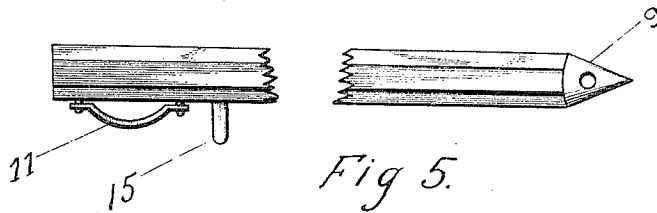


971,487.

3 SHEETS—SHEET 1.



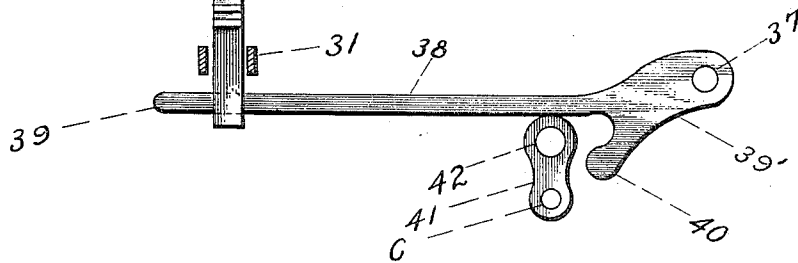
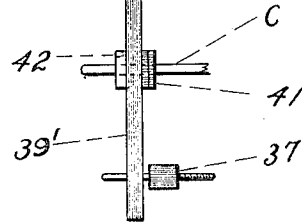
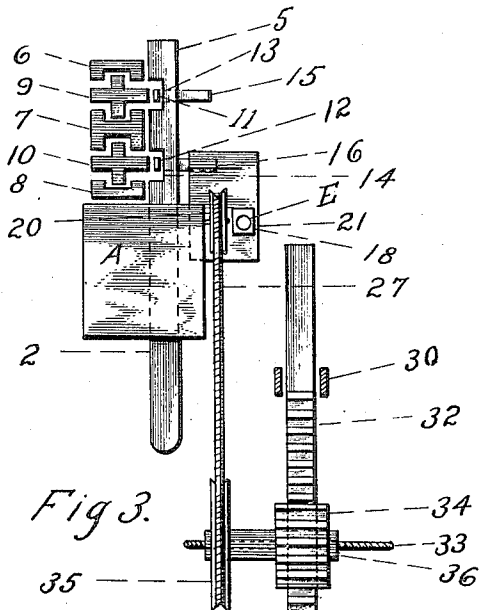
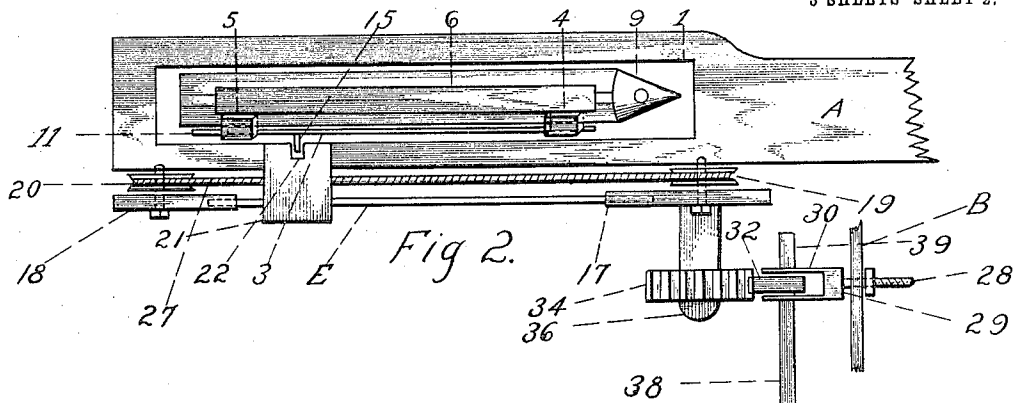
INVENTOR,
John C. Brooks

J. C. BROOKS.
NEEDLE LOOM.
APPLICATION FILED OCT. 2, 1907.

971,487.

