

1,027,704.

Fig. 2.

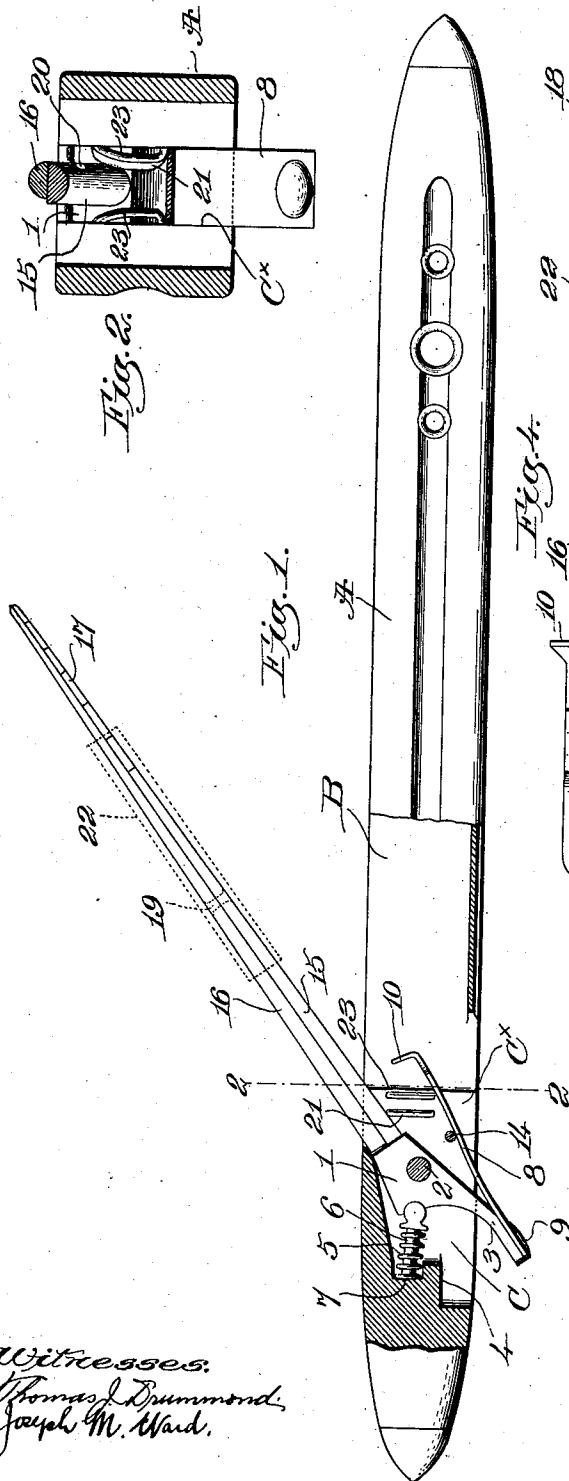


Fig. 1.

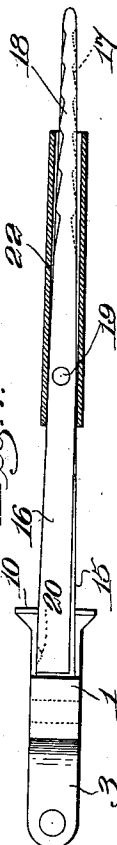


Fig. 4.

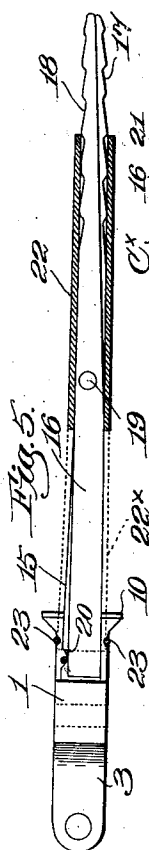


Fig. 5.

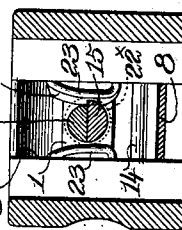


Fig. 3.

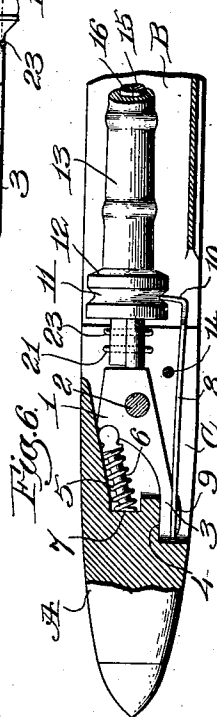


Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## LOOM-SHUTTLE.

1,027,704.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed January 31, 1911. Serial No. 605,684.

