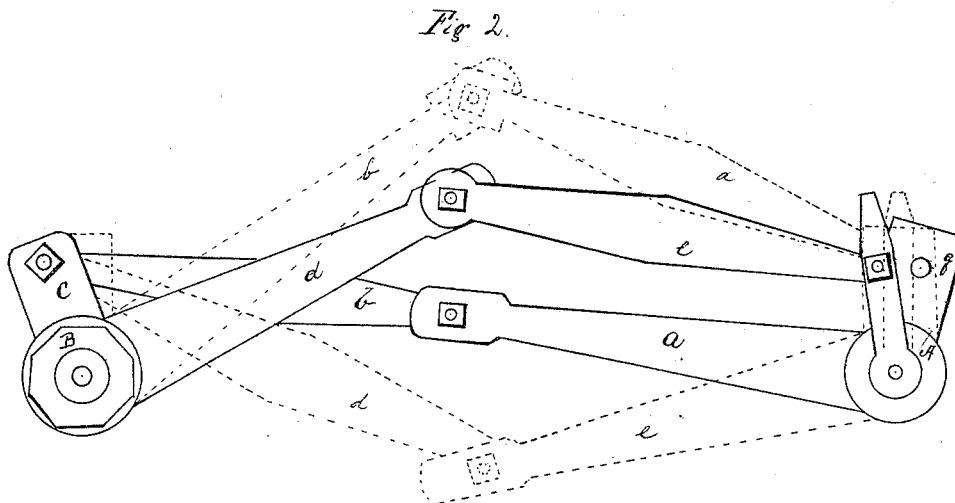
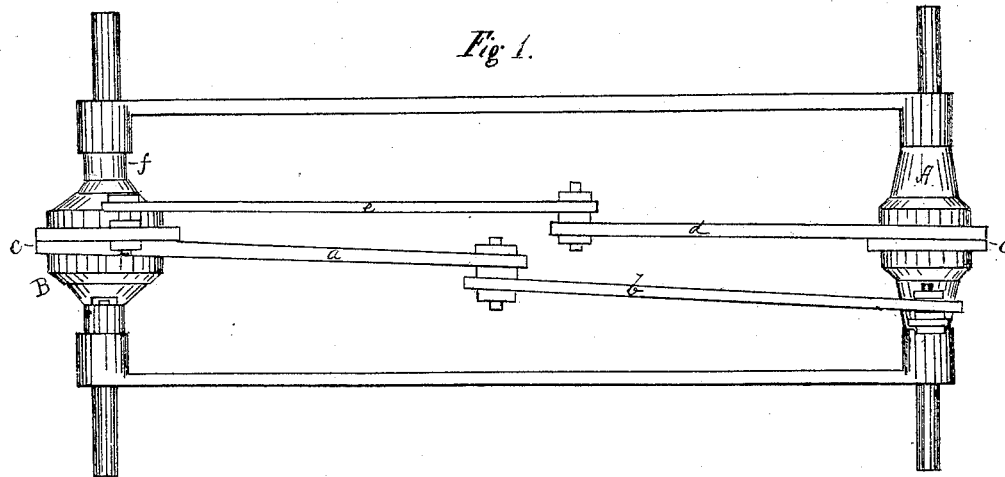


JOHN CORLEY.

Improvement in Mechanical Movements.

No. 114,111.

Patented April 25, 1871.



Witnesses:
Parker H. Sweet, Jr.
Charles A. Randall

Inventor:
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By his Attorney
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United States Patent Office.

JOHN CORLEY, OF NEAR COALFIELD, KANSAS.

Letters Patent No. 114,111, dated April 25, 1871.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

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, JOHN CORLEY, near Coalfield, in the county of Cherokee and State of Kansas, have invented a new and useful improved Mechanical Movement or Device for Multiplying Motion; and I do hereby declare the following to be a clear and exact description thereof sufficient to enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a top view of a device illustrating my invention.

Figure 2 is a side view of the same, showing the motions of the lever or levers.

The invention relates to an improved mechanical movement, the object of which is to provide means which shall take the place of gearing, belts, and pulleys for increasing or multiplying motion by a geometrical progression; and

The invention, to this end, consists of a system of jointed or toggle levers so constructed and arranged as that it shall never be overcome by a dead center.

