(No Model.)

Z. KELLEY.

WEFT TENSION REGULATING DEVICE FOR LOOMS.

No. 420,644. Patented Feb. 4, 1890.

FIG. 1.

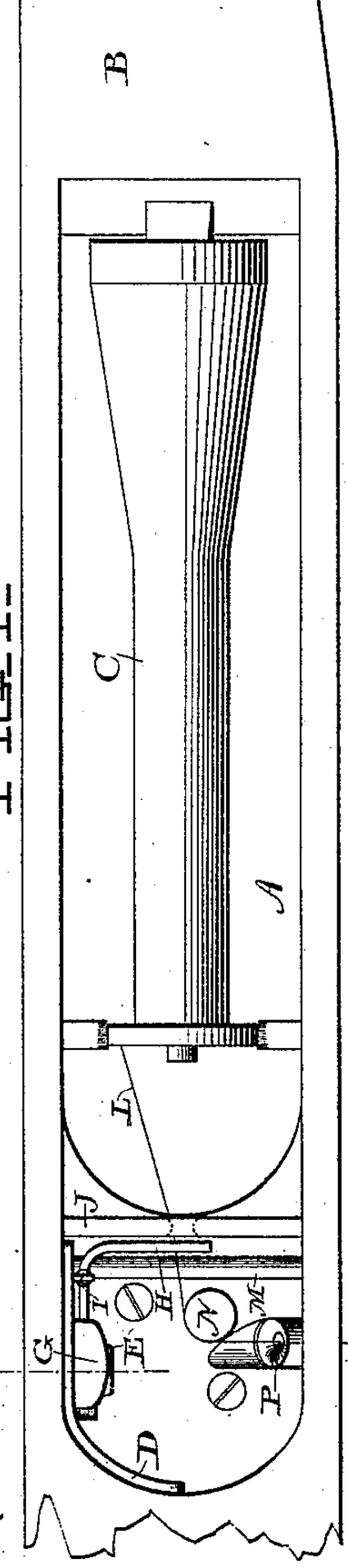


FIG. 2.

