L. LANGÉNIEUX.

WEFT REPLENISHING APPARATUS FOR WEAVING LOOMS.

APPLICATION FILED APR. 6, 1909.

960,965. Patented June 7, 1910.

FIG_1

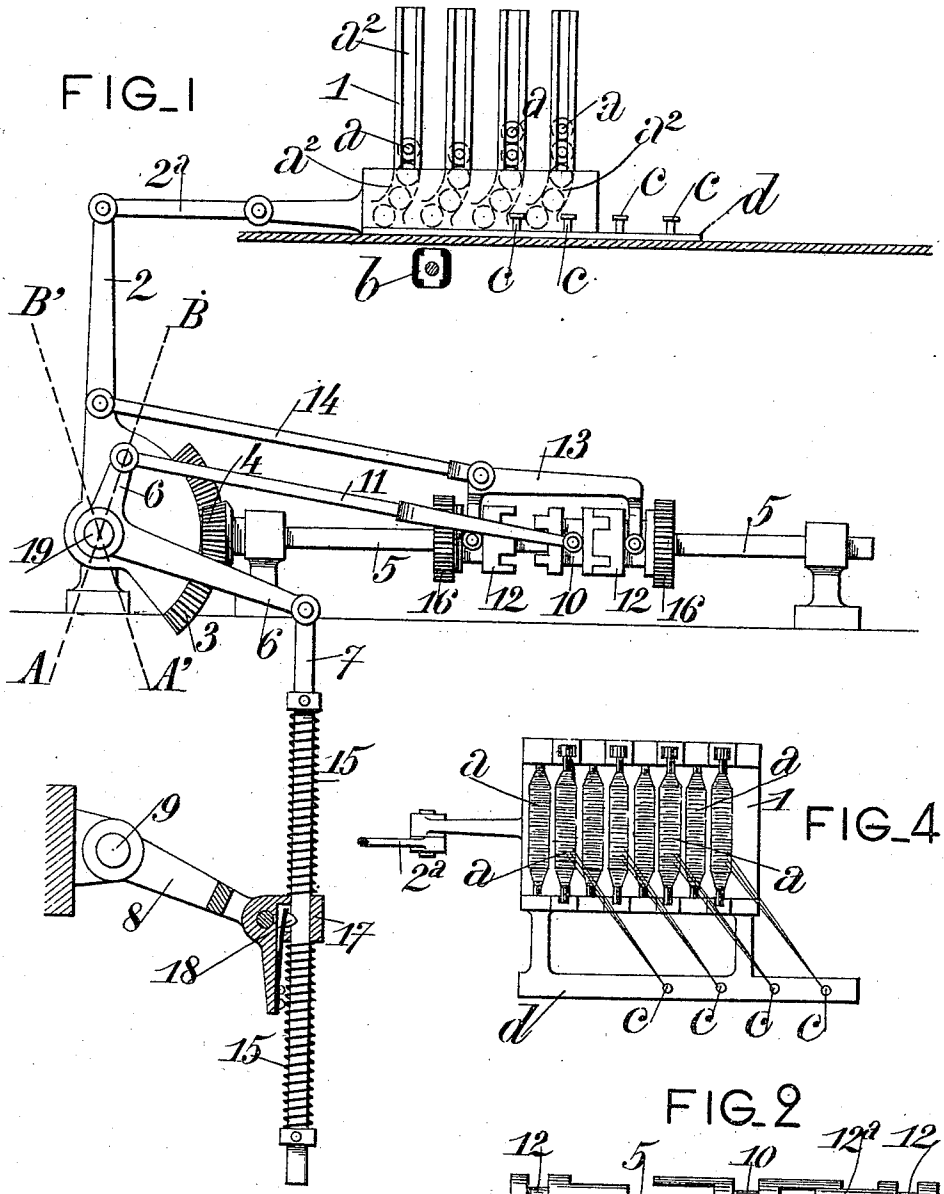


FIG_4

FIG_2

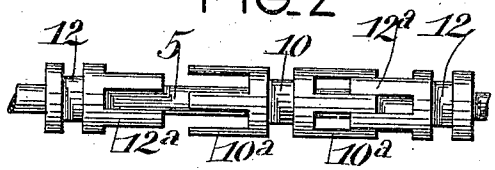
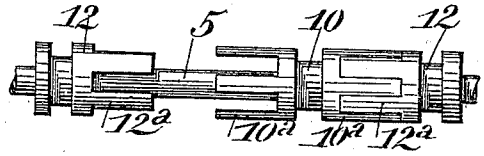


