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TENSION DEVICE FOR SHUTTLES.

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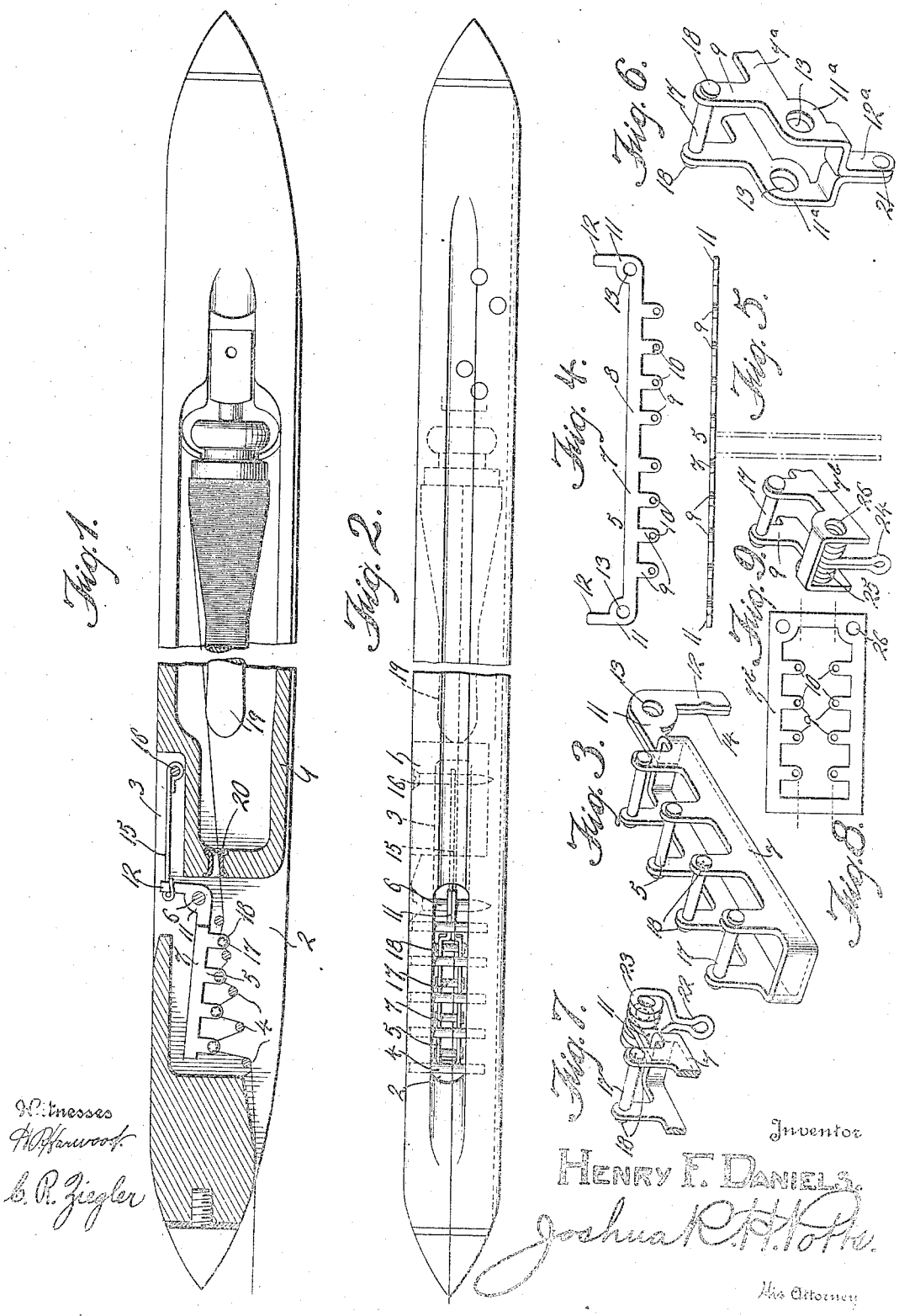

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UNITED STATES PATENT OFFICE.

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TENSION DEVICE FOR SHUTTLES.

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Application filed September 12, 1916. Serial No. 119,651.

To all whom it may concern:

Be it known that I, HENRY F. DANIELS, a citizen of the United States, residing at Shamokin, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Tension Devices for Shuttles, of which the following is a specification.

My invention consists of an improved tension device for shuttles, and acts to apply tension to the thread as it passes from the bobbin in the shuttle and during the progress of the shuttle backward and forward across the race of a loom.

Prior to my invention, a number of tension devices have been used in connection with shuttles, but in most instances the constructions are such that the constant pressure of the thread causes grooves to be cut in portions of the tension device, said grooves being detrimental and furthermore, said passage of the thread relative to the tension devices causes the parts to be entirely severed by frictional engagement with said thread.

One object of my invention is to provide a tension device which will be extremely durable and which will last for a long time.

Another object of my invention is to provide a friction device in which grooves will not be cut by the thread thereby rendering it especially valuable in the art.

A further object is to so design my improved tension device that the main body portion may be stamped or cut from sheet material and afterward readily bent into form.

Another object of my invention is to provide a tension device which will be of extremely simple construction, and which may be manufactured and applied to shuttles at a comparatively low cost.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which

Figure 1 is a top plan view of a shuttle, partly in section, having my improved tension device thereon.

Fig. 2 is a side elevation of the shuttle shown in Fig. 1 and showing my improved tension device as it appears within a slot formed in said shuttle.

