E. R. SEIFERT.

BOBBIN WINDING MACHINE.

APPLICATION FILED APR. 18, 1917.

1,267,913.

Patented May 28, 1918.

5 SHEETS—SHEET 1.

Fig. 1.

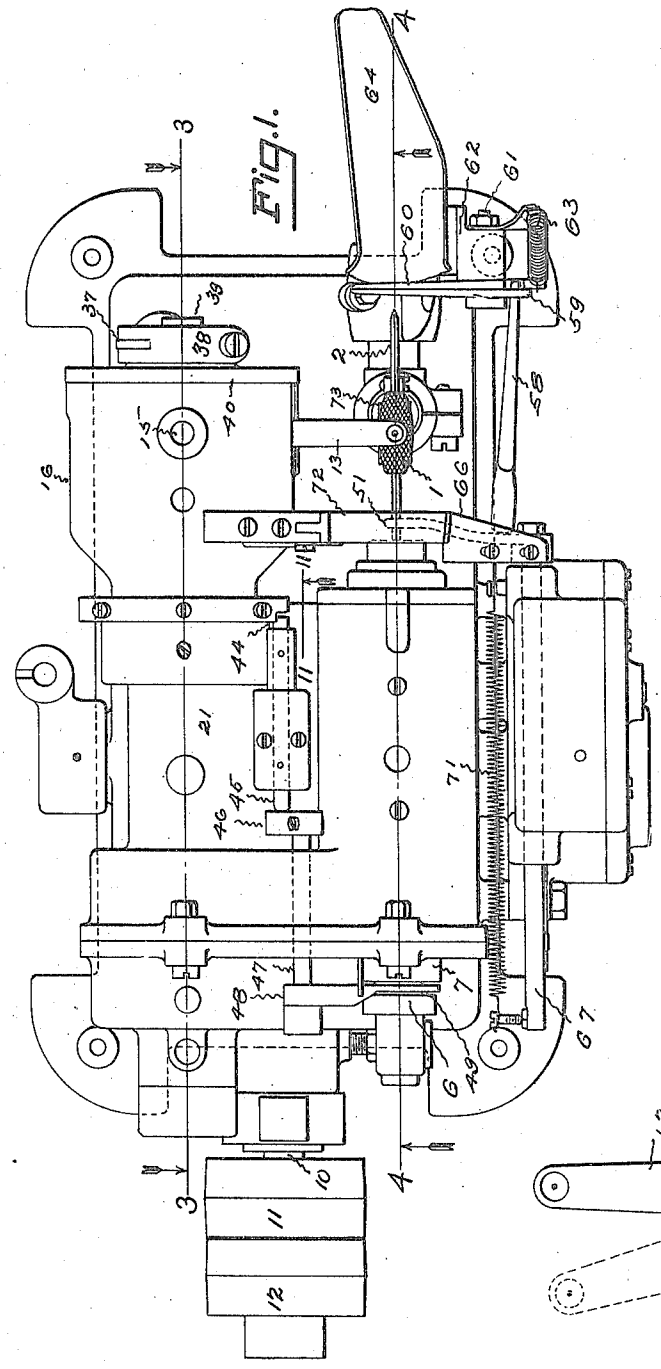


Fig. 11.

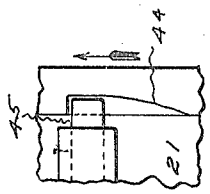
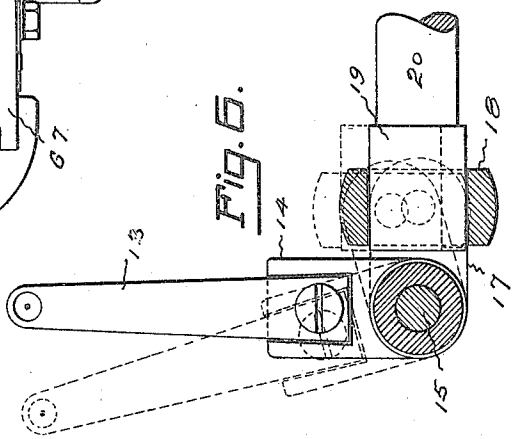


Fig. 6.



