W. W. STEARNS.

SHUTTLE.

APPLICATION FILED JUNE 27, 1910.

978,502. Patented Dec. 13, 1910.

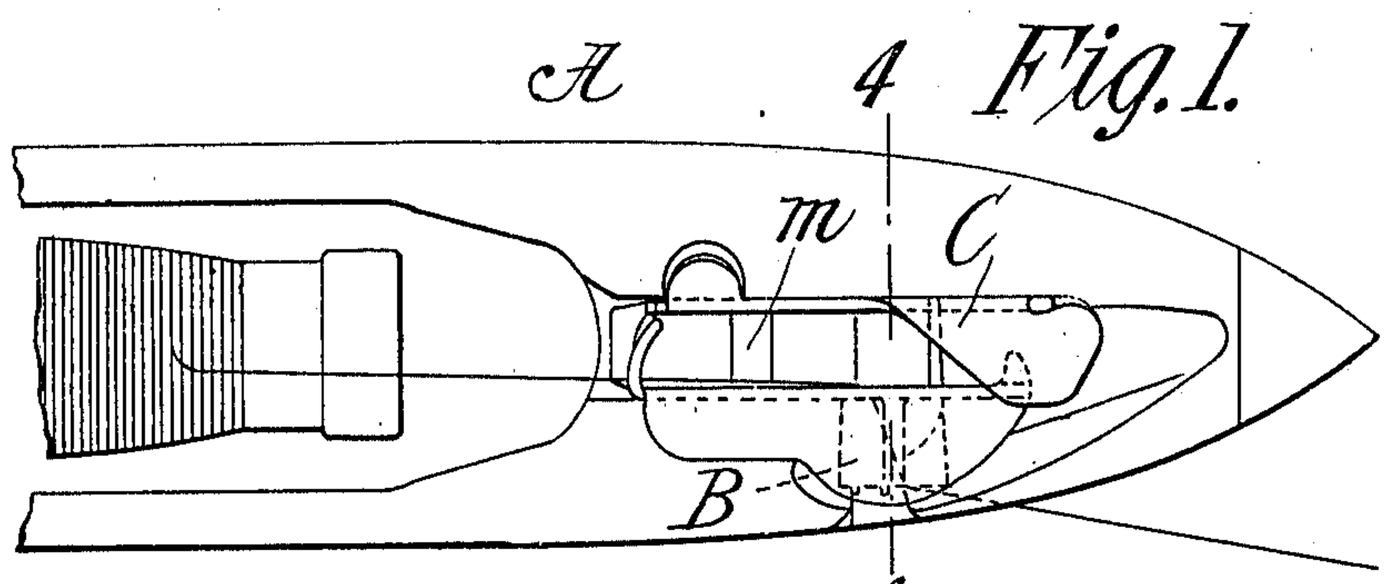


Fig. 1.

Fig. 2.

