(No Model.) 2 Sheets—Sheet 1.

O. B. TRUESDELL.

LOOM SHUTTLE.

No. 576,921. Patented Feb. 9, 1897.

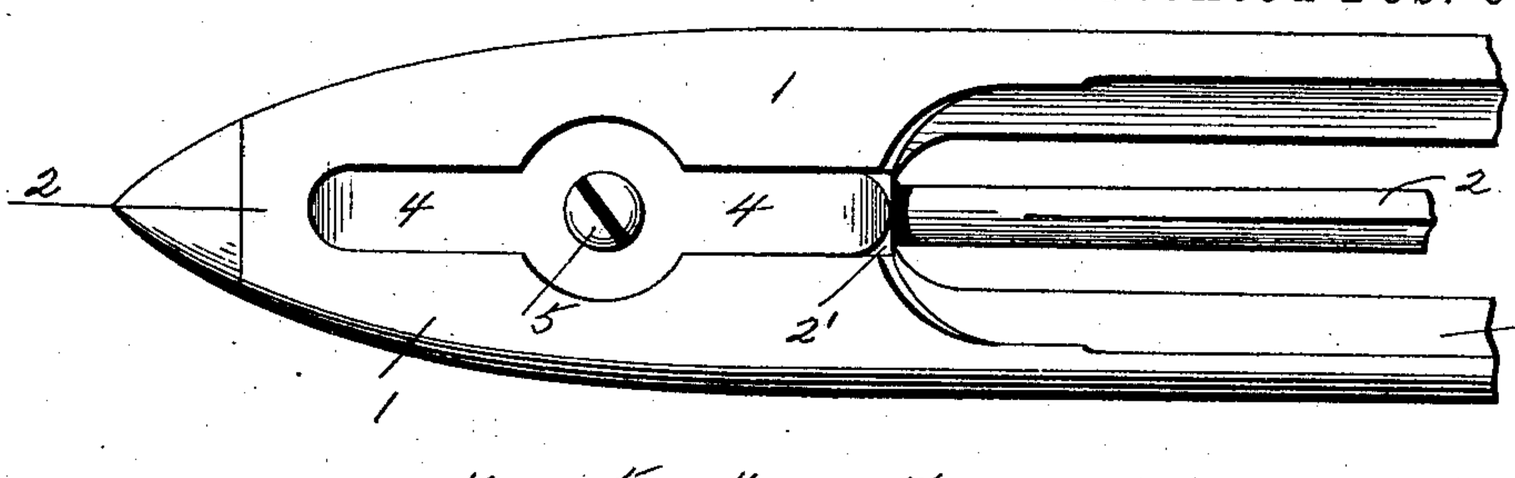

Fig. 1.

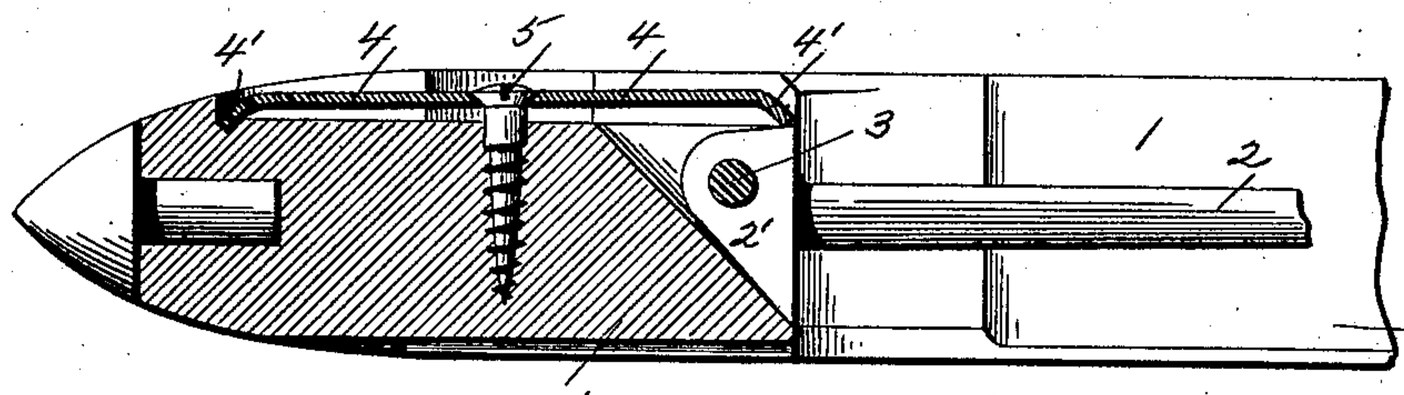

Fig. 2.

