

(No Model.)

C. H. WILLCOX.

TENSION APPARATUS FOR STRAW HAT AND OTHER SEWING MACHINES.

No. 309,514.

Patented Dec. 16, 1884.

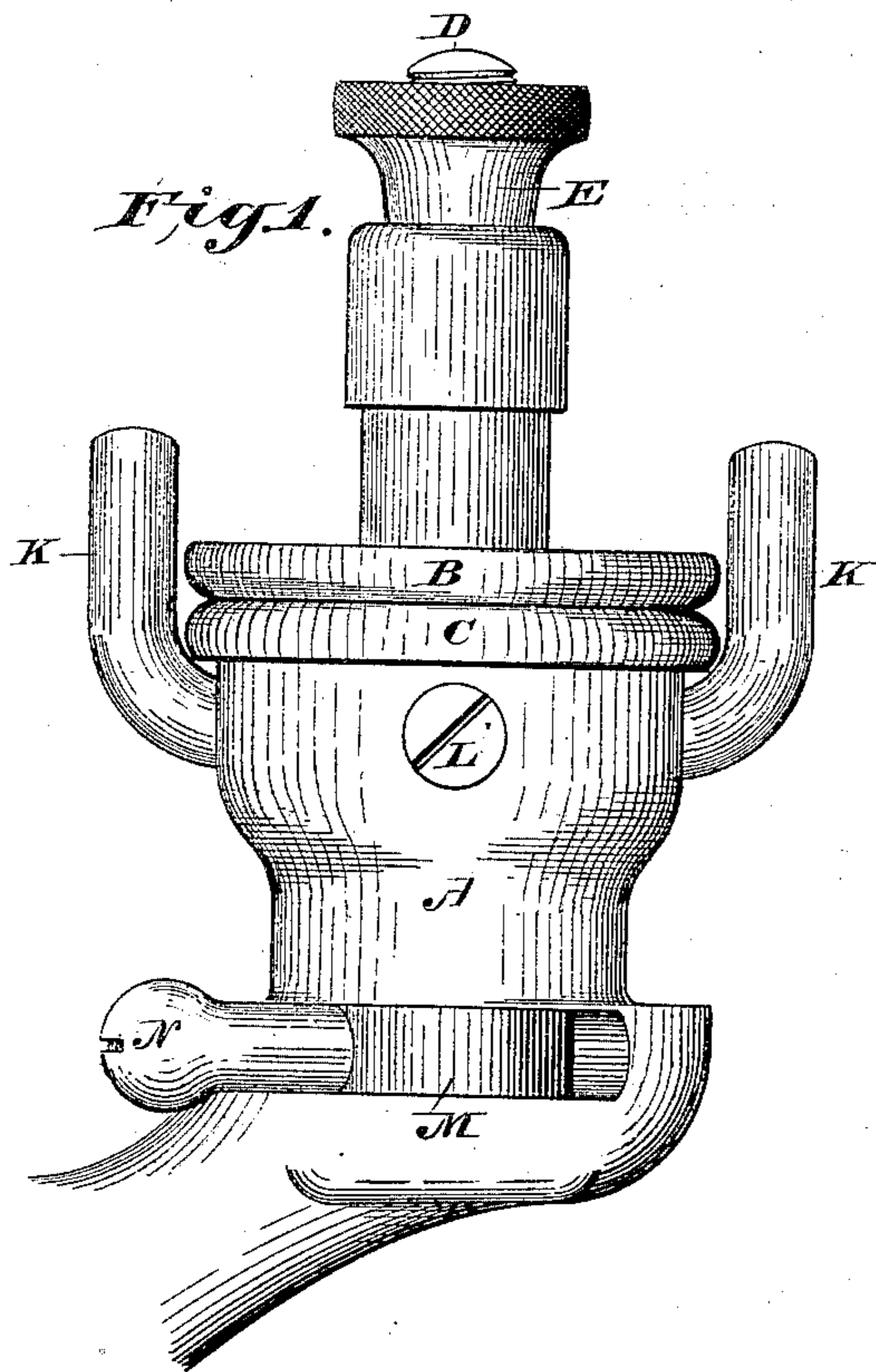


Fig. 1.

