No. 704,411.

Patented July 8, 1902.

H. A. WEBSTER.

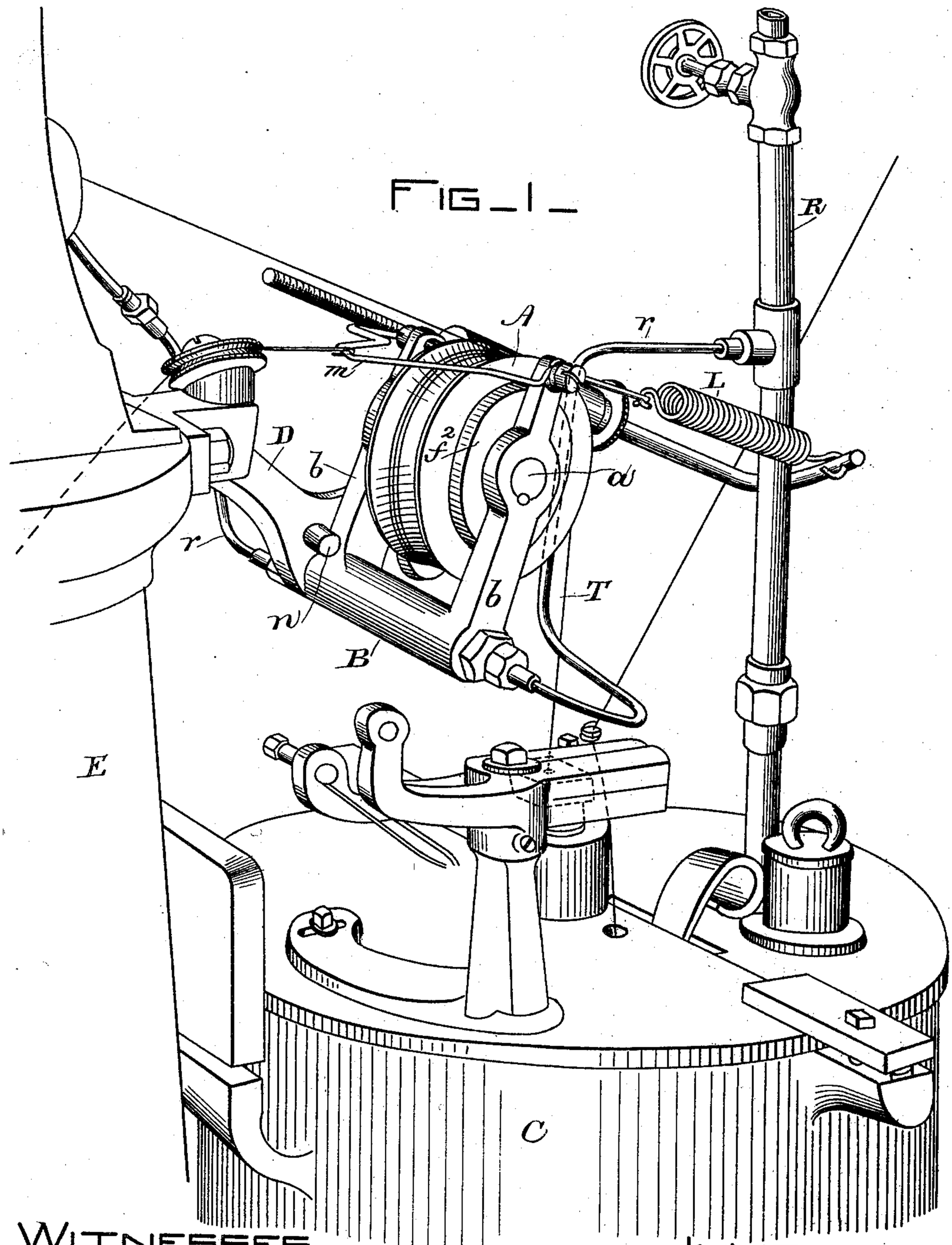
TENSION DEVICE.

(Application filed July 20, 1898.)

(No Model.)

3 Sheets—Sheet 1.

FIG_1_



WITNESSES

C. Kitching.
A. E. Wright.

INVENTOR

Harold A. Webster,
By his attorneys,
Phillips & Anderson.

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3 Sheets—Sheet 2.

FIG. 2.

