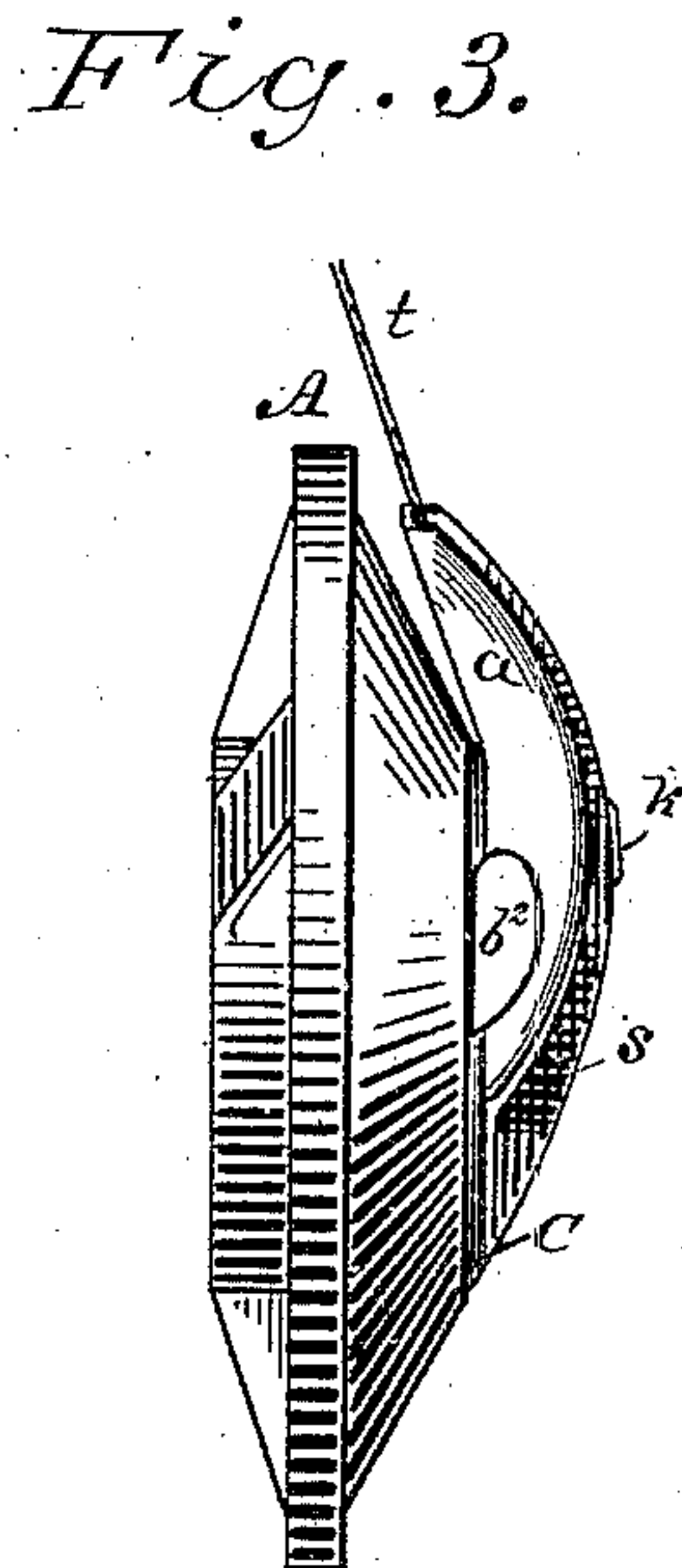
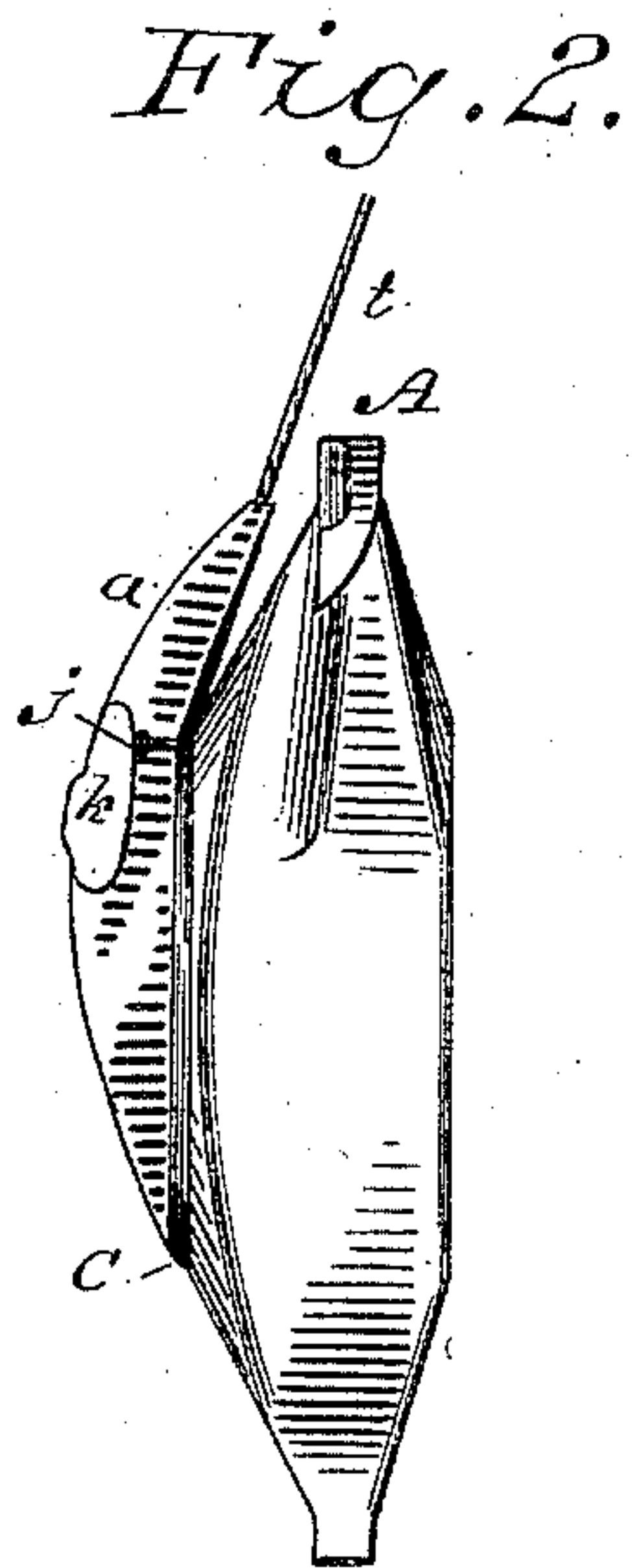
