

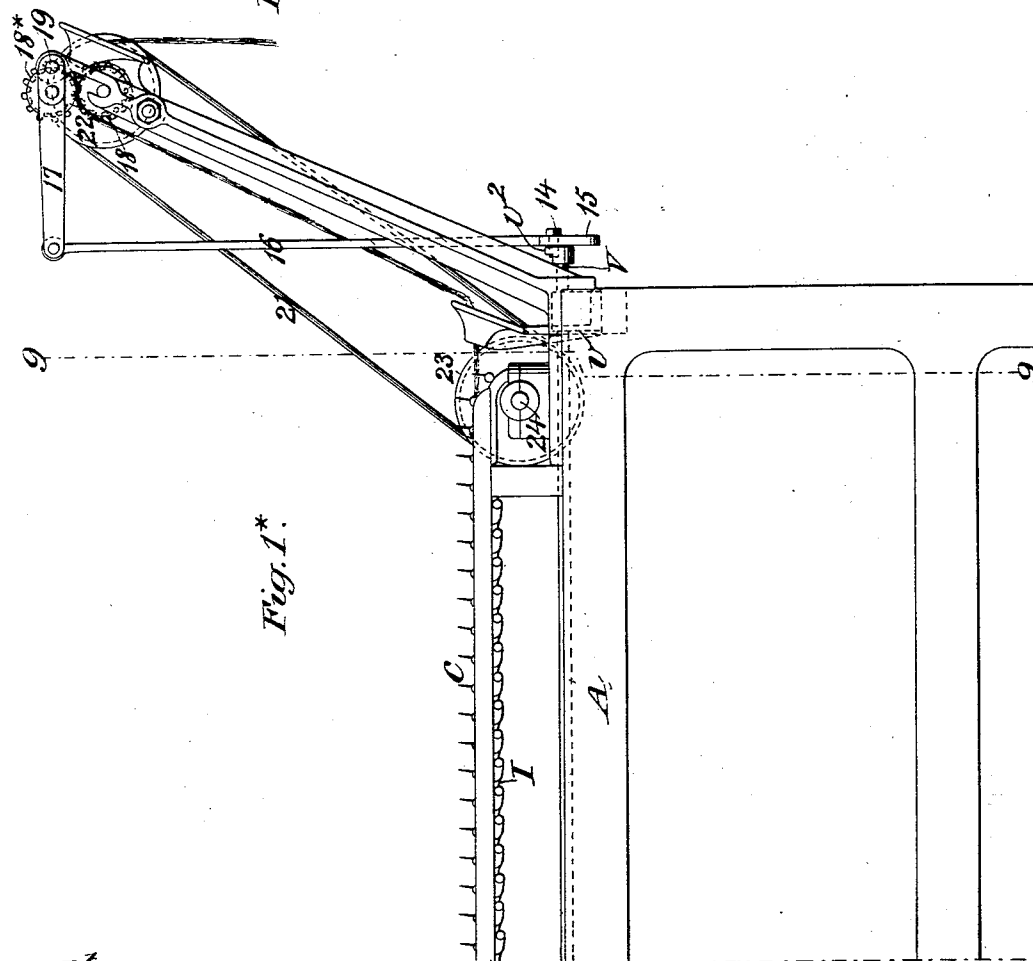
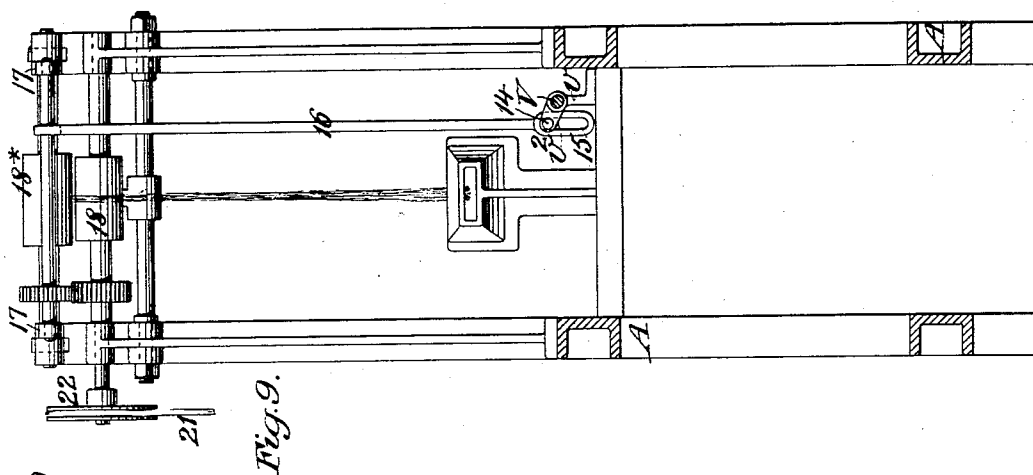
(No Model.)

