J. H. RYALLS.

REVERSING MECHANISM FOR THE BAND CYLINDERS OF SPINNING MULES.

APPLICATION FILED FEB. 15, 1909.

942,752.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

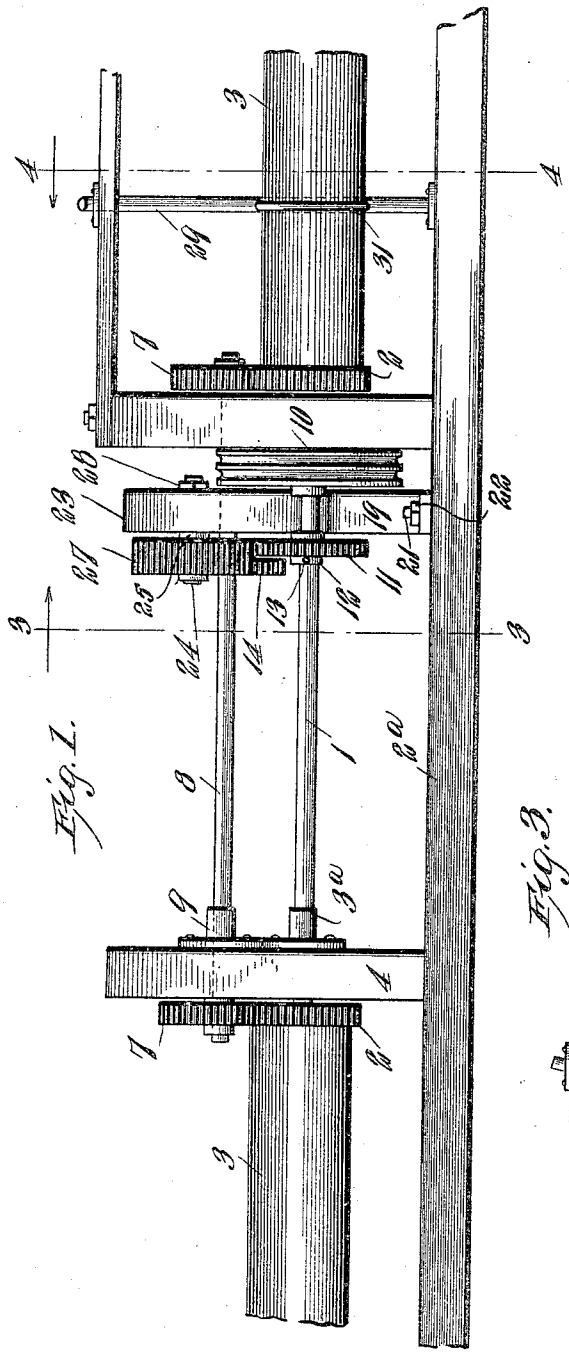

Fig. 1.

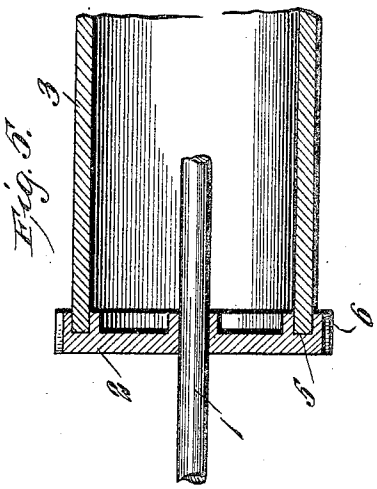

Fig. 2.

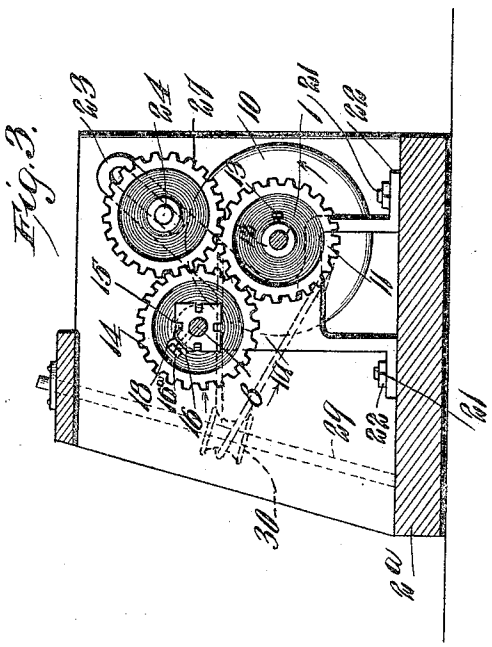

Fig. 3.

WITNESSES

E. M. Callaghan

C. E. Trainor

INVENTOR

JOHN H. RYALLS

BY Munn & Co.

