

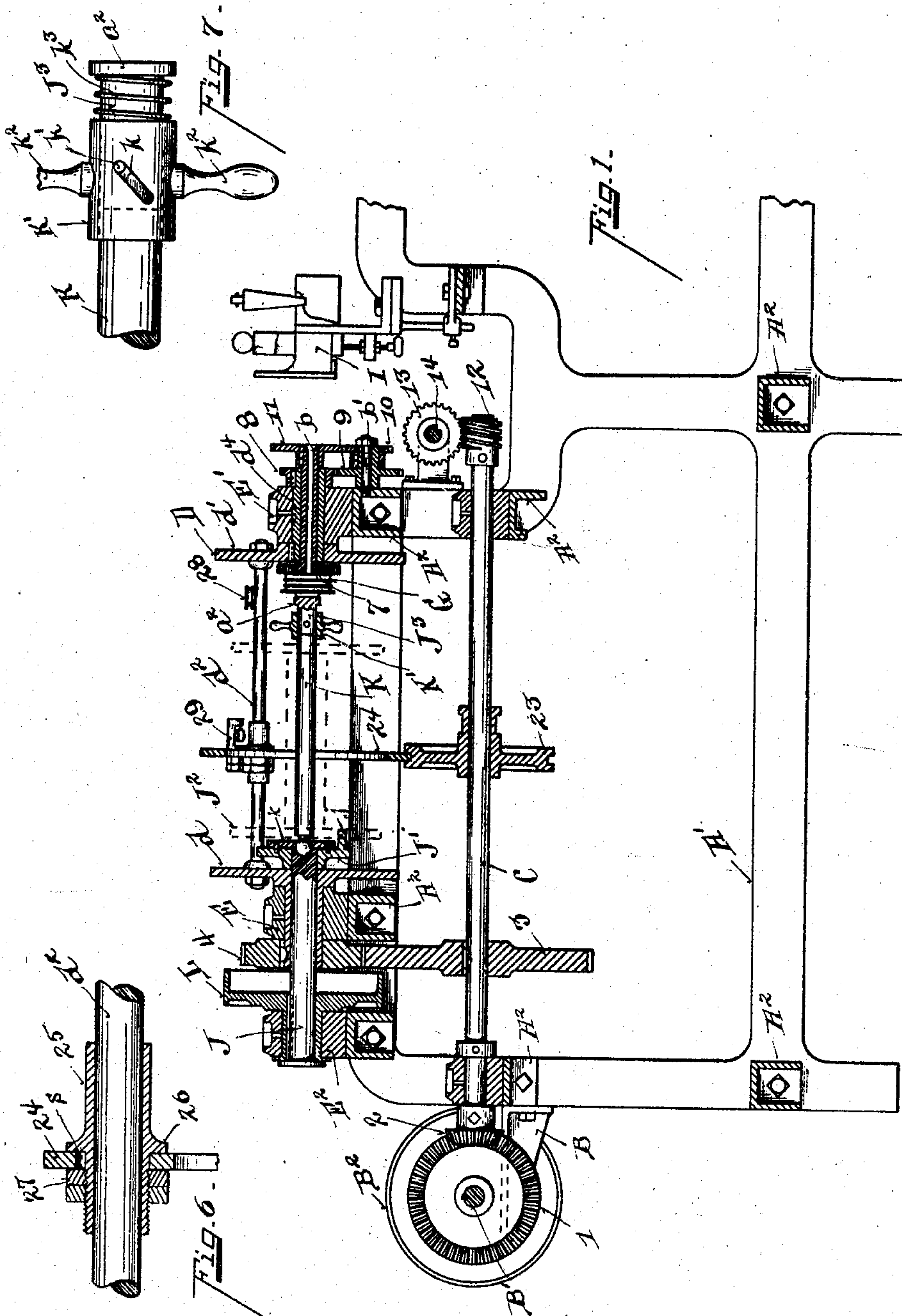
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G. J. CUZNER.
SPINNING MACHINE.

APPLICATION FILED OCT. 22, 1903.

2 SHEETS—SHEET 1.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE J. CUZNER, OF MIAMISBURG, OHIO.

SPINNING-MACHINE.

No. 806,068.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE J. CUZNER, a citizen of the United States, residing at Miamisburg, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Spinning-Machines, of which the following is a specification.

My invention relates to improvements in spinning-machines.

One of the objects of my invention is to provide a spinning-machine with a single driving medium for operating the flier and capstan, the flier being driven through the main source of power, and the flier in turn conveying power to the capstan, thereby producing a uniformity of drive through the various parts.

