No. 613,717. Patented Nov. 8, 1898.

F. PURDY.

FOOT POWER MECHANISM.

(Application filed Nov. 22, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2.

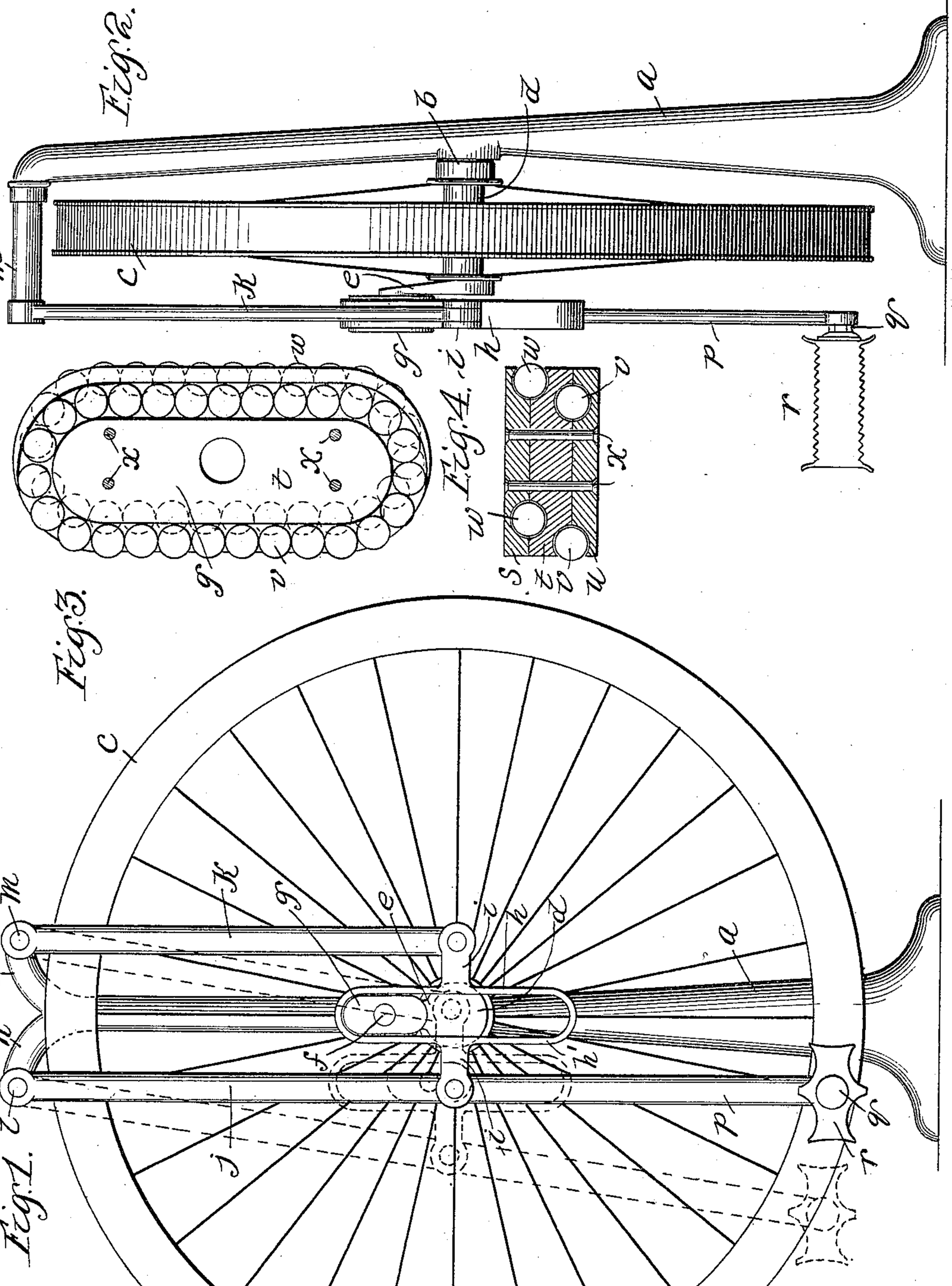

Fig. 3.

