(No Model.)

4 Sheets—Sheet 1.

W. D. HUSE.

YARN WINDING MACHINE.

No. 348,561. Patented Sept. 7, 1886.

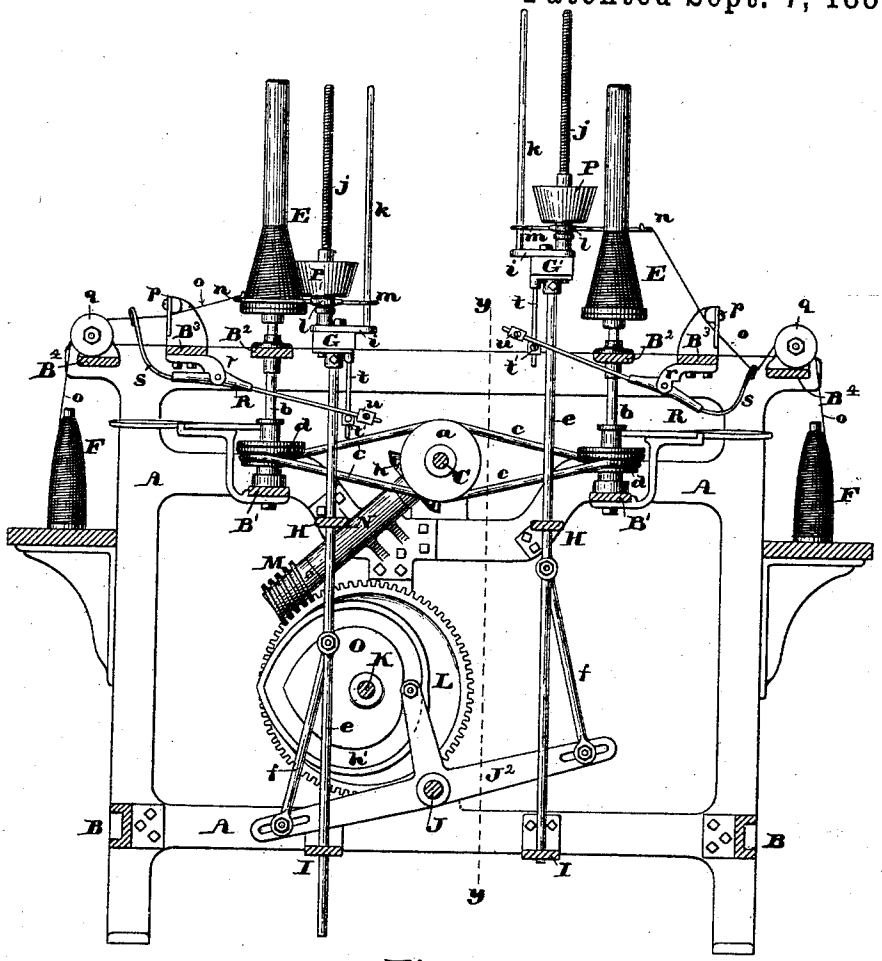

Fig. 1.

Witnesses:
Walter G. Lombard.
Alex G. Donnelly

Inventor:
Warren D. Huse,
by N. G. Lombard
Attorney.

(No Model.)

4 Sheets—Sheet 2.

W. D. HUSE.

YARN WINDING MACHINE.

