No. 734,390. PATENTED JULY 21, 1903.

F. E. ZENGERL.

NARROW WARE LOOM.

APPLICATION FILED OCT. 16, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

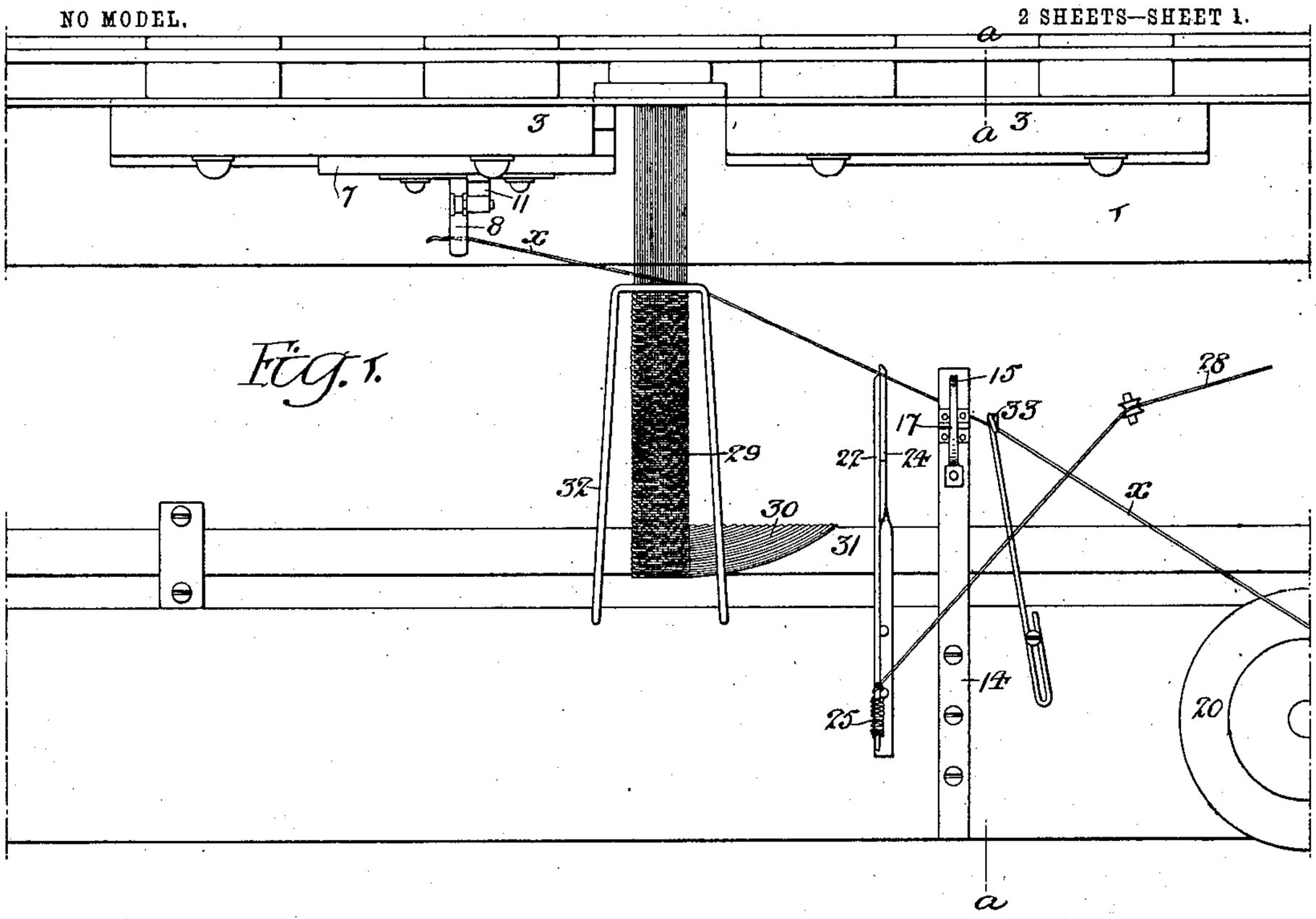

Fig. 1.