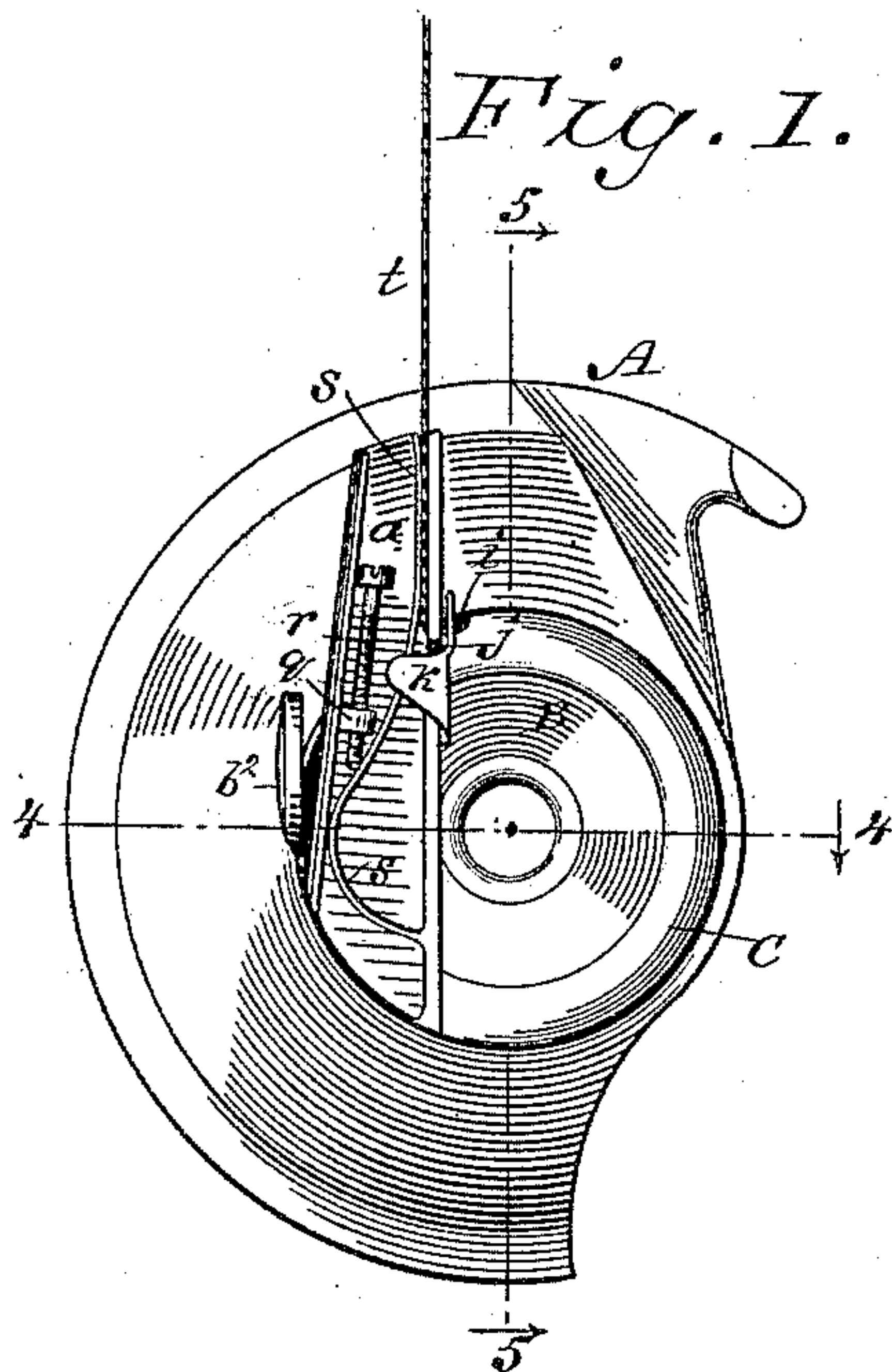


