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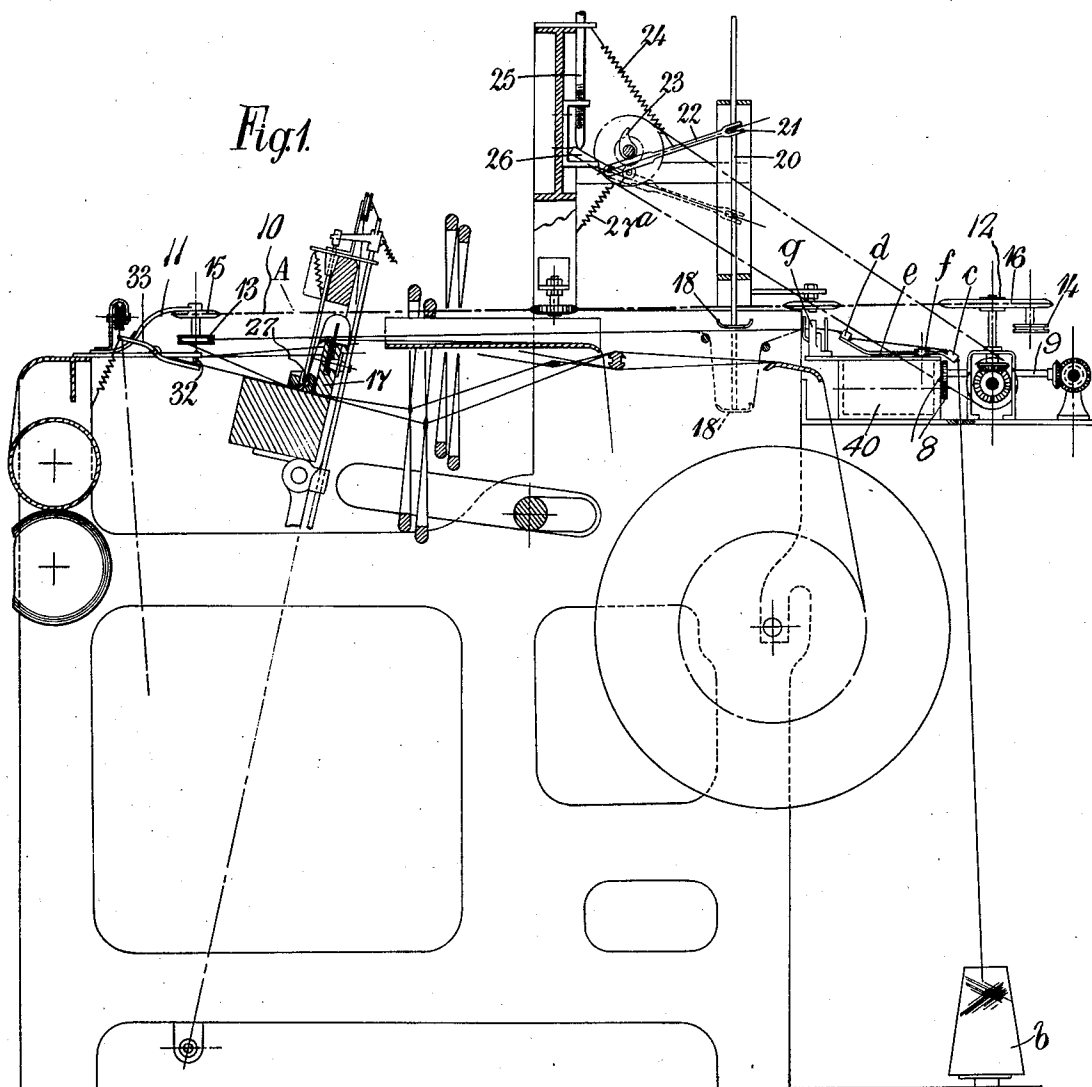
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LOOM FOR WEAVING