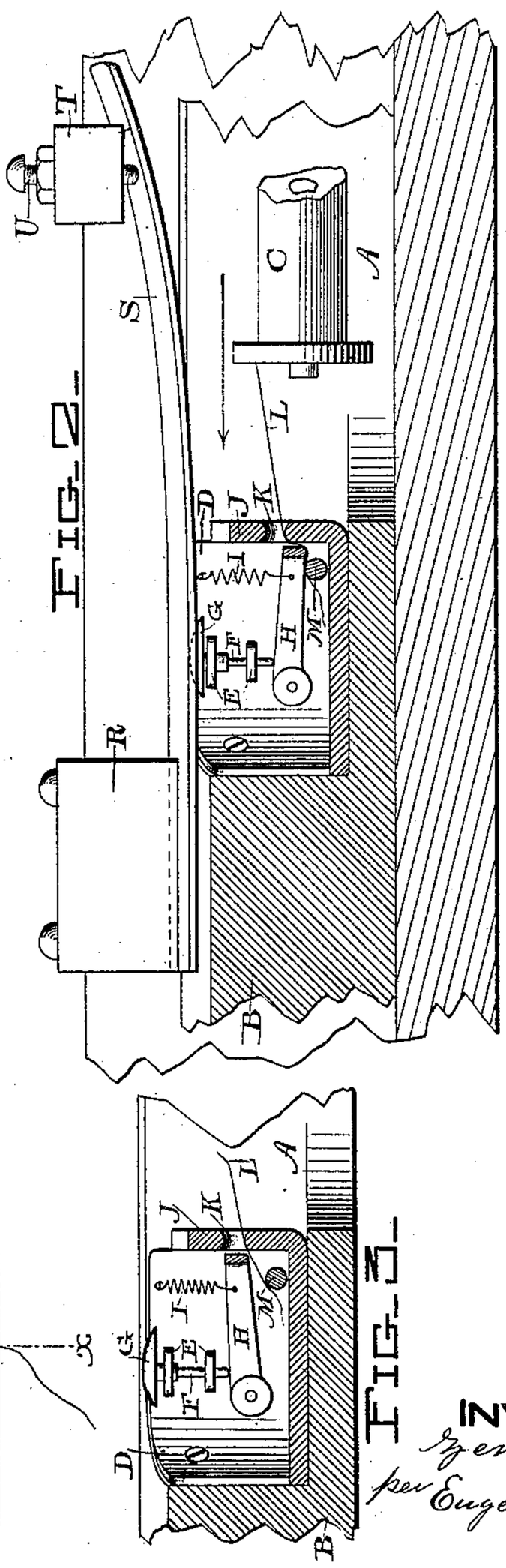


FIG. 3.

FIG. 4.

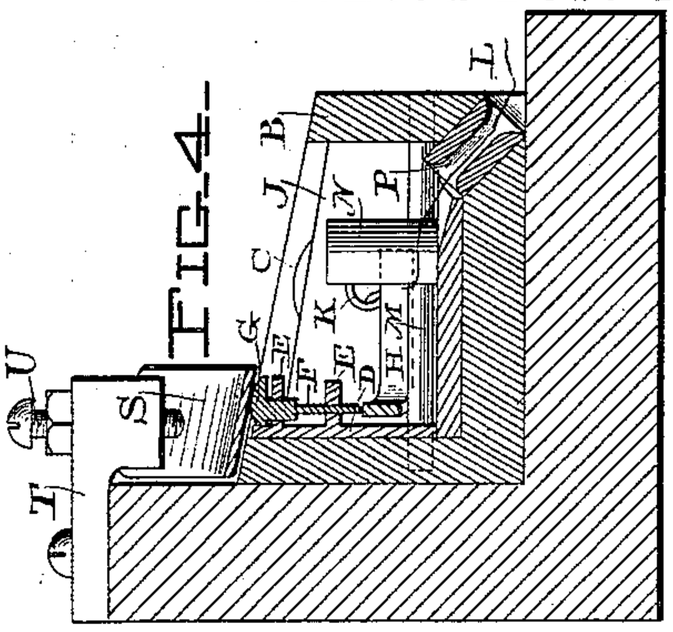


FIG. 5.

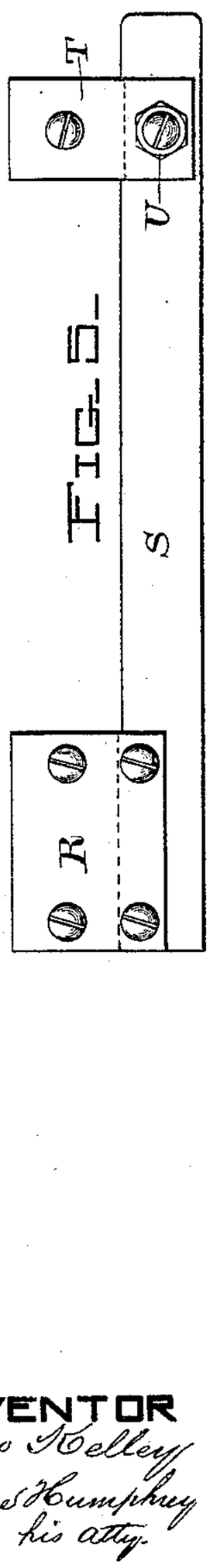


FIG. 6.

