Nov. 12, 1940. T. MARTIN 2,221,146

NARROW WARE LOOM

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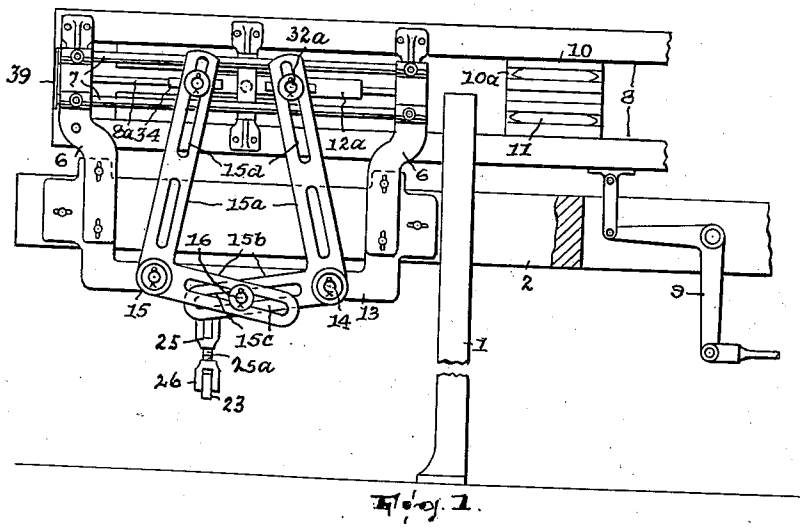


Fig. 1.

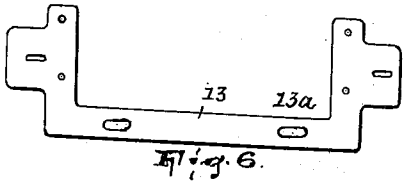


Fig. 6.

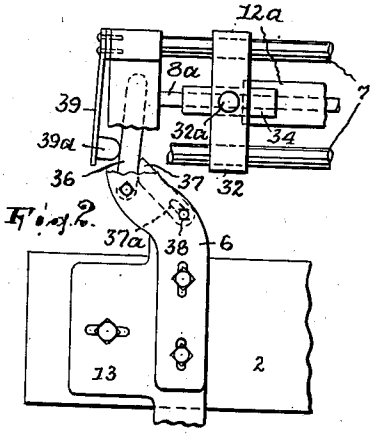


Fig. 2.

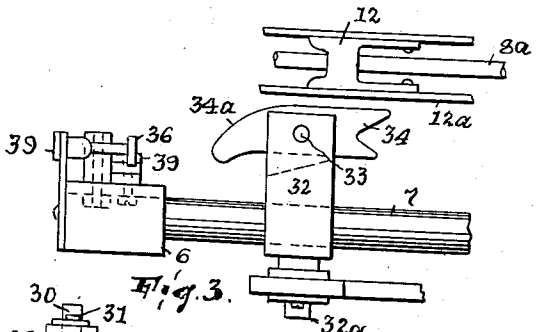


Fig. 3.

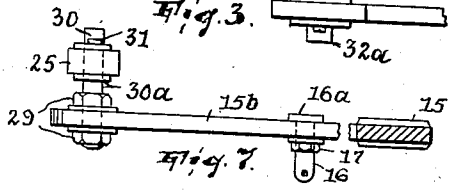


Fig. 7.

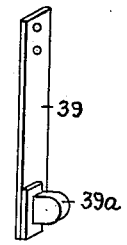


Fig. 4.

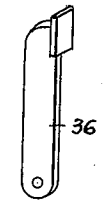


Fig. 5.

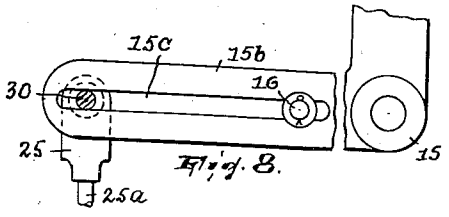


Fig. 8.

