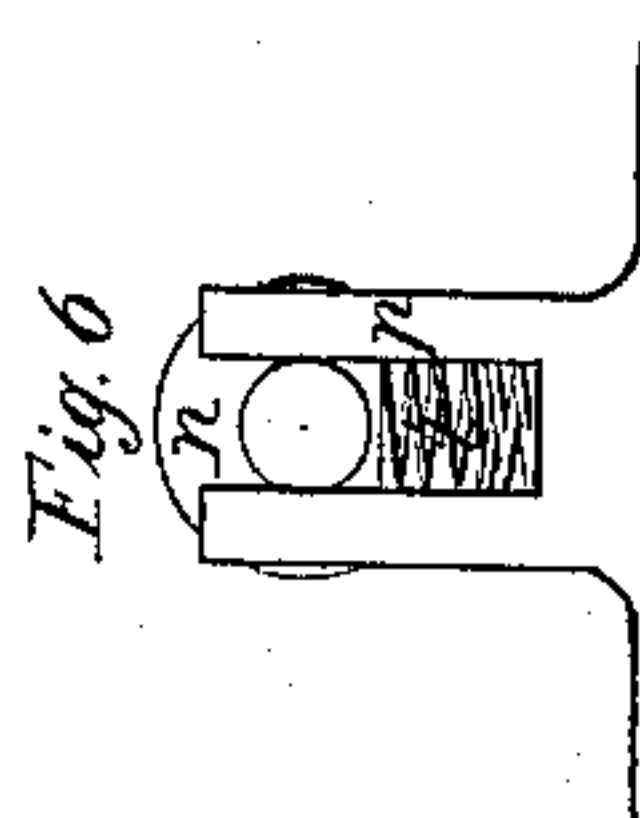