3 Sheets—Sheet 2.

J. GOOD.
SPINNING MACHINE.

No. 541,271.

Patented June 18, 1895.



Witnesses:

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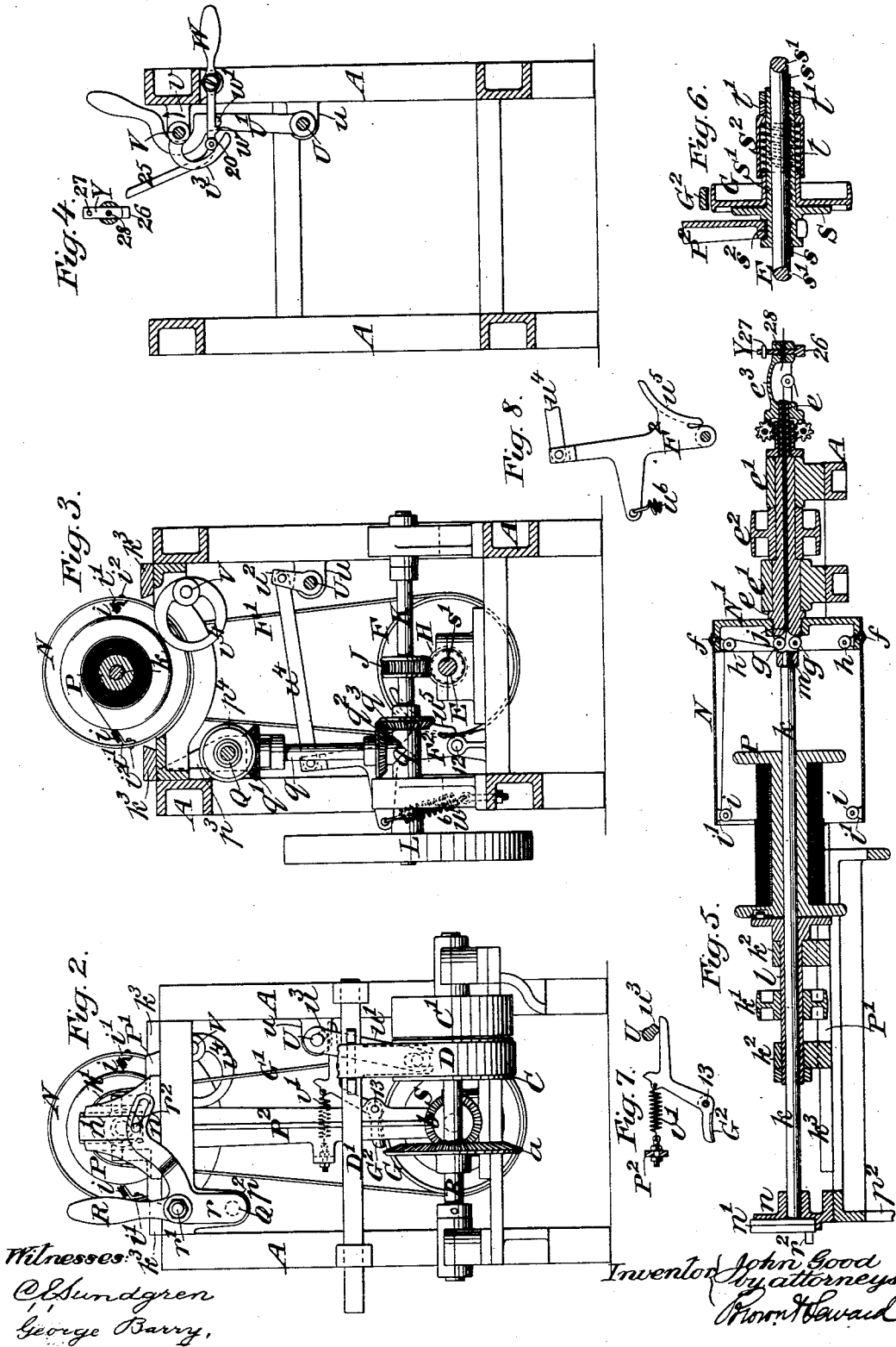
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

JOHN GOOD, OF FAR ROCKAWAY, NEW YORK.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,271, dated June 18, 1895.

