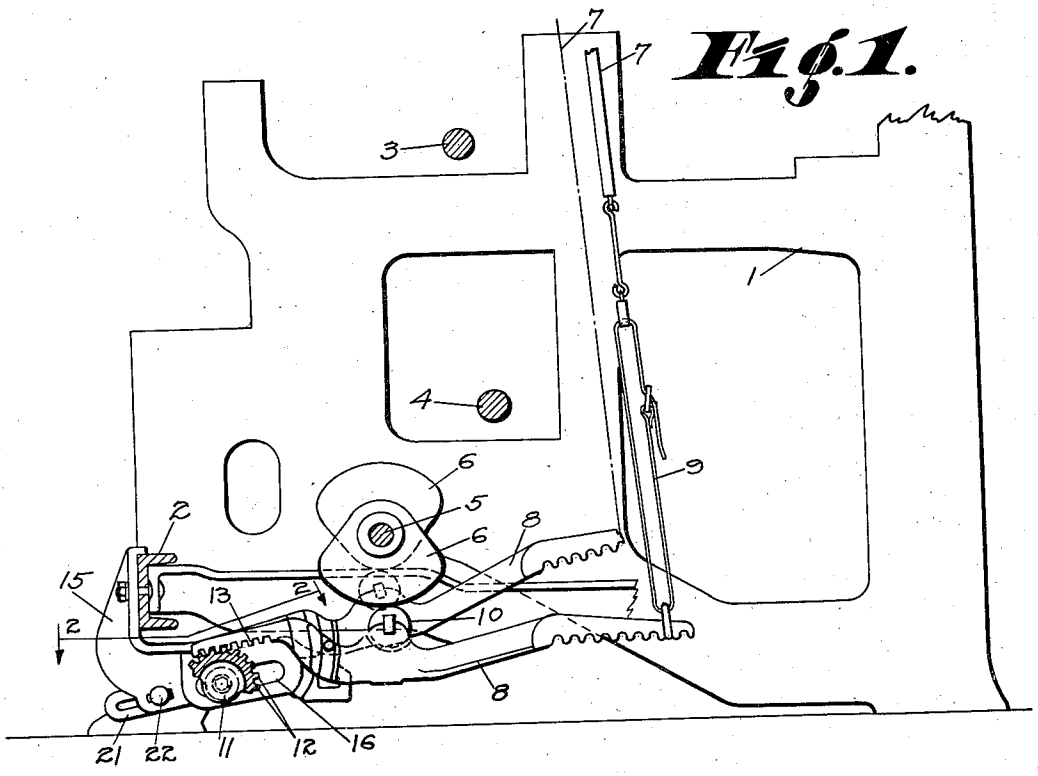
May 26, 1936. C. D. BROWN 2,042,422

SHEDDING MECHANISM FOR LOOMS

Filed Dec. 21, 1935

Fig. 1.



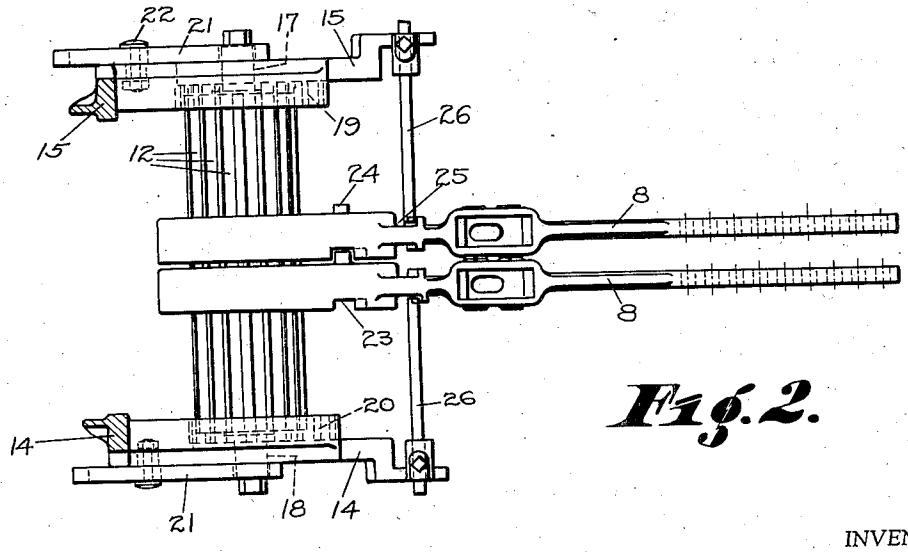


Fig. 2.