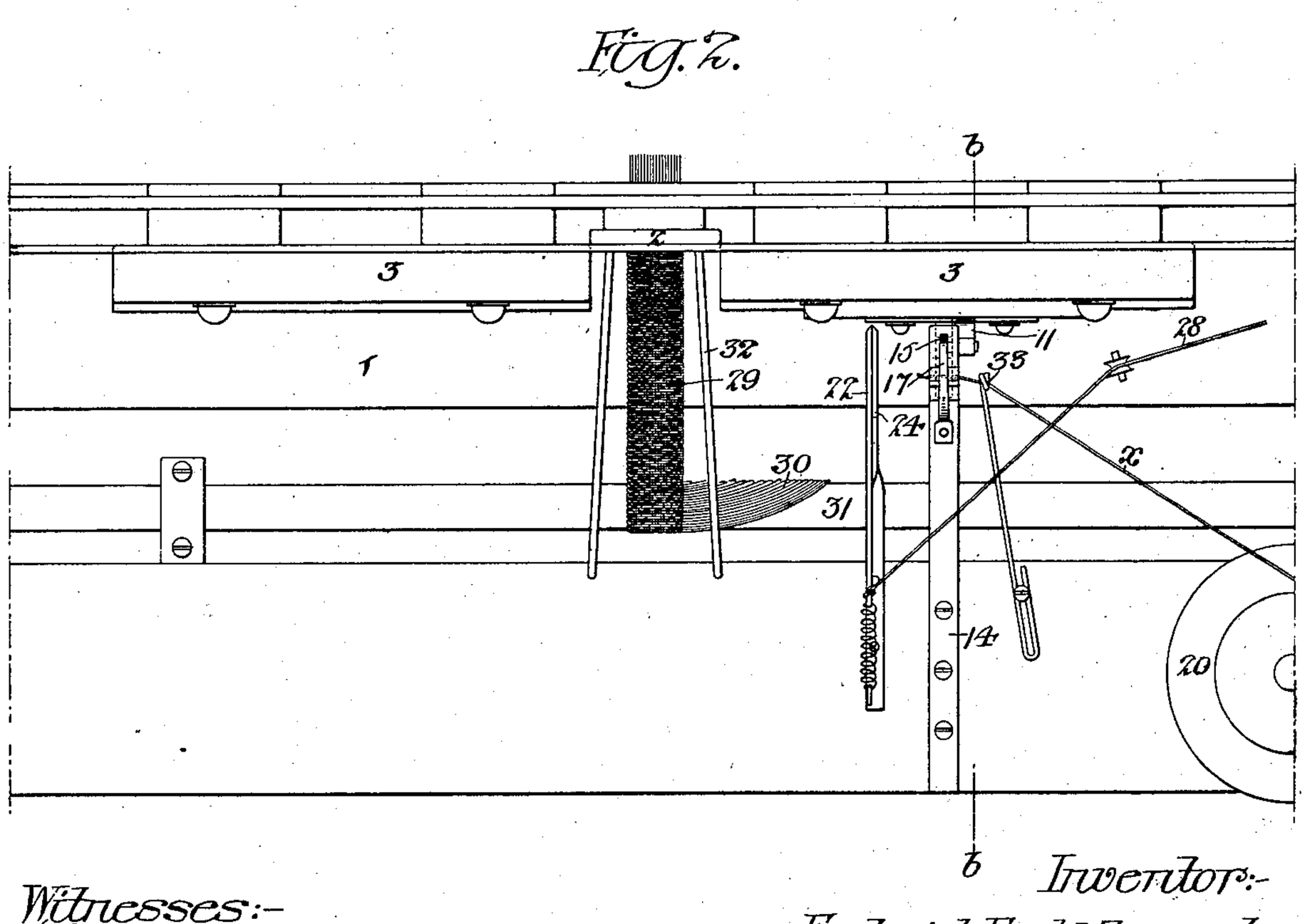

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

