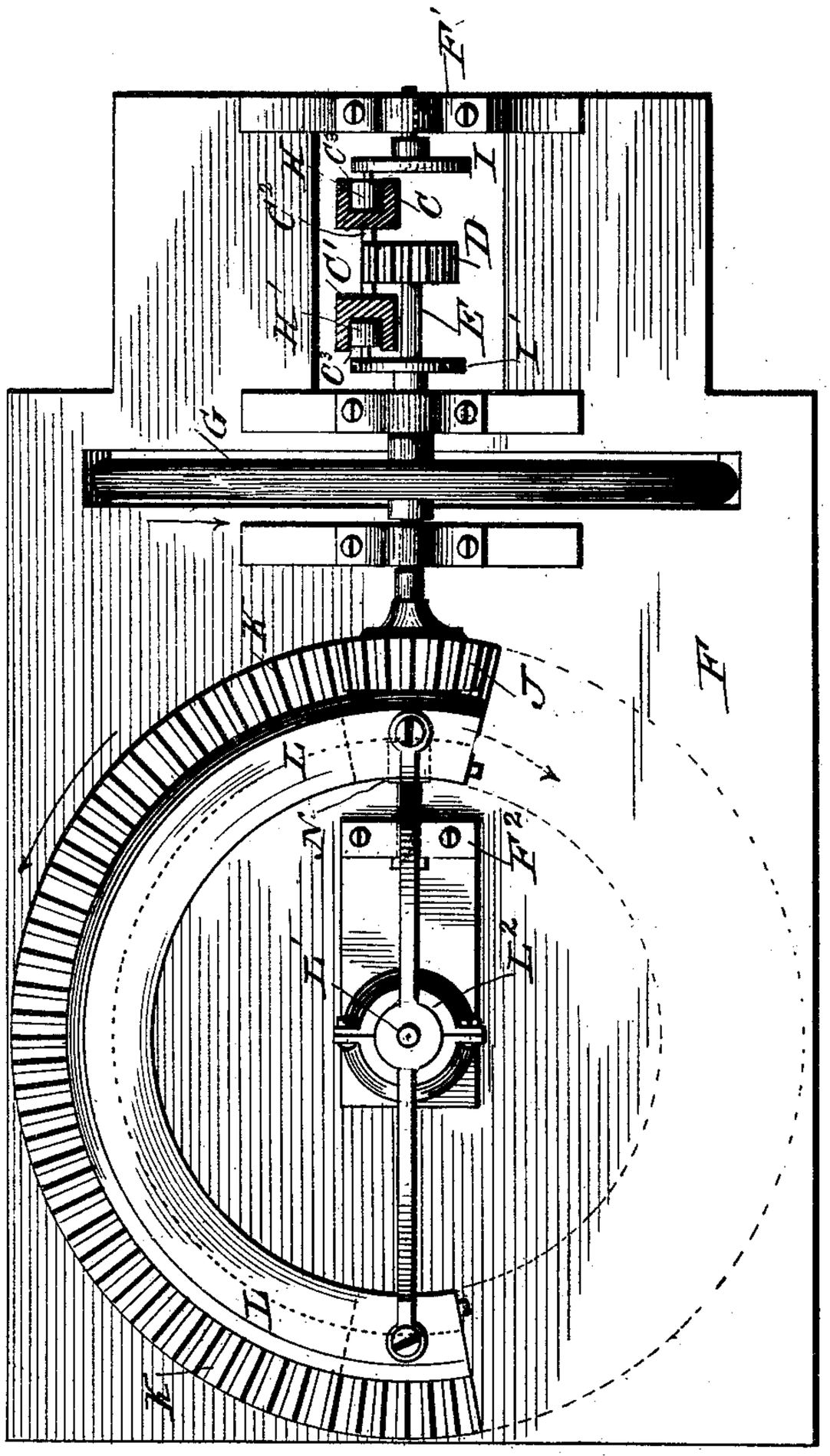

Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE W. THOMAS, OF OGALLALA, NEBRASKA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 407,136, dated July 16, 1889.

Application filed September 24, 1888. Serial No. 286,179. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. THOMAS, of Ogallala, in the county of Keith and State of Nebraska, have invented a new and Improved Mechanical Movement, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved mechanical movement specially intended for reversing motion and for applying power in a direct manner throughout the length of the stroke.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a sectional end elevation of the same on the line *x x* of Fig. 1, and Fig. 3 is a sectional plan view of part of the improvement on the line *y y* of Fig. 1. Fig. 4 is a top plan view, partly in section, of the improvement.

The improved mechanical movement A is provided with a pitman B, connected with a piston-rod A′, operated by steam or other power; or the said pitman B may be connected with other mechanical means for imparting an up-and-down motion to it. Said pitman may also be operated by hand, if necessary. The pitman B is provided with two parallel grooved bars C and C′, between which are formed teeth C^2, adapted to be engaged at either side by a gear-wheel D, secured on the main driving-shaft E, mounted to rotate in suitable bearings in the frame F, of any approved construction. On the main shaft E is secured, in the usual manner, a fly-wheel G.

