(No Model.)

M. MULLANEY.

SPINNING MULE.

No. 249,199. Patented Nov. 8, 1881.

Fig. 1.

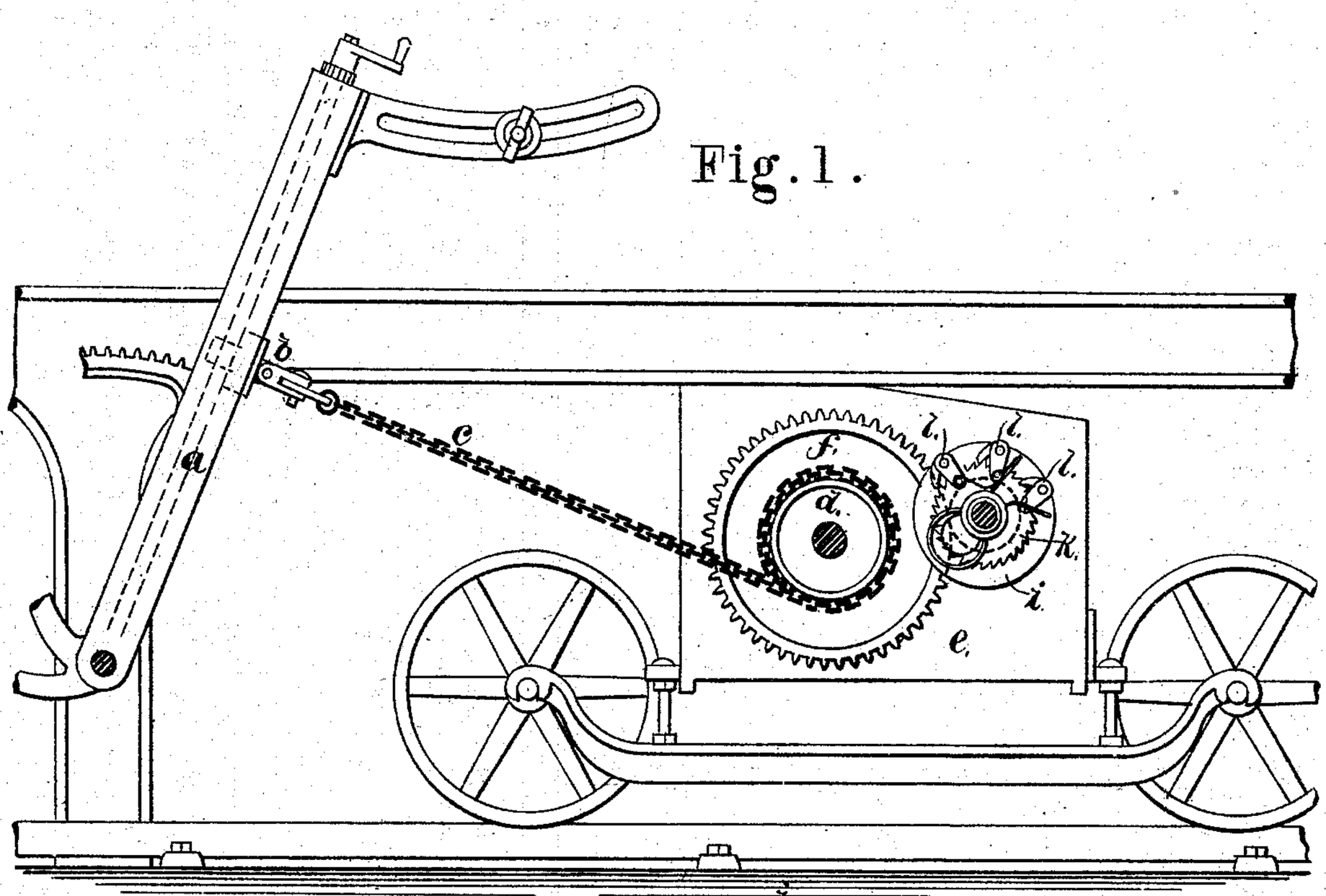


Fig. 2.