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NARROW WARE LOOM

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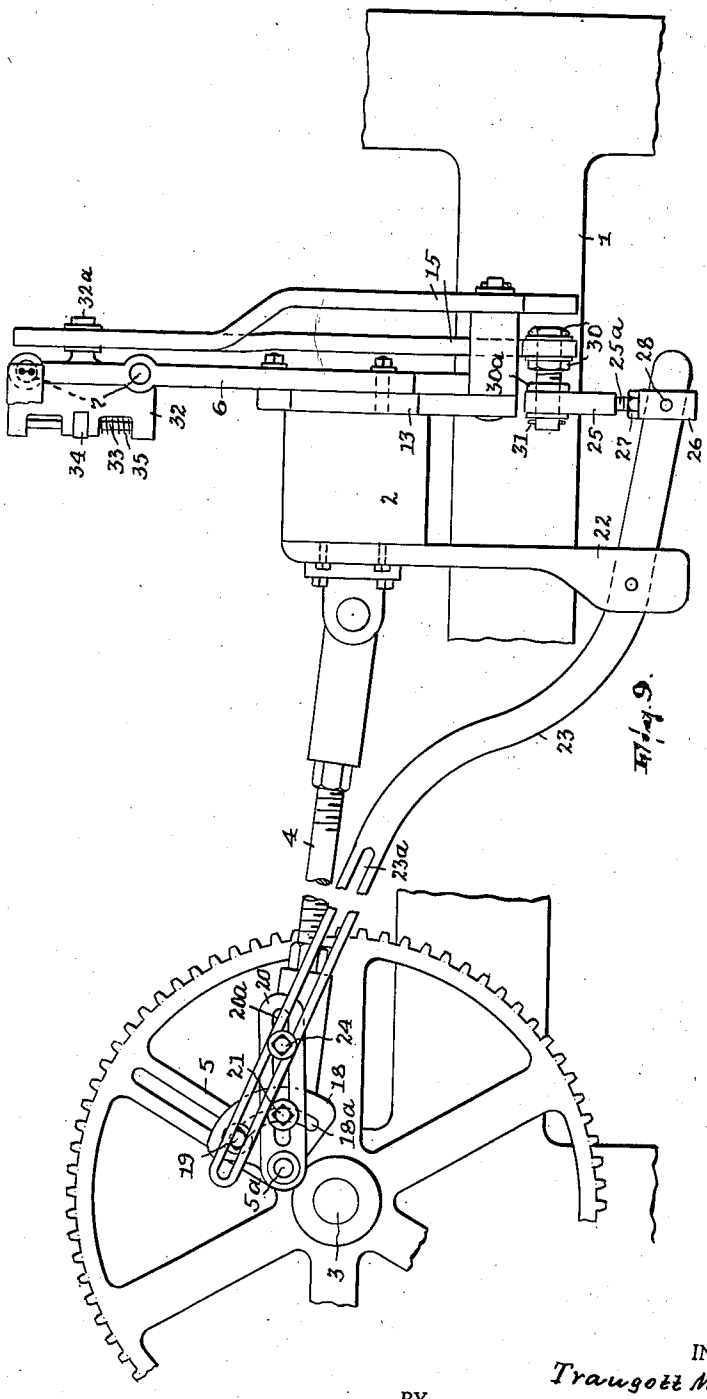


Fig. 9.

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2,221,146

NARROW WARE LOOM

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Application February 10, 1940, Serial No. 318,272

4 Claims. (Cl. 139—138)

This invention relates to looms and it consists in certain improvements in a loom of the type of that set forth in the patent to Emery, No. 1,057,133.

