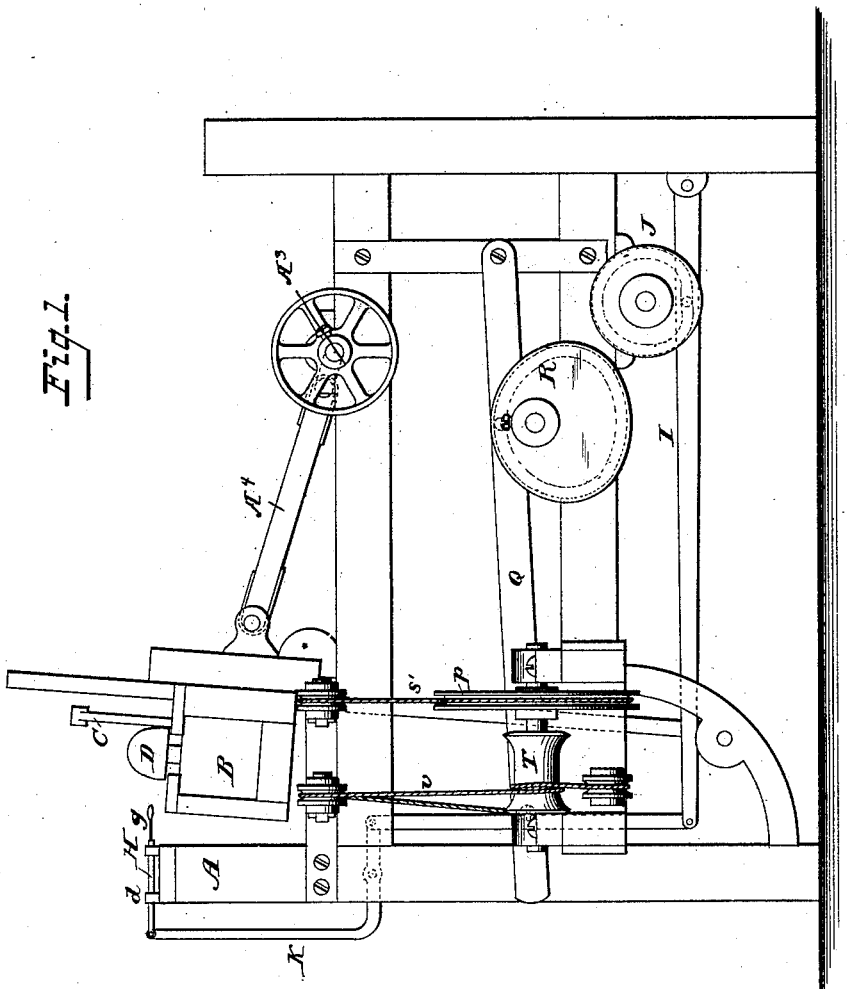
(No Model.) 3 Sheets—Sheet 1.

W. WEAVER.

LOOM.

No. 342,408. Patented May 25, 1886.

Fig. 1.



Attest:
Court A. Cooper.
Wm. F. Jayers.

Wm. Weaver
Inventor:
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Attys.

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W. WEAVER.

LOOM.

No. 342,408. Patented May 25, 1886.

Fig. 2.

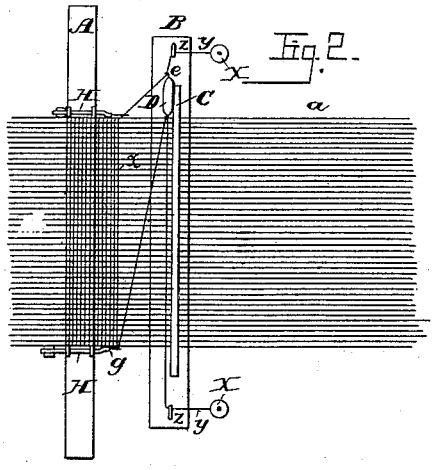


Fig. 3.