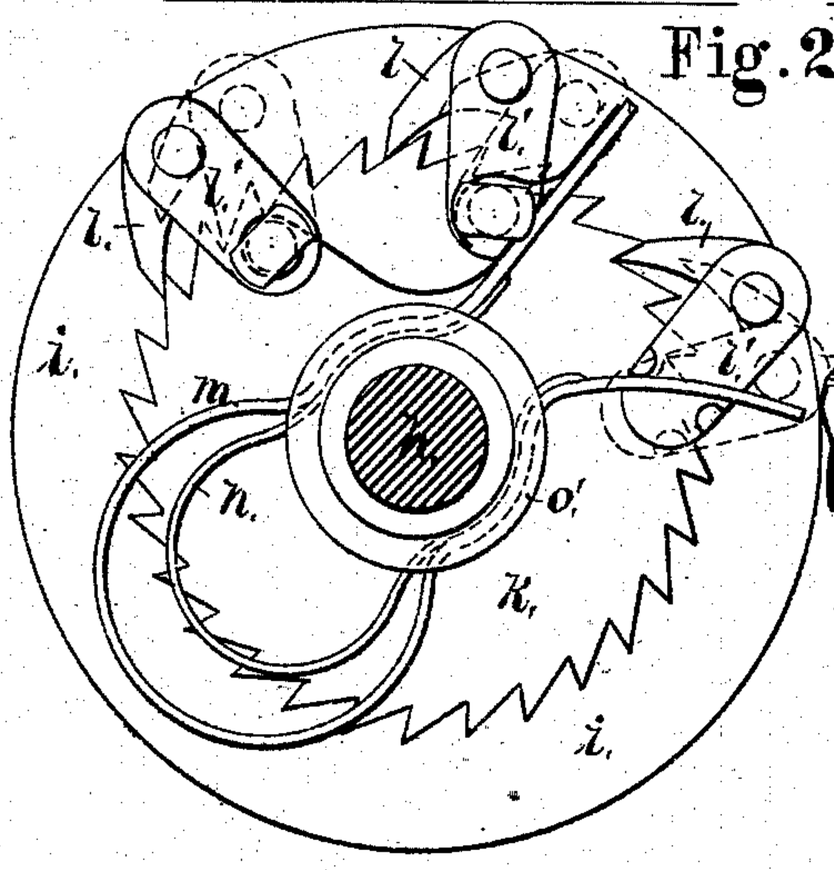
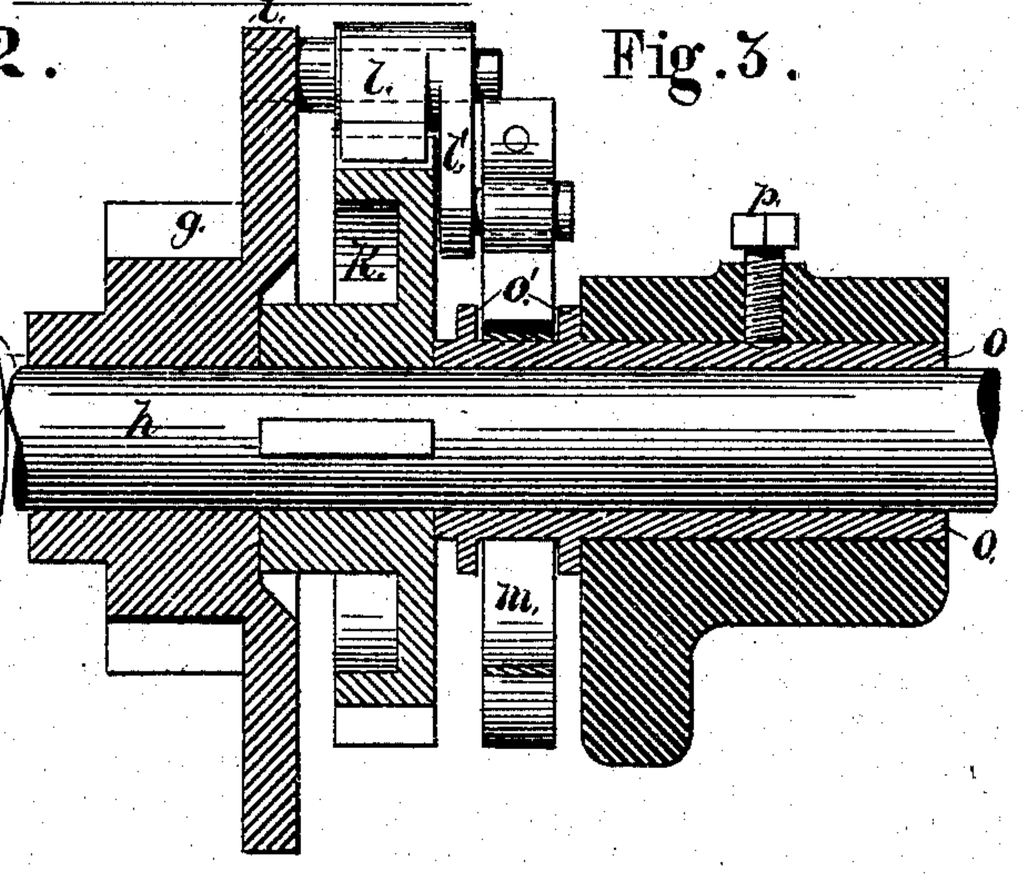


Fig. 3.



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SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 249,199, dated November 8, 1881.

Application filed December 24, 1880. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL MULLANEY, of the city of Fall River, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Spinning-Mules; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in what is known as the "Parr-Curtis mule" and spinning-mules of similar construction, such as are used in England and are also largely used in the United States.

The invention consists in providing the drum from which the spindles are driven with a peculiar clutch mechanism, by means of which the instant the quadrant-arm moves the spindles also must move, and all backlash is avoided, and thus slacked, twisted, and kinked yarn is prevented.

