

(No Model.)

3 Sheets—Sheet 1.

J. L. BROOK.
SPINNING MULE.

No. 414,012.

Patented Oct. 29, 1889.

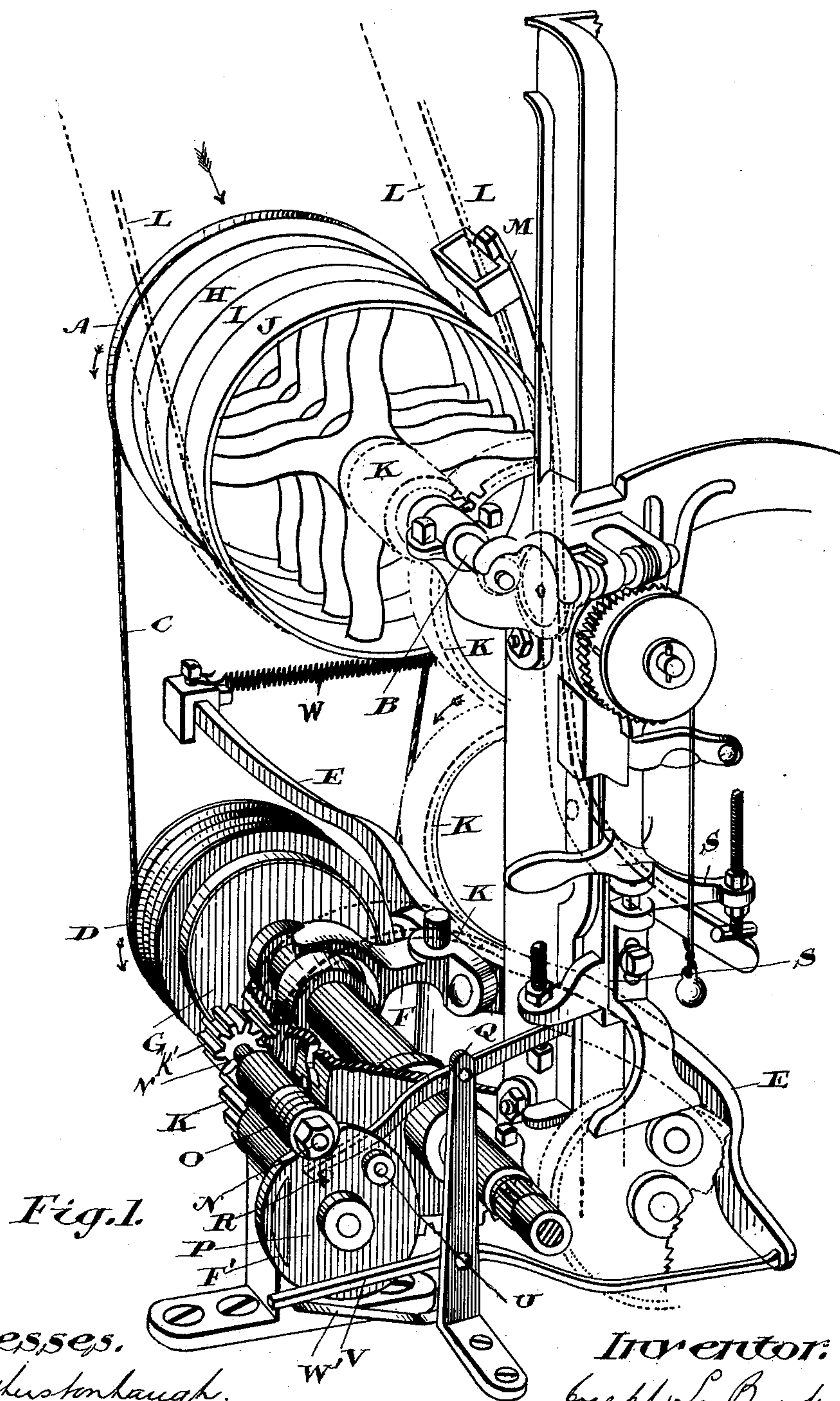


Fig. 1.

