

J. M. Baker.
Straw and Cane Weaving.

No. 5,115.

Patented Nov. 15, 1864.

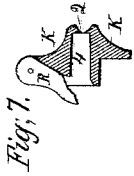


Fig. 3.



Fig. 4.



Fig. 2.

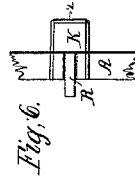
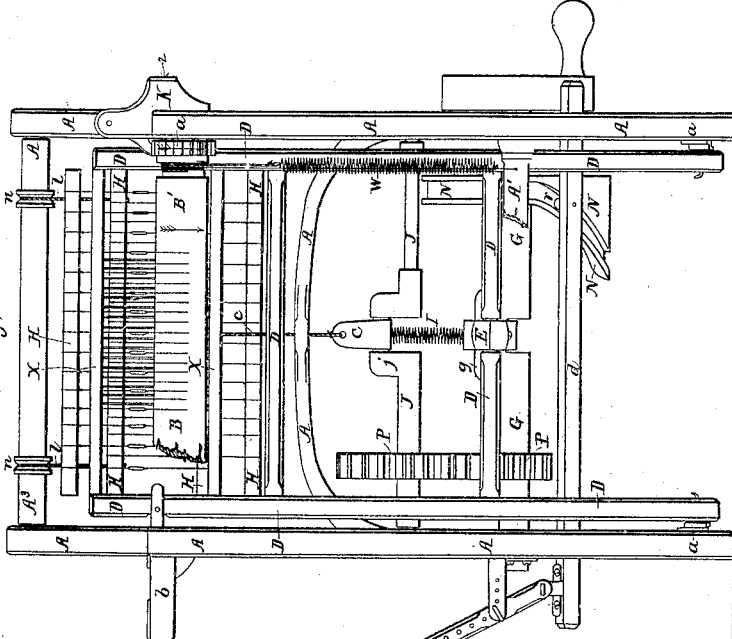


Fig. 5.

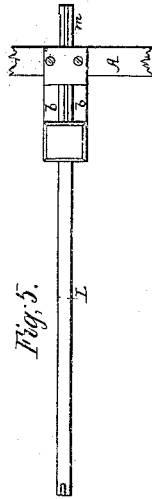


Fig. 9.



Fig. 8.

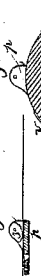


Fig. 10.

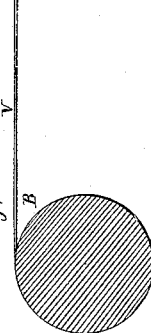
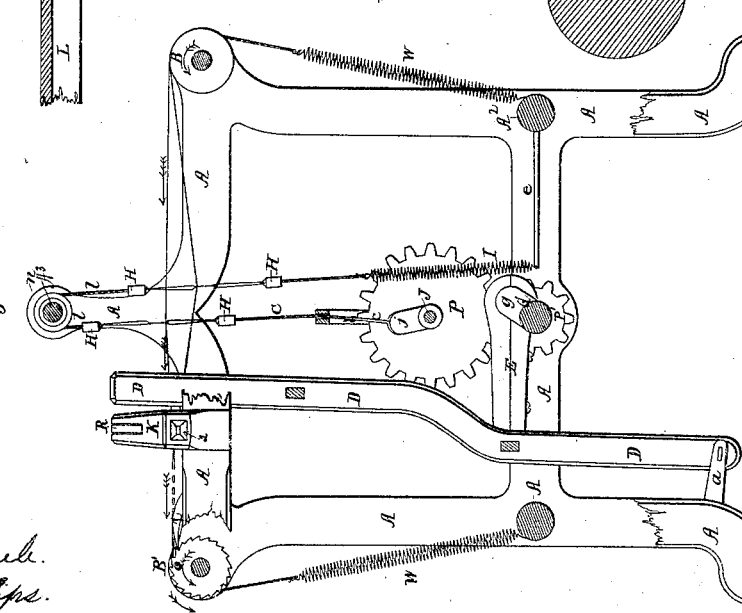


Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES M. BAKER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO HIMSELF AND ELLIOTT P. GLEASON, OF NEW YORK CITY.

