A. CRAWFORD.

TENSION DEVICE.

APPLICATION FILED SEPT. 6, 1911.

1,021,919. Patented Apr. 2, 1912.

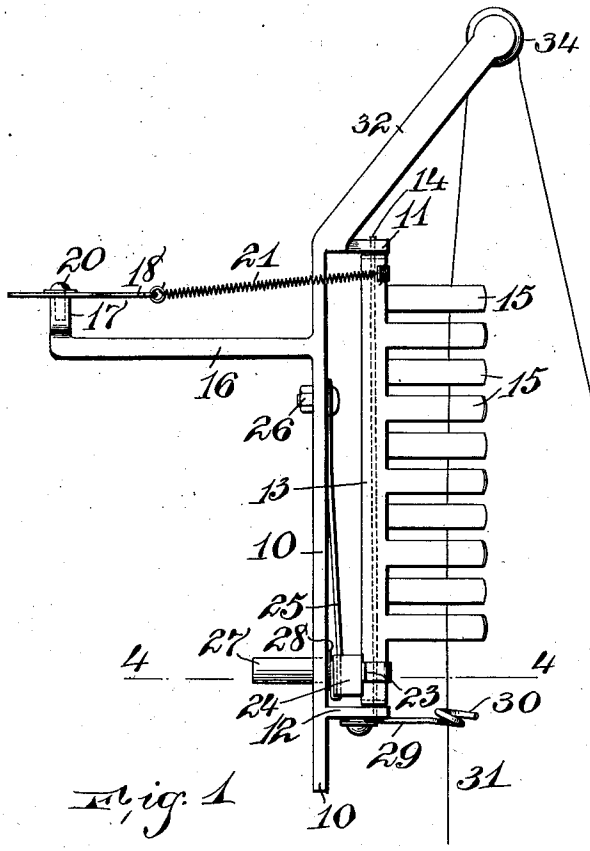

Fig. 1

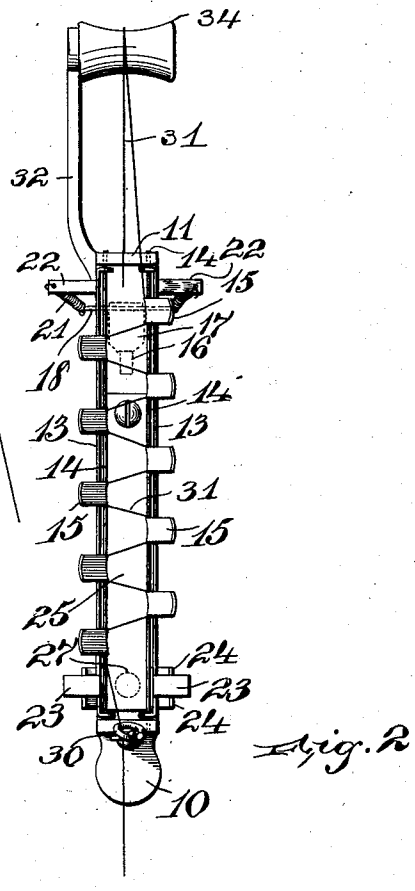

Fig. 2

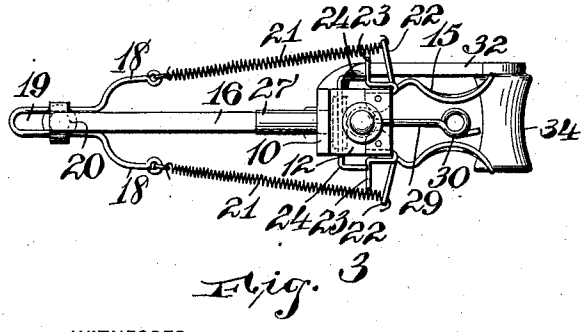

Fig. 3

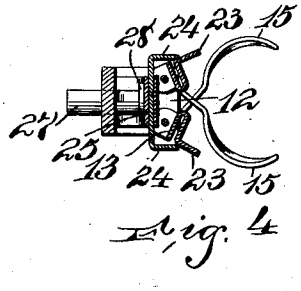

Fig. 4

WITNESSES:

Joseph F. Ford

M. A. Johnson.

INVENTOR

Andrew Crawford,

BY

Mc H. Campbell.

ATTORNEYS.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ANDREW CRAWFORD, OF PATERSON, NEW JERSEY, ASSIGNOR TO THOMAS SMITH, OF PATERSON, NEW JERSEY.

TENSION DEVICE.

1,021,919. Specification of Letters Patent. Patented Apr. 2, 1912.

Application filed September 6, 1911. Serial No. 647,876.

To all whom it may concern:

Be it known that I, ANDREW CRAWFORD, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Tension Devices; 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, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to a tension device which is adapted to guide and sustain a strand, such as a cotton or silk thread, and hold the strand with just enough strain to cause it to be taut when it emerges from the device.

The tension device consists of sets of arms, arranged in staggered relation, over which the strand passes, these arms having a yielding tendency to move away from each other. To insert the strand quickly in the device I provide a means for swinging the arms toward and beyond each other so that the sets of arms open wide or "gape" so as to provide a channel in which the strand is placed. When the arms are again released, the strand is caught between them and held by them under a tension.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a side view of the tension device. Fig. 2 is a front view thereof. Fig. 3 is a bottom view, and Fig. 4 is a section on line 4, 4, in Fig. 1.