Each of the bars C and C′ is provided in its outer side with a groove C^3, in which travel the friction-rollers H and H′, respectively, mounted on the crank-disks I and I′, of which the latter turns loosely on the main driving-shaft E, and the former turns in a bearing F′, erected on the frame F.

On the outer end of the main driving-shaft E is secured a gear-wheel J, adapted to mesh into the gear-teeth K at the top and bottom, said gear-teeth K projecting from a segmental wheel L, provided with a shaft L′, having a ball and mounted in a ball-socket L^2, so as to permit a turning and swinging motion of the said segmental wheel L. On the inside of the rim of the segmental wheel L is formed a segmental groove N, closed at each end, and in which travels a friction-roller O, secured on the crank-arm P, mounted to turn in the bearing F^2, erected on the main frame F.

The operation is as follows: An up-and-down motion is imparted to the pitman B, either by hand or other power, so that the gear-wheel D receives a rotary motion by engaging the teeth C^2 of the said pitman B. The main driving-shaft E is thus rotated in one direction. When the said pitman B is moved downward and the gear-wheel D is in mesh with the uppermost gear-teeth C^2, then the friction-rollers H and H′ engage the upper closed ends of the side bars C and C′, so that the latter move around the gear-wheel D, whereby the other side of the gear-teeth C^2 come in contact with the gear-wheel D and the upward stroke of the pitman B takes place. When the pitman B is at the end of its upstroke, the friction-rollers H and H′ are in the lower closed ends of the grooves C^3 and carry the pitman again over to the rear of the gear-wheel D. It is understood that the distance of the centers of the friction-rollers H and H′ from the centers of their disks I and I′ is equal to the pitch radius of the gear-wheel D. When the device is in the position shown in Fig. 1 and the pitman B is moved downward, the main driving-shaft E rotates in one direction, and when the pitman B is moved upward while in the position shown in Fig. 1 the main driving-shaft E rotates in the opposite direction. It will be seen that the power employed on the pitman B is transmitted to the gear-wheel D on the main driving-shaft E throughout the full stroke of the said pitman, and consequently no lost motion takes place by changing the reciprocating motion to a rotary motion. The rotary motion of the main driving-shaft E causes the gear-wheel J to engage the gear-teeth K on the segmental wheel L, so that the latter swings on its shaft L′. When

the last tooth on one end of the said segmental wheel L meshes into said gear-wheel J, then the friction-roller O strikes against the closed end of the segmental groove N, whereby the said end of the segmental wheel L is swung up or down, (see dotted lines, Fig. 1,) and the gear-wheel J acts on the under side of the gear-teeth K, consequently turning said segmental gear-wheel L in an opposite direction, thus reversing its motion. The same movement takes place when the last tooth on the other end of the segmental wheel L meshes into the gear-wheel J. The friction-roller O then strikes at this end of the groove N and swings the said end of the wheel L up or down, as the case may be. The motion of the segmental wheel L is now again reversed as the said gear-wheel J meshes into the other side of the gear-teeth K. Thus it will be seen that the reversing motion takes place whenever one end of the segmental wheel L is in contact with the gear-wheel K.

It is understood that the distance between the friction-roller O and the center of its crank-arm P is equal to the pitch radius of the gear-wheel J. Thus it will be seen that the power applied to the pitman B is utilized equally throughout its stroke and the segmental wheel L is reversed, as above described.

The crank-disks I and I′ serve as guides for the side bars C and C′ of the pitman B, so as to prevent a sidewise motion of the said pitman.

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

1. In a mechanical movement, the combination, with a pitman consisting of two grooved bars and teeth connecting the bars with each other, of a gear-wheel meshing into the said teeth, a main shaft carrying the said gear-wheel, and crank-disks engaging by their crank-pins the grooves in the said bars of the pitman, substantially as shown and described.

2. In a mechanical movement, the combination, with a pitman provided with two grooved bars connected with each other by gear-teeth, of a gear-wheel adapted to mesh in the said gear-teeth at either side, a main driving-shaft carrying the said gear-wheel, friction-rollers fitting into the grooves in the said bars, and crank-disks carrying the said friction-rollers and held in axial line with the said main driving-shaft, substantially as shown and described.

3. In a mechanical movement, the combination, with a main driving-shaft and a gear-wheel secured on the same, of a segmental wheel having gear-teeth adapted to mesh at either side into the said gear-wheel, a shaft carrying the said segmental wheel and mounted to turn and to swing, and a crank-arm held in axial line with the said main shaft and carrying friction-rollers engaging a segmental groove in the said segmental wheel, substantially as shown and described.

GEORGE W. THOMAS.

Witnesses:
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H. CARNAHAN.