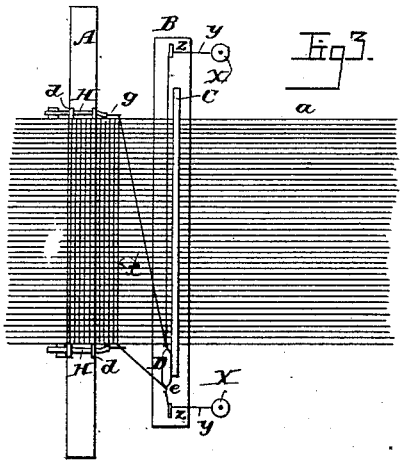


Fig. 4.

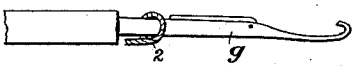


Fig. 5.

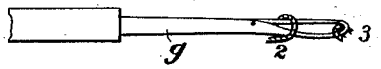
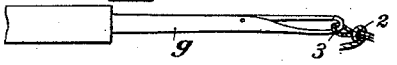


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 7.

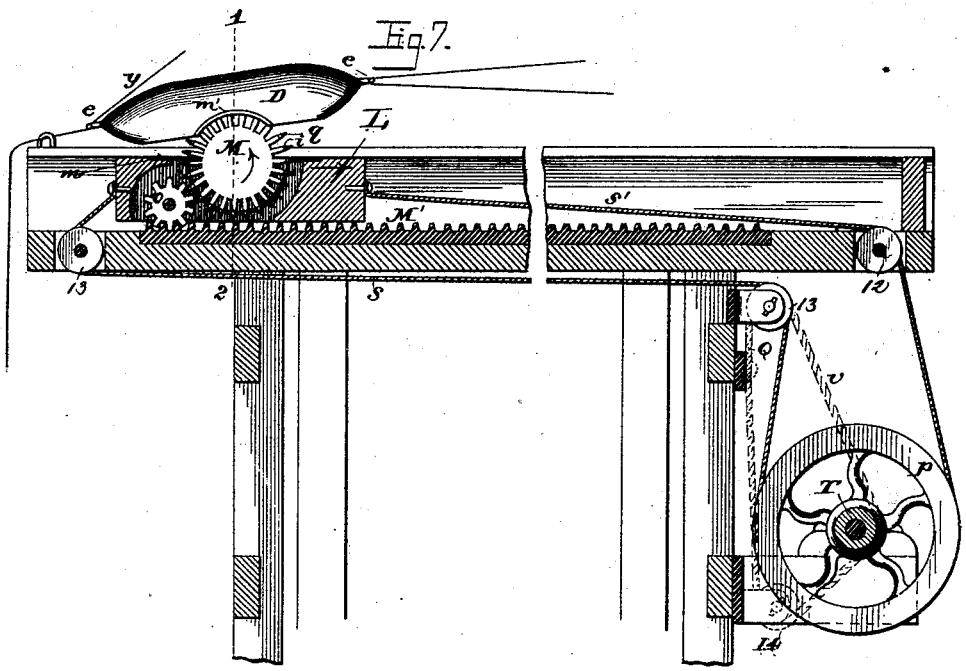


Fig. 8.

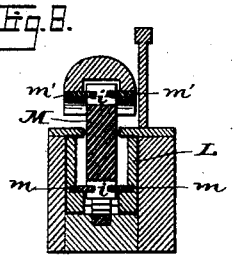


Fig. 9.

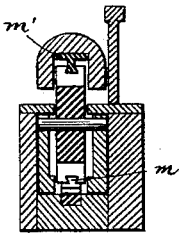
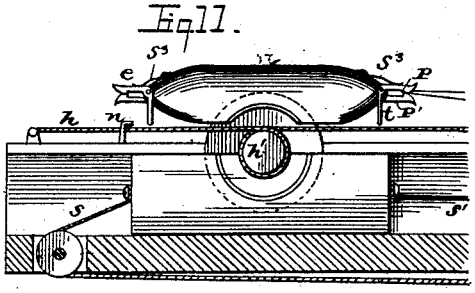


Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM WEAVER, OF GREENWICH, ASSIGNOR OF ONE-HALF TO A. G. STORY, OF LITTLE FALLS, NEW YORK.

