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A. Benneckendorf. Mechanical Movement.

No. 119,735. Patented Oct. 10, 1871.

Fig. 1.

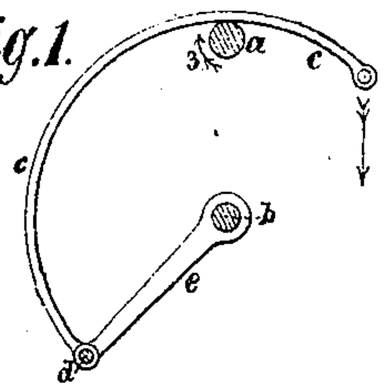


Fig. 2.

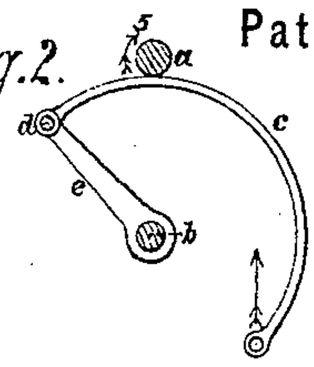


Fig. 3.

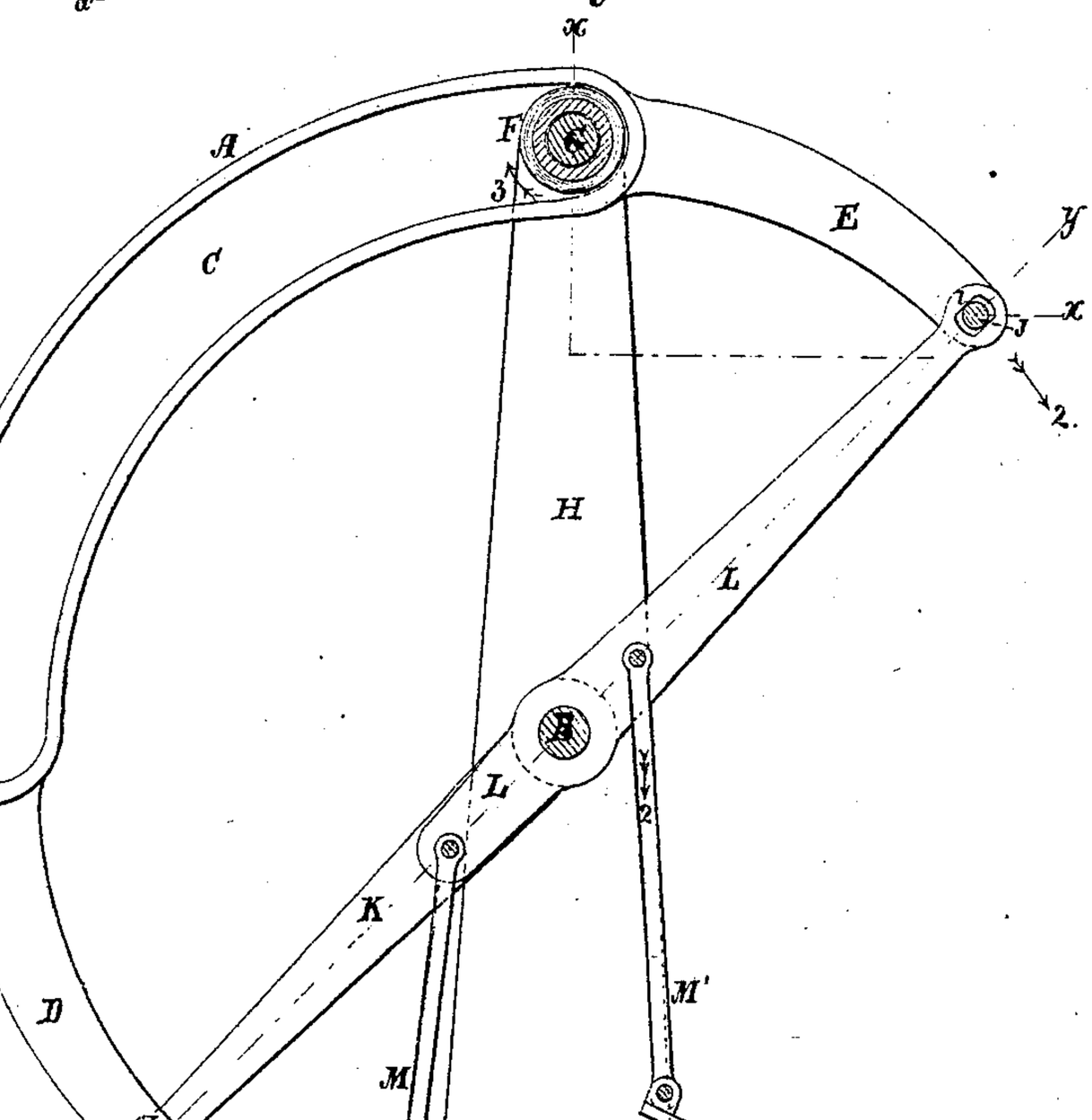


Fig. 4.

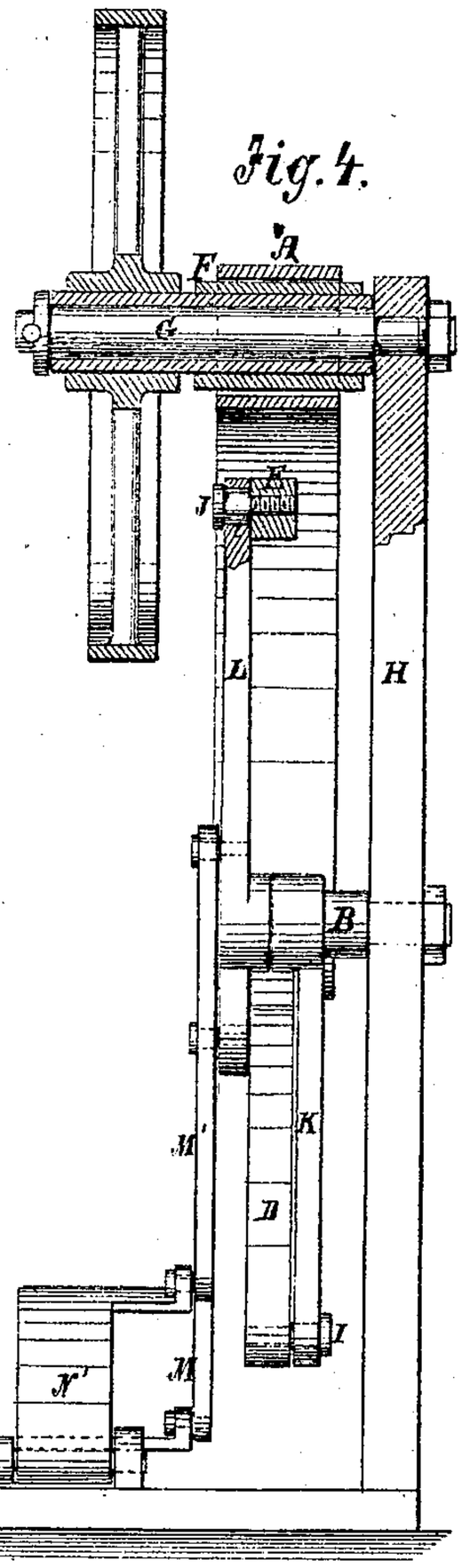


Fig. 5.