Filed Feb. 27, 1925

5 Sheets-Sheet 1



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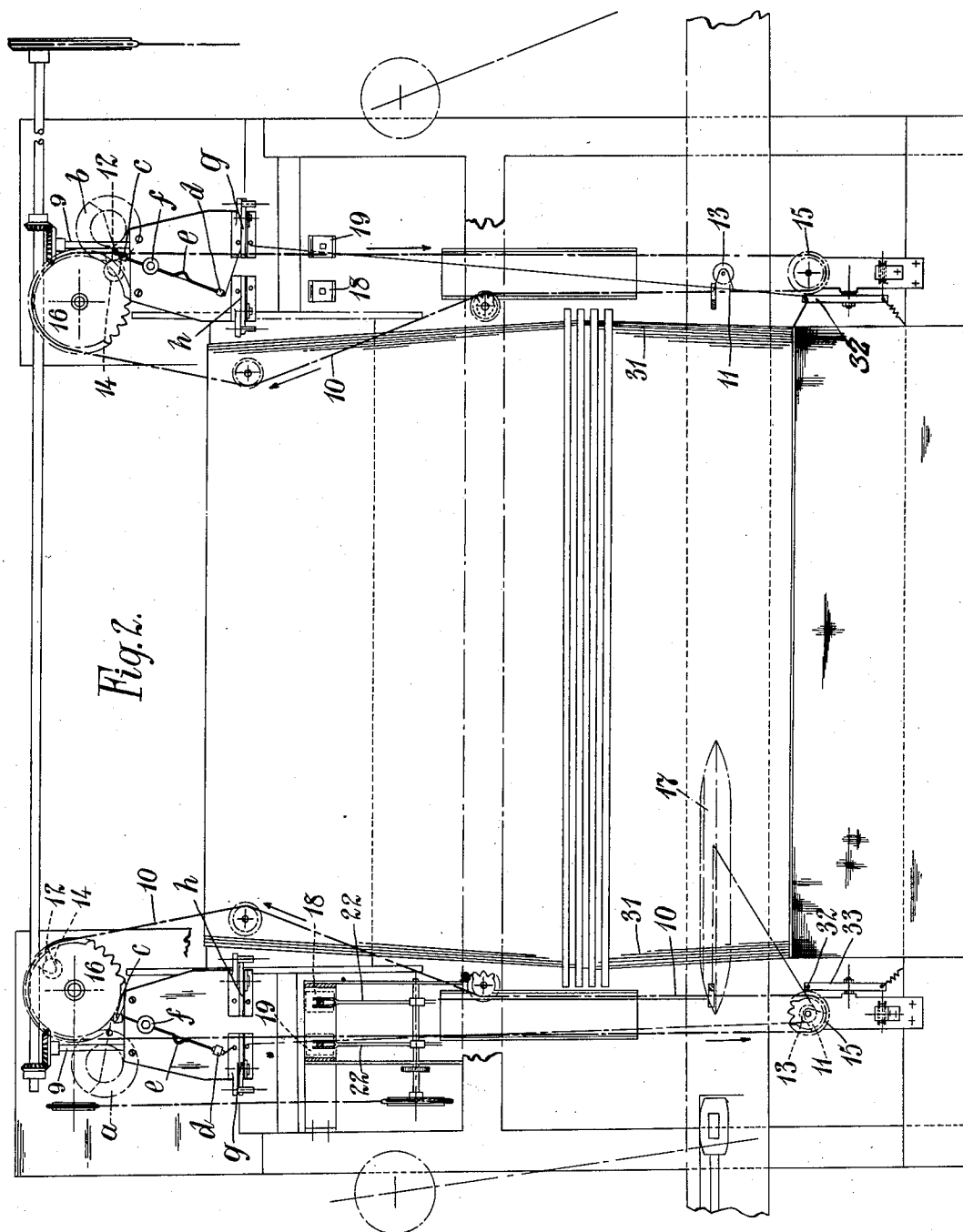
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5 Sheets-Sheet 2