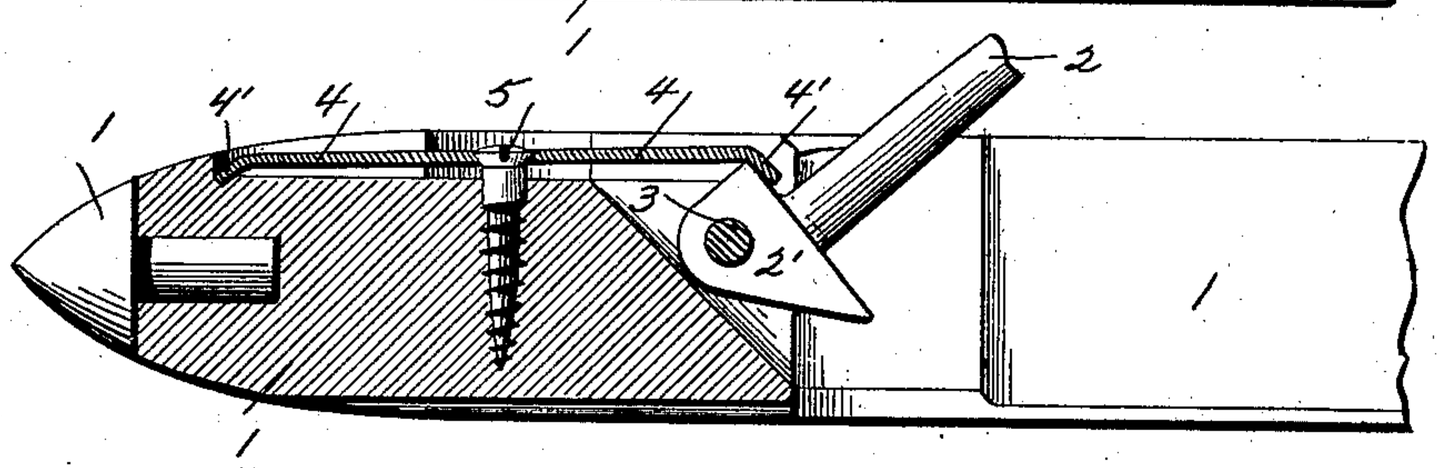

Fig. 3.

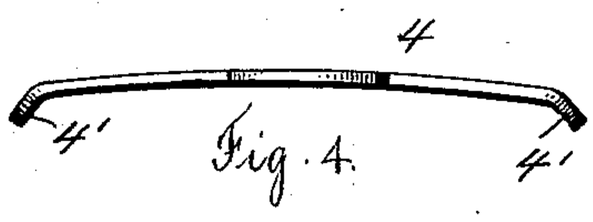

Fig. 4.

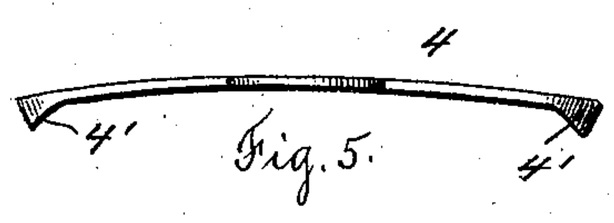

Fig. 5.