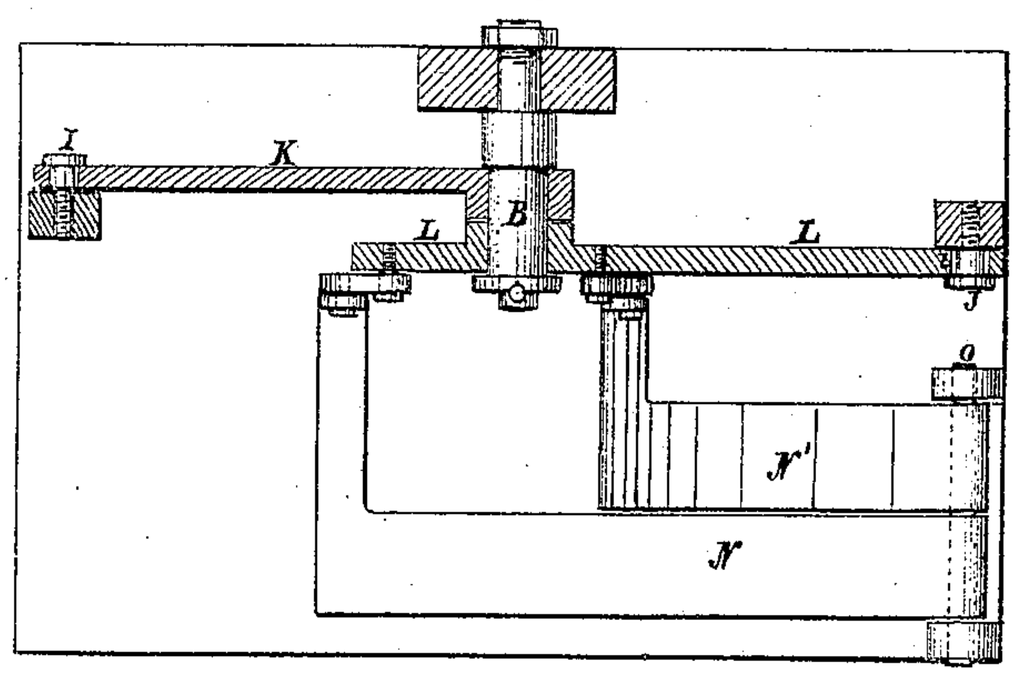
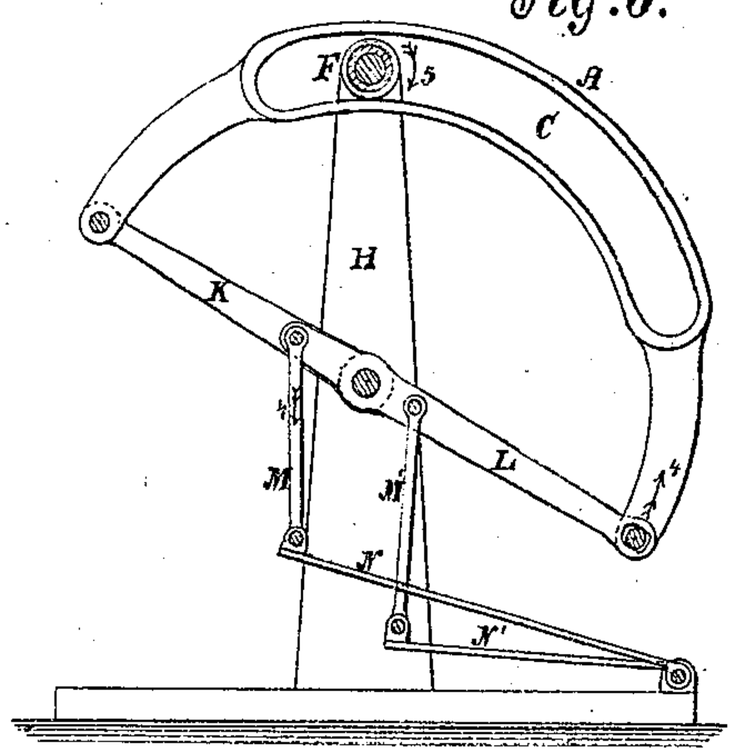


Fig. 6.



