(No Model.) 2 Sheets—Sheet 1.

J. WIGGINS & J. B. GREENHALGH.

MECHANISM FOR REVERSING THE ROTATION OF THE SPINDLES IN SPINNING JACKS AND MULES.

No. 262,523. Patented Aug. 8, 1882.

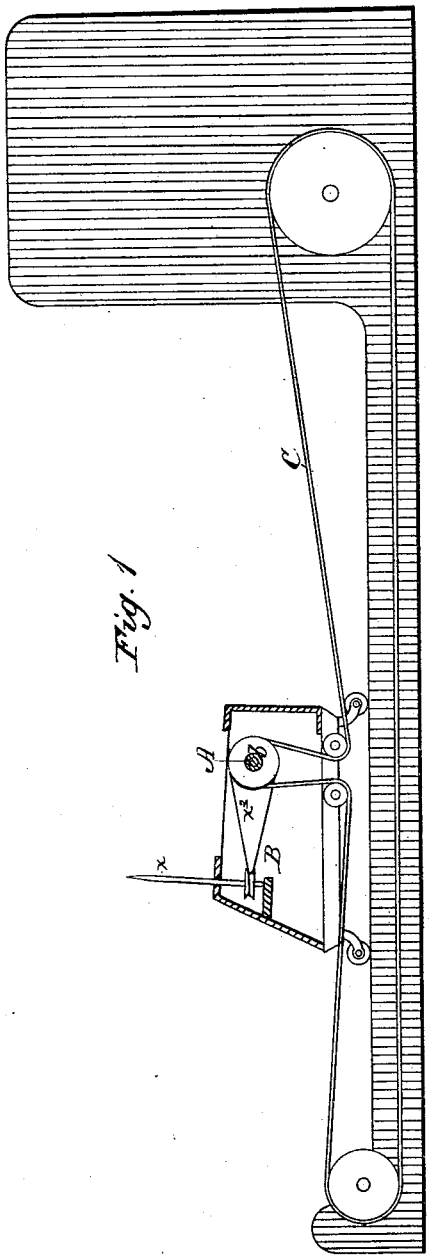

Fig. 1

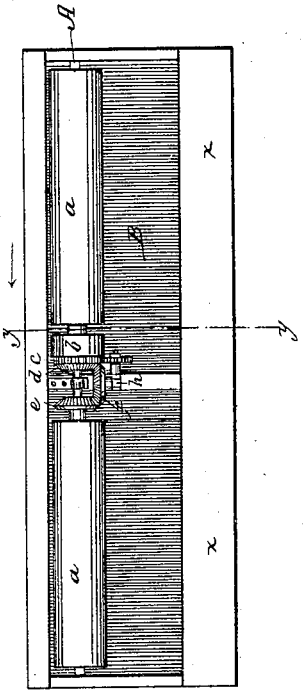

Fig. 2

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

J. B. Greenhalgh

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(No Model.) 2 Sheets—Sheet 2.

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MECHANISM FOR REVERSING THE ROTATION OF THE SPINDLES IN SPINNING JACKS AND MULES.

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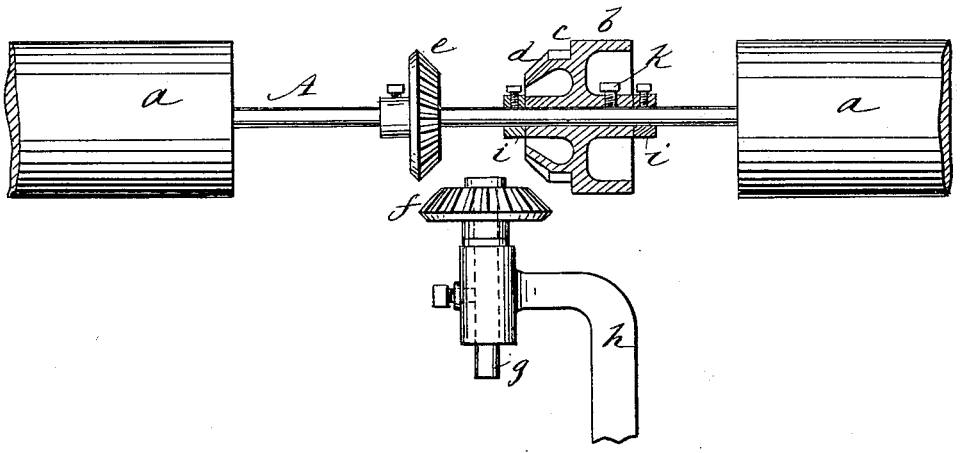
Fig 3



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UNITED STATES PATENT OFFICE.