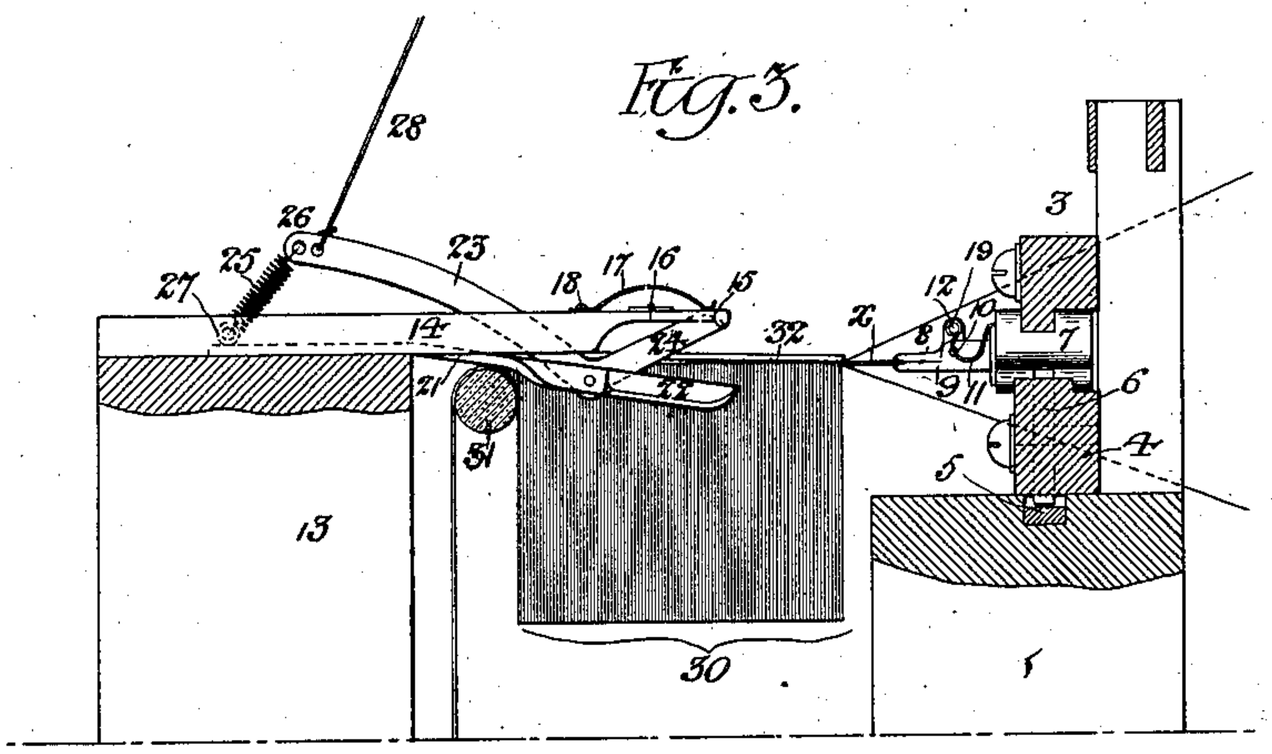


Fig. 4.