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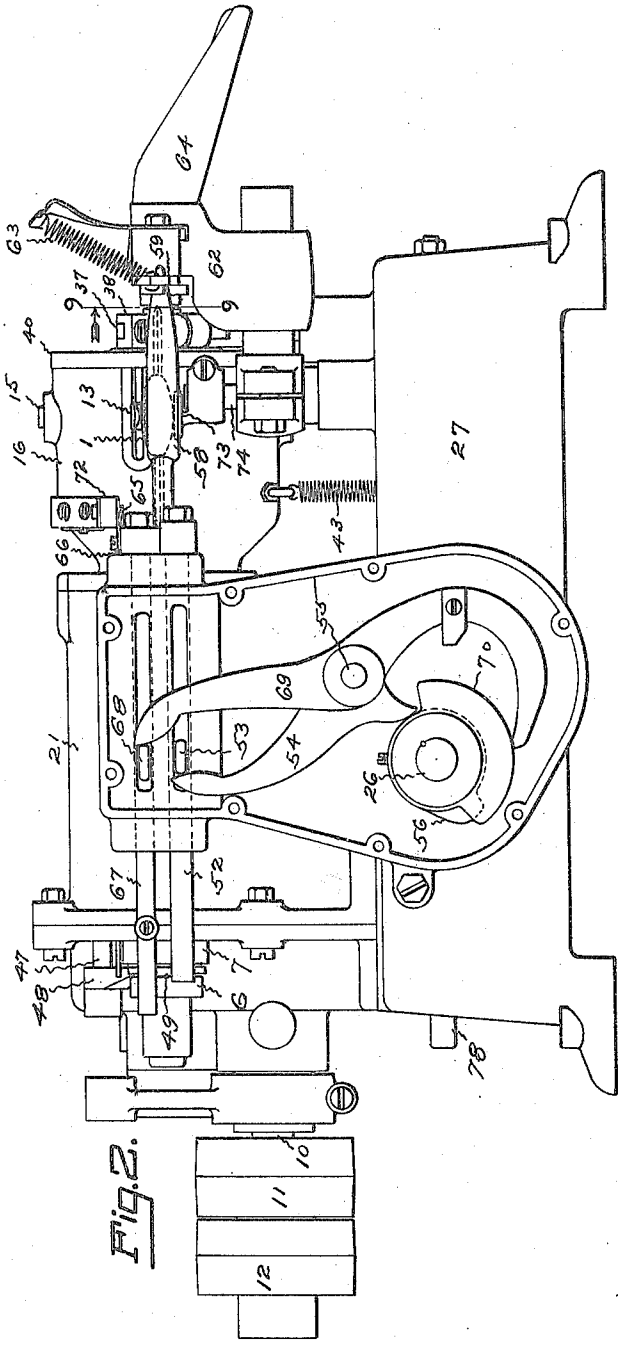


Fig. 2.

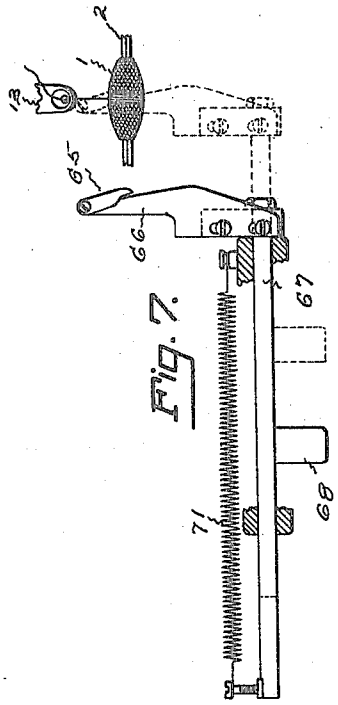


Fig. 7.