Another object of my invention is the employment of a bobbin having no lineal movement, but providing independent traversing mechanism, thereby enabling the production of a spinning-machine of contracted form.

Another object of my invention is to provide a traversing mechanism, mounted on the cross-bars of the flier, with means for enabling the same to travel freely in either direction under the various expanded positions of the cross-bars at any speed at which the machine is run.

Another object of my invention is to provide means for manually operating the traversing mechanism.

Another object of my invention is to provide a stationary retarding mechanism for the bobbin-shaft with means for adjusting the same under various tensions while the machine is in operation.

Another object of my invention is to provide simple and efficient means for readily releasing the bobbin from its shaft, yet at the same time forming safety means in that the bobbin cannot be placed in operating position without being automatically locked in such position.

Other features of my invention relate to various details of construction fully set forth in the description of the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central vertical section of my improved spinning-machine. Fig. 2 is a top plan view of the traversing mechanism. Fig. 3 is a top plan view of the flier and bobbin-retarding mechanism. Fig. 4 is a side elevation of the retarding mechanism for the bobbin-shaft. Fig. 5 is a detail plan view of the

traverse-ring. Fig. 6 is an enlarged sectional view showing the construction of mounting the ring upon the cross-bars of the flier. Fig. 7 is an enlarged detail elevation of the means for holding the bobbin-shaft in its operating position.

A A' represent the side frames of my spinning-machine; A², the cross-beams for supporting the working parts secured to the side frames.

B represents a bracket, one being secured to the front end of each side frame, having journal-boxes mounted thereon for journaling the power-shaft B', carrying the pulley-wheel B².

1 represents a bevel-gear fixed to shaft B', meshing with a bevel-gear 2, fixed to shaft C, forming the main power-transmitting shaft. Said shaft C is journaled in suitable bearings upon the cross-beams A².

D represents a flier journaled in bearings mounted on the cross-beams, the flier being constructed as follows: d d' represent the heads of the flier, secured together by the cross-bars d^2 d^3 . The head d is provided with a sleeve journaling with the bearing E and extending beyond the same. To this free end of the sleeve is fixed a gear 4 in mesh with a gear 3, fixed to the shaft C, forming the transmitting means for the flier. The opposite head d' is fixed to a sleeve d^4 , journaled within the bearing E'. Upon the inner face of head d' is mounted the usual form of capstan, consisting of the grooved rollers G G', fixed to gears 5 and 6, respectively, journaled on stud-pins a a' , (shown in dotted lines, Fig. 3,) projecting from the head d' . These gears 5 6 are in mesh and receive motion from a gear 7. This gear 7 has an extended sleeve b , journaling within the sleeve d^4 . Motion is imparted to the gear 7 as follows: 8 represents a gear fixed on the outer end of the sleeve d^4 and in mesh with a gear 9, loose on a stud-shaft b' , secured in the cross-beams. To this gear is fixed a gear 10, on stud-shaft b' , in mesh with a gear 11, fixed to the sleeve b of the gear 7. By this arrangement a proper ratio of speed may be imparted to the capstan relative to the speed of the flier in producing twine of the desired number of twists per foot, this construction of capstan transmission means being such as to readily enable the employment of change-gears for varying the speed of the capstan, thereby varying the number of twists per foot in the twine. The outer end of the sleeve b is funnel-shaped, affording free pas-

sage for the twine from the nipper I to the rollers G H of the capstan.

J represents the bobbin-retarding shaft, journaled within the sleeve of the head d and the journal-bearing E^2 .

J' represents a plate secured to the shaft J, provided with the usual form of pin projection j , adapted to be fitted into a socket in the bobbin.

10 J² represents the bobbin, (shown in dotted lines, Fig. 1,) mounted upon the spindle K, one end of said spindle having a ball-and-socket connection with the shaft J, the ball portion of the spindle K seating in a socket
15 bored in the end of the shaft J and the spindle K held in position by segmental plates k , secured to the plate J'. The opposite end of the spindle K is held in position by the following mechanism: a^2 represents a plate secured to the stud-pins a a' of the capstan,
20 from which a stud J³ is projected, meeting the spindle K. K' represents a sleeve fitting said stud and provided with angled slot k , through which projects a pin k' , secured in the stud
25 J³. k^2 represents handles projecting from the sleeve K'. (See Fig. 7.) By this construction as the sleeve K' is turned in one direction such action will tend to slide the sleeve toward the right. The bore of the sleeve be-
30 ing of the same diameter as that of the spindle K and the stud J³, it will necessarily free the same from the socketed connection of the spindle, and as soon as the same is released it will be moved forward in its normal position
35 by the tension of the spring k^3 . This method of mounting and securing the bobbin in position affords easy and convenient means for removing and inserting the bobbin. Further,
40 with the construction shown it is impossible to mount the bobbin improperly. This prevents accidents, which were previously quite frequent. Where the bobbin is not properly secured when the machine is started under
45 the high velocity at which the machine is run, it would frequently throw the bobbin outward. Further, the ball-and-socket engagement of the spindle with the retarding-shaft permits the spindle to be swung upward after it has been released to freely insert and re-
50 move the bobbin.