JOHN WIGGINS, OF UXBRIDGE, AND JOHN B. GREENHALGH, OF WATERFORD, MASSACHUSETTS.

MECHANISM FOR REVERSING THE ROTATION OF THE SPINDLES OF SPINNING JACKS AND MULES.

SPECIFICATION forming part of Letters Patent No. 262,523, dated August 8, 1882.

Application filed February 18, 1881. (No model.)

To all whom it may concern:

Be it known that we, JOHN WIGGINS, of Uxbridge, in the county of Worcester and State of Massachusetts, and JOHN B. GREENHALGH, of Waterford, in the county of Worcester and State of Massachusetts, have invented a new and Improved Mechanism for Reversing the Rotation of the Spindles of Spinning Jacks and Mules, of which the following is a full, clear, and exact description.

The object of our invention is to provide for reversal of the spindles in mule-spinners to reverse the twist without changing the bands or reversing the race-belt.

The invention consists in the combination, with the cylinder-shaft, of changeable gearing, fitted for operation by the race-belt pulley for running the shaft in either direction, as described and claimed hereinafter.

Figure 1 is a view showing the mule in vertical cross-section through the line *y y* of Fig. 2 and applied to the race-belt. Fig. 2 is a plan view of parts of the mule with our improvement applied, the position of the devices being for the production of a left-hand twist. Fig. 3 is an enlarged detail of our improved gearing, partially in section, and with the parts adjusted for a right-hand twist.

In the drawings, Fig. 1, C represents the race-belt, which passes around the pulley *b* of the mule B and gives rotary motion to the two cylinders *a a*, which cylinders connect by short bands x^2 with the spindles *x*.

Referring now to Fig. 3, A is the shaft, carrying cylinders *a a*, also a pulley, *b*, for the race-belt, as usual.

c is a gear-wheel formed with straight teeth on its face and with bevel-teeth *d* on one side. This wheel *c d* is preferably formed solid with pulley *b*, and in case the mule has other wheels on the shaft for working the quadrant or other parts, the pulley *b* and gears *c d* will be cast solid with such wheels.

e is a bevel-gear wheel fast on shaft A.

f is a bevel-gear loose on a shaft, *g*, that is fixed in a bracket, *h*, rising from the mule-frame. The shaft *g* is fitted for endwise adjustment, so that the gear *f* can be engaged with or disengaged from gears *d e*, and a set-screw is provided in bracket *h* for retaining the shaft as adjusted.

The pulley *b* and gears *c d* are between collars *i i*, set on shaft A for retaining the pulley in place when running loose. The pulley has a set-screw, *k*, tapped in its hub for making the shaft A and pulley fast together.

As shown, with pulley *b* fast on the shaft and gear *f* disengaged, the cylinders *a* are turned in a direction corresponding to the revolution of pulley *b*. To reverse the movement of the cylinders, screw *k* is to be loosened and the intermediate gear, *f*, engaged with gears *d* and *e*, as in Fig. 2, when the shaft A and cylinders *a* will be turned in an opposite direction, while the pulley *b* will continue in the same direction as before. The parts driven by gear *c* and other wheels that may be connected with the pulley are thus undisturbed by the reversal of the cylinders.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

In a spinning jack or mule, the combination of the race-belt C, the shaft A, having cylinders *a a*, the spindle *x*, bands x^2, the race-belt pulley *b*, having a gear-wheel, *d*, attached thereto and adjustably held on the shaft, as described, a gear-wheel, *e*, rigidly connected to the shaft, and a loosely-revolving and adjustable connecting-gear adapted to connect the same, as described.

JOHN WIGGINS.
JOHN B. GREENHALGH.

Witnesses:
JOHN N. TAYLOR,
CHARLES GOUGH.