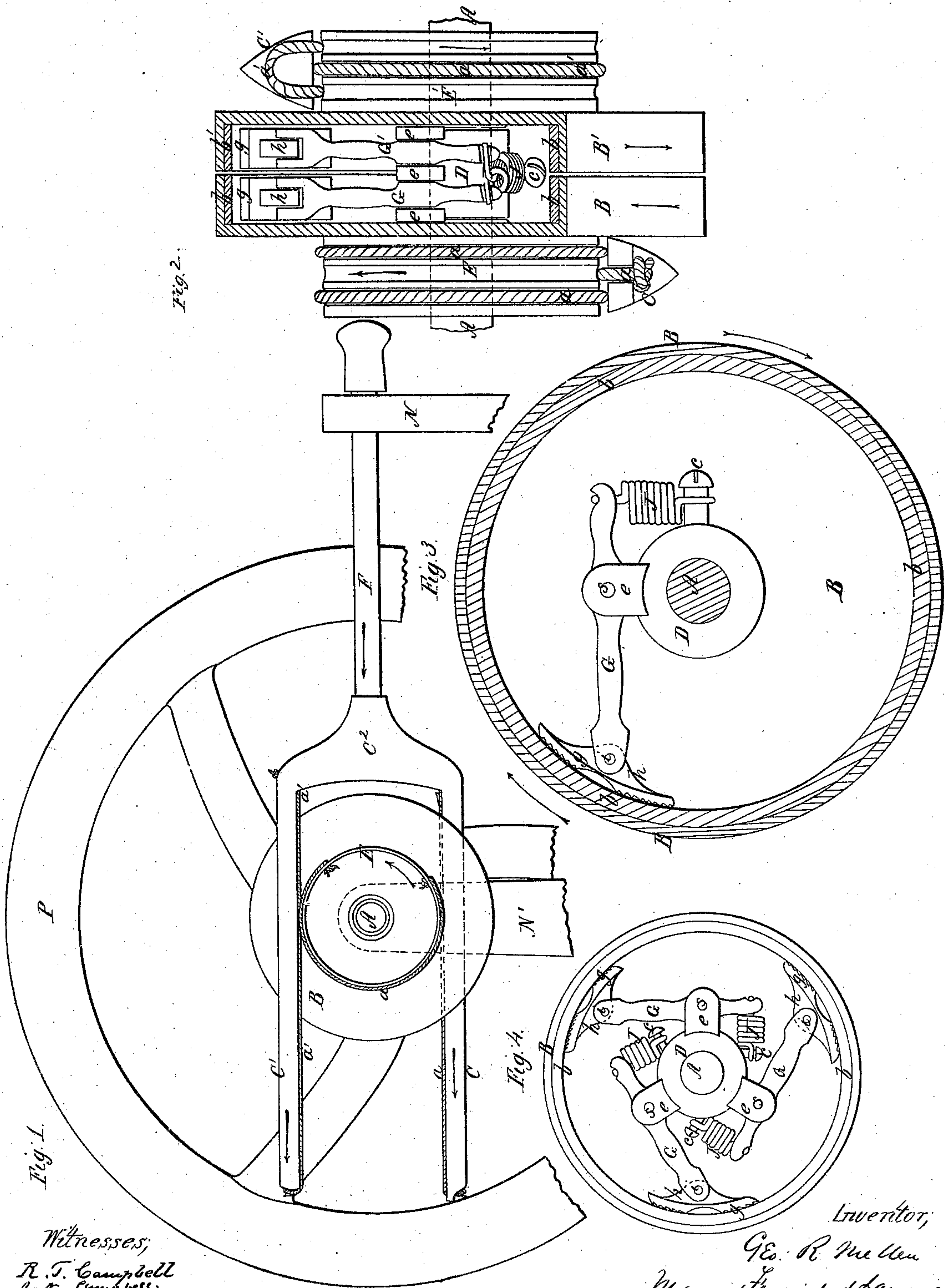


G. R. Metten.

Mechanical Movement.

N^o 87,353.

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GEORGE R. METTEN, OF CLEVELAND, OHIO.

Letters Patent No. 87,353, dated March 2, 1869.

IMPROVED MECHANICAL MOVEMENT.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE R. METTEN, of Cleveland, in the county of Cuyahoga, and State of Ohio, have invented a new and improved Mechanical Movement; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a view of one end of the improved mechanical movements, showing the forked pitman, balance-wheel, and one of the clutch-carrying drums on its hub.

Figure 2 is a side view of the movement enlarged, with portions of the rims of the two drums broken away to expose the clutches therein.

Figure 3 is a face view of one of the drums, showing its friction-clutch and connecting-hub.

Figure 4 shows a mode of applying three friction-clutches to one drum.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a new and improved construction of mechanical movement, which is especially adapted for operating sewing-machines, but which is also applicable to velocipedes, and to machinery generally, where it is desired to communicate a continuous rotary motion from a pitman receiving a relative or reciprocating motion.

The nature of my invention consists in applying loosely, upon the shaft of a balance-wheel, two hollow drums, which are constructed with grooved pulleys on their closed ends, and frictional surfaces upon the inner sides of their rims or flanges, and in employing, in combination therewith, spring-clutch arms, and a forked pitman-rod, the forked arms of which latter are connected to the pulleys of said drums by means of cords, in such manner that by giving a reciprocating motion to the pitman, it will rotate the said drums in opposite directions alternately, and at every stroke communicate to the balance-wheel shaft a rotary impulse, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

Before describing my improvement, I desire to state that I am aware that a variety of contrivances, operating upon the general principle of the mechanical movement, hereinafter described, have been used for converting motion, and I do not claim broadly the principle of giving a rotary motion to a shaft by means of a rectilinear-moving rack, or a frictional pitman.