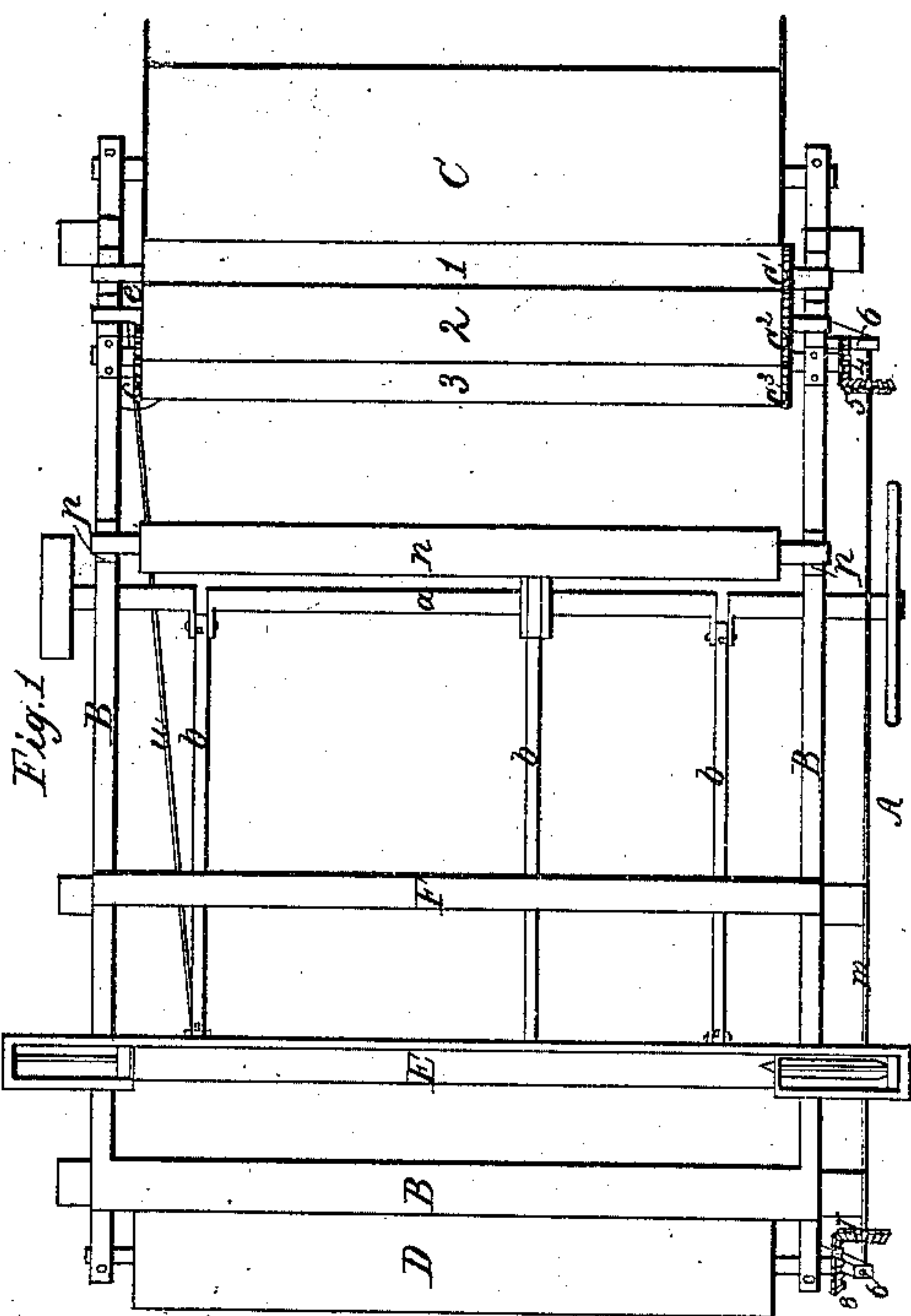
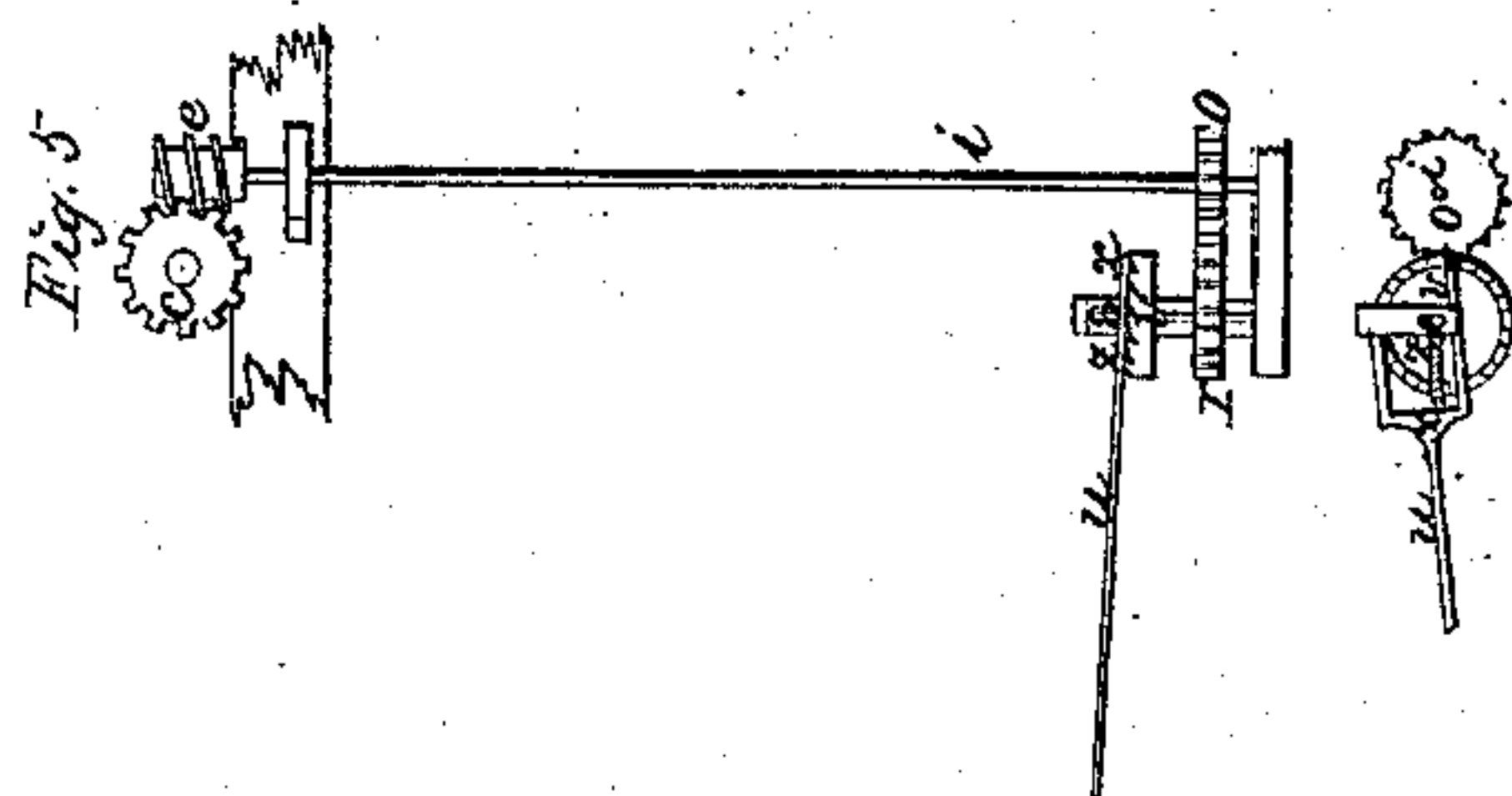
