E. Nicholson,

Clutch Gearing.

No. 108,817. Patented Nov. 1. 1870.

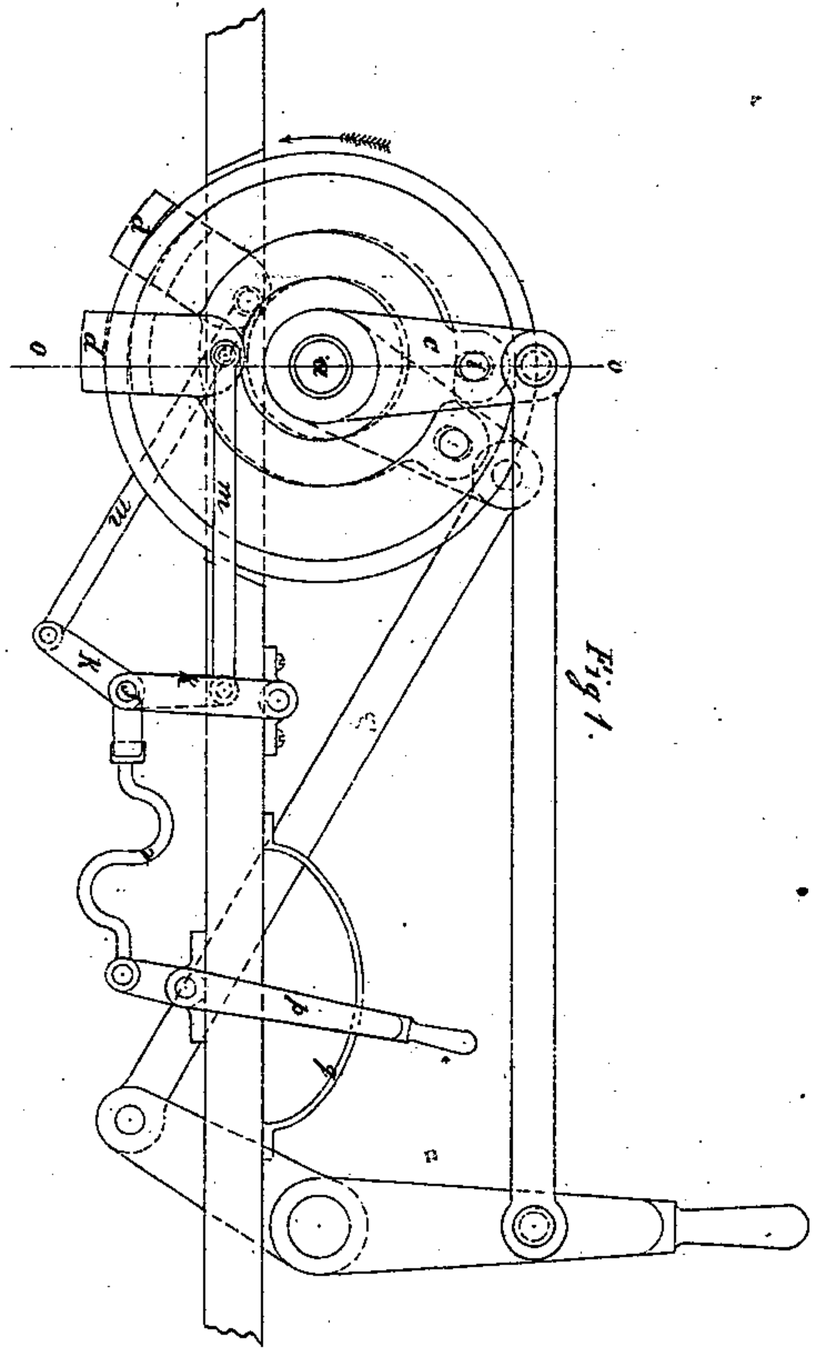

Fig 1.