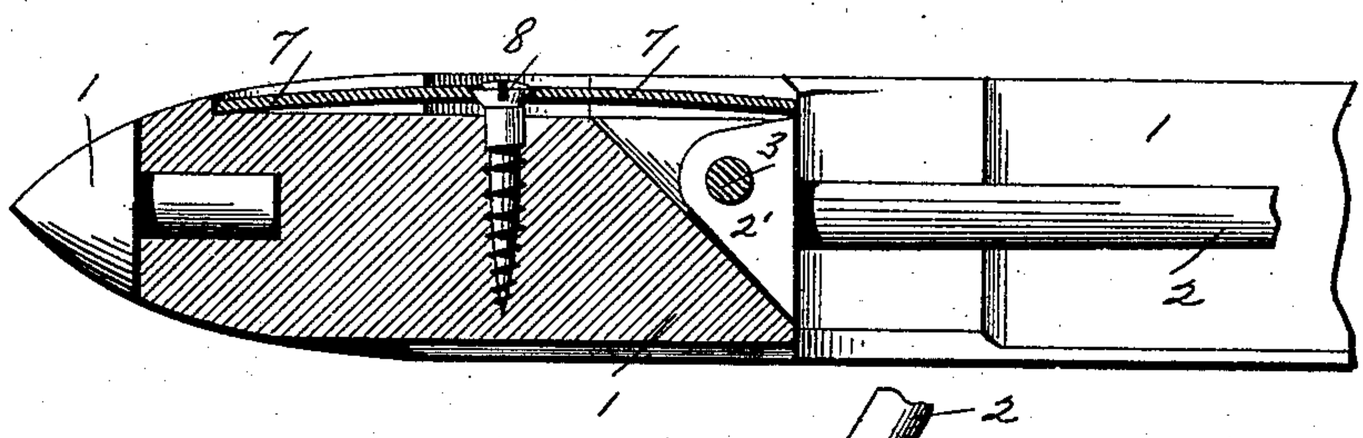

Fig. 6.

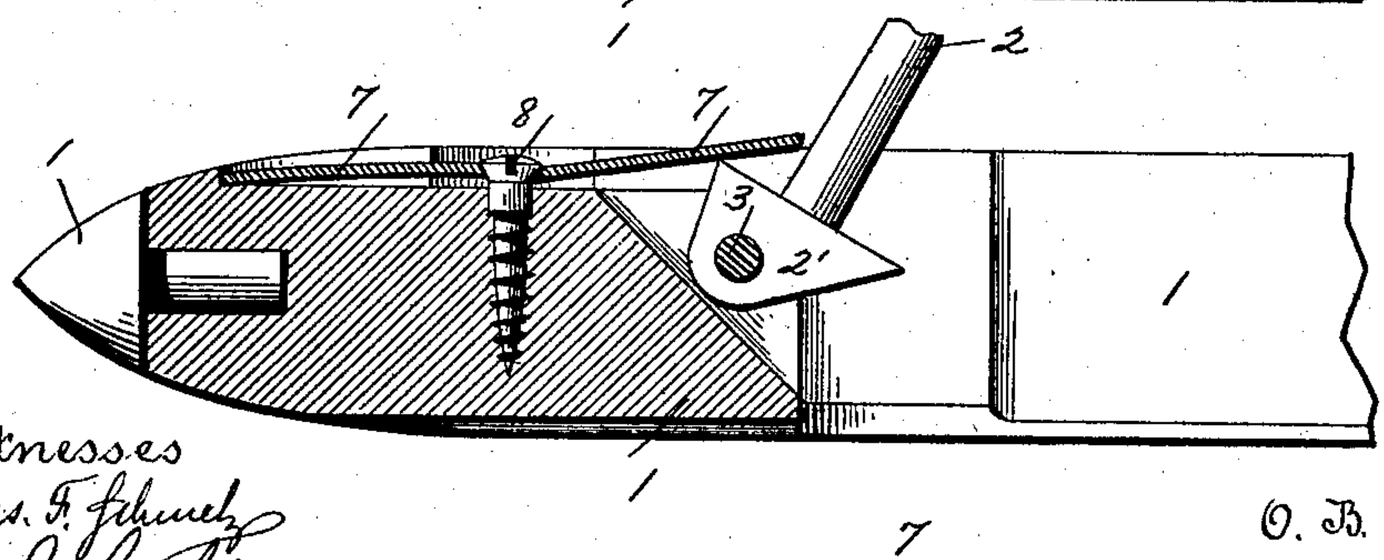

Fig. 7.

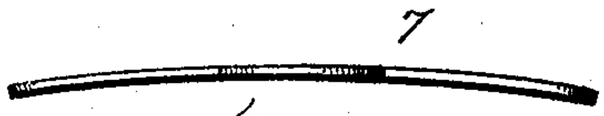

Fig. 8.

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(No Model.) 2 Sheets—Sheet 2.

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LOOM SHUTTLE.

No. 576,921. Patented Feb. 9, 1897.