Patented Sept. 27, 1910.

3 SHEETS—SHEET 2.



WITNESSES:

Philip Chapman
W. U. Whitehead.

INVENTOR.

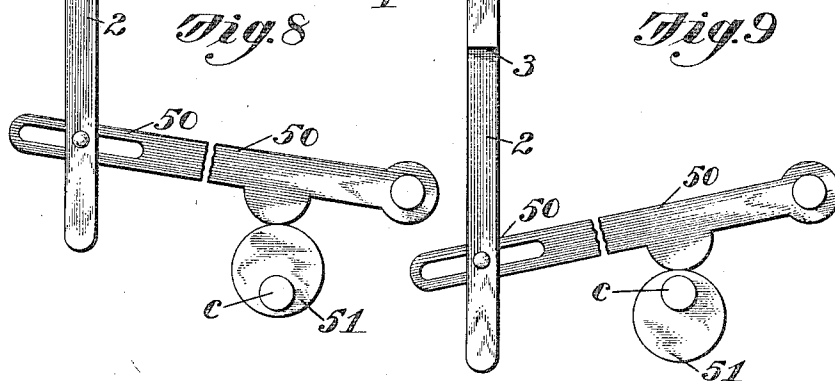
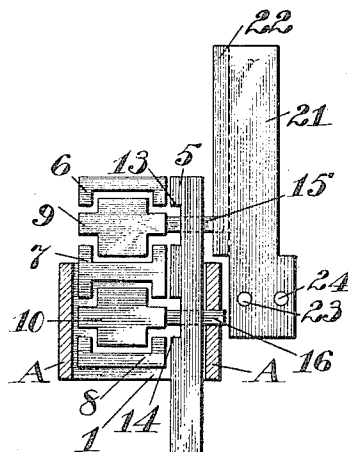
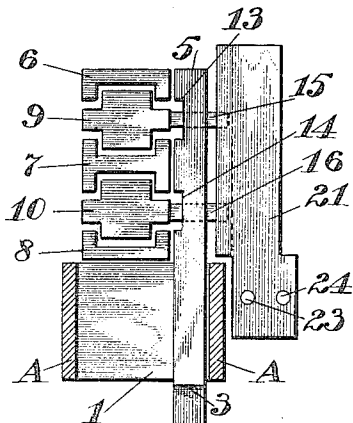
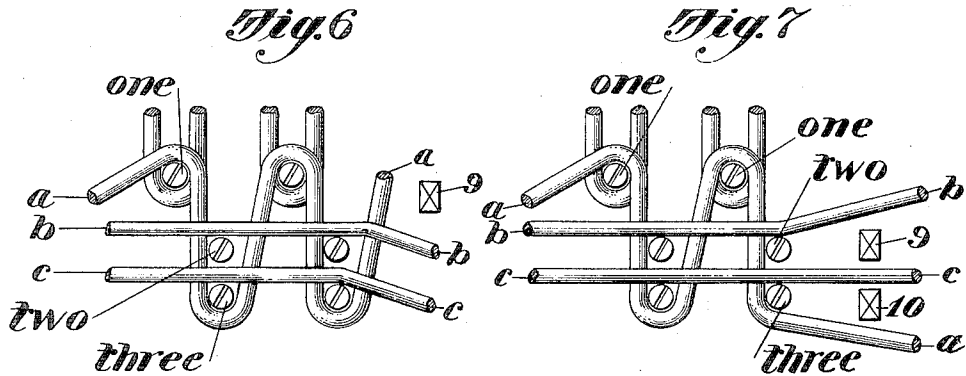
John C. Brooks

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Patented Sept. 27, 1910.

3 SHEETS—SHEET 3.



Witnesses:
William VanDusen
Garret G. Smith

Inventor
John C. Brooks

UNITED STATES PATENT OFFICE.

