

(No Model.)

A. ISHERWOOD.
LOOM SHUTTLE.

No. 563,179.

Patented June 30, 1896.

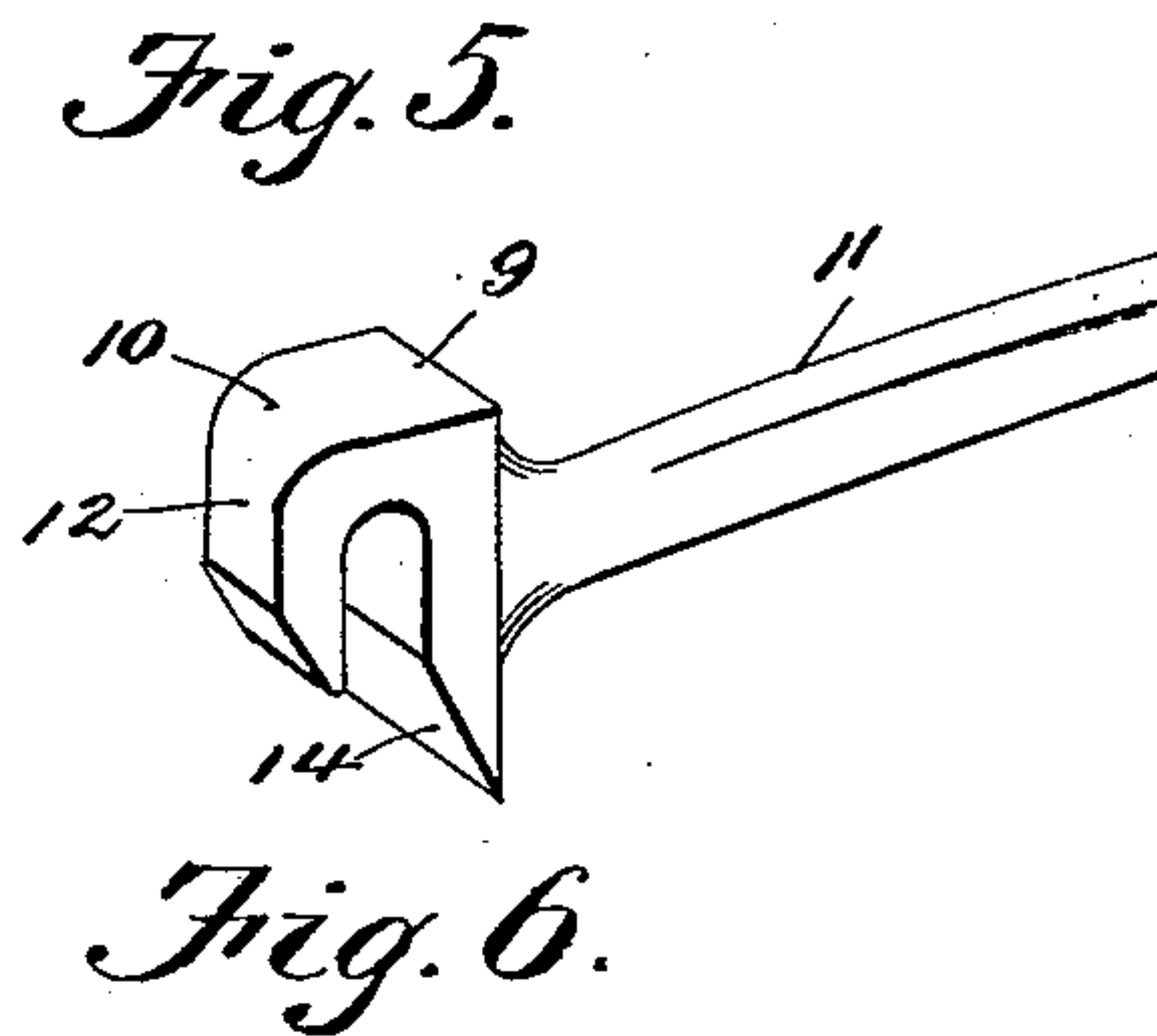
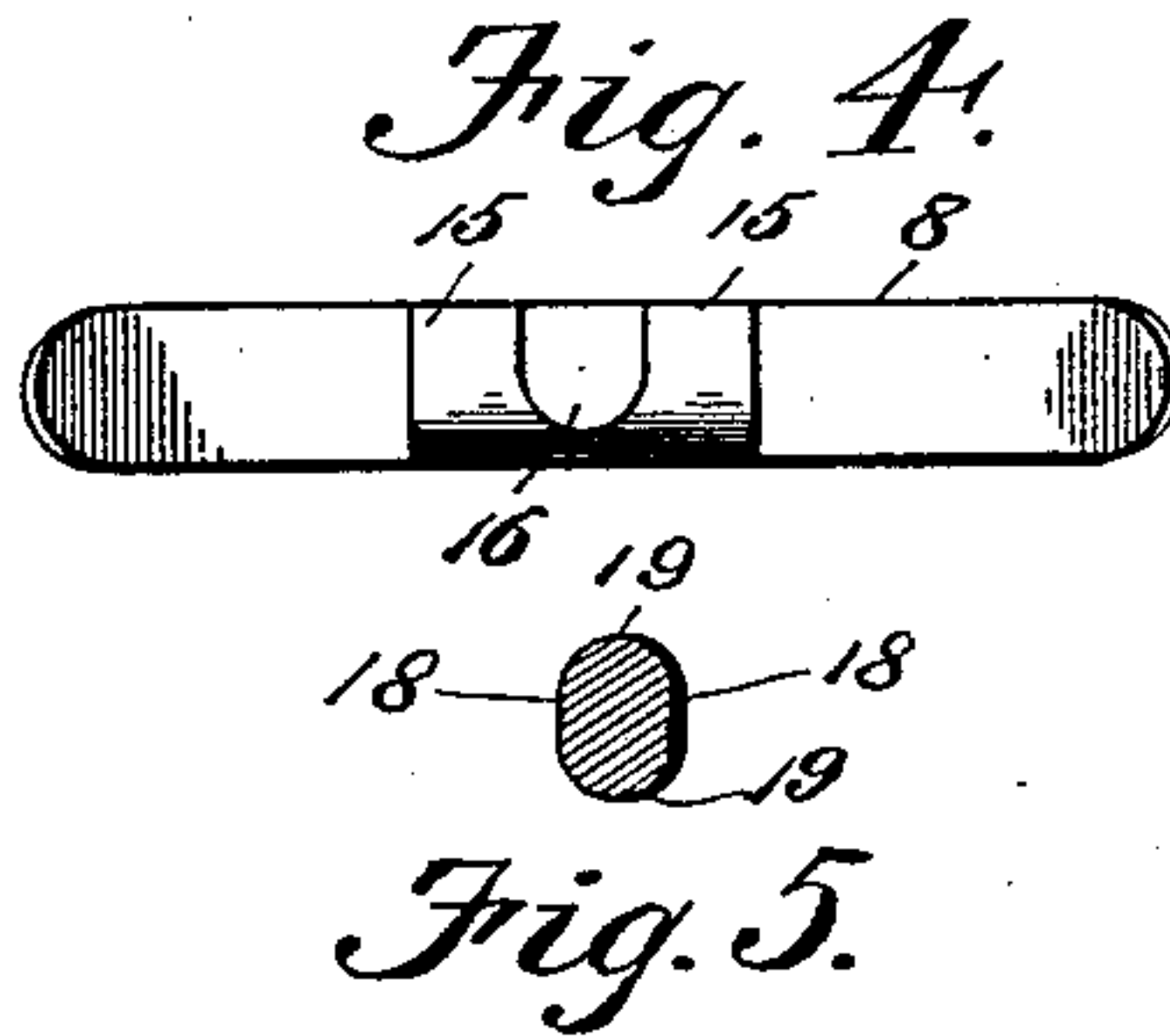