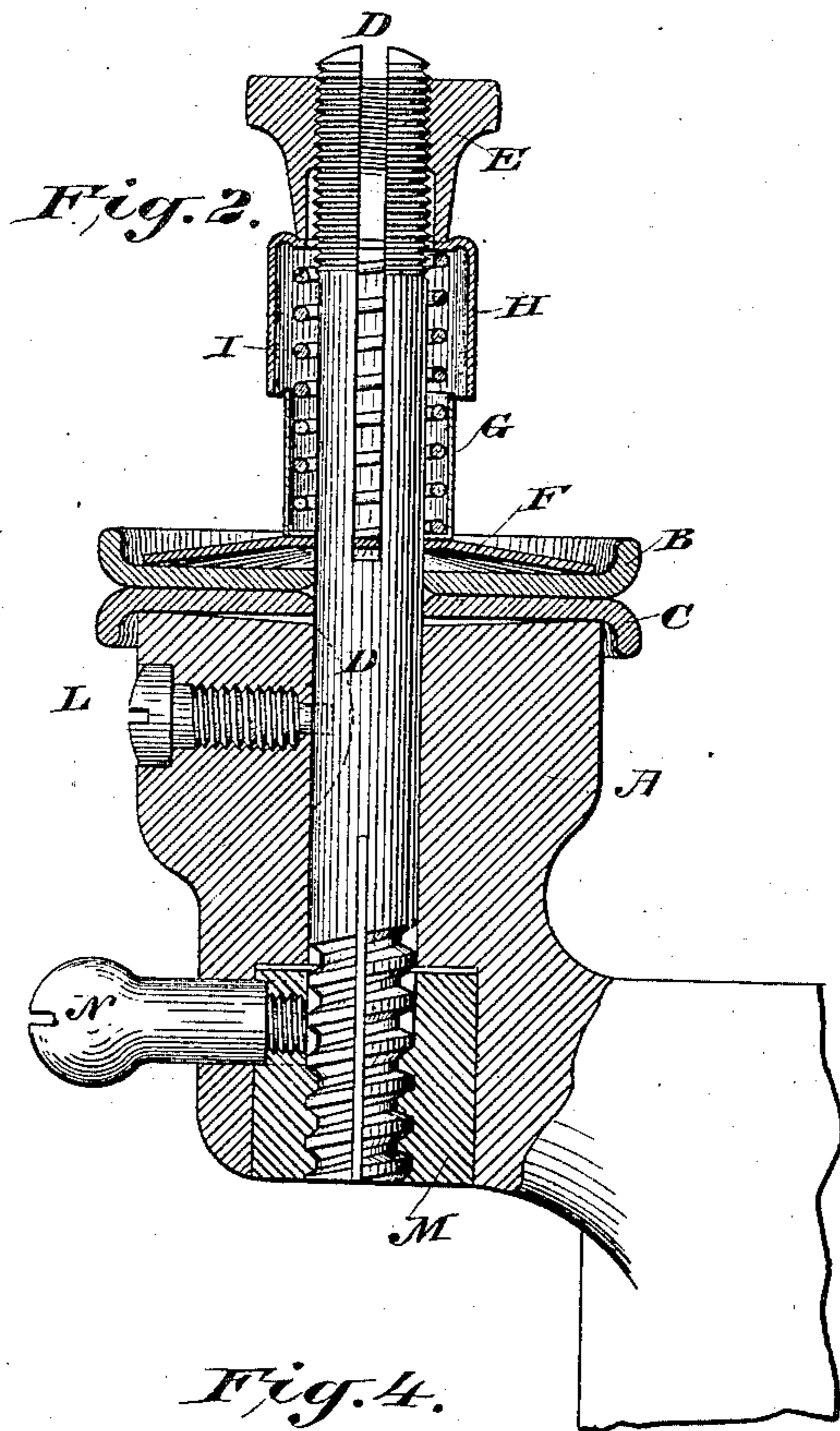


Fig. 2.

Fig. 3.

