

June 30, 1931.

O. SHIMWELL

1,812,562

SHUTTLELESS LOOM FOR WEAVING

Filed Aug. 20, 1929

4 Sheets-Sheet 1

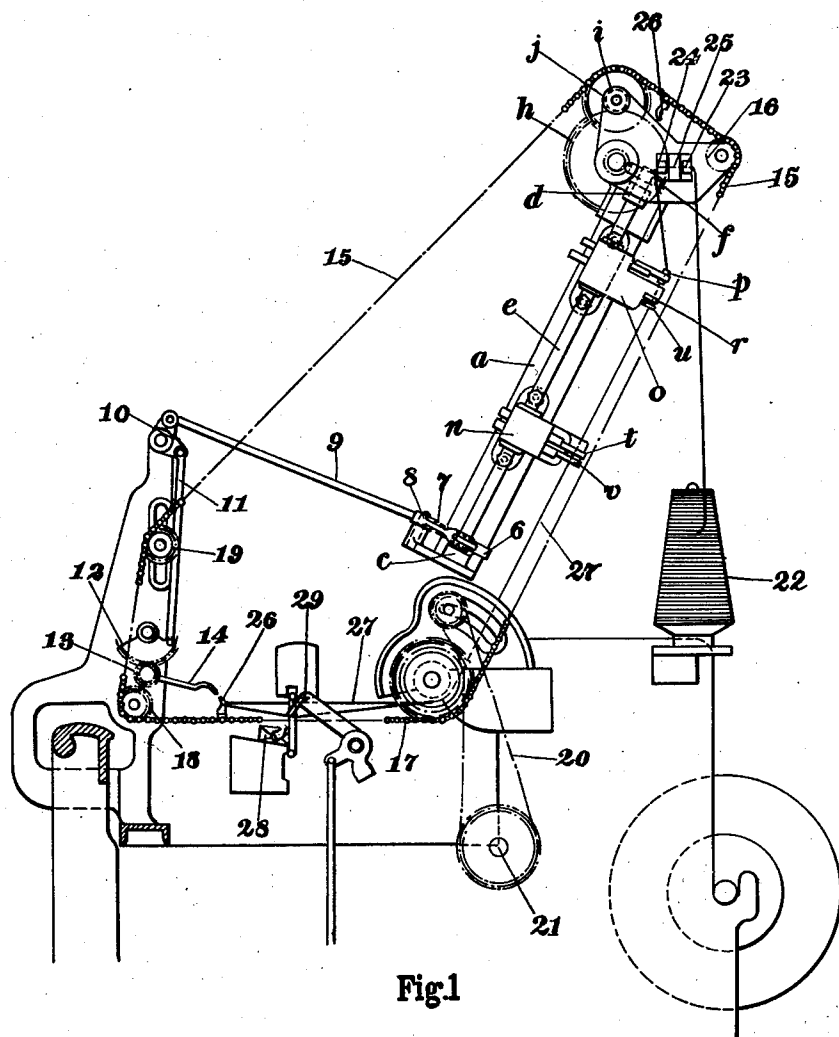


Fig 1

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4 Sheets-Sheet 2

