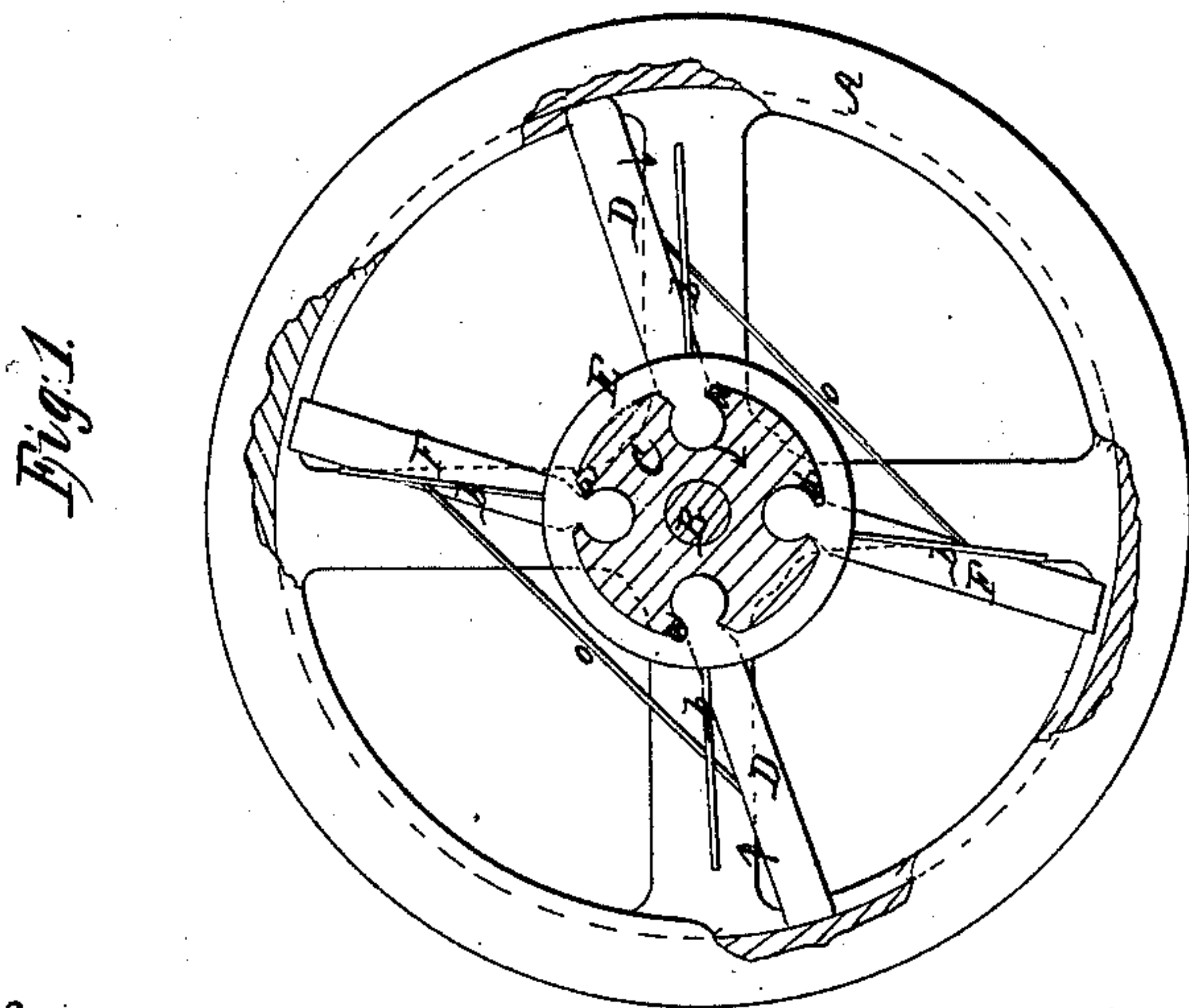