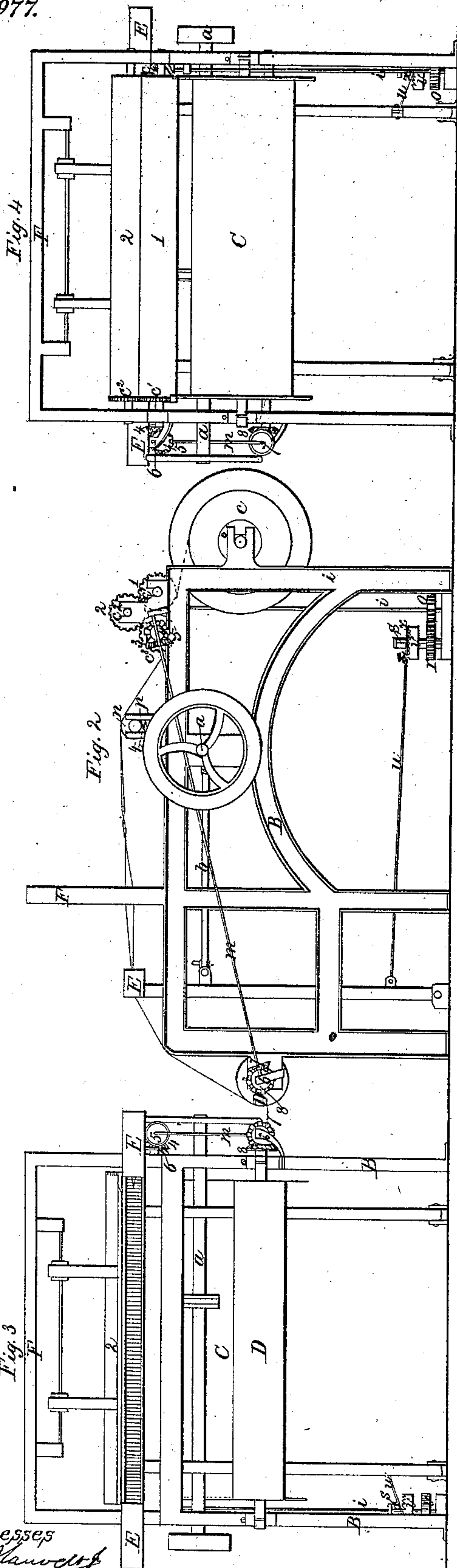


