

958,703.

2 SHEETS—SHEET 1.

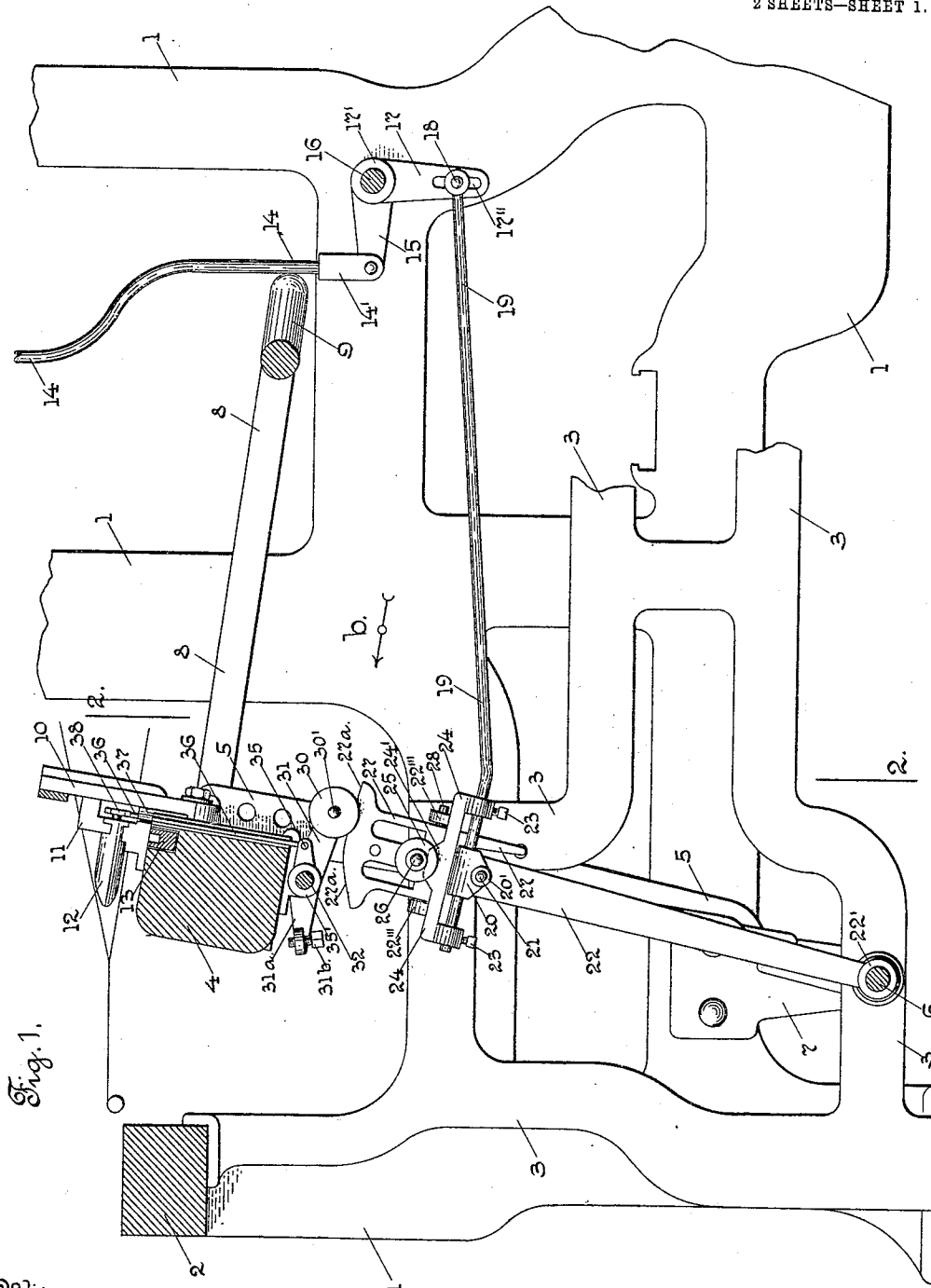


Fig. 1.

