

No. 775,893.

PATENTED NOV. 22, 1904.

J. C. BROOKS.  
LAPPET LOOM.

APPLICATION FILED NOV. 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

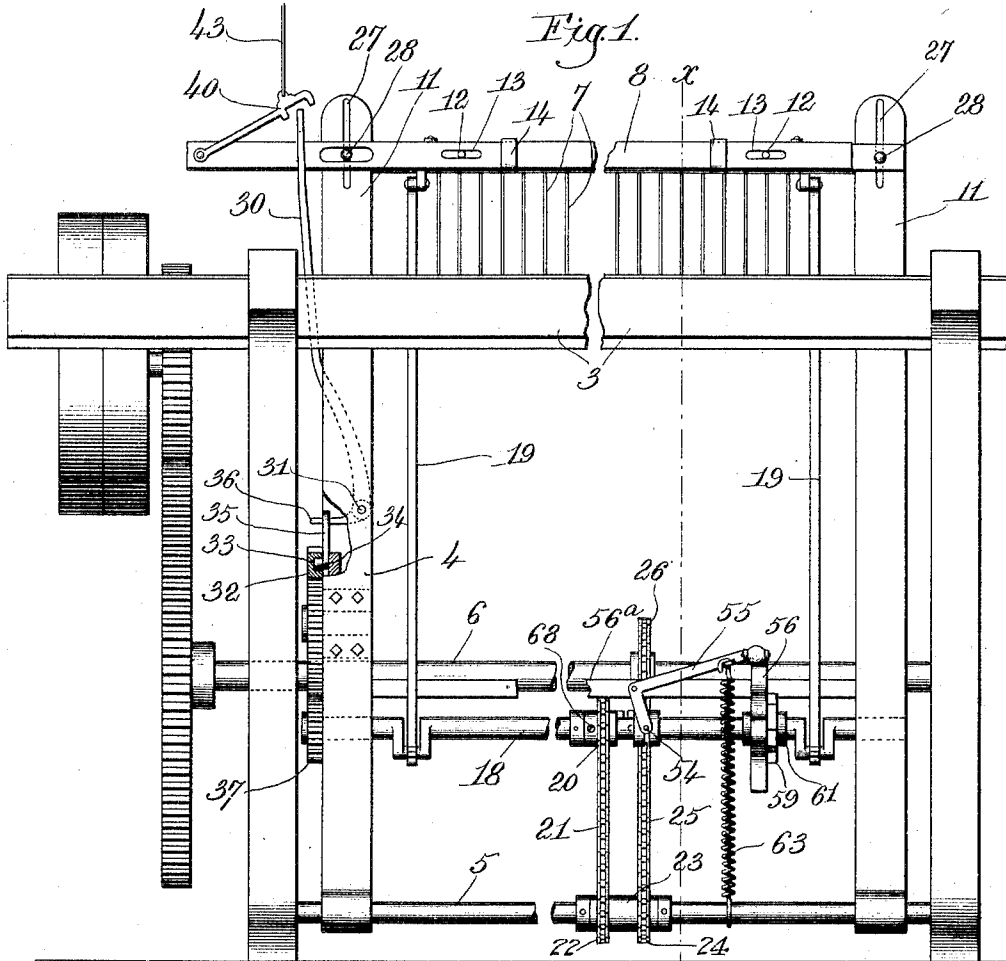


Fig. 2.

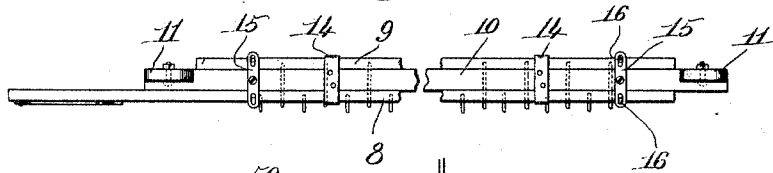
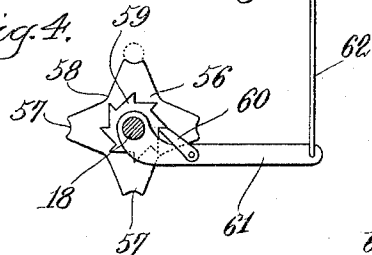


Fig. 4.