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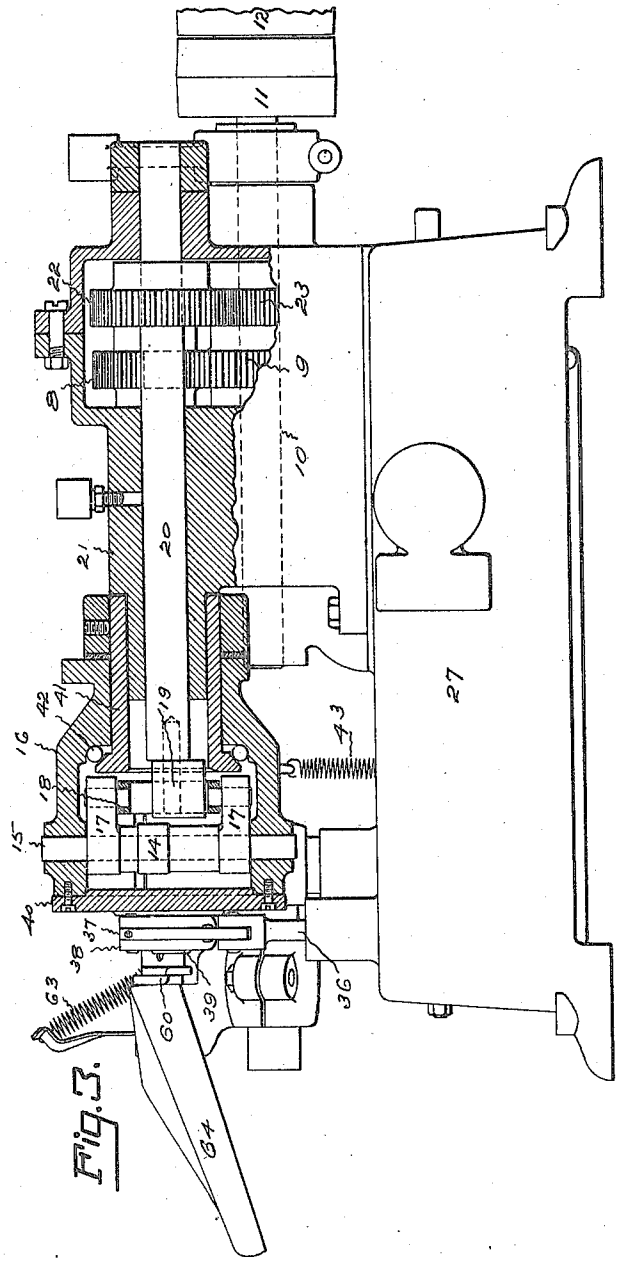


Fig. 7.

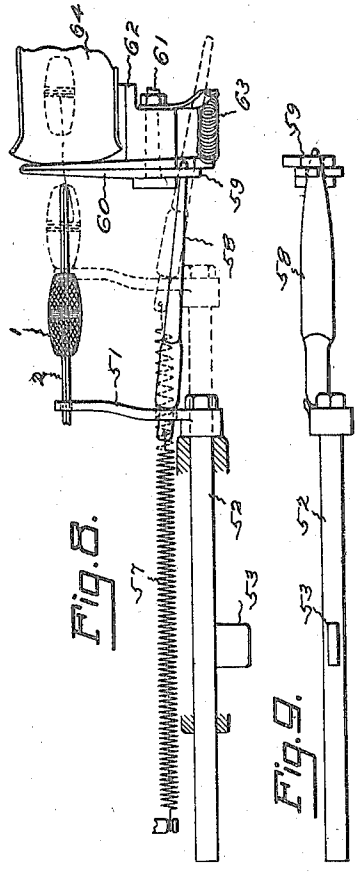


Fig. 8.

Fig. 9.

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Fig. 4.