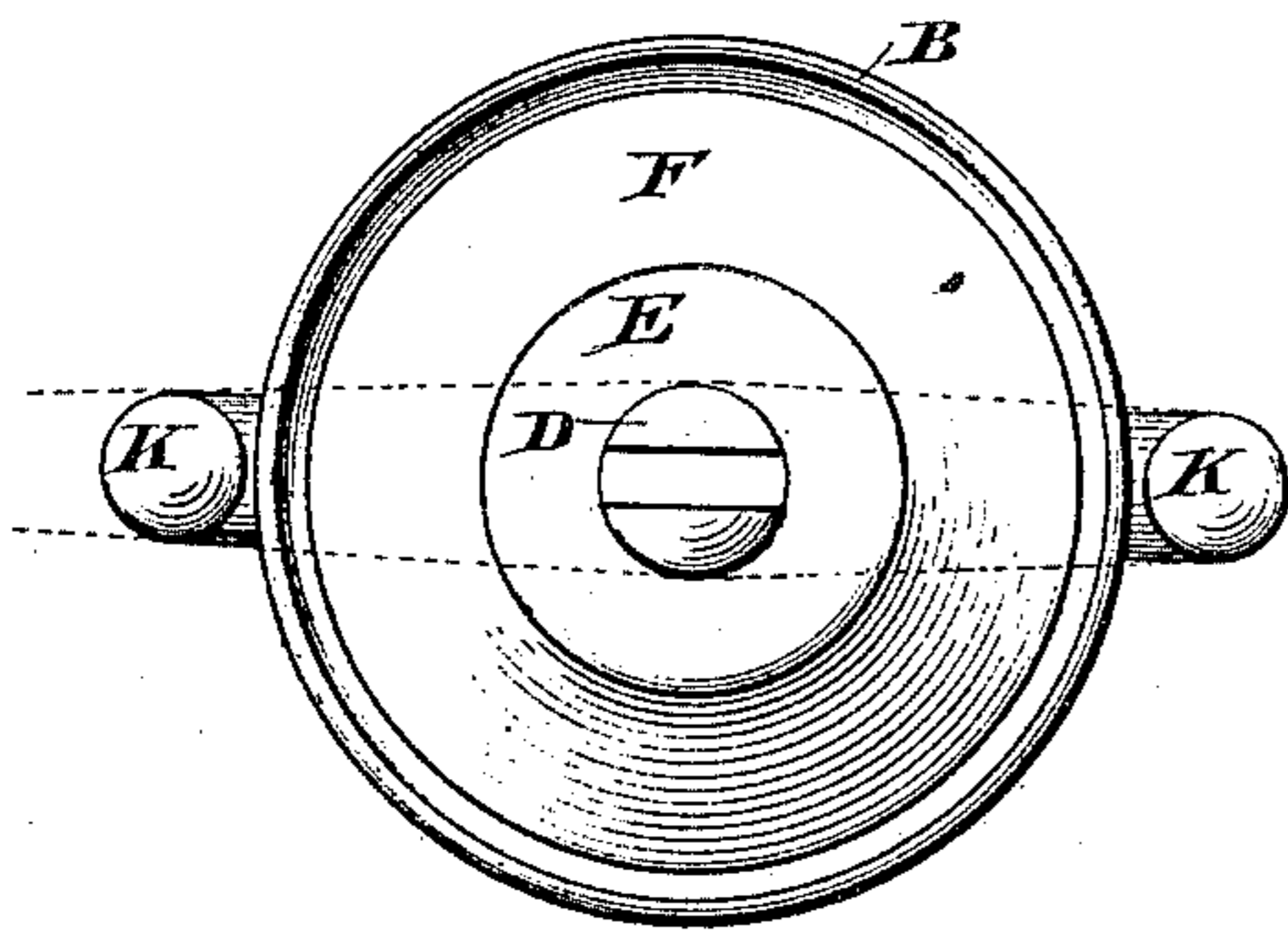