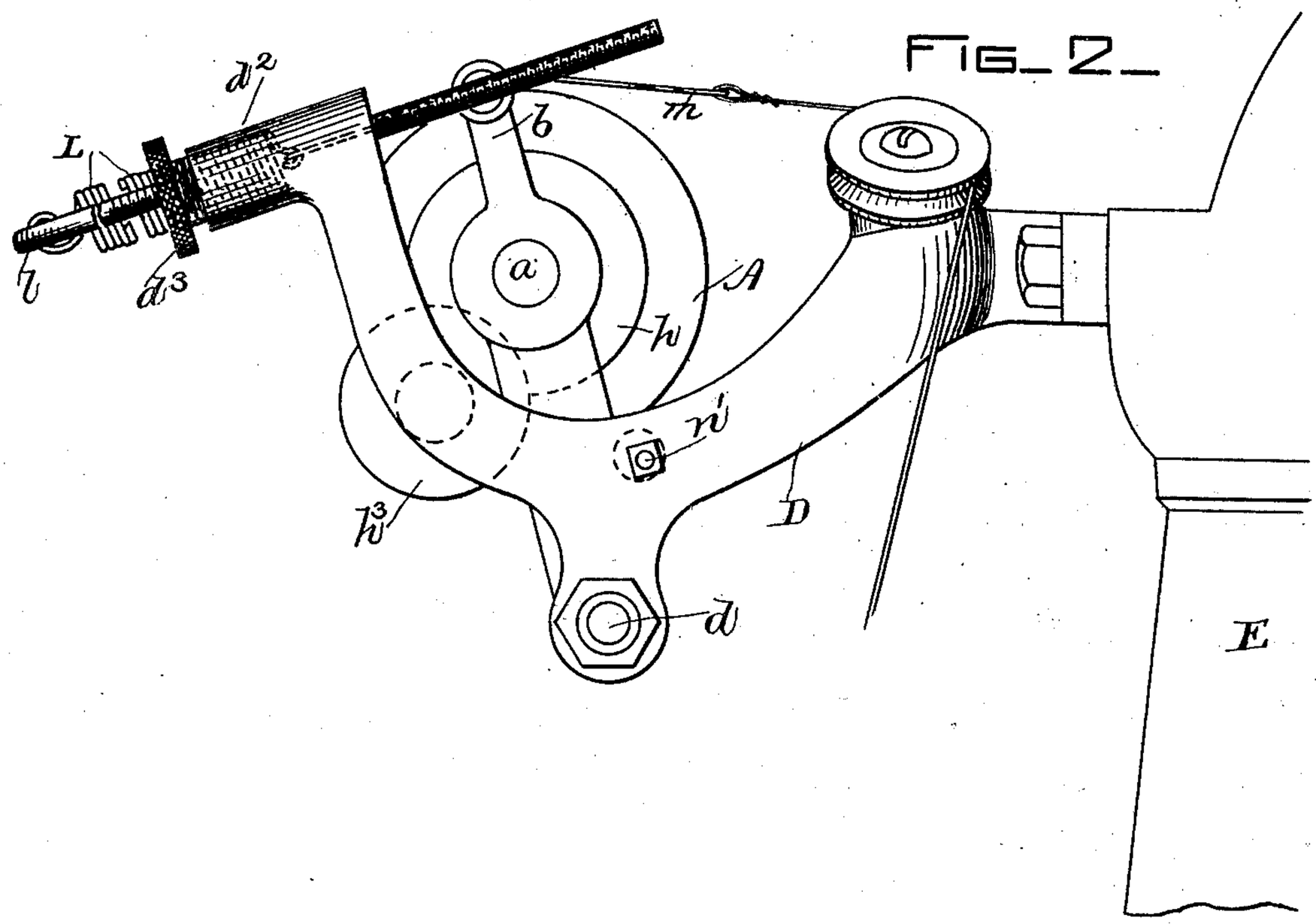