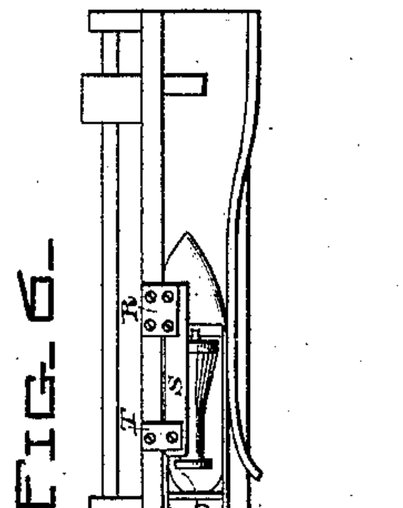
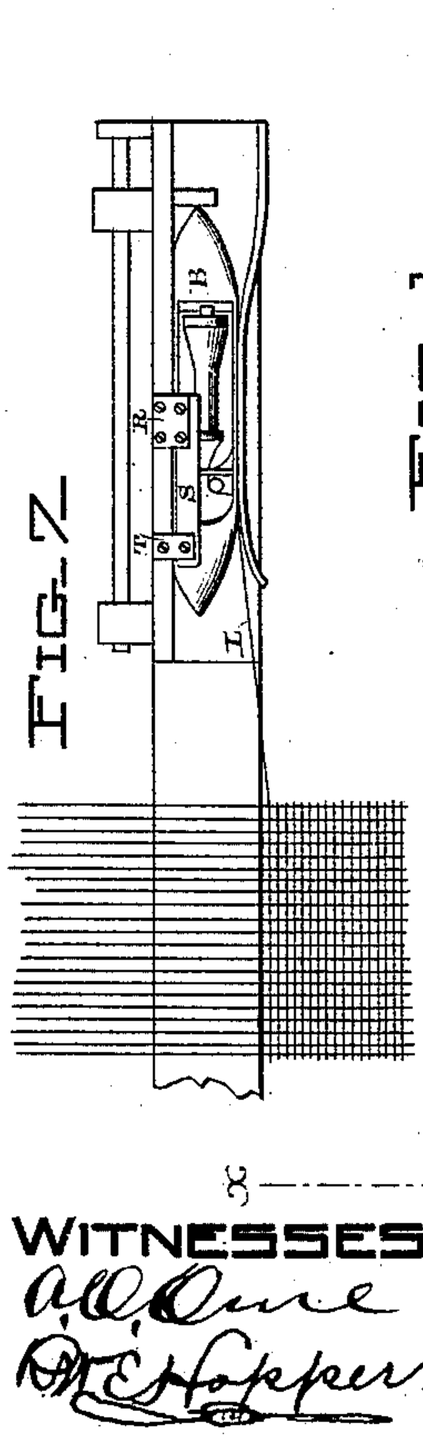


FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

ZENO KELLEY, OF YARMOUTH, MASSACHUSETTS.

WEFT-TENSION-REGULATING DEVICE FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 420,644, dated February 4, 1890.

Application filed April 23, 1887. Serial No. 235,834. (No model.)

To all whom it may concern:

Be it known that I, ZENO KELLEY, of Yarmouth, in the county of Barnstable and State of Massachusetts, have invented a new and useful Improvement in Weft-Tension-Regulating Devices for Looms, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

The object of my invention is to draw each pick of weft-thread straight in the warp after it has been thrown in loosely or under light tension, so that it lies wavy in the warp-threads, and to do so without unduly drawing in upon the selvages and rendering them uneven; and my invention consists in mechanical devices and combinations of mechanism for accomplishing said object, which are hereinafter fully described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top view or plan of a weaver's shuttle in which my automatic tension devices are shown so far as they are attached to the shuttle and being applied to a weft-thread when drawn from a conical bobbin or quill in the usual manner, one end of the shuttle-body being broken away. Fig. 2 is a detached longitudinal vertical section taken as on a line which would pass through a continuation of the axis of the bobbin in Fig. 1, and showing, in addition to a portion of the shuttle and its attachments, a portion of a shuttle-box, partly in section and partly in elevation, and an attachment thereto by contact with which the devices in the shuttle are operated, as will be explained hereinafter. Fig. 3 is a detached vertical section through the tension devices in the shuttle the same as in Fig. 2, but showing that portion of the shuttle as out of the shuttle-box and free from the adjustable depressing-spring attached to the box and as not acting upon the weft-thread. Fig. 4 is a vertical cross-section taken as on line X X, Fig. 1, including the shuttle-box and its depressing-spring. Fig. 5 is a plan of the depressing-spring and the parts by which it is attached to the back side of the shuttle-box and adjusted relatively to the shuttle attachments. Fig. 6 is an illustrative reduced plan showing a portion of a warp, the shuttle-race, and a shuttle and shuttle-box embodying my invention, with the shuttle just entering the box as when thrown from the opposite side of the loom. Fig. 7 is a plan like Fig. 6, but showing the shuttle wholly within the shuttle-box and at the terminus of its movement in that direction.

