

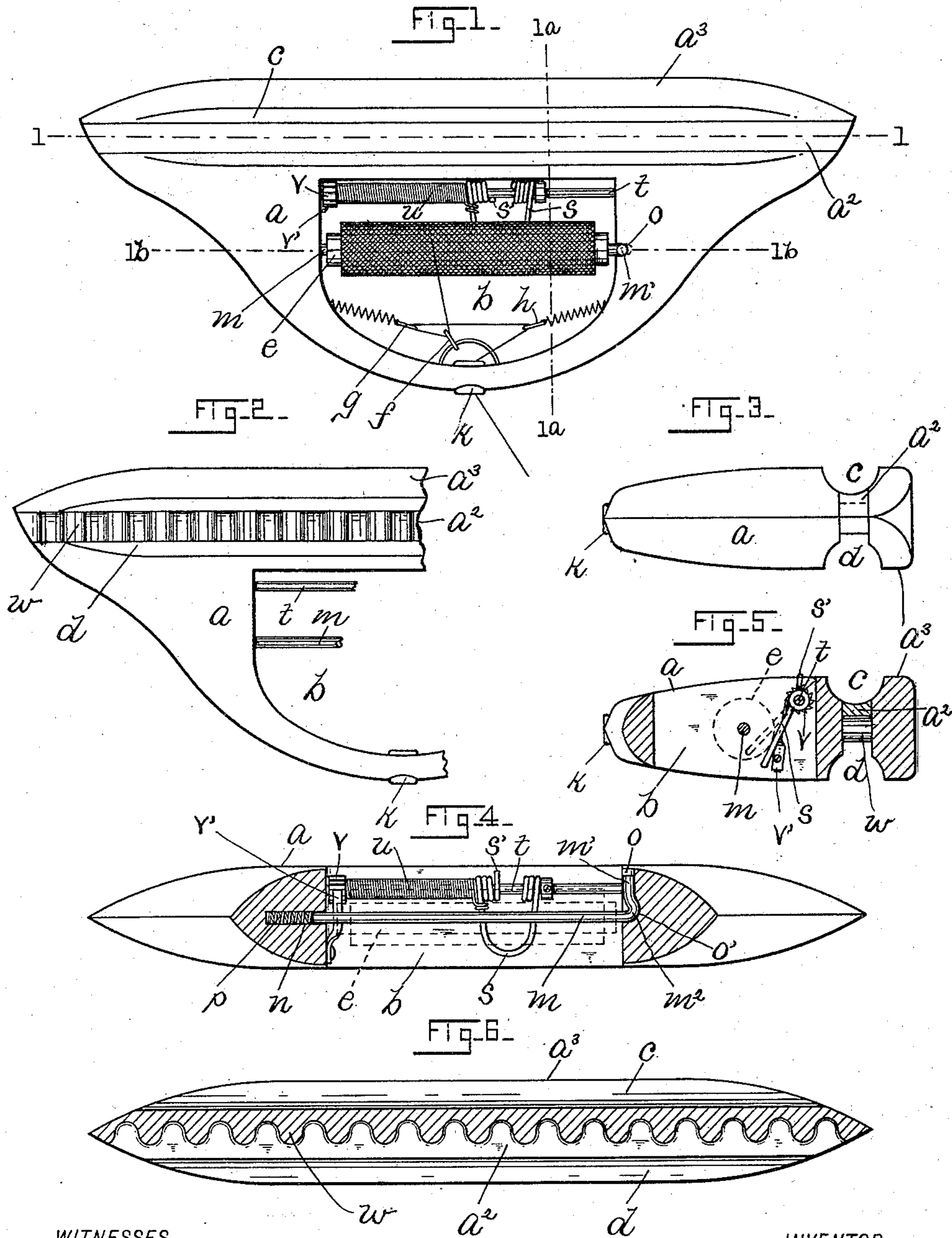
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SHUTTLE.

(Application filed Jan. 24, 1899. Renewed Feb. 14, 1900.)

(No Model.)



WITNESSES

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SHUTTLE.

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To all whom it may concern:

Be it known that I, EDWIN OLDFIELD, a citizen of the United States, residing at Norwich, in the county of New London, State of Connecticut, have invented certain new and useful Improvements in Shuttles, of which the following is a full, clear, and exact description.

This invention relates to shuttles for use in ribbon and other narrow-fabric looms, my purpose being to improve the tension and quill-holding devices of such shuttles. I have also improved materially the construction of the body portion of the shuttle with a view to increasing its efficiency and durability.