Witnesses:
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Fig. 7.

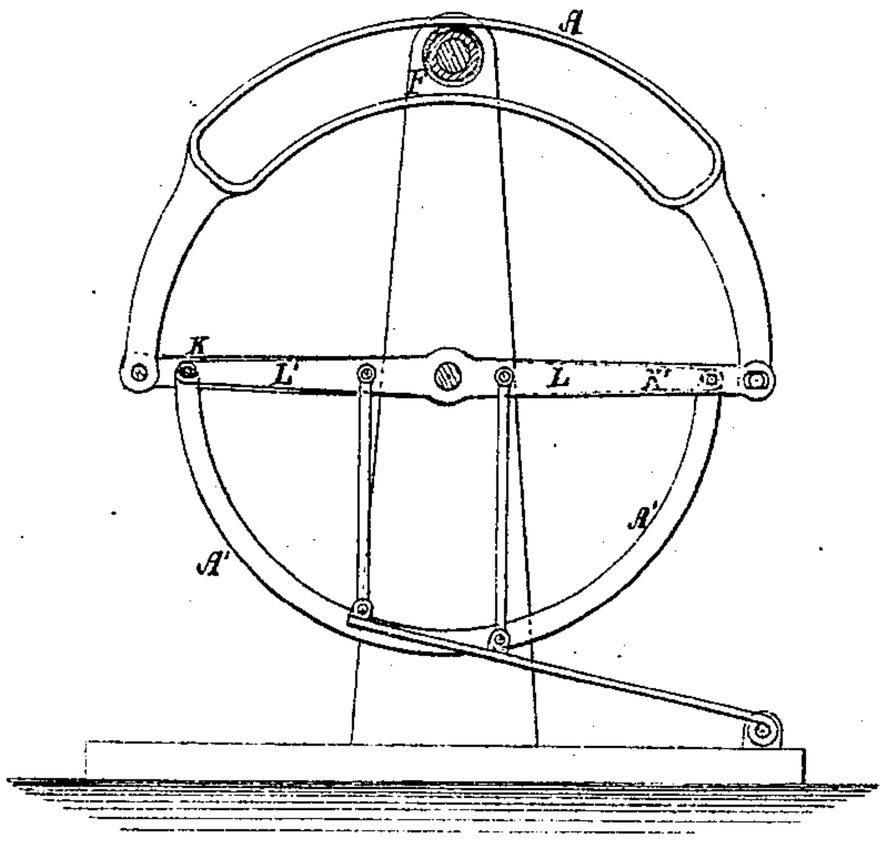


Fig. 8.