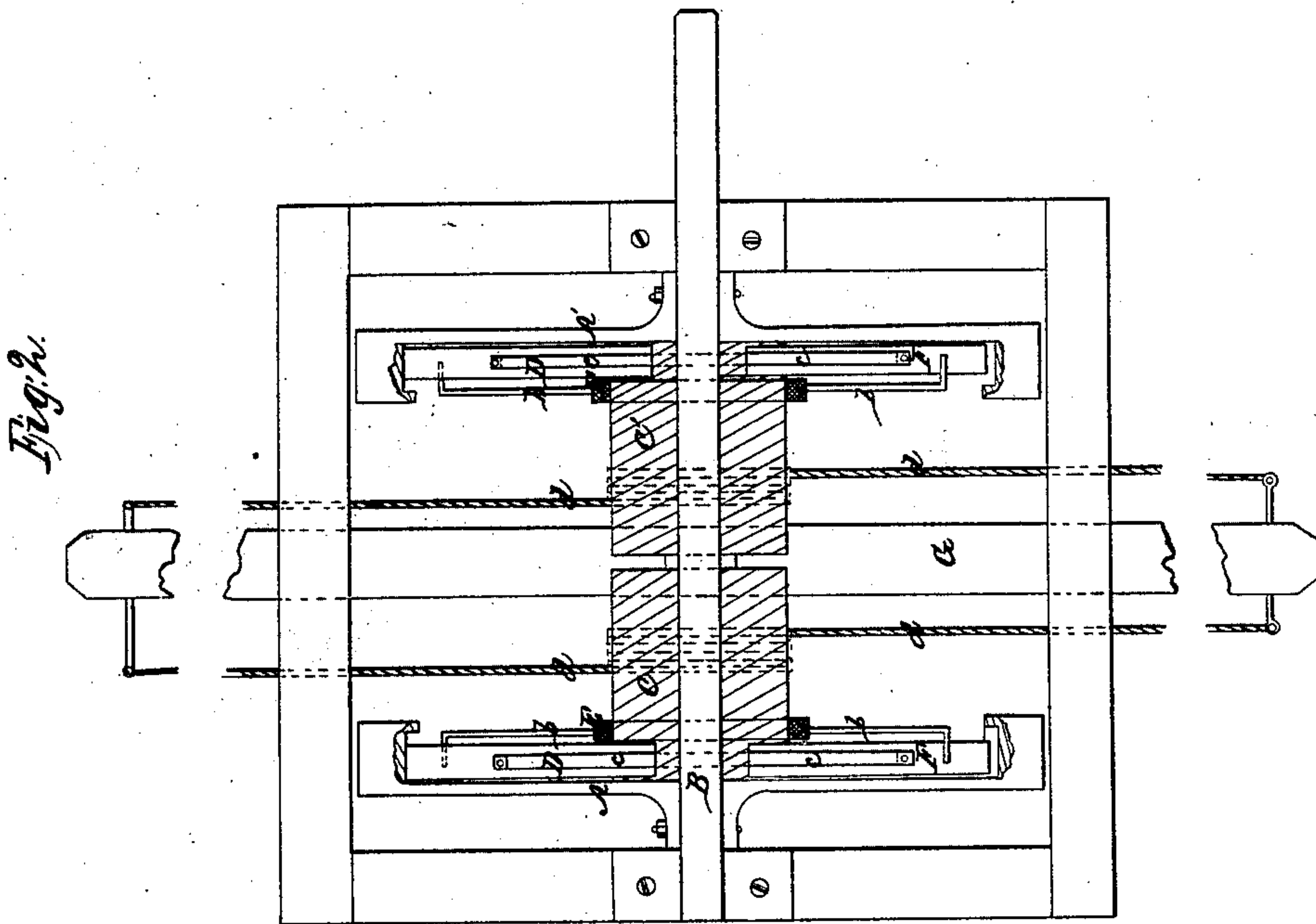