To assist in explaining this invention, the accompanying drawings have been provided, illustrating the same, as follows:

Figure 1 is a plan view of a shuttle embodying my newly-invented improvements. Fig. 2 is a plan view of a portion of the reverse side of the shuttle to that shown in Fig. 1, and Fig. 3 is an end view of the said shuttle. Figs. 4, 5, and 6 are sectional views of my newly-invented shuttle and are taken, respectively, on the lines 1^b 1^b, 1^a 1^a, and 1 1 of Fig. 1.

Referring to the drawings, the letter *a* denotes as a whole my newly-invented shuttle, having the usual opening *b* for the reception of the quill and the tension device, and the letters *c d* denote grooves provided in the opposite faces of the shuttle and extending parallel to the back thereof, which said grooves are adapted to cooperate with certain tracks or ways provided on the batten of the loom for the support of the shuttle and to guide the latter in its travel.

The reference-letter *e* denotes a quill located in the said opening *b* and having the thread wound thereon, said thread leading in turn through the usual rings *f, g*, and *h* and out from the shuttle through the eye *k*, the general arrangement of the several elements thus far mentioned and the general construction and operation of the shuttle being well understood by those conversant with the class of looms with which it is adapted for use.

Describing now the manner of supporting the quill *e*, the reference-letter *m* denotes a pin extending across the opening *b*, parallel with the length of the shuttle, and adapted to

pass through the said quill *e*, as shown. One end of the pin *m* is received in a hole *n*, provided in one of the walls of the opening *b*, and the opposite end of said pin is bent substantially at right angles to its main portion. To receive said right-angular portion, (denoted by the letter *m'*), the wall of the opening *b* opposite the hole *n* is grooved, as at *o*, said groove extending from the face of the shuttle to a point directly opposite the hole *n*.

The letter *p* denotes a spring located in the hole *n* and confined therein (when the pin *m* is in position) between the bottom of said hole and the adjacent end of the pin. The spring *p* seeks by expansion to force the pin *m* outward, and thus serves to hold the right-angular extension *m'* of the latter in close contact with the groove *o*. To prevent the accidental displacement of the said pin, the groove *o* is undercut, as at *o'*, and the pin *m* is bent to form an extension *m*² to fit such undercut portion, as shown.

When the above construction is provided, it will be seen that should it be desired to remove the pin *m* (as would be necessary in removing or replacing the quill) said pin must first be caused to travel longitudinally in the hole *n*, against the force of the spring *p*, sufficiently to withdraw the pin portion *m*² from the undercut groove portion *o'*, after which the pin may be readily removed from the shuttle-body. Should it be desired to replace the pin and quill, the pin end is entered in the hole *n*, and the opposite end of said pin is pressed downward in the groove *o* with sufficient force to compress the spring *p*, which latter then acts to force the projection *m*² into the undercut seat *o'*.

My said newly-invented tension device has for its office to prevent the loose rotation of the quill *e* upon its supporting-pin and to thus provide suitable tension upon the thread as it renders therefrom. Describing now said device, the letter *s* denotes an arm mounted upon a pin *t*, crossing the opening *b* parallel with the pin *m*, the free end of which arm is adapted to engage and drag upon the quill *e* or the thread wound thereon. Said arm is here shown as a piece of wire doubled upon itself, the bow portion thus provided forming the free end of said arm and the ends of the same being here shown as coiled upon the

pin *t* to secure the arm to the pin. To hold the arm *s* in close contact with the quill *e* as the thread is drawn therefrom, a coiled spring *u* is located upon said pin *t*, one end of which
 5 spring is secured to the arm *s* and the opposite end to a ratchet *v*, also mounted upon the pin *t*. A spring-pawl *v'* is secured to that wall of the opening *b* adjacent to the said
 10 ratchet *v*, which pawl is adapted to engage the ratchet, as shown in the drawings, to lock the same from accidental rotation.

With the construction shown and described it will be seen that the spring-pawl *v'* may be disengaged, if necessary, to permit the winding or unwinding of the spring *u* to correspondingly increase or diminish the frictional engagement of the arm *s* with the quill *e*. To
 15 limit the rocking of the arm *s* when the quill and its pin are removed from the shuttle, one of the ends *s'* of the wire arm *s* extends beyond its coil sufficiently to engage the rear wall of the opening *b*, as shown in the drawings.

It will of course be obvious that the arm *s* and spring *u* could be constructed of a single
 25 piece of wire; but I preferably construct the said arm of slightly-heavier wire, as shown.