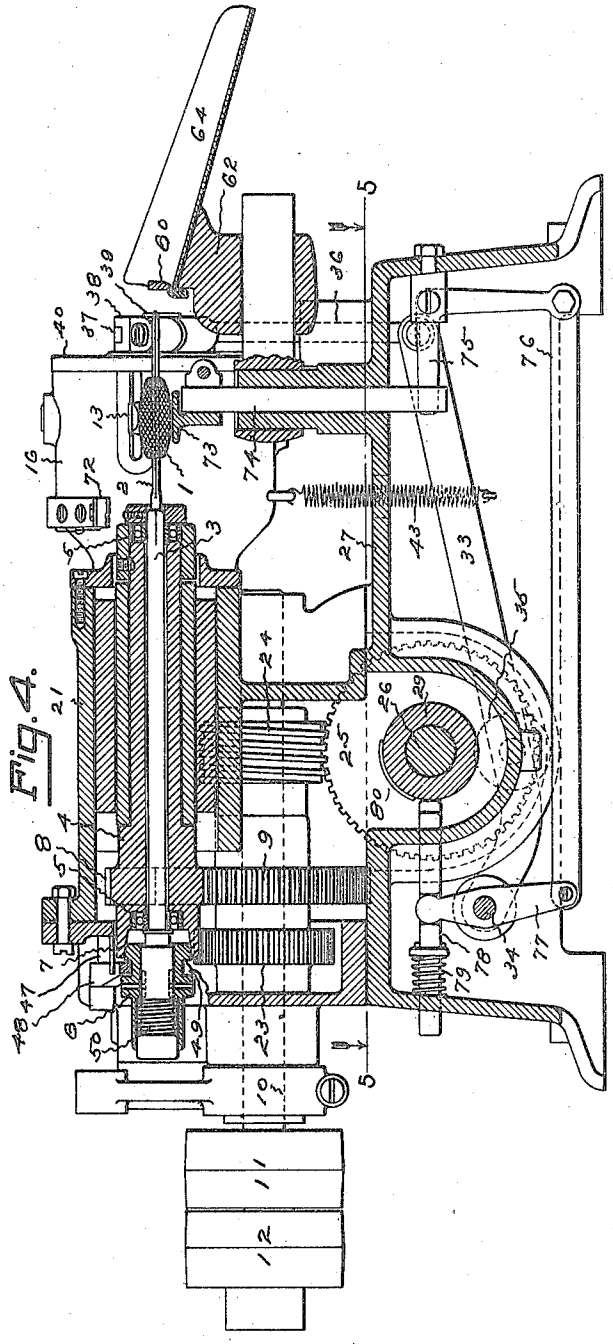


Fig. 13.

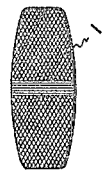
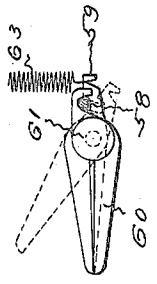


Fig. 10.



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Fig. 5.

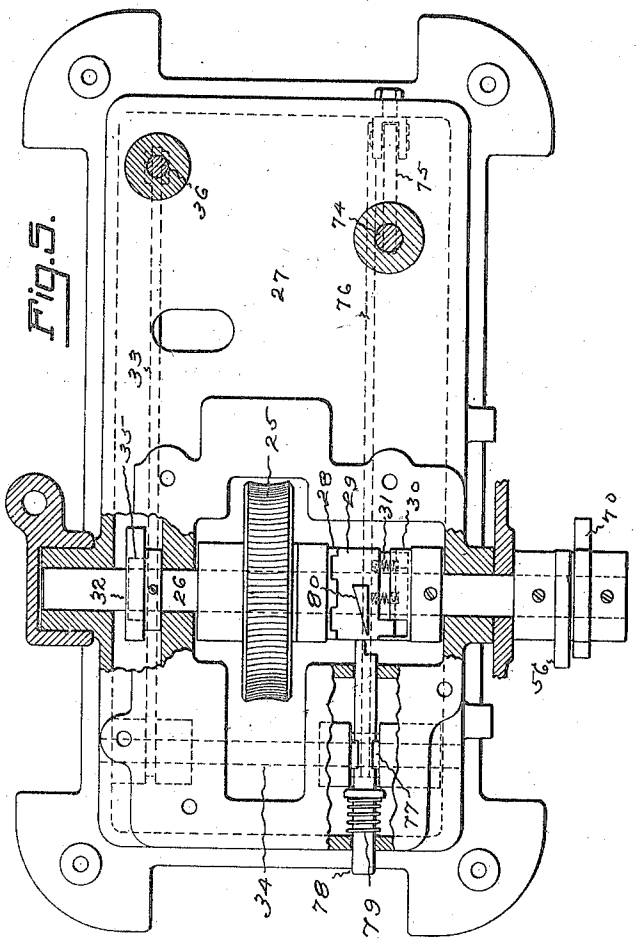
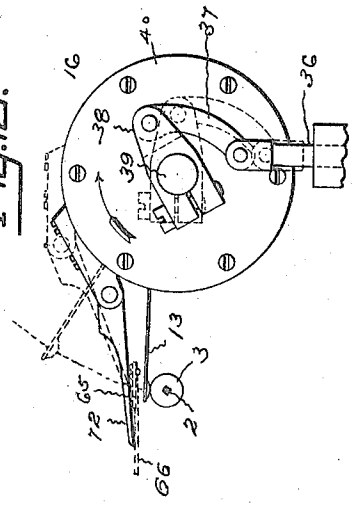


Fig. 12.



