

992,669.

Diagram illustrating a horizontal beam with a vertical support on the left. A dashed line indicates a horizontal cut through the beam, labeled '35'.

Diagram 34 shows a perspective view of a truncated cone. A dashed line runs through the center of the cone, representing its axis of symmetry. The cone is wider on the left and tapers to the right.

This technical drawing illustrates a mechanical assembly, possibly a pump or engine component, with various parts labeled with numbers. The drawing includes a side view and a detailed view of a specific component.

The main assembly consists of a vertical frame (1) supporting a central shaft (2). A large circular component (18) is mounted on the shaft, featuring a series of radial vanes or blades. A spring (30) is connected to the shaft assembly. A horizontal rod (26) is connected to the shaft via a coupling (25). A vertical rod (27) is also connected to the shaft via a coupling (23). A detailed view of the coupling (23) is shown at the top left, with labels 28, 36, and 23. A vertical rod (34) is connected to the shaft via a coupling (32). A horizontal rod (33) is also connected to the shaft via a coupling (32). A vertical rod (31) is connected to the shaft via a coupling (29). A horizontal rod (31) is also connected to the shaft via a coupling (29). A vertical rod (31) is connected to the shaft via a coupling (29). A horizontal rod (31) is also connected to the shaft via a coupling (29).

This technical drawing illustrates a mechanical assembly, possibly a pump or engine component, with various parts labeled with numbers 1 through 34. The drawing includes a side view and a cross-sectional view of a cylinder.

The main components and their labels are:

- 1:** A horizontal shaft or rod extending from the right side.
- 2:** A vertical shaft or rod passing through the center of the assembly.
- 3:** A component at the top right, possibly a valve or connector.
- 4:** A component at the bottom left, possibly a spring or support.
- 5:** A vertical rod or shaft on the right side.
- 6:** A component at the top right, possibly a valve or connector.
- 7:** A component at the top right, possibly a valve or connector.
- 8:** A gear or flywheel at the bottom right.
- 9:** A spring or coiled wire at the bottom.
- 10:** A gear or flywheel at the bottom right, connected to the main shaft.
- 11:** A component at the bottom right, possibly a valve or connector.
- 12:** A component at the bottom right, possibly a valve or connector.
- 13:** A component at the bottom right, possibly a valve or connector.
- 14:** A component at the bottom right, possibly a valve or connector.
- 15:** A component at the top left, possibly a valve or connector.
- 16:** A component at the top left, possibly a valve or connector.
- 17:** A component at the top left, possibly a valve or connector.
- 18:** A component at the top left, possibly a valve or connector.
- 19:** A component at the top left, possibly a valve or connector.
- 20:** A component at the top left, possibly a valve or connector.
- 21:** A component at the top left, possibly a valve or connector.
- 22:** A component at the top left, possibly a valve or connector.
- 23:** A component at the top left, possibly a valve or connector.
- 24:** A component at the top left, possibly a valve or connector.
- 25:** A component at the top left, possibly a valve or connector.
- 26:** A component at the top left, possibly a valve or connector.
- 27:** A component at the top left, possibly a valve or connector.
- 28:** A component at the top left, possibly a valve or connector.
- 29:** A component at the top left, possibly a valve or connector.
- 30:** A component at the top left, possibly a valve or connector.
- 31:** A component at the top left, possibly a valve or connector.
- 32:** A component at the top left, possibly a valve or connector.
- 33:** A component at the top left, possibly a valve or connector.
- 34:** A component at the top left, possibly a valve or connector.

The drawing shows a complex arrangement of mechanical parts, including a central vertical shaft, a horizontal shaft, a gear, and various valves and connectors. The cross-sectional view of the cylinder shows internal components and the path of the shafts.

WITNESSES:
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UNITED STATES PATENT OFFICE.

SOLOMON KENDRICK, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-FOURTH TO A. VOGT AND ONE-FOURTH TO A. E. VOGT, BOTH OF ROCHESTER, NEW YORK.

WINDING-MACHINE.

992,669.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed March 28, 1910. Serial No. 552,042.

To all whom it may concern:

Be it known that I, SOLOMON KENDRICK, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Winding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvement in winding machines, and the object of my invention is to produce a simple machine by which a cone-shaped bobbin may be automatically wound from a straight base.

With this object in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings—Figure 1 represents a side view of an empty bobbin. Fig. 2 is a side view of the bobbin when full. Fig. 3 is a side view of a part of my winding machine, and Fig. 4 is an end view of the same.

1 represents the driving shaft, which is journaled in suitable bearings in the frame 2 and projections thereof. This shaft is provided with a beveled gear wheel 3, which meshes with a similar gear wheel 4 on the shaft 5. The shaft 5 is also provided with a beveled gear wheel 6, meshing with a similar gear wheel 7 on a cam shaft 20, mounted in bearings such as 19 on the frame 2.

31 represents a subsidiary frame or brace, cross braces being also provided wherever necessary.