In that loom the shuttles obtain their motion from a pair of levers fulcrumed on parallel axes in and crossing the main batten and so interconnected that their picking or motion-imparting ends move together (that is, simultaneously) toward and together from each other, motion being imparted to one of them from a constantly going shaft parallel with the main batten through a shaft-like transmission which, on account of the movement of the batten around an axis parallel with said shaft, is formed both telescopic and with a universal joint. The construction is such that not only do the levers depend to an undue extent below the batten but the space which is required for the movements apart of these levers and the picker-slides attached to them encroaches on space measured lengthwise of the loom that might be utilized either to afford greater clearance at the ends of the loom, assuming it contains a given aggregate extent of actual weaving space, or to afford an increase in such aggregate extent of actual weaving space. The mentioned transmission, moreover, is cumbersome and expensive to install and it encroaches on useful space under the batten.

In a loom of this type the mentioned levers impart their own movements to so-called picker-slides each having a picker or pawl which is normally held out of the path of a picker-plate, of shorter length than the combined ranges of movement of the two pickers and which is a part of an intergeared system that includes a bank or row of shuttles; when the picker-slides move apart one of two adjustable elastic media, one for each picker, acts to move the adjoining picker into position to catch the adjacent end of the picker-plate so that on the next inward movements of the pickers the one which thus catches the picker-plate will transmit its motion thereto and hence to the corresponding shuttles. (Usually there is a plurality of superposed shuttle-banks arranged in an auxiliary batten and such auxiliary batten is by suitable pattern means raised or lowered to bring a given shuttle-bank and hence its picker-plate into the horizontal plane of action of the two pickers.) Besides improving the loom in the respects already indicated the present invention contemplates improving the adjustable elastic medium active on either picker with a view to making it more permanent or enduring in construction than characterizes the elastic medium of the said Emery patent.

In the drawings,

Fig. 1 is a front elevation of one end portion of a loom embodying the present invention, the auxiliary batten being not shown;

Fig. 2 is a similar view on a larger scale of a fragment of what appears in Fig. 1 illustrating, particularly, the improved elastic picker-controlling medium;

Fig. 3 is a plan on a still larger scale of parts appearing in Fig. 2.

Figs. 4 and 5 are isometric views of the two movable parts of said medium;

Fig. 6 is a front elevation of a certain bracket in which the interconnected levers 15 are fulcrumed;

Figs. 7 and 8 are respectively a plan, partly in section, and a front elevation of one such lever; and

Fig. 9 is a side elevation of what is shown in Fig. 1, with the means to reciprocate the batten and transmit motion to one of said levers.

The following parts are or may be of substantially the same as in the mentioned Emery patent: The loom-frame 1; the main batten 2 suitably supported for back-and-forth movement in an arcuate, here an arched, path; the crank-shaft 3 and the adjustable pitman 4 connecting an eccentric stud 5a on the gear 5, fast to the crank-shaft, with such batten; the uprights 6 fixed to the batten and connected by a pair of guide-rods 7; and the auxiliary batten 8 suitably guided by parts (not shown) on the main batten for verticle movement from any suitable pattern means (not shown) acting through some such means as is shown at 9, such auxiliary batten having spaced shuttle-blocks, such as 10, provided with races 10a for the shuttles 11 of the shuttle-banks, each such shuttle-bank forming a part of an intergeared train of which a picker-plate-slide 12 is another part, the latter being slidable on a rod 8a of the auxiliary batten and 12a being its picker plate. When the auxiliary batten is raised or lowered to bring some intergeared train into the weaving plane its picker-plate-slide is then in position to undergo the motion (by means now to be described) which will pass the corresponding shuttles one way or the other, or back and forth, through the warp sheds that have been formed in the spaces between the blocks 10.