In order to properly wind the twine on the bobbin, it is essential to employ retarding mechanism in connection with the bobbin, which consists in the following instrumentalities: L represents a wheel having an extend-
55 ing rim-face fixed to the shaft J. L' represents a bracket secured to one of the side frames. L² represents a brake-shoe, preferably constructed of wood having grooves cut along its bearing-face forming air-passages
60 in order to cool the shoe under action. L³ represents a supporting-rod for the shoe, having bearings in the bracket L'. L⁴ represents a spring having bearing against the adjusting-nuts on the rod L³, which exerts its

tension pressure in the direction of the wheel L. By adjusting the nuts any desired tension to the shoe against the wheel L can be maintained. In this form of retarding mechanism the retarding means is stationary and
70 adapted to be adjusted while the machine is in motion. Further, a much superior result is maintained and the parts do not become as heated as in devices revolving with the flier.

The guiding of the twine upon the bobbin
75 is accomplished by the following instrumentalities: To the main driving-shaft C is secured a worm 12, in mesh with a worm 13 on cross-shaft 14. 15 represents a bevel-gear fixed to shaft 14. 16 represents a transverse
80 screw-shaft having right and left hand threads journaled in bearings mounted upon the side frame of the machine. 17 represents a bevel-gear loose on the shaft 16, in mesh with bevel-gear 15 and receiving motion therefrom.
85 This gear 17 is provided with a sleeve extension having clutch-teeth adapted to clutch the teeth of a sleeve 18 and shaft 16. The sleeve 18 is provided with a slot 19, through which projects a pin secured in the shaft 16.
90 20 represents a spring having tension against the sleeve 18 to normally maintain the teeth in clutching engagement with the teeth of the gear 17. Thus it will be seen that in one direction of movement the teeth of sleeve 18 will
95 always be in clutching engagement, thereby driving the feed-shaft 16 by power.

If the shaft is revolved at the opposite end, the engagement of the inclined edges of the teeth will force the sleeve 18 inward, thereby
100 suspending the transmission of motion between shafts 14 and 16.

22 represents a traversing arm mounted upon the screw-shaft 16, provided with the usual form of swiveled crescent riding the grooves
105 of the screw of the shaft 16 for traversing the arm forward and backward. Upon shaft C is loosely mounted a grooved wheel 23, provided with a grooved collar, into which is fitted a yoke of the arm 22.
110

24 represents a ring slidably mounted upon the cross-bars d^2 d^3 of the flier, the preferred form of mounting being as shown in Fig. 6, which consists of a sleeve 25, projecting through an oblong slot S in the ring 24, provided with a central flange 26, bearing against
115 the ring 24 on one side and on the other side by set-nuts 27, screw-threaded upon the sleeve 25. In this class of machine under the high speed at which the flier is run the cross-bars
120 d^2 d^3 have a tendency to expand outwardly at their central point. I have provided the ring 24 with oblong slots through which the sleeves 25 project, thereby preventing any binding effect of the ring with the cross-bars
125 d^2 d^3 , due to the contraction and expansion of the arms by centrifugal force, and which would have a tendency to interfere with the free travel of the ring, which is the twine-guiding element to the bobbin. These enlarged
130

ring-slots effectually prevent any binding of the ring and arms.

The ring 24 fits within the groove of the wheel 23, and it is thereby traversed forward 5 and backward under the action of the lead-screw.

By the construction of traversing mechanism herein shown a free guiding of the twine is accomplished, the essential characteristics 10 being in the mounting of the pulley 23 loosely upon the main driving-shaft, which being run at a high speed materially assists in the traversing action with a minimum amount of friction between the ring 24 and the grooved 15 wheel 23, requiring very little power to traverse the ring, as would otherwise be required were the ring 24 in direct connection with the traverse screw-shaft.