33 represents the hank or skein of yarn or thread, mounted on a revoluble holder of the usual construction, and 35 represents the bobbin covered with yarn or thread 34. The yarn or thread passes from the skein 33 over a movable guide 36, shifted by means hereinafter described. The bobbin is mounted on a spindle bearing 28, on which the bobbin 35, which has a hollow shank, is adapted to be slipped, and this spindle bearing is driven by a friction wheel 27, mounted on the shaft 26, said shaft being provided with a beveled gear wheel 25, which meshes with a gear wheel 24 on the driving shaft 1. The shaft 26 is mounted in suitable bear-

ings carried on the main or subsidiary frames.

The guide 36 is adapted to be moved back and forth by the reciprocating rod 22, supported on rollers such as 23. To the end of the rod 22 is fastened a right-angled arm 21, provided with a slot, and in this slot is mounted a pin 16, which projects from the upper end of the guide arm 15. The lower end of this guide arm is pivotally mounted on a sliding shaft 12, but is kept in its proper position on said shaft by pins or other suitable securing devices. The guide arm 15 is provided with a roller 17, which engages with the cam 18 on the shaft 20.

The lower end of the shaft 5 is provided with a worm 8, which meshes with a worm wheel 9, and on the same shaft with this worm wheel is a cam 10, which engages a roller 11, mounted near one end of the sliding shaft 12. The guide arm 15 is provided with a brace 14, having an extension below the shaft 12, and a spring 29, connected to the arm or brace 14 and to the main frame, normally tends to pull said guide arm 15 toward the highest part of the cam 18, as shown in Fig. 2. A spring 30, attached to said guide arm and to the brace 31, keeps the roller 17 in contact with the cam 18. As shown in Fig. 4, the pin 16 is long enough to always engage the slot in the arm 21, no matter how the guide arm 15 is shifted by the motion of the cam 10. The cam 18 is made by taking two heart-shaped cams, one larger than the other, and filling in the space between them so as to form a single cam with a differential surface. The cam 18 is tapered on the pointed side from the point of the small cam to the point of the large cam, as shown in Figs. 3 and 4. The lateral elements of the reëntrant surface of the cam 18 are parallel to the shaft 20, on which said cam is mounted.

The operation is as follows:—The parts being in the position shown in Fig. 4 and the bobbin 35 being substantially empty, the end of the thread or yarn is wound around the spool 35 at or near its head, and the machine is started. As the cam 18 makes one turn, the parts being in the position shown in Fig. 4, the guide 36 at first travels only about half way of the spool. As the guide arm 15 is gradually moved by the cam 10, the travel of the guide 36 becomes longer

and longer until finally it runs from the base to the point of the bobbin, being reversed at the proper time by the cam 18. Owing to the construction of this cam, the guide is
 5 always stopped at the same place at the head of the spool or bobbin. This operation causes the bobbin to be filled, cone-shaped, with yarn or thread, the throw of the guide 36 being successively longer and longer.

10 I claim—

1. In a winding machine, the combination of a bobbin support, means for revolving the same, a thread guide movable parallel to the axis of the bobbin support, a heart-shaped cam having a differential surface, an
 15 upright traversing bar engaging said cam and flexibly connected to said thread guide, devices for moving said traversing bar across the face of said cam, including a second heart-shaped cam operating said traversing bar, and connections whereby said heart-shaped cams are operated by said means, substantially as described.

2. In a winding machine, the combination
 25 of a bobbin support, means for revolving the same, a movably mounted thread guide, a heart-shaped cam provided with a differential surface, an upright traversing bar provided with a roller engaging said cam, said bar being flexibly connected to said
 30 thread guide, a sliding support on which said traversing bar is mounted, a spring for holding the roller on said traversing bar against said cam, said support being provided with a roller, a heart-shaped cam engaging said last named roller, and connections whereby both of said cams are operated by said means, substantially as described.

3. In a winding machine, the combination
 40 of a bobbin support, means for revolving the same, a thread guide movable parallel to the axis of the bobbin support, a bent sup-

port for said guide provided with a slot, a heart-shaped cam having a differential surface, an upright traversing bar provided
 45 with a pin engaging the slot in the thread guide support and with a roller engaging said cam, a spring forcing the roller on said traversing bar against said cam, a slidably mounted support for said traversing bar, 50 provided with a roller, a heart-shaped cam engaging said last named roller, a spring forcing said last named roller against said last named cam, and connections whereby said cams are operated by said means, substantially as described. 55

4. In a winding machine, the combination of a supporting frame, a bobbin support mounted in said frame, means for revolving said bobbin support, a thread guide movable
 60 parallel to the axis of the bobbin support, a guide roller on said frame, a bent support for said thread guide, engaging said roller and provided with a slot at one end, a heart-shaped cam having a differential surface, an
 65 upright traversing bar provided with a pin engaging the slot in the thread guide support and with a roller engaging said cam, a spring connected to said frame and to said traversing bar, a support for said traversing
 70 bar, mounted on said frame and provided with a roller, a heart-shaped cam with which said last named roller engages, a spring connected to said last named support and to said frame, and connections whereby both of
 75 said cams are operated by said means, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

SOLOMON KENDRICK.

Witnesses:

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