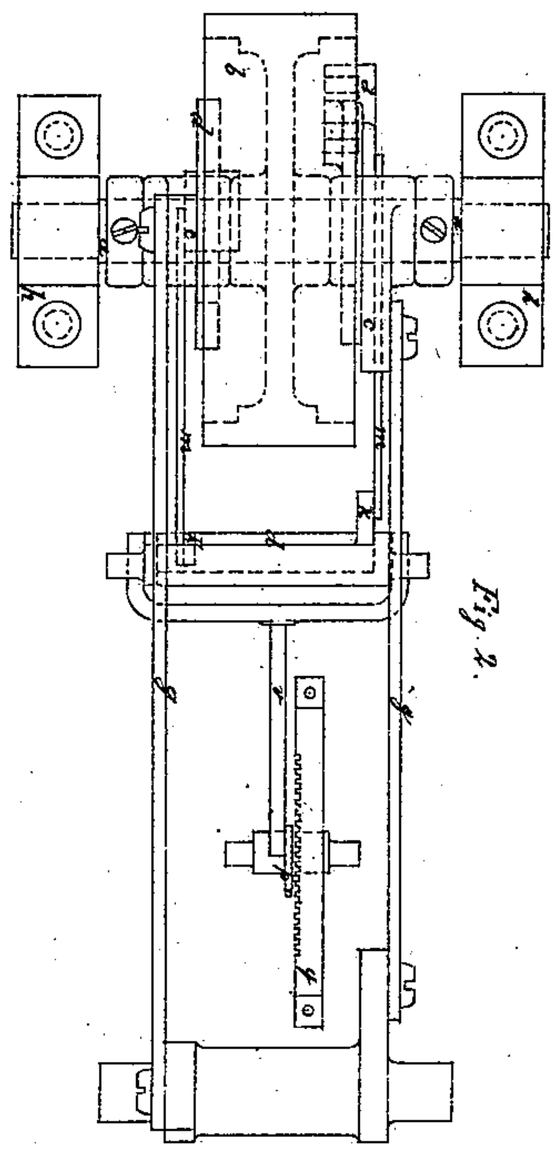

Fig 2.

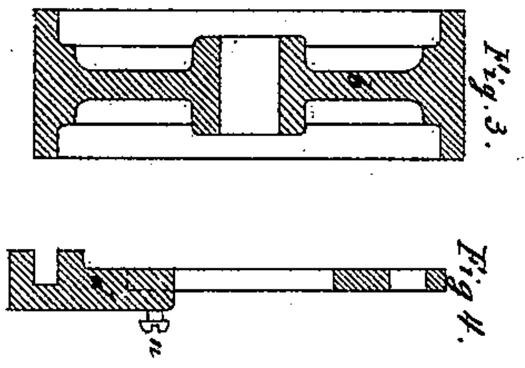

Fig 3.

Fig 4.

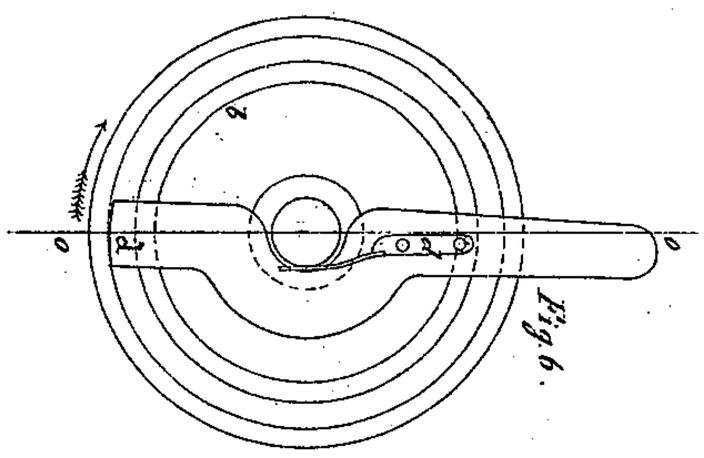

Fig 6.

Fig 5.

Fig 7.

Witnesses Present.

Chas. P. Calhoun

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UNITED STATES PATENT OFFICE.

EZRA NICHOLSON, OF CLEVELAND, OHIO.

IMPROVEMENT IN CLUTCH-GEARING.

Specification forming part of Letters Patent No. **108,817**, dated November 1, 1870; antedated October 26, 1870.