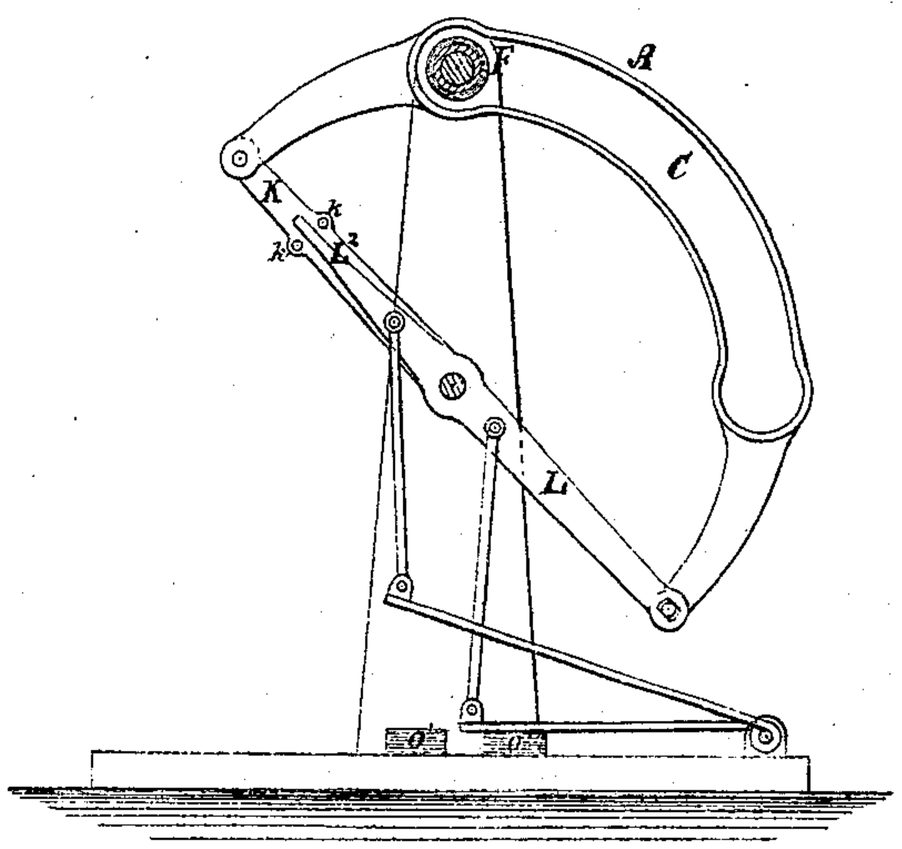


Fig. 9.

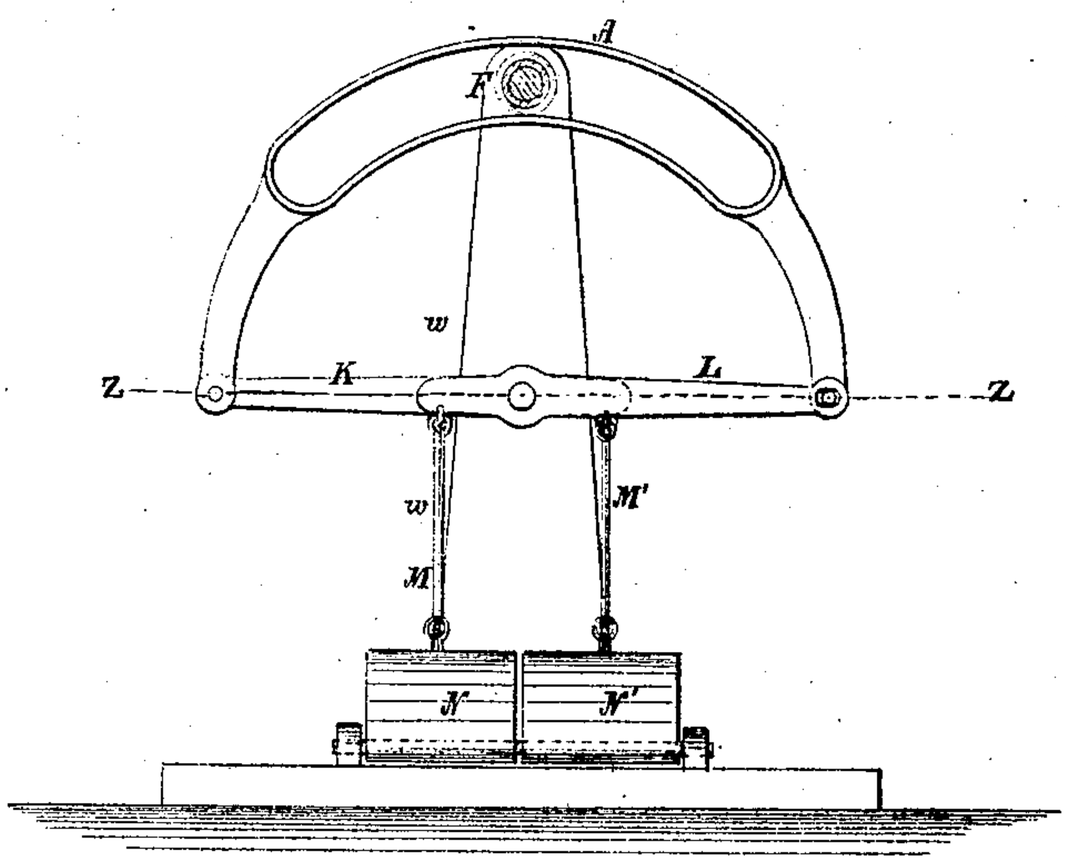


Fig. 11.