# B. Slingerland. Power Loom.

N<sup>o</sup> 3,977.

Patented Apr. 1, 1845.



Witnesses  
Combs & Hancock  
H. W. Bibb

Inventor  
Benjamin Slingerland



# UNITED STATES PATENT OFFICE.

BENJAMIN SLINGERLAND, OF PATERSON, NEW JERSEY, ASSIGNOR TO PHENIX MANUFG. COMPY.

## WEAVING-LOOM.

Specification of Letters Patent No. 3,977, dated April 1, 1845.

*To all whom it may concern:*

Be it known that I, BENJAMIN SLINGERLAND, of the Phenix Mills, Paterson, Passaic county, in the State of New Jersey, machinist, have invented and made and applied to use certain new and useful improvements in the construction and arrangement of machines for weaving, usually known as "power-looms," the first part of which improvements removes all the gearing, weights, and friction belts that have hitherto been used with the yarn-beam, so that the feed of the yarn is taken by its own tension from the beam by separate means; the second part of these improvements comprises an arrangement for taking up the cloth exactly as it is woven or as the warp-yarn is delivered doing away with the ratchet-wheels, catches, weights, and springs hitherto used with the cloth-beam; the third part of these improvements, combined with the two first, renders the power-loom capable of weaving non-elastic substance, such as hemp, flax, or silk, which materials have not to my knowledge been hitherto woven in power-looms on account of their liability to break the warp; for which said improvements I seek to have Letters Patent of the United States issued, vesting in the Phenix Manufacturing Company, of Paterson aforesaid, all my legal right and title to the exclusive use of the said invention and improvements as the lawful assignees and representatives of me, the said BENJAMIN SLINGERLAND; and that I do hereby authorize and request the Commissioner of Patents to issue the said patent accordingly in conformity herewith and in conformity with a deed of sale and with my memorial therefor, both bearing even date herewith; and that the said improvements and the mode of constructing and using the same and the advantages attained thereby are fully and substantially set forth and shown in the following description thereof and in the drawing annexed hereto and making a part of this my specification thereof, wherein—

Figure 1 represents a plan of a power loom. Fig. 2 is an elevation, seen on the side A, of the plan; Fig. 3, is an elevation of the cloth beam end, and Fig. 4 is a like elevation at the yarn beam end thereof, collectively showing a loom, with my improvements attached, and in use; the auxiliary figures are separately referred to, and the same letters

and numbers, as marks of reference, apply to the same parts, in all the several figures.

B, is the main frame; C, the yarn beam; D, the cloth beam; E, the lay, with the connecting rods  $b, b, b$ , to the working crank and cams, on the shaft  $a$ ; F, is the frame for the heddle and harness gear, all these parts being made in the usual manner, need no further remark, except that the yarn beam C is mounted in place, without any gear wheels, or other motive or regulating parts attached to it. Before and above the yarn beam, on the main frames B, are three rollers, which I term, collectively, the gage rollers, but designate them singly, the first as 1, the leading roller which receives, beneath it, the yarn from the beam C, the yarn then passes upward, and over the holding roller 2, passes downward, beneath the fixed delivering roller 3, and onward, to the harness gear and lay. The rollers 1, and 2, have the journals set in forked carriages, or vertical journal boxes, that allow of removal, to fill the warp; the delivering roller 3, is set with the journals in fixed and covered boxes at each end. On the right hand ends, looking from the cloth beam, the rollers 1, 2, and 3, are geared to each other, by small tooth wheels  $c^1, c^2, c^3$ , the shaft of the roller 3, at the left hand end, looking from the cloth beam; carries within the frame and box, a worm tooth wheel  $e$ , which is geared into by a vertical worm pinion  $e$ , set on a shaft  $i$ , which has at the foot, a tooth wheel  $o$ , gearing into a similar wheel  $r$ , fitted on an upright stud  $s$ , attached to the floor. On the same studs, above the wheel  $r$ , is a ratchet wheel  $v$ , made with vertical ratchet teeth. A rod  $u$ , is jointed, at one end, on the lay frame, and has at the other end, a fork  $x$ , one prong of which lies over the ratchet wheel  $v$ , the other prong is formed with a point, terminating downward, like a reversed latch catch, which takes the ratchet teeth on the wheel  $v$ , and a helical spring  $z$ , is fastened at one end, in the throat of the fork, the other end is secured by a ring to the stud  $s$ , so that at each back motion of the lay, the rod  $u$ , and prong  $x$ , send the ratchet wheel partly round, and the spring  $z$ , allows the rod and fork to move, as required, but holds it so far, as to prevent the parts separating, the mode of fitting and connecting these parts, is shown, vertically and in plan, in the detached Fig. 5. The intermittent ro-