(No Model.)

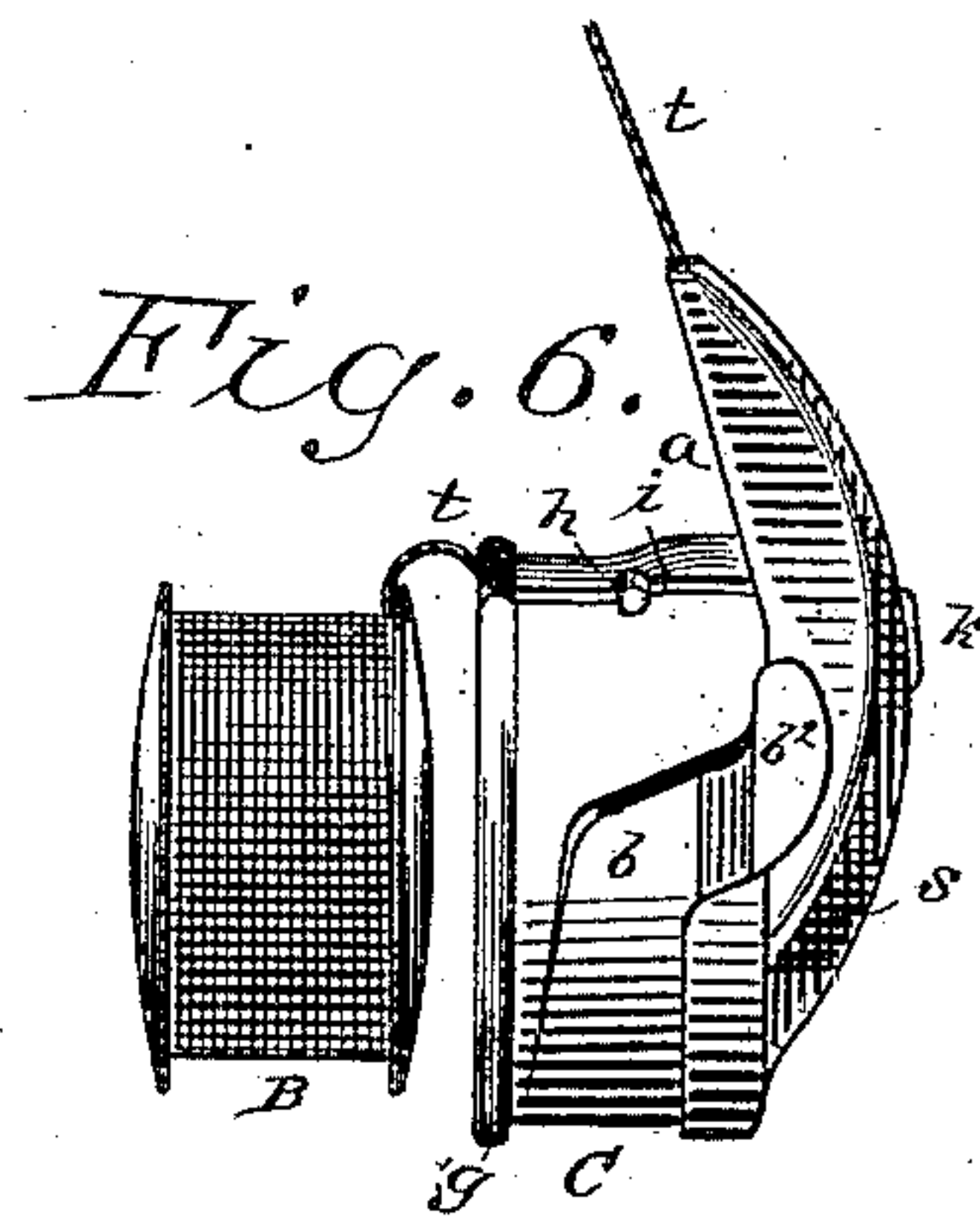