*J. Hathaway,
Converting Motion.*

N^o 27,715.

Patented Apr. 3, 1860.



*Witnesses
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UNITED STATES PATENT OFFICE.

JOSHUA HATHAWAY, OF MARIETTA, GEORGIA.

IMPROVEMENT IN DEVICES FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.

Specification forming part of Letters Patent No. 27,715, dated April 3, 1860.

To all whom it may concern:

Be it known that I, JOSHUA HATHAWAY, of Marietta, in the county of Cobb and State of Georgia, have invented a new and Improved Device for Converting Reciprocating into Rotary Motion; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of my invention, taken transversely through the axle of the wheels to which a rotary motion is to be imparted. Fig. 2 is a horizontal section of the same, taken through the center of the rotary shaft.

Similar letters of reference indicate corresponding parts in both views.

This invention consists in arranging a reciprocating sliding rod, in combination with two flanged wheels and with said independent pulleys and hinged tangential bars on the same shaft, in such a manner that by imparting a reciprocating motion to the sliding bar a continuous rotary motion of the flanged wheels is produced.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A A' are two flanged wheels arranged on a common shaft B at a certain distance apart, so as to leave room between them for two pulleys C C'. These pulleys turn loosely on the shaft B, and they are furnished with one or more sockets *a*, to make room for the tangential bar or bars D. Two such bars are applied to each of the wheels A A', and they extend close up to the inside surface of the rim of the wheels. Behind the bars and placed on the pulley is a ring E, from which arms *b* extend in a radial direction. The upper ends of these arms are turned over at right angles, and they form bearings for additional bars F, which rest in sockets *a'* in the pulleys C C', similar in every respect to the bars D, with the only exception that they are not long enough to press against the inner surface of the rims and to bear against the hooked ends of the arms *b* at the same time. Small elastic bands *c* extend from the bars F to the bars D, exerting on them a tension in the direction of the arrows marked on the same in

Fig. 1. The strain exerted by these bands or springs is very slight, and but just sufficient to keep the upper ends of the bars D up to the inside of the rim of the wheels without producing any sensible friction. The pulleys C C' connect by means of ropes or chains *d* with the ends of a sliding rod G, and said ropes are wound around the pulleys several times in opposite directions, so that by imparting to the rod G a reciprocating rectilinear motion a reciprocating rotary motion is imparted to the pulleys in opposite directions.

The operation is as follows: If the pulley C in Fig. 1 is moved in the direction of the arrow marked on the same, the bars D, by coming in contact with the rim of the wheels, will be turned from the radius passing through the centers of the sockets and they will slide on the inside surface of said rim without producing any motion of the wheel. If, on the other hand, the pulley C is turned in the direction opposite to the arrow marked on the same in Fig. 1, the bars D, by the slight friction of the rim against their ends, are turned toward the radius passing through the centers of their sockets, they bind against the inside surface of said rim, and the wheel will be caused to move with the pulley. It will be understood that one of the bars D would be sufficient to produce the same effect on the wheel; but by having two bars, one opposite the other, the pressure exerted by each of the bars toward the center of the axle is balanced and the friction is diminished. By connecting both wheels A A' firmly to the same shaft B and by imparting to the two pulleys C C' a reciprocating rotary motion in opposite directions a continuous rotary motion is imparted to the wheels and to the shaft. One set of bars D begins to act on one of the wheels at the moment the other set begins its retrograde motion, so that a continuous power in the same direction is exerted on the shaft B.

The principal object of this invention is to produce the continuous rotary motion of the shaft B without the aid of a crank and to save the employment of heavy fly-wheels. When connected to a steam-cylinder, both the cylinder and the piston-rod can be made and applied of unlimited length or as long as may be deemed economical. It is particularly applicable to steamboats, where high-pressure

power and low velocity are required, or it may be used with equal advantage where high velocity and low power may be required.

When one wheel only is used, my invention may be applied with advantage to sewing-machines, turning-lathes, and other machines where it is desirable to prevent a motion of the working parts of the machine in the wrong direction.

With my device the wheel works in one direction only and the full power of the treadle is transmitted to the wheel, no matter how large or how small the motion of the foot.

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

The arrangement and combination of the reciprocating sliding rod G, rotary flanged wheels A A', shaft B, independent pulleys C C', and hinged bars D, constructed and operating substantially in the manner and for the purpose specified.

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Witnesses:

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