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5 Sheets-Sheet 3

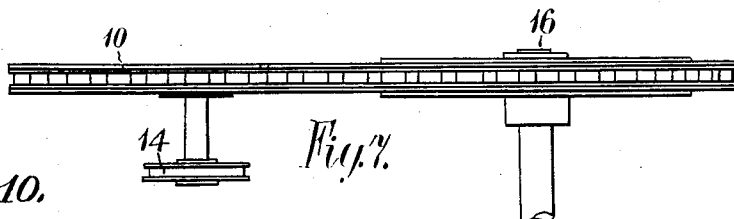
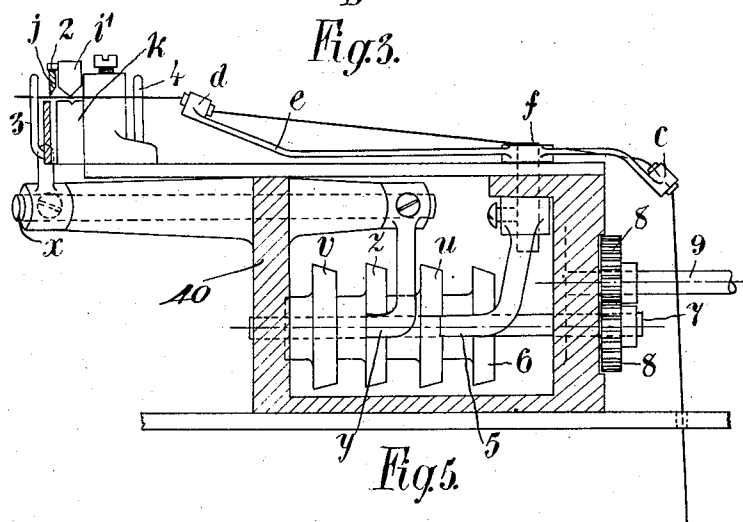
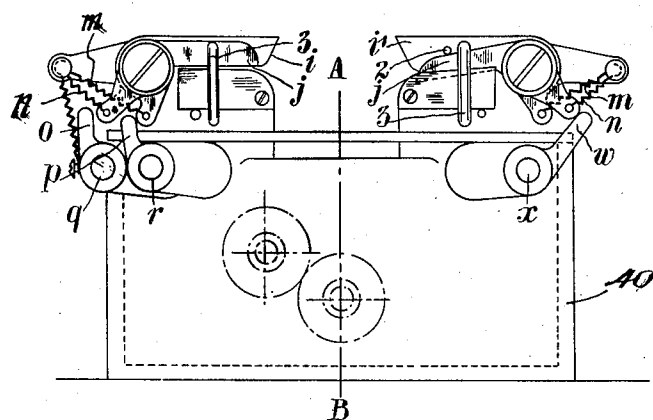
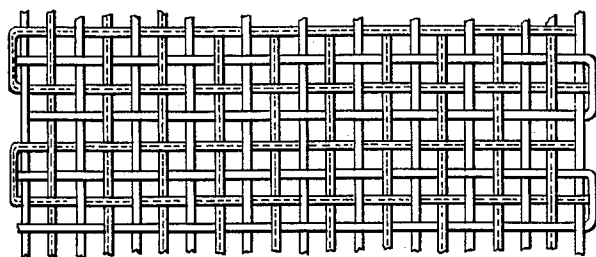


Fig. 10.



