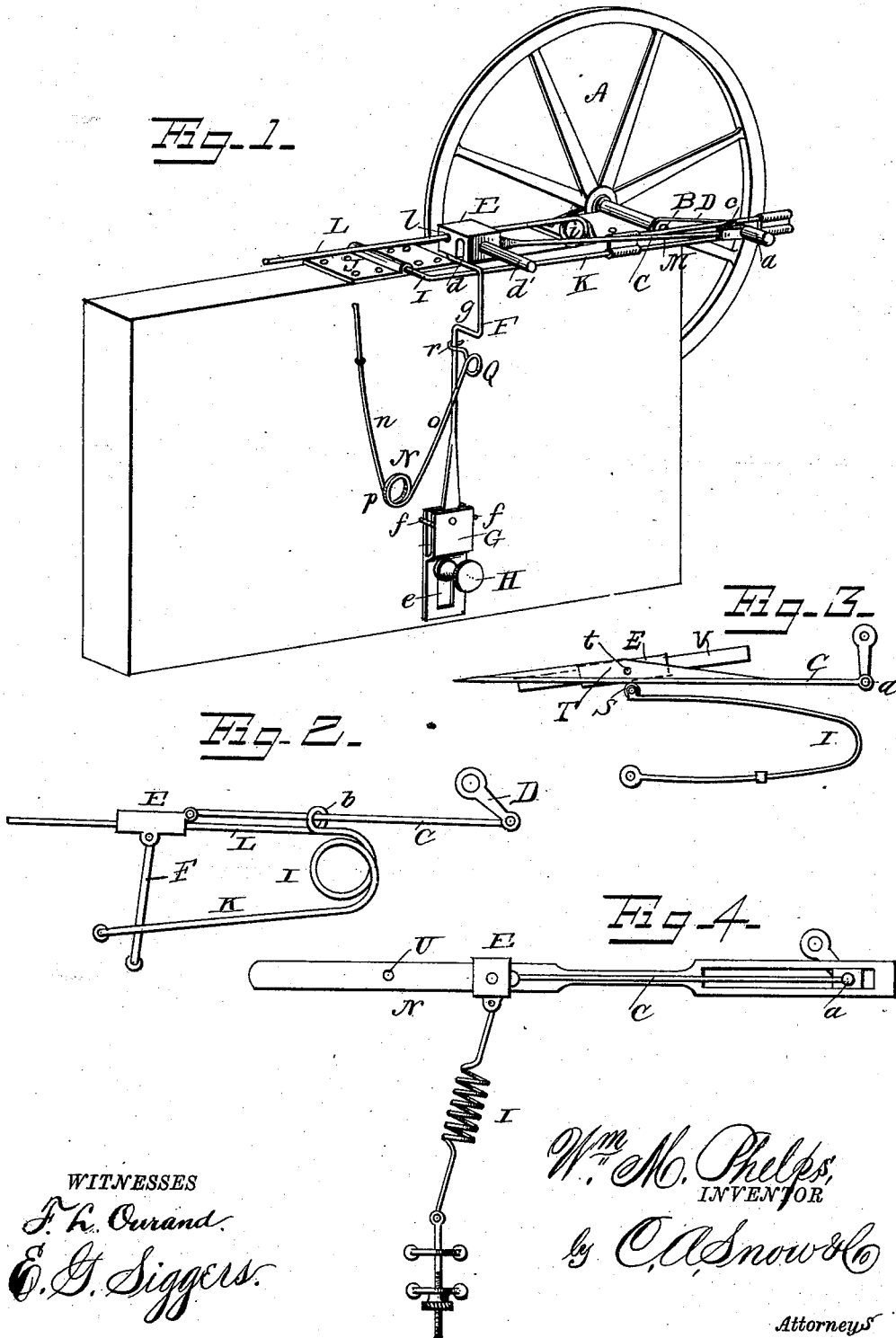


(No Model.)

W. M. PHELPS.  
MECHANICAL MOVEMENT.

No. 287,574.

Patented Oct. 30, 1883.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

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## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 287,574, dated October 30, 1883.

Application filed September 18, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. PHELPS, a citizen of the United States, residing at Marshall, in the county of Calhoun and State of Michigan, have invented a new and useful Mechanical Movement, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to mechanical movements adapted to be applied to machinery of all kinds; and it has for its object to provide means for converting a reciprocating into rotary motion, and vice versa, and for overcoming "dead-centers" in crank motion.