FIG_3



WITNESSES

W. P. Burke

R. R. Christy Jr.

INVENTOR

Lucien Langénieux

By J. M. Dillon Atty.

UNITED STATES PATENT OFFICE.

LUCIEN LANGÉNIEUX, OF ROANNE, FRANCE, ASSIGNOR OF ONE-HALF TO CLAUDIUS BELUZE, OF ROANNE, FRANCE.

WEFT-REPLENISHING APPARATUS FOR WEAVING-LOOMS.

960,965. Specification of Letters Patent. **Patented June 7, 1910.**

Application filed April 6, 1909. Serial No. 488,282.

To all whom it may concern:

Be it known that I, LUCIEN LANGÉNIEUX, citizen of France, residing at Roanne, Loire, France, have invented new and useful Improvements in Weft-Replenishing Apparatus for Weaving-Looms, of which the following is a specification.

The object of the present invention is to permit of an increase in the speed of weaving looms having a plurality of shuttles and provided with means for automatically changing the bobbins. In these apparatuses the bobbins carrying the threads of different colors are placed in a magazine divided into compartments which are automatically brought above the point where the change is effected. The ascending and descending movements of the shuttle box which are transmitted directly to the magazine determine said displacement.

Since the movement of the box is effected in a very short time, the magazine is sharply displaced which causes wear of the mechanism and objectionable vibration of the bobbins in said magazine. This inconvenience has not hitherto been remedied except by reducing the speed of the loom.

The present invention permits of reducing the speed of displacement of the magazine without reduction in the speed of the loom. In effect it is not necessary that the magazines should move with the same rapidity as the box provided that it is in its correct position at the moment the change of the bobbin is to be effected. A speed of the loom can thus be obtained at least equal to that of ordinary looms with a plurality of shuttles. To this end the movement of the magazine is rendered independent of the shuttle box, the displacement of the latter having no other effect than braking this movement in the desired direction, said movement being caused to stop automatically when the magazine has arrived at the desired point.

The invention is illustrated in the annexed drawing in which:—

Figure 1 is a sectional elevation of the mechanism for actuating the magazine. Figs. 2 and 3 are detail views showing a modification and Fig. 4 is a plan view of the bobbin magazine.

In the construction illustrated the magazine 1, Figs. 1 and 4, comprises four compartments and the bobbins a are superposed in guides a^2 curved at their lower ends in such a way that the lowermost bottom bobbin of each row can be forced into the shuttle b at the required moment.

The horizontal displacement of the magazine is effected by a lever 2 connected thereto by a link 2^a and fulcrumed on a fixed axle, 19, said lever being connected to a toothed sector 3 in mesh with a pinion 4 mounted on a horizontal shaft 5 adapted to rotate in either direction to produce the movements of the magazine. On the axle 19 is also rotatably mounted an angle lever 6 independently of lever 2 and the long arm of which is controlled by the movements of the shuttle box, situated on the opposite side of the loom, by means of the transverse shaft 9, lever 8 and rod 7. The latter is pivotally connected to lever 8 by means of a sliding ring 17 held in place by a spring catch 18 which can yield under a certain effort in one direction or the other. Springs 15 coiled about the rod 7 tend to draw back the ring 17 to its central or normal position.

On the shaft 5 two clutch members 12, 12 constantly rotate in opposite directions by means of suitable mechanism (not shown) acting on the toothed pinions 16, 16. Said clutch members are adapted for longitudinal movement on the shaft while always being held at the same distance apart by means of a forked stirrup 13 connected to the lever 2 by a rod 14.