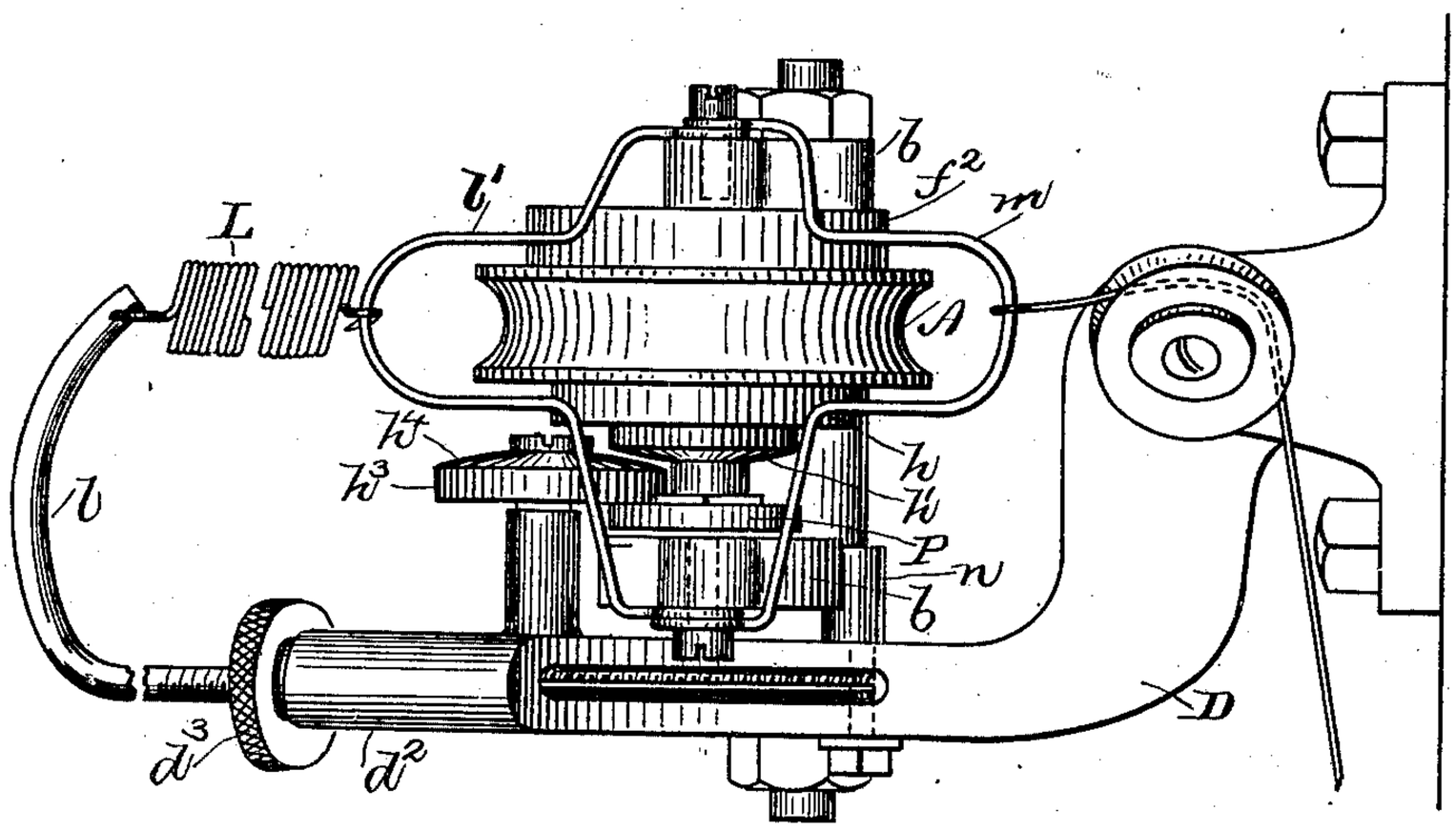