To attain these ends the said invention consists in certain details of construction and combination of parts, as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved mechanical movement. Fig. 2 is a detached view of a portion of the mechanism illustrating a modification. Figs. 3 and 4 are modifications.

Like letters refer to corresponding parts in the several figures.

Referring to the drawings, A designates a wheel secured to one end of a shaft, B, which is suitably mounted upon the frame-work of the machinery with which my improved mechanical movement is employed.

A pitman, C, is provided with a bifurcated plate, *c*, at one end, having openings *c'* to receive a crank-pin, *a*, projecting from crank D, the latter being secured to the other end of shaft B. The other end of pitman C is held in place in the sleeve E by means of an upward extension, *d*, of rod F, said extension passing through the sleeve, so as to connect the pitman, and provided at the outer end with a collar, *d'*, which serves as a wrist-pin, and to which the necessary reciprocating motion can be imparted by any machinery now in use.

The rod F is fitted at its lower end in a sliding plate, G, slotted at *e*, and working between guides *f*, a thumb-screw, H, or equivalent device being used to bind the plate at any desired point, for the purpose hereinafter set forth.

I is a spring, one arm, K, of which is pivoted in a plate, J, secured to the frame-work of the machinery, the other and longer arm, L,

passing through an opening, *l*, in the sleeve E, which, when reciprocated, slides over the said arm L, the latter having a coil, *i*, formed therewith and bearing on the lower arm, K, said arms K L being connected together at their rear ends and running parallel to each other, the crank-pin *a* working in a slot, M, inclosed by the two arms between their rear ends and the coil *i*.

The rod F is bent, as shown at *g*, so as not to interfere with the movement of spring I, and a spring, N, having two arms, *n o*, and a coil, *p*, is arranged to give force to the backward movement of sleeve E, the arm *n* being secured to the frame-work, while the other arm, *o*, is formed with a handle, Q, and a hook, *r*, said hook being adapted to engage with the rod F and to be disengaged therefrom by means of the handle Q.

The operation of my invention can be readily understood from the foregoing description, taken in connection with the annexed drawings. Power from a windmill, steam-engine, treadle, or any other device can be applied to the wrist-pin or collar *d'*, so as to impart a reciprocating motion to the sleeve E, which will slide over arm L of the spring I. As the sleeve moves forward, the rod F is turned in that direction, and the pitman C is brought forward, so as to draw the crank-pin *a* to the extreme inner end of slot M, causing the arms K L of the spring I to be lifted above the frame-work. In this position the rod F and sleeve E are beyond the pivot of arm K, and thus when the dead-center is nearly reached the power of the spring I will force the crank-pin over the dead-center, ready to be operated again.

It will be seen that the crank-pin passes through the slot M of the arms K L and works in said slot; said arms being interposed between crank D and the plate *c* of pitman C, a knob or equivalent device being used to prevent plate *c* from slipping off of the crank-pin.

Since it is mainly through spring I that the dead-centers in crank motion are overcome, it is important that said spring should be nicely adjusted to perform this function, and for this purpose I provide the sliding plate G and thumb-screw H, the arm J being drawn downward and held at any point, so as to increase the tension of the spring.

In Fig. 2 I have illustrated a modification

of the form of spring I, the latter consisting of two arms connected by a coil, the rearward extension, with its slot M, being eliminated, while the pitman C is simply connected to the crank and passes through an eye, *b*, in the upper arm, L, of the spring, and is attached to the sliding sleeve E. The arrangement and fitting of arms K L of the spring are substantially the same, and the operation is also the same.

The modification shown in Fig. 3 consists in providing an inclined extension, T, to the upper face of pitman C, the sleeve E being fulcrumed at *t* in the extension and sliding over inclined ways V. It will be seen that the pitman will operate the sleeve and cause the same to traverse the ways, the spring I being provided with a roller, *s*, which is pressed against the under side of the pitman and causes the dead-center to be overcome.

As shown in Fig. 4, I may dispense with a U-shaped spring, I, by employing a coiled spring, the tension of which is adjusted in any suitable manner. The spring is connected to the sleeve E, which travels on one end of a plate, N, forming ways, which are fulcrumed at U, the other end of said plate being slotted to allow the passage of the crank-pin. The operation and purposes of this construction are substantially the same as that specified for Figs. 1 and 2.