LOOM.

SPECIFICATION forming part of Letters Patent No. 342,408, dated May 25, 1886.

Application filed April 16, 1884. Serial No. 128,137. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WEAVER, a citizen of the United States, residing at Greenwich, in the county of Washington and State of New York, have invented certain new and useful Improvements in Looms, of which the following is a specification.

My invention consists in certain improvements in mechanism, fully described hereinafter, whereby I am enabled to lay a double weft across the warp at each traverse of the thread-carrier and prior to each beat of the lay. My invention further consists in means for imparting a positive traversing motion to the thread carrier.

In the drawings, Figure 1 is a side elevation of sufficient of a loom to illustrate my invention. Figs. 2 and 3 are plan views showing the breast-beam, lathe, thread-carrier, selvage devices, and warps and wefts. Figs. 4, 5, and 6 are views illustrating the operation of the selvage-needle. Fig. 7 is an enlarged longitudinal section of the lathe and part of the frame, showing the thread-carrier and its operating devices. Fig. 8 is a transverse section on the line 1 2, Fig. 7. Figs. 9, 10, and 11 are views showing modifications of the carrier-connecting mechanism.

In Figs. 2 and 3 parallel lines *a* represent the warp-threads. A represents the breast-beam; B, the lathe; C, the reed, and *x* the line to which the wefts have been beaten up by the lathe. A^3 is the usual crank-shaft, and A^4 one of the pitmen connecting the shaft and lathe. These parts are constructed as in ordinary looms, and the warps are operated by the heddles in the ordinary manner.

The wefts or filling-threads, instead of being carried by the shuttle, as usual, are conducted from two bobbins, X, one or more, adjacent to each side of the warp, and extending through eyes *z* upon the lathe, or otherwise suitably guided, so as to be seized by a carrier that traverses the lathe in the manner of an ordinary shuttle.

As shown, and more fully described hereinafter, the carrier D is provided at each end with a hook or catch, *e*, and receives a positive motion, and is so operated that as it approaches either end of the lathe its hook will engage with the adjacent thread *y*, and then as it moves away from that end will draw it in the form of a loop, or doubled completely across the warp, and will then be detached from the weft as the latter is beaten up by the forward motion of the reed. As the carrier brings one loop of thread *y* to one edge of the warp its opposite or outside hook engages with the thread *y* adjacent to such edge, and after the shed is again opened this last-mentioned thread *y* is also drawn in the form of a loop, or doubled to the opposite edge of the warp, and is then released and beaten up as the first thread *y* is again seized by the outside hook of the carrier. By this mode of operation the weft is laid doubled in the warp at each traverse of the carrier, so that there is no loss of time, as results from a return movement without the laying of the thread.

For general purposes, it is sufficient to draw a loop close to the edge warp, and there release it without any further securing of the same than results from the thread being beaten up and the shed closed, thus forming a sufficient selvage in most instances. I prefer, however, to form the selvage by interlocking the successive loops of weft-thread by means of a latch-needle, *g*, carried by a needle-bar, H, sliding in bearings *d*, arranged upon the breast-beam close to the edge warp, as shown.

Each needle-bar is operated from a cam, J, through the medium of connected levers I K, arranged to move the needle-bar back and forth, so as first to pass the needle through the loop 2 of the thread *y* as soon as it is formed, as shown in Fig. 4, and to retain it upon the shank, and then seize the next loop, 3, as soon as it is formed, as shown in Fig. 5, and then move backward and draw the loop 3 through the loop 2, as shown in Fig. 6, after which its forward movement will carry the loop 3 upon its shank to the position formerly occupied by the loop 2. It will be noted that the carrier, after seizing the loop and doubling it in the warp, passes wholly beyond the side of the warp, and the warp-operating appliances are set to permit the weft to be beaten up before the return movement of the carrier with the weft from the opposite side. Each doubled weft is thus beaten up and secured by the closing of the shed.