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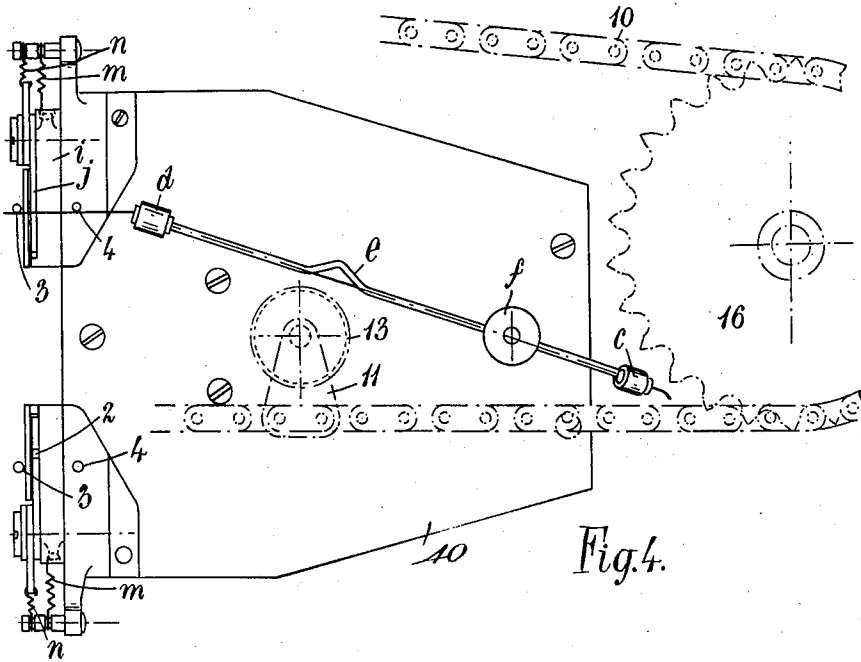


Fig. 4.

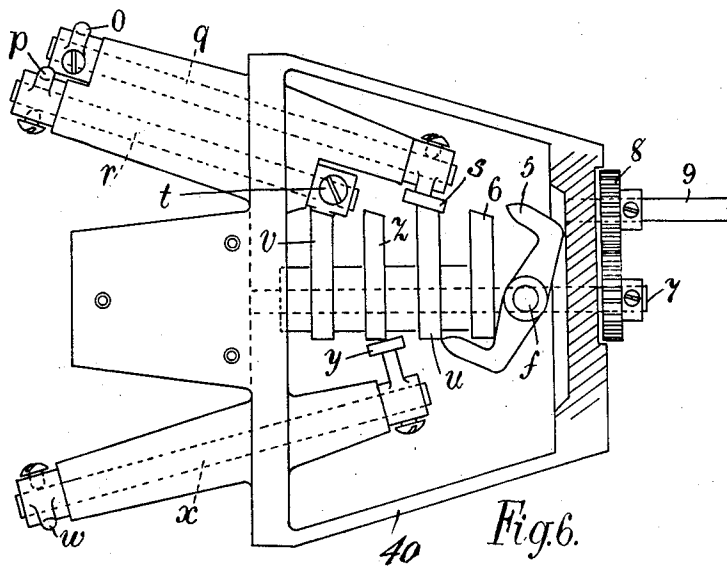


Fig. 6.

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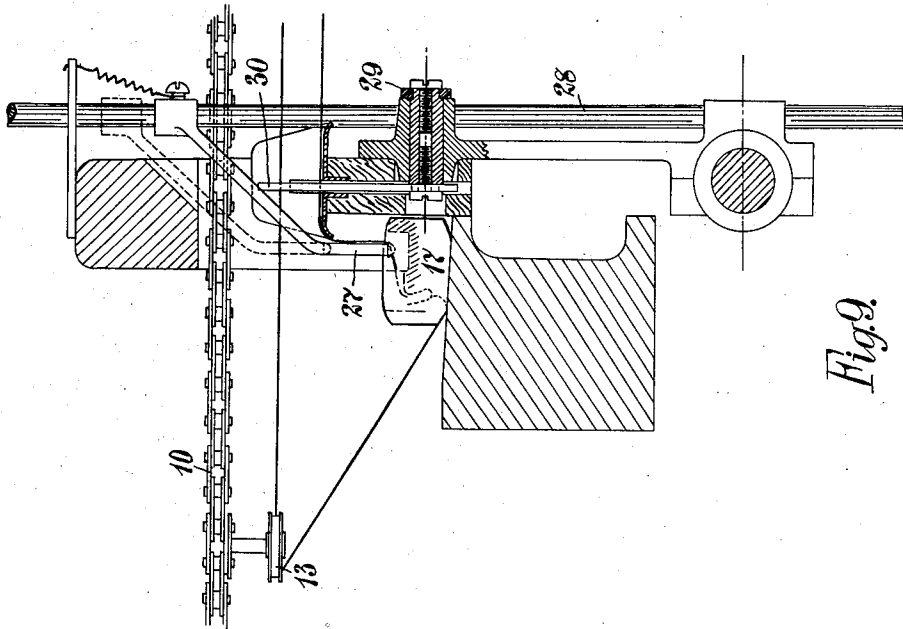


Fig. 9.