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UNITED STATES PATENT OFFICE.

ERICH R. SEIFERT, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE SEIFERT SPECIAL MACHINERY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

BOBBIN-WINDING MACHINE.

1,267,913. Specification of Letters Patent. Patented May 28, 1918.

Application filed April 18, 1917. Serial No. 162,822.

To all whom it may concern:

Be it known that I, ERICH R. SEIFERT, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Bobbin-Winding Machines, of which the following is a specification.

This invention relates to a machine for winding small bobbins of cotton, linen or silk thread.

The object of the invention is to provide a compact machine which will very rapidly wind bobbins one after the other in an efficient and desirable manner, and as fast as one bobbin is completed automatically push it out of the way, commence the winding of another bobbin, cut the thread between two bobbins and discharge the completed and separated bobbins from the machine.

The machine which is illustrated as embodying the invention has a needle which is rapidly rotated for winding the thread thereon and which is stopped while the completed bobbin is being discharged; it has an oscillatory finger for guiding the thread and giving it a traverse while being wound upon the needle; it has a finger for pushing the bobbin when completed along the needle and shears for cutting the thread between two completed bobbins; it has a hook which temporarily catches the thread and so guides it that the last few windings will have no traverse but will form a band about the middle of the completed bobbin, which hook also temporarily guides the thread in such manner that the following bobbin will be wound on the needle in the proper locality; it has a finger for disengaging the thread from the guiding hook: and there are means which when the bobbin is built up are actuated from the bobbin for causing the proper action of the guiding hook, the discharging finger, the shears, the disengaging finger and for stopping the rotation of the needle and then commencing the cycle again, all of these mechanisms coöperating to attain the automatic continuous production of tightly wound bobbins of thread.

Figure 1 of the accompanying drawings shows a plan view of the complete machine. Fig. 2 shows a front elevation of the same with one of the casing plates removed. Fig. 3 shows a rear elevation with parts cut in vertical section on the plane indicated by the dotted line 3—3 on Fig. 1 and looking in the direction indicated by the arrows. Fig. 4 shows a vertical section on the plane indicated by the dotted line 4—4 on Fig. 1 looking in the direction indicated by the arrows. Fig. 5 shows a plan of the bed, with portions broken away, looking down on the plane indicated by the dotted line 5—5 on Fig. 4. Fig. 6 shows on larger scale a plan of the oscillatory thread guiding finger. Fig. 7 shows a plan of the hook which temporarily engages the thread and causes the winding of the band and insures the starting of the winding of the bobbin at the proper location on the winding needle. Fig. 8 shows a plan of the discharging finger and its slide, and the shears and shear operating means. Fig. 9 shows a front view of the discharge slide and shear opening finger. Fig. 10 shows a face view of the shears. Fig. 11 is a detail view showing the cam on the thread guide head for causing a clutch to release the winding needle spindle from the rotatory shaft by which it is carried and driven when the clutch is engaged. Fig. 12 is a face view looking at the head which carries the oscillatory thread guide. Fig. 13 shows a full size bobbin that has been wound by one of these machines.

The bobbin 1 is wound onto the needle 2 which is angular in cross section and that projects from a rotatory spindle 3. The needle spindle passes through a rotatory tubular shaft 4, anti-friction bearings 5 being arranged at each end between the spindle and the shaft. Movably mounted upon and keyed to the needle spindle near the end opposite the needle is a male clutch member 6 and at the same end of the tubular shaft is a female clutch member 7, Fig. 4. A pinion 8 is fastened on the tubular shaft and meshing with this pinion is a gear 9 which is fastened on the driving shaft 10 that is provided with a fixed pulley 11 and loose pulley 12, Fig. 4. When the machine is in operation and these clutch members are engaged the needle spindle and needle are rotated at a high rate of speed from the driving shaft through the gear and pinion and tubular shaft. When the clutch members are disengaged the needle spindle and needle remain stationary.