ATTORNEYS

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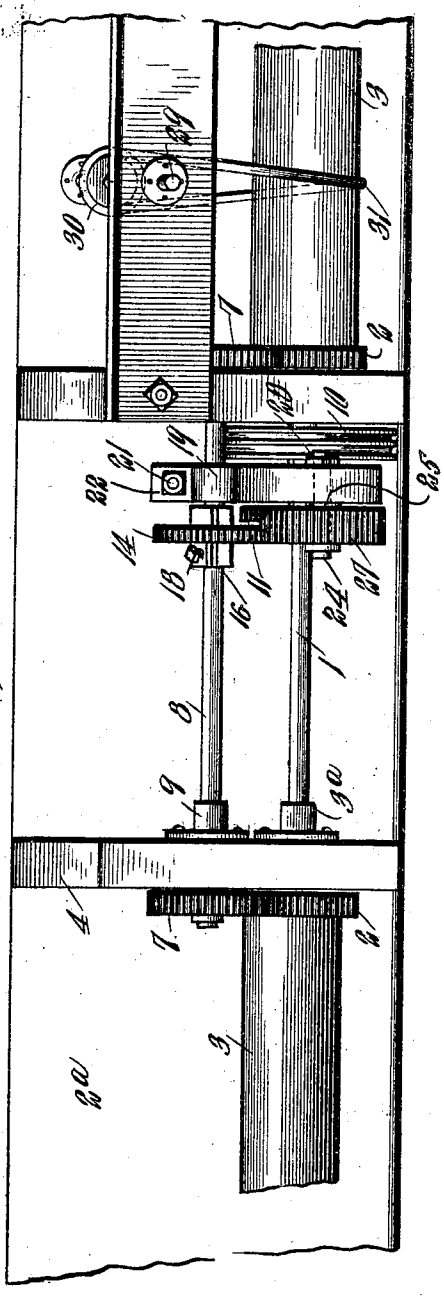

Fig. 3.

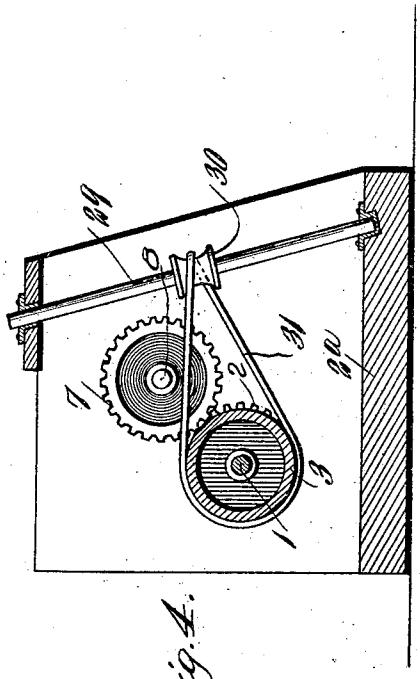

Fig. 4.

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C. E. Trainor

INVENTOR

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ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN H. RYALLS, OF CHARLOTTESVILLE, VIRGINIA.

REVERSING MECHANISM FOR THE BAND-CYLINDERS OF SPINNING-MULES.

942,752. Specification of Letters Patent. Patented Dec. 7, 1909.

Application filed February 15, 1909. Serial No. 477,357.

To all whom it may concern:

Be it known that I, JOHN H. RYALLS, a citizen of the United States, and a resident of Charlottesville, in the county of Albemarle and State of Virginia, have invented certain new and useful Improvements in Reversing Mechanism for the Band-Cylinders of Spinning-Mules, of which the following is a specification.

My invention is an improvement in reversing mechanisms for band cylinders for spinning mules, and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

In spinning, the warp is twisted in one direction, and the filling yarn or weft in the opposite direction, and the object of the present invention is to provide a means for changing the direction of travel of the bands within a minimum of time.

In the ordinary spinning mule there is approximately 420 spindles, and it is necessary in changing from warp to weft spinning to remove the bands and twist the same whereby to reverse the direction of the spindles, and this operation requires about one hour of time.

Referring to the drawings forming a part hereof—Figure 1 is a side view of the improvement; Fig. 2 is a plan view; Fig. 3 is a section on the line 3—3 of Fig. 1, looking in the direction of the arrow; Fig. 4 is a section on the line 4—4 of Fig. 1, looking in the direction of the arrow, and Fig. 5 is a longitudinal section of one of the cylinders.