FIG. 3.



WITNESSES

C. Sketching:
A. E. Hyde!

INVENTOR

Harold A. Webster,
By his attorneys,
Phillips & Anderson.

No. 704,411. Patented July 8, 1902.

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TENSION DEVICE.

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(No Model.) 3 Sheets—Sheet 3.

FIG. 4.

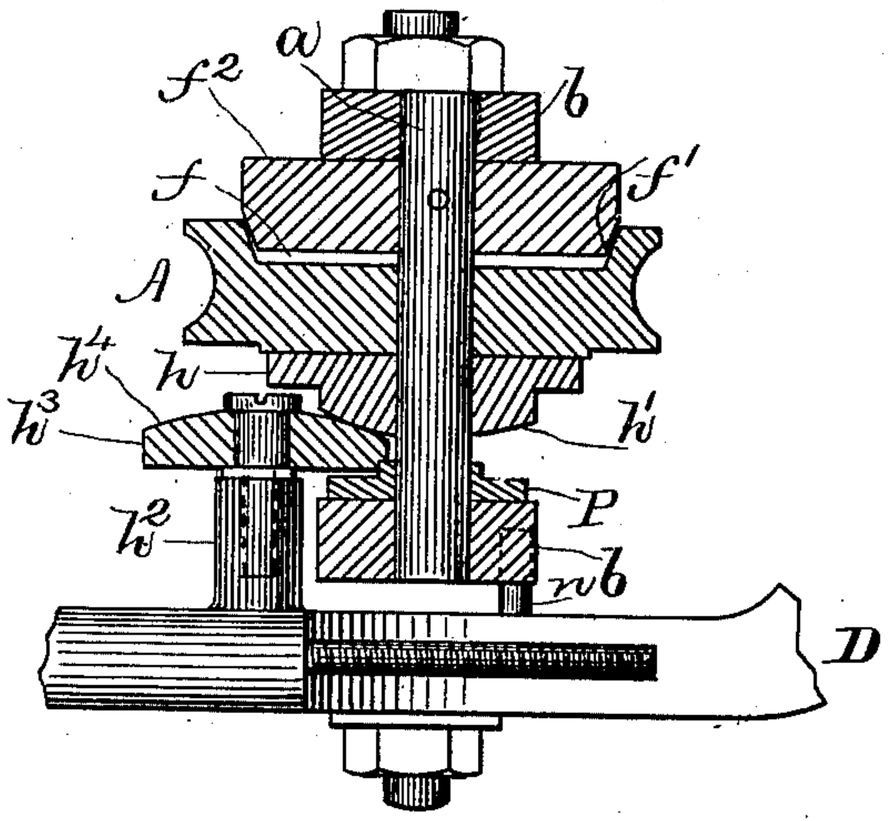
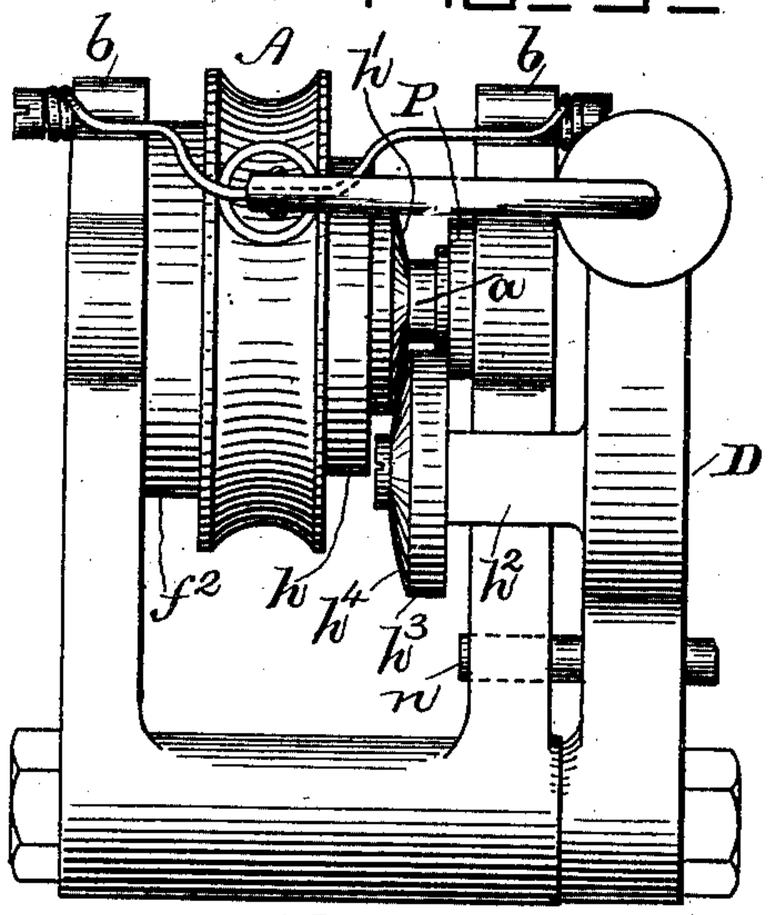


FIG. 5.



B

WITNESSES

R. E. Hyde.

E. Stetching.

INVENTOR

Harold A. Webster,

By his attorneys,

Phillips & Anderson.

UNITED STATES PATENT OFFICE.