Fig. 4.

Witnesses
Wm. H. Rheem.
Wm. F. Fleming

Inventor.
Frederick Purdy
by Dixon & Fletcher,
Attys.

No. 613,717. Patented Nov. 8, 1898.

F. PURDY.

FOOT POWER MECHANISM

(Application filed Nov. 22, 1897.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

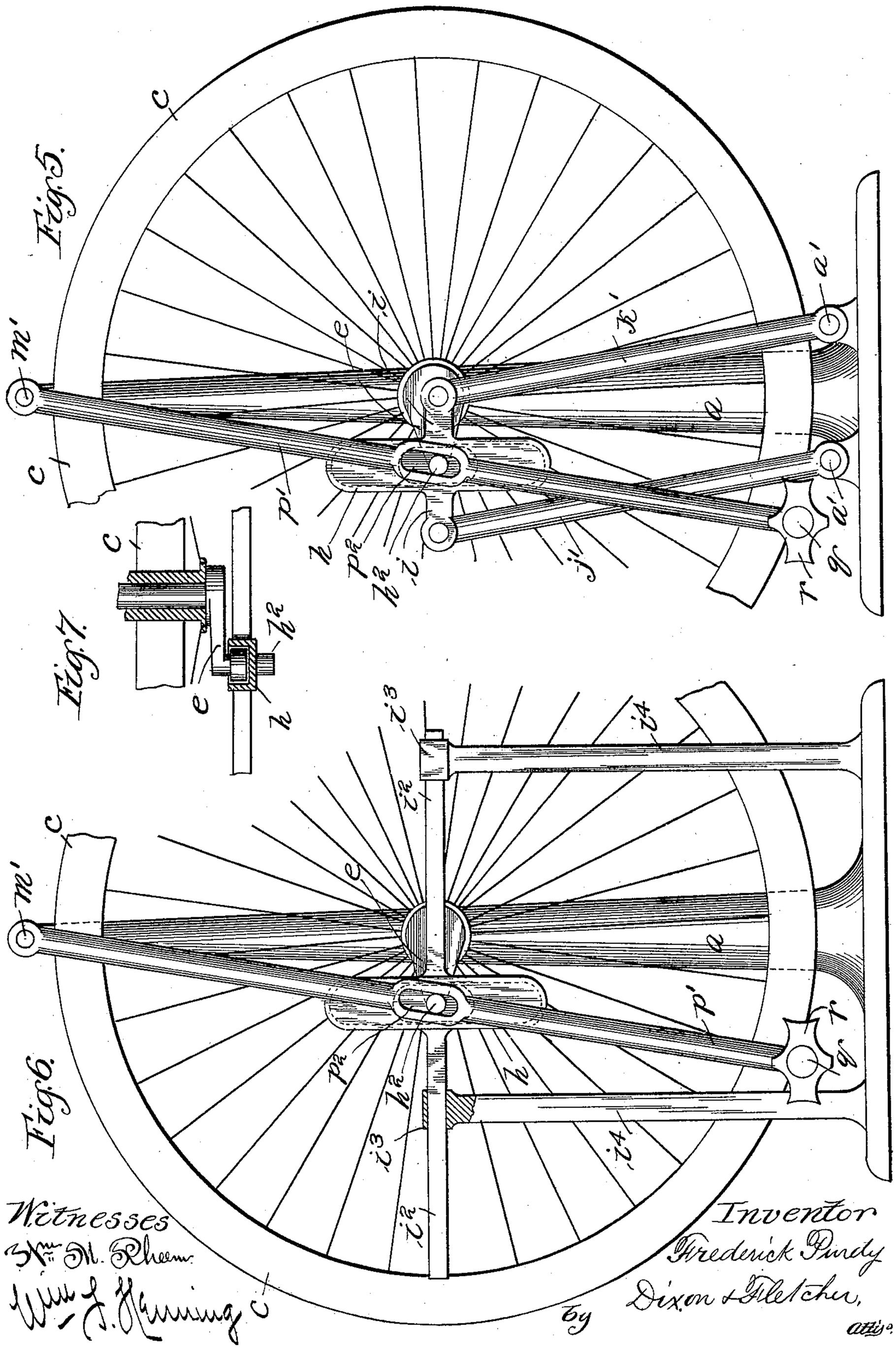

Fig. 7.

Fig. 6.

Witnesses
Wm. M. Rheem.
Wm. F. Fleming Jr.

Inventor
Frederick Purdy
by Dixon & Fletcher,
attys.

UNITED STATES PATENT OFFICE.

FREDERICK PURDY, OF CHICAGO, ILLINOIS.

FOOT-POWER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 613,717, dated November 8, 1898.

Application filed November 22, 1897. Serial No. 659,444. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK PURDY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Foot-Power Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which corresponding letters of reference in the different figures indicate like parts.

Heretofore foot-power wheels for driving jewelers' lathes and analogous light machinery have been so constructed that in imparting a uniform motion to the wheel the treadle has necessarily been driven at an irregular speed—that is to say, owing to the fact that the end of the crank-arm is nearer during one half of its revolution to the center of the arc described by the treadle than during the other half of the revolution the stroke of the treadle in one direction is comparatively slow, while in the other it is correspondingly rapid—thereby imparting a jerking motion to the foot of the operator, which is very objectionable in that it is liable to interfere with the accuracy of his work in fine and delicate manipulations.

The object of my invention is to overcome this objection and to so construct a foot-power mechanism that the speed of the wheel may be constant, while that of the treadle may be uniform in both directions.