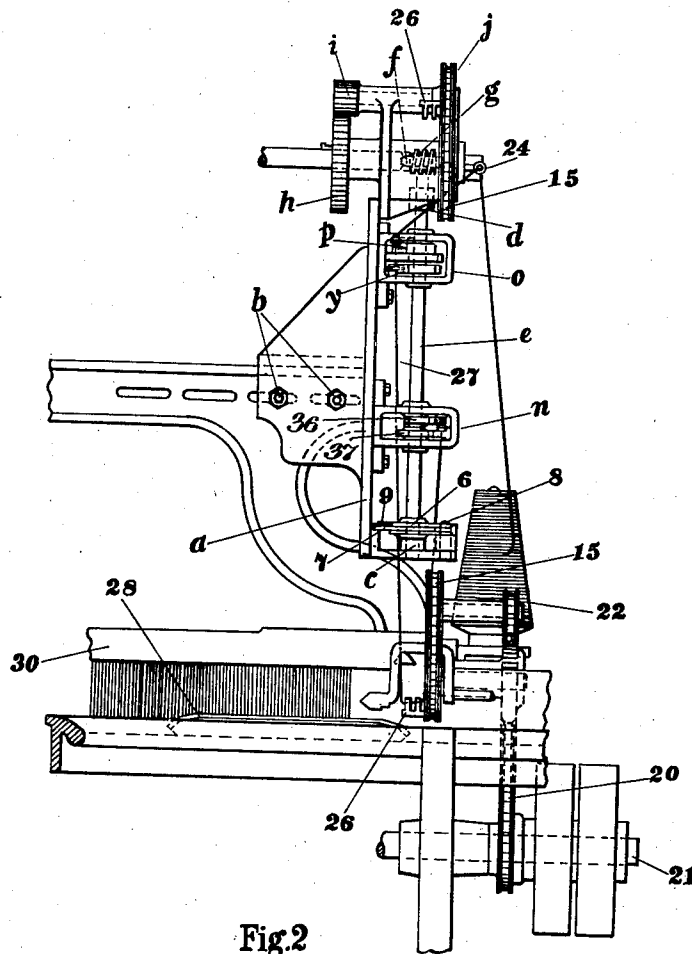


Fig. 2

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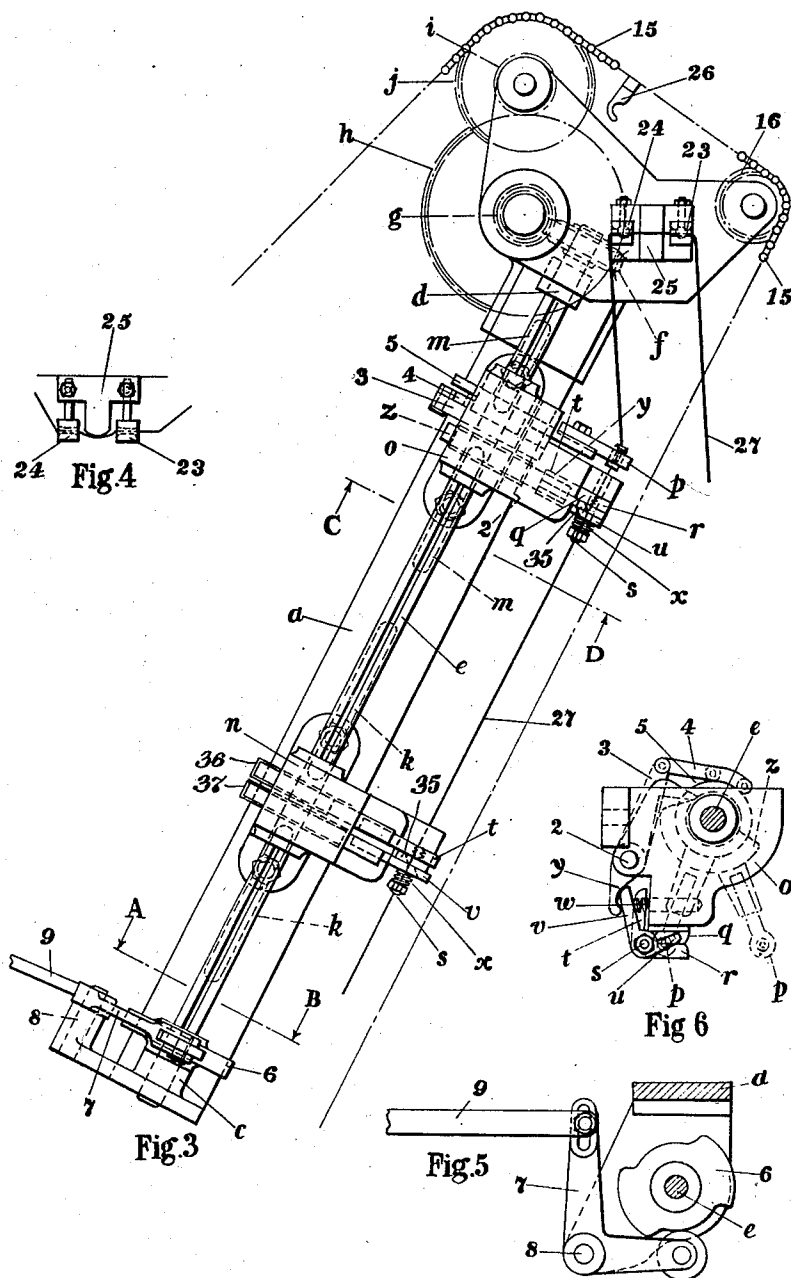
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SHUTTLELESS LOOM FOR WEAVING