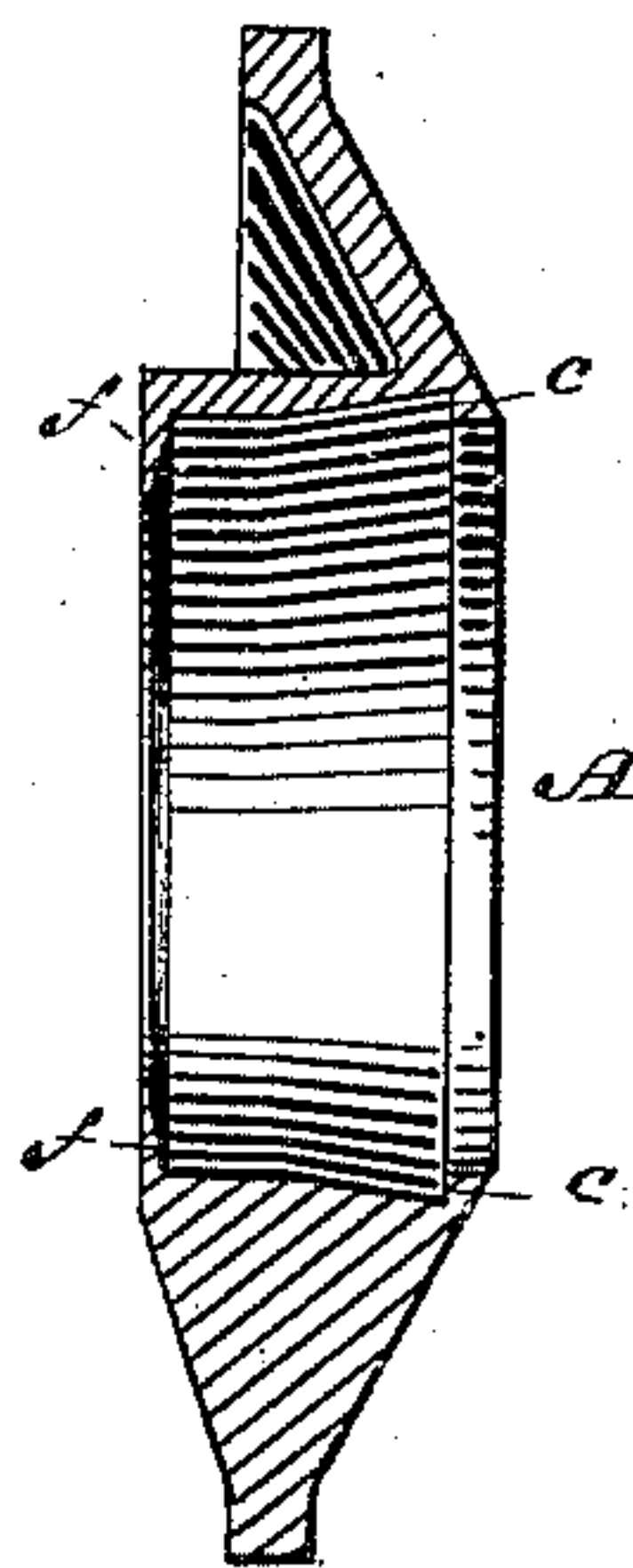
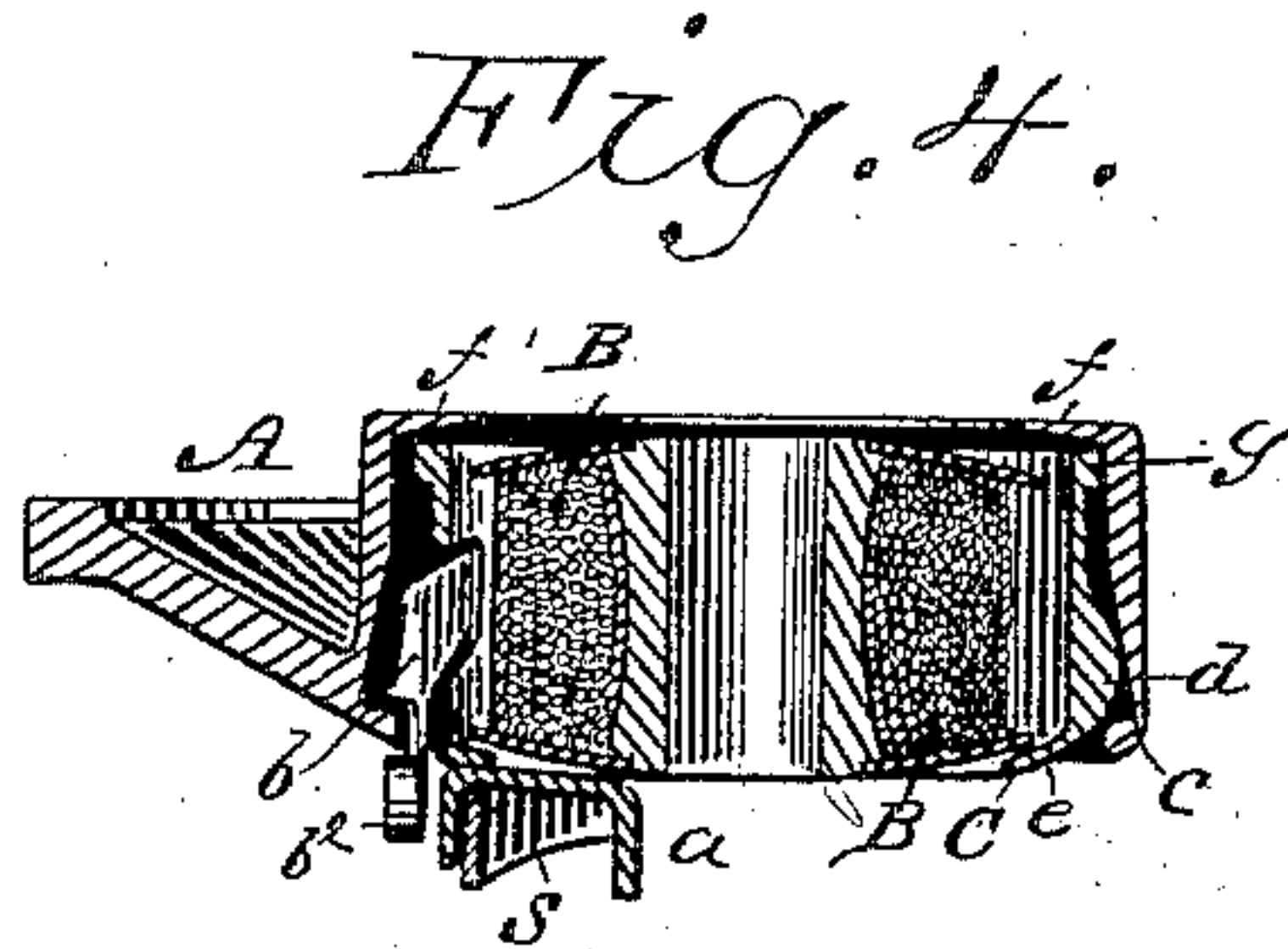
A. M. LESLIE.  
SHUTTLE FOR SEWING MACHINES.