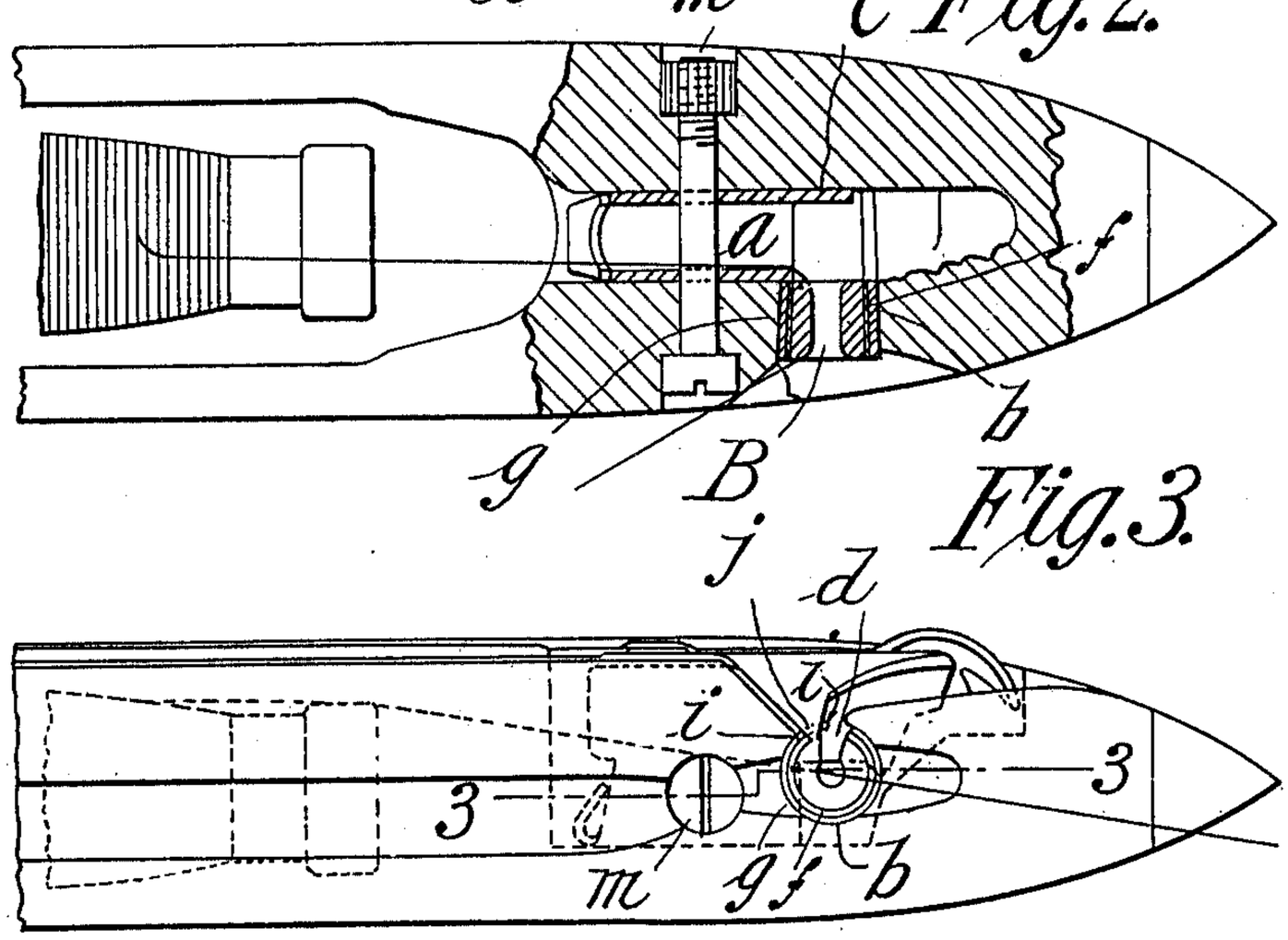


Fig. 3.

Fig. 4.

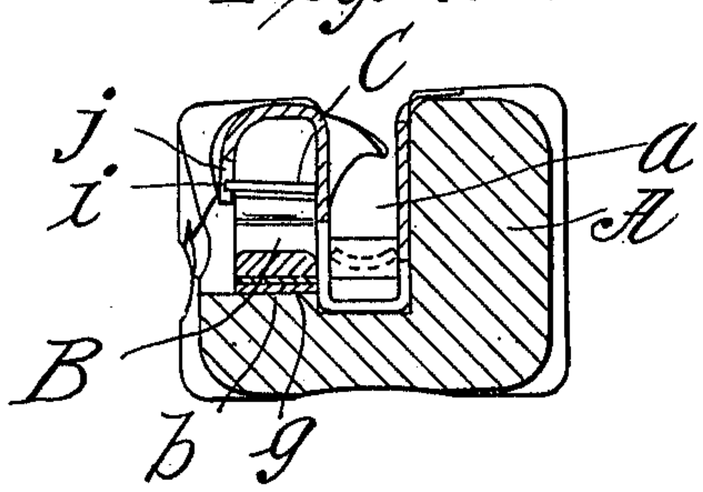
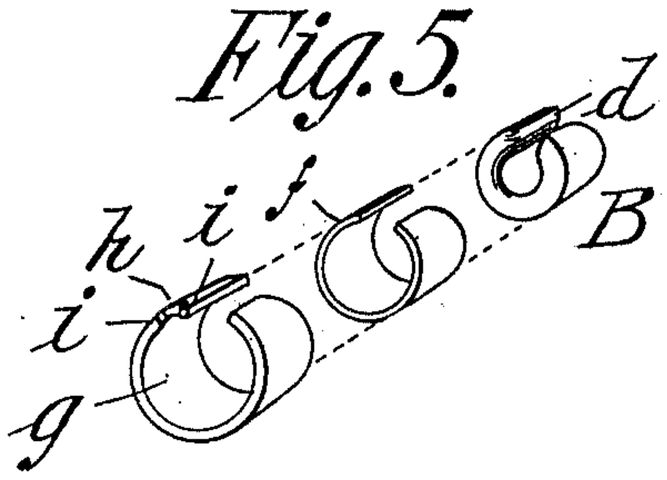