JOHN C. BROOKS, OF PATERSON, NEW JERSEY.

NEEDLE-LOOM.

971,487.

Specification of Letters Patent. Patented Sept. 27, 1910.

Original application filed January 18, 1902, Serial No. 90,273. Divided and this application filed October 2, 1907. Serial No. 395,641.

To all whom it may concern:

Be it known that I, JOHN C. BROOKS, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Needle-Looms, of which the following is a specification.

My invention relates to the insertion of weft by means of needles, and has for its object to provide an improved needle-loom for the weaving of ply, pile, and compound fabrics, and in particular for the weaving of Brussels, velvets, Axminster and kindred fabrics. I attain these objects by the mechanism, herein illustrated by drawings, in which;—

Figure 1 is a rear side view, Fig. 2 is a top plan view, and Fig. 3 an end view in elevation of my invention, as applied to a loom, Fig. 4 being a detail view of my actuator, Fig. 5 a detail view of my needle. Figs. 6 and 7 illustrate a weave plan for Axminster or other fabrics. Figs. 8 and 9 show the operation of my invention to weave a fabric as shown in Figs. 6 and 7.

The usual parts of a loom are designated by letters, and are the lay, A, loom framing B, cam or lower shaft C, and actuator spindle E.

Provided, somewhat as usual for box looms, is a space, 1, in which is placed the needle-holders, or needle-boxes, comprising an arm, or rod, 2 having a cross piece, 3, carrying uprights, 4 and 5, to which are secured the grooved rails, 6, 7 and 8, forming race-ways for the weft inserting needles, 9 and 10. These needles are shaped somewhat as a "Greek cross," the upper and lower parts engaging within the grooves in rails 6, 7 and 8, and have near their pointed ends, weft delivering eyes, 9', 10', and near their butt ends are springs, 11 and 12, respectively, which engage within the notches, 13 and 14, provided in the uprights, 5, and serve to hold the needles in a predetermined position when inactive; adjacent to said springs 11 and 12, and secured in their respective needles, are pins 15 and 16, which as hereafter referred to, engage with the actuator 21. The spindle, E, is retained within brackets, 17 and 18, secured upon the lay, the means used to secure said brackets upon the lay, serves as bearing pins for grooved pulleys, 19 and 20. An actuator, 21, is provided with a vertical groove, 22, within its front portion, in which the aforesaid

pins 15 and 16 engage, and also provided, longitudinally within the actuator, are holes, 23 and 24, containing antifriction rollers, 25 and 26, respectively, that would bear upon spindles engaging within said holes 23 and 24. The construction shown, in Fig. 4, of two holes for the spindles, provides an actuator that would be balanced upon its bearings; though, in practice hole 24 could engage the spindle and the belt, 27, which passes over grooved pulleys, 19 and 20, could have its ends secured within said hole 23, and being normally taut, the actuator would be held in a predetermined position.

Secured to a rear and low portion of the loom framing is a stud, 37, carrying a lever, 38, having its loose end, 39, engaging within the lower end of rack 32, and at the pivoted and under end of said lever 38 there is formed a thumb projection 40. Upon the shaft C is carried a cam, 41, provided with a roller, 42, in line of engagement with lever 38 and its projection 40.

It will be understood that the shaft C, during the operation of the loom, rotates continuously in one direction and turns the cam 41 with it, so that at each revolution of said cam, wheel 42 would engage lever 38 causing its end 39 to raise rack 32 then engage thumb 40 causing rack 32 to be lowered, and by the construction shown, a reciprocative movement would be imparted to the driving wheel 35, belt 27, and a reciprocative movement would be given to the actuator 21 causing whichever needle was in engagement with said actuator, to have its end inserted and withdrawn within a warp shed.

It is obvious that by connecting any of the well known shuttle-box shifting mechanism to the rod 2, or even the simple expedient of a lever 50 pivoted to the loom framing, and bearing upon a cam turning with the loom shaft C, and the lever engaging said rod 2; the aforesaid needle-raceways, and needles therein would be moved in and out of contact with the actuator; the pins 15 and 16 engaging and disengaging within the aforementioned slot 22.

