(No Model.)

J. F. DYER.

TREADLE MOTION.

No. 301,810. Patented July 8, 1884.

Fig. 1.

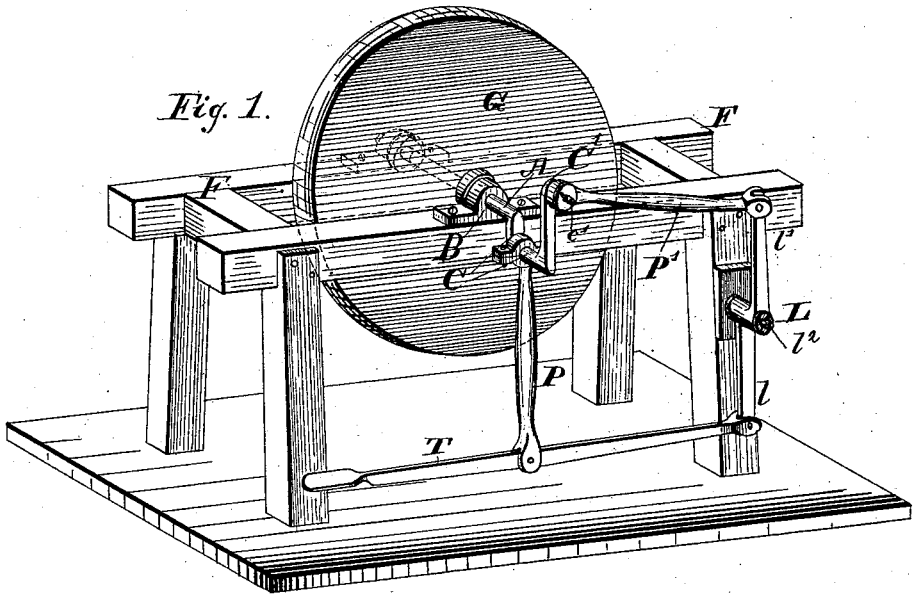


Fig. 2.

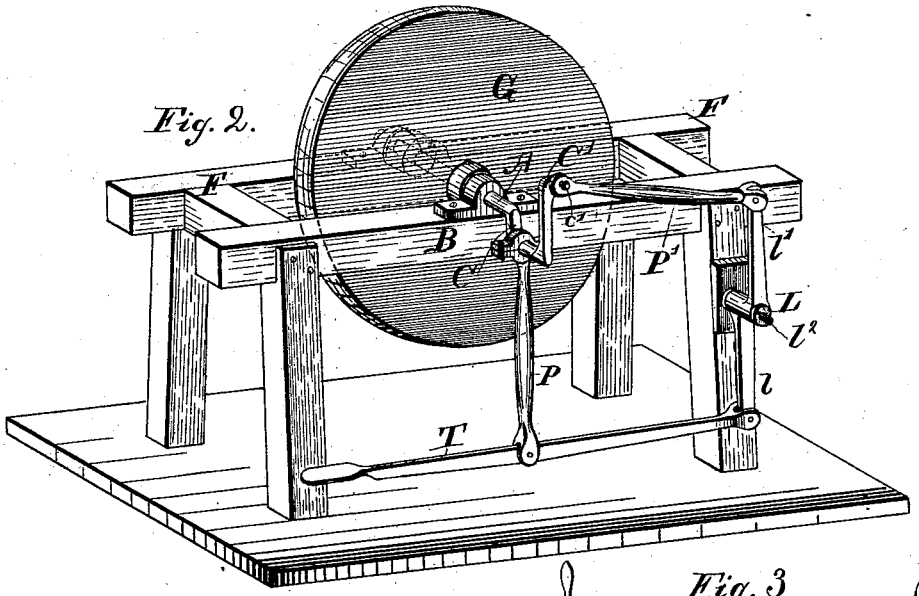


Fig. 3

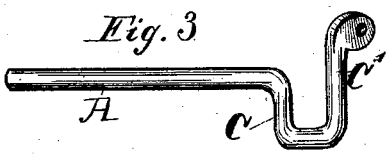
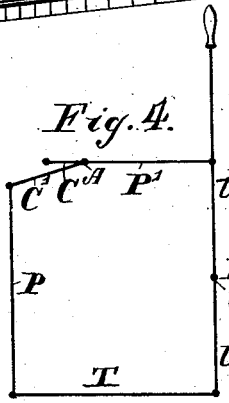


Fig. 4.



Witnesses:-
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his atty

UNITED STATES PATENT OFFICE.

JAMES F. DYER, OF ATLANTA, GEORGIA.

TREADLE-MOTION.

SPECIFICATION forming part of Letters Patent No. 301,810, dated July 8, 1884.

Application filed April 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. DYER, a subject of the Queen of England, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Treadle-Motions; 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in treadle-motions or foot-powers for light machinery; and it has for its object to reduce the fatigue inherent to such powers or motions, and also to avoid dead-centers.

The invention consists in providing the driven shaft with a double crank, one of which is longer than the other, operated from a pitman and from a lever and pitman, respectively, connected with a treadle-bar, said parts forming practically or substantially a parallelogram.

