

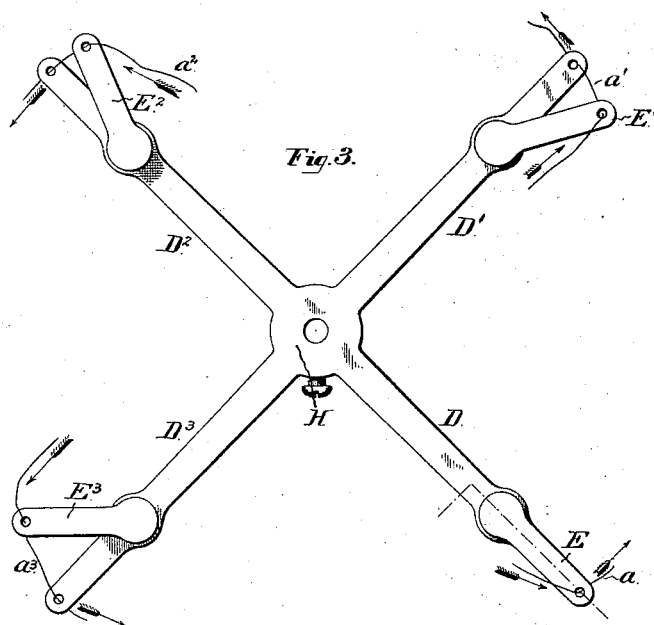
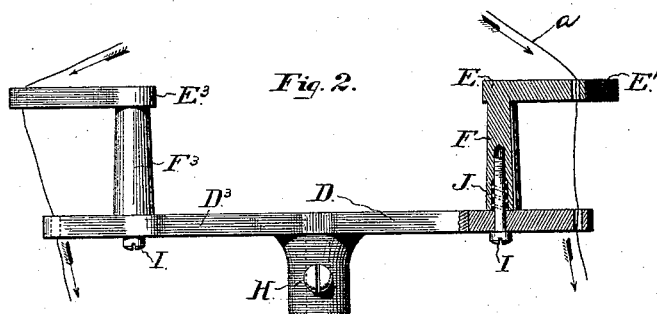
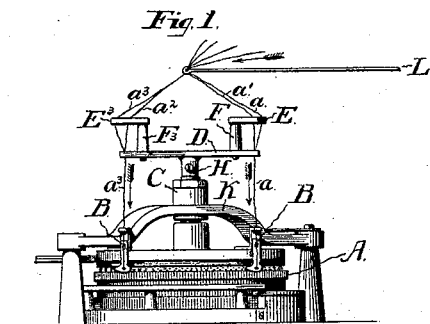
(No Model.)

H. P. BALLOU.

DEVICE FOR REGULATING THE YARN TENSION IN KNITTING MACHINES.

No. 455,896.

Patented July 14, 1891.



WITNESSES:  
*J. H. Bell.*  
*E. R. Burket.*

INVENTOR  
*Hiram Peabody Ballou*

# UNITED STATES PATENT OFFICE.

HIRAM PEABODY BALLOU, OF BRISTOL, PENNSYLVANIA.

DEVICE FOR REGULATING THE YARN-TENSION IN KNITTING-MACHINES.

**SPECIFICATION** forming part of Letters Patent No. 455,896, dated July 14, 1891.

Application filed August 20, 1888. Serial No. 283,282. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM PEABODY BALLOU, of Bristol, in the State of Pennsylvania, have invented a certain new and useful Improvement in Devices for Regulating the Yarn-Tension in Knitting-Machines, whereof the following is a specification, reference being had to the accompanying drawings.

In said drawings, Figure 1 represents a partial elevation of the head of a knitting-machine to which my improvement is applied. Fig. 2 is a view on an enlarged scale, partly in elevation and partly in vertical section, of the tension device detached from the knitting-machine, the plane of section being indicated by the dotted line  $xx$  in Fig. 3; and Fig. 3 is a top or plan view of the device on a scale similar to that of Fig. 2.

In the accompanying drawings I have illustrated the tension device as applied to a circular-knitting machine of the general character described in my Letters Patent No. 284,591, dated September 11, 1883, but having four feeds. As, however, the details of the knitting-machine have no bearing upon the present invention, I do not deem it necessary to describe them in detail.

My invention is adapted for use with a single feed to produce any given tension upon the knitting-thread; but it is especially valuable in knitting-machines with more than one feed, where it is requisite that the tension upon all the knitting-threads should be uniform, and where consequently each tension device must be independently adjustable. In this latter case the tension devices are alike, their number being merely multiplied to correspond with the number of threads.

Referring to the drawings, A represents the head of the machine, across which the bridge K extends to carry the dial-plate and its adjuncts.

Upon an upright C, supported by the bridge K, or upon any suitable portion of the machine, I mount the tension device. In the present instance this consists of a central hub H,

having four radiating arms D, D', D<sup>2</sup>, and D<sup>3</sup>, whose outer extremities are vertically over the thread-guides B of the knitting mechanism. The tension-producing devices upon all the arms are similar, and I will therefore proceed to describe them by reference to that one which is upon the arm D, and which in Fig. 2 is shown in vertical section.

A vertical post F, having at the upper end a horizontal finger E, is pivotally mounted upon the arm D at a short distance from its outer end. To permit the rotative adjustment of the post, while at the same time preventing its accidental displacement, I secure it in the following manner: A central cavity is formed in the bottom of the post, as indicated in the sectional view on right-hand side of Fig. 2, said cavity being provided with a screw-thread at its inner end portion and being slightly enlarged from the termination of the threaded part to the outer end. A screw I passes freely through a hole in the arm D and engages with the threaded portion of the cavity. A spiral spring J fits snugly around the screw-shank within the enlarged portion of the cavity, and, being compressed by the action of the screw, forms an elastic bearing between the post and the arm D. In the outer end of the finger E, and in the end of the arm D beneath it, vertical holes or eyes are formed for the passage of the thread  $a$ , which travels in the direction of the arrows to the thread-guide B. By turning the post upon the pivot I in either direction the thread will be made to pass at an angle from the hole of the finger to the hole of the arm, and a tension or drag will be produced upon it, which will increase with the angle between the finger and arm, and as the finger will retain its position against ordinary strain, it is obvious that a very delicate adjustment of the tension may thus be produced.

In the instance shown I have illustrated the four threads  $a$ ,  $a'$ ,  $a^2$ , and  $a^3$  as all passing through the eye of a single overhanging

thread-guide L and thence diverging to the respective tension devices, which are represented as arranged at different angles.

Having thus described my invention, I  
5 claim—

The combination, with the thread-guide, of a supporting-arm mounted in proximity thereto, a post rotatively adjustable upon said

arm, and a finger carried by said post, said arm and finger being respectively provided with eyes for the passage of the thread, substantially as set forth.

HIRAM PEABODY BALLOU.

Witnesses:

CHARLES F. ZIEGLER,  
JAMES H. BELL.