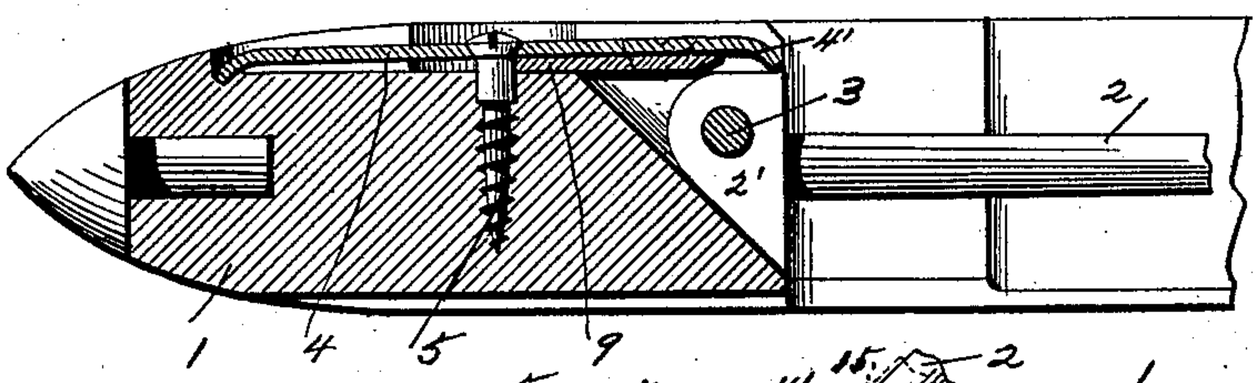

Fig. 9.

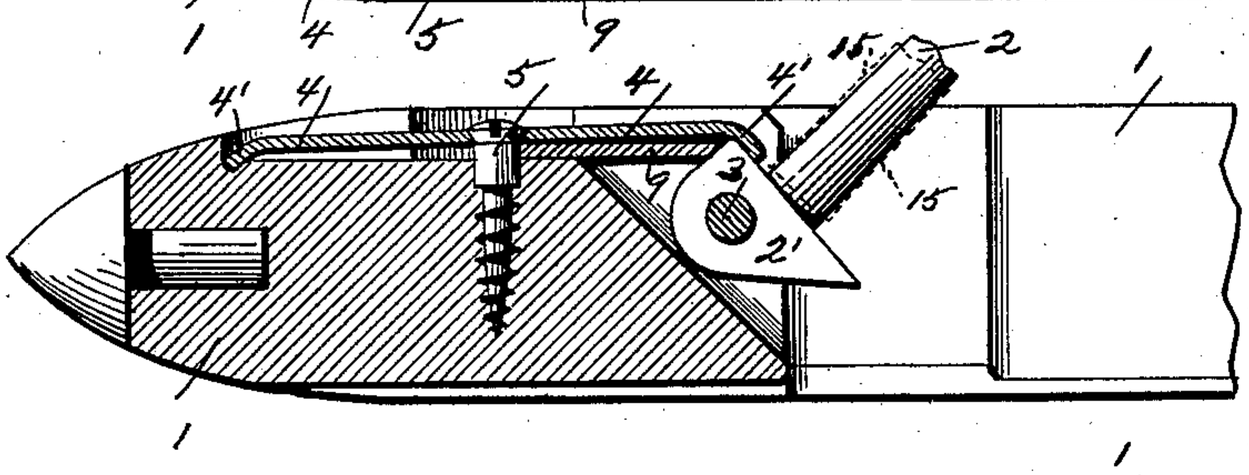

Fig. 10.

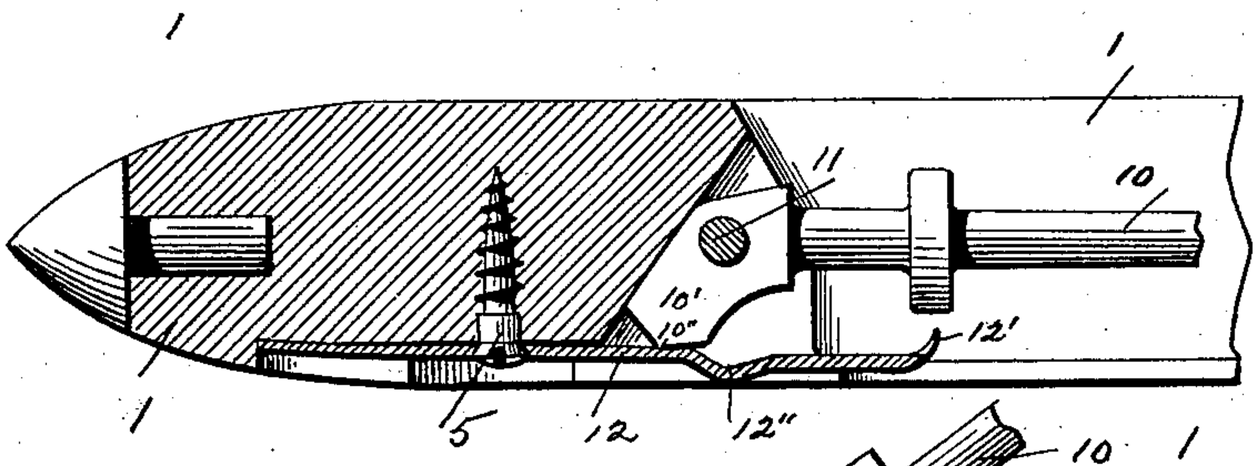

Fig. 11.