The thread to be wound upon the needle is passed through an eye in the end of the oscillatory guiding finger 13 which extends

forward over the needle. This finger is fastened to a block 14 that is secured upon an arbor 15, Fig. 6, which is pivotally mounted in the casing of the rotatable head 16. This arbor has two rocker arms 17 that pivotally support a yoke 18, Fig. 3. Turning in the opening in this yoke is an eccentric 19 that is secured to the end of a shaft 20 which is journaled in the frame casing 21. Secured to this shaft near the end opposite from the eccentric is a gear 22 meshing with which is a gear 23 on the driving shaft, Fig. 3. When the machine is in operation these gears through the eccentric, yoke and rocker arms cause the thread guiding finger to rapidly oscillate.

On the drive shaft is a worm 24 engaging with which is a worm wheel 25 that is loosely mounted on the cam shaft 26 which is supported in bearings in the bed 27 of the machine, Fig. 4. One side of the hub of the worm wheel has a clutch member 28 and sliding on the shaft is a complementary clutch member 29 which is rotatably connected with a collar 30 that is fastened on the shaft, Fig. 5. Springs 31 are arranged between the collar and the sliding clutch member in such manner as to tend to cause the engagement of the clutch parts. When these clutch members are engaged the cam shaft is slowly rotated from the driving shaft and when the clutch members are disengaged the cam shaft remains stationary.

The cam shaft near the back of the machine carries a cam 32, Fig. 5. A lever 33 which is hung in the bed on an arbor 34 has a roll 35 that is held in engagement with this cam. The front end of this lever is joined to a vertically movable post 36, Fig. 4, and this post is connected by a link 37 with a crank arm 38 which is clamped upon a stud 39 projecting from the cap plate 40 on the end of the rotatable head 16, Fig. 12.

The head 16 is mounted to turn on a sleeve 41 which is secured to the frame casing 21, anti-friction bearings 42 being interposed between the head and the end of the sleeve, Fig. 3. A spring 43 connected between the bed and the head, Fig. 4, tends to turn the head over toward the front so that the thread guiding finger will normally travel back and forth just above the winding needle, and the effect of this, that is, the pull of the spring on the head, through the crank arm 38, link 37 and post 36 holds the lever 33 up with the roller 35 against the cam 32. When the cam shaft is clutched to the worm wheel and the machine is running the cam 32 is rotated so that at the proper time the head is by the connecting mechanism turned over toward the back. This turning of the head lifts the thread guiding finger a little distance above the winding needle and it also causes the wedge cam 44 on the head, Fig. 11, to engage the pin 45 and press it into engagement with a block 46 on one end of a slide 47, the other end of which carries a clutch shifting arm 48, Fig. 1. The clutch shifting arm extends into a groove 49 in the male clutch member 6 on the winding spindle. When the shifting arm is pushed back by the action of the cam 44 on the guide carrying head the male member 6 of the clutch is slid back against the thrust of the spring 50, Fig. 4, so as to disengage it from the female member 7 of the clutch and thus release the needle winding spindle from the tubular driving shaft, Fig. 4. When this occurs the winding needle stops rotating. When the cam 32 allows the head to be returned toward the front the cam 44 permits the spring 50 to close the clutch so that the needle will resume winding.

The ejector finger 51 is secured to a horizontally movable slide 52 and it has an opening in its end through which the winding needle passes, Fig. 8. This slide is mounted in the casing and has a projecting lug 53 that is held in engagement with the upper end of a lever 54 which is mounted on a stud 55 and that has its lower end engaged with the cam 56 on the cam shaft, Fig. 2. The ejector finger and slide are drawn back and the lever is held against the cam by the pull of the spring 57. At the proper time the cam 56 moves the ejector finger out so as to push a wound bobbin along the winding needle from winding position.