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4 Sheets-Sheet 3



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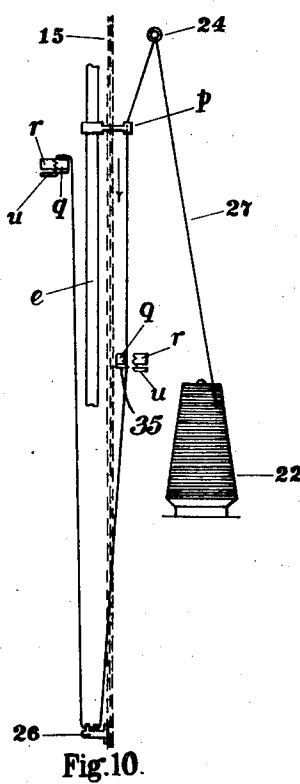
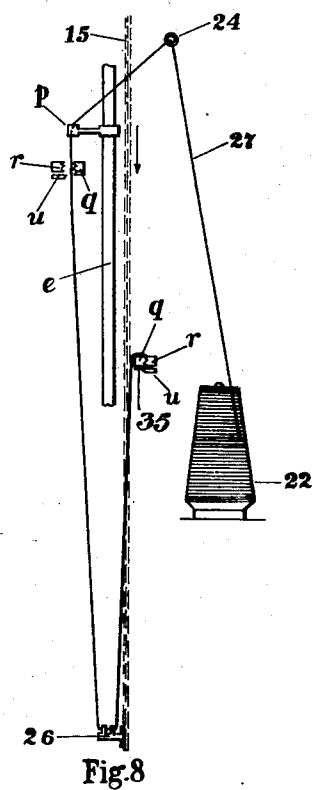
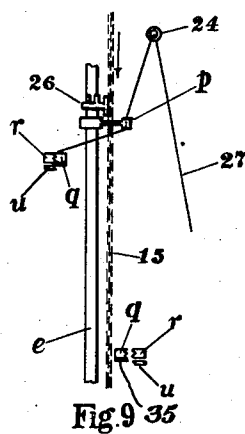
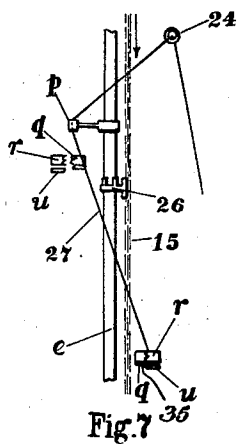
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SHUTTLELESS LOOM FOR WEAVING

Filed Aug. 20, 1929

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

OLIVER SHIMWELL, OF MANCHESTER, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO GAWSWORTH PATENTS LIMITED, OF MANCHESTER, ENGLAND, A BRITISH COMPANY, AND ONE-HALF TO PLATT BROTHERS & COMPANY LIMITED, OF OLDHAM, ENGLAND

SHUTTLELESS LOOM FOR WEAVING

Application filed August 20, 1929, Serial No. 387,171, and in Great Britain October 17, 1928.

This invention relates to what are known as shuttleless looms for weaving, and particularly to the arrangement described in prior Patent No. 1,571,878 wherein the weft threads are drawn out at the opposite sides of the loom into loop form by endless chains which carry guides which pass into the path of the weft threads, each stretched between two weft gripping and severing devices disposed at the opposite sides of the loom. Here-
 10 tofore in order to vary the length of the thread in each loop to suit the width of cloth being woven, deflectors have been provided which draw out the thread in the legs of the
 15 loop to increase the lengths thereof.

The invention comprises the arrangement of the thread gripping and severing means for each leg of the loop adjustable away from and towards the extreme position to which
 20 the yarn is carried during the formation of the loops.

The invention further comprises the improved constructions and arrangements of parts hereinafter described and claimed.

25 Referring to the four accompanying sheets of explanatory drawings:—

Figure 1 is a side elevation and Figure 2 a front elevation of the loop forming mechanism at one side of a loom, constructed and
 30 arranged in one convenient form in accordance with my invention.

Figure 3 is an enlarged view of part of the mechanism illustrated in Figures 1 and 2.

Figure 4 is a detail view of the thread tensioning means.

35 Figure 5 is a detail sectional plan view on the line A B of Figure 3.

Figure 6 is a detail inverted sectional plan view on the line C D of Figure 3.