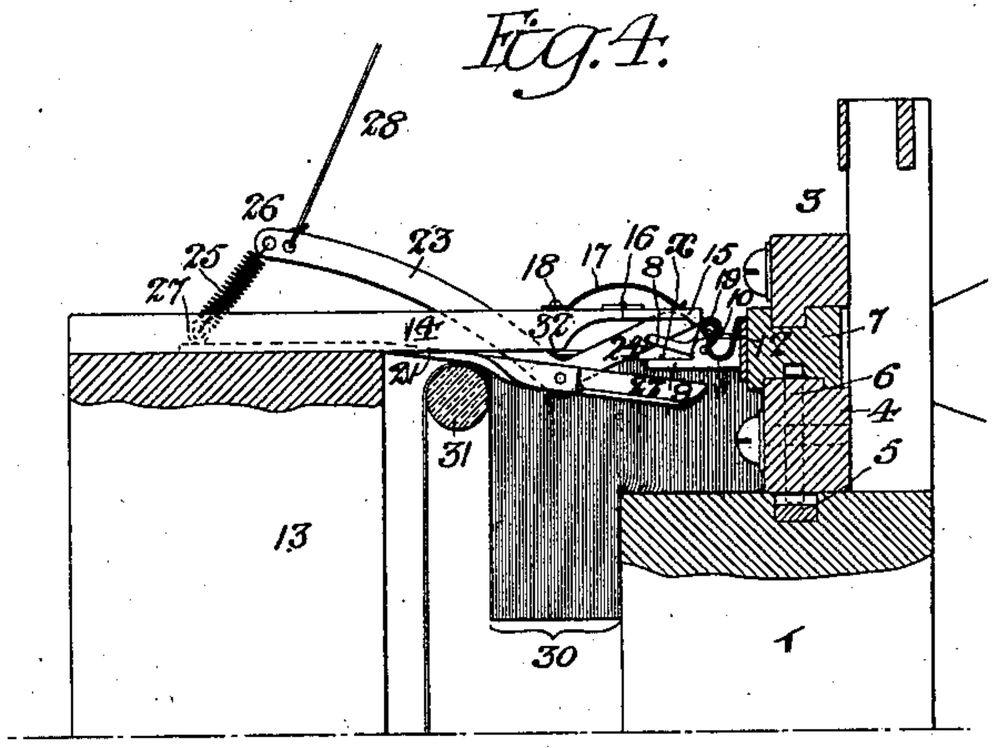
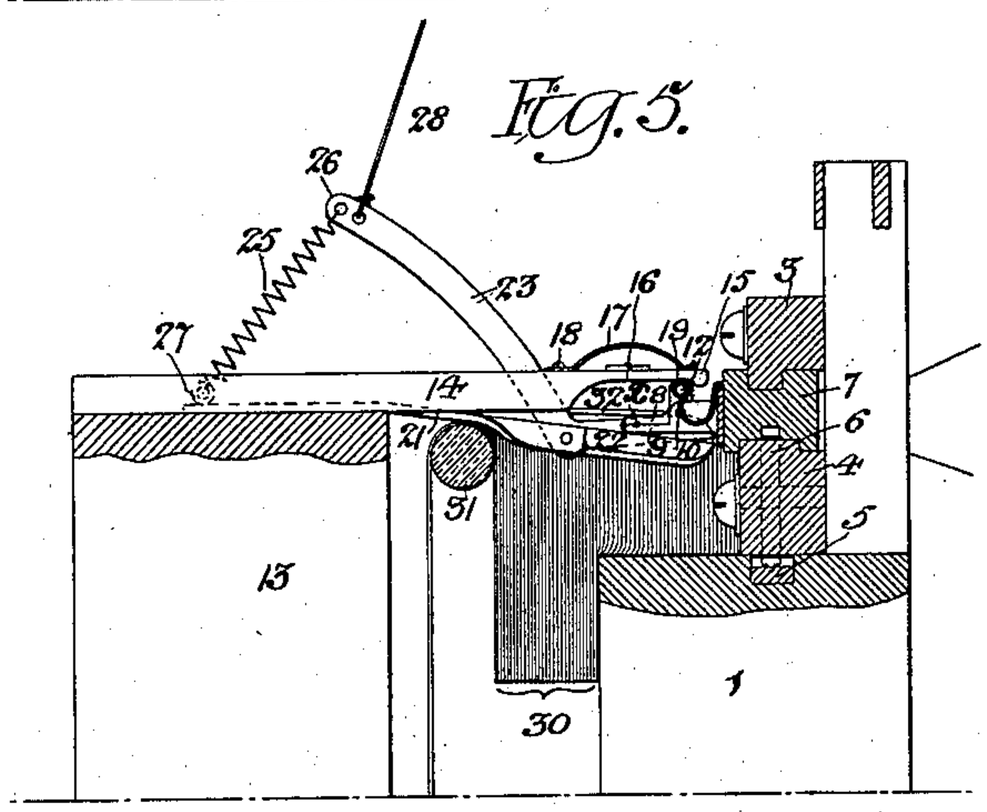


Fig. 5.



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No. 734,390. Patented July 21, 1903.

UNITED STATES PATENT OFFICE.

FREDERICK EWALD ZENGERL, OF PHILADELPHIA, PENNSYLVANIA.

NARROW-WARE LOOM.

SPECIFICATION forming part of Letters Patent No. 734,390, dated July 21, 1903.

Application filed October 16, 1901. Serial No. 78,871. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK EWALD ZENGERL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Narrow-Ware Looms, of which the following is a specification.

My invention relates to looms for weaving carpet and other fringes, familiarly known as "narrow-ware" looms, in which bobbin-holding shuttles carried by a race-bar in the swinging lay are shot through the warp-threads to lay fringe ends therein and form the heading.

The object of my invention is to dispense with the bobbins carried by the shuttles and in lieu thereof to provide the shuttle-bodies with a pair of nippers or clamping-jaws adapted to carry the yarn from a stationary cop to the warp-threads, so as to be woven therewith to form the fringe.

My invention also includes means for severing the weft-thread at regular intervals in order to form fringe ends of uniform length.

My invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of sufficient of a loom to which my improvements have been applied to illustrate my invention. Fig. 2 is a similar plan view showing the operating parts in another position. Fig. 3 is a sectional view taken on the line *a a*, Fig. 1; and Figs. 4 and 5 are similar sectional views taken on the line *b b*, Fig. 2, showing the parts of the loom in different positions.