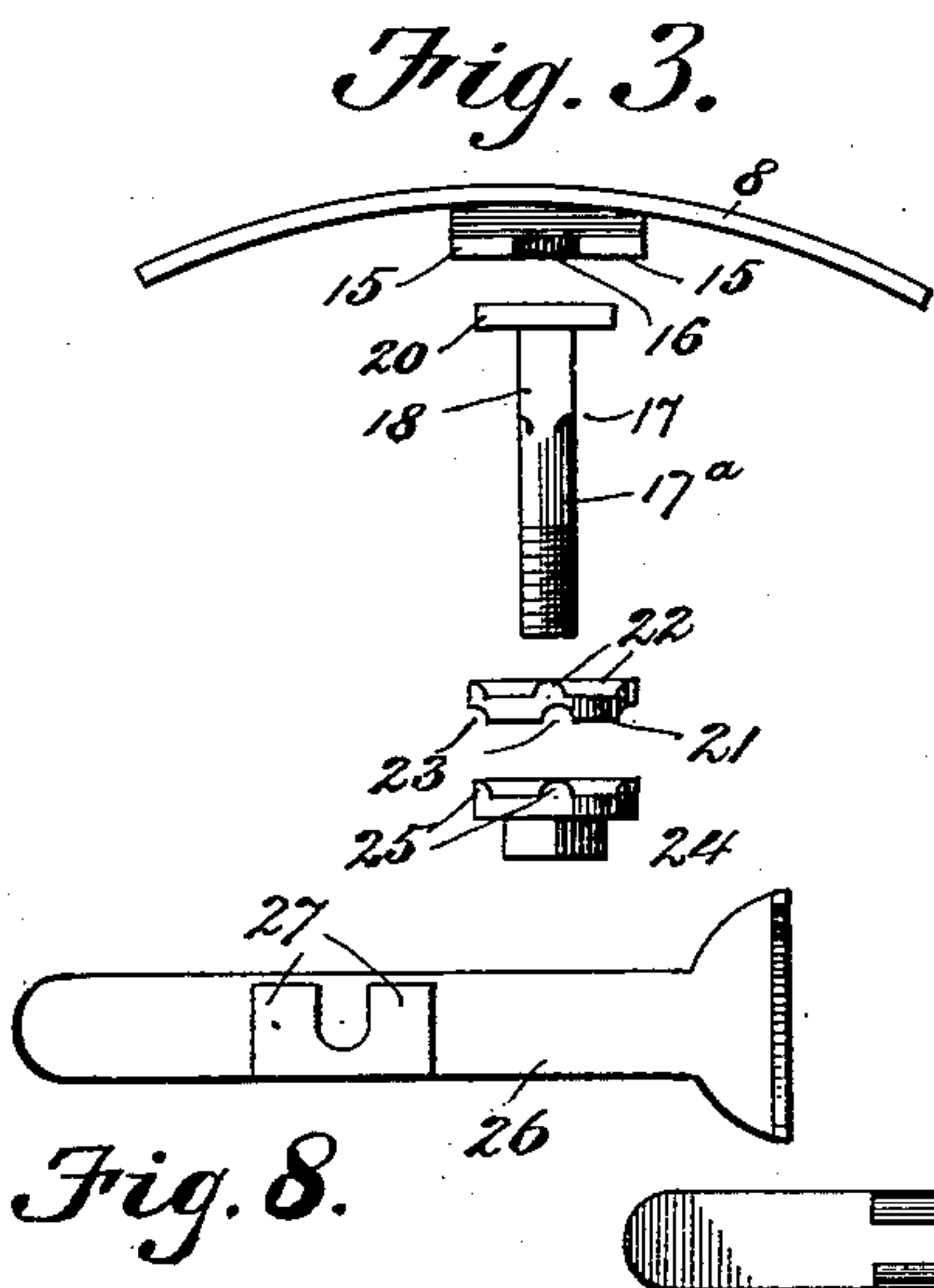