HAROLD A. WEBSTER, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO THE GOODYEAR SHOE MACHINERY COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

TENSION DEVICE.

SPECIFICATION forming part of Letters Patent No. 704,411, dated July 8, 1902.

Application filed July 20, 1898. Serial No. 686,422. (No model.)

To all whom it may concern:

Be it known that I, HAROLD A. WEBSTER, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, 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.

The present invention relates generally to tension devices, and more particularly to tension devices of the type in which the tension is released by a pull on the thread.

The object of my invention is to reorganize and improve tension devices of the above-described type to secure the holding of the thread with certainty until the pull on the thread reaches a predetermined amount and to secure other advantages apparent to those skilled in the art.

To the above ends the present invention consists in the devices and combinations hereinafter described, and particularly pointed out in the claims.

A preferred form of my present invention as applied to a shoe-sewing machine of the usual type—such, for example, as the Goodyear machine—is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view. Fig. 2 is a side elevation. Fig. 3 is a plan. Fig. 4 is a transverse section, and Fig. 5 is an end elevation.

Like letters of reference designate like parts throughout the several views.

In my improved tension device means are provided whereby the thread as it leads from the supply to the stitch-forming devices is held from running off until the tension thereon has reached a predetermined amount and when such predetermined tension has been reached is released and allowed to run freely from the supply, the device, however, being so arranged that the release of the thread, as above stated, as soon as the tension falls below said predetermined amount effects a locking of the thread-controlling devices and prevents a further running of the thread from the supply, the result being that the pull or tension upon the thread can never exceed a predetermined amount, and the thread is drawn off by successive increments, as required by the stitch-forming devices, the pull required to draw off any increment after the thread has been released, as above stated, being only that required to overcome the resistance of the passage of the thread through the wax-pot.

In the specific embodiment of my invention illustrated in the drawings the thread-holder consists of a thread-truck A, around which the thread T passes as it leads from the wax-pot C to the stitch-forming devices.

The thread-truck A is rotated by the thread T when it is being drawn from the supply, and means are provided for locking the truck A from rotation, and thus holding the thread against any pull of less than a predetermined force, and the devices controlling the rotation of the truck A are so constructed and arranged that when such predetermined pull or tension is reached the truck A will be released, so that the thread T will be released and will run freely from the wax-pot, said devices being, however, further so arranged that when the truck A is released and tension reduced the truck will be immediately locked again from rotation and the running of the thread stopped after an increment thereof has been drawn off.

To secure the above-suggested results in the machine of the drawings, the thread-truck A is mounted and free to rotate upon a short shaft *a*, which is fixedly secured at its opposite ends to the arms *b b* of a yoke B, which embraces the truck A.

For the purpose of locking and unlocking the truck A its supporting-yoke B is arranged to have a swinging movement in a vertical plane. As shown, the body of the yoke B is hollow and has a bearing on a short shaft or cylindrical stud *d*, about which the yoke B is free to swing and which is projected horizontally from a bracket D, which is bolted or otherwise suitably secured to the column E, which is the usual supporting-column of this class of machines.

In one of the lateral faces of the truck A is

formed a recess f, which forms the female member of a conical frictional clutch, the male member f' of which is formed upon a disk f^2, fixedly secured to the shaft a.

In addition to its motion of rotation about the shaft a the truck A is arranged to have a limited lateral movement sufficient to effect an engagement and disengagement of the clutch, as hereinafter described.

The truck A carries upon its opposite lateral face an annular disk h, the outer face h' of which is conical or wedge-shaped, said disk h being secured to the truck A so as to move laterally and rotate therewith. Projected horizontally from the bracket D is a stud h^2, upon the inner end of which is mounted a disk h^3, the inner lateral face h^4 of which is conical or wedge shape and which when the yoke B is swung back—that is to say, in a direction opposite to that of the pull of the thread—is arranged to engage the conical face h' of the disk h and to move the truck A laterally to engage the clutch members $f f'$ and hold the truck A from rotation. A suitably-placed spring is provided, which tends to impart a backward movement to the yoke B and normally holds the conical face h^4 of the disk h^3 in engagement with the conical face h' of the disk h and the clutch members $f f'$ in engagement to prevent rotation of the truck A. As shown, the spring above referred to consists of a coiled spring L, one end of which is secured to a fixed support l and the other to a bridle l', attached to the yoke B at or near the upper ends of the arms b. Means are provided whereby the tension of the spring L may be regulated conveniently by an adjustment of the support l, and to this end said support is adjustably secured to a bracket D, so that it may be set nearer to or farther away from the yoke B.