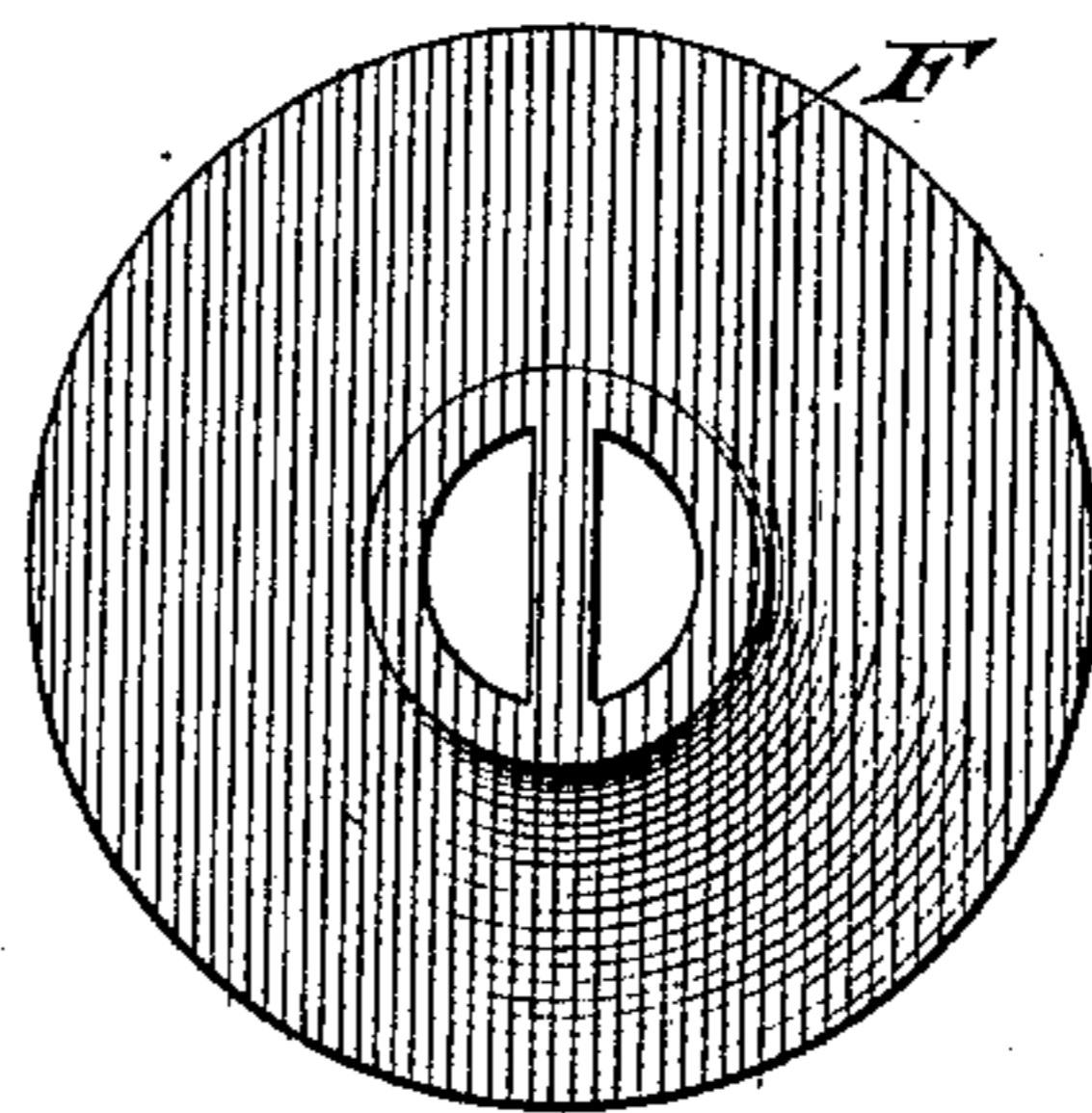