Witnesses.

Thomas Drummond  
S. Wm. Luton.

Inventor.

John C. Brooks,  
by Ansony Gregory,  
Attys.

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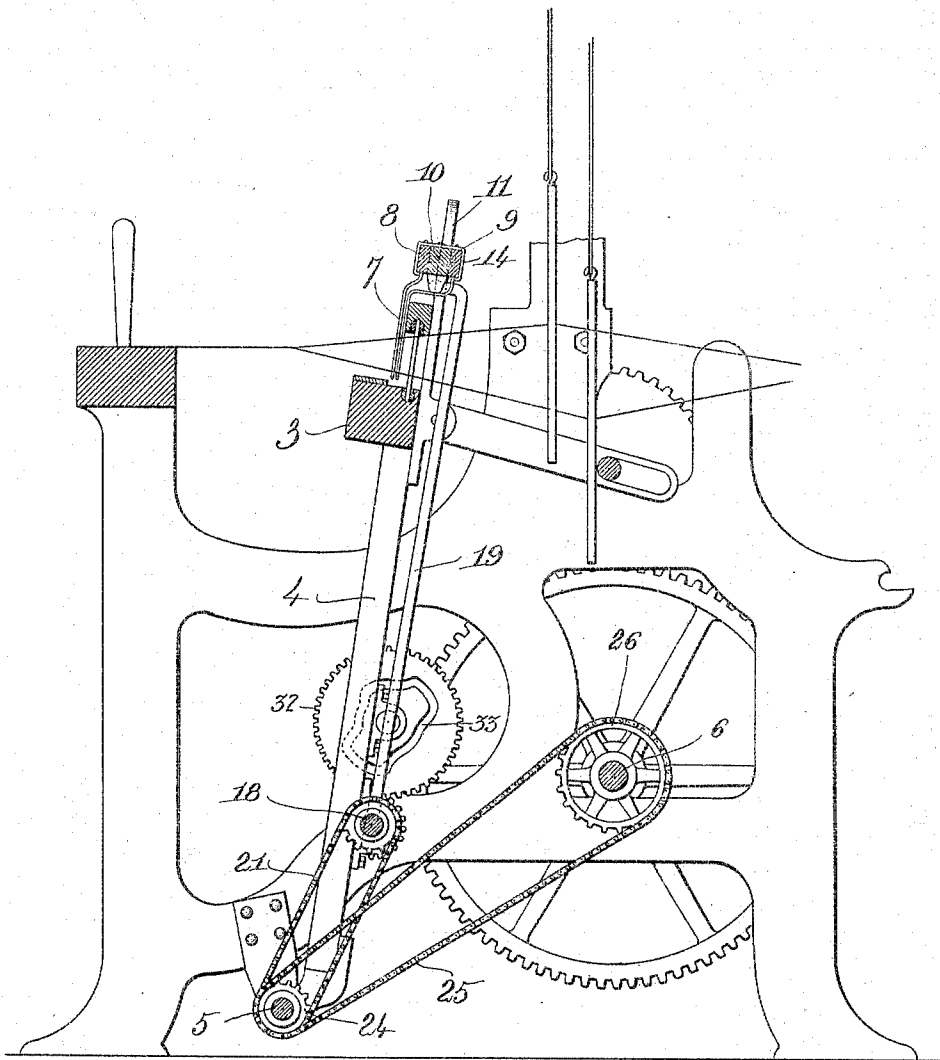
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LAPPET LOOM.

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NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 3.*



*Witnesses.*

*Thomas Drummond*  
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*Inventor*

*John C. Brooks,*  
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# UNITED STATES PATENT OFFICE.

JOHN C. BROOKS, OF PATERSON, NEW JERSEY, ASSIGNOR TO DRAPER COMPANY, OF PORTLAND, MAINE.

## LAPPET-LOOM.

SPECIFICATION forming part of Letters Patent No. 775,893, dated November 22, 1904.

Application filed November 27, 1903. Serial No. 182,790. (No model.)

*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 an Improvement in Lappet-Looms, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to lappet-loom, and especially to the means for giving the needles or other auxiliary weaving means the requisite movement to produce the desired pattern or design on fabrics.