A bracket 13 is bolted to the batten, incidentally affording support for the uprights 6. On studs 14 therein are fulcrumed two bell-crank

levers 15 in relatively reversed positions, by which I mean that, while each has an upstanding arm 15a, its arm 15b projects reversely to and laps the corresponding arm 15b of the other lever. The arms 15b are longitudinally slotted at 15c. Fixed in the slot of one arm (here the inner one) and adjustable therein is a stud 16 clamped to the arm by the coaction of a head 16a of the stud and a nut 17 thereon. This stud is received and free to slide in the slot of the other arm. Thus if either lever be oscillated the other lever will also oscillate and the movements of their upstanding arms will be together toward and together from each other. Referring, now, to the means for oscillating one of these levers:

Adjustable around the stud 5a of the gear 5 is a segment 18, 19 being any suitable means to clamp it to a spoke of the gear. A crank 20 is adjustable around the stud 5a as a pivot and relatively to the segment, which latter has a slot 18a receiving means 21 for clamping the crank to the segment. The parts 18 and 20 are present so as to obtain the proper timing of the levers 15 with respect to the movements of the main batten. In a hanger 22 fixed to and depending from the main batten is pivoted a lever 23 movable in a vertical plane and having its rear end formed with a longitudinal slot 23a. This slot receives a stud 24 adjustable in the longitudinal slot 20a of the crank 20. The forward end of the lever is to be pivotally and adjustably connected to one of the levers 15, as preferably the one having the stud 16 fast therein. For this purpose there is a coupling comprising two members 25—26. Member 26 has a threaded stud 25a which is screwed into member 26 and has a lock-nut 27. The member 26 is forked and receives lever 23, pivoted therein at 28 on an axis parallel with the crank shaft. The lever 15 having stud 16 has clamped in its slot 15c and by means of nuts 29 a stud 30 and on this stud, between a shoulder 30a thereon and a cotter-pin 31, is pivoted the member 25 of the coupling. Thus in the rotation of the gear 5 and through the lever 23 and coupling the two levers 15 will be oscillated.

On the rods 7 back of the upstanding arm of each lever 15 is a picker-slide 32 having a forward stud 32a received in a slot 15d of the arm of the corresponding lever. Pivoted on an upstanding pin 33 in suitable projecting arms at the back of the picker-slide is a picker or pawl 34 notched at one end and having its other end bent forward and providing a rounded surface at 34a. The notched ends of the two pickers adjoin each other and the combined ranges of movement of the pickers exceeds the length of any picker-plate 12a. A spring 35 connecting each picker with the picker-slide normally holds the pawl in the position of Fig. 3, or out of the path of such picker-plate when it is being shifted by the other picker. Each picker is moved into position to catch in its notched end the adjoining end of the picker-plate when the two pickers approach their limits of movement apart, as will appear:

A fault existing in the elastic medium which controls either picker in the mentioned Emery loom is that a coiled spring is relied on to cushion the picker and effect its movement into position to catch a picker-plate. The spring frequently breaks, putting the loom out of commission until it can be repaired. My construction avoids this fault:

On each upright 6 is an abutment 36 pivoted at its lower end thereto so that its upper or acting end is in line with the rounded or tail end of the adjoining picker. At the inner side of the abutment (i. e., adjoining the pawl) is a stop 37 fixed to the upright by a bolt 38 but having a slot 37a receiving the bolt and extending more or less horizontally. At the opposite side of the abutment is a plate-spring 39 fast at its upper end to the upright and having a knob 39a at its lower end engaging the abutment, the plate-spring normally holding the latter against the stop. By adjusting the stop the position of the abutment can be set so as to cause it to shift the picker into position to catch an outwardly moving picker-plate brought into the horizontal plane of action of the pickers.

By lapping the levers 15 several advantages result: Their over-all horizontal extent is reduced to the minimum, whereby there is no unnecessary encroachment by the loom at its end on useful space, as between it and a loom alined therewith, or the actual weaving spaces may be added to; the levers may be of light yet strong construction; and the connection between them may be a simple stud (as 16) fast to one of them.

The construction is further such that neither lever depends so far as to encroach unduly on useful space below the level of the batten or to require actuating means which would encroach on useful space under or back of the batten, it being noted that such means may involve a single lever, as 23, movable in a vertical plane cutting the batten and quite close to the end of the loom; in view of the circumstance that lever 23 and the lever 15 to which it is connected move in planes at right angles to each other the coupling 25—26 is, in effect, a universal-joint connection.

