

J. A. GENDRON.
SHUTTLE MOTION FOR LOOMS.
APPLICATION FILED SEPT. 15, 1911.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.

1,036,483.

Fig. 1.

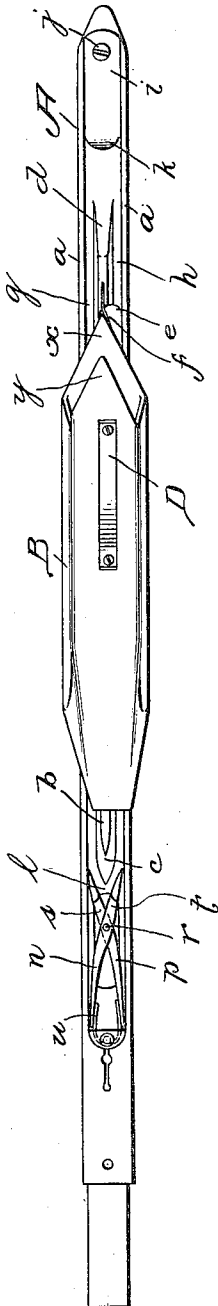


Fig. 3.

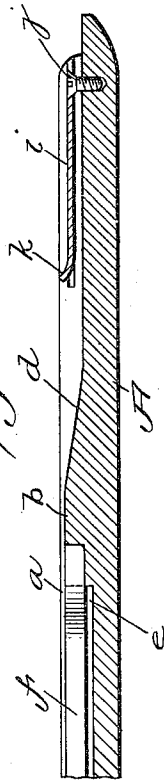


Fig. 2.

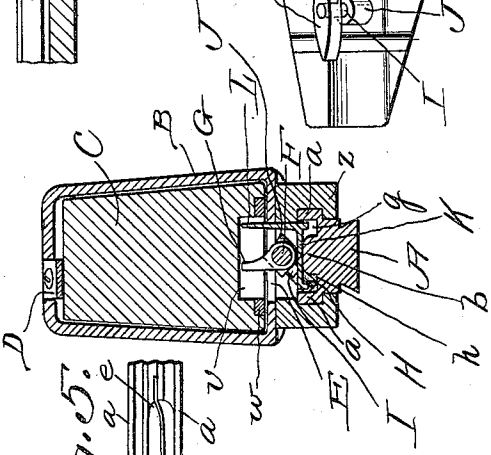
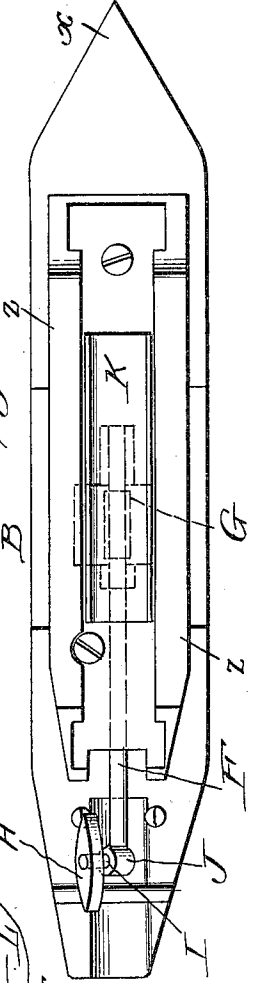


Fig. 5.



Fig. 4.



WITNESSES

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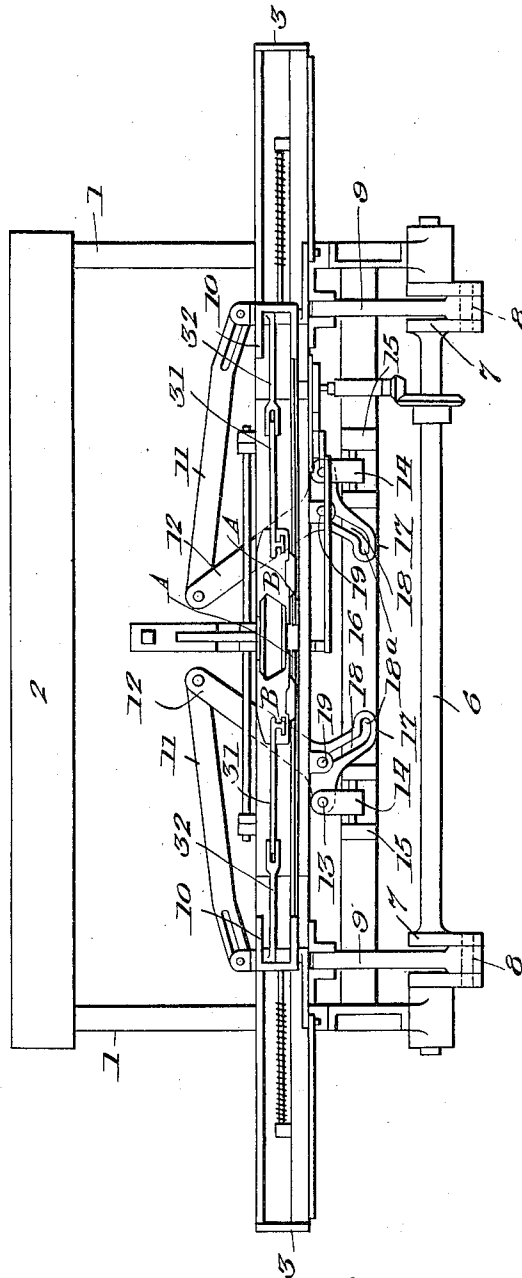
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2 SHEETS—SHEET 2.

Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH A. GENDRON, OF NASHUA, NEW HAMPSHIRE.

SHUTTLE-MOTION FOR LOOMS.

1,036,483.

Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed September 15, 1911. Serial No. 649,417.

To all whom it may concern:

Be it known that I, JOSEPH A. GENDRON, a citizen of the United States, residing at Nashua, in the county of Hillsboro and State of New Hampshire, have invented new and useful Improvements in Shuttle-Motions for Looms, of which the following is a specification.

My present invention pertains to positive shuttle motions for looms, and is designed more particularly as an improvement upon the shuttle motion constituting the subject matter of my Letters Patent No. 928,440, dated July 20, 1909.

The object of the present invention is to provide and simplify means for precluding the shuttle accidentally flying out of the shuttle holder incidental to the outward and inward movements of the two, which movements are ordinarily attended by considerable shock and jar. I would also here state that preventing the shuttle accidentally flying out of the shuttle holder at the outer end of the outward traverse of the holder and shuttle is materially advantageous since otherwise the shuttle is liable to fall in and seriously damage the warp of the fabric that is being woven.

With the foregoing in mind, the invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation showing a carrier arm and a shuttle holder constructed in accordance with my present invention. Fig. 2 is an enlarged transverse section of the same; and also showing a shuttle in the holder. Fig. 3 is an enlarged longitudinal central section of the inner end portion of the carrier arm. Fig. 4 is an elevation of the inner side of the shuttle holder as the same appears when removed from the arm of the carrier. Fig. 5 is a detail side elevation of the arm, showing the spring in a recess in the rib of the arm. Fig. 6 is a plan view of a portion of a loom constructed in accordance with my present invention.

Similar letters and numerals designate corresponding parts in all of the views of the drawings, referring to which:

A A, Fig. 6, are the arms of carriers such as shown in my Letters Patent *supra*; it being understood that in a loom two of the said arms will be employed at opposite sides of

the center of the loom and each arm will be equipped with a shuttle holder such as hereinafter specifically described, the devices at opposite sides of the center of the loom being similar to each other and symmetrically and oppositely arranged.

By reference to Fig. 6 it will be understood that 1 represents the forward portion of a loom frame. 2 represents the breast beam, and 3 represents the lay supported by swords (not shown). 6 represents the operating crank shaft, and 7 the cranks which are connected through pins 8 and links 9 with the lay for the purpose of oscillating the same toward and from the breast beam. Mounted on the ends of the lay are shuttle-carriers 10, and to which are connected links 11 for the purpose of reciprocating them toward and from each other longitudinally of the lay. The ends of the links 11 are connected to levers 12 which are pivoted at 13 to holders 14 which swing about horizontal pivots held in brackets 15 which are fastened to a cross-bar 16 of the loom frame. Each of the levers 12 has an arm 17 extending inwardly and provided with a cam slot 18. Into the latter extends a pin or roll 19 carried by the lay. This slot extends throughout the greater part of its length in a direction transverse to the movement of the lay. Consequently the latter causes the lever 12 to oscillate about its pivot 13 and through link 11 to reciprocate the carrier. The slot 18 has a portion 18^a here shown as near its end, which extends in the line of movement of pin 19 when the lay is nearest to the breast beam. A A are arms of the carriers 10, and B B are shuttle holders. These are moved longitudinally on the arms A by links 31 and arms 32 secured upon rock-shafts passing through the carriers 10. With the exception of the arms A and the shuttle holders B, the construction described is similar to that shown in my mentioned prior patent, the said rock-shafts being actuated in the manner and for the purpose fully set forth in said patent and which it is deemed unnecessary to set forth herein.

The operation of the mechanism thus far described is as follows: While the lay is in the position illustrated in Fig. 6, the shuttle carriers are at the limits of their motion, and the transfer of the shuttle C is effected. Then as the lay moves toward the breast-beam, the shuttle-carriers retract,

carrying the shuttle in the holder of one of them. At the proper time the lay begins to move backward, and during the latter part of said movement the carriers 10 are moved outward to carry the arms A, and the shuttle holders are moved on said arms as will be hereinafter specifically set forth. The shuttle holders B are also moved on the arms A when the arms are moved inward, all in the manner fully set forth in my Letters Patent aforesaid.