The lathe is provided with a channel or race,

within which is reciprocated a block, L, carrying a wheel, M, having a central hub and thin radial projecting blades or teeth, *q*, each of which has a notch, *i*, in each edge, and into the notches upon each side of the wheel extend curved plates *m*, secured to the carriage in such position that a portion of the wheel projects above the upper face of the carriage with the teeth or blades thereof above the upper face of the lathe. The curved blades *m* hold the wheel positively in a fixed position in respect to the carriage, but permit it to be revolved freely upon said curved blades as bearings, a rotary motion being imparted from a stationary rack, M′, over which the carriage slides through the medium of a pinion, O, carried by the carriage and engaging both with the rack and wheel, or by means of a stationary cord, *h*, secured at its opposite ends to the lathe and passing one or more times around a hub or drum, *h′*, of the wheel to rotate the latter as the carriage reciprocates. In any case the arrangement is such that upon drawing the carriage L toward either end of the lathe the wheel M will be revolved in a reversed direction to the travel of the carriage, and at such a speed that its blades will pass through the warps lying upon the face of the plate without drawing or imparting any lateral deflection thereto.

The carrier D is positively connected to the wheel M by curved plates *m′*, which extend from the carrier into the notches *i* in the sides of the teeth *q*. This connection is a positive one, rendering the carrier undetachable from the wheel, yet permitting the latter to revolve freely, so that as the wheel is moved from end to end of the lathe the carrier is conducted by it with a positive motion above the lower plane of the warp-threads, which enter the spaces between the teeth *q* and pass between the hub of the wheel and the carrier without being deflected and without any friction or wear. The lower edge of the carrier D may be set so close to the face of the lathe that the carrier will practically occupy a horizontal position. I prefer, however, to set the carrier a short distance above the said face, the result being that the forward end of the carrier is always tilted down toward said face, so that the outer hook, *e*, that approaches either thread *y*, will first pass beneath the latter, and will then be lifted to catch the same as soon as the carrier is tilted as the carriage begins to be drawn in the opposite direction, the hook upon the inner end being thus at the same time depressed, and being thereby withdrawn from the loop of thread *y*, which has just been carried between the warps, and which is held by the warp stationary, so that the hook can be drawn therefrom.

By means of the curved plates fitting the notches in the teeth of the wheel M a positive connection between the wheel and carrier is secured, which connection, however, permits absolute freedom of revolution of the wheel with comparatively no friction, so that the carrier is driven positively by connections from below completely through the shed without the connection with the driving parts interfering with the beating up of the weft.

It is not necessary that the grooves for the reception of the curved connecting-plates *m m′* shall be in the sides of the blades or teeth *q*, for they may be in the ends thereof, either central or otherwise, as shown in Figs. 10 and 11, and adapted to receive curved plates *m m′*, which are T-shaped or dovetailed in cross-section, the positive connection and the free rotation of the wheel being secured as before.

Instead of a hook at the end of the shuttle, the latter may be provided with jaws, which open to receive the thread *y* when brought against it, and then close positively or spring together, one of said jaws being brought against a suitable device for opening it as the shuttle reaches the limit of its movement in either direction. Thus there may be a spring, S^3, movable jaw P, and a fixed jaw, P′, each having a shouldered horizontal arm, and an arm, *t*, of the jaw P may be arranged to strike a stud, *n*, as the carrier reaches the limit of its movement, thus opening the jaws and releasing the thread.

It will be obvious that where it is desired to employ a shuttle the latter may take the place of the carrier, being connected to the wheel M by one or more curved bearings, fitting notches in the said wheel in the same manner as the carrier is attached.

The carriage may be reciprocated by different appliances. As shown, two draft-cords, *s s′*, are connected to the ends of the carriage and conducted in opposite directions around guide-pulleys 12 13, and wound in opposite directions around a grooved wheel, *p*, which is revolved first in one direction and then in the other by the winding and unwinding of the cord *v* upon a drum, T, upon the shaft of the pulley, which cord passes around guide-pulleys 14 and is connected to a lever, Q, vibrated by means of a cam or wiper, R, upon one of the shafts of the machine.