Application filed September 27, 1894. Serial No. 524,223. (No model.)

To all whom it may concern:

Be it known that I, JOHN GOOD, of Far Rockaway, in the county of Queens and State of New York, have invented a new and useful Improvement in Spinning-Machines, of which the following is a specification.

This invention relates more particularly to a spinning machine of the kind known as the "jenny" used for the spinning of twine and of yarns for cordage, and the object of the improvement is to simplify the machine and to enable it to be driven at a higher speed than has hitherto been practicable.

The nature of the improvement will be described with reference to the accompanying drawings and its novelty will be set forth in the claims.

Figures 1 and 1* represent together a side elevation, partly in section, of a machine embodying my invention; Fig. 2, an elevation of the driving end of the machine; Fig. 3, a transverse vertical section in the line 3 3 of Fig. 1; Fig. 4, a transverse vertical section in the line 4 4 of Fig. 1; Fig. 5, a central longitudinal sectional view of the bobbin and flier and their immediate appurtenances; Fig. 6, a central longitudinal sectional view of the friction device which produces the draft on the yarn or twine between the bobbin and the flier. Figs. 7 and 8 are detail views which will be hereinafter explained. Fig. 9 represents a transverse vertical section of the machine in the line 9 9 of Fig. 1*.

Similar letters and figures of reference designate corresponding parts in the several figures.

A is the framing of the machine.

B is the main shaft arranged at one end of the framing transversely thereto and furnished with fast and loose pulleys C C' which receive motion through the main belt D which is shipped from one of said pulleys to the other by a belt-shipper D'.

E is a horizontal shaft running lengthwise of the machine and deriving motion from the main shaft B through bevel gears a b. This shaft E carries a pulley F for driving the flier N N', a pulley G for driving the bobbin P and an endless screw H for driving the chains I which carry the gill-pins c c; the said endless screw H gearing with and driving a worm-gear J on a transversely arranged shaft K which

carries a pulley L from which a belt L' runs to and drives a pulley M on the driving shaft d of the gill-pin chains I.

The flier N N' herein represented consists of a cylinder open at one end and closed at the other end by which it is attached to its journal e which runs in two journal boxes e' on the top of the framing and is furnished with a pulley e² to receive the driving belt F' from the pulley F. This cylindrical flier is represented as composed of a metal disk N' and cylindrical shell N attached at one end to said disk. This cylindrical shell I make of a piece of seamless paper tubing because that material is very cheap and enables a flier having the necessary stiffness and strength to resist the effects of centrifugal force to be made of less weight than a metal flier of cylindrical form and therefore to be run at a higher speed and with less wear of journals and to be more easily stopped when run at a high velocity. The metal disk N' is represented (see Fig. 5) as formed with a rim projecting from its face substantially parallel with its axis for the purpose of attaching the shell N which fits tightly over the said rim and is attached thereto in any suitable and secure manner as by screws f. The flier thus constructed is furnished internally with sheaves g, h, i for guiding the yarn from its eye j to the bobbin. The sheaves i which are arranged near the mouth of the flier and are attached to the shell N of paper or light material, are pivoted in metal angle pieces i' which are riveted or secured to the shell as indicated at i² in Fig. 3. The journal e of this flier may have a capstan head e³ of any known or suitable kind.