No. 444,756.

Patented Jan. 13, 1891.



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

ARTHUR M. LESLIE, OF CHICAGO, ILLINOIS.

## SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 444,756, dated January 13, 1891.

Application filed August 2, 1886. Renewed June 28, 1890. Serial No. 357,122. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR M. LESLIE, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented a new and useful Improvement in Shuttles and Bobbin - Cases, of which the following is a specification.

This invention relates to the construction of the rotary shuttles and non-rotary bobbin-cases of those lock-stitch sewing-machines in which the shuttle revolves or rotates continuously while the machine is in operation, and to the construction of their tension devices and bobbin-retainers. Its objects are, first, to facilitate removing and replacing the bobbin, the retainer being so located as to be actuated by the grasp which takes hold of the bobbin-case for withdrawing it; secondly, to more securely fasten the bobbin-case in working position by said retainer and accessories thereof; thirdly, to accommodate a thick bobbin, so as to obviate frequently replenishing the thread and at the same time to more effectively guard against the escape of thread over the disks of the bobbin and to isolate the bobbin from the rotary shuttle; fourthly, to facilitate threading the bobbin-case and tension device; fifthly, to accommodate a long-bowed tension-spring so adapted to be adjusted without straining it, and, sixthly, to facilitate regulating the tension with nicety.

The invention consists in certain novel combinations and arrangements of parts, some of them peculiarly constructed, as hereinafter set forth, whereby said objects respectively are accomplished.

A sheet of drawings accompanies this specification as part thereof.

Figure 1 of the drawings is a face view of a shuttle and bobbin-case, illustrating this invention. Figs. 2 and 3 are edge views thereof from opposite points of view. Fig. 4 represents a section through all on the line 4 4, Fig. 1. Fig. 5 represents a section of the empty shuttle proper on the line 5 5, Fig. 1; and Fig. 6 represents an edge view of the bobbin and bobbin-case removed and separated.

Like letters of reference indicate corresponding parts in the several figures.

The shuttle proper A (represented in the drawings) is in its general features of a construction heretofore patented by me, and,

apart from the internal construction hereinafter specified, may for the purposes of my present invention be of any approved make. 55

The bobbin B is a thick disk bobbin with convex ends or faces, and the bobbin-case C (hereinafter termed the "case") forms the peripheral and outer bearings for the bobbin, so as to isolate the latter to this extent from the shuttle and is removable therewith from the shuttle-chamber, as illustrated by Figs. 5 and 6. 6c

The case C is rendered non-rotary, as heretofore, by a holding-arm *a*, fast upon its face or outer end, to engage with some part of the machine which is stationary relatively to the shuttle-motion, and to facilitate removing and replacing the case, and therewith the bobbin B, the retainer *b*, in the form of a one-part spring-catch, is attached to the periphery of the case, engaging a circumferential shoulder *c* within the shuttle-chamber, as best seen in Fig. 4, and has a thumb-lug *b*<sup>2</sup> at its outer end, which, when the parts are united, projects at the face of the shuttle, as seen in Figs. 1, 3, and 4, substantially parallel to the inner edge of said arm *a*, so that the two may be conveniently grasped between finger and thumb to unfasten and withdraw the case. In replacing the case the arm and retainer are less tightly grasped, so that the latter may "snap" behind the shoulder *c*. A rounded protuberance *d*, Fig. 4, diametrically opposite the effective point of the retainer *b* and in the same plane, is forced behind the shoulder *c* by the spring-pressure of the retainer, and materially assists to keep the annular case and bobbin in correct position. The retainer is so set that when its point and said protuberance are both properly behind the shoulder *c* it is completely relaxed, so as to prevent friction. The protuberance *d* may in practice be dispensed with, the lateral play of the case being so limited as to prevent the escape of the retainer *b* from behind the shoulder *c* without first retracting the retainer. The bearings of the case at the face of the shuttle are formed by the practically cylindrical portion of the periphery of the case in front or outside of said shoulder *c*. (Compare Figs. 1, 4, and 6.) 75 80 85 90 95 100