tation, thus given to the ratchet wheel *v*, at each motion of the lay, is communicated through the small tooth wheels *o*, and *r*, to the worm pinion *e*, and delivering roller wheel *c*, and by duly proportioning these parts, in the way known to every mechanic, the delivering roller 3, may have an intermittent motion, so gaged, that it shall deliver, or allow to pass, only so much length of warp yarn, as is occupied by the thread of filling, or woof yarn, as it is placed in by the shuttle, and beat up, at each motion of the lay, and this supply is totally independent of any irregularity in the winding on, or off, of the yarn on the yarn beam, as this latter rolls in its place, according to the tension of the tightest yarns, and the rollers 1, 2, and 3, being geared to each other, will, collectively, only take on so much length of each yarn, as the delivering roller forwards, because the yarn can only go over the holding or tightening roller 2, as the delivering roller 3, draws it, by its own motion, united with that given by the gearing, leaving the slacks of the yarns to lie between the leading roller 1, and the yarn beam. On the end of the shaft that carries the roller 3, on the side A, of the machine, a small bevel or miter pinion 4, gears into a similar pinion 5, on the shaft *m*, this is sustained in two bracket bearings 6, 6, on the frame, and carries, at the other end, a similar pinion 7, gearing into a like pinion 8, on this end of the shaft that carries the cloth beam, and by proportioning these, the motion of the cloth beam will "take up" the cloth, as the due proportion of yarn is supplied from the gage rollers. In combination with these parts, and for the purpose of making the machine, as thus described, capable of weaving fabrics; the yarn of which shall be of non elastic material, such as hemp, flax, or silk, or materials of less elasticity than cotton yarn usually is, instead of mounting the horse, or whiproll *n*, in unyielding bearings, I have mounted this part of the machine in standards *p*, of which the upper part is slotted, to receive the gudgeons of the whiproll, or

horse, and beneath this, the standard is made a hollow cylinder, in which is placed an expansive helical spring *t*, which will yield to the tension, by contracting, when the yarns are tightened over the horse, by the forward motions of the weaving parts, and rise, to keep the yarns at the proper tension, on the back motions, this construction of the whiproll, or horse standard, and spring, is shown sectionally, in larger size, in the detached Fig. 6. By combining this mode of mounting the horse, or whiproll, with the mode described, of mounting and using the gage rollers, and the yarn and cloth beams, fabrics may be woven, with warp of the most rigid materials, as regards their capacity for stretching by tension, as sail cloth, made from flax, hitherto supposed the most unmanageable material, that can be worked in a power loom, has been successfully woven by me, in a power loom, thus fitted. It will, of course be understood, that it may not be always needful, to use this mode of mounting the horse, or whiproll, in a loom for weaving cotton goods although I prefer it in my own practice.

What I claim as my invention and desire to secure by Letters Patent is—

The mode of arranging rollers 1, 2 and 3 for the purpose of regulating the delivery of the yarn, the arrangement being such by placing one of the rollers between and above the other two and carrying the yarn under roller No. 3 then over No. 2 and then under No. 1 and from thence to the heddles so that the tension of the yarn draws the upper one upon the other two to increase the bite on the yarn and thus prevent slipping all as herein described.

In testimony whereof I the said BENJAMIN SLINGERLAND have hereunto set my hand and seal at Paterson aforesaid this tenth day of March in the year one thousand eight hundred and forty five.

BENJAMIN SLINGERLAND. [L. S.]

Witnesses:

WM. H. K. BIBBY,  
CORNELIUS H. POST.