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SHEDDING MECHANISM FOR LOOMS

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10 Claims. (Cl. 139—79)

The present invention pertains to the shedding mechanism of looms and more particularly relates to the cam type of such mechanism.

Looms of the type to which my invention pertains have a plurality of harness frames connected with and operated by reciprocating harness treadles, the treadles being reciprocated about a fixed axis by suitable cams. The throw of the cams and the length of the treadles are properly proportioned to produce a movement of the harness frames which will provide the desired opening of the warp for the passage of a shuttle. The warp opening is generally kept as small as possible, consistent with proper passage of the shuttle, but must be varied in accordance with the size of the shuttle, and with other weaving conditions. For this reason, a tremendous number of sizes of harness cams is required, both for equipping new looms and for replacement purposes in adapting existing looms to different weaving conditions.

It has been proposed heretofore to eliminate most of the cam sizes required, by making the shedding mechanism adjustable in one manner or another, to thereby provide for adjustment of the warp opening obtainable from a given harness cam. In this connection, reference is made particularly to patent to A. E. Rhoades, No. 1,312,751, granted Aug. 12, 1919, wherein it was proposed to provide adjusting means for the fulcrum of the harness treadles. The Rhoades construction did not prove satisfactory, and accordingly was not used commercially, principally because the adjustable parts were inaccessible and inconvenient to adjust.

The principal object of the present invention is to provide, in a shedding mechanism, a harness frame, harness treadle for operating the frame, harness cam for operating the treadle, and adjustable fulcrum devices for the treadle, which fulcrum devices shall comprise a gear and rack which shall be accessible and easy to adjust.

In the preferred embodiment of the invention, conventional harness frames are reciprocated by harness treadles positioned below the harness frames and extending rearwardly from the planes thereof. Harness cams engage the treadles for depressing the same in the usual manner. The rearward ends of the treadles are provided with rack teeth, the treadles resting on an elongated gear member which extends transversely of the treadles and constitutes the fulcrum therefor. The gear member is adjustable longitudinally of the treadles, or of the racks thereon, for varying the fulcrum point, and thereby adjusting the warp opening.

The said preferred embodiment is illustrated on the accompanying drawing, of which:

Fig. 1 is a view partly in section and partly in elevation, showing the shedding mechanism of a loom to which my invention has been applied; and

Fig. 2 is a horizontal sectional view taken approximately on line 2—2, Fig. 1.

The loom shown on the drawing is, except for the shedding mechanism, of conventional construction, and accordingly is but fragmentarily illustrated. Of the conventional construction there is shown the right hand loom side 1, which is connected to a left hand loom side (not shown) by a plurality of cross members, as girt 2. The front of the loom is at the right of Fig. 1 of the drawing. The loom also has crank shaft 3, a cam shaft 4, and an auxiliary shaft 5 for carrying a plurality of harness cams 6, to be further mentioned.

The specific embodiment of the invention herein disclosed includes a very common arrangement of harness frames 7, wherein a plurality of such frames extend widthwise of the loom in adjacent vertical, or substantially vertical, planes and are adapted to be reciprocated vertically by the cams 6 and harness treadles 8 positioned below the harness frames. The shedding mechanism shown is further conventional in that the harness treadles, to the desired plural number, are positioned parallel to each other, side by side, and extending rearwardly from the planes of the harness frames. The forward end of each treadle is connected to a harness frame by any usual means, such as strap 9.

The rotating harness cams 6 are positioned above the treadles, intermediate the ends of the latter, each harness cam serving to depress its respective treadle through engagement with the roller 10 thereon. The harness treadles being fulcrumed at their rearward ends in this particular form of shedding mechanism, depression of a treadle results in the connected harness frame being depressed an amount which corresponds to the throw of the forward end of the treadle. No means for raising the harness frames is herein disclosed, any of a number of well known "top motions", so-called, being adapted to such purpose. Reference may be had, for example, to the top motion disclosed in patent to Bell, No. 1,580,948, granted April 13, 1926.