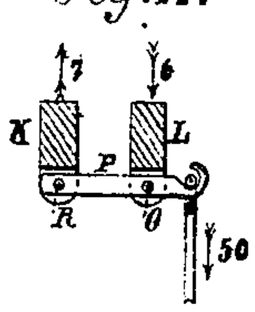
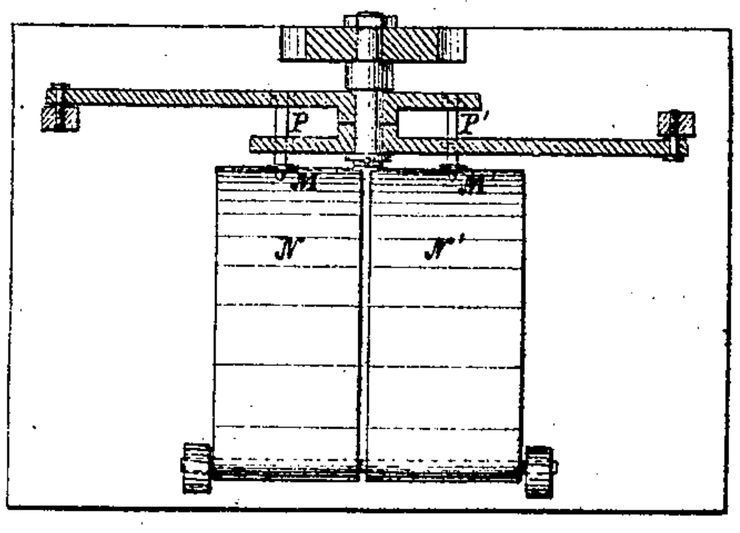


Fig. 10.



Witnesses:

Alex F. Roberts

Frank Blockley

Inventor:

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119,735

UNITED STATES PATENT OFFICE.

ALBERT BENNECKENDORF, OF HOBOKEN, NEW JERSEY.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. 119,735, dated October 10, 1871.

To all whom it may concern:

Be it known that I, ALBERT BENNECKENDORF, of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Mechanical Movement; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figures 1 and 2 are diagrams to illustrate the principles of my invention. Fig. 3 is a front view of the mechanism; Fig. 4, a side view, partly in section, on the line *x x*, Fig. 3; Fig. 5, a horizontal section on the line *y y*, Fig. 3; and Fig. 6, also a front view on a reduced scale, showing the parts in the second position. Figs. 7 to 11 show modifications of the mechanism.

Similar letters of reference indicate corresponding parts.

This invention relates to a new mechanical movement for converting oscillating or reciprocating into rotary motion; and consists in the application, to the roller to be revolved, of a vibrating semicircular friction-band or brace, connected with operating-levers in such manner that when swung on its pivot it will convey motion in one direction to said roller.