Witnesses.
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Charles H. Riches.

Inventor:
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(No Model.)

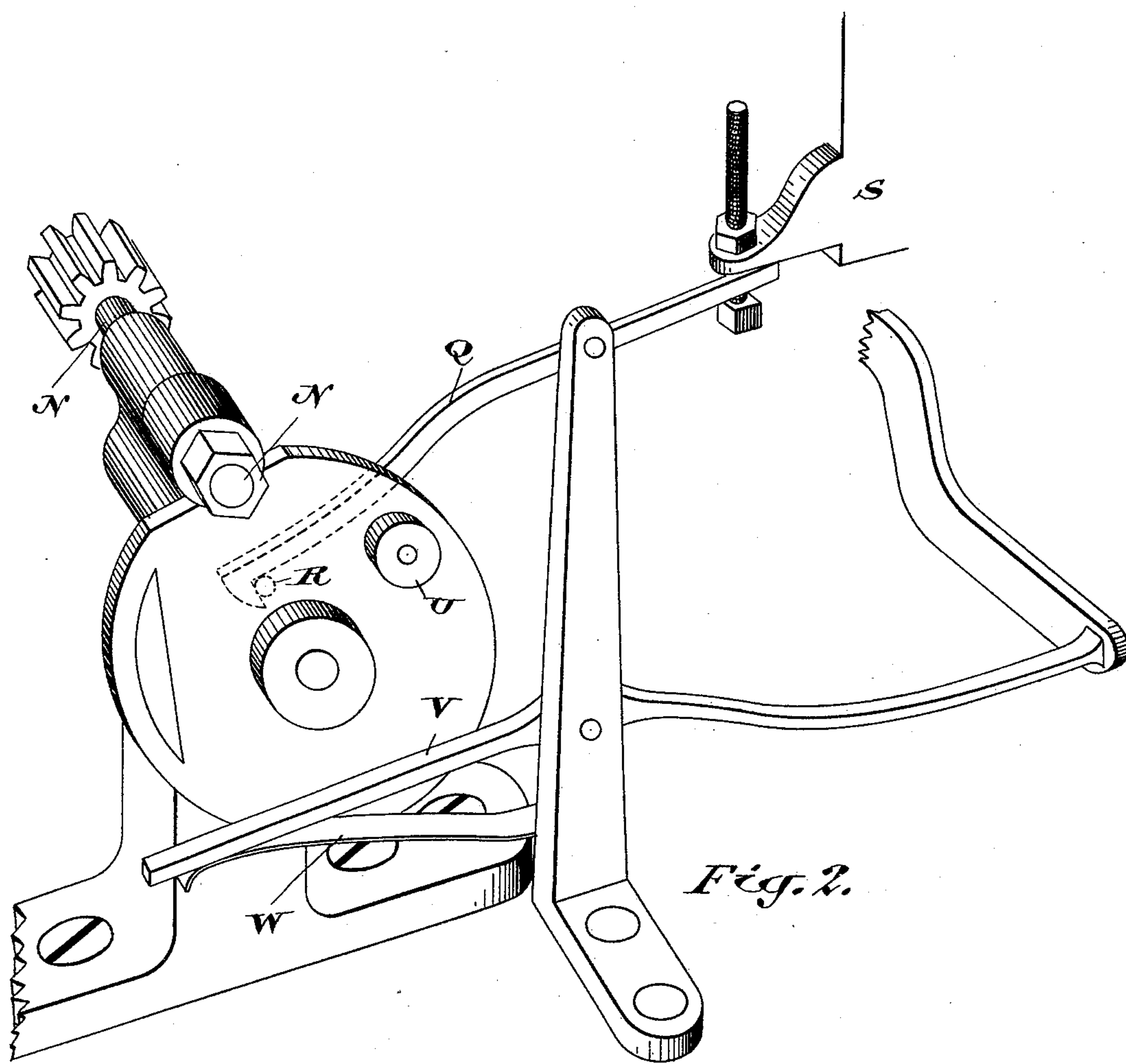
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Witnesses.