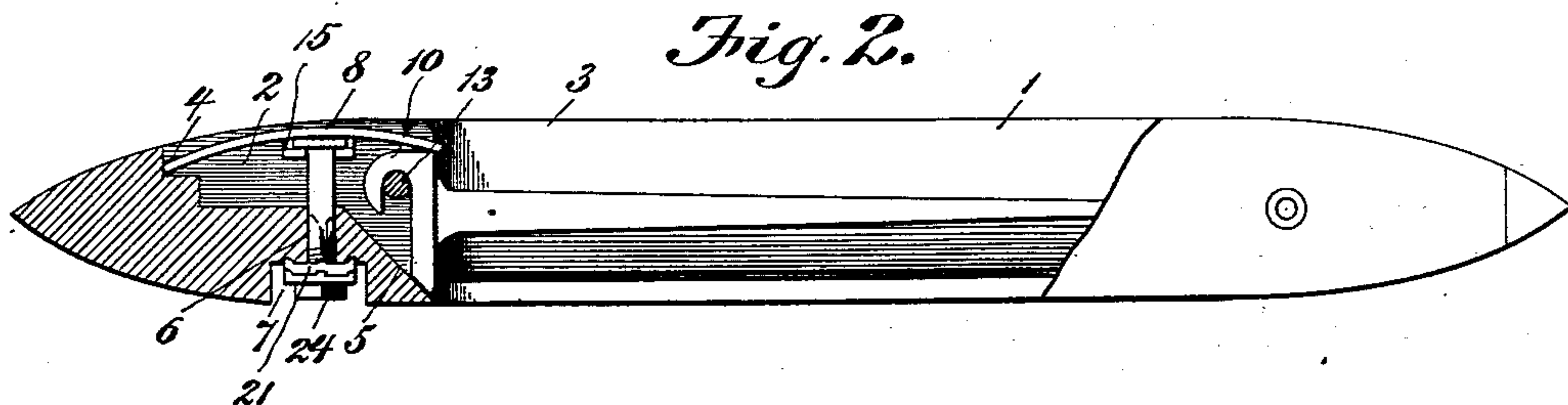
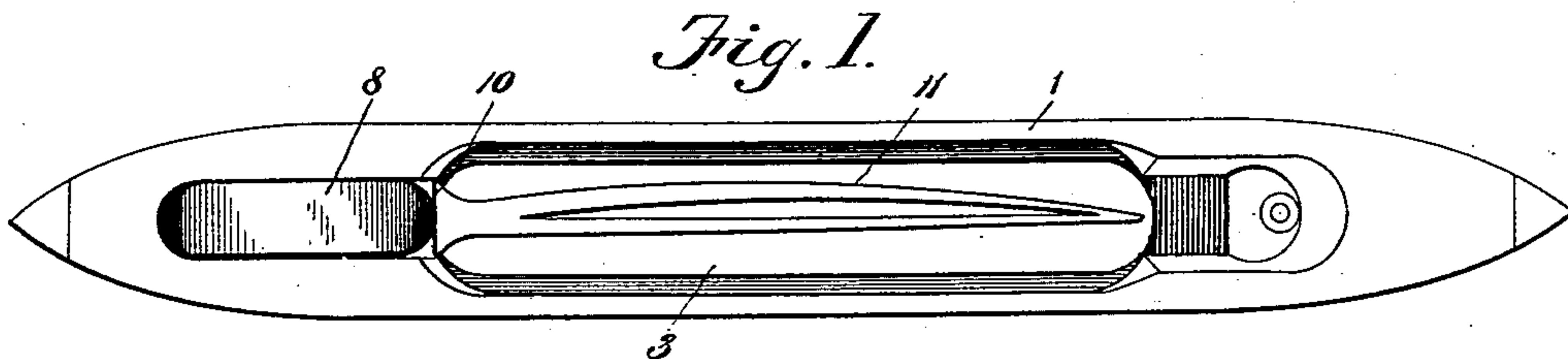