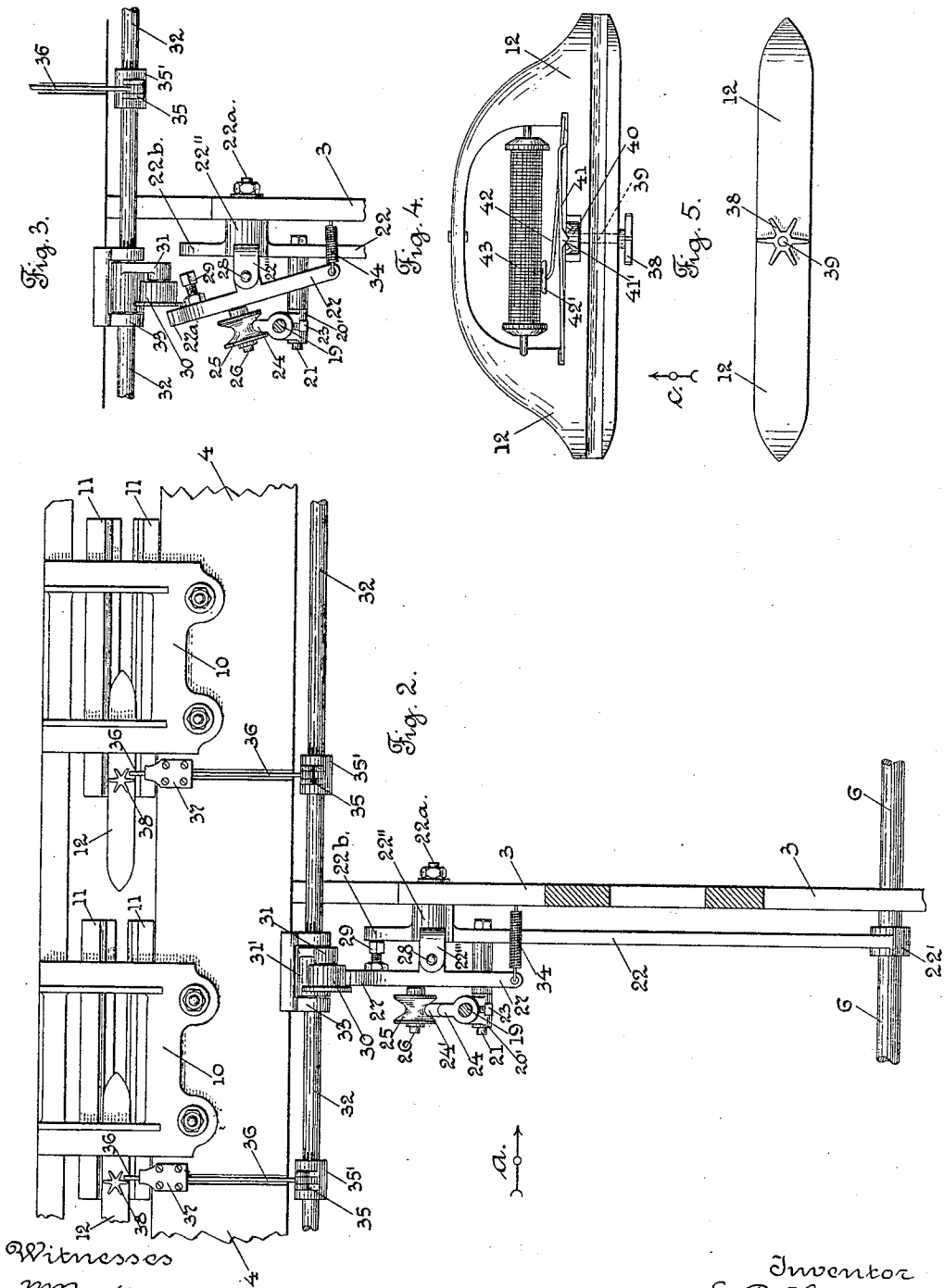
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NARROW WARE OR RIBBON LOOM.
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ELBRIDGE R. HOLMES, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

NARROW-WARE OR RIBBON LOOM.

958,703.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed March 20, 1909. Serial No. 484,810.

To all whom it may concern:

Be it known that I, ELBRIDGE R. HOLMES, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Narrow-Ware or Ribbon Looms, of which the following is a specification.

My invention relates to narrow-ware or ribbon looms, and particularly to the tension mechanism on the shuttles, for the quill or bobbin, and means to automatically vary the tension of said mechanism, during the operation of the loom.

In weaving certain kinds of fabric on narrow-ware or ribbon looms, it is desirable and necessary to have the tension on the quill or bobbin on the shuttle, changed or varied for a certain number of picks, and the object of my invention is to provide tension mechanism on the shuttles for the quill or bobbin in the shuttles, and means to automatically vary the tension of said mechanism, at predetermined intervals.

My invention consists in certain novel features of construction of my improvements, which may be adapted to be applied to and used on any well known type of narrow-ware or ribbon looms.