To this end my invention consists in the combination of elements hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a side elevation of a treadle mechanism embodying the features of my improvement. Fig. 2 is an elevation taken at right angles thereto. Fig. 3 is an enlarged longitudinal detail view, partly in section, of a sliding block. Fig. 4 is a transverse sectional view thereof. Fig. 5 is a side elevation showing a modification of said invention. Fig. 6 is a like view showing a still further modification; and Fig. 7 is a horizontal sectional detail view in plan, showing the connection of the crank with the vertically-slotted cross-head.

Referring to the drawings, *a* represents a rigid standard or frame, preferably of cast metal, upon which is formed a stud at *b*, which serves as a bearing for a drive-wheel *c*. The latter consists, preferably, of a turned metal ring secured to a hub *d* by means of wire spokes in the same manner in which bicycle-wheels are ordinarily constructed. Rigidly attached to the hub *d* is a crank-arm *e*, having a wrist-pin *f*, Fig. 1, upon which is preferably mounted an oblong block *g*, which is fitted loosely and adapted to slide in a vertical slot *h'*, formed in a cross-head *h*, which is provided with laterally-extended supporting-arms *i i*, formed thereon or rigidly attached thereto. The arms *i* are pivotally attached to links *j k*, which in turn are pivotally attached, respectively, to studs *l m*, formed upon arms *n o*, which branch laterally from the top of the upright standard *a*. The links *j k* are parallel to each other, and the former is provided with an extension *p*, having a wrist-pin *q* at the bottom, upon which is pivotally mounted the usual treadle *r*.

It will be seen that the links *j k* remain parallel while the treadle is being oscillated. This causes the arms *i i* to vibrate horizontally, while the slot *h'* constantly retains a vertical position, as indicated in dotted lines in Fig. 1. It follows, therefore, that the upper half of the cross-head would move the same distance during one-half of a revolution of the crank that the lower half would move during the succeeding half-revolution. The speed of the treadle, therefore, would be precisely the same during the forward as during the backward stroke, while the speed of the wheel *c* would remain constant.

