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Patented May 1, 1900.

C. & G. BRUN.
SHUTTLE FOR LOOMS.

(Application filed July 18, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 5.

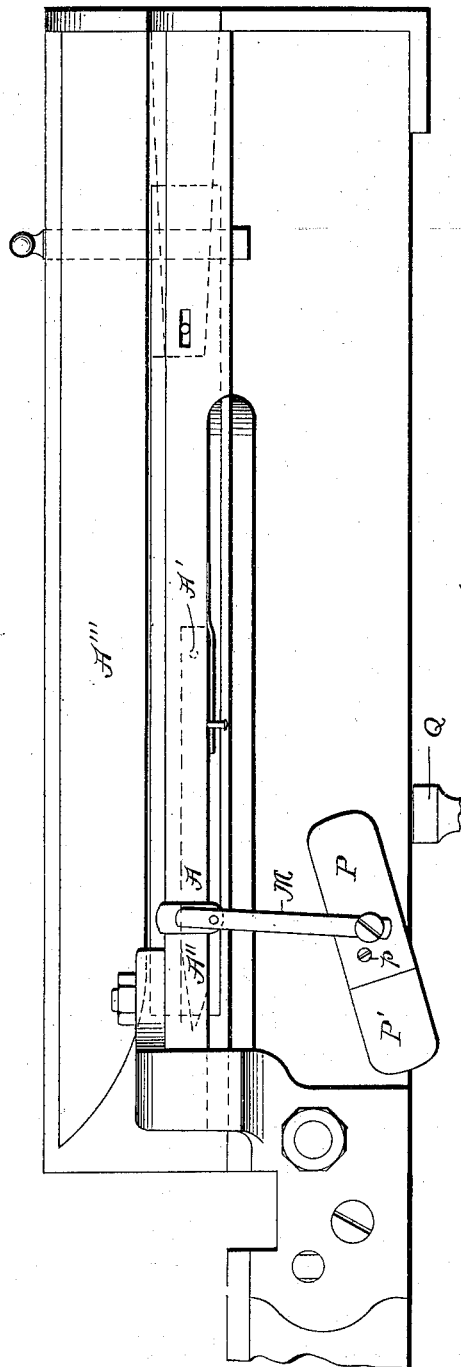
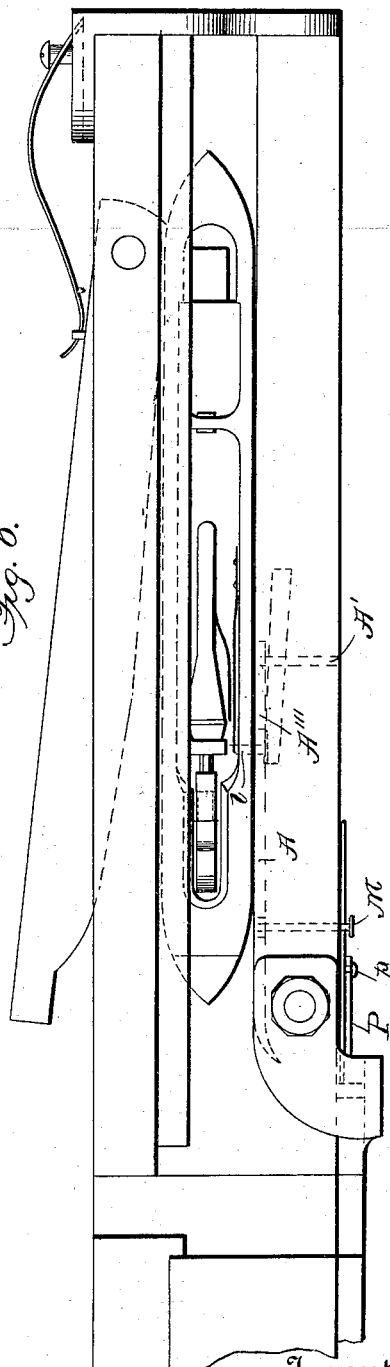


Fig. 6.



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SHUTTLE FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 648,547, dated May 1, 1900.

Application filed July 18, 1899. Serial No. 724,282. (No model.)

To all whom it may concern:

Be it known that we, CAMILLE BRUN and GUSTAVE BRUN, citizens of the Republic of France, residing at St. Etienne, in the Department of Loire, France, have invented certain new and useful Improvements in and Relating to the Shuttles and Shuttle-Bobbins of Looms of Any Kind; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to the shuttles and shuttle-bobbins of looms of any kind; and it consists of an improved system of winding the spool or bobbin of the shuttle and of improved operative parts in and connected with the said shuttle and lay of the loom, whereby the stoppages of the loom having one or more shuttles and the replacement of a full threaded shuttle for any empty shuttle are effected before the complete emptying of the thread cop or spool of the shuttle, the transfer being effected at the end only of any shoot of the weft-thread. The improved system, therefore, depends, essentially, upon the principle of the incomplete unwinding of the weft-thread in the shuttle during work and upon the consequent resulting movements set into operation by the unwinding of the thread from the shuttle spool or cop before the latter is completely unwound, as will be hereinafter more fully described. This system of control is quite independent of the control of the usual weft-fork, which acts in the well-known manner upon any accidental breaking of the weft-thread. One of the greatest advantages of this system is the avoidance of partly-missing or short weft-threads in the fabric.

It is well known that when the usual weft-fork stops the loom by reason of the complete unwinding of the shuttle-thread the end of the last shoot-thread stops in the middle or body of the fabric—that is, leaves an incomplete shoot—necessitating a repair or artificially knotted or added thread to complete the shoot, which in fine fabrics is a serious disadvantage and is in all cases a cause of loss of time.