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Inventor.

Joseph L. Brook

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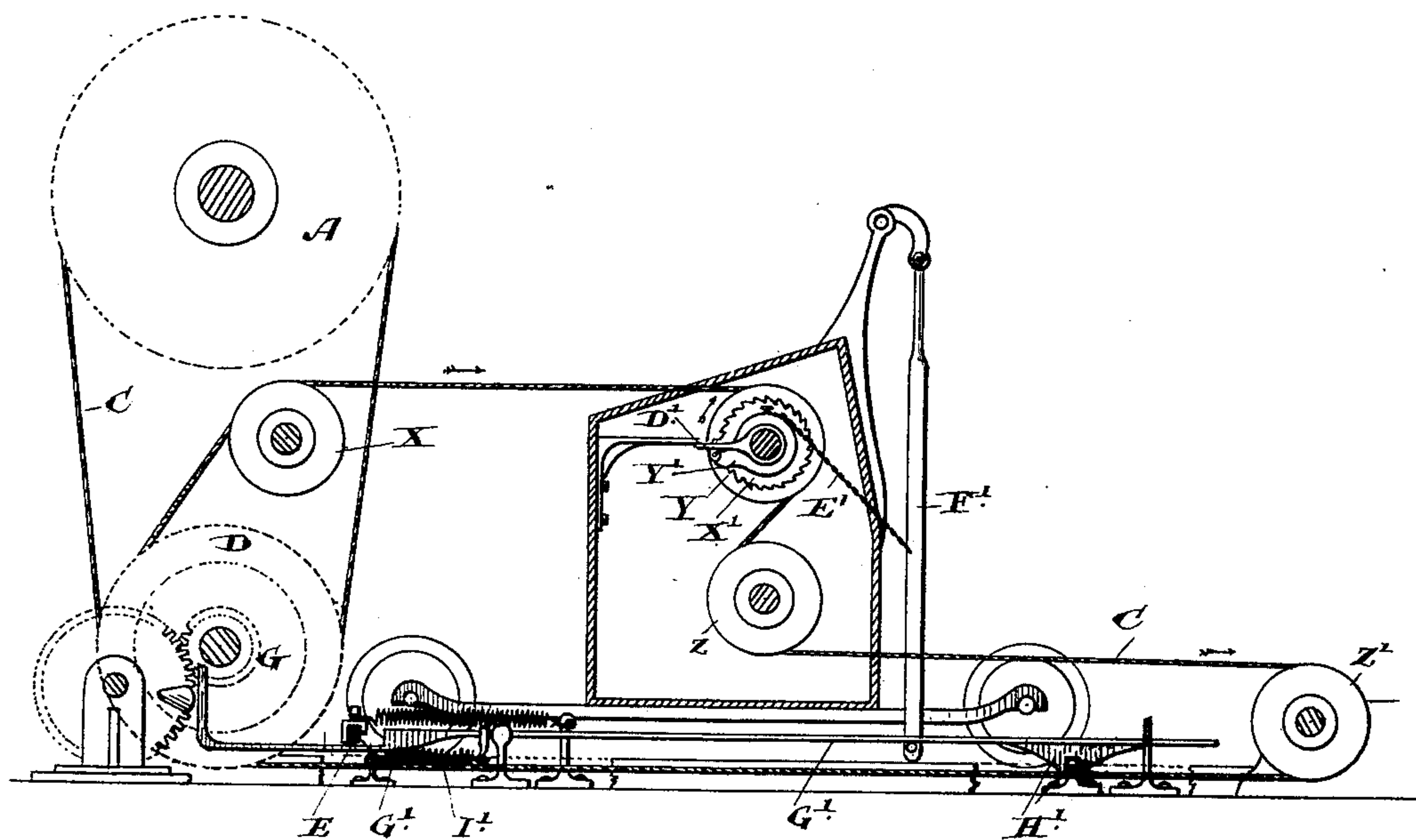


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOSEPH L. BROOK, OF SIMCOE, ONTARIO, CANADA.

SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 414,012, dated October 29, 1889.

Application filed March 17, 1888. Serial No. 267,483. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. BROOK, manufacturer, of the town of Simcoe, in the county of Norfolk, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Spinning-Mules, of which the following is a specification.

The object of the invention is to arrange mechanism to operate the backing-off mechanism, so that the clutch shall not be thrown into action until after the driving-power has been thrown off the rope-drum for operating the spindles for twisting; and it consists in the peculiar combinations and the construction and arrangements of parts, all as more fully hereinafter described and claimed.

Figure 1 is a perspective view of that portion of the mechanism in a self-acting spinning-mule to which my invention is applied. Fig. 2 is an enlarged perspective view of the cam, levers, and other parts involved in my invention. Fig. 3 is a side view with parts in section, looking in the direction of the arrow in Fig. 1, showing also parts of the machine not seen in Fig. 1.

In all self-acting mules with which I am familiar the friction-clutch for connecting the driving mechanism by which the motion of the spindles is reversed or the backing off effected is thrown into action simultaneously with the shifting of the belt from the driving-pulley from which the spindles derive their motion for twisting. Consequently the backing-off clutch is thrown into action with a pulley which is revolving at a high speed, and as the clutch is revolving in the opposite direction a very heavy strain is directed on the machine, and it is this strain which my invention is designed to avoid.

In the drawings, A is a rim-pulley around which the rope for driving the spindles passes. This pulley is keyed to its shaft B, and the rope C, which passes around it, also passes around the rim-pulley D, which is loosely journaled on its shaft and derives motion from the pulley A during the period that the spindles are being operated for twisting the yarn.

E is a pivoted lever having a forked arm F fastened to it and extending from its pivot-point to connect with a grooved hub formed on the friction-clutch G, which clutch is driven

by suitable mechanism, preferably that shown in Fig. 1, which consists of the train of gearing K K K K K, and revolves in the opposite direction to that in which the rim-pulley D revolves, and in its normal position is held clear of the said pulley.

H is a pulley attached to the shaft B.

I represents a pulley loosely journaled on the shaft B, and J represents a pulley formed upon or fastened to a sleeve connected to the gearing K, which drives the rim-pulley D during the backing off.

L represents the driving-belt, which is wide enough to extend over the pulleys H and J, so that the rim-pulleys A and D revolve simultaneously, although in the opposite directions.

M is a belt-shifter, which is operated by the twist-slide S, arranged to shift the belt off the pulley H when the spindles are to cease twisting.

In the machine now in use the clutch G is simultaneously thrown into connection with the pulley D; but by my invention this connection is delayed sufficiently long to permit the motion of the pulleys A and D to slacken down, if not altogether cease.

The parts that I have so far described constitute the old portion of the machine which I still retain, adding the following parts to obtain the end sought for by my invention:

N is a small shaft caused to revolve slowly through connection with any suitable revolving part of the machine, preferably through the medium of the gear-wheel K', meshing with the gear K. This shaft has a friction-pulley O connected to it and designed to be in contact with the periphery of the disk P, so that the motion of the shaft N is conveyed to the disk P. A portion of the periphery of the disk P is flattened, as indicated, so that the friction-pulley O shall not be in contact with it when the said flattened portion is opposite to the friction-pulley O. This is the normal position of the disk P, and it is held in that position by the hooked pivoted lever Q, which engages with a pin R, projecting from the disk P, as indicated. When the twist-slide S falls, it first comes in contact with and operates the belt-shifter M. It then strikes the end of the lever Q, so as to raise

the hooked end of the said lever clear of the pin R, when the weight F' on the disk P causes the said disk to revolve until its periphery comes in contact with the friction-pulley Q, which slowly continues the said movement, carrying with it the roller or pin U, which projects from its surface, as indicated, and the said roller is thus slowly brought into contact with the end of the lever V, so as to tilt the said lever and carry its opposite end clear of the lever E, which is thus left free to be acted upon by its spring W, which moves the said lever on its pivot, so as to cause the friction-clutch G to come in contact and form a connection with the rim-pulley D, which will thus be driven in the opposite direction to that in which it has been previously moving; but as the pin or roller U takes a little time to reach the lever V the pulleys D and A have had time to partially, if not altogether, stop before they are made to revolve in the opposite direction by being connected with the friction-clutch G. Instead of the disk P, with the roller U fixed on its face, the same effect would of course be produced by making a cam groove or projection on the face of the disk P and suitably connecting the same with the lever V.