Fig. 5.



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SHUTTLE.

978,502. Specification of Letters Patent. **Patented Dec. 13, 1910.**

Application filed June 27, 1910. Serial No. 569,049.

To all whom it may concern:

Be it known that I, WILLARD W. STEARNS, a citizen of the United States of America, and resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Shuttles, of which the following is a full, clear, and exact description.

This invention relates to improvements in shuttles, and more especially self threading shuttles for looms.

As well known, shuttles having closed delivery eyes, that is, eyes having continuously circular walls, require on the part of the operative a drawing out of the thread through the eye by inhalation or sucking, resulting in not infrequent cases in the breathing into the lungs of lint or thread particles greatly endangering health; and in order to effect a drawing of the thread delivered from the bobbin and extending along the thread passage in the shuttle body out through the eye without the action of inhalation as above mentioned, various devices have been invented and are now in extensive use for the guidance of the thread to and into the eye member, which latter is now made with a slot or recess through the wall thereof for the entrance of the thread sidewise into the eye.

In many cases the eye members of the shuttles are made of metal, as, for instance, hardened steel, such being serviceable in the shuttle used for weaving with many kinds of weft threads, but where a bobbin thread is employed for the weaving of worsted or silk goods, the comparatively rough thread has the effect of very quickly cutting a deep channel, and in fact "sawing" through the wall at the side of the eye at which the thread has its running course. It has been proposed to make use of an eye member in the shuttle to be used in worsted weaving composed of porcelain or like vitrified material, but such eye member owing to the frangible character of the porcelain, and because of its having the thread entering recess at its side whereby the circular continuity of its wall is broken, has quickly become broken from the shock brought upon the shuttle at every pick. And the object of this invention is to provide in a shuttle, and more especially one of the automatic or self threading kind, an eye member which even although composed of a vitrified material such as porcelain, will remain intact and unbroken throughout long usage by reason of its being so yieldingly mounted in the body of the shuttle as to be cushioned and thereby safeguarded against breakage from the shock to which the shuttle is subjected. And a shuttle having an eye member of a character which is consistent with the present invention is hereinafter described in conjunction with the accompanying drawings and is set forth in the claims.

In the drawings,—Figure 1 is a plan view of the portion of a loom shuttle comprising a self threading device and the delivery eye member. Fig. 2 is a horizontal longitudinal section through the shuttle on the plane of its thread delivery eye. Fig. 3 is a side elevation of Fig. 1. The line 3—3, on Fig. 3, indicates the plane on which the section, Fig. 2 is taken. Fig. 4 is a cross section on line 4—4, Fig. 1. Fig. 5 is a perspective view representing the eye member and its incasement equipments in separated relation.

In the drawings, A represents the body of the shuttle having a thread passage *a* longitudinally in the end portion thereof which is in communication with the eye member B which is fitted in the sidewise opening aperture *b* made in the side wall of the shuttle body.