*To all whom it may concern:*

Be it known that I, GORDON J. DUSTIN, a citizen of the United States, and resident of Fulton, county of Oswego, State of New York, have invented an Improvement in Loom-Shuttles, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention has for its object the provision of a loom-shuttle with novel means for holding a cop or a cop-tube from movement on the shuttle-spindle when the latter, pivotally sustained in the shuttle-body, is swung into operative position substantially in alinement with the longitudinal axis of the shuttle.

Yarn is spun on long cop-tubes and on short tubes, and in some cases the cop is spun on a base spindle, the shuttle-spindle being forced into the axial hole in such a cop, and often trouble arises from movement of the cop or cop-tube, as the case may be, upon the spindle in the shuttle during the weaving operation. To overcome this so-called split spindles have frequently been used, the spindle blade being split for a portion of its length and sprung outward so that when the cop or cop-tube is applied it is pushed onto the spindle to compress the opposite sides thereof. In many instances these split spindles work satisfactorily, but they are always open to the objection that considerable force must be used to push the cop into position thereon, and this is bad for the yarn, while with a short cop-tube or no tube at all the interior of the cop is apt to be cut or frayed by the edges of the split part of the spindle.

In my present invention I have overcome the objections referred to while providing means to hold the cop securely upon the spindle, the construction being such that when the spindle is swung out of the shuttle the cop, whether or not provided with a tube, can be slipped onto the spindle and properly placed without forcing or jamming. When the spindle is swung into operative position in the shuttle such movement brings into action means to cooperate with the cop or cop-tube and hold the same securely and effectively from any movement upon the spindle.

As will be explained hereinafter I have

made provision herein for locking upon the spindle the base of a long cop-tube by compressing or pinching the latter upon the spindle, and as many mills use bobbins as well as cops I have provided means for locking a bobbin from movement upon the spindle, neither device interfering with the other. Thus my shuttle is adapted for use with yarn carriers of different forms, as well as for use with cops spun on bare spindles and having no sustaining tube, long or short.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a side elevation and part longitudinal section of a loom shuttle embodying my present invention, the spindle being shown as swung out of the shuttle for the reception or removal of a yarn carrier; Fig. 2 is an enlarged transverse sectional detail thereof on the line 2-2, Fig. 1, looking toward the left; Fig. 3 is a similar view, but showing the spindle in operative position, the means for effecting expansion of the spindle being illustrated in action; Fig. 4 is a top plan view of the expansible spindle in contracted condition, for the application thereto or removal therefrom of a cop or cop-tube, a cop-tube being shown in section loose upon the spindle; Fig. 5 is a similar view but with the spindle expanded and in its operative position, the means for expanding the spindle being indicated in section, and the means for locking the base of a long cop-tube is similarly indicated; Fig. 6 is a part longitudinal section of one end of the shuttle and its spindle, the latter in its operative position, showing the manner of locking a bobbin from endwise movement on the spindle.

The shuttle body A, having the usual elongated opening B for the spindle and yarn carrier, is cut out or socketed at one end and at its bottom to accommodate the spindle head 1, mounted to swing on a transverse pivot-pin 2 fixed in the shuttle-wood. Said head has an extension 3 adapted to bear against a stop 4 in the socketed part C of the shuttle when the spindle is in operative position, Fig. 6, substantially in alinement with the longitudinal axis of the shuttle, and a spring 5 is arranged to act upon the head and hold the spindle in its

operative or inoperative position, the spring surrounding a guide 6 pivotally connected with the head. Opposite ends of the spring engage a shoulder on the guide and the bottom of the seat 7, respectively, the construction so far as described forming no novel part of my present invention.

A resilient arm 8 is riveted at 9 upon the extension 3 and is extended inward beneath the head and into the opening B of the shuttle, the free end of the arm being upturned and widened at 10, and arranged to enter the usual crease 11, Fig. 6 in the annular head 12 of a bobbin 13, when the spindle is in operative position, to lock the bobbin from endwise movement on the spindle. When the spindle is swung out of the shuttle arm 8 is engaged by a stop pin 14 and the bobbin catch 10 is retracted to release the bobbin, the retracted catch being shown clearly in Fig. 1.