Figure 1 is a partial side view of the headstock of a Parr-Curtis mule, showing the quadrant, the chain connected with the same, and the carriage in the position of half-stretch. Fig. 2 is an enlarged view of the ratchet-gear and pawls, showing the spring for operating the pawls in frictional contact with the sleeve-bearing for the drum-shaft. Fig. 3 is a sectional view of the end of the shaft of the drum from which the spindles are driven, showing the sleeve-bearing for the shaft provided with two collars, between which a double spring is secured by frictional contact with the sleeve; and connected with said spring are the arms of three pawls, which pawls are supported on pins secured to a disk forming part of the pinion driven by the large gear shown in Fig. 1.

When in this class of spinning-mules the carriage is drawn in, and the yarn spun in the outward movement of the carriage is wound on the spindles, the quadrant holds back on the chain, thereby revolving the drum on which the chain is wound, and by means of the large gear on this drum engaging with the small gear on the driving-drum the latter is revolved to effect the winding of the yarn on the spindle.

On mules as heretofore constructed the connection of the small gear with the driving-drum is made by means of the ratchet-gear and a pawl, which pawl has heretofore been liable to slip on the ratchet-wheel, causing backlash, and, as the carriage is at this time moving in, causing slack, and consequently kinked yarn. One of the causes producing such kinked yarn was the fact that with one pawl the same does not rest against the face of the teeth on the ratchet-wheel at all times; but the most serious fault lies in the fact that such pawl is liable to stick, and fails to operate, owing to the fine waste which always covers cotton-spinning machinery and frequently clogs and prevents its prompt action. To avoid this difficulty and prevent the kinking of the yarn by rotating the spindles at the very instant the carriage commences to move in, I place two or more pawls on the disk driven by the geared pinion, so that one shall always bear on the face of the ratchet-teeth, and I provide such pawls with arms longer than the pawl, and connect the same with a strong spring, which is held by frictional contact on the stationary sleeve, so that the instant the chain pulls on the drum, when the carriage starts inward, the spindles will commence to wind on the yarn.

In the drawings, *a* represents the quadrant-arm, in which the nut *b* can be adjusted in the usual manner to regulate the formation of the cop, as is well understood in the art.

To the nut *b* the chain *c* is secured, the other end being wound on the drum *d*, secured to the carriage *e*.

To the drum *d* the large gear *f* is secured, so as to turn with the same. This gear *f* meshes into a small pinion-gear, *g*, placed loose on the spindle-drum shaft *h*, the disk *i* forming part of, or is secured to, the pinion *g*. The ratchet-wheel *k* is secured to the shaft *h*, and the pawls *l l l* are hinged to pins projecting from the said disk *i*. These pawls are provided with the arms or levers *l' l'*, the ends of which are provided with studs, by means of which they are operated by the spring *m*, which bears tightly on the sleeve-bearing *o* by frictional contact, so as to turn on the same with the ratchet-gear. When the pawls *l l* are engaged an additional spring, *n*, may be used to secure additional frictional contact with the fixed bearing-sleeve *o*; and to retain the spring *m* in proper position and prevent it from bearing on or interfering with the prompt action of the

pawls, I provide the two shoulders *o' o'* on the sleeve *o*, between which shoulders the springs *m* and *n* bear on the sleeve. As the springs *m n* are bearing on the fixed sleeve, which is held by the set-screw *p*, the first and slightest motion of the disk *i* carries the pins forward and engages the pawls, and firmly holds the same in contact with the ratchet-wheel *k*, revolving with the same in frictional contact with the sleeve *o*, and as soon as the disk *i* turns in the opposite direction the pawls are disengaged and out of contact with the ratchet-wheel *k*, thereby saving power, noise, and wear. The arrangement is quick and accurate in its action; it is strong and durable, not liable to get out of order, and prevents the kinking of the yarn.

In place of the springs *m* or *n*, a device may be used which is in frictional contact with the sleeve *o*, and provided with arms extending to the arms *l'* of the pawls *l*, so as to operate the pawls by the turning of the disk *i* in either one or the other direction, as the motive force is the overcoming of the frictional contact on the fixed sleeve in either direction.

I am aware that it is old to drive a ratchet-wheel by a single pawl pivoted to a rotating disk and constructed with an arm under the control of a spring frictionally supported and turning on a stationary bearing; also, that a ratchet-wheel has been combined with a series of pawls, graduatingly arranged, so that one or the other of them may be in position to drive the ratchet-wheel immediately on rotating the pawl-carrying disk in the direction for driving the ratchet-wheel. I do not claim either of these features separately.

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

The combination, substantially as before set forth, of the shaft *h*, the loose disk *i*, means for rotating the disk, the fast ratchet-wheel, a series of graduatingly-arranged pawls pivoted to the said disk and provided with lever-arms, a single rotating spring or device controlling all said pawls through their arms, and a stationary bearing on which the rotating spring or device is frictionally supported.

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Witnesses:

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