

(No Model.)

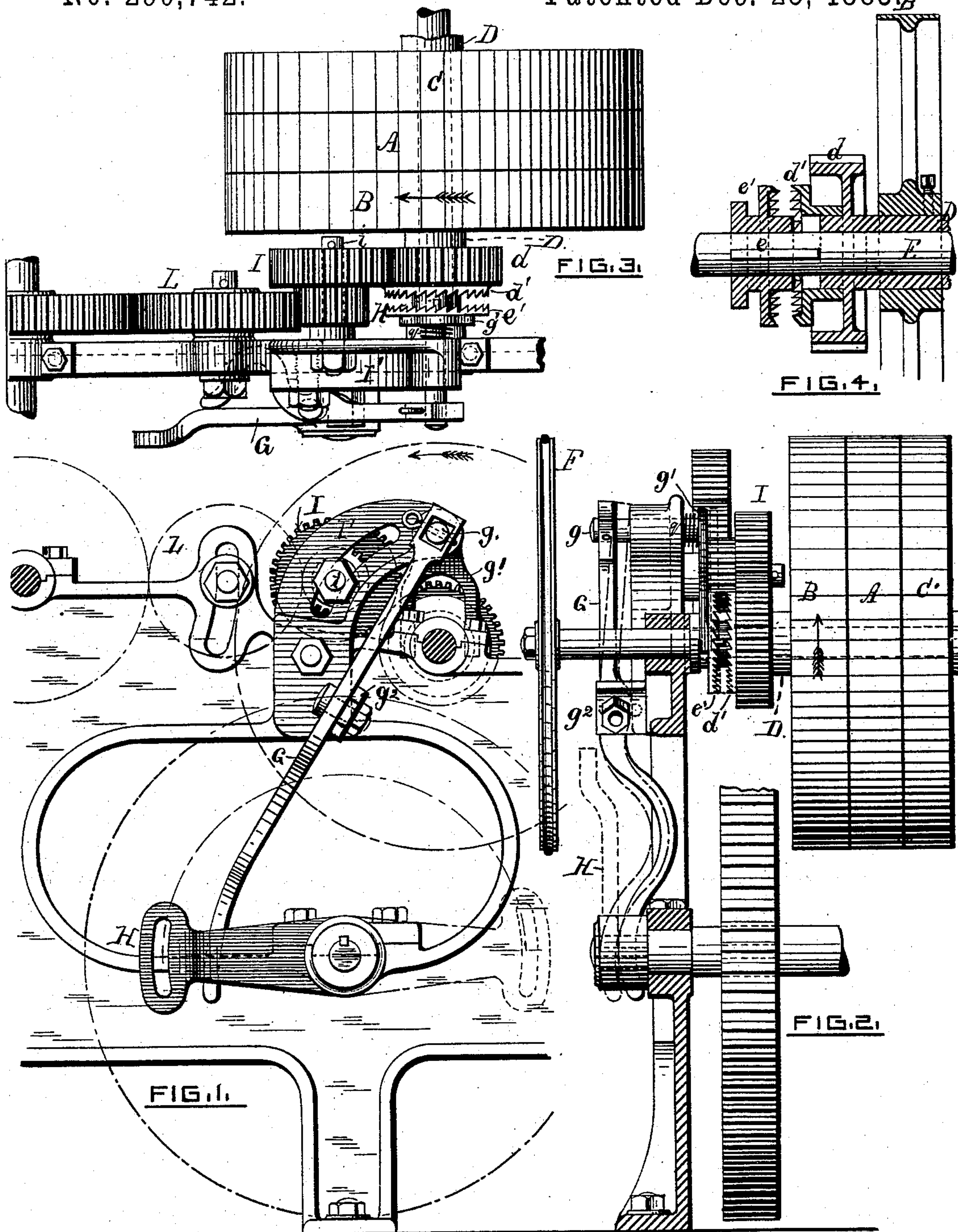
2 Sheets—Sheet 1.