The particular features of the invention will be hereinafter more fully described and then pointed out in the claims.

In the drawings I have illustrated only a sufficient portion of a lappet-loom to show the manner in which my invention is applied.

Figure 1 is a front view of the loom with the reed omitted in order to avoid confusion. Fig. 2 is a top plan view of the needle-supporting mechanism. Fig. 3 is a section on substantially the line *xx*, Fig. 1; and Fig. 4 is a detail.

The lay 3, the lay-swords 4, the rock-shaft 5, and cam-shaft 6 are or may be as usual in looms of this class. The lay-swords 4 are provided with suitable upward extensions 11, supporting between them a cross-bar 10, which is capable of vertical movement relative to said extensions 11. On either side of the cross-bar 10 are the needle-bars 8 and 9, from which depend the lappet-needles 7. These needle-bars are supported so that they move vertically with the cross-bar 10, but can have a movement longitudinally of the lay relative to said bar, and for this purpose I have illustrated the bar 10 as having pins 13 projecting from either side thereof, which pins enter and play in slots 12 in the needle-bars 8 and 9. If desired, guides or clips 14 may be employed, which are secured to the cross-bar 10 and partially embrace the needle-bars. The needle-bars 8 and 9 are so connected together that they move in unison, but in opposite directions. This is accomplished in this form of my invention by the connecting-levers 15, which are pivoted to the top of the cross-bar

10 and are provided at their ends with slots 16, in which suitable pins rising from the top of the needle-bars enter. One of the needle-bars is positively moved longitudinally of the lay by means hereinafter described, and such movement is, through the levers 15, communicated to the other needle-bar.

The needles are depressed by means of a crank-shaft 18, journaled in suitable bearings upon the lay-swords 4, said crank-shaft being connected to the cross-bar 10 by means of the links 19. The crank-shaft 18 is operated in any suitable way, preferably by connections leading to the cam-shaft 6. As one simple means for thus driving the crank-shaft 18 from the cam-shaft I have illustrated the sprocket-wheel 20 fast to said crank-shaft and operated by means of a sprocket-chain 21 from a sprocket-wheel 22 on a sleeve 23, loose upon the rock-shaft 5. Said sleeve 23 has rigid therewith another sprocket, 24, which is connected to a sprocket-wheel 26 upon the cam-shaft 6 by a sprocket-chain 25. The gearing will preferably be so timed that when the sprocket-wheel 26 is made fast or clutched to the cam-shaft the crank-shaft 18 will be rotated and the needles consequently depressed once every pick.

The vertical movement of the bar 10 upon the extensions 11 is permitted by means of slots 27 in said extensions, in which pins 28 in the cross-bar play. The needle-bars are moved longitudinally of the lay by means of an actuating-lever 30, which is pivoted upon the lay-swords, as at 31, and is operated by a suitable pattern-cam, which is driven from the crank-shaft 18. In this embodiment of my invention I have shown the pattern-cam as mounted on the lay-sword, although the cam might be placed upon the cam-shaft 6 or any other place without departing from my invention. The pattern-cam is designated by 32 and is illustrated as having the face-groove 33, in which a finger 34 on the slide 35 plays. The slide 35 is connected to the toe 36 of the lever in such a way that the up-and-down movement of the slide serves to rock the lever about its fulcrum 31. The cam 32 has gear-teeth on its periphery which mesh with a gear 37, fast on the crank-shaft 18. The

gearing between the crank-shaft and pattern-cam is so proportioned as to give the pattern-cam the requisite speed of rotation relative to the crank-shaft to produce the desired patterns.

Any other suitable pattern mechanism for actuating the lever 30 may be employed than that herein shown.

Pivoted to the needle-bar 8 is a latch 40, having a notch which is adapted to engage the end of the lever 30, as shown in Fig. 1. When the latch 40 and the lever 30 are in engagement, as shown, the oscillation of the lever caused by the pattern-cam will obviously give the needle-bar 8 a movement longitudinally of the lay, and through the connections 15 this movement will be transmitted to the other needle-bar, 9.