As shown, the shank of the support l is threaded and is projected through a sleeve d^2 on the bracket D, a spline connection being provided, leaving the shank of the support l free to slide, but not to rotate, in the sleeve d^2. A threaded nut d^3, engaging the threaded shank of the support l at the outer end of the sleeve d^2, serves to adjust the support l and hold it in its adjusted position. I also find it convenient in practice to provide upon the shaft an annular disk or washer P, which serves to take up the end thrust when the disks h and h^3 are in engagement. I have also provided means for limiting the forward movement of the yoke B—*i. e.*, its movement in the direction of the pull of the thread—which means may consist of any suitable device, conveniently of the stop n, which projects into the path of movement of the yoke B. As shown, the stop n is eccentrically mounted upon a cylindrical supporting-block n', which is mounted to rotate in suitable bearings in the bracket D, and provision is made to clamp it in any desired position, the arrangement being such that by turning the block n' the position of the stop n may be varied to vary the amplitude of oscillation of the yoke B. In the device of the drawings the limitation of the forward movement of the yoke B, as above described, is of considerable importance in that when my improved tension is applied to a rapidly-running machine it prevents the yoke B being carried too far forward to be returned at the proper time to lock the truck A to prevent the drawing off of more thread than is required. I do not, however, desire it to be understood that such arrangement is an essential feature of the present invention.

To release the truck A at the will of the operator and allow the thread to be drawn freely from the wax-pot, I have provided in the device of the drawings a bridle m, which is secured to the arms b b of the yoke B and to which is attached a cord or other suitable connection connecting the same with a conveniently-placed lever, (not shown,) whereby the yoke B may be drawn forward against the tension of the spring L to unlock the truck A. I desire to say in this connection that in this specification I have used the term "lock" in its broadest sense to include a frictional holding, as illustrated, and also a positively-locking means. It is also to be noted that the conical clutch members f and f' are made slightly tapering to increase their holding capacity and that although the yoke B is actuated by the spring L to close the clutch members when closed the action of the clutch members to hold the truck from rotation is not affected by variations in the tension of spring L.

To prevent the cooling of the thread while passing over the truck A, suitable heating means r' are provided, which leads from the wax-pot-heating pipe R to the yoke-supporting shaft or stud d, which is made hollow to permit the passage of steam, and thence to other parts of the machine.

It is to be further noted that the arrangement of the spring L is such that any sudden pull of the thread—such, for example, as occurs in the illustrated type of sewing-machine as the stitch is set—is taken up by the spring, so that the stitch is set under a uniform tension and the strain on the thread occuring when other forms of tension are used is prevented.

The operation of the device of the drawings is described as follows: The spring L having been adjusted so that the tension thereof will hold yoke B in position to keep the disks h and h^3 in engagement and the clutch closed against any pull on the thread less than the required tension, if a tension be exerted on the thread equal to the required tension the yoke B will be drawn forward against the tension of the spring L, disengaging the disks h and h^3 and allowing the clutch to open to permit a free rotation of the truck A, which allows the thread to run freely from the supply. The release of the thread, as above stated, releases the yoke B, and the

spring L acts to restore it to its original position, and the clutch is again closed, locking the truck A and preventing the drawing off of the thread from the supply until the required tension is again brought on the thread.

While I have illustrated and described the preferred form of my invention in connection with a sewing-machine, I desire it to be understood that my invention is susceptible of use in any place where it is desired to employ tension of this character, although I believe this tension device to constitute a useful adjunct of a sewing-machine.

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

1. In a tension device, the combination with a thread-truck capable of rotation and lateral movement, of a clutch to hold said truck from rotation opened and closed by the lateral movement of said truck, means controlled by the pull of the thread for imparting the said lateral movement to said truck, substantially as described.

2. In a tension device, the combination with a thread-truck, of a clutch comprising two clutch members capable of relative lateral movement toward and from each other, one of said clutch members being held to rotate with said truck and the other held from rotation, and means controlled by the pull of the thread to effect a relative lateral movement of said clutch members to engage and disengage the clutch members, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HAROLD A. WEBSTER.

Witnesses:
T. HART ANDERSON,
HORACE VAN EVEREN.