To illustrate the advantage of my invention, Fig. 6 and Fig. 7, show a weaving plan for an Axminster fabric which requires three picks of the loom, to complete the weave to insert the three picks of weft,—thus;—for pick one, warp *a* is up, warps *b* and *c* down; for pick two, warp *b* is up, warps *a* and *c* are down; for pick three,

warps *b* and *c* are up, warp *a* down. To weave the same fabric, with my invention, for pick one, warp *a* up, warps *b* and *c* down; the needles to insert the weft being in the position shown in Fig. 9; and only needle 9 actuated; for picks, two and three, warp *b* would be up, warp *c* half way up, warp *a* down; the needles to insert the weft changed to the position, shown in Fig. 8, and both needles actuated. The pile tufts, in this instance being inserted by special means, but it is obvious that pile loops, or cut pile, could be obtained by weaving two or more fabrics face to face, as shown and described in my application filed April 6th 1907 Serial No. 366,749, textile fabrics, by duplication of weft inserting needles, and joint use of pile-forming wires.

It will be understood that the details of construction of my improvement may be varied without departing from the spirit of my invention, and that while I have shown a cam, lever, rack, gear, wheel and belt to transmit a reciprocative motion to the actuator, to cause the needles to be moved into and out of warp sheds, it is to be understood, of course, that my invention is not limited in that respect, as any desired form of mechanism may be employed to transmit a reciprocative motion, from the loom shaft to the picker.

Having thus described my invention, what I claim as my invention, and desire to secure Letters Patent for is,—

1. A weft inserting device for looms comprising a plurality of race-ways located one above the other, a plurality of needles co-operating respectively with the raceways, means upon the needles coöperative with means within the raceways to yieldingly hold the needles in a predetermined position, and means to simultaneously, intermittently, or consecutively reciprocate the needles within their raceways.

2. In a needle loom, the combination of needle raceways adapted to move the needles in and from a predetermined position, means to reciprocate the needles within their respective raceways, means within the raceways and flexible means upon the needles coactive to hold the needles in a predetermined position previous to being again inserted.

3. In a needle loom, a plurality of needle

race-ways, an actuator carried upon a spindle and provided with a groove with which to engage projections from the needles, and move the needles within their race-ways; means to move the raceways, means to move the actuator, and means within the raceways coacting with means upon the needles to engage the ends of the needles, and hold them in a predetermined manner.

4. In a loom, the combination of a weft needle holder adapted to be movable and provided with a plurality of needle raceways, an actuator to engage the needles and longitudinally move them within their raceways, flexible means upon the ends of the needles and means within the raceways to engage with each other to prevent the needles from being accidentally unpositioned with reference to the actuator therefor.

5. In a needle loom, a weft needle holder having race-ways for the needles and adapted to move the needles in and out of the pathway of an actuator adapted to reciprocate the needles within their respective raceways; means to actuate the actuator, and means at the end of the raceways and upon the end of the needles, coactive, to prevent the needles from accidental misplacement when inactive.

6. In a needle loom, a weft needle holder, having race-ways for the needles, and adapted to be movable, means within the raceways and upon the needles coactive to hold the needles from accidental misplacement, an actuator to reciprocate the needles within their raceways, and means to reciprocate the actuator comprising, a wheel operatively connected with said actuator, a hub connecting said wheel with a gear, a toothed rack meshing with said gear, a lever engaging said rack, the lever engaging a cam rotating with the loom shaft, a roller upon the said cam to engage the lever and cause it to reciprocate the aforesaid rack and cause the aforesaid wheel to rotate first in one direction then in the other.

In testimony whereof I have affixed my signature in the presence of two attesting witnesses.

JOHN C. BROOKS.

Witnesses:

PATRICK H. LAMB,
LORETTA B. DELANEY.