The cam 32, it will be understood, is so shaped as to give the needle-bars their longitudinal movement when they are in their elevated position. The lever 30 and latch 40 are so proportioned that when the needle-bars are elevated and the latch is in engagement with the lever it stands substantially horizontal. As the needle-bars are depressed the latch is swung out into the position shown in Fig. 1 by its engagement with the lever.

43 designates a cord or other connection secured to the latch and extending to the dobbie or other pattern mechanism which operates the shedding mechanism.

When it is desired to weave the lappet-figure in the fabric, the pattern mechanism allows the cord 43 to be sufficiently slackened so that the latch drops into engagement with the lever 30, in which position of the parts the lappet-needles will be shifted transversely of the fabric or longitudinally of the lay, as called for by the pattern mechanism 32. When the figure has been woven, the pattern mechanism operates to raise the cord 43, and thus swing the catch out of engagement with the lever 30. So long as the cord 43 is held elevated the needle-bars will have no movement longitudinally of the lay, and consequently no lappet-figure will be woven. My invention therefore contemplates as one of its features a pattern mechanism for controlling the movements of the needles longitudinally of the lay and a pattern-controlled connection between said pattern mechanism and the lappet-needles.

While the mechanism thus far described is operative to produce the desired result, yet in some instances it may not be desirable to depress the lappet-needles at every pick, but only when it is desired to produce the lappet-figure on the fabric. Accordingly, I have provided means whereby the action of the crank-shaft 18 may be rendered intermittent and have also constructed said means to be controlled by a pattern mechanism.

The sprocket-wheel 20 is provided on one face with clutch projections, which cooperate

with a sliding clutch member 54, carried by said shaft 18, said clutch member being splined to the shaft to rotate therewith, but capable of being moved longitudinally thereof.

55 designates a clutch-operating lever, which is pivoted to any suitable fixed support—as, for instance, a cross-bar 56<sup>a</sup>—extending from one lay-sword to the other and has a forked arm to engage a groove in the sliding clutch member 54. The other end of said lever 55 is engaged and operated by a cam 56, loosely mounted upon the shaft 18. Said cam is illustrated as being star shape, it having the elevations or rises 57 and the depressions 58. Rigid with the cam is a ratchet 59, which cooperates with a pawl 60, carried by the lever 61. This lever is loosely mounted on the shaft 18 and has connected to its outer end a cord or other connection 62, which extends to the pattern mechanism controlling the shedding mechanism or to any other suitable means for operating it.

63 designates a spring which serves normally to keep the lever 55 in engagement with the cam. When the end of the lever is held elevated by one of the rises 57 of the cam, the clutch 54 will be thrown out of engagement with the sprocket-wheel 20. When, however, the end of the lever rests in one of the depressions 58, the clutch is thrown into engagement through the action of the spring 63.

When it is desired to intermittently rotate the crank-shaft 18, the set-screw 68 will be removed, so as to allow the sprocket 20 to run loosely upon the shaft 18.

When the clutch mechanism is in the position shown in Fig. 1, the sprocket-wheel 20, which is driven from the cam-shaft, will run loosely upon the crank-shaft 18, but will not rotate said shaft, and the lappet-needles will consequently remain elevated.

At the time when the figure is to be woven the pattern mechanism will raise the cord 62, turn the lever 61, and thus turn the cam 56 one step. The end of the lever 55 will then enter one of the depressions 58, and the springs 63 will operate to throw the clutch into operation. So long as the clutch remains in operation the shaft 18 will be rotated and the lappet-needles raised and lowered, and at the same time through the pattern-cam 32 the necessary longitudinal movement of the needle-bars will take place. At the appropriate times the pattern mechanism will again raise the cord 62, and thus turn the cam 56 another step to again bring the parts into the position shown in Fig. 1. The entire auxiliary weaving means or lappet mechanism is thus thrown out of operation and will remain so until again thrown into operation through the pattern mechanism above described.

In case it is desired to have the lappet-needles depressed every pick, the clutch mechanism above described can be dispensed with and the sprocket-wheel 20 rigidly connected

to the shaft by any suitable means, such as a set-screw 68, or the cam 56 may be so positioned that the clutch will be constantly in engagement.