I have only shown in the drawings a detached portion of a narrow-ware or ribbon loom, with my improvements combined therewith, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a vertical transverse cross section, through a narrow-ware loom, showing the lay and other parts, and my improvements combined therewith, looking in the direction of arrow *a*, Fig. 2. Fig. 2 is a sectional rear view of the lay, and other parts, on line 2, 2, Fig. 1, looking in the direction of arrow *b*, same figure; the loom side, the breast-beam, and some other parts are not shown in this figure. Fig. 3 shows a part of the mechanism shown in Fig. 2, detached, and in a different position. Fig. 4 is, on an enlarged scale, a top or plan view of a shuttle, and the tension mechanism thereon for the quill or bobbin, and, Fig. 5 is a rear edge view of the shuttle shown in Fig. 4, looking in the direction of arrow *c*, same figure.

In the accompanying drawings, 1 is a loom side or end frame, 2 the breast-beam, 3 a

cross-girt, 4 the lay-beam carried on the lay-sword 5, which is mounted at its lower end on the cross shaft 6, which is carried in brackets 7 secured on the loom side 1. The lay-sword 5 is connected, through the crank connector 8, with the crank shaft 9, in the usual way. The lay-beam 4 has secured thereon, at certain distances apart, a series of shuttle blocks 10, carrying the shuttle guides 11 for the shuttles 12, operated from the shuttle rack 13, see Fig. 1, in the usual way. All of the above mentioned parts, except the tension mechanism on the shuttles, are of the usual and well known construction in narrow-ware looms.

I will now describe my improvements for automatically varying the tension on the quill or bobbin in the shuttle, when the loom is in operation, from an indicating or pattern mechanism, not shown, which may be located at one end of the loom.

A connector 14 extends downwardly from an indicating surface, or a pattern indicator or finger, not shown. On the lower end of the connector 14 is a rod-head 14', which is in this instance pivotally connected to a lever 15 fast on a shaft 16. A second lever 17 has its hub 17' fast on the shaft 16, see Fig. 1, and extends downwardly, and has an elongated slot 17'' in its lower end, in which is adjustably secured a stud 18, to which is pivotally connected one end of a forwardly extending rod 19. The other end of the rod 19 is slightly bent upwardly, and is adapted to slide loosely in a guide 20, which has a hub 20', which is pivotally mounted on a stud 21 secured on a stand 22. The stand 22 has in this instance a hub 22' on its lower end, which is loosely mounted on the shaft 6. The upper end of the stand 22 is adjustably secured to the cross-girt 3, by a bolt 22^a, see Fig. 2.

The front end of the rod 19 has adjustably secured thereon, in this instance by set screws 23, a plate 24, which has an inclined or cam-shaped projection 24', in this instance on its upper edge, at its central portion. The plate 24 is adapted to move back and forth, or have a reciprocating movement with the rod 19, according to the indications of the indicating or pattern mechanism, not shown, through the connector 14, lever 15, and lever 17. A roll 25, having a grooved or recessed periphery, extends over the upper edge of the plate 24, and is adapt-

ed to rest on said plate. Said roll 25 is loosely mounted on a stud 26, which is secured in a vertically extending plate 27, pivotally supported on a bolt 28, held in ears or lugs 22''' on the upper enlarged end 22'' of the stand 22. The upper end of the plate 27 carries a set screw 29, which may be turned in or out, and its head is adapted to bear against an upward extension 22^b on the stand 22, see Fig. 2, to limit the inward movement of said plate 27. The upper end of the plate 27 is preferably made with a curved or cam-shaped edge 27^a, as shown in Fig. 1, and is adapted to be moved into the path of and extend under a roll 30, which is pivotally mounted on a stud 30' on the inner end of a lever 31, the hub 31' of which is mounted on a shaft 32, see Fig. 3. An arm 31^a extending out from the hub 32', carries a set screw 31^b, see Fig. 1, which is adapted to engage with its inner end the lower side of the lay-beam 4, to limit the downward movement of the roll 30, when it is released from the plate 27, as shown in Fig. 3. The shaft 32 is mounted in brackets 33 on the lay-beam 4. A helically coiled contraction spring 34 is attached at one end to the lower end of the plate 27, and at its other end to the loom girt 3, and acts to move outwardly the upper end of the plate 27, as shown in Fig. 3. A lever 35, (there is a lever 35 for each shuttle block 10), has its hub 35' fast on the shaft 32, and the end of each lever 35 is connected with the lower end of an upwardly extending rod or wire 36. The upper end of each rod or wire 36 is suitably guided in a guide plate 37, at the rear of the lay-beam, see Fig. 2, and is adapted to be moved up into the path of, and be engaged by a wheel 38, as the shuttles move back and forth, and also be moved down out of the path of the wheel 38. There is one wheel 38 for each shuttle 12, and the wheel is preferably located on the rear edge or part of the shuttle, and is fast on a shaft 39, see Figs. 4 and 5, which shaft extends inwardly to the open part of the shuttle, and has secured on its inner end a cylindrical cam 40. The cam 40 is provided in this instance with three high, and three low V shaped notches, disposed alternately, see Fig. 4, which are adapted to engage an extension 41' on a spring wire 41. The spring wire 41 acts to press the pad 42' on the spring wire 42, toward the quill or bobbin 43.