While the sliding block *g* may be of the usual construction, I prefer to place ball-bearings therein, as shown in Figs. 3 and 4. The block, as represented in the latter figure, may be made of three separate plates *s t u*, each of which is provided with grooves, as shown, for the reception of the balls *v w*. The grooves are arranged so as to cause one set of balls, as *v*, to bear against one face of the slot in the cross-head, while the other set *w* are adjusted so as to bear against the opposite face. The plates may be attached to each other by means of rivets *x* or in any approved manner. The advantage of the balls in lessening friction is obvious. It is also apparent that the wrist-pin of the crank itself may be directly connected with the slot in the

yoke; but I prefer to use some form of sliding block.

In Fig. 5 I have shown a modification of said invention, in which, instead of connecting the links *j k* to the top of the standard *a*, I pivot the lower ends of similar links *j' k'* to studs *a' a'*, formed upon the base, and the upper ends to the ends of the arms *i i* of the cross-head. The lever *p'* is pivoted at *m'* at the top of the standard in a vertical plane cut through the axis of the wheel *c*. A slot p^2 in the lever engages with the laterally-projecting stud h^2, formed upon the cross-head.

In Fig. 6 I have shown a still further modification, in which, instead of pivoting the arms of the cross-head to oscillatory links, I substitute straight bars or arms i^2 i^2 and support them in sliding bearings i^3 i^3 in the upper ends of rigid standards i^4 i^4, which are rigidly attached to or form a part of the frame, the other features of the construction being the same as those shown in Figs. 5 and 7.

I do not confine myself to the use of the slot *h'*, as it is obvious that any well-known adaptation of a sliding or rolling bearing arranged to act in connection with a straight guide and a crank may be employed; nor is it necessary that the straight guide or bearing should stand in a vertical plane, provided the other parts are arranged to conform to the relative position thereof.

Having thus described my invention, I claim—

1. The combination in a foot-power device of a driving-wheel, a crank-arm, a vibratory cross-head having a straight bearing-guide in operative connection with the crank-arm of said wheel, supporting-bearings for said cross-head substantially in a plane extending diametrically across the circle described by the path of movement of the crank-arm and at right angles to said straight guide, and a driving-lever and treadle, substantially as described.

2. The combination in a foot-power mechanism, of a driving-wheel, a cross-head pivotally supported, oscillating links having their pivotal bearing-points in parallel planes, a crank-arm upon said wheel, means for operatively connecting the same with said cross-head and a driving-lever and treadle, the former being connected with said cross-head, substantially as described.

3. A foot-power device in which is combined a driving-wheel, a slotted cross-head in operative connection with the crank-arm of said wheel, said cross-head being supported in bearings arranged to permit of a vibratory movement thereof while maintaining the slot in a vertical position, a driving-lever in operative connection with said cross-head and a suitable treadle, substantially as described.

4. The combination in a foot-power mechanism, of a driving-wheel mounted in a suitable frame, parallel links pivoted to the frame upon opposite sides of and equally distant from the plane of the axis of the wheel, a cross-head pivotally attached to said links, said cross-head having a slot therein adapted to connect with the crank-arm of the wheel, and a treadle in operative connection with said cross-head, substantially as described.

5. The combination in a foot-power mechanism, of a driving-wheel mounted in a suitable frame, parallel links pivoted to the frame upon opposite sides of and equally distant from a given plane through the axis of the wheel, a cross-head pivotally attached to said links, said cross-head having a slot therein arranged at right angles to the plane of the bearings which support the cross-head, a sliding block arranged to move in said slot, said block being in operative connection with the crank-arm of said driving-wheel, and a treadle for actuating said cross-head, substantially as described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 16th day of November, 1897.

FREDERICK PURDY.

Witnesses:
D. H. FLETCHER,
JAMES MCINTIRE.