S. W. BURCH & J. GILSON.

SPINNING MULE.

No. 290,742.

Patented Dec. 25, 1883.



WITNESSES.

INVENTORS.

C. H. Lathrop Jr.

Wm. L. Cook.

Smith W. Burch and
John Gilson
by Joseph A. Miller & Co.
Attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

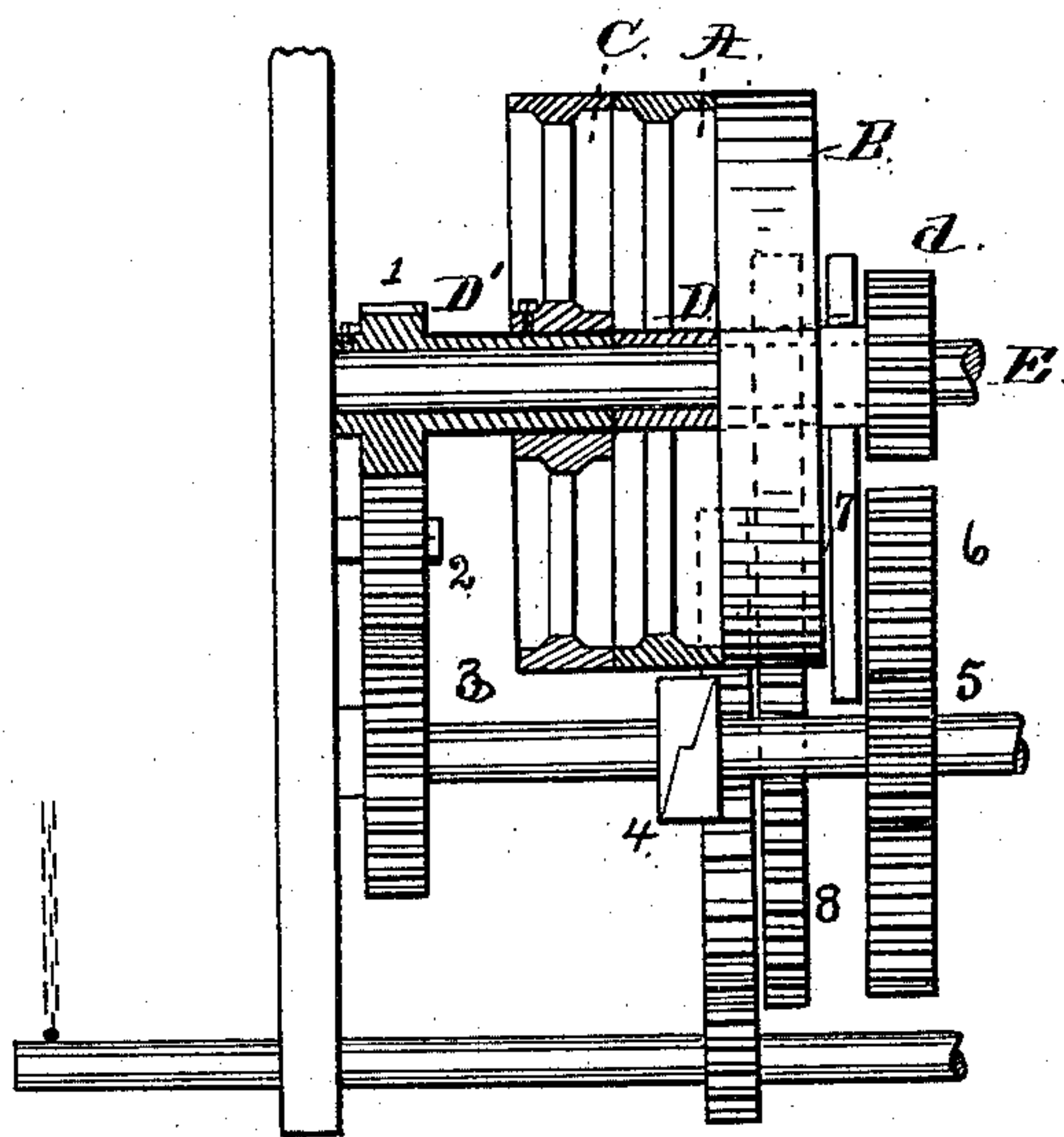
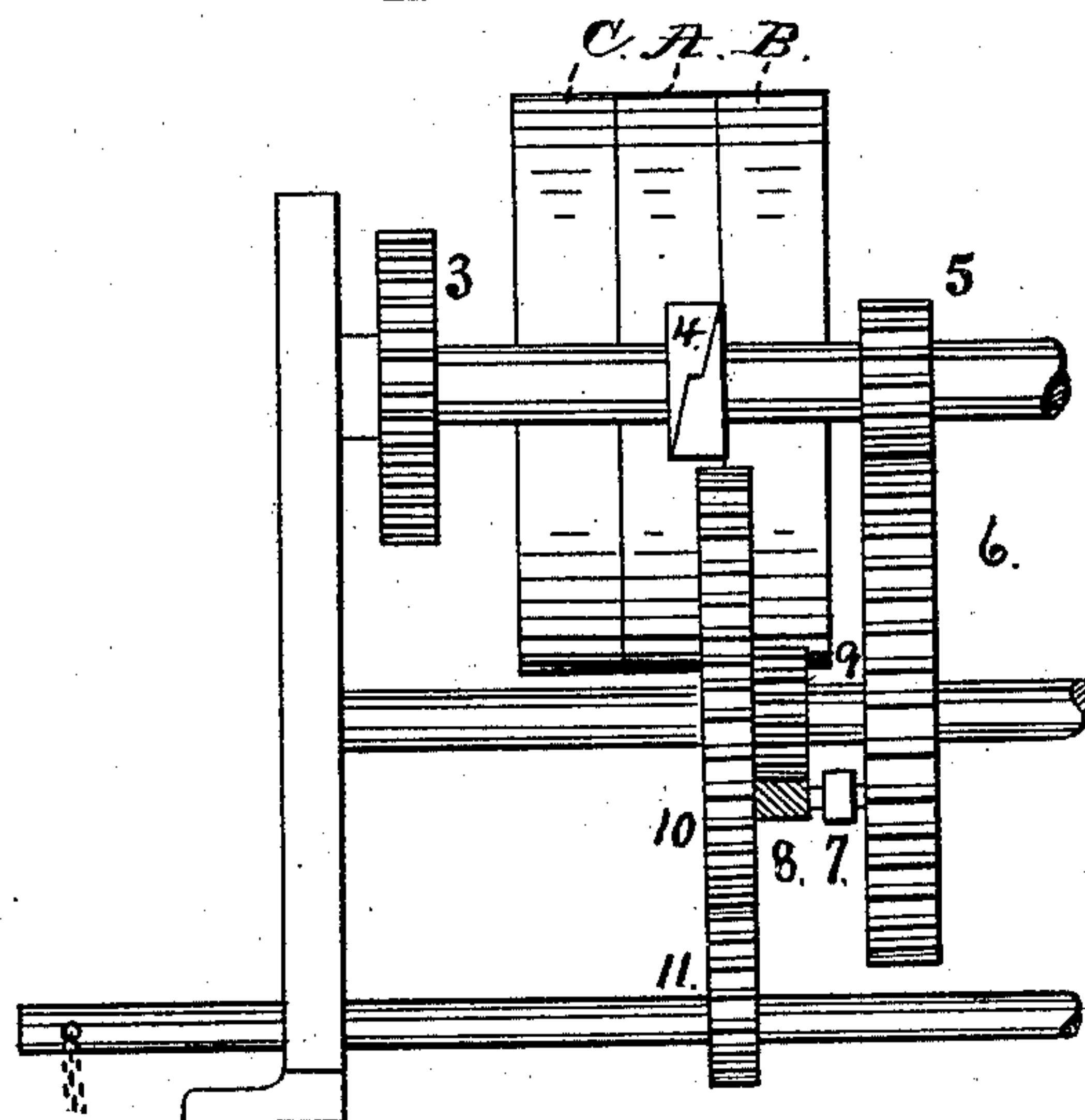


Fig. 6.