To all whom it may concern:

Be it known that I, EZRA NICHOLSON, of the city of Cleveland, State of Ohio, have invented a new and useful Improvement in Clutch-Gearing, applicable to every kind of machinery wherein it is desirable to clutch and relieve the same at will while the machine is in motion or at rest; where the rotary movement of one part of the machinery is to be communicated to another, as in case of countershafts of turning-lathes, &c.; where reciprocating or vibratory movement is to produce rotary motion to shafts, as in the case of treadles to foot-lathes, sewing-machines, locomotive-axles of steam or hand cars of railroads, feed-gearing of planing and other machinery; wherein direct movements are required, as in the case of measuring-machines or ascending inclined planes, by clutching rails, &c.; and I do hereby declare the following to be a true and exact description of my said invention, reference being had to the accompanying drawings, and to the letters of reference thereon.

To enable those skilled in the arts to make and use my invention, and, although by slight modifications of its form it is equally applicable to all the purposes named above, I shall proceed to describe its construction and operation as applied to vibratory and rotary movements.

Figure 1 is a side elevation, and Fig. 2 a top view. Figs. 3, 4, 5, 6, and 7 are detail views.

a is an axle fitted in journal-bearings *h*.

b is a wheel or pulley fitted and keyed to axle *a*, and has projecting rims on each side.

c c are levers fitted loosely on axle *a*.

d d' are wrench-levers made with a grooved jaw at one end, which fit loosely over the projecting rims of the pulley *b*. In the other end of this wrench-lever is a slot, and is loosely connected to the lever *c* by a pin at *i*.

g is a connecting-rod coupling the lever *c*, through which the power is transmitted from the hand-lever, steam-engine, or other source of power.

Reversing apparatus.—*j* is a rock-shaft resting in movable journal-bearings. *k k* are arms of nearly equal length attached to said rock-shaft. *m m* are links connecting the arms *k'* to the wrench-lever *d d* at *n n*. *p* is a reversing-lever; *q*, a notched guard; *r*, a link connecting the lever *p* to the movable journal-bearings of the rock-shaft *j*. *o o* is an imaginary line, always bisecting the pin *i* in the lever *c* and the center of the axle, and used for the purpose of explanation.

Having thus described its construction, its operation will be as follows: By drawing the reverse-lever *p* back, the rock-shaft *j* will be thrown forward, and the links *m m* will move the wrench-levers *d d* forward of the bisecting line *o o'*. The notch-guard will hold all these parts in this position. The clutch is then set to revolve the shaft in the direction of the arrows. By vibrating the lever *c*, by hand or other power, the pin *i*, acting in the slot at the upper end of the wrench-lever *d*, will cause it to move and firmly grip the rim on both outer and inner surface, and cause the wheel to turn in the direction of the arrow, while the other wrench-lever, *d'*, being held by the link *m'* in its relative position forward of bisecting line *o'*, will not clutch the rim, but slide freely back and grip the rim on the return-stroke of the lever *c*, and thus the wrench-levers *d* and *d'* will act alternately, and the motion be continuous. By throwing the reversing-lever forward, the wrench-levers *d* and *d'* will be drawn back of the bisecting line *o o'* and cause the wrench-levers to grip on their return movement and the axle *a* to revolve in the opposite direction.

Note first.—In cases where fly-wheels or other continuation of powers are used, but one of the wrench-levers will be needed.

Note second.—In case the axle is only required to move in one direction, the whole of the reverse apparatus may be dispensed with, as it is only necessary to prevent the wrench-lever *d* from passing from the side of bisecting line on which it is intended to work, and the axle will answer all the purposes by so forming the wrench-lever as to touch it on the return-stroke, as shown in Figs. 6 and 7.

Note third.—It is immaterial to the plan or well-working of the clutch whether the rim of the wheel be clamped by the groove in the lever or the lever be clamped by the groove in the wheel, as shown in Figs 6 and 7.

What I claim as new, and desire to secure by Letters Patent, is—

1. The clutch entire, as constructed and specified.

2. The wrench-lever *d*, acting on a rim or in a groove, as described.

3. The reversing apparatus, as applied to the wrench-levers, or its equivalent, substantially as described, and for the purposes herein set forth.

E. NICHOLSON. [L. S.]

Witnesses:
LEWIS H. FRENCH,
WILLIAM BURNHAM.