In my present invention I make the spindle in two parts, each part being substantially semi-circular in cross-section, with the flat faces of the parts superposed one upon the other. Referring to the drawing the parts of the spindle are indicated at 15, 16, the part 15 being fixedly attached to, or forming a part of, the head 1 and swinging with it as a unit on the pin 2, said part tapering from base to tip and having its flat face uppermost, while it is corrugated at one side adjacent the tip, as at 17. The part 16, also substantially semi-circular in cross-section, is tapered from base to tip, and adjacent the tip it is corrugated at the side opposite the corrugations 17, as at 18, Figs. 4 and 5, the flat face of the part 16 resting upon the flat face of the part 15, as shown in Figs. 2 and 3. Between the tip and base the two parts are connected by a rivet or other suitable fulcrum 19 so that the part 16 can swing laterally relatively to the part 15 while both parts swing together about the transverse pivot-pin 2. As shown in Figs. 1, 4, 5, and 6 the base of the spindle part 16 can swing laterally without interfering with the head 1, and on one side the base of the part 15 is provided with a notch 20. When the spindle is swung out of the shuttle to inoperative position, Figs. 1, 2, and 4, the tip ends of the parts 15, 16 can overlap, as clearly shown in Fig. 4, the spindle then being in contracted position, for the ready reception of a cop, whether spun on a cop-tube or without such a tube, the cop being easily slipped onto the spindle to proper position. The swinging movement of the spindle into operative position in the shuttle effects the expansion of the spindle to engage and hold internally the cop or cop-tube. For this purpose one upright wall of a recess C<sup>x</sup> in the shuttle wood at the inner end of the socket C is provided with an expanding device, herein

shown as a staple-like piece of stiff wire 21 driven into the wall of such recess opposite the notch 20. When the two-part spindle is swung into the shuttle the device 21 enters the notch 20, see Fig. 5, engaging the adjacent side of the part 16 near its base and swinging the part 20 on its fulcrum 19, thereby separating the parts 15, 16 between their tips and the fulcrum 19. This expansion of the spindle adjacent its tip causes the opposite corrugations 17, 18 to engage and firmly hold the interior of a cop-tube, as 22, Fig. 5, so that the tube cannot move relatively to the spindle, the spindle being maintained expanded so long as it is in its operative position in the shuttle. If the cop is spun without a tube the bore of the cop is engaged and held in a similar manner by the corrugated portions 17, 18, as will be apparent. Thus a short cop-tube, or a tubeless cop, will be held with equal firmness upon the spindle and any movement of the yarn mass upon the spindle during weaving is prevented. When the spindle is swung out of the shuttle, Figs. 1 and 2, the expanding device 21 immediately ceases to act, and as there is nothing to maintain the spindle expanded the cop-tube can be easily removed and a fresh one with its yarn load is applied. Sometimes long cop-tubes are used, the base of such a tube projecting beyond the bottom of the cop, and in such case this projecting base is clamped or locked upon the base portion of the spindle by opposed clamping members 23, 23 mounted on the opposite walls of the recess C<sup>x</sup>. It will be obvious that these clamping members act only when the spindle is operatively positioned, Figs. 3 and 5, and as the spindle is expanded at such time the cop-tube will be locked externally at its base by the members 23, and it will be locked or held internally by the corrugated portions 17, 18, a double hold being thus effected. In Figs. 3 and 5 the base of a long cop is indicated by dotted lines at 22<sup>x</sup>. The clamping members 23 do not interfere in any way with the proper operation of the expanding device 21, and the latter does not interfere with the operation of said clamping members, as will be manifest.

Practically any kind of a yarn mass can be used with my present invention, so that a single shuttle can be employed without respect to the particular manner in which the yarn is spun up into a mass for use in the shuttle.

As the two parts of the spindle close together when the spindle is swung out it is not necessary to push or force a cop into place thereupon, for the contracted spindle enters easily the bore of the cop and then holds it in place when the spindle is expanded.

Having fully described my invention, I

what I claim as new and desire to secure by Letters Patent is:

1. In a shuttle, a laterally expansible spindle pivotally mounted therein to swing into and out of operative position, means on the shuttle to cooperate with and expand the spindle laterally when swung into operative position, to engage internally a cop-tube and lock the same from movement on the spindle, and separate means on the shuttle-body to engage opposite sides of the base of the cop-tube externally and compress and lock it upon the spindle.
2. In a shuttle, a two-part spindle pivotally mounted therein to swing into and out of operative position, said parts being substantially semi-circular in cross-section, with their flat faces superposed, one of the spindle parts being fulcrumed upon the other between its base and tip, the other part having a notch in its side near its base, and a staple-like expander fixed in the shuttle-body and adapted to enter the notch in one part of the spindle and engage the side of and move laterally the base of the other spindle part to effect relative lateral movement of the parts of the spindle when swung

into operative position in the shuttle, to cause said parts to separate near the tip of the spindle and engage internally a cop or cop-tube and prevent movement thereof upon the spindle.

3. In a shuttle, a spindle pivotally mounted therein to swing into and out of operative position, said spindle having a laterally expansible tip, means mounted on the shuttle-body to engage externally the opposite sides of the base of a cop-tube to compress and lock it on the spindle when the latter is operatively positioned, and independent means to at such time effect lateral expansion of the tip of the spindle to engage internally and hold the cop-tube from movement relatively to the spindle, whereby the cop-tube is engaged adjacent each end thereof and held securely upon the spindle.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GORDON J. DUSTIN.

Witnesses:

J. R. SULLIVAN,  
J. F. DUSTIN.