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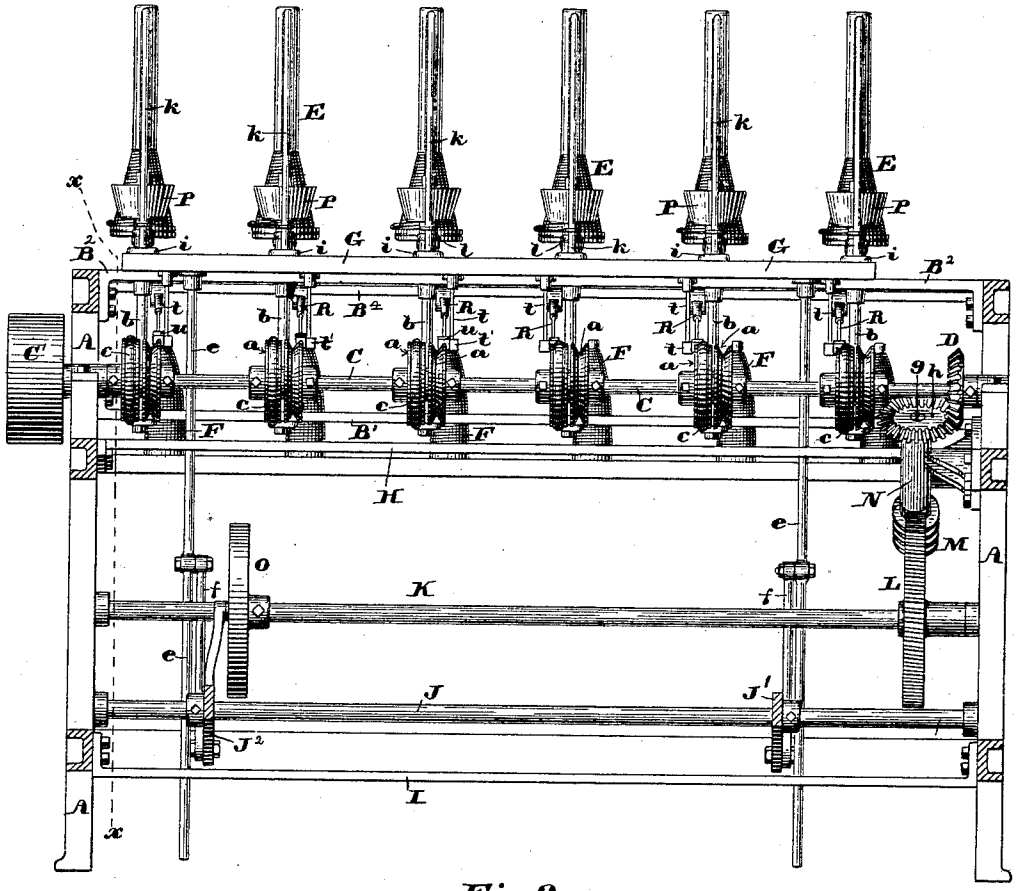

Fig. 2.

Witnesses:
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(No Model.)

4 Sheets—Sheet 3.

W. D. HUSE.

YARN WINDING MACHINE.

No. 348,561. Patented Sept. 7, 1886.

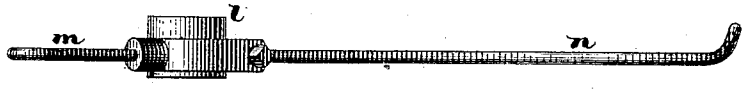

Fig. 4.

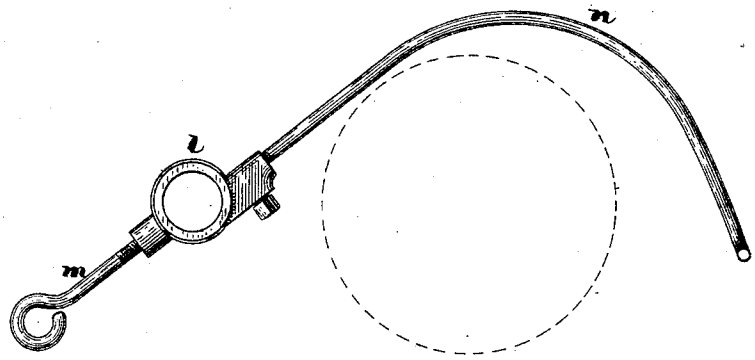

Fig. 3.

Witnesses:
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(No Model.) 4 Sheets—Sheet 4.

W. D. HUSE.

YARN WINDING MACHINE.