Witnesses—

*P. Hawley,
W. E. Glatts*

Inventor

*Smith W. Burch
John Gilson
Per Warwick & Bartlett
Their attorneys.*

UNITED STATES PATENT OFFICE.

SMITH W. BURCH AND JOHN GILSON, OF VALLEY FALLS, RHODE ISLAND.

SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 290,742, dated December 25, 1883

Application filed January 22, 1883. (No model.)

To all whom it may concern:

Be it known that we, SMITH W. BURCH and JOHN GILSON, both of Valley Falls, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Spinning-Mules; and we hereby declare the following to be 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 that class of mule spinning machines known as the "Mason mule;" and it consists in the novel arrangement by which the interchange of the change-gears is facilitated, and in means for arresting the momentum of the driving mechanism, so as to facilitate the shipping of the belt at the end of the traverse of the carriage, as will be more fully set forth hereinafter. In the Mason mule spinning machine, when the carriage reaches the limit of its outward traverse, the belt-shipper would at once move the belt from one driving-pulley to the other, so as to instantly reverse the motion of the carriage, as no standing twist is required; but, owing to the momentum of the driving-pulleys, belts, and bands, this is not possible until such momentum is arrested. Various devices have been resorted to to arrest the momentum—such, for instance, as automatic brakes. Such means have, however, always proved inadequate for the purpose intended, difficult to adjust, and liable to interfere with the free motion of the machine. In the Mason mule spinning machine, the gear for driving the delivery-rolls is connected with the driving-shaft, and when a change of speed is required the substitution of one size of gear for another causes considerable trouble and delay.

The object of this invention is to accomplish both the ends by different means in a better and more practical manner than that employed heretofore.

To arrest the momentum of the driving mechanism, we disconnect the band-wheels from the driving-pulleys by an adjustable device before the carriage has reached the extremelimit of its outward traverse, and the change-gear we place on an adjustable arbor, so that it can be quickly changed.

Figure 1 is a partial side view of a Mason

mule-head, showing the roller-clutch arm in connection with an adjustable hinged arm. Fig. 2 is a vertical sectional view of the mule-head, showing the driving-pulleys and the hinged arm, by means of which a clutch is operated to connect or disconnect the driving-shaft and other mechanism hereinafter referred to. Fig. 3 is a top view, showing, in connection with other parts of the machine, the pulleys, gears, and clutch forming part of the mule-head. Fig. 4 is a sectional view, showing the shaft, sleeve, clutch, and driving-pulley. Fig. 5 is a plan, partly in section, of so much of the gearing as is necessary to illustrate the connection of driving-pulley to the drawing-in mechanism. Fig. 6 is a side elevation of gearing used in the drawing-in mechanism, similar to that used in the Mason mule.

In the drawings, A is the loose pulley; B, the pulley by which the carriage is moved in traversing outward, and C the pulley by which the carriage is moved inward. The pulleys A and B are mounted on the sleeve D, which is loose on the driving-shaft E. The pulley B is fast to said sleeve and the pulley A runs loose thereon. The pulley C is mounted on a sleeve, D', forming part of gear 1, mounted on the shaft E. Gear 1 gears into the intermediate gear, 2, and through the intermediate gear to the gear 3, which, when the shipper-ball has closed the clutch 4, will give motion through the gear 5 to the gear 6, called the "main sweep gear," to which the main sweep rod is attached at one end, and at the other to the rack 8, which operates the driving-in chains through the gear 9, which is fastened to the same shaft on which the gear 10 is attached, and on which the main sweep gear 6 is loosely mounted. Gear 10 connects with gear 11, mounted on the back shaft 12, over which the driving-in chain 13 passes to draw the carriage.