Fig. 4.



Attest:

Geo. T. Smallwood.  
J. Henry Kaiser.

Inventor

Charles H. Willcox  
by A. Pollok  
his attorney

# UNITED STATES PATENT OFFICE.

CHARLES H. WILLCOX, OF NEW YORK, N. Y., ASSIGNOR TO THE WILLCOX & GIBBS SEWING MACHINE COMPANY OF NEW YORK.

TENSION APPARATUS FOR STRAW-HAT AND OTHER SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 309,514, dated December 16, 1884.

Application filed July 31, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HENRY WILLCOX, of New York city, in the county and State of New York, have invented a new and useful Improvement in Tension Apparatus for Straw-Hat and other Sewing-Machines, which improvement is fully set forth in the following specification.

This invention has for its object to improve the construction and operation of the tension apparatus more particularly of machines sewing straw braid into hats; but it can be applied to the tension apparatus of other sewing-machines.

Heretofore tension apparatus has been devised which comprises means whereby, when the tension is properly adjusted in the ordinary way to the degree desired in sewing the body of the crown and the brims of straw hats, an increased tension may be temporarily applied in sewing the tip or button without disturbing the previous adjustment.

The present invention consists, first, in new or improved means for applying and releasing such extra tension. The nut which compresses the tension-spring more or less, so as to increase or diminish the tension upon the thread, is carried by a stud movable in its support, which forms a part of the machine-frame, and on the lower end of said stud is a nut for giving the extra tension. This nut is placed in a recess in the aforesaid support, and is provided with a handle for turning. A pin projecting into a groove in the stud prevents the latter from turning. The entire combination constitutes the improved means aforesaid.

The invention consists, secondly, in improved means for retaining in position the disks or washers of such tension apparatus as operate by clamping the thread with elastic pressure between disks or washers. When these latter are placed loosely on a stud, the movement of the thread tends to turn them, and if, instead of being simply passed around the stud, the thread is led across the disks or washers, (as has been done in order that they may act evenly and with the fullest and best effect upon the thread,) the turning causes the thread to work out on one side. Heretofore the disks

or washers have been held from turning by two fixed pins placed near their circumference and fitting in holes therein, said pins serving also as guides to the thread, which is led between the disks or washers, and substantially across the same on one side of the central stud and back on the other. As the thread wears the surfaces of the disks or washers, they are renewed by turning them so that the pins fit in new holes. It is obvious, however, that the number of holes must be limited, so that the disks or washers are capable of only a small number of changes, and only a small portion of the surfaces can be utilized in any event. In the present invention the difficulty is avoided by retaining the disks or plates in position by friction applied near their circumference. Instead of having a flat bearing-surface or a shoulder near the center to support the inner disk or washer, the support is hollowed out, so that the bearing is near the circumference of said disk or washer. The pressure of the spring for forcing the disks or washers together, instead of being applied near the center, is communicated to the outer disk or washer, through a spring-washer or arched spring-plate, against the outer tension disk or washer, near the circumference thereof. The arched plate is prevented from turning by a connection with the central stud. The friction near the edges of the tension disks or washers suffices to prevent the turning, while at the same time it admits shifting their position an indefinite number of times, so that all parts of the clamping-surfaces may in turn be equally acted upon by the thread. The pins, which serve only as guides, are placed without the circumference of the tension disks or washers.

The invention further comprises certain particular constructions and combinations of parts, as hereinafter set forth.

The best mode which I have contemplated of carrying the invention into effect is as follows, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a tension apparatus constructed in accordance with the invention; Figs. 2 and 3, respectively, a sectional elevation and plan of the same; and Fig.

4, a plan of the arched plate for bearing upon the outer tension disk or washer.