a and *b* in Figs. 1 and 2 are horizontal shafts. C is a semicircle which has its center in the axis of the shaft *b*, and is at one end connected to the lever *e* by a pivot, *d*, said lever *e* being fastened to the shaft *b*. Pulling or pushing the free end of the semicircle in the direction of the arrows, Figs. 1 and 2, will make it work by friction on the shaft *a* and cause the same to rotate. The semicircle may work above or below *a*, as is respectively indicated in Figs. 1 and 2, but in either case the shaft *a* will be rotated in the same direction. When, however, the semicircle is moved contrary to the direction indicated by the arrows in Figs. 1 and 2 it will be swung clear of the shaft *a* and consequently transmit no motion to it. Applying this principle it is easy to understand the mechanism shown in Figs. 3 to 6. A is a semicircle which has its center in the axis of the stud B. This semicircle is slotted as at C, and has arms D and E at the ends. The slotted portion of the semicircle embraces a friction-roller, F, which is hung on a pin, G, and covered with rubber, leather, or equivalent material for increasing friction. The slot C must be so much wider than the diameter of F as to offer but one side for contact at a time. The roller F turns loosely on the stud G, which is fastened by screw and nut, or otherwise, to a stationary frame, H, which also sustains the stud B. The stud B serves as pivot for two levers, K and L. The long arm of the lever K is attached to the arm D of the semicircle by a pin, I, and the long arm of the lever L is attached to the arm E of the semicircle by a pin, J. The pin J plays in the slot *l* of the lever L. By this connection the semicircle A can be moved up and down as far as the slot *l* will permit. Treadles N and N′ turning upon a pivot, O, or other suitable operating-levers or handles, are, by connecting-rods M and M′, or otherwise, attached to the lever L, as shown. When the parts are in the position shown in Fig. 3, and pressure is applied to the treadle N′, the rod M′ will be drawn down and act by the lever L upon the semicircle A in the direction of the arrows 2. This will cause the upper side of the slot in the semicircle to work over the roller F and by the consequent friction to rotate the roller F in the direction of the arrow 3, the same as in Fig. 1. If, subsequently, the parts being in the position shown in Fig. 6, pressure is applied to the treadle N, the rod M will be drawn down and swing the lever L so as to carry the semicircle A in the direction of the arrows 4. This draft will cause the under side of the slot in the semicircle to work against the roller F, and the consequent friction to rotate the roller in the direction of the arrow 5, the same as in Fig 2. Thus, it is seen that by working the treadles alternately a continual rotary motion is transmitted to the roller. A pulley may be attached to the roller to convey the motion to suitable mechanism. The weight of the semicircle A, which, in the mechanism described, is shown to rest on the roller F, may be balanced by a semicircular or other shaped brace, A′, pivoted to the short arms of the levers K L, as is clearly shown Fig. 7. The pivots of this brace A′ should work in slots. Whenever a fly-wheel is to be applied to the roller F, I propose to use the modification shown in Fig. 8. In this the slot C is enlarged at the ends, the relative displacements of the lever L and K being limited by pins *k k* fastened to lever K, which strike the the prolongation or short arm L^2 of the lever L, while the downward motion of the treadles N and

N′ is arrested by rubber or other springs *o′* O′. Thus it will be seen that at the end of each stroke the roller F has free play to be turned by the fly-wheel till another stroke commences.

A mode of increasing the friction on the roller F is shown in Figs. 9 to 11, in which Fig. 9 is a front view; Fig. 10 a horizontal section on the line *z z*; Figs. 9 and 11 a detail section on the line *w w*, Fig. 9. The treadles N and N′ are in this case put at right angles to the plane of the semicircle, and the connecting-rods M and M′ not directly attached to the lever L, but to small levers P and P′ that connect K L. Each of these levers P P′ turns on a pivot Q in the lever L, while the end is attached by a pivot, R, to lever K as shown in Fig. 11. This lever K has the same short arm as the lever L. If in Fig. 11 the connecting-rod M is pulled in the direction of the arrow 5 0, this draft will move the levers in opposite directions, as shown by arrows 6 and 7, whereby the semicircle will be pressed upon the roller F. The attachment of the connecting-rods to levers and treadles allows a four-way motion. Working the treadle N, the under side of the slot in the semicircle will press against the roller, while by the treadle N′ the upper side of the slot is pressed against the same.

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

The slotted oscillating semicircle, arranged to embrace the roller F, substantially as described, to convert reciprocating or vibrating into rotary motion, as specified.

A. BENNECKENDORF.

Witnesses:
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GEO. W. MABEE.