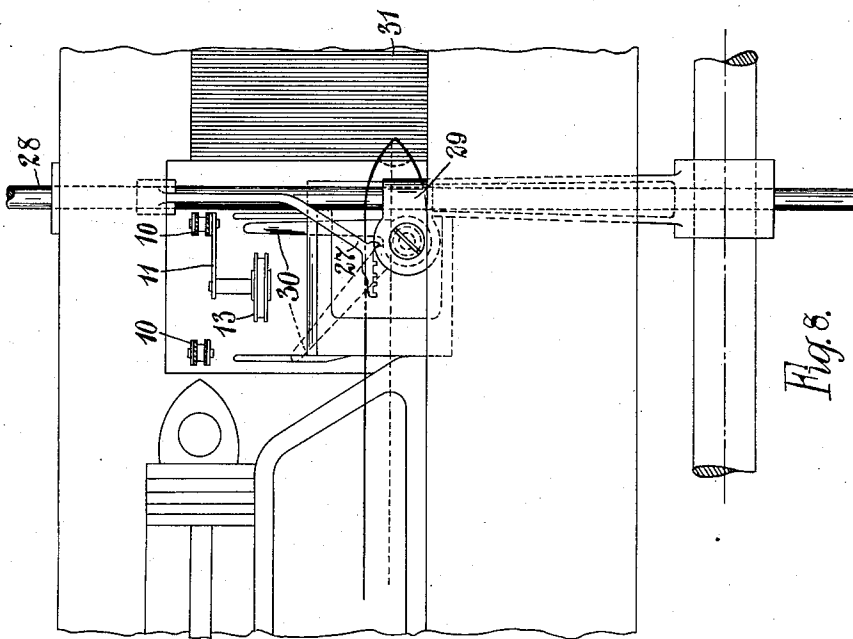


Fig. 8.

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Patented Feb. 2, 1926.

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UNITED STATES PATENT OFFICE.

OLIVER SHIMWELL, OF GAWSWORTH, ENGLAND.

LOOM FOR WEAVING.

Application filed February 27, 1925. Serial No. 12,130.

To all whom it may concern:

Be it known that I, OLIVER SHIMWELL, a subject of the King of Great Britain and Ireland, and residing at Gawsworth Old Hall, Gawsworth, in the county of Chester, England, have invented certain new and useful Improvements in Looms for Weaving, of which the following is a specification.

This invention relates to what are known as "shuttleless looms" for weaving, in which the weft instead of being carried in cop form in the usual shuttles is provided at the opposite sides of the sheet of warp threads and is carried through the said warp threads by carrier-like parts which engage a length of weft thread drawn from the weft supply bobbins by suitable means.

Heretofore means have been provided whereby the weft at each side of the sheet of warps is cut into doubled lengths, the end of each length being carried to the opposite side of the loom and being separated by one half of a length supplied from the other side. The cloth produced has therefore its selvages bound by the loops of the weft threads, each separated by a cut thread from a loop at the opposite side.

My present invention has for its object to provide improved and simplified means for producing a cloth similar to that before referred to.

My invention comprises the combination with each of the cheeses or bobbins, which are disposed one at each side of the loom, of two combined yarn gripping and severing devices, a movable yarn guide adapted to pass the yarn from gripper to gripper, a pin or like deflector adapted to be brought against the length of thread between the two grippers and to draw the same out into loop form by withdrawing further yarn from the cheese or bobbin, a carrier-like member with a hook thereon adapted to engage one length of the looped yarn and pass the same through the sheet of warp threads, and means whereby the said carrier after its return stroke (during which it puts into the warp an end of a loop thread from the opposite side of the loom) engages and puts into the warp the other length of the loop, the end of which has been released by its gripper.

