L. B. Potter,

Machine Gearing.

No. 59,064 Patented Oct. 23, 1866.

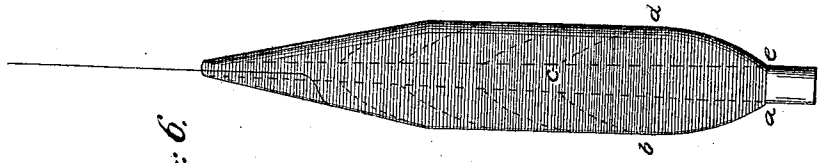


Fig. 6.

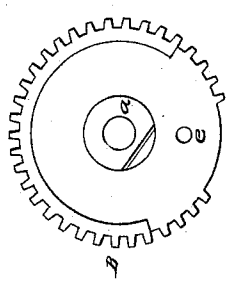


Fig. 3.

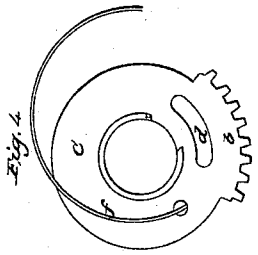


Fig. 4.

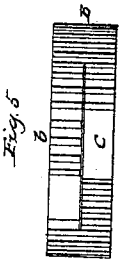


Fig. 5.

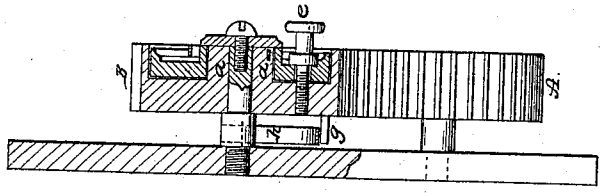


Fig. 2.

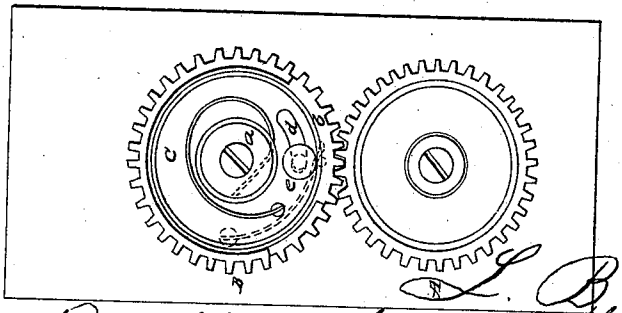


Fig. 1.

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AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE

LYMAN B. POTTER, OF PUTNAM, CONNECTICUT.

IMPROVEMENT IN INTERMITTENT AND EXPANSIVE GEARING.

Specification forming part of Letters Patent No. **59,064**, dated October 23, 1866.

To all whom it may concern:

Be it known that I, LYMAN B. POTTER, of Putnam, in the county of Windham and State of Connecticut, have invented a new and Improved Intermittent and Expansive Gearing; 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 drawings, forming part of this specification, in which—

Figure 1 is a plan view of the gearing. Fig. 2 is a section. Fig. 3 is a plan of a part of the gear, detached. Fig. 4 is a plan of another part, detached. Fig. 5 is a side view. Fig. 6 is a view of a cotton-yarn cop, showing one of the applications.

Similar letters of reference indicate like parts.

The nature of this invention consists in the application of a device to spur-gearing for the purpose of changing the speed of a wheel while the driver gearing into it continues its motion without variation of velocity. The change of motion is effected by means of a segment-gear, which is made fast or loose on the wheel by a set-screw.

When the segment is fast, the cogs on the periphery engage all around, and the wheel makes an entire revolution; but when the segment is loose it slips back at every revolution of the driving-wheel, and there is an intermission or stop in the movement of the wheel that receives motion for a space equal to a part of the shifting segment, and a corresponding diminution of speed caused by the expansion of the gearing to that extent.

When the segment is again made fast with the set-screw, the cogs of the driven wheel all come into gear again, and it moves without intermission, thus alternately having its revolutions increased or diminished, as desired, without any change in the velocity of the driving-wheel.