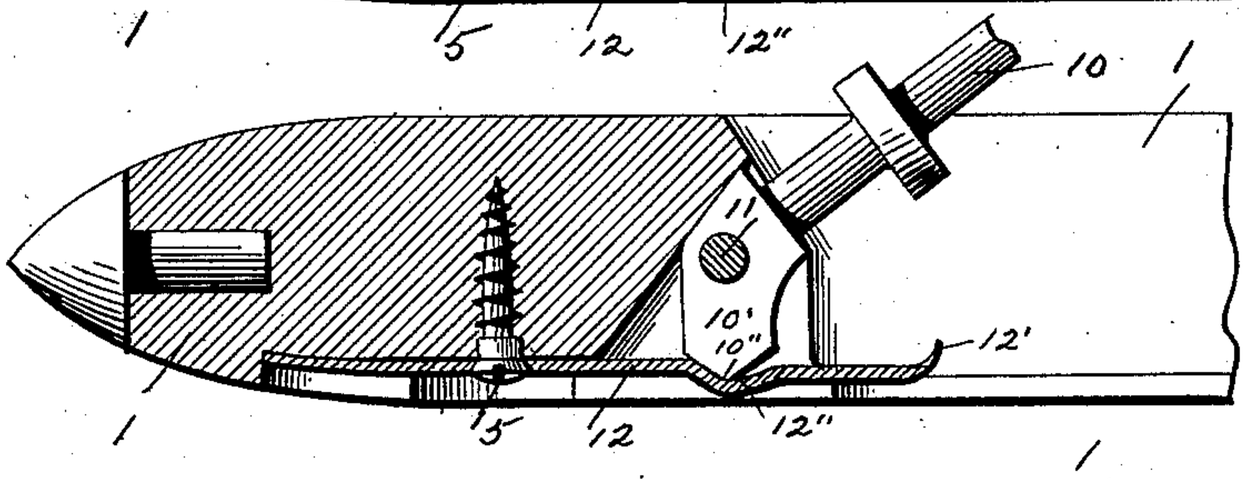

Fig. 12.

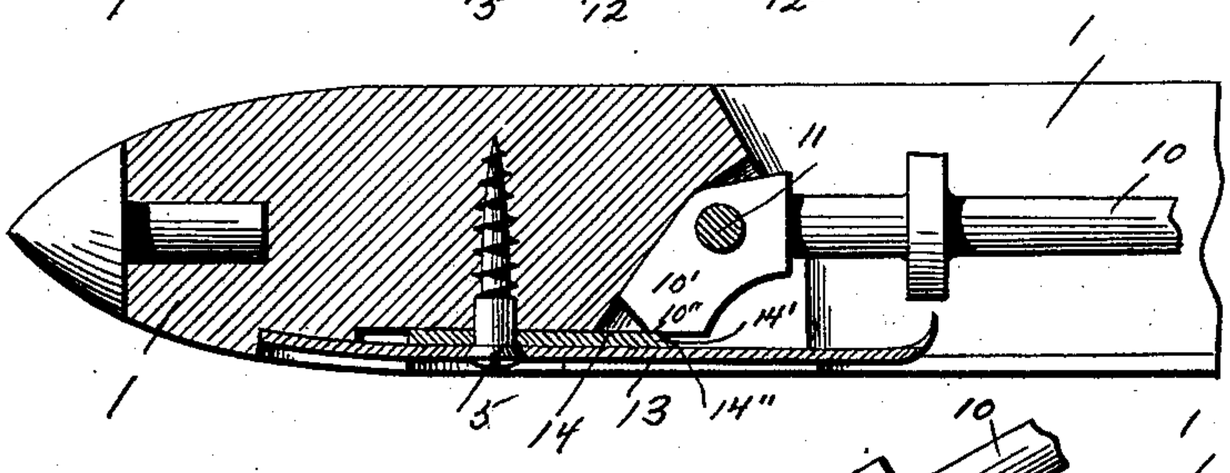

Fig. 13.