My invention further comprises the employment of an endless chain with pins or yarn guides thereon for deflecting the yarn between the two combined yarn grippers and

severing devices, the said pins or yarn guides projecting inwards from the chain so as to come between the chain lengths and be coaxial with the sprocket wheel over which the chain passes as the pin or guide completes the formation of the loop of yarn, so that each of said guides pauses while the part of the chain to which it is secured passes round the sprocket wheel.

My invention further comprises the provision of means for drawing out or increasing the quantity of yarn in each length of the loop for a constant traverse of the deflector carried by the chain.

My invention further comprises the improved details of construction and arrangement of parts hereinafter described and claimed.

Referring to the accompanying sheets of explanatory drawings:—

Figure 1 is a sectional side elevation of a loom constructed and arranged in one convenient form in accordance with my invention;

Figure 2 is a plan view of the loom shown in Figure 1;

Fig. 3 is an end view of the two yarn gripping and severing devices,

Fig. 4 is a plan view of the same,

Fig. 5 is a sectional side elevation on the line A—B of Fig. 3,

Fig. 6 is a plan view of the actuating box beneath the yarn gripping and severing devices,

Fig. 7 is a plan view of the chain and its operating wheels, and

Figs. 8 and 9 are elevations taken at right angles to one another showing an arrangement of a depressing and a deflecting finger.

Fig. 10 is a top plan view of a portion of the material produced by the loom.

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

In the illustrated application of my invention, the weft is carried in cheese form at *a*, *b*, at the opposite sides of the loom, the cheeses being placed in any convenient positions. The weft from each cheese passes through two guide eyes *c*, *d* at the opposite ends of an arm *e* fulcrumed at *f* between the said eyes. Two gripping and yarn severing devices shown diagrammatically at *g*, *h* in Figure 2 and in detail in Figures 3, 4, and 5 are provided in conjunction with each pivoted arm *e* and the guide eye *d* is adapted to feed the yarn from gripper to

gripper with a length stretched between the grippers.

The yarn gripping and severing devices each comprise two bell-crank levers *i, j*, one arm of each clipping lever *i* being adapted to grip the weft between itself and a fixed member *k*, while the other arm is permanently acted upon by a spring *m* which tends to hold the gripper in its service position. The severing lever *j* is similar to the gripper lever and is acted on by a spring *n*. At one side the gripping and severing devices are operated upon by two separate arms *o, p* upon spindles *q, r* which carry tappets *s, t* engaging cams or eccentrics *u, v*. At the other side the severing lever or knife *j* is operated upon by an arm *w* upon a spindle *x* carrying a tappet *y* engaging a cam *z*. The gripper lever *i'* at the right-hand side of Figure 3 has a pin 2 mounted thereon which rests upon the severing lever or knife *j* so that the movement of the said lever *i'* is determined by the movement of the knife *j*, but the gripper grips the weft thread always slightly before the knife severs the same as hereinafter described. Guides 3 and 4 are arranged at the opposite sides of each gripper and severing device to keep the weft threads in correct position for gripping and severing. The fulcrum pin *f* of the guide carrying lever *e* carries the tappet 5, Figures 5 and 6, which engages the cam or concentric 6. The cams *v, z, u, 6* are secured upon the spindle 7 rotated by gearing 8 from the shaft 9. The cams *u, v, z* and 6 are enclosed within a box 40 upon which the thread gripping or holding and severing devices before described are mounted.