C represents a self threading device which is located and fitted in the thread guide, and which is effective for quickly and reliably causing the thread for the weft carried by the bobbin to be brought to engagement for delivery through the eye member,—the thread entrance into the eye being through a slot or recess *d*, which necessarily breaks the circular continuity, and more or less weakens the eye member.

The aforementioned self threading device represented in a general way by the reference letter C is composed of sheet metal bent into trough shape and having various flanges, lips or tongues and is to be understood as the kind extensively used in the Draper automatic self threading loom shuttle, and further description of the threading device will not be herein given, as the same forms no part of my invention.

The eye member B which I make of porcelain or similar material is provided with an incasement which is here represented as consisting of a surrounding layer *f* of a cushioning or shock absorbing material, such, for instance as tape or other textile fabric and an outer metallic shell or sheath *g* so

that the parts B, *f* and *g* in their assembled and engaged or united relations, may be easily inserted in the sidewise opening aperture *b* for the eye member. Said aperture is made slightly inwardly tapering and the eye member inclusive of its incasement is also made slightly tapering so that when the latter is crowded with comparatively tight fit into the aperture, it will "bottom" therein and be prevented from having any displacement in an inward direction beyond its appropriate position.

The metallic shell or sheath *g* at its outer edge near its top is provided with a recess *h* whereby opposite and slightly separated shoulders *i i* are produced in engagement with which is a prong or projection *j* of the self threader C, which latter is removably held in the shuttle by the screw *m*. This prong *j* extending across the recessed edge portion of the sheath *g* and having an engagement between the shoulders *i i*, serves the double purpose of preventing outward displacement of the eye member from within the aperture *b* in which it is fitted and of preventing the eye member from rolling or rotatively moving in the socket in which it is placed.

The layer *f* of the shock absorbing or cushioning material may advantageously be composed of "electric tape," that is a tape surfaced with a rubber, viscous, solution, whereby it is rendered adhesive so that when the parts are assembled the cushioning material *f* will be stuck both to the porcelain eye member proper B and to the metallic sheath *g*.

An eye member B notwithstanding the fact that it is composed of porcelain, and is, consequently, brittle, may be used in, and as a part of, the shuttle for an indefinitely long time when having the shock absorbing material employed in conjunction therewith, as the latter provides an efficient cushioning means which protects the hard though somewhat frangible eye member from becoming broken by reason of the violent shocks to which the shuttle is subjected, by the impact thereagainst of the picker stick.

The sheath or shell composed of thin metal properly split as shown, so as to leave the sidewise opening into the eye unobstructed, imparts a reinforcement for the eye, and, moreover, by its resilient quality acquires a reaction for spring engagement in the socket or aperture *b* in which it is fitted.

I claim:—

1. A shuttle body having a thread passage therein and an aperture leading from said thread passage through the side wall of the shuttle body and an eye member, surrounded by shock absorbing material, located and tightly fitted in said aperture.

2. A shuttle body having a thread passage and provided with an aperture leading from said thread passage through the side wall of the shuttle body and an eye member surrounded by a shock absorbing material and a metallic sheath or bushing in which the so surrounded eye member is inclosed, fitted in said sidewise opening aperture.

3. A shuttle body having an aperture leading through its side wall to the thread passage in such body, which aperture is inwardly tapered, and a thread delivery eye member having an incasement which is inwardly tapered, and which includes a shock absorbing material.

4. A shuttle body having a sidewise located aperture therein and an eye member having a layer of shock absorbing material surrounding it and incased in a metallic sleeve, fitted in said aperture, and means provided on the shuttle body for engaging, and preventing rotative movement of, said sleeve.

5. A shuttle body having a sidewise located aperture therein and an eye member having an incasement consisting of a surrounding layer of shock absorbing material and an outer metallic shell or sheath which is provided at its outer edge with a recess, and a thread guide detachably engaged within the shuttle body having a projection which engages in the aforesaid recess and prevents both outward displacement and rotative movement of said incased eye member.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

WILLARD W. STEARNS.

Witnesses:
G. R. DRISCOLL,
WM. S. BELLOWS.