5 While I have herein shown one form which my invention may assume, I do not wish to be limited to the constructional details illustrated, as obviously many changes may be made in such details without departing in any way from the main features of the invention set forth in the appended claims. This same construction with appropriate modifications could also be used for depressing or operating the swivel-rack of a swivel-loom.

15 Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lappet-loom, the lay, lappet-needles thereon, a crank-shaft mounted on the lay-swords and operatively connected to said needles to depress the same, and means independent from the movement of the lay to operate said shaft.

2. In a lappet-loom, a lay, lappet-needles thereon, a rotatable crank-shaft movable with the lay and connected to said needles to elevate and depress the same, and operative connections between said crank-shaft and the cam-shaft of the loom.

3. In a lappet-loom, a lay, lappet-needles thereon movable with the lay, a crank-shaft journaled on the lay-swords, connections between said shaft and the lappet-needles whereby the complete rotation of the former raises and lowers the needles, and means to rotate said shaft continuously.

4. In a lappet-loom, a lay, needle-bars carried thereby, lappet-needles depending from said bars, a crank-shaft journaled on the lay-swords, connections between said crank-shaft and needle-bars, and means to rotate said shaft continuously.

5. In a lappet-loom, a lay, lappet-needles carried by and movable with the lay, a crank-shaft journaled on the lay-swords and operatively connected with said needles, and means to rotate said crank-shaft, said means including a pattern-controlled clutch.

6. In a lappet-loom, a lay, needle-bars carried thereby, and pattern-controlled means operative to give said bars their vertical movement at any desired intervals.

7. In a lappet-loom, a lay, auxiliary weaving means carried thereby, and pattern-controlled means to throw the auxiliary weaving means into or out of operation.

8. In a lappet-loom, a lay, needle-bars carried thereby, means to move said needle-bars longitudinally of the lay, said means including pattern mechanism, and pattern-controlled connections between said mechanism and said bars.

9. In a lappet-loom, a lay, needle-bars mounted thereon for movement longitudinally thereof, an actuating-lever for giving said

bars their longitudinal movement, and a latch pivoted to one of said needle-bars and adapted to engage said lever.

10. In a lappet-loom, a lay, needle-bars mounted thereon for movement longitudinally thereof, a pattern-controlled actuating-lever carried by the lay for giving said bars their longitudinal movement, and pattern-controlled connections between said levers and the bars.

11. In a lappet-loom, a lay, two needle-bars mounted thereon and connected together for simultaneous movement in opposite directions, an actuating-lever mounted on the lay for giving said needle-bars their longitudinal movement, and pattern-controlled connections between said lever and one of the needle-bars.

12. In a lappet-loom, a lay, needle-bars carried thereby and movable longitudinally thereof, pattern mechanism carried by the lay-swords to give the bars their longitudinal movement, a crank-shaft also journaled to the lay-swords, means to rotate said shaft and connections between the shaft and the needle-bars whereby the rotation of the shaft raises and depresses said bars.

13. In a lappet-loom, a lay, needle-bars mounted thereon for movement longitudinally thereof, pattern-actuating mechanism carried by the lay-swords and operating to give the bars their longitudinal movement, a crank-shaft journaled to the lay-swords, connections between said shaft and the needle-bars, and driving means for the crank-shaft including a pattern-controlled clutch.

14. In a loom, a lay, lay-swords, a crank-shaft journaled on the lay-swords, auxiliary weaving means carried by the lay and operated by the crank-shaft, and means independent of the movement of the lay for operating said crank-shaft.

15. In a lappet-loom, the lay, lappet-needles thereon, a rotatable crank-shaft movable with the lay and connected to said needles to elevate and depress the same, and means independent from the movement of the lay to operate said shaft.

16. In a lappet-loom, a lay, lappet-needles thereon movable with the lay, a crank-shaft journaled on the lay-swords, connections between said shaft and the lappet-needles, and means independent from the movement of the lay to rotate said shaft.

17. In a lappet-loom, a lay, needle-bars carried thereby, means to move said needle-bars longitudinally of the lay, said means including pattern mechanism carried by the lay, and pattern-controlled connections between said mechanism and said bars.

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

JOHN C. BROOKS.

Witnesses:

W. C. HOWARD,

M. C. MURPHY.