Heretofore in weaving fringe in looms of this character it has been the common practice to provide each shuttle with a bobbin, such bobbin carrying the weft-thread to form the fringe. These bobbins are so small, however, that they must be renewed many times during the day, entailing a considerable loss of time, with a consequent increase in the cost of manufacture.

The object of my invention is to dispense with such bobbin and to employ the shuttle-body usually carrying the same as a carrier to introduce the weft-thread to the warps to form the fringe ends, such weft-thread being taken from a stationary cop of large size, which may be carried by the loom at any suitable point.

My invention is particularly applicable to looms of this character weaving fringe consisting of a heading and fringe ends proper, and for the purpose of forming these latter of uniform length means must be provided for severing the weft-threads at predetermined intervals. In looms ordinarily constructed for the purpose of making fringe of this character the thread as it is woven into the heading is carried back and forth over a bar, and as the completed fringe is taken up by the usual collecting-roll a pivoted knife-blade is operated in connection with said bar, cutting the weft-threads looped over the same, and thus forming the fringe. This knife is so disposed that at all times there are a sufficient number of weft-loops over the bar to prevent any pull or strain upon the weft-thread that is being woven into the heading during the cutting operation. With the structure forming the subject of my invention, however, the weft-thread is cut at predetermined intervals after it is woven into the heading in order that a fringe of uniform length may be made, the portion cut representing two ends of the fringe, such portion having been doubled at the selvage of the fringe-heading. This cutting is effected by means of a pair of scissors having one blade fixed to the breast-beam of the loom and the other blade pivoted to the fixed blade and operated by a suitable cam or other member on a moving part of the operating mechanism. The movable blade of the scissors is supported in its raised position by means of a suitable spring, and its end to which the spring is attached is also connected with the cam by a cord, so that it may be positively operated at the proper time. The movement of this cam or other member to effect a pull upon the cord is timed so as to be coincident with the movement of the lay when beating up and takes place after the weft-thread has been engaged by the nippers of the thread-carrier. This cam may operate a suitable trip or latch controlling a spring or weight, such trip or latch to be released by said cam immediately after the thread has been engaged by the nippers

of the carrier, or it may control any other suitable mechanism to effect a pull upon the cord at the proper time.

In the accompanying drawings, 1 represents the movable lay carrying the reed 2 and the bars 3 and 4, between which the shuttle-race is formed. The race-bar is shown at 5, operating the pinions 6, which in turn drive the carrier 7 in the race. The carrier is provided with a pair of nippers comprising upper and lower jaws 8 and 9, the lower jaw being fixed to the carrier, while the upper jaw is pivoted to the lower jaw at 10 and is maintained in the lowered or closed position by means of a spring 11, such spring engaging a pin 12, carried by said upper jaw and having its opposite end in engagement with the carrier. The spring is arranged at one side of the nippers, so that it will not interfere with the finger serving to open the jaws of the same.

The breast-beam 13 of the loom carries an arm 14, suitably fixed thereto and having at its outer end a movable finger 15, hinged at 16 and maintained in a horizontal position by means of a spring 17, secured at 18 to the arm 14. When the carrier is in the position shown in Fig. 4, the projection 19 of the upper jaw 8 of the nippers is engaged by said finger 15 as the lay moves to beat up, whereby the nippers may be opened to receive the weft-thread x, carried by the cop 20, at a point between the portion already woven into the fringe-heading and said cop. The cop 20 is carried by the breast-beam, as shown. As the nippers open the lay continues its movement toward the breast-beam and the finger raises and passes over the projection 19, releasing the upper nipper 8 and permitting the same to close upon the weft-thread. The thread will be firmly retained by the nippers, and as soon as the lay finishes its inward movement to beat up the cord controlling the moving scissors-blade is pulled and the thread is cut. These scissors are mounted adjacent to the arm 14 and consist of the member 21, secured to the breast-beam in any suitable manner and carrying the lower fixed blade 22 of the scissors, and the member 23, pivoted to the member 40 and carrying the upper movable blade 24. The upper blade is maintained in an open position by means of a spring 25, secured at 26 to one end of said member 22 and at 27 to the breast-beam. At the moment the lay begins its rearward movement the scissors are operated, and this action is effected by a pull of the cord 28, such pull being accomplished by the aid of a cam controlling a suitable spring or weight to which the cord is connected, the cam being carried by a moving part of the mechanism for operating the loom. The weft-thread having been cut, forming the fringe end, the carrier 7, having previously engaged the weft-thread, is in position to carry the same forward to the warps, so that it may be woven in the heading, and said carrier is immediately moved in the shuttle-race to effect this operation. It will be understood that the end of the weft-thread is retained by the nippers during the movement of the carrier in both directions, so that the thread carried by the same makes two fringe ends. In the drawings herewith the fringe being woven is shown, in which 29 represents the heading, and 30 the fringe ends proper. This fringe is passed as fast as woven over the bar 31 and is collected by a suitable roll or drum below the same, which may be driven by any suitable means. The portion of fringe directly adjacent to the free weft-threads at the point where the weaving operation takes place is immediately under the guard-wire 32, against which the reed strikes when beating up. This insures a uniform tension to the fringe and prevents distortion of the weft-threads, which would be occasioned if the beating was directly against the portion of the fringe-heading already woven. The finger 15 is so hinged to the arm 14 that when the nippers are moved away from engagement with the same such hinged finger will readily rise to permit such disengagement. The thread x from the cop 20 is preferably fed through an eye 33, so that it will be in position for engagement by the nippers as soon as the latter are opened by the finger 15.