Secured to the sleeve D is the gear d , on the forward end of which the clutch-plate d' is secured. This half of the clutch d' and the gear d revolve with the sleeve D and the driving-pulley B. The shaft E is provided with the spline e , and the other plate, e' , of the clutch is mounted on the shaft E, so that it will rotate with the same, and can be moved laterally on the shaft into or out of connection with the

clutch-plate d' , and thereby connect or disconnect the driving-shaft with the sleeve D and the driving-pulley B.

F is the band-wheel secured to the driving-shaft E, and by it the spindles in the carriage are operated.

g is a rod sliding in the frame, the inner end of which is provided with the fork g' , which enters a groove on the clutch-plate e' , so that by means of the fork g' the clutch-plate e' can be moved into connection with and out of connection with the clutch-plate d' . A coiled spring, q , is placed between the frame and the fork g' , to hold the clutch in engagement until it is forcibly separated. The lever G is connected at its upper end with the rod g , and is adjustably connected at the fulcrum g^2 by securing the screw-bolt in a slot. The lever G extends downward, and is curved, as shown in Fig. 2, so as to pass behind the roller-clutch arm H. The coiled spring placed between the frame and the fork g' , holding the clutch-plate e' in engagement with the clutch-plate d' , secured to the sleeve, the shaft E, sleeve D, and the driving-pulley, as well as the band-pulleys, all revolve together, and the mule-carriage is driven outward until near the end of the outward traverse, when the roller-clutch arm H comes in contact with the curved end of the lever G and disengages the clutch-plates $e' d'$, thereby releasing the shaft E and connecting mechanism, which now revolves independent of the driving-pulley, and by the momentum acquired brings the carriage to the end of its traverse, thereby consuming the stored-up power, and allowing the shipper to move instantly from one pulley to the opposite one and reverse the motion, thereby saving the time now required to arrest the momentum, which in a mule spinning-machine is considerable, amounting to from eight to twelve per centum of all the time the machine is in operation, and which, if saved, will correspondingly increase the production. The gear d , which is now secured to the sleeve D, was formerly secured to the shaft E, and when the weight of the yarn to be spun was to be changed had to be removed and other gears substituted. We now fix this gear d permanently and secure the gear I on the adjustable arbor i , secured in the slot of the

curved bracket I', as is shown in Fig. 1. The pinion K, gearing into the gear L, communicates motion thereto, any suitable connection securing the pinion K to change-gear I. By this arrangement a change can be easily and quickly effected by detaching the arbor i and exchanging the gears, without disturbing the driving-shaft E and the pulleys, belts, and other parts connected therewith. The clutch-plate d' is recessed, so as to allow of a longer bearing for the sliding clutch-plate e' .

Our invention is designed for attachment to the well-known Mason mule, patented in 1840, No. 1,801, and in 1846, No. 4,779, and reference is made to these patents as showing other operative parts of the device.

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

1. The combination, with the driving-shaft and the pulley B, of the sleeve D, loose on said shaft, but attached to said pulley, and the clutch-plate d' and clutch-plate e' , all arranged and operating substantially as described.

2. The combination, with the driving-shaft E, of the sleeve D, loose thereon, the pulley A, loose on said sleeve, and the pulley B, attached thereto, said sleeve provided with the gear d and the clutch-plate d' , and the spring-pressed clutch-plate e' constructed to connect sleeve D with shaft E until the same is released near the end of the outward traverse of the mule-carriage, as set forth.

3. The combination, with shaft E, sleeve D, and clutch, constructed to connect the sleeve with the shaft, of lever G and fork g' , and the roller clutch-arm H, arranged, substantially as described, to disengage the clutch by the partial rotation of said roller clutch-arm.

4. The combination of shaft E, sleeve D, mounted loosely thereon, and gear d , secured to said sleeve, with gear K, change-gear I, having adjustable arbor i , and slotted curved bracket I', in which said arbor i is adjustable, substantially as described.

SMITH W. BURCH.
JOHN GILSON.

Witnesses:

J. A. MILLER, Jr.,
M. F. BLIGH.