In accordance with the invention, the fulcrum for the treadle is comprised of a gear member 11

which has teeth 12 extending transversely of the treadle and meshing with rack teeth 13 formed on the latter. In the specific embodiment shown, the gear member 11 is elongated sufficiently to engage and support the rearward ends of all of the harness treadles 8, there being but two such treadles shown. The harness treadles, in reciprocating, rock on the gear member, which is normally fixed. It will be apparent that shifting the gear member longitudinally of the treadles, that is, forwardly or rearwardly, without shifting the treadles, will serve to simulanteously and equally vary the throw of the treadles, thereby varying the size of warp opening obtainable from the one set of harness cams.

The gear member 11 may be supported for the above mentioned adjustment by being adjustably mounted in brackets, as 14 and 15, which are bolted to the girt 2. The brackets are provided with slots 16 which extend generally longitudinally of the treadles. The gear member is provided at its ends with integral stud portions 17 and 18 which are positioned in the slots 16. The gear member 11 may be, as shown, cast in segmental form, with an attendant saving in weight and cost, the segmental gear usually providing ample adjustment.

I prefer to adjust the gear member by rolling the same along the racks 13. This rolling movement is facilitated by a fixed rack which engages the teeth of the gear member and prevents the latter from moving longitudinally of the treadles without also rotating. Two such racks are shown at 19 and 20, there being one rack formed integrally with each of the supporting brackets 14 and 15. The teeth of these fixed racks mesh with the teeth 12 of the gear member at the ends of the latter.

There is shown on the drawing a convenient means for fixing the gear member 11 in adjusted position, the same comprising a plate 21 at each end of the gear member. Each plate is apertured to fit over the end of a stud portion 17 or 18 and is also slotted to receive a bolt, as 22, by which it may be fastened to the respective bracket 14 or 15. When the plates are thus fastened, they securely hold the gear member in adjusted position. However, when the fastening bolts are loosened, the plates, which are accessible from the rear of the loom, may be pushed forwardly or pulled rearwardly to thereby roll the gear member along the racks on the treadles, as above described.

The treadles 8 as shown are each provided with a slot 23 on one side and a projecting lug 24 on the other side, to facilitate meshing of the proper teeth of the treadle racks with the teeth of the gear member when installing the treadles on the loom. The treadles are also provided with guide grooves, as 25, to receive guide rods such as rods 26, 26, which may be adjustably mounted in the supporting brackets. The guide rods serve to prevent the treadles from spreading apart or separating during the normal operation of the loom. The rods may be adjusted to accommodate more than the two treadles shown.

The embodiment of the invention above described is extremely simple, both in its construction and in the manner of its use. The single elongated gear member is further desirable in that it provides equal adjustment for all of the treadles, and will, within limits, provide a fulcrum for any desired number of treadles. The invention accordingly provides a practical form of shedding mechanism wherein the warp opening obtainable may be varied or adjusted without the necessity of changing the harness cams.

Having fully disclosed the preferred embodiment of my invention, I claim:

1. In a loom, a harness frame, a harness treadle connected with said harness frame for operating the latter, a cam for operating said treadle, and means constituting an adjustable fulcrum for said treadle, said means consisting of a gear member having teeth extending transversely of the treadle and meshing with rack teeth formed on the latter, means supporting said gear member for adjustment longitudinally of the treadle along said rack, and means for fixing said gear in adjusted position.

2. In a loom, a harness frame, a harness treadle connected with said harness frame for operating the latter, a cam for operating said treadle, a gear member on which said treadle is fulcrumed, said gear member having gear teeth extending transversely of the treadle and meshing with rack teeth formed on the latter, means supporting said gear member for rolling movement longitudinally of the treadle along said rack to thereby adjust the fulcrum point of the treadle, and means for fixing said gear member in adjusted position.