40 Figures 7-10 illustrate diagrammatically the method by which the loops are formed.

The same reference letters in the different views indicate the same parts.

At each side of the loom is carried a frame
 45 *a* secured to the loom by the bolts *b*, Figure 2. One frame and one side only of the loom are shown in Figure 2. Each frame *a* at its opposite ends provides journal bearings *c*, *d* for a shaft *e* rotated by the worm wheel *f*, worm
 50 *g*, and gears *h*, *i*, from a sprocket wheel *j*.

The frame *a* has elongated slots *k*, *k* and *m*, *m* therein to receive the securing bolts of two brackets *n*, *o* which house yarn gripping and severing mechanism operated from the shaft *e* which passes through each bracket. 55 The bracket *o* also has located therein a thread guide *p* which is freely journaled upon the shaft *e* and is turned to one or other side as indicated in Figure 6 by the mechanism which operates the yarn gripping and
 60 severing means.

The yarn gripping means comprise two jaws *q*, *r*, see Figure 6, the one *r* forming part of a bell crank lever pivoted about a pin *s* and having a spring (not shown as it comes
 65 behind the spring *w*, Figure 6) acting on the part *t* thereof to hold the jaw *r* closed on the jaw *q*. The yarn severing means comprise a fixed blade 35 and a movable knife blade *u* forming part of a bell crank lever, 70 the other arm *v* of which is loaded by the spring *w*. A spring *x* presses the blade *u* towards the fixed blade. The gripper and cutter are operated by an arm *y* of a lever which bears upon a cam *z* keyed to the shaft *e*. 75 The first movement of the lever *y* moves the blade *u*; thereafter the gripper *r* is moved away from the fixed jaw *q*. The lever *y* is fixed upon a spindle 2 which forms its fulcrum and such spindle has secured thereon
 80 the arm 3 connected by the link 4 with the part 5 carrying the thread guide. When therefore the shaft *e* turns the cam *z* and the lever *y*, it turns also the thread guide from the position to the left in Figure 6 to the
 85 position to the right in that figure.

Figure 6 shows the gripping and severing means which are carried in the bracket *o*. The gripping and severing means carried in the bracket *n* (Figure 1) are similar to those
 90 carried in the bracket *o* with the exception that separate cams 36 and 37 upon the shaft *e* (Figure 3) operate the gripper jaw *r* and the blade *u* at the requisite times and that no
 95 guide as *p* is required.

The shaft *e* has thereon a cam 6, Figure 5, which turns a bell crank lever 7 about its fulcrum 8 and by means of a rod 9, bell crank lever 10, rod 11, quadrant 12 and wheel 13 100

turn a thread guide or finger 14 to be herein-after referred to.

An endless chain 15 passes over sprocket wheels *j*, 16, 17, 18 and 19. The sprocket wheel 17 has its shaft rotated by the chain 20 driven from the prime motion shaft 21.

The weft yarn is upon spools or bobbins as 22, located one at each side of the machine. It is fed into the machine through a yarn tensioning device shown in detail in Figure 4 which comprises two guide eyes 23, 24 with a friction surface or pad 25 between. The tension of the yarn is adjusted by varying the positions of the guide eyes 23 and 24 with relation to 25.

The chain 15 carries double hooks or guides 26 each of which is adapted to engage the weft thread 27 stretched between the guide *p* and one of the grippers as shown in Figures 7 and 9 and to draw such thread out into loop form as shown in Figures 8 and 10. In Figure 7, the yarn is held by the lower gripper and the guide *p* has moved to the left to bring the yarn between the gripper and the guide in the path of the hooks 26 on the chain 15. The thread is then drawn out into loop form by such hooks as shown in Figure 8. The upper gripper *r* and also the blade *u* adjacent thereto are now closed and one leg of the loop is cut, such leg being transferred into the warp threads by the weft carrier 28 shown in Figures 1 and 2. The portion of the loop adjacent to the side of the cloth is always passed into the warp threads first. Thereafter the lower gripper is opened to free the other leg of the loop which is transferred into the warp threads by the weft carrier after it has been returned from the opposite side of the warp threads by the weft carrier after it has been returned from the opposite side of the warp threads. The end of the thread from the bobbin 22 is now held in the upper gripper. The guide *p* is turned to the position shown in Figure 9 and the hooks 26 draw the thread out into a loop as shown in Figure 10. The upper gripper is then released and its leg of the loop transferred into the warp threads. The lower gripper and its blade are then closed and the other leg of the loop severed and then transferred into the warp threads. The cycle of operations is then repeated. It will be understood that the operation of the weft carrier 28 in transferring the two legs of each loop into the warp threads is the same as described in my prior Patent No. 1,571,878 so that no further description thereof is necessary in this specification.