In the present embodiment of the invention, the main shaft 1 has its ends loosely journaled in the heads 2 of the band cylinders 3, the shaft being mounted in bearings 3^a secured to the frames 4 supported on the base 2^a. The heads 2 of the cylinders are provided with an annular recess 5, in which is received the edge of the cylinder as shown in Fig. 5, and the periphery of the head is provided with gear teeth 6, which mesh with a pinion 7, secured to a counter shaft 8, journaled in bearings 9 on the frames above and in front of the main shaft.

The main shaft 1 is provided with a pulley 10 for connecting it with a source of power, and with a pinion 11, having a hub 12 keyed on the shaft, and also provided with a set screw 13. On the counter shaft 8 is a gear wheel 14, which is provided with a square opening as shown in Fig. 3, the sides of the opening being provided with teeth 15, and the gear wheel is longitudinally movable on a block 16 provided with an opening for receiving the shaft, and with a set screw 16^a engaging the shaft for retaining the block in position, and the block is provided with longitudinal grooves 18, in which are movable the teeth 15, before mentioned.

It will be evident that the gear wheel may be moved longitudinally of the shaft, but is constrained to rotate therewith.

A bracket 19 is arranged between the power wheel 10, and the gear wheel 11, and is secured to the base 20 by means of bolts 21, passing through openings in lateral lugs 22, on the bracket, and engaging the base. The bracket 19 is provided with a bearing for receiving the shaft 8, and with a slotted extension 23 extending upwardly and forwardly from the bracket, at an angle of approximately 45°.

A stud shaft 24 is movable in the slot, the shaft being provided with a collar 25 at approximately its center. On one side of the collar, the shaft is formed into a journal pin on which is journaled a broad pinion 27. On the other side of the collar, the shaft is threaded and passes through the slot, the free end being engaged by a nut 28.

It will be evident from the description that by loosening the nut 28, the stud shaft may move toward and from the counter shaft and the main shaft, whereby to bring the gear into mesh with the pinions 11 and 14.

The spindles 29 are each provided with a pulley 30, and a belt 31 passes from the band cylinder to each spindle, the belt being twisted between the cylinder and the pulley. The gears 7, and 12 are each keyed to their respective shafts, whereby to constrain them to rotate therewith, and are prevented from longitudinal movement by the set screws before mentioned.

In operation with the parts shown as arranged in Fig. 1, rotation of the power shaft in either direction will cause the band cylinders to rotate in the opposite direction, that is if the power shaft is rotated in the direction of the arrow shown in Fig. 3, the belts or bands 31 will move in the direction of the arrow shown on the upper run in the said figure.

When it is desired to reverse the direction of the band cylinders, the nut 28 is loosened and the broad pinion is moved out of mesh with the gear wheels 14 and 11. The gear wheel 14 is then shifted longitudinally of

the shaft, until it engages the gear wheel 11, directly. A rotation of the power shaft in the direction of the arrow shown in Fig. 3 will now rotate the cylinders in the same direction, and the bands will move in the direction of the arrow shown on the lower run in Fig. 3.

I claim:—

1. In an apparatus of the class described, the combination with alined band cylinders spaced apart by a power shaft between the cylinders, a gear on said power shaft, a bracket having a bearing for said counter-shaft said bracket being provided with an extension extending outwardly relatively to the bearing for the counter-shaft and slotted longitudinally, a broad pinion, a stud shaft having a bearing for said broad pinion and means securing the stud shaft adjustable in the slot of the bracket extension whereby the stud shaft may be adjusted in and out relatively to the gear on the power shaft, and a counter-shaft journaled to the bracket and a pinion keyed on and movable along the counter-shaft and adjustable in one position into mesh with the gear on the power shaft and also adjustable laterally to said first position whereby it may be meshed with the broad pinion when the latter is moved into position to mesh directly with the gear on the power shaft, all substantially as and for the purposes set forth, whereby the broad pinion may be utilized to transit motion from the gear on the power shaft to the counter-shaft or the parts may be adjusted to move the broad pinion out of mesh with the gears on both the power shaft and counter-shaft and said gears be meshed directly together as set forth.

2. In an apparatus of the class described the combination with alined band cylinders spaced apart of a power shaft between the cylinders a gear on the power shaft, a counter-shaft, a gear keyed on and movable along the counter-shaft into and out of mesh with the gear of the power shaft, a pinion broader than the gear on the power shaft and movable into and out of mesh with the gear on the power shaft and adapted when meshed with the gear on the power shaft to also mesh in a different plane with the gear on the counter-shaft all substantially as described, whereby the broad pinion may be adjusted to transmit motion from the gear on the power shaft to that on the counter-shaft or the gear on the counter-shaft may be meshed directly with that of the power shaft and the broad pinion be moved out of mesh with both of said gears substantially as and for the purpose set forth.

JOHN H. RYALLS.

Witnesses:
GEO. R. B. MICHIE,
J. G. HOPKINS.