Fig. 3 is a perspective view of my improved tension device, the same being in a position which is inverted to the position shown in Fig. 1.

Fig. 4 is a view of the frame or body portion of the device shown in Fig. 3 after it has been stamped or cut from sheet metal or the like and prior to bending.

Fig. 5 is a top plan view of Fig. 4 showing how the blank shown in Fig. 5 is bent from a flat piece.

Fig. 6 is a fragmentary perspective view showing a slight modification of the end of the frame portion shown in Fig. 3.

Fig. 7 is a fragmentary perspective view of another modified form of my invention.

Fig. 8 shows a modified form of cutting a blank to provide another kind of frame, and

Fig. 9 is a fragmentary perspective view illustrating the end of the frame shown in Fig. 8 when it is bent and having other portions thereon acting to complete the tension device prior to its being applied to the shuttle.

Referring to Figs. 1 to 5 inclusive of the drawings, the shuttle 1 has a slot 2 therein which extends entirely through the shuttle from side to side, and includes a recessed portion 3. A series of rods 4 extend entirely through said slot 2 in the form of the rungs of a ladder, and my improved tension device 5 is pivoted within the slot 2 by means of a pivot pin 6. My improved device consists of a frame 7 which is preferably made out of sheet metal which is stamped in a blank or flat form as shown in Figs. 4 and 5.

This blank when thus stamped, has an elongated portion 8 and a series of ears 9, each of said ears having a hole 10 therein. The portion 8 is bent into the position shown in dot-and-dash lines in Fig. 5, and the end portions 11 are afterward pinched together as shown in Fig. 3.

These end portions 11 have arms 12 and also have registering holes 13 through which extends the pivot pin 6 above referred to. The arms 12 are preferably notched as shown at 14 to form a good gripping edge for one end of an elastic band 15 which has its other end secured to a pin 16 within said recess 3.

The ears 9 form bearings for a series of rotatable rods 17, said rods passing through respective holes 10 within ears on the opposite sides of the frame formed by the bending of the member 8. The rods 17 are preferably beaded at their opposite ends to provide heads 18 to permit rotatable move-

ment of the rods, but prevent longitudinal movement within the frame 7.

The rods 17 extend substantially parallel to each other, and are so placed both with respect to the frame and to the pivot pin 6 that the yarn or thread as it passes from the bobbin 19 through the eyelet 20 can be laced first under one of the rods 4, then up over one of the rods 17, then under another of the rods 4, and continuing in this zigzag formation, and finally passing outwardly through the slot 2 in the shuttle, such position being clearly shown in Fig. 1 of the drawing.

The thread or yarn is thus compelled to take a zigzag course between the rods 4 in the shuttle and the rods 17 in the movable frame.

The fact that the frame is always held in control by the elastic 15 causes a tension or drag to be placed on the yarn during the progress of the shuttle over the shuttle race. The relative movement between the yarn and the rods 17 causes the latter to rotate, thus preventing the thread from cutting grooves into said rod 17, since it will be noted that as the rods 17 rotate, the surface relatively changes with respect to the yarn, so that the yarn does not run over the same portion of the surface at all times as it does in other devices now on the market.

In the form of my invention shown in Fig. 6, instead of pinching the end portion 11 of the frame as shown in Figs. 1 to 5 inclusive, the end portions 11^a are permitted to remain in the same plane as the sides of the frame 7^a. In this particular form, the arms 12^a have a bar 21 which extends between and secures them together for the attachment of the elastic 15. In all respects the construction is similar to that above described, and I have therefore given the like parts similar reference numerals.

In the form of my invention shown in Fig. 7, I have omitted the arms 12 and substituted a spring-pressed arm 22 which includes a coiled spring 23 which is soldered or otherwise connected to the end portions 11. This construction may be preferred in some instances, since it provides a slightly resilient connection between the arm and the frame in addition to the resiliency of the elastic 15.

Instead of cutting the frame from a blank as shown in Fig. 4, I may in some instances produce the frame by cutting the blank as shown in Fig. 8.

In Fig. 9, I have shown a fragmentary perspective view of an end portion of the frame shown in Fig. 8, as it appears when bent and includes a resilient arm 24 similar to the resilient arm 22 above noted in connection with Fig. 7, with the exception that the spring coil 25 of the arm 24 is positioned within the body portion of the frame 7^b and in line with holes 26, so that the pivot pin 6 may extend entirely through the spring coil 25 and said holes 26.

In this construction the coil 25 may be soldered or otherwise joined to the frame 7^b.

In each of the constructions shown, the frame is provided with bearing portions or ears 9 which form supports for the rotatable rods 17, and these rods are designed to apply tension as above described.

I am aware that tension devices having rings or other stationary guides have been made prior to my invention, but I am not aware of any instance where rotatable rods have been used as the guiding members for the thread, said rods being carried by a frame which forms a bearing therefor.

Furthermore, I am not aware of any construction wherein the frame has been made by stamping or pressing sheet metal or the like and bent into shape to form bearings for the thread-engaging members. My invention is of particular value to the art since it may be employed on shuttles using very fine gage thread. It may be used also with advantage on shuttles employing silk thread.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A tension device for shuttles including a frame made of a single piece of sheet material and having a portion bent to form an elongated loop closed at both ends, ears projecting from the sides of said loop and having holes therein, rods rotatably mounted in said holes in the ears and extending across said loop, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY FERDINAND DANIELS.

Witnesses:
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