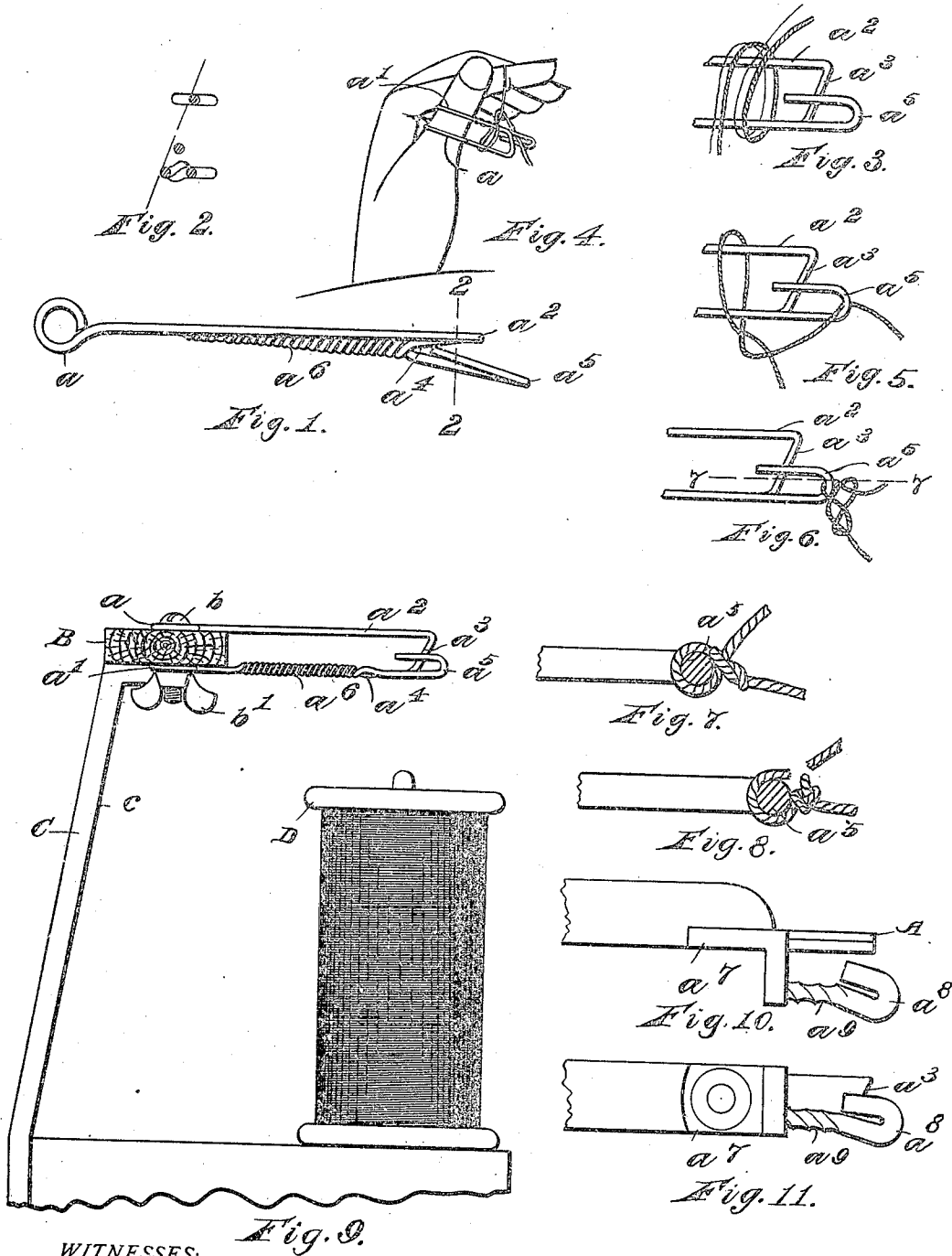


C. R. JUDGE.
KNOT TIER.
APPLICATION FILED NOV. 9, 1908.

952,528.

Patented Mar. 22, 1910.



WITNESSES:

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CHARLES R. JUDGE, OF CHELMSFORD, MASSACHUSETTS.

KNOT-TIER.

952,528.

