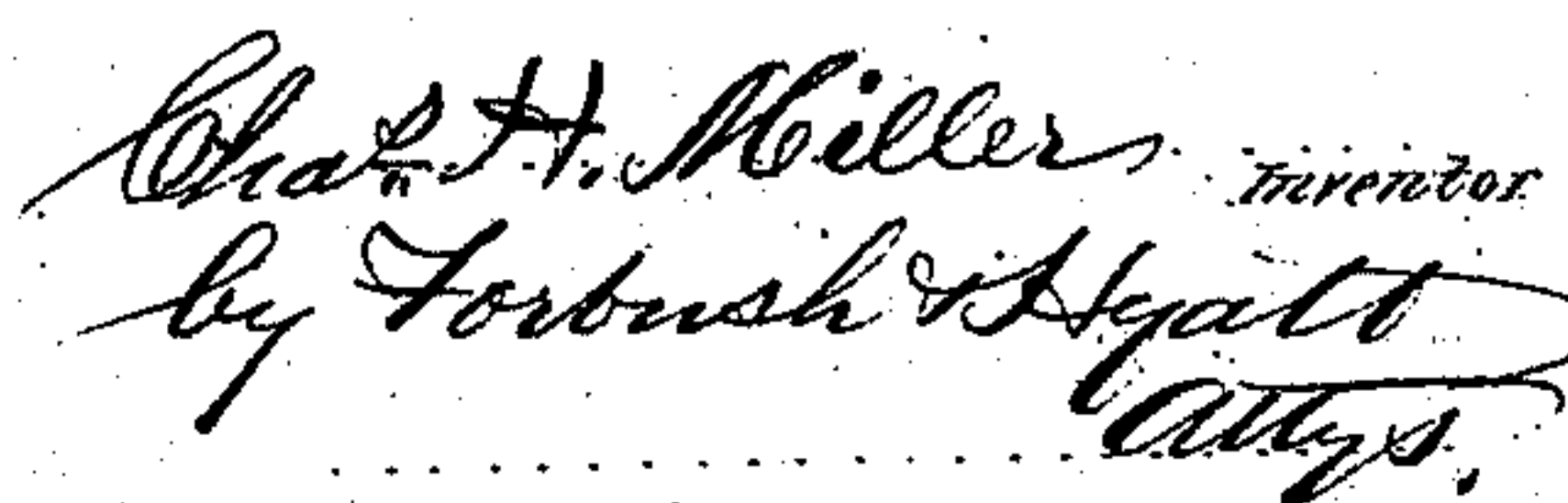


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# United States Patent Office.

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AND EMORY CUMMINGS, OF NEW YORK CITY.

Letters Patent No. 105,964, dated August 2, 1870.

## IMPROVEMENT IN MEANS FOR COMMUNICATING MOTION TO MACHINERY.

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

I, CHARLES H. MILLER, of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Means for Communicating Motion to Machinery, of which the following is a specification.

My improvements relate to certain means to be used as a substitute for the ordinary means, such as belting, wire ropes, or shafting, which are employed in communicating motion to machinery where the motive-power is situated at a considerable distance therefrom.

Belting for the purpose is objectionable on account of its expense, and the fact that it cannot be employed when it is exposed to the weather, owing to the contraction and expansion thereof, which result from the changes or the temperature and degree of moisture in the atmosphere.

Shafting is very expensive, requiring bearings at a short distance from each other, which have to be adjusted with great precision to avoid great wear and friction, which is always considerable, however carefully the bearings are adjusted.

Wire-rope, of the three means, is, perhaps, the least objectionable for communicating motion when the distance is considerable, although it is quite expensive.

My invention consists:

First, in the combination of two rock-levers with tie-connections of wood or metal, uniting the respective ends of each, together with a suitable number of rock-levers intervening, the two end ones to support the tie or connecting-pieces, so that the motion which is imparted to the first lever will be communicated to the last or most remote by the two connecting-pieces, one of which, during each movement of the reciprocation, is subjected to a compressive strain, and the other to a tensile strain, whereby the one under tension prevents the flexion of the one under compression, and thereby enables comparatively slender connections of cheap material to be used, which could not, were only a single connection employed.

Secondly, of a slotted arm attached to the first rocking lever, and forming therewith a double bell-crank, which connects with the wrist-pin of the rotary power, in combination with a weight supported at the end of an arm projecting from the opposite side of said rocking lever, and operating as a counterpoise for the slotted arm during the movement thereof.

In the accompanying drawing—

Figure I is an elevation;

Figure II, a cross-vertical section; and

Figure III, a detached fragmentary view.

Like letters designate like parts in each of the figures.

A represents a water-wheel or motive-power;

B, the crank, and

b, the wrist-pin thereof.

C is a rocking lever, and

D, the slotted arm attached thereto and connecting with the wrist-pin b, which plays in the slot thereof.

The lever C is pivoted at its center in any suitable bearings, F, represented in the drawing as consisting of two inclined standards.

C<sup>1</sup> is a rocking lever, similar to the first one, C, and is supported in similar bearings at the point where the machinery to be operated is located.

The respective ends of these levers C C<sup>1</sup> are united by means of strips of wood, H, or other suitable material possessing the requisite tensile strength to drive the machinery which connects with the end of one of them, as shown at e, fig. I.

The length of these connections H H, which are spliced at intervals, as required, will depend on the distance of the machinery from the motive-power.

Intermediate of the levers C C<sup>1</sup>, other and similar levers, C<sup>2</sup> C<sup>2</sup>, may be arranged at suitable intervals, to support and steady the connections H, to which they are united by a jointed connection, as shown.

The pivots of the levers and their bearings in the frame or standards F and connections with the ties H, may be of any approved construction, such, for instance, as scale-bearings are provided with, to reduce the friction thereof as much as possible.

I represents the weight suspended from the end of an arm, J, projecting from the center of the first lever C on the side opposite the slotted arm D, so as to form a counterpoise therefor, so that its weight may not serve to retard the movement of the wheel A or other motive power.

The operation of my improvement is as follows:

The wheel A, being set in motion, a rocking movement, through the medium of the slotted arm D, is imparted to the first lever C, which, through the connections H, communicates a corresponding movement to the last lever C<sup>1</sup> at the opposite end.

One of the connections H, operating by tension, and the other by compression, in thus communicating this motion, the flexion of the connection under compression is prevented by the opposite one, which is under tension, and *vice versa*. Stiffness is not, therefore, an essential quality in these connections, which may be of any size that possesses the requisite tensile strength.

It is evident that my improvement is adapted to communicate motion in either a horizontal, inclined, or vertical direction, the supports or bearings for the levers being arranged to correspond therewith.

When the direction of communication is vertical it is evident that the counterpoise I is not required.



Where the motive-power is a steam-engine, the end of the piston-rod is made to connect with the rocking lever, thus dispensing with the use of the slotted arm, which is necessary in communicating motion from a wheel or crank-shaft.

My improved device is simple, may be made of wood, and consequently effects a great saving over the other methods hereinbefore enumerated; it involves but little friction, and is specially adapted for communicating motion, where the means are exposed to the action of the weather.

What I claim as my invention is—

1. The combination of the rocking levers C C', tie connections H H, and bearings or supports F, for communicating motion, substantially as hereinbefore set forth.

2. The slotted arm D, and counterpoise I, combined and arranged with the rocking levers C C', and connections H H, as hereinbefore set forth.

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Witnesses:

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