While I have referred to the driving connection with the shuttle or carrier as being below the shuttle, it will be evident that an inversion of this arrangement—the driver being above and the shuttle suspended—would be attended with like results. It will also be evident that the wheel M may turn on a stud upon the carriage.

I am aware that weft-threads have been carried doubled between the open warps by sliding bars with shoulders engaging with the weft-threads, and introduced first from one side and then from the other. My invention is distinguished from this by the fact that my carrier moves bodily between and beyond the warps, which can at once be closed on the doubled thread as soon as it is laid, while in the other case the warp must be held open until the carrier-arm moves back. In other cases an arm is extended between the warps to seize a yarn and draw it doubled to the op-

posite side of the warp; but in this case the warp must be held open while the arm passes inward to catch the yarn, whereas by passing the thread-carrier bodily from one side to the other it is only necessary to open the warp while the yarn is being laid.

Without limiting myself to the precise construction and operation of parts shown, I claim—

1. The combination of the lathe, guides for directing a weft-thread at each side of the warp, a thread-carrier and devices, substantially as described, for reciprocating it bodily across the lathe between and completely beyond the warps, and catches upon each end of the carrier adapted to seize the weft-thread at each side as it is brought in contact therewith, substantially as described.

2. The combination of the lathe, guides for directing weft-threads at opposite sides of the warp, a weft-carrier provided with catches at the opposite ends, and driving means, substantially as described, arranged below the warps for driving it bodily across and beyond the warp, so as to seize a weft and carry it doubled through the warp at each traverse, substantially as described.

3. The combination, with the lathe and a carrier with a catch at each end for carrying a doubled weft-thread across the warp, and means for actuating the carrier, of a latch-needle arranged at the side of the warp, and actuating mechanism, substantially as set forth, whereby the said needle is caused to carry each weft-loop through that of the weft previously laid, substantially as described.

4. A positive driving mechanism consisting of a lathe, a carriage traversing the lathe, a toothed wheel revolving upon said carriage, and a yarn-carrier provided with one or more bearings adapted to and entering notches in the wheel-teeth, and constructed to connect the wheel and carrier, while permitting the wheel to revolve independently of the carrier, substantially as described.

5. The combination, with a lathe and a traveling carriage upon the lathe, and means for propelling the same, of a toothed wheel having notched blades projecting above the face of the lathe, devices for turning said wheel, and a thread-carrier provided with one or more projections constructed to fit the notches of the blades and connect the carrier and wheel without interfering with the turning of the latter, and supporting the carrier in a position for the warps to pass between it and the lathe, substantially as described.

6. The combination of the carriage, thread-carrier, reciprocating appliances, substantially as described, toothed wheel supported by the carriage, and connections between the same and the thread-carrier, and means, substantially as described, for turning the wheel in a direction the reverse of that in which the carriage travels, substantially as set forth.

7. The combination of the carriage, driving appliances substantially as described, wheel and thread-carrier, hooks at the ends of the carrier and connections, substantially as described, supporting the carrier upon the wheel, all constructed and arranged to permit the carrier to assume an angle to the face of the carriage, substantially as described.

8. The combination of the lathe and carriage bodily traversing the lathe, appliances for imparting the traversing movement, thread-carrier, connecting wheel, and catches upon the carrier, substantially as described.

9. The combination of the lathe, carriage, carrier, connecting toothed wheel, rack upon the lathe and pinion carried by the carriage and gearing with the rack and with the wheel, and devices for driving the carriage back and forth, substantially as described.

10. The combination of the lathe, carriage, thread carrier, connecting toothed wheel, appliances for turning the wheel as the carriage travels, and mechanism for reciprocating the carriage on the lathe, substantially as described.

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

WILLIAM WEAVER.

Witnesses:
CHARLES E. FOSTER,
L. C. YOUNG.