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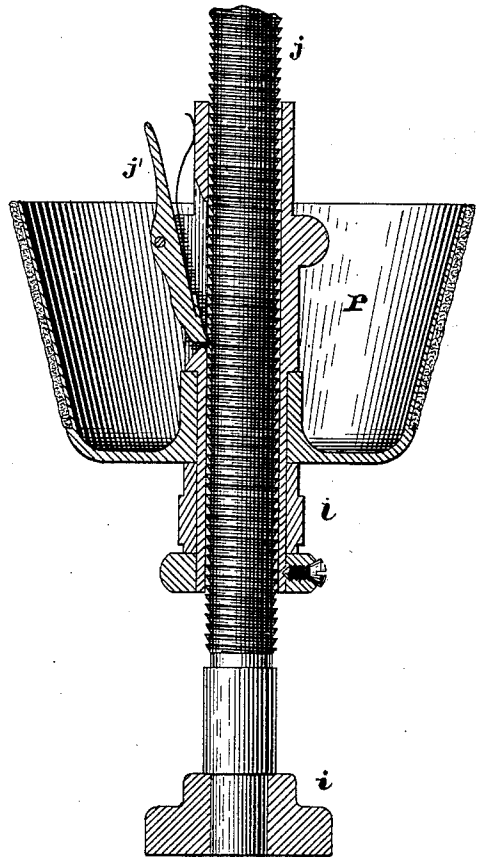

Fig. 5.

Witnesses:
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Charles K. Stearns.

Inventor:
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by N. C. Lombard
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UNITED STATES PATENT OFFICE.

WARREN D. HUSE, OF LACONIA, NEW HAMPSHIRE.

YARN-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,561, dated September 7, 1886.

Application filed May 8, 1886. Serial No. 201,520. (No model.)

To all whom it may concern:

Be it known that I, WARREN D. HUSE, of Laconia, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in Yarn-Winding Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to machines for winding yarn from a spool or bobbin upon another bobbin, and especially to the devices employed to guide and control the yarn; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claim to be hereinafter given.

Figure 1 of the drawings is a transverse section of a machine embodying my invention, the cutting-plane being on line *x x* on Fig. 2, and showing many of the parts in elevation. Fig. 2 is a longitudinal section on line *y y* on Fig. 1, and showing the parts at the left of said line in elevation. Figs. 3 and 4 are respectively a plan and elevation of the yarn-guide for directing the yarn upon the bobbin drawn to an enlarged scale; and Fig. 5 is a vertical section through the yarn-guide-regulating cone and the spring-actuated lever, by which said cone is supported upon the threaded standard, and which serves instead of a nut to move said cone and the yarn-guide carried thereby up and down on said standard as said cone is revolved thereon.

A A are the end frames of the machine, connected together by the tie-girts B, B′, B^2, B^3, and B^4.

C is the driving-shaft, mounted in bearings in the frames A A, and having mounted thereon the driving-pulley C′, the bevel gear-wheel D, and the series of grooved pulleys *a a*, from which motion is transmitted to the vertical spindles *b b*, mounted in bearings in the girts B′ and B^2 by means of the belts *c c* and the pulleys *d*, as shown.

E E are the bobbins upon which the yarn is to be wound, and F F the filled bobbins from which the yarn is taken.

G G′ are two bars extending nearly the whole length of the machine between the frames A A, and each supported upon the vertical rods *e e*, which rods are fitted to bearings in the girts H and I, so as to be movable vertically therein, as and for the purposes to be hereinafter described.

J is a rocker-shaft mounted in bearings in the end frames, A A, and having mounted thereon the two-armed lever J′ and the three-armed lever J^2, the ends of the horizontal arms of which are connected by the links *f f* to the rods *e e*, as shown.

K is a shaft mounted in bearings in the frames A A, and having mounted thereon the worm-wheel L, with which the worm M engages to impart a rotary motion to the shaft K. The worm M is firmly secured upon the lower end of the shaft *g*, mounted in an oblique position in the stand N, the upper end of said shaft *g* having firmly secured thereon the bevel gear-wheel *h*, which engages with and is revolved by the bevel gear-wheel D, all as shown in the drawings.