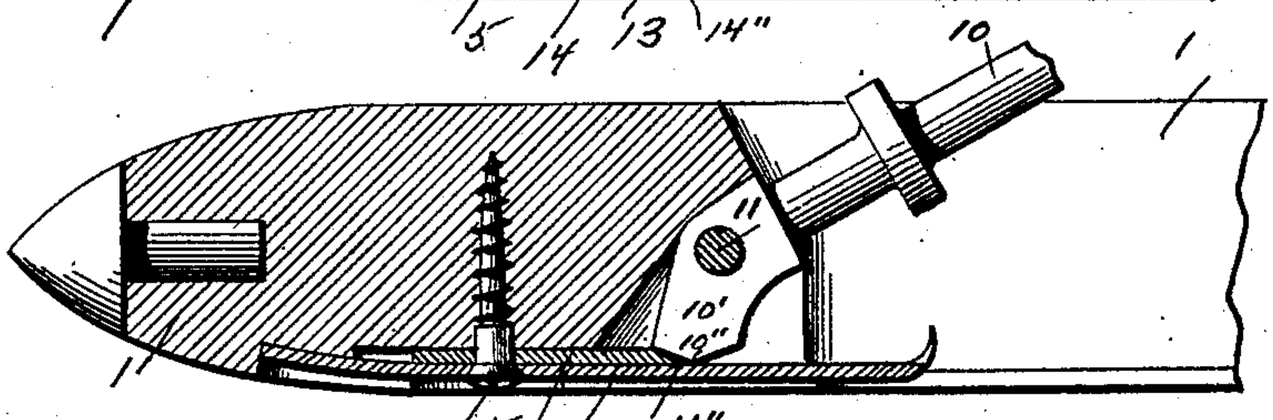

Fig. 14.

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UNITED STATES PATENT OFFICE.

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LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 576,921, dated February 9, 1897.

Application filed March 18, 1896. Serial No. 583,649. (No model.)

To all whom it may concern:

Be it known that I, OSCAR B. TRUESDELL, a citizen of the United States, residing at Sturbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Loom-Shuttles, of which the following is a specification.

My invention relates to loom-shuttles, and more particularly to the spring which holds the spindle in its lowered or raised position.

In the ordinary construction of the spring which engages with the head of the spindle the spring is liable to set or break when the spindle is raised by reason of the strain thereon. This setting or breaking of the spring causes considerable trouble, and also expense in replacing the broken springs with new ones; and, further, the screw which secures the spring to the shuttle, by reason of the great strain on it when the spindle is raised, frequently breaks or pulls out, necessitating other means for holding the spring. The pressure of the spring during the operation of raising the spindle on the head thereof will wear the corner of the head very fast, so that the point of contact of the spring with the head will be worn back to a point nearly over or back of the fulcrum-point of the head, and the leverage of the spindle thus being lost the pressure of the spring, to hold the spindle in its lowered or raised position, will be practically ineffective, so that a new spindle must be substituted. Other objections to the ordinary construction and shape of the spring which bears on the head of the spindle, to hold it in its lowered or raised position, might be stated, for example, by increasing the leverage of the spindle, by placing the fulcrum-pin farther from the point of contact of the spring with the spindle-head, or by increasing the pressure of the spring by screwing in the holding-screw, so that the spindle will be more firmly held down in the shuttle-body when the shuttle is in motion. The strain on the spring and screw when the spindle is raised is also increased in proportion, which is very objectionable for the reasons above stated.

The object of my invention is to provide a spring which will overcome the objections above stated; and my invention consists more particularly in so constructing the spring that the strain thereon will be relieved when the spindle is being raised and when it is in its raised position, and the leverage of the spindle, and the pressure of the spring on the head of the spindle, can be increased without increasing the strain on the spring and screw, when the spindle is raised, as will be hereinafter fully described.

Referring to the drawings, Figure 1 is a plan view of one end of a loom-shuttle provided with a spring embodying my improvements. Fig. 2 is a central longitudinal section on line 2, Fig. 1. Fig. 3 corresponds to Fig. 2, but shows the spindle raised. Fig. 4 is an edge view of the spring shown in Figs. 1, 2, and 3 detached. Fig. 5 shows a modified construction of the spring shown in Fig. 4. Fig. 6 corresponds to Fig. 2, except that the old form of spring is substituted for the spring shown in Figs. 1 to 4, inclusive. Fig. 7 corresponds to Fig. 3, except that the old form of spring is shown. Fig. 8 shows an edge view of the old form of spring shown in Figs. 6 and 7 detached. Fig. 9 corresponds to Fig. 2, except that a supplemental plate is shown combined with the spring, which acts as a stop to limit the raising of the spindle. Fig. 10 corresponds to Fig. 9, but shows the spindle in its raised position. A cop-tube is shown in broken lines. Fig. 11 shows a spring embodying my invention used in connection with what is termed the "Baldwin-head" spindle. Fig. 12 corresponds to Fig. 11, but shows the spindle in its raised position. Fig. 13 shows another form of spring embodying my invention used in connection with the Baldwin-head spindle, and Fig. 14 corresponds to Fig. 13, but shows the spindle in its raised position.