The invention further consists in arranging the two cranks so that one will be slightly in the lead of the other—that is to say, by setting the wrist-pin of one of the cranks on a line parallel with the driven shaft, but not in the same plane, whereby the liability of a stoppage of the cranks on their dead-centers is greatly diminished, if not absolutely avoided, all substantially as hereinafter more fully described.

In the annexed drawings I have illustrated my invention in its application to a grindstone, though it may be applied to any other machinery adapted to be operated by foot-power.

Figure 1 is an isometrical view of a grindstone-frame and grindstone, showing the double crank on the grindstone-arbor on lines parallel with and in the plane of the said arbor. Fig. 2 is a like view showing one of the cranks of the arbor set to lead the other crank thereof. Fig. 3 is a detail view of the arbors detached on an enlarged scale, to better show the relative position of the cranks, and Fig. 4 shows by a diagram a different application of the operating devices.

Like letters of reference indicate like parts in the above figures of drawings.

F indicates the frame, G the grindstone, and B the bearings bolted to said frame, and in which the grindstone-arbor A is mounted, said frame and bearings being of any usual or preferred construction.

As shown in Fig. 1, the arbor A has two cranks, C C′. The former is connected by pitman P to a treadle-bar, T, and said bar is connected to the extremity of the arm *l* of a two-armed lever, L, that is pivoted upon a stud, l^2, secured to one of the uprights of the frame. The crank C′ is connected by a pitman, P′, to the extremity of the arm *l′* of the lever L, as shown. By means of this arrangement of cranks C C′ on the arbor A, the power required to drive the stone, and consequently the fatigue resulting from the application of the power, is greatly reduced, inasmuch as I obtain the same power from a treadle having one half the rise—that is to say, supposing the power required to drive a grindstone of given weight and diameter by a single crank on its arbor will require a crank describing an arc of a circle of, say, four inches in diameter, by employing a double crank, C C′, and making the latter four inches long, the length of the former can be reduced one-half, thus giving the treadle a rise and fall of two inches. In other words, I reduce the power necessary to drive the stone by one-half. In the relative arrangement of cranks as described, and as shown in Fig. 1, the axes of both of the cranks and shaft lie in the same vertical plane when on their vertical dead-center, for instance; consequently the stone cannot be rotated except by moving the cranks beyond their dead-center, and by other means than through the treadle-bar. This I obviate by setting the wrist-pin *c′* of crank C′ so that the axis of said pin will lie in a different vertical plane from that of the arbor A and the wrist of the crank C, as plainly shown in Figs. 2 and 3, thus causing the longer crank, operated indirectly from the treadle through the lever L, to slightly lead the crank operated directly from said treadle, whatever may be the direction of ro-

tation of the stone. From this arrangement it will be seen that a stoppage on a dead-center becomes almost an impossibility, while an additional amount of power is gained through the extended sweep of the wrist-pin c'.

As stated above, the treadle-motion is applicable to other mechanisms or machinery, and I do therefore not desire to limit myself to its application to grindstones; nor do I wish to limit myself to the combination, with a foot-power, of a double-crank shaft having one of its cranks of greater length than the other, as it is obvious that the power may be applied to the lever L by extending its upper or lower end and reversing the connection of the cranks therewith. For instance, if the lever is extended and power applied to the extension—as that of a piston, for example—or said lever is operated by hand, the pitman P′, instead of being connected with the crank C′, will be connected with the crank C, thereby reducing the throw of the lever, and through it that of the piston. It is obvious that such an arrangement could be advantageously applied for driving a circular saw by hand, and instead of reversing the connections, as set forth, the crank C may be made longer radially, as shown in diagram, Fig. 4.

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

1. The combination, substantially as herein described, of a power-lever, a double-crank shaft having cranks of different radial lengths, and connecting-rods for connecting the cranks to the power-lever to transmit the power applied thereto to both cranks simultaneously, for the purposes specified.

2. The combination, substantially as herein described, of a power-lever, a double-crank shaft the wrists of which are arranged in different vertical planes, whereby one of the cranks is made to lead the other, and connecting-rods for connecting said cranks to the power-lever to transmit the power applied thereto to both cranks simultaneously, for the purposes specified.

3. The combination, substantially as herein described, of a power-lever, a double-crank shaft having cranks of different radial lengths, the wrists whereof are arranged in different vertical planes, and connecting-rods for connecting both cranks with the power-lever, for the purposes specified.

4. The combination, substantially as herein described, of a power-lever, a treadle connected thereto, a double-crank shaft having cranks differing in radial length, and connecting-rods for connecting one of the cranks with the treadle and the other with the power-lever, for the purposes specified.

5. The combination, substantially as herein described, of a power-lever, a treadle connected thereto, a double-crank shaft having cranks differing in radial length, the wrists whereof lie in different vertical planes, and connecting-rods for connecting one of said cranks with the treadle and the other with the power-lever, for the purposes specified.

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

JAMES F. DYER.

Witnesses:
C. E. JARVIS,
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