It is essentially a number of rigid links bolted, pivoted, or otherwise hinged together, suitably attached to the operating portion of a locomotive or other engine, harvesters, sewing or other machine, where a rapid, uniform, or other motion is required, and may have a vertically-reciprocating or other motion, which imparts the desired motion, whether rotary or other, to the mechanism to be operated.

Two links (as will be described) of this device, if one end be attached to the operating power and the other to the mechanism to be operated, will give, to one movement of the power, two movements to the mechanism to which the power is to be applied, or, in other words, to that which is to be operated, as will be hereinafter more fully set forth.

Referring to the drawing—

The letter A may designate a bearing for a shaft, upon which is secured a link, *a*, made of metal or other material and of any desired shape.

In order that its application may be more readily understood, suppose it to be used to drive a locomotive-engine. The link *a* will be secured by a wrist or by some other device to the piston-rod, and a second link, *b*, equal or unequal in length to the first, is secured by a loose joint to one end of the first, *a*, and its free end is attached to the eccentric pin on the driving-wheel. One complete stroke of the piston-rod will give to the wheel two complete revolutions, thus doubling the speed of the engine over that obtained by the use of the old pitman connection.

If, now, the link *b* is attached to a wrist, *c*, and secured on a suitable bearing on the locomotive, and

has rigidly jointed therewith on the same bearing a third and fourth link, *d* and *e*, respectively, and the link *e* be attached to the driving-wheel, the wheel will make four entire revolutions to one stroke of the piston-rod, and thus on in a geometrical progression, every additional two links multiplying the number of revolutions last had by two; so that, starting with two, the next is four, the next eight, next sixteen, and so on indefinitely.

The principle involved in securing this is as follows:

The three joints are arranged in a straight line, and the central joint is so situated that a dead center is always overcome. The motion, whether it be rotary, reciprocating, or otherwise, is always uniform and complete, and is such that, as before said, the motion of the machinery to be operated is twice that of the power by which it is applied, or, if transmitted from the first two links to a set or system of two more, is twice that of the first set or system.

In some cases, in order to limit the movement of the link *d* the clamp or joint B, which holds the links *d* and *b* together, or the link *d* and the wrist *c*, has a small recess cut in it, which a stop or an adjustable sleeve, *f*, works, and which serves to regulate the length of the movement of the links *d* and *e*.

This is not always necessary; for instance, it would not be in some rotary motions and in others.

The clamps, bearings, or joints A and B may be made in one piece with the wrists *c* and *g*, or they may be made in separate pieces and secured together by nuts, &c. But at times, as when the motion is only to be twice that of the power applied, the bearing B and wrist *c* will be dispensed with.

The bearing A and wrist *g* are always required, and they, with the link *a*, may be made in one piece or separate.

When applied to harvesters the wrist *g* is secured to the main shaft by a crank or other suitable device for operating the knives, and about four sections of two links each would give a very rapid motion to the knives, and by an addition of these links a motion would be obtained very much more rapid than has heretofore been accomplished by systems of gearing or belts or pulleys, and likewise similar adjustments are required to apply it to other machines.

The main or first link of each section, as *a* and *d*, is attached to the bearing, while the second link, as *b* and *c*, is attached either to that which is to be operated, or, when two or more sections are used, to a wrist, as *e* *g*; and as one set has its three joints brought in a line, the center joint of the opposite set (when two or more sets are used) is at its highest or lowest point, (see fig. 2, dotted lines,) which gives to the device its uniformity and regularity of movement.

Its advantages over toothed wheels are many, as

the cogs of heavy machinery are constantly breaking and wearing away, as is also the case in other machinery, and, besides, occupy a large space, and are expensive.

The device has none of these objections, and, besides, is simple and seldom gets out of order.

Having thus described my invention,

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

1. The method of multiplying motion or speed in a machine or machinery by means of sets of links, connected and operating together substantially as described.

2. The device herein described for multiplying motion or speed, consisting of the links *a b*, bearing *A*,

and wrist *g*, with the bearing *B*, wrist *c*, links *d e*, and stop, substantially as set forth.

3. The mechanical movement herein described, having the three joints of the links arranged in a line and so operating that when one set of links has come to this line in its movements the central joint of the opposite set, when more than one is used, will be at its furthest point from said line, as set forth.

To the above I have signed my name this 7th day of April, 1871.

JOHN CORLEY.

Witnesses:

JAMES L. NORRIS,
W. J. PEYTON.