The rotation of the wheel 38, through its engagement with the upright rod 36, in one direction, or the other, for one-sixth of its revolution, will vary the tension on the quill or bobbin 43, according as the extension 41' on the spring wire 41, engages a lower, or a higher notch on the cylindrical cam 40.

The stand 22 has its lower end loosely mounted on the lay-sword shaft 6, as a fixed axis, so that in case of any adjustment of

the stand 22 on the cross-girt 3, toward the front or the back of the loom, the position of the parts carried on said stand, relative to the roll 30 moving with the lay, will not be changed, that is the arc of the circle in which the upper edge of the plate 27 moves, in the adjustment of the stand 22, will always be the same relatively to the arc of the circle in which the lay-beam moves.

From the above description in connection with the drawings the operation of my improvements will be readily understood by those skilled in the art.

As stated above my improvements are intended to be used on narrow-ware looms, in which it is desirable to vary the tension on the quill or bobbin in the shuttle. For example in weaving elastic fabric, the tension on the quill or bobbin in the shuttle may be more during the weaving of the fabric where the rubber is under tension and where the fabric is to be elastic, but where the fabric is not to be elastic, then the tension on the quill or bobbin in the shuttle may be reduced. In case of weaving fabric where it is desirable to have a less tension on the quill or bobbin in the shuttle, the indicating surface or pattern mechanism connected with my improved mechanism, and for operating my mechanism, will be so made that a certain number of filling threads will be put into the fabric while the indicating or pattern mechanism is stationary, the tension on the quill or bobbin in the shuttle remaining constant during such time.

In case the tension on the quill or bobbin in the shuttle is to be increased for a certain number of picks, then, through the operation of the indicating or pattern mechanism, not shown, the rod 19 and plate 24 have a longitudinal movement communicated thereto at the proper time, so that the cam-shaped projection 24' on the cam plate 24 will engage the roll 25 on the stud 26 on the plate 27, and move said plate from its inclined position, shown in Fig. 3, to the perpendicular position shown in Fig. 2, against the action of the spring 34, and as the lay moves backward on its backward stroke, the roll 30 on the lever 31 will be in alinement with the upper edge 27^a of the plate 27, and will ride up on said plate and raise the lever 31 and rock the shaft 32, to raise the wire 36 through the arm 35, and bring the upper end of the wire in the path of the wheel 38 on the shuttle, as shown in Fig. 2. The movement of the shuttle from left to right in Fig. 2, will cause the wheel 38 to turn a sixth of a revolution, and also the cam 40, to cause a high part on said cam to engage the extension 41' on the wire 41, and move inwardly the wire 42, and the pad 42' thereon, to increase the tension on the quill or bobbin 43.

When it is desired to decrease the tension on the quill or bobbin 43, the plate 24, through the indicating or pattern mechanism, not shown, is again moved longitudinally to bring the cam-shaped projection 24' under the roll 25, and when the lay is in its forward position, the plate 27 will be moved from the position shown in Fig. 3 into its perpendicular position shown in Fig. 2, and on the backward movement of the lay the roll 30, traveling on the cam-shaped edge 27^a of the plate 27 will raise the wire 36 to bring it into the path of the wheel 38 on the shuttle 12, and on the next throw of the shuttle, a one-sixth revolution will be communicated to said wheel 38 and to the cam 40, to bring a low part on said cam opposite the projection 41' on the spring 41, to decrease the tension on the spring wire 42 and the pad 42'.

It will be understood that the details of construction of my improvements may be varied if desired.

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

1. In a narrow-ware loom, a shuttle, a tension mechanism on the shuttle for the quill or bobbin, and means to automatically vary the tension of said mechanism during the operation of the loom, said means under the control of an indicating or pattern mechanism.

2. In a narrow-ware loom, a series of shuttles having tension mechanism for the quills or bobbins, and automatic means for simultaneously varying the tension of said tension mechanism during the operation of the loom.

3. In a narrow-ware loom, a shuttle, a tension mechanism on the shuttle for the quill or bobbin, a movable cam on the stationary part of the loom, connections intermediate said tension mechanism and said cam, and automatic means for moving said cam to vary the tension of said mechanism during the operation of the loom.

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