While I prefer to employ the means shown and described in my Letters-Patent *supra* to move the arms A and shuttle holders B, I do not desire to be understood as confining myself to said means, inasmuch as any appropriate mechanism may be employed to actuate said arms and shuttle holders without involving departure from the scope of my present invention as claimed.

My present invention resides in the combination of the arms A, the shuttle holders B and the automatic locks, and since the arms, shuttle holder and locks are similar in construction, a detailed description of the single combination shown in Figs. 1 to 5 will suffice to impart a definite understanding of both combinations. The arm A, Figs. 1, 2, 3 and 5, is provided with exterior longitudinal flanges *a*, as best shown in Fig. 2. It will also be understood by comparison of Figs. 1, 2, and 3 that the arm A is provided at its one side with a longitudinal central rib *b* the outer end of which is tapered, as indicated by *c*, and the inner end of which is inclined, as indicated by *d*. At an intermediate point of its length and adjacent its inner end the rib *b* is provided with a recess *e*, Figs. 3 and 5, and in the said recess is arranged a slightly-bowed spring *f*, the ends of which are fixed in the rib. Between the sides of the rib *b* and the side walls of the arm A longitudinal channels *g* and *h* are formed, and located between the said side walls at the inner end of the arm A is a retaining plate *i* which is fixed to the arm by a screw *j* and has its outer end *k* flared upward for a purpose hereinafter set forth. In the space *l* between the side walls of the arm A and adjacent the outer end of the rib *b* are arranged switch members *n* and *p*. These are pivoted at *r* to the arm A and are provided in their inner arms—*i. e.*, the arms adjacent the rib *b* with recesses or ways *s* and *t*. The outer arms of the said switch members *n* and *p* are arranged at opposite sides of the end portions of a U-shaped spring *u* that is suitably fixed in the arm A and has for its office to yieldingly retain the switch members in and return the same to positions shown in Fig. 1.

B is the shuttle holder or carrier of my improved mechanism, and C is a shuttle

shown in Fig. 2 as correctly positioned in the holder or carrier. In accordance with my invention the shuttle C is provided in its inner side and adjacent its ends with recesses bordered by plates fixedly connected to the shuttle body; one of the said recesses and its complementary plate being shown in Fig. 2 and being lettered *v* and *w*, respectively. The shuttle holder or carrier B is hollow, Fig. 2, and has one of its points *x* longer than the other point *y*, Fig. 1; the longer point being designed to enter the shed of the warp first and open the warp and make the way clear for the shorter point. In one side the shuttle holder or carrier B is provided with a bowed spring D, Figs. 1 and 2. This spring D is designed to yieldingly press against the shuttle and hold the same straight in the holder or carrier and in that way assure the shuttle entering the holder or carrier at the opposite side of the loom when said holder or carrier is presented to the shuttle. At its other side the holder or carrier is flanged as indicated by *z* so as to straddle and slide on the arm A and be held against vertical movement. It will also be seen by comparison of Figs. 2 and 4 that the holder or carrier is provided in its inner side with an opening E, and that said holder or carrier is provided with a shuttle lock and an auxiliary shuttle lock. The former, in the present and best practical embodiment of my invention that I have as yet devised, comprises a longitudinal rock shaft F, journaled in the holder or carrier B, a finger G fixed to said shaft and positioned to move in the opening E and into and out of the recess *v*, and a swinging runner H having a trunnion I journaled and suitably secured in a bearing J with which the rock shaft is equipped. The auxiliary shuttle lock is preferably in the form of a plate K, channeled at its underside to travel on the rib *b*, and having an outstanding projection L adapted to extend through the opening E and into the recess *v*. The shuttle or carrier B may be moved through the medium of the hereinbefore described means shown in my mentioned patent or through the medium of any other means consonant with the purpose of my present invention.

The practical operation of my novel mechanism is as follows: After delivering the shuttle to the other holder (not shown) the holder B moves outward on the arm A. Incidental to this movement the runner H of the shuttle lock moves in the channel or guideway *g* of the arm, and then moves through the recess in the switch member *n* into a position in alinement with the channel or guideway *h*. On the succeeding inward movement of the holder the runner H travels in the guideway *h* until it reaches a position alongside the inner portion of the spring *f*. At this time the plate K of the