The slot 15c is of course present in one lever 15 to permit stud 16 to shift therein during their oscillations. As for the other slot in the other lever: The levers are adjustably bodily toward or from each other to alter the spacing between them, to wit, by adjusting their fulcrum studs 14 in the slots 13c shown in bracket 13. If they are to undergo equal angular displacements whatever their spacing this is possible by adjusting the stud 16 in slot 15c of the other lever.

Having thus fully described my invention, what I claim is:

1. In a loom of the class described, the combination of the frame, a batten-including structure therein, a pair of pickers for moving back and forth the shuttle-including train of the loom, said pickers being confined by said structure to move lengthwise of the batten, and means to move the pickers simultaneously toward and simultaneously from each other including a pair of bell-crank levers fulcrumed in said structure on parallel axes crossing the batten, one arm of each lever projecting generally toward the other lever and such arms lapping each other and lying in different parallel planes perpendicular to said axes and one such arm having means, slidable lengthwise of the other such arm, intercoupling the levers for synchronous oscillation around their axes in reverse directions and the pickers being operatively connected respectively with the other arms of the levers to move back and forth therewith.

2. In a loom of the class described, the combination of the frame, a batten-including structure therein, means to reciprocate said structure transversely of the batten including a rotary driving member having its axis parallel with the

batten, a pair of pickers for moving back and forth the shuttle-including train of the loom, said pickers being confined by said structure to move lengthwise of the batten, means to move the pickers simultaneously toward and simultaneously from each other including a pair of bell-crank levers fulcrumed in said structure on parallel axes crossing the batten, one arm of each lever projecting generally toward the other lever and such arms lapping each other and lying in different parallel planes perpendicular to said axes and one such arm having means, slidable lengthwise of the other such arm, intercoupling the levers for synchronous oscillation around their axes in reverse directions and the pickers being operatively connected respectively with the other arms of the levers to move back and forth therewith, and means, including a lever having its fulcrum parallel with the batten, for transmitting motion from said driving member to one of the first-named levers.

3. In a loom of the class described, the combination of the frame, a batten-including structure therein, means to reciprocate said structure transversely of the batten including a rotary driving member having its axis parallel with the batten, a pair of pickers for moving back and forth the shuttle-including train of the loom, said pickers being confined by said structure to move lengthwise of the batten, means to move the pickers simultaneously toward and simultaneously from each other including a pair of bell-crank levers fulcrumed in said structure on parallel axes crossing the batten, one arm of each lever projecting generally toward the other lever and such arms lapping each other and lying in different parallel planes perpendicular to said axes and one such arm having means, slidable lengthwise of the other such arm, intercoupling the levers for synchronous oscillation around their axes in reverse directions and the pickers being operatively connected respectively with the other arms of the levers to move back and forth therewith, and means, including a lever fulcrumed in said structure, for transmitting motion from said driving member to one of the first-named levers.

4. In a loom of the class described, the combination of the frame, a batten-including structure therein, a pair of pickers for moving back and forth the shuttle-including train of the loom, said pickers being confined by said structure to move lengthwise of the batten, a pair of parallel fulcrum studs arranged on said structure and one of them being adjustable therein lengthwise of the batten, and means to move the pickers simultaneously toward and simultaneously from each other including a pair of bell-crank levers fulcrumed on said studs, one arm of each lever projecting generally toward the other lever and such arms lapping each other and lying in different parallel planes perpendicular to said axes and a stud fast to and adjustable lengthwise of one such arm and slidable lengthwise of the other such arm and intercoupling the levers for synchronous oscillation around the fulcrum studs in reverse directions, and the pickers being operatively connected respectively with the other arms of the levers to move back and forth therewith.

TRAUGOTT MARTIN.