IMPROVEMENT IN LOOMS FOR WEAVING PALM-LEAF, STRAW, &c.

Specification forming part of Letters Patent No. 45,115, dated November 15, 1864.

To all whom it may concern:

Be it known that I, JAMES M. BAKER, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Looms for Weaving Palm-Leaf, Straw, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an end elevation and section of my improved loom. Fig. 2 is a front elevation of the same, certain parts being represented as broken away to give an unobstructed view of the other more important part. Figs. 3 and 4 are views longitudinally and by transverse section of a full size nipper for inserting the lengths of weft in the warp. Fig. 5 is a plan of the said nipper and nipper-staff. Fig. 6 is a plan of the device which opens and closes the said nipper at the proper time. Fig. 7 is a vertical section of the said device. Fig. 8 represents a section of the warp beam in connection with the device in which the warps of palm-leaf, straw, &c., are attached thereto. Fig. 9 is a vertical section of the said attaching device, separately. Fig. 10 represents a section of the warp-beam and the strap by which the attaching device is connected thereto.

Similar letter of reference indicate corresponding parts in all the figures.

The machine which is the subject of the present improvement belongs to that class which weaves a web of which both the weft and warp are composed of separate short lengths or strands of material—such as palm-leaf, straw, reeds, grass, and the like—such web when woven being shaped or wrought into “shaker bonnets,” hats, mats, and many other useful articles; and my improvement relates to certain new appliances for holding and inserting the short lengths of warp and weft, and to a better and more convenient arrangement and mode of operation of well-known parts than that embodied in the construction of the ordinary hand-loom, which has hitherto been exclusively used for this kind of weaving, with a view to facilitate the operation and increase the production of a single machine.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation of the same.

In the annexed drawings, A is the frame of the machine, composed of two light cast-iron end pieces, united by cross rods or girts, A¹ A² A³.

B is the warp beam, and B' is the cloth-beam, which revolve in the direction indicated by the arrows.

D is the lay which swings on suitable studs in the arms *a a*, projecting from the frame, by motion imparted through the connecting-rod E from the crank *g* of the main shaft G.

H H are the two sets of heddles or harnesses which are suspended from the ends of the two bands *l l*, passing over the rollers *n n*, at the top of the frame, one set of harness being connected by a spiral spring, I, to an arm, *e*, extending from the girt A², while the other set of harness is connected by a band and strap, *c*, to the crank *j*, of the shaft J, which is revolved with a speed of one revolution to two of the main shaft by means of the two gears P P', thereon.

L is the nipper-staff, in one end of which the nipper is formed, as shown clearly in Fig. 4, the same consisting of a lever, *m*, pivoted in a suitable recess formed in the end of the nipper-staff, and actuated by a spring, *s*, beneath one end, to seize the length of weft *y*, between the other end and a suitable surface to grip it firmly in the bottom of the said recess, as shown, when properly presented thereto, the sides and ends of the gripping-jaws being beveled to direct the length of weft between the said jaws, and thereby insure a certain seizure of the same. The upper staff is made to slide across the loom in the guide-box *b*, in the act of advancing to seize the length of weft and of retreating to draw it into the open shed of the warp, by means of the connection *f*, the lever *h*, the sliding-bar *d*, and the cam N on the main shaft G, the two faces of the said cam acting against the friction-roller *r* on the said sliding bar to give the latter a swift reciprocating movement endwise with about one-eighth of a revolution of the main shaft.

The lengths of the weft are intended to be fed to the nipper by hand, the said lengths being presented in the proper position for

this purpose by thrusting one end of the weft into the opening 2 in the nipper-box *k*, in which is formed a recess, 4, for the reception of the nipper.