A bobbin of maximum thickness is accommodated by making both case and shuttle annular with beveled inner flanges *e* *f*, for the



outer and inner bearings of the bobbin. (See Fig. 4.) The convex ends of the bobbin may consequently project to the face and back of the shuttle and a large supply of thread be accommodated between them, while the escape of thread over the bobbin-disks is less liable to occur in proportion to the distance between the disks. Such escape of the thread is further prevented by the case itself, which extends back to said flange *f* beyond the edge of the back disk of the bobbin and ordinarily keeps the latter out of contact with said flange, so as to render the bobbin wholly unaffected by the motion of the shuttle. The back edge of the case has a peripheral flange *g* to steady it within the shuttle-chamber. Moreover, the thread *t* is drawn off through a radial hole *h*, Fig. 6, in the case *C*, midway between the bobbin-disks, so as to give it a tendency away from the latter. The thread *t* is drawn into said hole *h* through a slit extending thereto from the back edge of the case, as seen in Fig. 6, and from the hole it passes through a peripheral groove *i* in the case to a self-threading hole *j*, Figs. 1 and 2, in a flange of the arm *a*, perpendicular to the face of the case forming its said inner edge, and thence between said flange and a tension-spring *s*, as seen in Fig. 1, to the throat-plate of the machine. The outer end of the slit of said hole *j* in the arm *a* is masked by a spring-guard *k* in customary manner. The arm *a* is of trough shape, as seen in Figs. 1 to 4, with both edges formed by flanges perpendicular to the face of the case and properly curved as to their outer edges. Between these flanges a long bowed tension-spring *s* is readily masked. Its fixed end is attached to said flange, with which its free end coacts, as seen in Fig. 1. Attached to the other flange of the arm is a drilled and screw-tapped lug *q*, which forms the fixed nut of a regulating-screw *r*, the point of which coacts with the bend of said bowed spring, as clearly seen in said figure, so as to adjust the spring, and thus regulate the tension with great nicety. In working position said screw is vertical or substantially vertical, so that its head may be reached by a screw-driver inserted downward through the cloth-plate opening of the machine.

Having thus described my said improvement in shuttles and bobbin-cases, I claim as my invention and desire to be patented under this specification—

1. The combination, substantially as herein specified, of a rotary shuttle having a circular chamber provided with a circumferential catch-shoulder, and a non-rotary bobbin-case provided on its face with a holding-arm having an inner edge perpendicular to the face of the case, and with a retainer in the form of

a spring-catch attached to its periphery and having a thumb-lug substantially parallel to said arm edge, for the purpose set forth.

2. In combination with a rotary shuttle having a circular chamber provided with a circumferential catch-shoulder, a non-rotary bobbin-case having a retainer in the form of a spring-catch attached to its periphery, and a diametrically-opposite rounded protuberance which likewise engages with said catch-shoulder, substantially as herein specified, for the purpose set forth.

3. The combination, substantially as herein specified, of an annular rotary shuttle having a circular chamber provided with a circumferential beveled flange at the back of the shuttle, an annular non-rotary bobbin-case fitted to said chamber, extending inward to said flange, and having a corresponding beveled flange at its face, and having a radial thread-guide midway between its inner edge and said face, and a disk-bobbin running on its edges within said case, for the purposes set forth.

4. In combination with a rotary shuttle and its bobbin, a non-rotary bobbin-case having a holding-arm and a tension device on its face, and constructed with a radial thread-guide midway between its inner edge and its face, a slit extending thereto from said inner edge, a peripheral groove extending thence to said arm, and a self-threading guide in a longitudinal flange of said arm perpendicular to the face of the case, the tension-spring pressing against said flange and extending longitudinally thereof, substantially as herein specified.

5. In combination with a rotary shuttle and its bobbin, a non-rotary bobbin-case having on its face a holding-arm with a longitudinal flange perpendicular to the face of the case, and provided with a long-bowed tension-spring attached at one end to said flange and pressing against the same beyond a thread-guide therein, substantially as herein specified.

6. In combination with a rotary shuttle and its bobbin, a non-rotary bobbin-case having on its face a holding-arm with a longitudinal flange perpendicular to the face of the case, a thread-guide, and a fixed drilled and screw-tapped lug, and provided with a bowed tension-spring pressing against said flange beyond said guide, and a vertical regulating-screw which works in said lug and coacts with the bend of the spring, substantially as herein specified, for the purpose set forth.

Signed at Chicago this 17th day of July, 1886.

ARTHUR M. LESLIE.

Witnesses:

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WOLFRED N. LOW.