The invention consists of a suitable support 10 which is adapted to be fastened in any suitable manner and is provided with bearings 11 and 12 which project from the front of the main portion of the support. On the bearings are mounted the bars 13 which swing on the pins 14, although any other suitable means for mounting the bars on the support may be employed. The bars are provided with arms 15, these arms being spaced apart so that when the arms of the opposed sets of arms are swung toward each other they can be swung beyond each other, because the arms of one set are staggered in relation to the arms of the other set and the two sets of arms can pass. An arm 16 projects from the back of the main part of the support 10 and has a post 17 thereon on which is mounted a yoke 18, which yoke is formed with a slotted portion 19 which receives a screw 20 so that the yoke can be adjusted to vary the tension of the springs 21 which extend from the ends of the yoke 18 to the lips 22 of the bars 13. These springs 21 act on the bars 13 to swing the sets of arms away from each other and hold them yieldingly in their separated positions. The bars are provided with projections 23 which are both engaged by a stirrup 24 which is supported on the flat spring 25, this spring being held at its upper end by a bolt 26 and being bent back upon itself to hold the stirrup 24. A finger-piece 27 has a flange 28 to limit its outward movement and also the movement of the bars 13 and consequently the arms 15.

On the bearing 12 is mounted a guide 29 formed of wire bent into the loop 30 through which the strand 31 is passed. At the top of the support is a supporting arm 32 with a sheath 34 at the top over which the strand is passed. The arms 15 are preferably curved so that when they are in their normal positions the two sets are back to back as shown in Fig. 3, that is, the convex portion of the sets are toward each other. The arms can be covered with porcelain, china, or any suitable enamel, or they can be highly finished in metal so that the strand will easily slide over them and they will not interfere with the easy progress of the strand when it is under the tension caused by its engagement with the arms.

The device is particularly adapted for use in mills where the strain on the strand is uneven, as for instance when silk is being put on a quill, and in cases where, when the winding first begins, the strain on the strand is heavy and when it ends the strain on the strand is light. This tension device tends to equalize these strains and make them constant all the time. The strand is adapted to be threaded or passed in sinuous lines over the arms, first to an arm on the right side, then to an arm on the left, and so on up to the top of the arms, and then passed over the sheath 34 and to the point where it is to be used or wound.

To provide for a quick removal or insertion of the strand, it is first run through the open loop 30 and then the finger-piece 27 is pressed from the back by the finger of the

operator, and this forces the stirrup 24 forward which also acts to force forward the projections 23 as shown in Fig. 4. This simultaneously swings the sets of arms so that they are swung toward and then beyond each other so that they "gape" as shown in Fig. 4, and the strand can be laid between them, these "gaped" arms forming an open channel to the top of the device and the thread is passed over the sheath 34. When it is laid in between the arms, the finger-piece 27 is released, the springs 21 pull the arms back to the positions shown in Figs. 2 and 3 and the strand is at once put under a tension. The tension is never in excess of the tension of the springs 21, and by regulating the yoke by means of the screw 20, this tension can be adjusted to the desired strength. When the strand is under a comparatively strong tension, the arms 15 are swung toward each other by the strand, and when the tension is less, the springs act to place the required tension on the strand by taking up the slack between the arms.

I have not described any particular mechanism with which this tension device is used, because the machines and circumstances under which the device can be used are innumerable, my desire being to cover a tension device of this kind in itself where it regulates the tension of the strand when it comes from the tension device so that it is constant.

The bars and the arms are preferably made as shown in the illustration, that is, made of sheet metal to form the bars with the inturned ends 35 to form bearings and having the lips and the projections struck up from the same piece of metal whereby an economical structure is the result which is stiff and which provides a smooth surface for the passage of the strand over the arms.

Having thus described my invention, what I claim is:—

1. A tension device comprising a support, curved arms arranged back to back and staggered to pass each other, springs for yieldingly holding the arms apart, and a finger-piece connected to the arms and adapted to force them toward and beyond each other to permit the insertion of a strand between the arms.

2. A tension device comprising a support having bearings thereon, a pair of bars swinging in the bearings and having separated arms thereon whereby the arms of one bar permit the passage of the arms of the other bar between them, springs connecting the support and the bars to normally force the bars to separate the arms whereby the arms exercise a yielding tension on a strand passing over them, and a finger-piece acting to limit the outward movement of the bars and when pressed, operating on the bars to cause their arms to swing toward and beyond each other to permit the insertion of a strand simultaneously between all the arms.

3. A tension device comprising a support having bearings thereon, a pair of bars swinging in the bearings and having separated arms thereon whereby the sets of arms can be swung past each other, springs connected to the bars to normally force the bars apart, means for limiting the outward movement of the bars, the arms being curved when in normal position so that the convex portion of the sets of bars are toward each other, a finger-piece, a stirrup on the finger-piece, and projections engaged by the stirrup so that when the finger-piece is pressed the bars swing the fingers toward and beyond each other to cause the fingers to "gape."

4. A tension device comprising a support having bearings thereon, a pair of bars swinging in the bearings and having separated arms thereon whereby the sets of arms can be swung past each other, springs connected to the bars to normally force the bars apart, means for limiting the outward movement of the bars, the arms being curved when in normal position so that the convex portion of the sets of bars are toward each other, a finger-piece, a stirrup on the finger-piece, projections engaged by the stirrup so that when the finger-piece is pressed the bars swing the fingers toward and beyond each other to cause the fingers to "gape," a guide loop on the bottom of the support to feed the strand between the arms, a supporting arm on the top of the support, and a sheath on the supporting arm for receiving the strand as it comes from the arms.

In testimony, that I claim the foregoing I have hereunto set by hand this seventeenth day of August, 1911.

ANDREW CRAWFORD.

Witnesses:
M. A. JOHNSON,
WM. A. MERZ.