An endless chain 10 (at each side of the machine) with preferably two equally spaced brackets 11, 12 thereon carrying guide rollers 13, 14 projecting therefrom, is passed over two sprocket wheels 15, 16, the wheels 16 being positively rotated by suitable means. Figure 7 is an enlarged view of part of a chain 10 with its driving sprocket wheel 16 and yarn guide roller 14. The guides 13, 14 are adapted to engage the length of yarn stretched between the two grippers *g, h* (Figure 2) aforesaid and to deflect or draw out the same into loop form by withdrawing yarn from the cheese. When the loop is fully produced, the guide is on a part of the chain passing around the sprocket wheel 15 and as the guide is then coaxial with the sprocket wheel 15, there is a dwell or pause during which the loop is held by the guide roller, while means transfer one length thereof to the shuttle-like member or weft carrier 17. The end of said transferred length is cut by one of the combined gripper and severing devices.

If the length of yarn in the loop is not sufficient for the width of cloth being woven,

I provide auxiliary deflectors acting upon the two lengths of yarn constituting the loop. Such deflectors cause an increased length of yarn to be drawn from the cheese. Referring to Figures 1 and 2, the auxiliary deflectors are shown at 18, 19. They are each carried by a vertical rod 20 having a pin 21 thereon engaged by a forked arm 22 acted upon by a cam 23 carried by a spindle rotated in unison with the chain 10 as shown. A spring 24 tends to raise the arm 22 and the deflector. Adjustment of the stroke of the deflector is affected by means of the screw 25 which tilts the lever 26 carrying the pivotal point of the arm 22. A spring 27* tends to hold the lower end of the lever 26 down. In Figure 1 the displacer 18 is shown in dotted lines in a position in which it has drawn out an extra length of yarn into the loop formed by the chain guide 13.

In Figs. 8 and 9 there is shown an arrangement of the depressor and the deflecting finger for ensuring that the weft threads enter the weft carrier when the latter is propelled through the shed in the manner usual with ordinary shuttles. The arrow A, Figure 1, points to the part of the loom which is shown in more detail in Figures 8 and 9. The depressor 27 upon the rod 28 is shown in its lowermost position in full lines in the said figures. The dotted lines in Figure 9 show the depressor raised. Means (not shown) are provided, which turn an arm 29 causing the oscillation or turning of a finger 30 in such a way that it is moved to its upright position from the inclined position shown in dotted lines in Figure 8 and carries the weft thread which was at the left-hand side of the loop formed by the guide wheel 13 to what was the right-hand side of the said loop, where it comes beneath the depressor 27 and is so held in place to be engaged by the weft carrier and carried through the shed. The deflector does not operate on both lengths of the looped thread but only on the length which is the more removed from the sheet of warp thread represented by 31. The depressor 27 operates on both lengths of the loop to ensure their engagement by the weft carrier. Referring to Figure 8, if a loop of thread be disposed around the guide 13, the first lowering of the depressor 27 will bring the right hand side of the loop into the path of the weft carrier 17 by which it is taken into the shed. When the carrier has returned, the deflector or finger 30 will transfer the left hand length of the loop to the right so that it will be engaged and lowered by the depressor 27 on its next descent, after which the weft carrier transfers it into the shed.

The carrier-like member is double-ended so as to act on weft threads from each side of the loom. After taking one length

through the shed and returning with a length of yarn from the opposite side of the loom, the second length of the loop is depressed to engage the shuttle hook. A pin 32 on a lever 33 is moved into the loop at the correct moment in order to retain the yarn at the end of the loop after the guide 13 or 14 has passed round the end sprocket wheel 15 and so maintain the yarn tension between itself and the cloth selvage until the second length of yarn is transferred to the shuttle or weft carrier. At the right-hand side of Figure 2 the pin 32 is shown in the loop and at the left-hand side it is shown about to enter the loop.

It will be understood that similar mechanisms are provided at each side of the loom.