The bobbin P is represented as carried and driven in a well known manner by a central supporting spindle k and a hollow driving spindle l, through which said spindle k passes freely, the said spindle l being furnished with the pulley k' receiving the driving belt G' from the pulley G. The driving spindle l runs in bearings k² in a carriage P' which is fitted to slide in a direction lengthwise of the spindle in ways k³ on the top of the framing. When in operation the supporting spindle k is supported at its inner end, as shown at m in Fig. 5, in a bearing in the inner end of the flier journal, but it is always supported both

in the hollow driving spindle l and in a fixed bearing in a small stand n on the top of the framing. This stand n is fitted as shown in Figs. 1 and 2, with a vertically sliding bolt n' which abuts against the outer end of the spindle k when the said spindle is in its operative position and so locks it. This arrangement of the supporting spindle k and the means of locking it endwise are not new and are only here described as leading to the further explanation which will be hereinafter made of the means of simultaneously locking the said spindle and the traverse screw Q and simultaneously unlocking them.

The traverse screw Q turns in a box p in a hanger p' secured to the sliding carriage P' , the said box containing the usual switch nut for working either in the right hand or in the left hand thread of the said screw. The shaft of said screw also fits in bearings in two stationary hangers p^2 p^3 dependent from the framing A , and it is capable of sliding lengthwise outward through and beyond the said bearing in p^3 . The said shaft is furnished with a bevel gear p^4 which gears with a bevel gear q' on the upper end of an upright shaft q , which turns in a bearing in the bottom of the hanger p^3 and a second bearing q^5 secured to one of the journal-boxes of the shaft K , the said shaft being furnished on its lower part with a bevel gear q^2 which gears with a bevel gear q^3 on the transverse shaft K hereinbefore described, the said bevel gear q^3 , shaft q and bevel gears q' and p^4 thus driving the traverse screw. The traverse screw when in operation is confined longitudinally between its bearings in the hanger p^3 and a downward projection r on a hand-lever R (see Figs. 1 and 2) which works on a fixed fulcrum r' in the end of the framing outside the hanger p^3 . A laterally projecting arm of this lever is connected as shown in Fig. 2, by a slot and pin connection r^2 with the sliding bolt n' which locks the bobbin supporting spindle k in place. In the normal position to which this lever is brought by the weight of its laterally projecting arm and of the sliding bolt n' , the said bolt abuts against and acts as a stop to lock the spindle k and at the same time the projection r on the hand-lever forms an abutment and a stop to the outer end of the traverse screw and both the said spindle and the screw are locked endwise while the machine is in operation and until it is desired to remove the bobbin when the hand-lever is brought to a position to uncover the outer ends of the said spindle and screw and allow both the said spindle and screw to be drawn outward, the drawing outward of the screw being necessary to permit the drawing back of the carriage P' and spindle l to draw the bobbin out of the flier, because the screw is always engaged with the said carriage by the switch nut in the box p .

S (Figs. 1 and 6) is the friction disk for producing the draft on the yarn between the flier and the bobbin. This friction disk is

applied on the shaft E and operates against one side of the bobbin driving pulley G . The said disk is formed upon or rigidly secured to a sleeve S' which is fitted to the said shaft with a spline s and groove s' , in such manner that it is compelled to turn with the said shaft but is capable of moving longitudinally thereon. The pulley G is so fitted to the sleeve S' as to be capable of turning thereon but it is held against the friction disk S in such manner as to be capable of being turned by the friction thereof by means of a coil-spring t which surrounds the sleeve S' wherever it is incased by a box S^2 and held abutting against the said spring by nuts t' fitted to a screw thread on the sleeve. By screwing up these nuts the spring t is adjusted to exert a greater or less pressure against the pulley and so to adjust the friction which the said pulley receives from the disk S and thereby adjust the draft on the yarn as the flier is driven positively by the pulley F on the shaft E , while the bobbin is driven by the friction of the said disk S . The sleeve S' is journaled, as shown at s^2 in Fig. 6, into a rigid hanger P^2 dependent from the bobbin carriage P' , in such manner that the said sleeve may turn freely in said hanger but is compelled by it to move with the said carriage in the traverse movement of the bobbin and so to carry the pulley G and the friction disk back and forth along the shaft E and keep the pulley G and belt G' always in proper relation to the bobbin pulley k' .

The condenser T represented in Fig. 1 may be of any known or suitable kind and therefore needs no particular description.

