

G. O. WICKERS.

Winding Mechanism of Self-Acting Mules.

No. 134,180.

Patented Dec. 24, 1872.

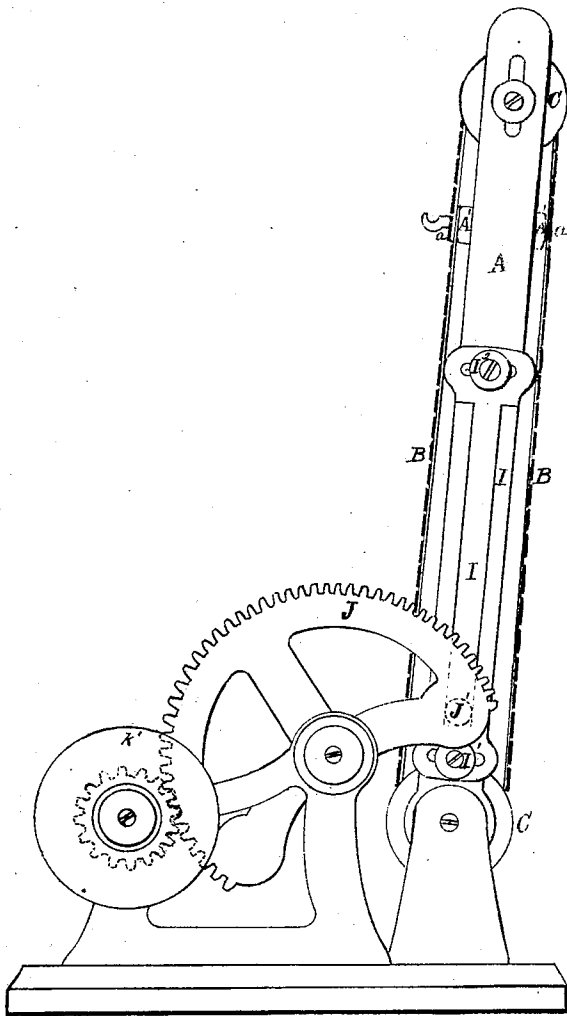


FIG. 1.

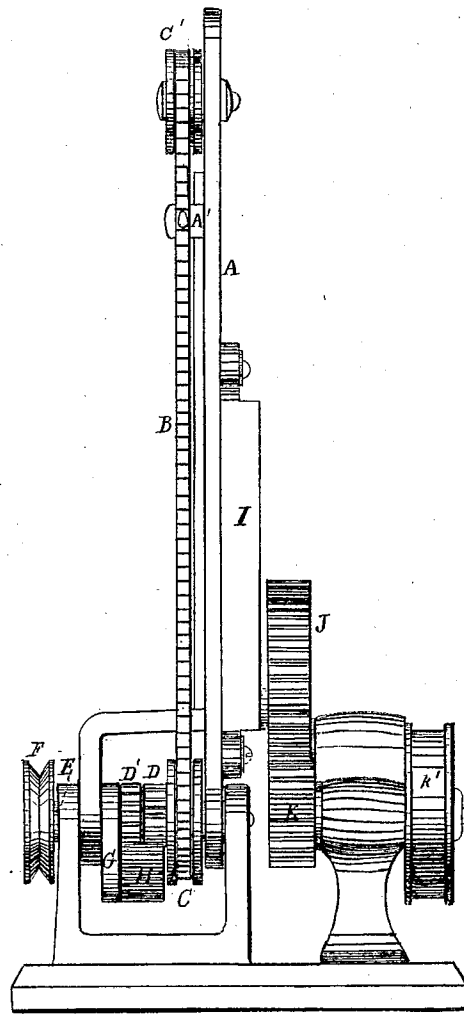


FIG. 2.

WITNESSES.

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INVENTOR.

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GEORGE O. WICKERS, OF LAWRENCE, ASSIGNOR TO GEO. L. DAVIS, J. H. WILEY, JOSEPH M. STONE, GEO. G. DAVIS, J. H. STONE, AND J. H. DAVIS, OF NORTH ANDOVER, MASSACHUSETTS.

## IMPROVEMENT IN THE WINDING MECHANISMS OF SELF-ACTING MULES.

Specification forming part of Letters Patent No. 134,180, dated December 24, 1872.

*To all whom it may concern:*

Be it known that I, GEORGE O. WICKERS, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain Improvements in Self-Acting Mules, of which the following is a specification:

My improvements relate to the construction and operation of that part of a self-acting mule which is called the radial arm, for controlling the winding motion of the spindles, by which improvements the said winding motion may be modified and regulated with greater nicety than by any other mode before known to me. These improvements consist in combining with the radial arm a long slotted cam-groove and a sector carrying a wrist-pin which works in said groove, by the united action of which, in the manner to be described, the proper movement of the radial arm can be accurately produced; and they also consist of certain devices for shifting the block upon the radial arm, to which the winding-chain is attached, which will be described.

In the drawing, Figure 1 is a side elevation of my improvement, and Fig. 2 is an end view.

A represents the radial arm, which is attached to the frame of the machine in the usual way, and carries the block A', which slides upon it radially, and to which the winding-chain is attached at a, as is usual. This block A' is moved along the arm by the endless pitch-chain B, which passes over the pitch-wheel C and pulley C', as shown. To the pitch-wheel C is attached the gear D, and by the side of it and upon the same axial line is placed the fixed gear D'. In the continuation of the same axial line is a short shaft, E, upon the outer end of which is the pulley F, which receives the endless band which is moved by the carriage under control of the faller to adjust the position of the block A', as is usual, and upon the inner end is a crank, G, which, upon its wrist-pin, carries the loose gear H, which meshes into both of the gears D and D'. The gear D has one tooth more or less than the gear D', and as the gear H rolls around upon their peripheries it has the effect to move the gear D either backward or forward one tooth, and through the medium of the endless chain B slides the block A' along on the arm A in an

obvious manner, this being a modification of the well-known differential motion. Upon the opposite side of the radial arm A is attached the long slotted grooved cam I, by means of adjusting-bolts I<sup>1</sup> I<sup>2</sup>, by which the position of the cam may be adjusted upon the arm A and in relation to the sector J, which operates it. The sector J is a portion of a gear somewhat more than a half of a circle, as is shown, which is rotated back and forth by the pinion K, which is rotated by a band upon the pulley K' in the usual way. The proportions of the gears are such that the sector makes about a half a revolution for one travel of the spindle-carriage. This sector carries a wrist-pin, J', as shown, which works in the cam-groove I, and by a half revolution carries the arm A from the upright position shown to a horizontal position by the wrist J' sliding along in the groove, and thereby imparting a peculiar motion to the arm.

The cam I is represented as having its groove straight; but it may be made with any curvature that may be desired by which any local variation in the winding motion in any part of its operation may be obtained within reasonable limits; and this can be also further modified by setting the cam-groove I to different positions upon the arm A by the adjusting-bolts I<sup>1</sup> I<sup>2</sup>. The importance of this is obvious in adapting the winding motion accurately to the form of the cop that is to be made.

It is also obvious that this part of the mechanism may be used in connection with the usual mechanism for moving the block A', instead of that shown, with the same beneficial result.

What I claim is—

1. The combination of the cam-groove I and crank or wrist pin J' with the radial arm, substantially as described.

2. The differential gears and chain B, in combination with the block A' of the radial arm, substantially as described.

Executed October 23, 1872.

G. O. WICKERS.

Witnesses:

ALBERT E. DOWNS,  
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