Between the members 12 a double clutch member 10 is keyed to the shaft 5 and may by engaging one or other of the members 12 communicate to the shaft a movement in one direction or the other. The clutch member 10 is connected to the short arm of lever 6 by the rod 11.

The operation of the apparatus is as follows: When at rest and the magazine is in any position which corresponds to that of the movable box, the short arm of the lever 6 and the lever 2 are in alinement and the clutch member 10 is in its central position. This is the position which the apparatus always tends to assume when in movement. If the movable box is displaced, its movement is transmitted to the lever 6, by the shaft 9, lever 8 and rod 7. It being assumed as shown in the drawing that the displacement is of a single box, and that the lever 8 is inclined downward, the lever 6

is caused to occupy the position indicated by broken lines A—B forming a certain angle with regard to the lever 2 and causes the sleeve 10 to engage with one of the members 12 which communicates movement to the shaft 5 in such a direction as to draw the lever 2 in the direction of A—B through the pinion 4 and segment 3. By this displacement the clutch members 12 are moved to the right by the rod 14 and when the lever 2 arrives in the position A—B the member 12 is released from the member 10 and the apparatus returns to normal position, but the magazine remains in the position given thereto until the change of the following box.

When the displacement is for more than one box, the lever 8 passes the position shown in the drawing and the engagement of the clutch members 10 and 12 prevents the rod 7 from following, the full movement of said lever 8 whereupon the spring catch 18 of the ring 17 yields and said ring is caused to move downward and compress the spring 15. During the movement to the right of the sleeves 12, the spring 15 forces back the ring 17 keeping the clutch members 10 and 12 in engagement until the ring is again secured by its catch whereupon the parts resume the position shown in the drawing and the movement takes place as above described.

It will be understood that a movement in the reverse direction of the box and lever 8 will move the lever 6 into the position A^1 B^1 at the left of lever 2 and that the movements of the parts will be symmetrically opposite to the movements previously described.

The spring catch 17 can be dispensed with and the rod 7 pivoted directly to the lever 8 by giving the clutching parts or claws of the members 10 and 12 sufficient height to allow the full stroke of lever 8. When the displacement is for a single box the connection is effected by the ends of the claws as shown at 10^a, 12^a Fig. 2. On complete displacement from the first to the last box the engagement of the claws 10^a 12^a is complete, see Fig. 3. The other displacements give corresponding intermediate positions.

In order that the apparatus described produces the desired effect it is indispensable that breakage of the weft to be replenished should be prevented at the stroke of the shuttle. The thread of the fresh bobbin connected at its end to the magazine receives, at the moment when the shuttle is driven out, a shock which is rendered more dangerous owing to the recoil of the batten, the thread assuming a direction oblique with regard to the path of the shuttle. This disadvantage is obviated by the arrangement shown in Fig. 4 in which the threads of all the bobbins in each compartment are attached to one of the buttons *c c*—carried by bar *d* located at or about the height of the shuttle. The buttons *c* are situated behind the respective compartments at such distance that on the return stroke of the batten the thread is exactly in the plane of the axis of the shuttle when the latter receives its impulse.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In weft replenishing mechanism for weaving looms the combination of a plurality of shuttles, a shuttle box, a magazine for containing the weft bobbins and means controlled by the movements of the shuttle box for reciprocating said magazine and means operated by the movement of the magazine for automatically stopping same when the magazine arrives at the point corresponding to a given position of the shuttle box.

2. In weft replenishing mechanism for weaving looms, the combination of a shuttle box, a magazine for containing the weft bobbins, rotating clutch members, and means for connecting said clutch members with the magazine to reciprocate the same, said means including a co-acting clutch member in connection with the shuttle box.

3. In weft replenishing mechanism for weaving looms the combination of a shuttle box, a magazine for containing the weft bobbins, two interconnected and rotatable clutch members in connection with said magazine, a clutch member adapted to co-act with either of the aforesaid clutch members, connecting means between said last mentioned clutch member and the shuttle box and means for slipping said connecting means during certain movements of the shuttle box substantially as described.

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

LUCIEN LANGÉNIEUX.

Witnesses:

J. J. BRISON,

EDMOND A. BURRILL.