The machine is fitted with a stop motion which provides for stopping it automatically and almost instantaneously under the following circumstances, viz: first, in case of interruption of the supply of sliver to the chains of gill-pins; second, in case of the yarn or twine breaking or being interrupted between the flier and the condenser or gill-pins; third, when the bobbin has received upon it a certain quantity of yarn or twine. The several parts of this stop motion are all upon or operated by two horizontal rock-shafts U V which are arranged one below the other lengthwise of the machine in bearings u and v affixed to the interior of the side of the framing. The lower shaft U may be termed the "stop shaft" and the upper one V the "tripping shaft."

The stop shaft U which extends as shown in Fig. 1, from the driving end of the machine to a little beyond the head of the flier is furnished with a hand-lever U' (Figs. 1 and 4) which may be termed the "stop lever." The said shaft is also furnished with an arm u' (Figs. 1 and 2) connected with and operating the belt-shipper D' , and is further furnished with an arm u^2 (Figs. 1 and 3) for throwing and holding off the brake F^2 from the flier driving pulley F , and with a cam u^3 (Figs. 1, 2 and 7) for throwing and holding off the brake

G² from the bobbin driving pulley G. The connection between the arm w' of the stop shaft and the belt-shipper D' is of ordinary kind. The arm w^2 is connected (see Fig. 3) by a rod w^4 with the flier-pulley brake F². This brake F² which is shown separately in Fig. 8, consists of a three-armed lever working on a fixed fulcrum 12, one arm having the rod w^4 connected with it, another arm carrying the brake shoe w^5 which acts on the inside of the rim of the pulley F, and the third arm being connected with the framing A by the spring w^6 which always tends to put the brake in operation and at the same time acting through the brake lever, the rod w^4 and the arm w^2 of the stop shaft U, always tends to turn the said shaft in a direction to make its arm w' ship the main belt from the fast pulley C to the loose pulley C'. This action of the said spring is counteracted, when the machine is in proper operation, by means of a small lever W which I call the "locking lever," which is furnished with a hook w which hooks over a projection w' on the hand lever and so holds the said lever in a position to keep the brake F² out of operation and to hold the belt-shipper in position to keep the belt on the fast pulley.

The brake G² of the bobbin driving pulley G which is shown in Fig. 2 but more clearly in the separate view Fig. 7, has to move with the said pulley along the shaft E and therefore it is attached to the bobbin-carriage. The said brake G² consists of a lever, the fulcrum 13 of which is affixed to the hanger P², one arm of the said lever constituting the brake shoe and operating on the outer periphery of the said pulley and the other arm being connected with the said hanger by a spring v' which exerts a constant tendency to apply the brake to the pulley but the action of which, when the machine is in proper operation, is counteracted by the cam w^3 before mentioned on the stop shaft U. This cam must be of a length in the direction of the length of the stop shaft, as shown in Fig. 1, a little greater than the length of the bobbin traverse in order that it may remain operative in all positions of the bobbin.

The tripping shaft V which extends (as shown in Figs. 1 and 1*) from a position in rear of the chains I to a position some distance beyond the front end of the flier, is furnished with an arm v^2 (Figs. 1 and 9), a hook-like cam v^3 (Figs. 1 and 4), which may be termed the tripping cam and with an eccentric-like arm v^4 (Figs. 1 and 3). The arm v^2 which is at the rear end of the tripping shaft has a crank-pin 14 which is received in a link or fork 15 on the lower end of a rod 16 which is suspended from one of two levers 17 in which is journaled the upper one of the feed rollers 18, 18* for feeding the sliver to the chains I of the gill-pins c, the said levers having a fixed fulcrum 19 and being so proportioned that a very slight upward and downward movement of the feed roller 18* pro-

duces a very considerable rise and fall of the rod 16. While there is a proper supply of sliver to the feed rollers 18, 18* the rod 16 is so held up that its link or fork leaves the wrist-pin 14 of the arm v^2 of the tripping shaft free and the tripping shaft is held against any tendency to turn accidentally in the direction of the arrow shown near it in Fig. 4, by the engagement of its tripping cam v^3 with a small projection 20, preferably consisting of a friction roller, on the hooked locking lever W which is then itself locked by the engagement of its hook w with the projection w' on the hand-lever U'; but when the supply of sliver to the rollers 18, 18* is interrupted, the roller 18* comes down so low that by its action through the levers 17 and the rod 16, the upper end of the link 15 of the said rod will bear down on the arm v^2 of the tripping shaft V and the said shaft will thereby be caused to turn in the direction of the arrow shown near it in Fig. 4. The tripping cam v^3 then, by its action against the projection or roller 20 on the locking lever W, will lift or trip the said lever clear of the projection w' on the stop lever V', and so liberate the stop lever and leave the stop shaft free to the action of the spring w^6 by which the main belt D is shipped to the loose pulley and the brakes are brought into operation to stop the flier and the bobbin almost instantaneously. It will be understood that as the traverse screw and the gill-pin chains are driven from the same shaft F as the flier and bobbin, all will be stopped together and at the same time the feed rollers 18, 18* will be stopped as these rollers are driven by a belt 21 running to a pulley 22 on the roller 18 from a pulley 23 on the chain shaft 24.