R is a swing-finger arranged with the said nipper-box in such a manner that with the advance movement of the nipper the swell of the lever *m*, Figs. 3 and 4, slides beneath and is depressed by the lower end of said finger, which has the effect to open and close the nipper in instant succession just at the completion of the advance movement of same, and thus to seize the end of the weft within the said recess 4. When the nipper retreats in the act of drawing the weft into the warp, the swell of the lever lifts the finger *R* without being depressed or otherwise affected by it.

It has heretofore been the practice in the hand-loom to tie the strips of palm-leaf or other material forming the warp to a suitable number of cords or strands attached by one end to the warp-beams, which operation requires nearly double the time necessary to weave the entire web, besides being an inconvenient and tedious process. To remedy this difficulty, therefore, I make use of the device represented in Fig. 9, which consists of a serrated or roughened eccentric or cam, 3, pivoted in the shoe-piece *p*, Fig. 8, and connected by a metal strap, *V*, to the surface of the warp-beams *B*, as shown. Each strip of palm-leaf, &c., is gripped at one end between the said cam 3, and the bottom of the shoe-piece, and gripped still more firmly by stretching, &c., the warp tightly between the two beams *B B'*, the strain or pull upon the strips of warp having the effect to make the cam 3 wedge and pinch it the more forcibly. In lieu of the said cam 3 a lever or pinching-jaw, similar to that of the nipper *m*, suitably arranged with a set-screw, a wedge, or a stiff spring may be used, either being considered equivalent as a holding device for the specified purpose.

In consequence of the shortness of the web, which is limited to the length of the material and never exceeds forty or fifty inches, and of the width of the strips, it is difficult by means of a positive "let-off" and "take-up" mechanism to give the warp the required progressive movement with each beat of the lathe for the insertion of the succeeding length of weft. To obviate this difficulty and to provide a substitute for the said mechanisms, I apply a force which is represented by the spiral springs *W* to each of the beams *B B'* to turn each in effect in opposite directions, which has the effect to stretch the warp tightly between the

said beams, and to one of said beams, *B'*, I secure a ratchet-wheel, *Q*, with very fine teeth, and arrange therewith a ratchet, *x*, attached to the frame, and the several parts being thus arranged with the warp held tightly between the forces of the two springs or their equivalent, a strip or length of weft is thrust into the opening 2, where it is seized by the nipper and drawn into the open shed of the warp, and is beaten up with the sley *X*, which places it in position in the warp. Another length is then supplied and drawn by the nipper into the succeeding shed of the warp and is in turn beaten up by the sley, but owing to the width of the strip last inserted, and its stiffness or rigidity edgewise or beaten by the sley, and to the nearly equal forces between which the warp is held, the last beat of the lay has the effect to advance the warp or cause it to progress (in the direction indicated by the arrow) a distance equal to the width of the strip of weft just inserted, and by so doing to provide for the insertion of the next succeeding strip, which is then beaten up and the warp thereby made to progress in like manner as the preceding one, and in this way the operation continues until the web is completed. The fabric thus advanced at the insertion of each length of weft, being caught and held by means of the ratchet and ratchet-wheel on the warp-beam *B'*, weights should be used instead of the spiral springs *W*, as a more equable force with a greater range of motion is obtained with the former than with the latter.

Having thus described my improved loom, what I claim and desire to secure by Letters Patent, is—

1. The combination of the nipper, arranged substantially as described, with the recess 4, the opening 2, and the swing-finger *R*, the whole being arranged and operating substantially as described, for the purpose specified.

2. The described arrangement and method of operating the cloth and warp-beams, whereby the warp is made to progress regularly by the action of the sley in beating up the successive lengths of weft, substantially as described, for the purpose specified.

3. The use of the cam 3, or the equivalent thereof, arranged with the strap *V* and warp-beams *B B'*, substantially as described, for the purpose specified.

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