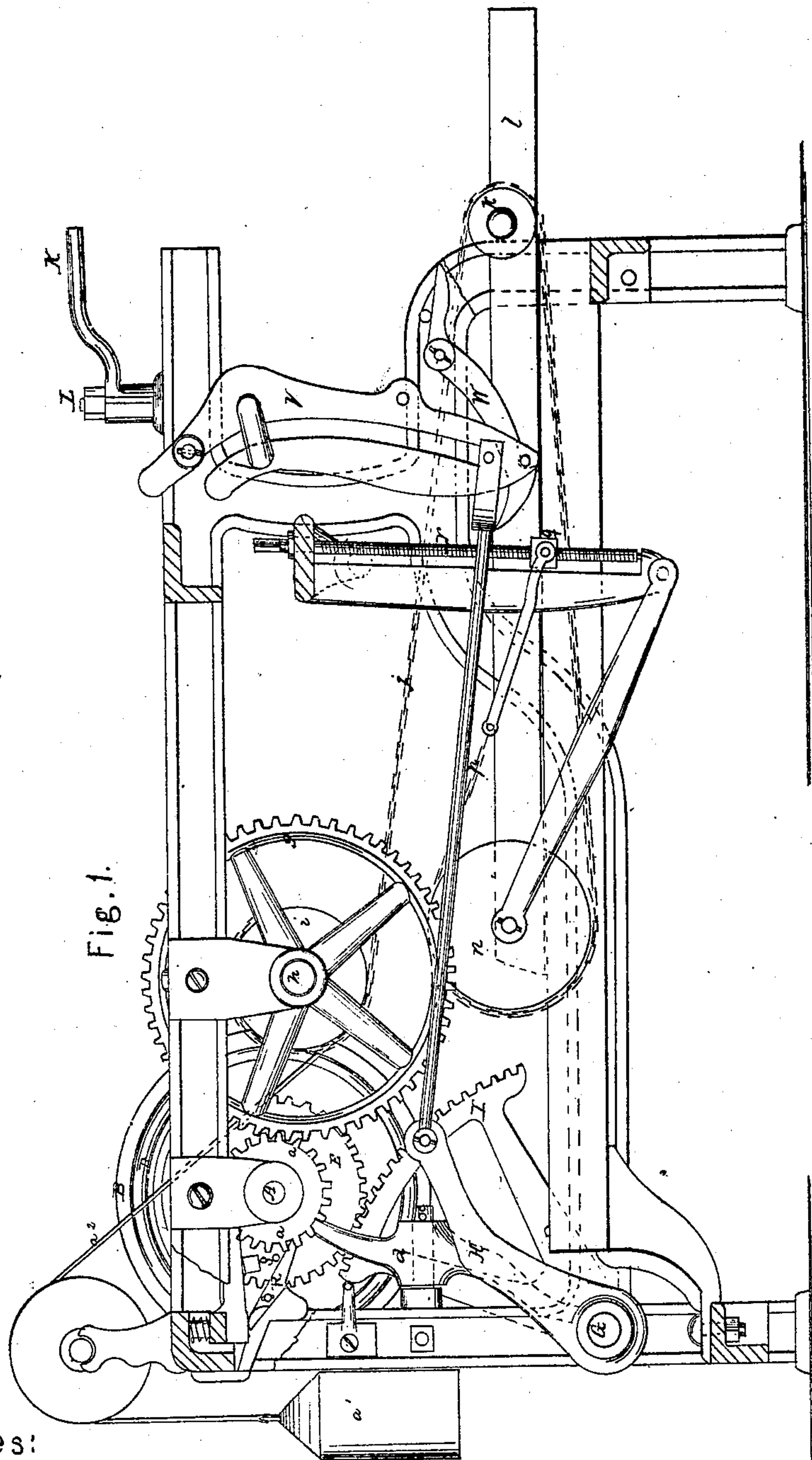


C. J. Green.

Mule for Spinning.