auxiliary lock has moved down the inclined end *d* of the rib *b* and under the plate *i* and hence the projection *L* of the said auxiliary lock is arranged with its upper end flush with the bottom of the holder *B*. When the runner *H* is positioned alongside the inner portion of the spring *f*, the said spring serves to yieldingly hold the finger *G* in up-right position in the holder *B* and hence when the shuttle enters the holder the shuttle moves and rides over the finger *G*, after which the finger *G* is moved or swung into the shuttle recess *v*, as shown in Fig. 2. On the following outward movement of the holder *B* with the shuttle therein, the plate *K* of the auxiliary lock moves from between the plate *i* and the arm *A*, and then moves along the inclined end *d* of the rib *b*, with the result that the said rib *b* serves to hold the plate so that the projection *L* rests in the shuttle recess *v* as shown in Fig. 2. During the said outward movement of the holder *B* with the shuttle therein, the runner *H* travels in the guideway *h* and then across through the recess in the switch member *p* to a position in alinement with the guideway *g*. This effects movement of the finger *G* of the shuttle lock and hence the shuttle so far as said lock is concerned is unfastened in the holder. It will be noticed however that the projection *L* of the auxiliary serves at the time stated to securely retain the shuttle in the holder. This will be appreciated as an important advantage when it is remembered that the outward movement of the holder or rather the end of said movement is attended by great shock and jar, and were the auxiliary lock not employed, the shuttle would be liable to jump from the holder and fall in and damage the textile that is being woven. On the succeeding inward movement of the holder and shuttle, the runner *H* presses the inner arm of the switch member *p* out of its way and passes the same and then continues in the guideway *g* with the result that the finger *G* is held down out of the recess *v*. During the completion of the said inward movement, the plate *K* of the auxiliary-lock rides along the inclined rib end *d* and to a position between the plate *i* and the arm *A*, with the result that the projection *L* is drawn out of the recess *v*, and then and not until then is the shuttle fully unlocked and free to leave the holder *B* and be taken by the other holder. It will also be understood that at the time stated both ends of the shuttle are in the holders which is advantageous because it lessens the liability of the shuttle being accidentally thrown out. After the described release of the shuttle from the holder *B*, the operation set forth is repeated.

It will be gathered from the foregoing that the adaptability of one point of the holder *B* to get into the shed of the warp

before the other is materially advantageous, inasmuch as it obviates breaking of the warp. It will also be understood that at the time a shuttle end is moved into the holder *B*, the finger *G* of the first mentioned or main lock is in position to engage the shuttle and enable the holder to positively carry the shuttle outward, while at the time that the shuttle is to be delivered from the holder shown to the complementary holder the finger *G* will be entirely out of engagement with the shuttle—*i. e.*, entirely out of the recess *v* and clear of the shuttle.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a shuttle motion for looms, the combination with a suitably-supported arm having a longitudinal rib the inner end of which is inclined and also having longitudinal guideways at opposite sides of said rib, a bowed spring arranged in a recess in the side of the rib adjacent the inner end thereof, a retaining plate fixed with respect to the arm and located inward beyond the rib, and spring-pressed switch members pivoted to the arm and arranged outward beyond the rib and having recesses in their arms adjacent the rib; of a shuttle holder movable longitudinally on the arm and constructed to receive the end of a shuttle and having an opening in its side, a bowed spring carried by the holder and adapted to exert pressure against the shuttle, a rock-shaft journaled in the holder and having a finger adapted to extend through said opening and into a recess in the shuttle and also having a swinging runner adapted to cooperate with the said guideways, spring and switch members of the arm, and a vertically-movable plate carried by the holder in position to cooperate with the said rib and retaining plate and having a projection adapted to extend through the opening in the holder side and into the shuttle recess.

2. In a shuttle motion for looms, the combination with a suitably-supported arm having a longitudinal rib the inner end of which is inclined and also having longitudinal guideways at opposite sides of said rib, a spring carried by the arm and arranged adjacent the inner end of the rib, a retaining plate fixed with respect to the arm and located inward beyond the rib, and a switch carried by the arm and arranged outward beyond the rib; of a shuttle holder movable longitudinally on the arm and constructed to receive the end of a shuttle and having an opening in its side, a rock-shaft journaled in the holder and having a finger adapted to extend through said opening and into a recess in the shuttle and also having a swinging runner adapted to cooperate with the said guideways, spring and switch of the arm, and a laterally-movable plate

carried by the holder in position to cooperate with the said rib and retaining plate and having a projection adapted to extend through the opening in the holder side and into the recess of the shuttle.

3. In a shuttle motion for looms, the combination of a suitable support, a shuttle holder movable to and fro on the support, cooperating means on the support and holder for locking a shuttle to the holder while the holder is at the inner end portion of the support and for unlocking the shuttle on a subsequent traverse of the holder, and cooperating auxiliary means on the sup-

port and holder for locking a shuttle to the holder while the holder and shuttle are away from the inner end portion of the support and for unlocking the shuttle when holder and shuttle are at the inner end portion of the support.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH A. GENDRON.

Witnesses:

PAUL S. GENDRON,
A. F. MULVANY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."