Specification of Letters Patent. Patented Mar. 22, 1910.

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To all whom it may concern:

Be it known that I, CHARLES R. JUDGE, a citizen of the United States, residing at Chelmsford, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Knot-Tiers, of which the following is a specification.

This invention relates to knot-tying devices.

The object of this invention is to provide a simple, inexpensive and efficient device for tying together broken "ends" of yarns in spooling, twisting and other machines and to leave the free ends of the yarns beyond the knot of uniform length. The knot-tier hereinafter described is without joints or movable parts and without cutting edges or other portions liable to require repairs and is preferably made of a single piece of wire bent to form the looper or part around which the yarn is looped and the hook or part which retains the free end portions of the yarns while the loop is drawn over them. Said looper may however, be made of cast metal and have the hook attached thereto in any convenient manner.

The knot-tier will usually be permanently secured to the spooler or twister, but I have also shown it provided with means for attaching it to the hand of the operator, so that it may be moved from one broken thread to another as may be required in some cases, as in jack-spooling or warping cotton, woolen or worsted. When permanently attached to a spooler or twister it will be convenient to have one knot-tier at every interval between spools or bobbins.

In the accompanying drawing, Figure 1 is a plan of the best form of my invention; Fig. 2, a vertical transverse section of the same on the line 2 2 in Fig. 1; Fig. 3, a left side elevation of the front end, showing the operative parts of the knot-tier, with the first position of the two yarns or ends to be united; Fig. 4, an elevation of the knot-tier inverted, showing the second position of the yarns, also means of attaching the same to the left hand of the operator; Fig. 5, an elevation of the parts shown in Fig. 3, the yarn being in the second position; Fig. 6, like Figs. 3 and 5, but showing the yarn in the

third position with the bends of the knot completed but not drawn tight; Fig. 7, a horizontal section of the hook on the line 7 7 in Fig. 6 with completed knot drawn close; Fig. 8 like Fig. 7, except that the waste end of the yarn is severed; Fig. 9, an end elevation of the front side of the locker or waste-box, spindle-rail and the attaching rail, a side elevation of one of my knot-tiers attached to said rail, a spindle and a spool; Figs. 10 and 11, a plan and left side elevation, respectively of a modification of my invention.

In the cheapest and best form (Figs. 1-9) of my invention, one end of a single wire is provided with an eye a and an intermediate portion of said wire is provided with another eye a^1 and these eyes may be fastened to an attaching rail B secured to the top of the front c of the waste-box or locker C, as commonly used in a spooler, or to any other convenient stationary part of a machine, in connection with which the device is to be used. I have shown these eyes arranged above and below said rail B and secured thereto by a bolt b and nut b^1 . From the eye a at the top of the rail B the wire projects horizontally forward at a^2 and at a^3 runs downward and backward, to form an incline, then at a^4 backward to the eye a^1 and then forward and slightly in advance of the incline a^3 , where it is provided with a hook a^5 , the point of which extends back of said incline.

In making the tier of wire it will be more convenient first to double the wire and to form the lower eye a^1 at about two-fifths of the length of the wire from one end thereof, then to twist the doubled wires together at a^6 nearly to the end of the shorter portion leaving enough of the shorter portion to form the hook a^5 which is inclined outward from the body of the device, preferably to the left as one faces the device, as shown in Fig. 1, and the other portion of the wire is then bent to form the incline a^3 and the upper horizontal portion of the tier, the extreme end of the said last-named portion being formed into the eye a . The looper (meaning the parts a^2 a^3 a^4) and the hook a^5 should extend forward beyond the line of the spindles in a spooler and should be from two and a half to three inches above

the plane of the tops of the spools to allow sufficient space between the tiers and the spool for the hands of the operatives. The incline a^3 directs yarns pressed against it down upon the hook a^5 and into the space between said hook and the looper.