3. In a loom, a harness frame, a harness treadle connected with said harness frame for operating the latter, a cam for operating said treadle, a gear member on which said treadle is fulcrumed, said gear member having gear teeth extending transversely of the treadle and meshing with rack teeth formed on the latter, brackets having slots in which said gear member is supported for movement in a direction longitudinally of said treadle, a fixed rack engaging the teeth of said gear member for causing the latter to roll on the first said rack as the gear member is moved along said slots, and means for fixing said gear member in said slots.

4. In a loom, a plurality of harness frames, a plurality of parallel harness treadles each connected with a harness frame for operating the same, cams for operating said treadles, a single elongated gear member on which all of said treadles are fulcrumed, said gear member having gear teeth extending transversely of said treadles and meshing with rack teeth formed on the latter, means supporting said gear member for rolling movement longitudinally of said treadles along the racks thereon, to thereby simultaneously and equally adjust the fulcrum points for all of the treadles, and means for fixing said gear member in adjusted position.

5. In a loom, a harness frame, a harness treadle connected at one end thereof with said harness frame for operating the latter, a harness cam engaging said treadle intermediate the ends of the latter, a gear member having teeth meshing with rack teeth formed in the other end of said treadle, said gear member constituting the fulcrum for said treadle, means supporting said gear member for adjustment longitudinally of the treadle independently of the latter to thereby shift the fulcrum for the treadle, and means for fixing said member in adjusted position.

6. In a loom, a vertically movable harness frame positioned in a substantially vertical plane extending widthwise of the loom, a harness treadle positioned beneath said harness frame and extending at right angles to the plane thereof, means connecting the forward end of said treadle with said harness frame, a harness cam en-

gaging said treadle intermediate the ends of the latter for reciprocating said treadle and harness frame, a gear member having gear teeth meshing with rack teeth formed on the rearward end of the treadle, said gear member constituting the fulcrum for said treadle, means supporting said gear member for adjustment forwardly and rearwardly by rolling the same along said rack, and means for fixing said member in adjusted position.

7. In a loom, a plurality of harness frames, a plurality of harness treadles each connected at one of its ends with a harness frame, said treadles being positioned side-by-side in parallel planes, a harness cam for each of said treadles, each harness cam engaging its respective treadle intermediate the ends of the latter, a single elongated gear member having gear teeth which extend transversely of said treadles, each said treadle having rack teeth meshing with the first said teeth whereby said member constitutes a fulcrum for all of said treadles, and means for simultaneously varying the throw of all of said treadles by rolling said gear along said racks without moving said treadles relative to said cams and harnesses.

8. In a loom, a harness frame, a harness treadle connected at one end thereof with said harness frame for operating the latter, a harness cam engaging said treadle intermediate the ends of the latter, a gear member having teeth meshing with rack teeth formed in the other end of said treadle, said gear member constituting the fulcrum for said treadle, a fixed rack engaging the teeth of said gear member and normally preventing the latter from rotating, means supporting said member for rolling movement along said racks, to thereby adjust the fulcrum of the treadle longitudinally of the latter, and means for fixing said member in adjusted position.

9. In a loom, a vertically movable harness frame, a harness treadle positioned below said harness frame and extending rearwardly from the plane thereof, means connecting the forward end of said treadle with said harness frame substantially in the said plane, a cam positioned above said treadle intermediate the ends thereof and adapted to depress the treadle to thereby lower said harness frame, a fulcrum for said treadle consisting of a gear member positioned beneath the rearward end of the treadle, said gear member having teeth extending transversely of the treadle and meshing with rack teeth formed in the lower face thereof, means supporting said gear member for rolling movement along said rack teeth to thereby adjust the gear member longitudinally of the treadle, and means for fixing said gear member in adjusted position.

10. In a loom, a plurality of vertically movable harness frames positioned in adjacent planes and extending widthwise of the loom, a plurality of harness treadles positioned side by side below said harness frames and extending rearwardly from said planes, the forward end of each of said treadles being connected with a harness frame, cams positioned above said treadles intermediate the ends thereof, each cam being adapted to depress a treadle to thereby lower a harness frame, a single fulcrum member for all of said treadles, said member consisting of an elongated gear member extending transversely of said treadles beneath the rearward ends thereof, said member having gear teeth meshing with rack teeth formed on said treadles, means supporting said gear member for adjustment longitudinally of the treadles, and means for fixing said member in adjusted position.

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