A is the support for the tension apparatus, being, as shown, a portion of the frame of the machine for sewing straw hats made and sold by the Willcox & Gibbs Sewing Machine Company. B C are the tension disks or washers; D, the central stud; E, a nut on the upper split end of said stud; F, the arched spring-plate resting upon the outer tension disk or washer, B; G, a cup surrounding the central stud and resting on said plate; H, a cap surrounding the central stud just beneath the nut E; I, a spiral compression-spring surrounding the central stud and inclosed in the cup G and cap H; K, the pins serving as thread-guides; L, a screw for preventing the central stud from turning; M, a nut engaging the lower split end of the central stud, and N an arm or handle for turning nut M. The support A is bored vertically for the passage of the central stud, D. It is hollowed on top to form an annular bearing for the inner disk or washer, C, near the circumference thereof. At the bottom the bore is enlarged to receive the nut M, and a slot is cut through the inclosing-wall on one side for the reception of handle N. A hole is made above this slot to receive the screw L. The stud D fits loosely within the support A, and opposite the screw L is a groove (shown in dotted lines, Fig. 2) into which the end of said screw extends, so that said stud is prevented from turning, but is allowed a limited endwise movement. The cap H and cup G are free to move up and down, and by turning the nut E the spring H will be compressed a greater or less degree, so that the clamping action of the tension disks or washers upon the thread will be increased or diminished. The nut M on the lower end of the stud prevents it from moving in either direction except as the said nut is turned the proper direction by the handle N, which, as shown, is tapped into the side of the nut. The thread at the lower end of the stud is coarse, so that the small turn allowed by the slot in which handle N moves gives a comparatively large endwise movement to the central stud and produces a corresponding effect in the compression of the spring. The thread at the upper end of the stud is, on the contrary, fine, so that a nice adjustment may be made. The arched plate or spring-washer has a bar which fits into the slit or slot in the upper end of the central stud, and prevents the said plate or washer from turning. The friction between the tension disks or washers and the annular bearings of the arched plate or spring-washer above and the support A below prevents them from turning under the action of the thread, (which is passed around the pins, as shown in Fig. 3.) When the clamping-surfaces wear, the disks or washers

are shifted. The normal tension is adjusted by turning the upper nut or thumb-nut, E. The extra tension is put on or taken off by turning the lower nut, M, by its handle N. Since the nut M draws down the thumb-nut E along with the stud D, it is obvious that each adjustment of the said thumb-nut alters the tension which the apparatus has when the stud is depressed as well as when it is raised. The tension may, in fact, be adjusted while the stud is depressed without moving the nut M. The handle N would ordinarily be moved the full length of its slot; but it is not necessary so to do unless the full increase is desired. The arrangement of the devices for producing the extra tension at the bottom of the stud is very convenient, since they are then entirely out of the way, and in no wise interfere with the threading or manipulation of the tension disks or washers.

Modifications may be made in details without departing from the spirit of the invention, and parts of the invention may be used separately. For example, the improvement in the means for temporarily increasing the tension could be used with a tension apparatus of any ordinary or suitable construction.

Having thus fully described the said invention and the means of carrying the same into effect, what I claim is—

1. In a sewing-machine tension apparatus, and in combination with the means for securing and the nut for adjusting the tension upon the sewing-thread, the stud carrying the said nut, provided with a screw-thread at each end and movable lengthwise in its support, the pin projecting into a groove in said stud, to prevent the same from turning, and the nut engaging the screw-thread on the lower end of the stud, for giving an extra tension, said nut turning on said stud within said support, substantially as described.

2. The combination, with the clamping disks or washers of a tension apparatus, and one or more thread-guides for leading the thread across the disks or washer, between the adjacent faces thereof, of tension-spring, and the means for applying friction to said disks or washers near the circumference thereof, substantially as described.

3. The support for the inner tension disk or washer, hollowed out so as to give an annular bearing near the circumference thereof, in combination with the disks or washers, and the spring for clamping the outer disk or washer against the inner and the latter against the said hollowed-out support, substantially as described.

4. The combination, with the tension disks or washers, of the non-rotating arched plate or washer for bearing upon the outer disk or washer, substantially as described.

5. The combination of the tension disks or

washers, the hollowed support for the inner disk or washer, the non-rotating arched plate or washer, the spring, the central stud, and the thumb-nut, substantially as described.

5 6. The combination of the support or frame, hollowed out on top to form an annular bearing to the inner tension disk or washer, the central stud passing through a hole in said support or frame, the two tension disks or  
10 washers, the arched plate or spring-washer,

the spring, the thumb-nut, and the nut and handle at the lower part of the stud, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscrib- 15  
ing witnesses.

CHAS. H. WILLCOX.

Witnesses:

J. PARMLY,

S. A. SWART.