Fig. 7.

Witnesses
W. S. Duvall.
T. J. Keating

Inventor
Alfred Isherwood,
By *W. S. Duvall* Attorney.

UNITED STATES PATENT OFFICE.

ALFRED ISHERWOOD, OF NEW BEDFORD, MASSACHUSETTS.

LOOM-SHUTTLE.

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To all whom it may concern:

Be it known that I, ALFRED ISHERWOOD, a citizen of the United States, residing at New Bedford, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Loom-Shuttles; 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.

My invention relates to the class of weaving, but more particularly has reference to certain improvements in the shuttles employed therein.

The objects of my invention are to obviate, as much as possible, in the shuttle all angular shoulders or protrusions that are calculated to engage the warp-yarn or offer obstructions of any kind whatever; to strengthen the shuttle-spring and also the bobbin-catch spring, when the latter is employed, by avoiding the necessity of forming bolt or screw receiving holes therein.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a shuttle embodying my invention. Fig. 2 is a partial side elevation and sectional view of the same. Fig. 3 is a view showing in detail the shuttle-spring, its bolt, washer, and nut. Fig. 4 is an inverted plan view of the shuttle-spring; Fig. 5, a transverse sectional view of the bolt just below the head. Fig. 6 is a perspective view of the inner or pivoted end of the spindle. Fig. 7 is an inverted plan view of a bobbin-catch spring having my invention applied. Fig. 8 illustrates how the invention may be applied to a bobbin-catch spring.

Like numerals of reference indicate like parts in all the figures of the drawings.

The shuttle-body 1 has formed upon its upper side at one end the recess 2, which at its front end communicates with the filler-opening 3. This recess 2, at its rear wall, is provided with an angular seat 4, while at its front end there is formed an inclined surface 5. Between the seat 4 and the surface 5 a vertical perforation 6 is formed, which latter commu-

nicates at its lower end with an annular cavity 7, produced in the under side of the shuttle-body. The recess 2, it will be observed, extends from a point near one end of the shuttle-body to and communicates with the filler-opening 3, and, as will be seen, is of a uniform width throughout its length. Heretofore it has been customary to produce this recess with an intermediate enlargement for the purpose of receiving the intermediate circular portion of the shuttle-spring. This circular portion of the shuttle-spring was necessarily employed, so as to obviate too great a weakening of the spring by the formation of the usual bolt-hole, which caused a reduction of metal at this point. This intermediate enlargement of the recess and shuttle-spring produced protrusions in the way of shoulders of a more or less angular nature, which often engaged with the yarn and offered obstructions to the free and unimpeded passage of the shuttle in its reciprocation. By my invention, as will hereinafter appear, it will be seen that I entirely avoid this possibility, in that, as before stated, I propose to construct the recess 2 of a uniform width throughout its length.

The shuttle-spring 8 corresponds in width to the recess 2, and at its rear end is seated in the angular seat 4 of said recess, while its front end projects over and rests upon the angular shoulder 9 of the head 10 of the spindle 11. The head 10 of the spindle is provided at its rear side with a hook 12, which engages removably over a transverse pin 13, passed through the shuttle-body and walls of the recess near 2 the front end of the latter and immediately above its inclined surface 5. The lower end of the head 10 is beveled, as at 14, and projects below the hook 12, so that when in position within the shuttle-body the same rests against the inclined surface 5 of the recess 2. Of course it will be understood that any kind or shape of spindle-head may be employed in lieu of that shown. Between its ends and upon its under side the spring has located a pair of horizontal lips 15, between which exists a recess 16. In the preferred manner of producing these lips, a portion of the stock from which the spring is formed is permitted to remain intact at one edge of the latter, and after being punched to form the opening 16 is bent downwardly and laterally

under the spring, as best shown in Figs. 3 and 4 of the drawings.

In Fig. 7 I have illustrated a second, though not preferable, manner of producing the lips 15. In this instance portions of the stock from which the spring is formed are left at opposite sides of the spring and are subsequently downwardly and horizontally bent toward each other, producing the lips 15' and the intermediate recess 16', which latter is open at both ends.

17 designates the shuttle-spring bolt, and the same comprises the lower cylindrical threaded portion 17^a, above which two sides of the bolt are made flat or parallel, as at 18, the remaining two sides being rounded, as at 19, as best shown in Fig. 5. It will be seen that the shape of the bolt 17, in cross-section near its upper end, is such as to cause it to fit in the recess 16 between the lips 15, in which position it will be held against turning by reason of the fact that the parallel edges of the two lips embrace the opposite flat sides 18 of the bolt, and by reason of the further fact that the angular head 20 of the bolt rests against the flat surface of that portion of the spring-stock that lies between the spring proper and the lips. The opening 6 in the shuttle-body, and through which the bolt extends, is likewise squared at its upper end and opposite sides, so that the shape of this opening is such as to further assist in preventing the bolt from turning.