For the purpose of causing the stoppage of the machine by a disengagement of the locking lever W from the stop lever U, similar to that above described, whenever the yarn or twine is broken or interrupted between the flier head and the condenser or the gill-pin chains, the locking lever is furnished with an upward prolongation 25 toward the flier head e^3 , as shown in Fig. 4, and there is provided in the flier head opposite this prolongation, a centrifugal tripping tappet Y consisting of a short pin which is fitted loosely within and projects through a hole or mortise bored or cut transversely through the flier head. In this tappet there is a hole 28 large enough for the yarn or twine to pass freely through. One of the projecting ends of the said tappet is represented as provided with a head 26 and the other as having a pin 27 inserted through it to prevent it from coming altogether out of the flier head, and one end, for instance that which has the head, is made heavier than the other so that when the flier is in motion the centrifugal force developed in the said tappet will tend to make the tappet fly out in one direction from the flier head, but while there is any yarn or thread passing through the hole in the tappet, that

will counteract this tendency. When, however, the yarn or twine is broken or interrupted there will be no restraint to the centrifugal tendency and the tappet will instantly fly out far enough to strike the prolongation 25 of the locking lever W and so to throw the said locking lever out of engagement with the stop lever U' and leave the stop shaft free to the action of the spring w^6 which produces the stoppage of the machine as before explained.

The eccentric-like arm v^1 (Fig. 3) on the tripping shaft V is for the purpose of stopping the machine when the proper quantity of yarn or twine has been spun on to the bobbin P. This arm v^1 is situated near the mouth or open end of the flier and in such position (see Fig. 3) that when the tripping shaft is in position for the proper operation of the machine, the heads of the bobbin may pass clear of the said arm to permit the bobbin to pass into the flier. When a body of yarn on the bobbin arrives at a certain circumference, its outer coils will come against and so press down the said arm and turn the tripping shaft V as to produce the action of the tripping cam v^3 on the locking lever as hereinbefore described for disengaging the stop lever and causing the stoppage of the machine. It may be here mentioned that the arm v^1 is not necessarily of eccentric-like form but is merely made round to prevent any loose portions or fibers of the yarn from catching on it.

After the machine has been automatically stopped in any of the ways hereinabove described or after it has been stopped under any circumstances and when it has been again started by pulling outward the stop lever U' by hand and thereby shipping the belt D on to the fast pulley C and throwing off the brake F², the locking lever W is operated by hand to re-engage with the projection w' on the stop lever and lock the latter lever. By this re-engaging movement of the locking lever the projection 20 on the said lever is made to so act upon the tripping cam v^3 as to turn the tripping shaft into the position in which it is ready to trip the locking lever W by the filling up of the bobbin or by the interruption of the sliver between the feed rollers 18, 18* in which position also the cam w^3 on the said shaft also holds the spindle pulley brake G² out of operation. The same movement of the locking lever brings its upper arm 25 into position to be operated by the action of the centrifugal flier tappet as hereinbefore described.

What I claim as my invention is—

1. The combination in a spinning flier of a metal disk having a rim projecting from its face and a cylindrical seamless shell of paper fastened to said rim, substantially as herein described.

2. The combination with the bobbin carriage and bobbin driving spindle and a traverse screw for moving said carriage, of a

pulley on said spindle, a driving shaft and a driving pulley thereon for driving the said pulley on the bobbin driving spindle, a connection between the said driving pulley and the bobbin-carriage whereby the said driving pulley is moved lengthwise on its driving shaft by the bobbin-carriage, and a driving belt between said pulleys, substantially as herein set forth.