No 92,958.

Patented July 27 1869.



Witnesses:

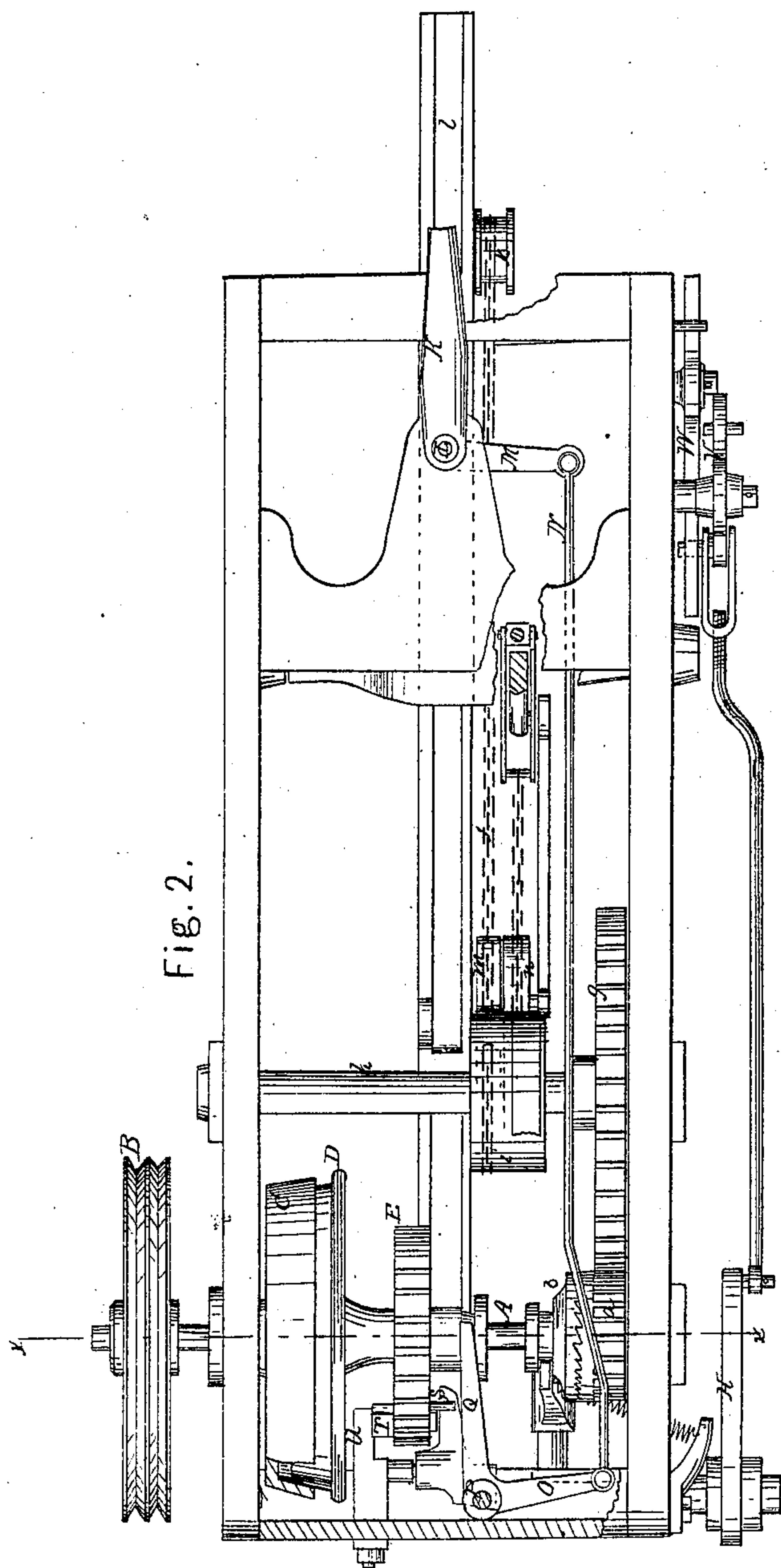
Chas. Nida
Wm A Morgan.