In order that this invention may be the better understood, a practical application of the same in the operation of any loom is illustrated herewith and will now be particularly described.

Figure 1 is a side elevation of a cop or bobbin. Fig. 1^a is an end view of the base of the same. Fig. 2 is a side elevation of the cop-spindle. Fig. 2^a is an elevation of the spindle from the under side. Fig. 3 is a side elevation of the shuttle. Fig. 4 is a similar view showing the commencement of the winding on the cop. Fig. 4^a is a view of the under side of the shuttle. Fig. 5 is a side elevation, on a smaller scale, showing the shuttle and its associated operating mechanism applied to the shuttle-box and lay of a loom. Fig. 6 is a top plan view of the same.

Fig. 1 shows in side elevation a bobbin or cop F in wood, cardboard, or other material detached, which has the peculiarity of a longitudinal slot *f*, pierced for a certain length from the spindle-hole through the body of the cop. Fig. 1^a is an end view of the base of the said cop, showing a small hole O in the said base to receive a pin or tongue *t*, fixed upon the butt E of the cop-spindle B, Figs. 2 and 2^a, which has for its object the holding of the cop F in a fixed position upon the spindle B during weaving.

Fig. 2 is a side elevation of the spindle B, mounted on a butt or base E. The spindle is furnished with a small lateral spring *b*, of suitable form, fixed at its upper end to the spindle and free at its lower extremity toward the butt or base of the spindle, playing outward through the slot *f* in the cop. Fig. 2^a represents an under view of the said spindle.

The essential idea of this improved system is the special winding of the shuttle cop or spool F with the first spiral of weft-thread from *a* to *a'* only, Fig. 4. These first layers or spirals of thread have a length equivalent, say, to three shoots of the fabric, and afterward the winding of the cop becomes normal from *s* to *s'*—that is, from top to bottom of the cop F—as is usual, Fig. 3, confining the spring *b* of the cop tightly in its slot *f* by the surrounding thread. The cop F thus specially wound is placed upon the spindle B in a definite and fixed position by the engagement of the pin or tongue *t* in the hole O, and

the spindle B is placed in position, as in Figs. 3 and 4, in the shuttle. The weft-thread unwinds itself in the usual way until nearly the end of the thread, and the spring *b* presses outward from the slot F of the cop so soon as the thread is unwound from the base of the cop, leaving only the first-wound layers of thread between *a* and *a'*. At this moment the spring *b* is completely free, as in Fig. 4, and presses down the end of the flat tongue-spring L, situated in front of it upon the interior of the shuttle. The outer free end of this spring L is furnished with a pin *l*, passing through a corresponding hole in the side of the shuttle, and projects upon the side outside the shuttle. On the other hand, while the cop F is completely covered with the thread, the spring *b* is kept in the slot of the cop and has no action upon the spring L, which in that case keeps the pin at its point within the shuttle, as in Fig. 3.

Figs. 5 and 6 show in elevation and plan the driver of any ordinary loom with a shuttle *in situ* and the novel control appliances of this invention added thereto. In the interior of the shuttle-box, at the side of the breast-beam, a lever A is fitted pivotally on axis A', presenting at its free extremity an inclined-plane or wedge face. By means of a trunnion traversing a vertical slot in the cheek of the beam this lever A is connected to a vertical connecting-rod M, this latter being pivoted on a lever P, pivoted at *p* upon the lay and having a counterweight P'. During normal weaving—that is to say, while the first part of the weft-thread is unwinding from the shuttle-cop and until the liberation of the spring *b*—the lay passes clear above the tappet Q. So soon as the spring *b* is liberated from the cop F it pushes the stop-pin *l* beyond the shuttle. The weaving continues until the return of the shuttle to its box, when the side of the pin *l* mounts upon the inclined face of the lever A and depresses it, finally resting in the recess A'''. The lever A by its depression pushes the rod M downward and throws the end of the lever P below the lower edge of the driver, so as to strike the tappet Q. The consequent movement upon the tappet Q may be utilized in any convenient manner either to

stop the loom or to put in action known mechanism for the replacement of a full shuttle for the nearly-empty one either in a loom of one or many shuttles.

It is obvious that the usual weft-fork operating by an accidentally-broken thread is not interfered with and that the results of our system of control are obtained before the complete exhaustion of the weft-thread. Moreover, the replacement of a full shuttle is always after completion of a shoot, avoiding short and partial shoots and the loss of time and damage to fine work resulting from such short shoots or from missing shoots resulting from the running out of the weft-thread from the shuttle. It is obvious also that this improved system of control is applicable to all sorts and types of looms and for the weaving of any material.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, we declare that what we claim is—

1. The combination with a shuttle, of a spring secured at one end to the inside of the shuttle, a pin on the other end of said spring playing in a hole through the side of the shuttle, a cop-spindle having a spring adapted to be compressed by the thread, and when released to come in contact with and force outwardly the spring-supported pin, a lever on the lay adapted to be wiped by said pin when forced outwardly, and stop-motion mechanism connected with said lever.

2. The combination with a shuttle, of a cop-spindle having a spring adapted to be compressed by the thread, a spring-mounted pin in line with said spring, a cam-surfaced lever on the lay, adapted to be wiped by said pin when forced outwardly, a counterweighted lever connected with the cam-surfaced lever, and a tappet arranged to be engaged by the counterweighted lever when depressed.

In testimony whereof we affix our signatures in presence of two witnesses.

CAMILLE BRUN.
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Witnesses:

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