In tying up a pair of ends, one end from a spool D and the other from a bobbin (not shown) are carried together up to the left of the looper and hook by the right hand and wound once around the looper, the parts of the yarns between the tier and the left hand from the spool and bobbin are then thrown over the tier to the right, so that the different parts of the yarn above mentioned will occupy the positions shown in Figs. 4 and 5 (the tier in Fig. 4 being inverted from the position shown in Fig. 3) and the free end-
portions of the yarn are then passed through the hook a^5 , as shown in said Figs. 4 and 5, and the yarn is drawn forward and makes a "figure-8" knot, shown in process of formation in Figs. 6 and 7 and completed in Fig. 8 where the free end-
portions of the yarns are separated or broken off, the yarn at both sides of the knot being drawn forward by the left hand with sufficient force, so that the yarns being held by the friction of its loops at one side of the wire and by friction of the wire as shown at the right hand portion of Fig. 7, placing the index finger of the right hand as close as possible to the knot Fig. 7, then with sufficient force, the ends will break at a point where the greatest strain comes, leaving the knot on the yarns connected to the spool and bobbin and leaving the free ends of the yarns projecting from the knots a distance substantially equal to the circumference of the wire at a^5 as shown in Fig. 8.

In the tier shown in Figs. 10 and 11 the looper is represented as a plate A of suitable material, as cast metal, formed in one piece with a supporting bracket a^7 which carries a hook a^5 the looper and hook serving the same purpose as the hook and looper shown in the preceding figures and above described. The bracket is fastened to any suitable support as by a screw passing a hole in said bracket.

The tier shown in Fig. 3 is provided with rings or eyes large enough to receive the thumb of the left hand. Of course for a left-handed person the hook might be arranged on the opposite side of the looper and the tier might be worn on the right hand. It is however, immaterial, except as a matter of convenience on which side of the looper the hook is placed, if the yarns are placed properly about the looper and in the hook.

The twisting of the wires at a^6 and the twisting of the shank of the hook a^5 in Figs. 10 and 11, represented at a^9 retain the yarn

on said shank and prevent the premature accidental displacement of said yarn.

I claim as my invention:—

1. A knot-tying device having a looper, around which a yarn or thread may be wound, and a hook, rigidly secured to said looper and lying wholly outside of the plane of said looper, the point of said hook being inclined toward said plane, to prevent said hook from catching in a loop being drawn from said looper and to facilitate the engagement of said hook with the free end portions of said yarn.

2. A knot-tying device having a looper, around which a yarn or thread may be wound, a hook, rigidly secured to said looper and lying wholly outside of the plane of said looper, the point of said hook being inclined toward said plane, to prevent said hook from catching in a loop being drawn from said looper and to facilitate the engagement of said hook with the free end portion of said yarn, and said looper being provided with one or more eyes which serve as attaching means for said tying device.

3. A knot-tying device having a looper provided with substantially parallel edges of unequal length, an inclined front end connecting the edges of said looper, a hook secured to the shorter edge of said looper, the closed end of said hook extending forward beyond said incline and the point of said hook extending back of said incline and arranged between the shank of said hook and the non-adjacent edge of said looper.

4. A knot-tying device having a looper provided with substantially parallel edges of unequal length, an inclined front end and a hook secured to the shorter edge of said looper, the closed end of said hook extending forward beyond said incline and the point of said hook extending back of said incline and arranged between the shank of said hook and the non-adjacent edge of said looper and the shank of said hook being notched to retain yarn thereon.

5. A knot-tier formed of wire, having a looper comprising substantially parallel portions of unequal length connected at their front ends by an incline, having also a hook, the shank of which is twisted to the shorter of said parallel portions, said hook extending forward beyond said incline and the point of said hook extending backward beyond said incline.

6. A knot-tier formed of a single piece of wire having substantially parallel portions, an incline connecting said portions and a hook having its closed end arranged to extend beyond said incline and said parallel portions and having its point arranged in the rear of said incline.

7. A knot-tier formed of a single wire, one

end of which is provided with an attaching
eye and an intermediate portion of said wire
is provided with another attaching eye, the
part of said wire between said eyes being
5 provided with an incline and the free end of
said wire being provided with a hook which
projects in front of said incline, the point of
said hook extending back of said incline and

said hook being inclined laterally outward
from the body of said tier. 10

In witness whereof, I have affixed my
signature in presence of two witnesses.

CHARLES R. JUDGE.

Witnesses:

ALBERT M. MOORE,
LUDGER A. NICOL.