3. The combination with the bobbin-carriage and the bobbin-driving spindle in said carriage furnished with a pulley, of a driving shaft, a driving pulley capable of turning about said driving shaft, a friction disk fitted to said shaft to turn therewith for driving said driving pulley, a traverse screw for moving the bobbin-carriage, a connection between said carriage and the said friction disk and driving pulley whereby the said driving pulley and disk are moved lengthwise on the said shaft, and a belt between said driving pulley and the pulley on said spindle, substantially as herein set forth.

4. The combination of a hollow bobbin driving spindle and a carriage therefor, a traverse screw for moving said carriage and a nut which connects the said carriage with said screw, a bobbin supporting spindle movable lengthwise through said driving spindle, bearings for said supporting spindle and screw, stops for preventing the longitudinal movement of said spindle and screw in one direction and a connection between said stops whereby both are movable together to lock and unlock said spindle and screw, substantially as herein set forth.

5. In a spinning machine comprising an endless series of gill-pin-bars and gill-pins thereon, the combination with the feed-rollers for supplying sliver to the gill-pins and mechanism for stopping the operation of the machine, of a stop lever for controlling said mechanism, a locking device for engaging with said stop lever to lock it in normal position to permit the running of the machine, a tripping shaft having a connection with one of said feed-rollers, and a cam on said tripping shaft for disengaging said locking device from the stop lever all substantially as herein described for producing the stoppage of the machine in case of interruption of the supply of sliver to the gill-pins.

6. The combination with a spinning flier and driving mechanism therefor and a stop mechanism for stopping the operation of said driving mechanism, of a stop lever for controlling the operation of said stop mechanism, a locking device for locking said stop lever, and a centrifugal tappet fitted to the flier head for disengaging the said locking device from said stop lever on the interruption of the yarn or twine at the entrance to the flier, all substantially as herein set forth.

7. The combination with the spinning flier having a transversely slotted head and driving mechanism for said flier, of a centrifugal tappet passing freely through the slot in said

head the said tappet having in it an opening for the passage of the yarn or thread into the flier and having one end heavier than the other, an automatic stop mechanism for stopping the operation of said driving mechanism, and means for causing said tappet to control said stop mechanism, substantially as herein set forth.

8. The combination with a flier and a bobbin spindle and driving mechanism therefor, of the stop shaft U arranged parallel with the flier and bobbin, means connected with said shaft for stopping the operation of said driving mechanism, the stop lever U' on said stop shaft, the locking lever W for locking said stop lever, the tripping shaft V arranged parallel with said stop shaft, the tripping cam v^3 on said shaft V for disengaging said locking lever, and the arm v^4 on said shaft V to be operated upon by the yarn or twine on a bobbin carried by said spindle for producing the operation of said tripping cam, substantially as herein set forth.

9. The combination with a bobbin-driving spindle and a carriage therefor, a traverse screw for producing a traverse movement of said carriage, a shaft for driving said spindle, a brake pulley on said shaft, a connection between the said pulley and the bobbin carriage whereby the said pulley is caused to move along the said shaft, and a spring-actuated brake attached to said carriage and means for causing said brake to operate upon the said pulley at any point in the traverse movement of the carriage, substantially as herein set forth.

10. The combination with a bobbin-driving spindle and a carriage therefor, a traverse screw for producing a traverse movement of said carriage, a driving shaft for driving said spindle, a brake pulley on said shaft, a connection between the said pulley and the bobbin carriage whereby the said pulley is caused to move along the said shaft, a spring-actuated brake attached to and moving with said carriage and means for causing said brake to operate on said pulley, a rock-shaft arranged in fixed bearings parallel with said driving shaft, and a cam on said rock-shaft extending lengthwise thereof a distance equal to the length of the traverse movement of the carriage for keeping said brake out of operation throughout the whole of the said movement, all substantially as herein set forth.

11. The combination with the driving shaft E, the friction disk S provided with a sleeve S' having a screw-threaded end and fitted to said shaft to turn therewith but to move longitudinally thereon, the bobbin-driving pulley G fitted to turn on said sleeve, the coil spring t surrounding said sleeve and the nut t' fitted to the screw-threaded end of said sleeve for adjusting the pressure of said spring against the said pulley and so adjusting the friction between said disk and pulley, substantially as herein set forth.

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