The twine is passed from the nipper I 20 through the sleeve *b* of gear 7 around the rollers G G' of the capstan in the usual form, thence to roller 28, mounted on one of the cross-bars of the flier, thence over the roller 29, mounted upon the ring 24, to the bobbin J, 25 two sets of those rollers 28 and 29 being employed, but only one set is used at a time, the power being transmitted to the flier through gear 3 on the main shaft C, which in turn transmits the proper speed through the train 30 of gears in connection with the flier and main capstan driving-gear 7. Under this action the bobbin is rotated by the twine, but retarded to the proper degree to suit the nature of the work by the retarding mechanism, having 35 friction-bearing against the wheel L, mounted directly upon the bobbin-shaft J. The twine is properly fed through the feeding mechanism in connection with the feeding-ring 24, mounted upon the cross-bars of the flier.

40 After the bobbin has been filled it sometimes occurs that the ring occupies a central position on the flier after the machine has been shut down, in which position it would be impossible to withdraw the bobbin. Further, at the high speed at which the machine 45 is run it would be quite difficult to stop the machine with such accuracy as to have the ring at either end of the flier. Consequently, no matter what position the ring occupies it 50 can be readily traversed forward or backward by the hand-wheel 21 of the traverse-shaft 16 by turning the same in the reverse direction from that of its rotation by the power-drive.

It will be seen in this invention that great 55 simplicity of construction of contracted form is obtained. The respective functions of the parts are positively maintained. The retarding mechanism being stationary and parallel with the bobbin-shaft also may be manually 60 adjusted independent of the rotation of the flier, enabling the most delicate adjustments of the tension while the machine is in operation, comprising the form of a stationary brake-shoe under tension frictionally against 65 a wheel on the bobbin-shaft. This I regard

as one of the most useful features of my invention, as I am enabled to obtain a retarding device devoid of becoming heated, yet enabling sufficient tension to be applied necessary to the perfect operation of winding the twine on 70 the bobbin. Further, the capstan transmission means are so arranged to permit of change-gears being employed, adapting various number of twists to the foot in the twine to be produced as occasion may require, due to the 75 change of speed of the capstan.

Having described my invention, I claim—

1. In a spinning-machine, a flier, means for positively revolving the same, a capstan journaled on the flier, power-transmitting means 80 between the flier and capstan, a sectional bobbin-shaft independently journaled within the flier, the sections being universally connected, means for detachably supporting one end of said sectional shaft, retarding mechanism for 85 said sectional bobbin-shaft, guiding means mounted upon the flier, means for reciprocating the same comprising a feed-shaft and intermediate transmission means, and means for manually operating the feed-shaft, substan- 90 tially as described.

2. In a spinning-machine, a flier, means for positively revolving the same, a capstan journaled on the flier, power-transmitting means driven by the flier for operating the capstan, 95 an independently-journaled bobbin-shaft, retarding mechanism for said shaft comprising a wheel fixed to said shaft, a stationary brake-shoe mounted transverse to the bobbin-shaft and frictionally engaging under tension the 100 rim-face of said wheel, means for adjusting the tension, feeding means mounted on the flier, means for reciprocating the same, substantially as described.

3. In a spinning-machine, a main power- 105 shaft, a flier, means for revolving the same, a capstan journaled on the flier, power-transmitting means between the flier and capstan, guiding devices mounted on the flier provided with means allowing for the contraction and 110 expansion of the flier-arms incident to the rotation of the flier, a traverse-shaft, intermediate transmission means between the guiding devices and traverse-shaft mounted on the power- 115 shaft having connection with said guiding devices and traverse-shaft for traversing said guiding devices and means whereby the guiding devices may be operated manually when the power-shaft is at rest, substantially as de- 120 scribed.

4. In a spinning-machine, a flier, capstan and bobbin, a single drive for the flier, and transmission devices from the flier to the capstan, driven by said flier, a traverse-ring slidably mounted on the flier, a traverse-shaft en- 125 gaging said ring, for reciprocating the same, means for manually operating said traverse-shaft, substantially as described.

5. In a spinning-machine, a flier, capstan and bobbin, a single drive for the flier, and 130

transmission devices from the flier to the capstan, driven by said flier, a traverse-ring slidably mounted on the flier, a traverse-shaft engaging said ring, for reciprocating the same,
5 and means for manually operating the traverse-shaft, substantially as described.

6. In a spinning-machine, a reciprocating twine-guide, a driving-shaft for traversing said guide, driving devices for rotating said
10 shaft, manually-operated devices for rotating

said shaft, and connections between said driving mechanism whereby the shaft rotation may be continued by hand, when the power-drive is suspended, substantially as described.

In testimony whereof I have hereunto set
my hand.

GEORGE J. CUZNER.

Witnesses:

LEWIS H. ZEHRING,
MAY DODDS.