O is a heart-cam firmly secured upon the shaft K, and provided with a path, *h′*, which engages with a truck or pin mounted in the free end of the upright arm of the lever J^2, to impart to the levers J′ and J^2 and the shaft J an oscillating motion about the axis of said shaft, thereby causing the bars G and G′ to be alternately moved upward and downward with a uniform speed suited to wind the yarns evenly and closely upon the conical bases of the bobbins E E.

Upon each of the bars G G′ are secured a series of plates, *i i*, in each of which is secured at one end the threaded standard *j*, and at the other end the smooth rod *k*.

Upon the threaded standard *j* is loosely fitted the cup P, made in the form of an inverted frustum of a cone having a taper corresponding to the reverse taper of the conical base of the bobbin E, as shown. The upper portion of the hub of the cup P has cut through its side a slot, in which is pivoted a spring-pressed lever, *j′*, the lower end of which engages with the thread on the standard *j*, to serve as a nut, so that as the inclined periphery of said cup comes in contact with the cone of yarn on the bobbin E with sufficient force to move said cup about the axis of the standard *j* it will be moved upward on said standard slightly, in a well-known manner. The lower end of the hub of said cup is encompassed by the collar *l* in such a manner that while the cup may revolve

freely without revolving said collar the cup and collar must be moved vertically together.

In one side of the collar *l* is set the wire *m*, in the outer end of which is formed an eye to receive the rod *k*, which serves to prevent the collar *l* revolving with the cup P, and in the opposite side of said collar is set the curved wire yarn-guide *n*, which extends partially around the bobbin E to a position in front thereof, where it can receive the yarn *o* as it passes from the stripper *p* to the bobbin E, after having been drawn from the bobbin F and passed over the pulley *q*.

The cup P, threaded standard *j*, guide-rod *k*, the yarn-guiding wire *n*, the stripper *p*, and yarn-guiding pulley *q* are old and well-known devices, and therefore need not be further described here.

A series of take-up levers, R, one for each winding-spindle, are pivoted to stands *r r*, secured to the under sides of the girts B^3 B^3, and have formed upon their outer ends hooks *s*, to engage with the yarns between the pulleys *q* and the strippers *p* to take up the slack of said yarns as the yarn-guides *n* are moved upward to guide the yarns upon the upper or smaller parts of the cones, the rear or inner ends of said take-up levers extending past the pendent rods *t*, secured to and movable vertically with the bars G and G′, and in such near proximity to said pendent rods as to be engaged by the collars *t′*, secured to the lower end of said rods, for the purpose of raising the inner ends of said levers, and thus cause their front or hooked ends to engage with and draw the yarns *o* downward as the bars G and G′ move upward, said levers being moved in the opposite direction when said bars are moved downward by the force of gravity acting upon the weights *u*, secured to their inner ends, as shown in Fig. 1.

The machine shown in the drawings is a double machine having two fronts and two sets of winding-spindles, and two sets of yarn-guiding and take-up devices, one pulley-shaft for driving both sets of winding-spindles, and a single cam for operating all of the yarn-guiding and take-up devices without the aid of a counterbalance-weight.

It will be observed that the bar G carries all of the yarn-guides and the rods for operating the take-up levers for one set of winding-spindles, and the bar G′ all of the corresponding devices for the other set of winding-spindles, and that when the bar G is being moved upward the bar G′ is being moved downward, and vice versa, both being operated by the action of the single cam O upon the lever J.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

In combination with the revolving bobbin-carrying spindle *b*, the yarn-guide *n*, the pulley *q*, and the stripper *p*, the vertically-movable bar G, the pendent rod *t*, secured to said bar, mechanism, as set forth, for moving said bar and rod vertically, the collar *t′*, secured upon said rod *t*, the pivoted take-up lever R, and mechanism, as set forth, for adjusting the yarn-guide *n* upward as the yarn is built up upon the bobbin, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 6th day of May, A. D. 1886.

WARREN D. HUSE.

Witnesses:
N. C. LOMBARD,
WALTER E. LOMBARD.