The lower end of the bolt extends into the cavity 7 of the shuttle-body, and upon this lower end, within the cavity, is located a washer 21, upon whose upper side superficial ribs are located which engage with the fiber of the wood of the shuttle-body. The under side of the washer has formed therein radial grooves 23, which correspond with the ribs 22. Below the washer upon a bolt is threaded the nut 24, which is contained wholly within the cavity 7, and which has formed upon its upper side radial superficial ribs 25, that correspond with and are designed to engage the grooves 23 in the under side of the superimposed washer 21.

By first arranging the spindle upon the transverse pin 13 and subsequently inserting the neck of the bolt between the lips 15 of the spring, and finally introducing the lower end of the bolt through the opening 6 of the shuttle-body, the bolt is in position to be secured. This is accomplished effectually by first introducing the washer 21 over the lower end of the bolt and subsequently following such introduction by an application of the nut 24 and a tightening of the latter upon the bolt. In such tightening a socket wrench or key is employed, and the farther the nut is run upon the bolt the more will the spring be drawn downward and placed under greater tension upon the head of the spindle. The bolt being immovable for the reason before stated, and the washer being forced upward until its ribs engage with the fiber of the wood, and

the ribs of the nut being in engagement with the grooves in the under side of the washer, it will be obvious that the nut is most positively and effectually secured against any accidental retrograde movement, and that any tension desired may be placed upon the spring.

It will be seen that the side walls of the recess 2 and the side edges of the shuttle-spring contained therein are wholly without angles or shoulders that could offer any obstruction to the movements of the shuttle or that will engage the warp-yarn, and, furthermore, that the spring is not weakened by perforation for the passage of the bolt, and that the head of the latter is wholly concealed from view.

In Fig. 8 I have illustrated how this invention may also be applied to that class of shuttles employing bobbin-catch springs. As is well known, it has been customary, in most instances in which a bobbin-catch spring is employed, to construct the bobbin-catch spring and its recess in somewhat the same manner as the shuttle-spring in the class of shuttles hereinbefore referred to, that is, the recess would be widened at an intermediate point, and likewise would the bobbin-catch be so widened and perforated. Therefore, although the invention is primarily intended to improve the shuttle-spring, yet it will be obvious that the bobbin-catch spring 26 may, as shown in Fig. 8, be provided with the parallel lips 27 upon its upper side and formed from the same stock as and integral with said catch. Therefore, by employing the general term "shuttle-spring," I mean the ordinary shuttle-spring or bobbin-catch spring, whichever form of spring is used.

Having described my invention, what I claim is—

1. The combination with the shuttle-body having a recess in its upper side, and a spindle having its head pivoted at the inner end of the recess, of an imperforate shuttle-spring arranged within the recess and at its inner end bearing on the head of the spindle, a bolt passed through the shuttle-body and removably connected to the under side of the spring and a retaining device on the lower end of the bolt, substantially as specified.

2. The combination with the shuttle-body having a recess in its side, and a headed spindle pivotally mounted at the inner end of the recess, of a shuttle-spring seated in the recess and at its front end bearing on the spindle-head, said spring between its ends having a pair of lips horizontally disposed and spaced apart and located under the spring, a bolt having its head resting upon the lips and its body portion embraced thereby and extending through the shuttle-body, and a securing device on the lower end of the bolt, substantially as specified.

3. The combination with the shuttle-body having the recess of uniform width formed in the upper side near one end, and the angular headed spindle pivoted at the inner end of the same, of the shuttle-spring within the

recess and bearing at one end on the head
of the spindle, said spring having at one side
a depending portion at the lower end of which
is located a pair of horizontal spaced-apart
5 lips, a bolt having an angular head seated on
the lips and having one of its flat faces abut-
ting against the depending portion of the
spring, the lower oppositely-flattened portions
of the bolt and the extreme lower cylindrical
10 portion thereof passing through a correspond-
ingly-shaped opening in the shuttle-body and
terminating in a cavity in the under side of
the same, a nut on the lower end of the bolt
within the cavity, and means for locking the
15 nut upon the bolt, substantially as specified.

4. As a new article of manufacture, an im-
perforate shuttle-spring of uniform width
having integrally-formed parallel lips on its
under side and adapted to support a bolt-
head and receive and embrace the body por- 20
tion thereof, substantially as specified.

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

ALFRED ISHERWOOD.

Witnesses:

JAMES REED,
THOMAS ISHERWOOD.