My object is, as will be hereinafter made evident, to obtain such a mechanical movement as is free from many of the objections heretofore attending it, and which may be practically and advantageously used for operating sewing-machines, velocipedes, and other machines where a smooth and regular rotary motion is required.

In the accompanying drawings—

A represents a shaft carrying balance-wheel P, and suitably supported in bearings N', which latter may represent the frame of a sewing-machine, or the pendants of a velocipede.

On this shaft, I loosely apply two cylindrical drums B B', with the edges of the flanges of their open ends nearly touching each other, as shown in fig. 2.

These two drums are constructed alike in every particular, and have grooved pulleys E E' formed on their outer or closed ends, adapted to receive respectively an arm of a pitman-rod.

Upon the inner surfaces of the flanges of drums B B', leather, rubber, or other suitable substance, *b b'*, is applied, for affording soft friction-surfaces, against which two or more serrated clutching-dogs *g g'*, are caused to press at proper times, as will be hereinafter explained.

These dogs *g g'* are pivoted at *i i*, by ribs *h h*, which are formed on them, to the ends of their respective levers G G', which latter are pivoted at *s s*, to lugs *eee*, formed on a hub, D, that is made fast to the shaft A, within the two drums B B'.

In fig. 3, I have shown clearly the manner of arranging the clutching-parts within one of the drums, and in this figure it will be seen that the shortest arm of the dog-carrying lever G is acted upon by a spring, J, which is attached to the hub D, by the same pin, or stud *c*, which keys this hub to its shaft A.

This spring acts upon the short arms of both levers G G', as shown in fig. 2, and presses the dogs *g g'* outwardly against the friction-surfaces *b b'* of their respective hubs B B'.

The dogs *g g'* are both alike, and each dog is the segment of a circle, having the same radius as the interior diameter of its drum.

Each dog has teeth formed upon its biting-surface, which, with the friction-surface, will prevent its drum from slipping when turned in one direction, but when such drum is turned in an opposite direction, the spring J will yield, and allow it to turn freely around its shaft A.

Each one of the pulleys upon the outer closed ends of a drum, has three annular grooves in its periphery, adapted for receiving the three cords which attach it to its arm of the pitman-rod F, as shown in figs. 1 and 2.

The pitman-rod F is constructed with two arms, C C', of suitable length, which are parallel to each other, but connected by a head, C², to rod F, in such manner as that one arm, C', lies flat upon the pulley E', and the other arm, C, is held up beneath the opposite pulley E. Thus, when said arms are connected by cords *a a'* to their respective pulleys, one of the drums will be moved in an opposite direction to the other drum during each stroke of the pitman-rod.

The cords *a a'* are wound around their respective pulleys, and attached to their respective arms in such manner, that each arm will rotate its respective drum and pulley, moving both forward and backward.

The operation is as follows:

When the pitman-rod F is moved forward, or toward

the shaft A, the cord-attachment *a*, on arm *O'* of said pitman, will turn the drum *B'* in the direction indicated by the arrows in figs. 1, 2, and 3, and turn shaft A in the same direction. At the same time, the cord-attachment on arm *C* will turn drum *B* in an opposite direction, during which this drum will be disengaged from its shaft A.

When pitman *F* is drawn backward, the drum *B'* will be disengaged from its shaft A, and this shaft will receive another impulse, in the same direction as before, from the arm *C* acting upon its drum *B*, through the medium of cord *a*.

In this way, and by this arrangement, a continuous rotary motion in one direction can be given to the shaft A, by a reciprocating movement of the pitman, and said shaft will receive an impulse at every stroke of the pitman.

In fig. 4, I have represented three separate clutching-dogs *g g g*, with their respective arms *G G G* and springs *J J J* applied to a hub, *D*, on shaft A, so as to operate upon the friction-surface *b* of a drum, *B*. I do not therefore confine myself to a single clutching-dog, *g*, as shown in fig. 3, as more than one can be employed whenever desired.

The object of using three cords on each pulley, is to have one cord act between or in the middle of two cords, so that the cords will draw evenly upon their

pulley during both strokes of each pitman-arm; also, to have the single cord of each pulley act when its pulley slips upon the shaft, and to have the two cords to act when the drum of their pulley engages with the shaft.

By these means, I obtain the strength of two cords for driving the shaft, and use the single cords when their respective pulleys are turned loosely backward.

Having described my invention,

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

1. The combination of drums *B B'*, applied loosely upon shaft A, and constructed with pulleys *E E'* and internal friction-surfaces, arms *O O'*, pitman *F*, dogs *g g'* applied on arms *G G*, spring *J*, hub *D*, and shaft A, substantially as described.

2. The combination of the serrated dog or dogs *g*, pivoted to an arm, *G*, which has its fulcrum upon a hub, *D*, made fast to shaft A, and flanged drum *B*, constructed with a pulley, *E*, and connected to a pitman by means of cords *a*, substantially as and for the purposes described.

GEO. R. METTEN.

Witnesses:

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