Inventor:

C. J. Green

per *Wmms & Co*
Attorneys.

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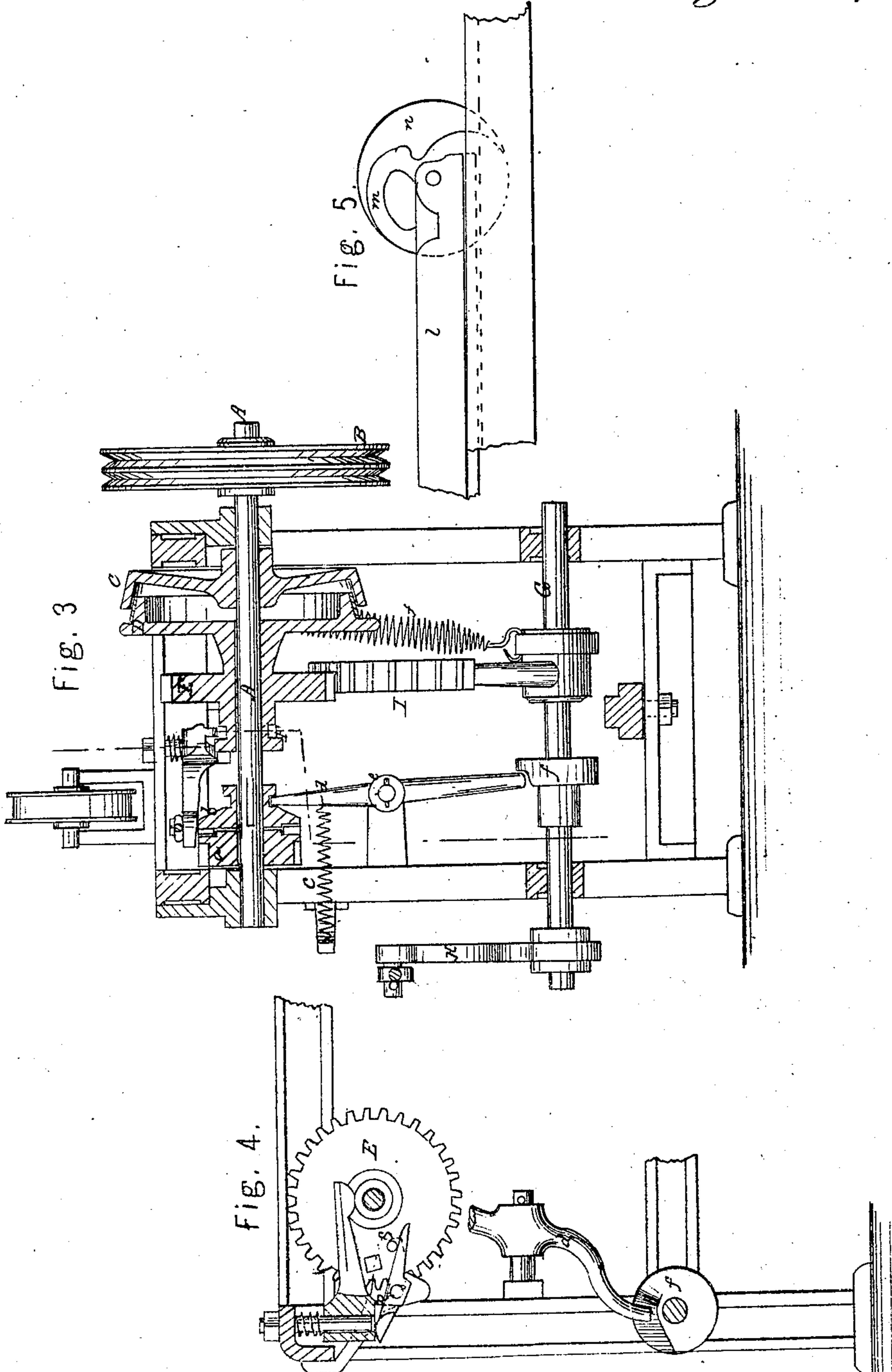
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Attorney

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Witnesses:
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United States Patent Office.