In the accompanying drawings, Figs. 1 to 10, inclusive, 1 is the shuttle-body of any ordinary shape and construction.

2 is the spindle, provided with a head 2′, which extends in a recess in the body of the shuttle and is pivoted on a pin 3, extending transversely in the shuttle-body in the usual way.

4 is a top spring embodying my improvement, which extends in a recess in the top of the shuttle-body, and is secured therein by a

screw 5 or other fastening device in the ordinary way. The spring 4 is reversible, so that either end may be used to act on the head of the spindle to hold it in its lowered or raised position.

In the spring 4 the ends of the spring which extend over and engage the upper side of the spindle-head when the spindle is in its lowered position are made bent, or provided upon their inclined surfaces with inclined portions 4′, which extend at an angle to the main portion of the spring, so that while the inner surface or main portion of the body of the spring extends in the arc of one circle the inner surface of the ends which come in contact with the spindle-head lie in the arc of another circle. By this construction of the ends of the spring I form a recess to receive the projecting portion of the spindle-head and lessen the pressure or strain on the spring when the spindle is being raised and held in its raised position, for as soon as the top point of the head of the spindle passes by the point or extreme end of the spring (shown in Figs. 1 to 5, inclusive) it follows the curve or incline on the end of the spring until it reaches the inner end of said incline when it is in its raised position, as shown in Fig. 3, and in this position the end of the spring is not raised to strain or break the spring or pull out the attaching-screw, but is substantially in its normal position. Moreover, by this construction the upper corner of the spindle-head is not worn and rounded, so as to bring the point of bearing of the spring on the head of the spindle back over the fulcrum. At the same time the fulcrum-pin may be set farther from the point of contact of the spring with the spindle-head to increase the leverage, or the attaching-screw may be screwed in to increase the pressure of the end of the spring on the spindle-head without causing the end of the spring to be raised any higher when the spindle is in its raised position.

In Fig. 5 is shown a modified construction of the spring shown in Fig. 4, in which the ends of the spring are thickened to provide curved or inclined surfaces 4′ at the ends, on the inner surface thereof, leaving the top surface of the spring of uniform curvature.

In Figs. 6 and 7 is shown the old form of top-spring, in which the spring 7 has a uniform curvature throughout its length, both on its top and bottom surfaces.

When the spindle is raised, as shown in Fig. 7, the end of the spring must be continually raised, causing a great strain to come on the spring at the point where it is attached to the shuttle-body by the screw 8, often causing the spring to break, and when it is desired to increase the pressure of the spring on the spindle-head when the spindle is down by screwing in the screw 8 a greater strain will be given to the end of the spring when the spindle is raised, which is not the case with my improved spring when the attaching-screw is screwed in.

In Figs. 9 and 10 of the drawings I have shown, combined with the spring shown in Fig. 4, a supplemental plate 9, which is secured in the shuttle-body below the spring 4 by the attaching-screw 5. The plate 9 does not extend to the end of the spring 4, and when the spindle is raised, as shown in Fig. 10, the end of the plate 9 comes in contact with the top corner of the spindle-head, as shown in Fig. 10, and limits the raising of the spindle and prevents the end of the spring from coming in contact with the cop-tube 15. (Shown by dotted lines in Fig. 10.)

I have shown in Figs. 11, 12, 13, and 14 what is termed a "Baldwin-head" spindle, which is shown and described in United States Letters Patent No. 1,485, of January 31, 1840, and a spring embodying my invention combined therewith. The spring is attached to the lower side of the shuttle instead of the upper side, as in the case of the spring 4, and acts upon the spindle-head to hold it in its raised or lowered position below and back of the fulcrum-point of the spindle-head. The upper edge of the spindle-head, when the spindle is in its raised position, strikes against the body of the shuttle and limits the raising of the spindle. In said Figs. 11, 12, 13, and 14 the spindle 10 is provided with a head 10′, ordinarily termed the "Baldwin head." A transverse pin 11 forms the fulcrum of the spindle.