I have described the operation of my mechanical movement with reference to the conversion of a reciprocating movement into a rotary motion; but it will be apparent that my devices can be used to change rotary into reciprocating motion. Thus power may be applied to the wheel A, secured on the end of shaft B, causing the revolution of said wheel along with the aforesaid shaft. As said shaft is turned, the crank-pin *a* will move forward in slot M, depressing spring I until the crank-pin comes near the dead-center, when the tension of said spring will react, causing the crank-pin to be carried over the center, ready to be operated anew. Since the crank-pin is connected to the sliding sleeve E by means of pitman C, a reciprocating motion will be imparted to the sleeve, which may be transmitted to any suitable machinery.

I do not limit myself to the machinery to which my mechanical movement can be applied, since its construction and purposes are such that a great many uses may be made of the same. I would therefore state that it can be applied to a windmill, steam-engine, sewing-machine, or lathe, reserving the right to apply it to any mechanical device to which it would form a useful adjunct.

In the construction shown in Fig. 2 the pitman C is liable to spring upward; but by making the spring I with the back extension having the slot M, that portion of the spring will be stiff and will not spring upward, and thus the springing of pitman C is avoided.

It is well known that when the wind is high a windmill runs rapidly, but as the wind dies down the mill goes slowly and often comes to

a standstill, so that the ordinary crank motion cannot be used with it, for it is liable to stop on the dead-center, and when the wind starts up again something in the mechanism would be likely to break. By the use of my invention this danger is obviated, since the crank will not stop on the dead-center, but will be always in position to be operated safely by the windmill. In its application to treadle-powers—such as sewing-machines, turning-lathes, &c.—when the treadle is hung in the middle, (like an ordinary sewing-machine,) it is not necessary to use spring N, since power is applied in its upward and downward movement; but when power is applied to the treadle only one way, the spring should be used, in order to throw the crank up and off the dead-center.

It is apparent that numerous modifications may be resorted to without departing from the spirit or scope of my invention.

Having described my invention, I claim as new—

1. In a mechanical movement, the combination, with the crank-pin *a*, of a pitman carrying a sliding sleeve, and a spring connected to the sleeve, as set forth.

2. In a mechanical movement, the combination, with the crank-pin *a*, of a pitman carrying a sliding sleeve, and a U-shaped spring connected to the sleeve, one of the arms of said spring passing through the sleeve, while the other arm is fulcrumed in the frame-work, the rear portion of the arms inclosing a slot, M, arranged and operating for the purpose set forth.

3. In a mechanical movement, the combination, with the crank-pin *a*, of a pitman connected to the crank-pin, a sliding sleeve, and a spring fulcrumed in the frame-work, the latter being arranged to act alternately on the sleeve on either side of its fulcrum, as set forth.

4. In a mechanical movement, the combination, with the crank-pin, of a pitman connected to the same and carrying a sliding sleeve, and a spring connected to the sleeve, said spring being provided with means for adjusting the tension thereof, as set forth.

5. In a mechanical movement, the combination, with a crank-pin, of a pitman connected to the same and carrying a sliding sleeve, a spring connected to the sleeve, a rod connected also to said sleeve and attached to a slotted plate, and a thumb-screw or equivalent device for binding the plate against the frame-work, as herein set forth.

6. In a mechanical movement, the combination, with the crank-pin, of a pitman connected to the same and carrying a sliding sleeve, a rod connected to the sleeve and held against the frame-work, and a spring bearing against said rod, for the purpose set forth.

7. In a mechanical movement, the combination, with the crank-pin, of a pitman connected to the same and carrying a sliding sleeve, a U-shaped spring connected to the sleeve, the

rear portion of said spring forming slot M, in which the crank-pin works, the lower arm, K, being pivoted at J, while the upper arm passes through the sleeve and is formed with a coil, *i*, and an eye, *b*, and devices for adjusting the tension of said spring, for the purpose set forth.

8. In a mechanical movement, the crank-pin having the pitman connected thereto, the

latter connecting with or carrying a sliding sleeve, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM MUNSON PHELPS.

Witnesses:

THEODORE H. COOK,  
AXBA SHROP.