The wedge shaped shear opening finger 58 is carried by the ejector finger and when the ejector is moved out the shear opening finger is pushed between the shanks 59 of the shear blades 60, Fig. 9. The lower shear blade is fixed upon a stud 61 held in the bracket 62 mounted on the frame casing, while the upper shear blade is pivotally mounted on this stud. The shear blades are held normally closed by a spring 63, Fig. 10, and are opened by the passage between their shanks of the wedge shaped finger 58. The cam which actuates the ejector and shear slide is of such shape that the ejector and the shear opening finger are moved outward comparatively slow, but are allowed to be drawn back by the spring very rapidly so that the ejector will get out of the way and the shear blades will close quickly for severing the thread between two wound bobbins.

The chute 64 into which the bobbins are discharged from the winding needle, is fastened at its upper end to the bracket 62 to which the shear blades are pivoted, Fig. 4.

As the bobbin is about completed a few threads are wound about the middle and when the completed bobbin is pushed along the winding needle by the ejector finger the thread leading from the oscillatory thread guide to the bobbin is pulled toward the

point of the needle. To cause the thread to wind without traverse around the middle of the substantially completed bobbin and retain the thread so it will start the next bobbin at the right locality on the needle means are provided for temporarily engaging the thread between the oscillatory thread guide and the guiding bobbin and guiding it to the middle of the needle. For this purpose a hook 65 is adjustably secured to a finger 66 that is adjustably attached to a slide 67, Fig. 7. This slide is mounted in the casing and has a lug 68 which is engaged by the upper end of a lever 69 that is pivoted in the case on the stud 55, Fig. 2. The lower end of this lever is held engaged with the cam 70 on the cam shaft by the pull of the spring 71 which is connected between the slide and the casing. This cam is so formed that at the proper time the guiding hook is allowed to move out and catch the thread between the bobbin and the oscillatory thread guide and temporarily retain it so that the last few windings of the thread will not have a traverse, but will wind a band about the middle of the bobbin, Fig. 13, and the hook also retains the thread so that the next bobbin will be started right.

In order to release the thread from the hook after the winding of the bobbin has commenced a finger 72 is hinged to the outside of the casing of the head 16, Fig. 1, in such manner that when the head is turned over toward the back the tip of this finger will be drawn away from the hook. When the head is again turned forward the tip of the finger is slid over the hook and pushes the thread therefrom, Fig. 12.

Below the locality on the needle where the bobbin is wound is a button 73. This button is clamped to the upper end of a vertically movable slide 74. The lower end of this slide is engaged by one end of a rocker lever 75 which is pivoted in the bed. The other end of the rocker lever is connected by a link 76 with the lower end of a lever 77 that is pivoted on the arbor 34. The upper end of the lever 77 is engaged with a pin 78 which is pressed by a spring 79 toward the movable member 29 of the clutch on the cam shaft, Fig. 4.

On the movable clutch member is a wedge 80, Fig. 5. When this wedge engages the pin 78 the movable member is pushed forward and the members of the clutch are disengaged so that the cam shaft will remain stationary. As the bobbin being wound approaches full size it presses the button and slide downward and this through the connecting levers and link withdraws the pin allowing the clutch members to reëngage and then the cam shaft and the cams carried thereby will be rotated so as to perform their functions.

The cams are so timed that when the button is pushed down by the bobbin the hook catches and holds the thread so that the last few turns will be wound without traverse. Then the spindle is stopped, the completed bobbin is pushed by the ejector along the needle and the shears are opened. When the ejector returns the shears close and cut the thread between the bobbin just pushed by the ejector and a bobbin that was previously formed and which in the machine illustrated remains on the needle until the following bobbin is formed, allowing that previously formed bobbin to drop into the chute and pass from the machine. The needle then resumes winding and the thread is disengaged from the hook. The winding then continues until another bobbin is formed when the cycle of operations described is repeated.

The invention claimed is:

1. A machine for forming thread bobbins having a winding needle spindle, gears for rotating said spindle, a clutch for connecting the driving gears with the spindle, an oscillatory head, means for oscillating the head, means carried by the head for controlling the clutch between the driving gears and the spindle, a thread guiding finger pivotally mounted in the head, means in the head for vibrating the guiding finger, a bobbin ejecting finger, and mechanism for periodically advancing and retreating the ejecting finger.