C. J. GREENE, OF OLNEYVILLE, RHODE ISLAND.

Letters Patent No. 92,958, dated July 27, 1869.

IMPROVEMENT IN MULES FOR SPINNING.

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, C. J. GREENE, of Olneyville, in the county of Providence, and State of Rhode Island, have invented new and useful Improvements in Self-Acting Mules; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in self-acting mules, such as are known as Mason's mules, the object of which is to provide more simple and reliable "backing-off" and "winding-on" motions.

The Mason mule has always been more or less uncertain in its "backing-off" and "winding-on" mechanisms, which are so arranged, with reference to one another, that they are liable to come in contact, often resulting in breakages, and also sometimes producing irregularity of speed, causing it to miss backing off.

Now, my improvements are designed to overcome these difficulties, the two motions being so separated that they cannot come into contact with each other, and the back-off motion is so arranged as to be substantially a positive movement.

In the first place, the friction-shaft is changed from the centre to near the front end of the head-stock, and the top rack, the rocker, and lever that works on the rocker, the back-off springs, the large lever to which the springs are attached, the ratchet and cam-wheel of the Mason mule are dispensed with, and a quadrant gear is placed on the rock-shaft, taking into a gear on the hub of the friction-shaft, and an apparatus provided for throwing the friction-hub into gear at the same time, or previously to the time that the rock-shaft is set into motion to effect the backing off, the rock-shaft being operated in the same manner as in the Mason mule.

A means is also provided for throwing the friction-clutch out when the backing off has been accomplished.

The winding on is effected by means of a loose pinion, on the friction-shaft, provided with means for clutching into gear (and also unclutching at the proper time) with the friction-shaft, which pinion derives motion from a wheel, on a shaft parallel with the friction-shaft, deriving motion by a chain attached to a drum thereon, and passing over a pulley, on a stud-pin, on the main rack, and thence on to the scroll-cam, on the end of the said main rack, as in the Mason mule.

Figure 1 of the drawings represents a side elevation of a portion of a head-stock, representing about two-thirds of the same;

Figure 2 represents a plan view, with some parts broken away;

Figure 3 represents a transverse sectional elevation of the same, taken on the line *xx* of fig. 2; and

Figures 4 and 5 are detail views.

Similar letters of reference indicate corresponding parts.

A represents the friction-shaft, which I arrange near the front of the head-stock, as represented in the drawings, instead of near the centre, as heretofore, on which the double-scored pulley B is secured, over which the belt, or cord which gives motion to the spindle works, as on a loose pulley, except when backing off or winding on.

C represents the shell of the friction-clutch, which is made fast to the shaft A.

D is the core of the same, placed loosely on the shaft A, and to its hub is attached a gear-wheel, E, and it is also provided with a groove, F.

G represents the backing-off rock-shaft, to the arm H of which a rocking motion is communicated, at the proper time, to effect the backing off. The said rocking motion being communicated thereto in the manner common to mules of this class, does not, therefore, need further description.

I represents a quadrant-gear, taking into the gear E, on the hub of the friction-clutch, and communicating motion thereto, when it is clutched into the shell C, by the mechanism which will now be described.

K represents a portion of the belt-shipper working on the stud L, as in the Mason mule, to the lower end of the spindle of which the arm M is secured, and connected, at its outer end, to the rod N, connecting with the arm O of a bell-crank, working on a stud P, on the front beam of the frame.

The other arm, Q, of the bell-crank takes into the groove, in the hub of the friction-gear.