The operation is as follows: The carrier 7, with a thread in its nippers, moves through the warp-threads, which are shedded immediately after the passage of the carrier, and then the lay moves forward to beat up the weft-thread engaged by said warps. As the lay moves back the carrier is again passed through the warp-threads, laying therein the free end of the weft-thread, and as the carrier continues its movement this thread pulls out of the nippers. As the lay moves forward to beat this last thread up the nippers will be opened to again engage the weft-thread, and immediately after this engagement the said thread will be cut between the portion first woven into the heading and the part engaged by the nippers. The cuts being made at the same point and the movement of the carrier being properly gaged, the fringe ends will be of equal length, the portion of the thread carried by the nippers to and fro forming two fringe ends.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a loom of the character described, the combination of the movable lay, and a thread-carrying member reciprocable in said lay, said member being movable in a straight line and having jaws at right angles to its line of movement to engage and carry a weft-thread in both directions through the warp-threads to form the fringe-heading, such thread also forming two fringe ends, substantially as described.

2. In a loom of the character described, the combination of the movable lay, a thread-carrier longitudinally movable in a straight line within the same, means for moving said carrier, a pair of jaws mounted on said carrier at right angles to the same, and means for introducing a thread to said jaws.

3. In a loom of the character described, the combination of the lay, a shuttle-race therein, a shuttle block or carrier adapted to said race and longitudinally movable therein in a straight line, nippers comprising a fixed and movable member carried by said shuttle-block at right angles thereto, such nippers being normally closed, and means for opening said nippers at regular intervals whereby a thread may be engaged.

4. In a loom of the character described, the combination of the lay, a shuttle-race therein, a shuttle-body adapted thereto, a pair of nippers comprising a fixed and movable member forming a thread-carrier secured to said shuttle-body at right angles to the same, a spring for maintaining said nippers in the closed position, a tripping-finger carried by the breast-beam and adapted to engage said nippers and open the same at predetermined intervals, and means for severing the thread immediately after it has been caught by the nippers.

5. In a loom of the character described, the combination of the movable lay, a thread-carrier adapted thereto and reciprocable within the same in a straight line, means for moving said carrier, nippers secured to said carrier at right angles to the same and comprising a fixed jaw and a movable jaw, a spring for keeping said jaws normally closed, and means for raising the movable jaw for the reception of a thread as the lay is moved during the beating-up operation.

6. In a loom of the character described, the combination of the movable lay, a thread-carrier reciprocable therein in a straight line, means for moving said carrier, nippers secured to said carrier at right angles to the same and comprising a fixed jaw and a movable jaw, a spring for keeping said jaws normally closed, means for raising the movable jaw for the reception of the thread as the lay is moved toward the breast-beam during the beating-up operation, a pair of scissors having a fixed and movable blade for cutting said thread at regular intervals, and means for closing said scissors after the nippers have closed upon the thread.

7. The combination in a loom of the character described, of the movable lay, a shuttle-race therein, a thread-carrier adapted to said shuttle-race, a pair of nippers secured to said thread-carrier, means for keeping said nippers normally closed, a movable tripping-finger carried by the breast-beam against which the said nippers are brought by the moving lay, and a spring for holding said finger so that it may be engaged by the nippers, said spring permitting the finger to rise and pass over the nippers in each direction, substantially as described.

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

FREDERICK EWALD ZENGERL.

Witnesses:
MURRAY C. BOYER,
JOS. H. KLEIN.