Although my invention has no connection with the means by which the lever E is operated, it may be well, for the purpose of explaining how the lever V resumes its initial position, that I should describe how the lever E is operated for the purpose of throwing the friction-disk out of contact with the pulley D. With that view I show a view of a portion of the machine which is not visible in Fig. 1, but which is driven by the rope C. Referring to this figure, I may say that the rope C, after passing over the pulley A, passes under the pulley D, thence over a loose pulley X, and over what is known in the trade as the "tin roller" Y, thence around the pulleys Z and Z' back to the pulley D. The rope travels in this direction, as indicated by arrows. The tin-roller pulley Y is keyed to a shaft and carries with it the ratchet-wheel X'. An arm Y' is loosely journaled on the shaft of the pulley Y, and a dog D' is pivoted on this arm Y', which dog will set so that it will not interfere or engage with the ratchet-wheel X' so long as the said ratchet-wheel is revolving in the direction indicated by arrows. E' is a chain connecting the arm Y' with the vertical rod F', the bottom of which rod is connected to the push-bar G'. The moment that the machine is reversed the rope C travels in the opposite direction, causing the ratchet-wheel X' to reverse, when one of its teeth engages with the dog D' and causes the arm Y' to revolve, drawing upon the chain E' and raising the rod F'. This

rod lifts the push-bar G' clear of its holder H', when the spring I' pulls the push-bar G' and causes it to strike the lever E, thus pushing the said lever back into its initial position, when the lever V will drop back into its initial position.

What I claim as my invention is—

1. The combination, with the clutch-shifting lever and clutch and a stop arranged to engage the lever and hold the clutch out of action, of the backing-off mechanism, the twist-slide, the flattened disk, means intermediate the disk and the stop to move the latter, a shaft operated from some moving part of the machine, a friction-roller on said shaft in contact with the disk, and the pivoted lever Q, engaging a stop on the disk and actuated by the twist-slide, as set forth, whereby the said mechanism fails to remove the stop from said lever till the power has been removed from the backing-off mechanism, substantially as and for the purpose specified.

2. A clutch-shifting lever E, a clutch, and a pivoted lever V, arranged to act as a stop for the clutch-shifting lever, combined with the twist-slide and the backing-off mechanism, the disk having flattened portion, the shaft N, friction-roller O thereon, roller U on the face of the disk, and the pivoted lever Q, one end engaging a stop on the disk and the other arranged to be actuated by the twist-slide, substantially as shown, and for the purpose specified.

3. The levers Q and V, the disk P, having a cam or a roller U, designed to engage with the lever V, a pin R, to engage with the lever Q, and a friction-pulley O, arranged to impart movement to the disk P, in combination with the rim-pulley D, clutch G, lever E, arm F, spring W, means for rotating said clutch G, and the twist-slide S, arranged to strike the lever Q, so that it will release the pin R and permit the roller U to strike the lever V, substantially as and for the purpose specified.

4. A pivoted lever Q, pin R, driving-pulley O, rim-pulley D, clutch G, lever E, arm F, spring W, and disk P, weighted on one side and having a portion of its periphery flattened to be held opposite to its driving-pulley O by the pivoted lever Q engaging with the pin R, in combination with means for rotating said clutch G, the twist-slide S, to act on the lever Q, and a cam or roller U, to act on the lever V, substantially as and for the purpose specified.

Toronto, February 23, 1888.

JOSEPH L. BROOK.

In presence of—

CHARLES C. BALDWIN,
DONALD RIDOUT.