As already stated, a feature of my invention consists in the improvement of the shuttle proper, and this feature I will now proceed to explain.

Ordinarily the body of shuttles of this class is produced in a single piece and the rack *w* (by means of which the shuttle is driven) is
 35 secured in the bottom of the groove *d* by glue; but when thus constructed the body portion or base that supports the rack-teeth must necessarily be thin, thus providing at best a weak means of support for said teeth that
 40 is frequently breaking away. To overcome this difficulty, I provide a shuttle *a*, consisting of three parts, the main one of which, constituting the body portion, is denoted by the letter *a*. Another portion of said shuttle
 45 may be termed the "rack-section" *a*², consisting of a strip having the rack-teeth *w* cut therein, and the third portion I term the "back section" *a*³. The several parts *a*, *a*², and *a*³ are glued or otherwise secured together to produce the complete shuttle. In
 50 this new construction it will be understood that the rack-teeth *w* are cut directly in the strip *a*², thus providing a strong support for said teeth. The face of section *a*² opposite
 55 the rack-teeth is cut away and forms the bottom of the grooved guideway *c*, which, cooperating with a suitable track, guides the complete shuttle in a right line as it travels forward and backward on the batten.

60 The described manner of constructing the shuttle makes it possible to bring the points of the shuttle exactly in line with the longitudinal center of said shuttle, (see Fig. 6,) whereas in shuttles of ordinary construction
 65 the point must be offset from said center, else the base of the strip in which the rack-teeth are formed would be entirely cut away.

In order to thus bring the points of the shuttle in line with the center of the shuttle-body, it is necessary that the pitch-line of the rack-teeth shall also register with the shuttle-points and center of the shuttle-body. When
 70 the rack is formed independently and glued in place in the bottom of groove *d*, as first above described, a seam or joint is exposed at each end of the shuttle, when the rack is
 75 glued to the solid part of the shuttle and the rack-base is also cut nearly through, for it should be understood that the guideway *c* must be provided on the opposite side of the
 80 shuttle, and therefore the combined intervening solid portion of the body and the base that supports the rack-teeth are of necessity very thin; but by forming the said solid portion and rack-base of a single piece a substantial support for the teeth is provided and
 85 the described objectionable seam or joint is avoided. When the said exposed joints are present, there is always a tendency on the part of the fine warp-threads to catch in the said
 90 joints and break, particularly when weaving silk goods.

My new construction allows the point of the shuttle to pass centrally through the "shed" of the warp instead of above said center, as is
 95 commonly the case, where it is likely to "pick up" any of the warp-threads that may sag or be otherwise displaced. It also provides a substantial support for the rack-teeth without interfering in any way with the groove *c*.

A further advantage of constructing the shuttle of sections assembled in the particular manner described is in the fact that the intermediate section *a*² may, if desired, be of
 100 hard wood, like lignum-vitæ, or of metal, thus increasing the efficiency and durability of the wearing surfaces—to wit, the rack and guideway—without materially increasing the weight of the complete shuttle. It should be
 105 understood that I am not seeking simply to cover by Letters Patent a shuttle-body built up of several parts, as it has to my knowledge been more or less common to so construct shuttles and various other articles for convenience of construction or economy of materials. My immediate aim is to provide a
 110 peculiar, novel, and useful arrangement of sections whereby the desirable results which I have referred to may be cheaply and practically attained.

As a whole the above-described improvements greatly improve this class of shuttles, while at the same time the expense of producing a shuttle embodying the same is no greater than when constructed in the ordinary
 125 manner.

Having thus described my invention, I claim—

1. In a shuttle of the class referred to, in combination with the quill-supporting pin, a
 130 tension device consisting of a pintle supported in the shuttle-body, parallel with the quill-supporting pin and having a radial arm *s* and stop projection *s'* as set forth, a spring coiled

upon the said pintle and having one end in engagement with the said tension-arm *s* and operating to hold said arm in yielding engagement with the quill, as specified, and means
5 for adjusting the torsional tension of said spring.

2. A shuttle comprising, in combination, the body portion *a*, the back-section *a*³, and the rack-section *a*² interposed between the
10 said body and back sections; one exposed face of the section *a*² being formed with rack-teeth

the pitch-line of said teeth being in line with the center of the shuttle-body as set forth and the other exposed face being cut away to form the bottom or wearing portion of the guide-
15 way *c*.

Signed at Norwich, Connecticut, this 16th day of January, 1899.

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Witnesses:

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