This device may be applied to machinery for any purpose where an independent change of speed is desired in the mechanism; but I have made a special application of it to self-operating mules for spinning cotton yarn.

By the present mode of spinning yarn with an equal or uniform twist on all parts of the cop, it is very liable to break in unwinding the bottom or foundation of the cop, on account of increased tension and friction at that part, and the waste produced by this cause is very considerable, while at the same time there is loss of time in mending broader yarn, and inequality of the fabric occasioned by the knots in weaving.

By means of my intermittent and expansive gearing I can increase or diminish the twist of the yarn readily at will, without interruption to any other part of the machinery, by simply turning the set-screw to make the segment-gear fast or loose, and in this way, by a variation of four cogs in the revolution, I give to the yarn on the foundation of a cop a little more twist than on the rest or upper portion of the cop, and just sufficient to impart the requisite strength to bear the increase of strain and friction to which it is subjected in unwinding, without changing the character of the yarn.

Fig. 6 in the drawings represents a cop of cotton yarn, which shows the mode of forming or building it up from the foundation *a b c d e*, a double cone, on which successive cones are wound to the upper end, where the unwinding begins.

In Fig. 1, A is the driving-wheel, engaging in the wheel B, to give it motion. The wheel B is so constructed that it makes more or less revolutions, while the wheel A revolves continuously without varying its velocity. A flat annular ring, C, Fig. 4, is fitted in a recess within the periphery of the wheel B, Fig. 3, so that it plays loosely upon a central boss, *a*, formed by making the annular recess, the depth of which is equal to one-half the thickness of the wheel B, Fig. 2. On the periphery of the annular ring C is a segment, *b*, embracing eight half-length cogs, which match the cogs on the wheels A B, as shown in Figs. 4 and 5. The annular recess in the wheel B is cut through the periphery on one side for the space of twelve cogs, so that when the annular ring C is placed in the recess the segment *b*, of eight half-length cogs, can traverse the space of four cogs, as seen in Fig. 5. Of the twelve half-cogs which would be left on the wheel B by opening out the annular recess, four middle ones are also cut out, so as to leave

a blank space, *c*, equal to four cogs, on the periphery of the wheel, as shown also in Fig. 5.

In the annular ring C is made a slot, *d*, through which passes a set-screw, *e*, into the wheel B, which slot allows the annular ring C to traverse with the segment *b* for the space of four cogs, by which arrangement it will be seen that one-half the segment *b* covers the space of the blank *c* in the wheel B, made by cutting out four half-cogs, so that whichever side the segment is shifted the connection of the gearing is continuous on the wheel B.

A spring, *f*, is attached to the segment-ring C, fastened at one end to the central boss, *a*, which, when allowed to act freely, moves the segment *b* up against one side of the open space in which it traverses.

The operation is as follows: When the segment *b* is made fast with the set-screw *e*, the cog-connection is continuous, and the wheel B is moved steadily by the wheel A without interruption; but when the segment is loose the connection of the wheel A with the wheel B is broken by the slip of the segment *b* four cogs backward at the moment the wheel A engages in the segment *b*, by which countermovement of the segment *b* the wheel B intermits its motion while the wheel A is engaged in the segment *b*, or loses its motion for the space of the blank *a*. As soon as the segment *b* is disengaged the spring *f* throws the segment forward again to the opposite side of the opening, and the same countermovement takes place at the next revolution of the wheel A, by which the motion of the wheel B is regularly intermitted for the space of four cogs, and the comparative speed reduced accordingly.

In order to prevent the wheel B from moving when the segment *b* engages with the wheel A, the pin *g* on the bottom of the wheel B bears upon a spring, *h*, until the segment is disengaged.

Having described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The device for an intermittent and expansive gearing, constructed and operated substantially as herein shown and described.

The above specification of my invention signed by me this 27th day of July, 1866.

LYMAN B. POTTER.

Witnesses:
WM. F. MCNAMARA,
ALEX. F. ROBERTS.