2. A machine for forming thread bobbins having a winding needle spindle, gears for rotating said spindle, a clutch for connecting the driving gears with the spindle, an oscillatory head, means for oscillating the head, means carried by the head for controlling the clutch between the driving gears and spindle, a thread guiding finger pivotally mounted in the head, means in the head for vibrating the guiding finger, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

3. A machine for forming thread bobbins having a thread winding needle, mechanism for rotating and periodically halting the needle, an oscillatory head, a cam and levers for oscillating said head, a thread guiding finger pivotally mounted in the head, an eccentric in said head for vibrating the guiding finger, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

4. A machine for forming thread bobbins having a winding needle, mechanism

for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, a wedge carried by the ejecting finger for opening the shears, and a spring for closing the shears across the path of the discharged bobbins.

5. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

6. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for oscillating the guiding finger along the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

7. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to and for periodically swinging the guiding finger away from the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

8. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, means movable with the ejecting finger for periodically opening the shears, and means for closing the shears across the path of the discharged bobbins.

9. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a finger for disengaging the thread from the guiding hook, mechanism for periodically reciprocating the disengaging finger across the guiding hook, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

10. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for oscillating the guiding finger along the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a finger for disengaging the thread from the guiding hook, mechanism for periodically reciprocating the disengaging finger across the guiding hook, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

11. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to and for periodically swinging the guiding finger away from the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a finger for disengaging the thread from the guiding hook, mechanism for periodically reciprocating the disengaging finger across the guiding hook, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread

cutting shears, and mechanism for periodically opening and closing the shears across the path of the discharged bobbins.

12. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a finger for disengaging the thread from the guiding hook, mechanism for periodically reciprocating the disengaging finger across the guiding hook, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, means movable with the ejecting finger for periodically opening the shears, and means for closing the shears across the path of the discharged bobbins.

13. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, an oscillatory head, a cam and levers for oscillating said head, a thread guiding finger pivotally mounted in the head, an eccentric in said head for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for advancing and retreating said hook along the needle, a finger carried by said head for disengaging the thread from the hook, a bobbin ejecting finger, and mechanism for periodically advancing and retreating the ejecting finger along the needle.

14. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, an oscillatory head, a cam and levers for oscillating said head, a thread guiding finger pivotally mounted in the head, an eccentric in said head for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a finger carried by said head for disengaging the thread from said hook, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, mechanism for periodically opening and closing the shears across the path of the discharged bobbins, and mechanism actuated from the bobbin for setting the ejecting finger and cutting shears mechanisms into action.

15. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a guiding finger, mechanism for vibrating the guiding finger adjacent to and for periodically swinging the guiding finger away from the needle, an ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, cutting shears, mechanism for periodically opening and closing the shears across the path of the discharged bobbins, and mechanism actuated from the bobbin for causing the operation of the ejecting finger and shears, the swinging of the guiding finger and halting of the needle.

16. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, a thread guiding finger, mechanism for vibrating the guiding finger adjacent to the needle, a hook for temporarily engaging the thread between the guiding finger and the needle, mechanism for periodically advancing and retreating the guiding hook along the needle, a bobbin ejecting finger, mechanism for periodically advancing and retreating the ejecting finger along the needle, thread cutting shears, means movable with the ejecting finger for periodically opening the shears, means for closing the shears across the path of the discharged bobbins, and mechanism actuated from the bobbin for causing the operation of the guiding hook, ejecting finger and shears.

17. A machine for forming thread bobbins having a winding needle, mechanism for rotating and periodically halting the needle, an oscillatory head, a cam and levers for oscillating said head, a thread guiding finger pivotally mounted in the head, an eccentric in said head for vibrating the guiding finger, a bobbin ejecting finger, and mechanism for periodically advancing and retreating the ejecting finger along the needle.

18. A machine for forming thread bobbins having a driving shaft, gears on said driving shaft, a needle spindle, a tubular shaft containing said spindle, a pinion mounted on said shaft and meshing with a gear on the driving shaft, a clutch between the pinion on the tubular shaft and the needle spindle, an oscillatory head, a cam and levers actuated from the driving shaft for oscillating said head, a thread guiding finger pivotally mounted in the head, a shaft having an eccentric in the head for vibrating the guiding finger and having a pinion engaging a gear on the driving shaft, and mechanism actuated by the oscillation of the head for controlling the clutch between said tubular shaft and the needle spindle.

ERICH R. SEIFERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."