This bell-crank is arranged on its axial stud, so that it may rise and fall thereon, and it is raised by a lever, R, moved by a pin, S, in the face of the wheel E, at the same time that a projection, T, on the opposite side of the wheel, having an inclined face, strikes a fixed stud, U, throwing out of gear the friction-clutch, and stopping the backing-off motion.

When the shipper-lever is moved, to throw the main driving-belt from the first fast driving-pulley, which causes the carriage to run out, and the drawing-rollers and the spindles to operate, to the second fast driving-pulley, which causes the last series of operations to take place, consisting of the winding on and the drawing in of the carriage, and during the interval, while the said belt is passing the central loose pulley, the bell-crank O Q receives from the shipper the movement to throw the friction-clutch into gear, and, at the same time, the rock-shaft G is set into motion, by motion communicated to its arm H, thereby rotating the pulley B in the direction to cause the movement of the spindles to back off.

This motion continues until the clutch is disconnected, by the action of the lever R and the stud T, as above described.

At the time the rocker-arm has performed its full movement, the slotted arm V, through which the rocking motion is transmitted to the rock-shaft G, is caught by a hook, W, on the side of the frame, which holds it in that position until the return-movement of the carriage disconnects it, at which moment a spring, X, throws the rocker-arm back to its position, ready to perform the next backing-off movement.

The same movement disconnects the winding-on mechanism, as will be presently described.

On the friction-shaft A is a pinion, *a*, capable of running loosely thereon, when disengaged from the rose-clutch *b*, feathered to the shaft, and provided with a forked lever, *d*, taking into a groove in the hub of the clutch *b*, and having a constant tendency to clutch the two together, by the action of a spring, *c*.

The said lever *d* is pivoted to a stud-pin, *e*, and the lower end extends into the path of a cam, *f*, on the rock-shaft G.

The pinion *a* gears into a wheel, *g*, on a shaft, *h*, arranged parallel with the friction-shaft, and having a drum, *i*, to which the chain *j* is connected, and around which it partially winds, running to the pulley *k*, on the main rack *l*, and thence to the scroll-cam *m*, fixed to the concentric wheel *n*, pivoted to the end of the main rack, and to which the chain *p* is secured, which, through the medium of the sliding nut *q*, on the screw *r*, regulates the winding-on motion, and is an arrangement common to mules.

When the carriage is moving back, the chain *j* communicates motion, through the wheel *g*, pinion *a*, and shaft A, to the pulley B, in the direction to wind the yarn on the spindles, and this continues until the carriage, having arrived near the return-position, disconnects the catch W, and allows the backing-off or rocker-

shaft G to be returned by the action of the spring X, which brings the cam *f* into action on the lever *d*, causing it to throw the rose-clutch out of connection with the pinion *a*, and thus stop the winding on, when the machine is ready to commence running out again under the fast-motion apparatus.

The drum *i* is provided with a balance-weight, *a*¹, and belt *a*², for keeping the chain taut.

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

1. The combination, with the quadrant-wheel I, of the rocker-shaft, with the gear E, for operating the friction-shaft to back off the yarn from the spindles, substantially as described.

2. The combination, with the shipper-lever K and the friction-clutch, of the gearing-mechanism, consisting of the bell-crank O Q and connecting-apparatus, substantially as described, for the purpose specified.

3. The combination, with the bell-crank O Q, of the lever R, actuated by a pin on the wheel E, substantially as and for the purpose specified.

4. The combination, with the friction-shaft A, of the drum *i*, when arranged relatively to each other, and to the main rack, and provided with actuating-mechanism, substantially as and for the purpose described.

5. The combination, with the clutch-pin *a*, of the shifting-lever *d*, arranged to be actuated by the return-movement of the rocker-shaft, substantially as and for the purpose described.

The above specification of my invention signed by me, this 2d day of October, 1868.

C. J. GREENE.

Witnesses:

HORACE CLARKE,

FRED. COWPERTHWAIT.