It is necessary to make loops containing varying lengths of thread to suit the width of the sheet of warp threads in the loom. To enable this to be effected, the brackets *n* and *o* in which the yarn gripping and severing means for the two ends of the loop are carried are made adjustable upon the frame *a* by

means of the elongated slots *k*, *m* through which the bracket securing bolts pass. If, therefore, in Figure 1 the bracket *n* be moved towards the bracket *o*, or both brackets be moved higher up the frame *a*, the length of yarn in each loop will be increased whilst if one or both of the said brackets be lowered upon the frame, the length of yarn in the loops will be reduced.

As the hooks 26 with the weft thread carried thereby reach the sprocket wheel 18, Figure 1, which is the limit of their traverse with weft thread thereon, the guide or finger 14 is lowered into the loop to receive the thread from the hooks for the latter as the chain 15 travels round the sprocket wheel 18 release the yarn which is caught by 14.

29 is a depresser operated by suitable means for lowering the legs of the loop into the path of the weft carrier 28. 30 is the warp thread carrying beam. The tension upon the chain 15 can be adjusted by means of the adjustable sprocket wheel 19.

By arranging the chains 15 at each side of the loom so that they pass over sprocket wheels *j* and 16 (carried by the frame *a*) mounted in a relatively high position and so that their path constitutes practically three sides of a triangle, I reduce the horizontal space requisite for the formation of the loops whatever their lengths may be. My improved means for altering the length of the weft threads transferred into the sheet of warp threads to suit the width of cloth being produced are very simple and effective and enable a reduction to be made in the number of auxiliary mechanisms employed with a corresponding increase in the efficiency and reliability of the loom.

What I claim is:—

1. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, frames supporting the drawing out means and a slot and pin connection between the gripping and severing devices and the frame permitting adjustment of said devices for varying the length of the weft loop.

2. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, and a guide member adapted to enter the closed end of each loop as it is formed and to hold the latter.

3. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, said drawing out means in-

cluding a chain provided with a hook engageable with the weft thread to draw the latter into looped form, and a guide member adapted to enter the closed end of each loop and to hold the latter when the hook disengages the weft thread.

4. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a drive shaft operating the gripping and severing devices, and a guide member for the weft thread actuated by the shaft.

5. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a drive shaft, means connecting said drive shaft with the gripping and severing devices for operating the latter, a movable weft thread guide carried and operated by the said shaft to properly position the weft thread with respect to the gripping and severing devices during the formation of loops.

6. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a shaft coupled with the drawing out means, a driving connection between the shaft and the gripping and severing devices, and a weft thread guide actuated by the shaft for displacing the weft thread with respect to the gripping and severing devices.

7. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a shaft coupled with the drawing out means, cams on said shaft for operating the gripping and severing devices, and a weft thread guide actuated by said shaft.

8. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a shaft coupled with the drawing out means, a driving connection between the shaft and the gripping and severing devices, and thread guide members actuated by said shaft located, respectively, in advance and following the drawing out means with reference to the direction of movement of the weft thread.

9. In a shuttleless loom, weft gripping and severing devices, means for drawing out the

weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a shaft coupled with the drawing out means, and guide members for the weft thread arranged, respectively, in advance of and following the drawing out means, with reference to the direction of movement of the weft thread.

10. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a drive shaft operating the gripping and severing devices, a guide member for the weft thread actuated by the shaft, and means for adjusting the weft gripping and severing devices axially along said shaft.

11. In a shuttleless loom, weft gripping and severing devices, means for drawing out the weft thread stretched between the gripping and severing devices into looped form, a weft carrier for carrying the weft thread through the warp shed, a shaft coupled with the drawing out means, a driving connection between the shaft and the gripping and severing devices, and thread guide members actuated by said shaft located, respectively, in advance and following the drawing out means with reference to the direction of movement of the weft thread, and means for adjusting the weft gripping and severing devices axially along said shaft.

In testimony whereof I have signed my name to this specification.

OLIVER SHIMWELL.

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