The operation of the mechanism is as follows:—Assuming in Figure 2 and the left-hand side thereof, that the loop of thread has been transferred into the warps by the weft carrier, then the gripping device at *g* will be holding the end of the thread. The guide carrying lever *e* now moves to pass the thread across from *g* to *h*, the gripper and severing levers on the latter being open. The guide wheel 14 on the chain comes into engagement with the thread stretched between the gripper of *g* and the guide eye *d* and draws the thread out into a loop, any additional thread required in the loop being obtained by the auxiliary deflectors 18 and 19 being depressed upon the two lengths of thread constituting the loop. When the guide wheel 14 comes coaxial with the sprocket wheel 15, the gripper of the device *h* closes and the severing lever or knife *i* of such device cuts the thread end between the gripper and the guide wheel 14. The depressor 27 presses the weft into the line of the carrier. The latter now carries the length of weft nearest the warp threads through the shed and the pin 32 enters the end of the loop. The weft carrier then returns through the shed with another length of thread from the opposite side of the loom. In preparation for the transfer of the second length of the loop into the shed, the deflector 30 carries the said length beneath the depressor 27 and the gripper of the device *g* opens so releasing the end of said length. While the carrier is carrying the remainder of the loop at the left-hand side of the loom through the shed the depressor 27 is raised, the deflector 30 moved to the dotted line position, Figure 8, the pin 32 lowered, the auxiliary deflectors 18, 19 are raised and the cycle of operations can now be repeated. This time the thread is stretched from the gripper of *h* to a point adjacent the device *g* by the guide *d* and the loop produced as already described. When the loop is produced, *g* grips its end and then *h* releases its end before the weft carrier acts thereon. Later the gripper *g* cuts

its end, still, however, holding the part of the thread adjacent the guide *d* so that the next loop can be formed in the manner previously described.

The chain 10 may be operated through a drive containing an eccentric so as to obtain a slowing down of the speed of the chain when a guide 13 or 14 is passing round the sprocket wheel 15.

I do not limit myself to any particular means for operating the gripping and thread severing devices and the deflectors. It will be understood that the application of my invention to a loom does not involve any material alteration to the latter.

I claim:

1. In a loom for weaving, weft supplying means comprising in combination two weft gripping and severing devices disposed in pairs at each side of the loom, means for transferring the weft from one of the devices of each pair to the other of the same pair, other means for drawing out the weft thread stretched between the said devices into loop form, and a weft carrier adapted to be traversed from side to side of the loom and to carry the halves of the loops successively from opposite sides of the loom through successive warp sheds.

2. In a loom as claimed in claim 1, wherein there is provided an endless chain, and guides carried by the chain and adapted to pass in the path of the thread stretched between the weft gripping and severing devices for the purpose of producing the loop threads, substantially as described.

3. In a loom, weft supplying means comprising in combination two spaced stationary devices each including a thread holding element and a thread severing element, means for operating said elements and a pivotally mounted lever provided with a guide-eye, means for oscillating said lever to carry the weft thread from one device to the other, an endless chain, a plurality of guides carried by and projecting downwardly from the chain and passing through the space between the said device so as to draw out the thread into a loop, and a weft carrier adapted to pass one length of the loop into the warp shed and then after its return to pass the other end of the loop into the successive warp shed, substantially as described.

4. A loom as claimed in claim 3, wherein auxiliary deflectors are provided for drawing additional lengths of thread into the loops, substantially as and for the purposes set forth.

5. A loom as claimed in claim 3, wherein means is provided for deflecting and depressing the second length of each loop to ensure of its engagement by the weft carrier.

6. A loom as claimed in claim 3, wherein a pin is provided and adapted to be inserted in the end of the loop until the second length

of thread has been passed into the warp sheds, substantially as and for the purposes set forth.

7. In a loom, stationary weft supplying means comprising in combination two spaced stationary devices each of which comprises a thread holding element and a thread severing element, means for operating said elements, weft presenting devices, a pivotally mounted lever provided with a guide-eye, means for oscillating the guide-eye carrying lever to carry the weft thread from one device to the other, an endless chain, a plural-

ity of guides carried by and projecting from the chain and passing through the space between the said devices and adapted to draw out the thread into a loop adjacent each weft presenting device and on opposite sides of the loom, and a weft carrier for separately taking the two lengths of the loop through the warp sheds, substantially as and for the purposes set forth. 15 20

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

OLIVER SHIMWELL.