The spring 12 embodying my invention is secured in the under side of the shuttle-body by the attaching-screw 5, and is in this instance provided with a catch 12′ at its end which extends into the circumferential groove in the bobbin (not shown) in the usual way. The spring 12 is provided with a recess 12″ therein for the purpose of relieving the strain on the spring when the spindle is being raised and is in its raised position, as shown in Fig. 12. That portion of the spring just back of the recess 12″ bears on the spindle-head back and below the fulcrum-point thereof when the spindle is in its lowered position, as shown in Fig. 11.

When the spindle is being raised, the lower corner or point 10″ of the head thereof follows down the outward incline or depression in the spring formed by the recess 12″ therein and extends into said recess. When the spindle is in its raised position, as shown in Fig. 12, the inclined portion of the recess bears on the inclined edge of the spindle-head below and back of its fulcrum-point and forces the upper edge of the spindle against the shuttle-body, as shown in Fig. 12.

By means of the bend in the spring forming the recess 12″ I accomplish with the Baldwin-head spindle the same result that I accomplish with the spring 4 in connection with the ordinary spindle-head, that is, I relieve the strain on the spring when the spindle is in its raised position. At the same time I can increase the leverage of the spindle by placing the fulcrum-pin farther from the

point of contact of the spindle and spring, or I can increase the pressure of the spring by screwing in the attaching-screw 5 without increasing the strain on the spring to any extent, and, further, I prevent the wearing of the lower corner or end of the spindle-head from the raising and lowering of the spindle, as is the case in the old form of spring used in connection with the Baldwin-head spindle.

In Figs. 13 and 14 I have shown a modified construction of the spring 12. (Shown in Figs. 11 and 12.) To provide the incline for the lower corner or point 10″ of the spindle-head to follow down when the spindle is being raised and the recess into which the lower corner or head of the spindle extends when the spindle is in its raised position, instead of bending the spring, as shown in Figs. 11 and 12, I combine with the ordinary spring, as 13, Figs. 13 and 14, a supplemental plate 14, extending upon the inside of the spring 13 and secured in the shuttle-body by the attaching-screw 5. The end 14′ of the supplemental plate 14 extends just beyond the lower point or corner of the spindle-head, as shown in Fig. 13, when the spindle is in its closed position, to bear on the spindle-head below and back of its fulcrum-point to act, in connection with the spring 13, to hold the spindle in its lowered position.

The end of the plate 14 is beveled and, in connection with the spring 13, forms a depression or recess 14″, into which the lower end or corner of the spindle-head extends when the spindle is in its raised position, as shown in Fig. 14. The spring 13 and plate 14, bearing on the lower end of the spindle at a point below and back of its fulcrum, holds the spindle in its raised position with the upper side of the head thereof bearing against the body of the shuttle, as shown in Fig. 14. It will thus be seen that by means of the supplemental plate 14, in connection with the ordinary spring 13, I provide a depression or recess into which the lower end or corner of the spindle extends when the spindle is in its raised position, and I accomplish the same result as is obtained by the recess 12″ in the spring 12, Figs. 11 and 12, that is, I relieve the strain on the spring, &c.

In carrying out my invention I do not limit myself to the particular form or construction of the spring shown in the drawings or its application to the particular spindles shown, as my invention may be embodied in other forms of springs and applied to other kinds of spindles, and I intend to cover, broadly, a spring for shuttle-spindles to hold them in their lowered or raised positions and so constructed as to relieve the strain on the spring when the spindle is being raised and in its raised position.

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

1. The combination with a shuttle-body, and a spindle pivoted therein, of a spring having the end which engages the spindle-head, when the spindle is in its lowered position extending at an angle to the body of the spring, to form a recess into which the projecting portion of the spindle-head will extend, when the spindle is raised, substantially as described.

2. The combination with a shuttle-body, and a spindle pivoted therein, of a spring having a recess to receive the projecting portion of the spindle-head, and release the tension on the spring when the spindle is raised, substantially as described.

3. In a loom-shuttle provided with a spindle pivoted therein, the combination with a spindle-spring, having the end which engages the spindle-head bent or inclined at an angle to the main portion of the spring, of a supplemental plate extending under the spring, the end of which plate is engaged by the projecting end of the spindle-head when raised, to limit the raising of the spindle, substantially as described.

4. The combination with a shuttle-body, and a spindle pivoted therein, of a spring, and a supplemental plate on the inside of said spring, forming a recess to receive the projecting portion of the spindle-head, and release the tension on the spring when the spindle is raised, substantially as described.

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