In one end of the usual cavity A of a shuttle-body B, in which the bobbin C is held, I secure to the side of the cavity a curved vertical plate D, upon which are two projections E E, which, being vertically drilled, serve as bearings for a pin F, which has an end-play up and down in said bearings. Pin F is provided with a cap G, the upper surface of which is convex. To plate D is pivoted a curved lever H, the free end of which is suspended by a light spiral spring I, one end of which is attached to the lever and its upper and opposite end secured to plate D. The lower end of pin F rests upon lever H near its fulcrum, and the top of its cap G is held slightly above the level of the upper face of the shuttle by the contractile force of spring I acting through lever H. A partition-wall J is placed across the cavity A, and an opening K is made through the same for the passage of the weft-thread L. A round bar or wire M is also extended across cavity A, and the weft-thread L passes through opening K, under the curved arm of lever H, over bar M, and thence around a vertical stud N, and through the usual tubular delivery P in the side of the shuttle.

Upon the top of the back side of the shuttle-box I secure a block R, to which is attached one end of a thin flat spring S, whose opposite end is curved upward. Near the upwardly-curved end of spring S, I secure to the top of the shuttle-box another block T, in which is threaded an adjusting-screw U, the lower end of which can be made to bear against the upper side of spring S, so as to thereby depress the spring to the level required.

When the shuttle has been thrown and has freely delivered the weft-thread, leaving it loose and wavy in the warp, as shown in Fig. 6, and has partially entered the shuttle-box to which it was thrown, the spring S, having been adjusted by means of screw U, after cap G has passed the upward curve of spring S, will come into contact with the under surface of the spring during such portion of its remaining movement into the shuttle-box as may be

required, and will be thereby depressed, and in turn will depress lever H, whose curved arm will bend the weft L down between opening K and bar M, and thus produce a tension upon the weft sufficient to straighten that portion of it in the warp while the shuttle completes its entrance into the box. The spring S being thus inclined from its fixed end outwardly toward the open end of the box, the time of its contact with cap G relatively to the progress of the shuttle into the box may be regulated by means of screw U, and thus such portion of the progressive movement of the shuttle in the box may be utilized for the purpose of straightening the weft without unduly drawing upon the selvage, as may by experiment be found necessary. Thus I have produced an effective adjustable automatic weft-tension which for some kinds of weaving I have found to be very desirable and useful.

I claim—

1. An automatic weft-tension embodying the combination of a shuttle-box having suspended therefrom an adjustable depressing device arranged over the path of the shuttle, a hollow shuttle provided with a yielding device projecting therefrom so as to come into contact with said shuttle-box device when the shuttle enters the box, and weft-guides secured in the hollow of the shuttle and arranged to so co-operate with such yielding device upon the weft as to increase the tension thereon during the movement of the shuttle into the box, all substantially as and for the purposes specified.

2. An automatic weft-tension mechanism embodying the combination of a shuttle-box provided with an adjustable spring S, secured thereto and overhanging the path of the shuttle, a shuttle provided with a movable vertical pin F, projecting above the shuttle-body so as to come in contact with spring S when the shuttle enters the box, a wall J, extending across a cavity in the shuttle-body and having an opening K, through which the weft-thread passes, a cross-bar M in the cavity of the shuttle-body, over which the weft passes, and a bent lever H, pivoted to the wall of the shuttle-cavity and at its free end suspended by a spring I, and so formed and arranged that when pin F is depressed by its contact with spring S lever H will be thereby forced down upon the weft between wall J and bar M, and thus increase the tension thereon as the shuttle moves into the box, as and for the purposes specified.

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Witnesses:
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