Jan. 15, 1929. 1,698,913

R. M. HUGHES

LOOM

Filed May 10, 1928 2 Sheets-Sheet 1

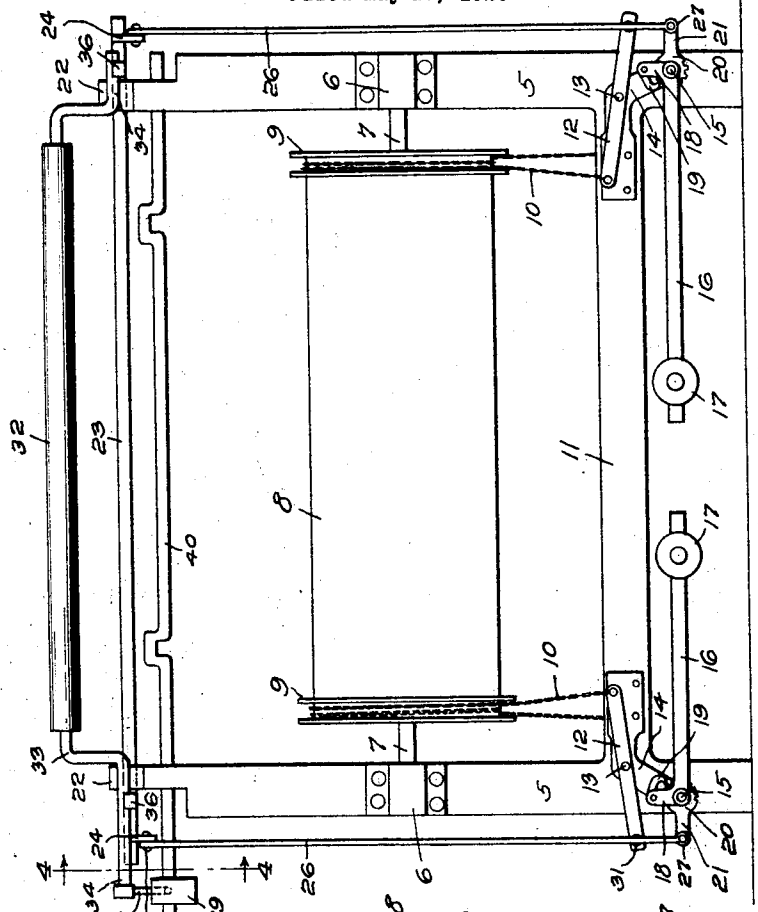


Fig. 1.

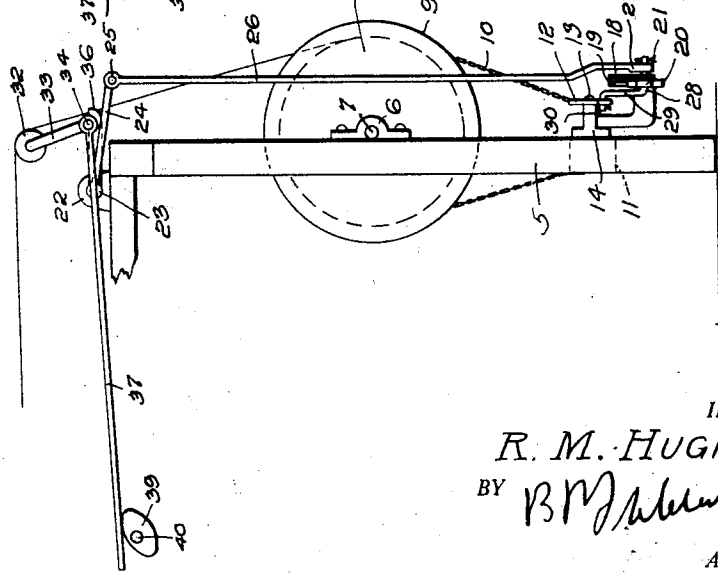


Fig. 2.

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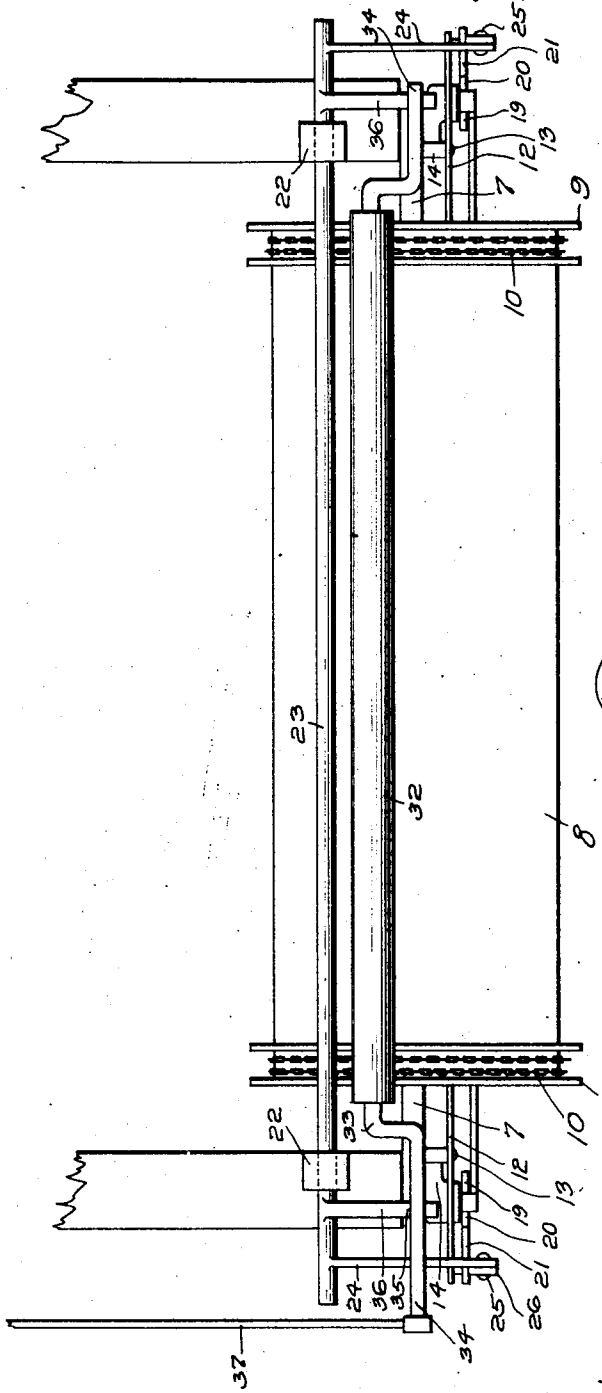


Fig. 3.

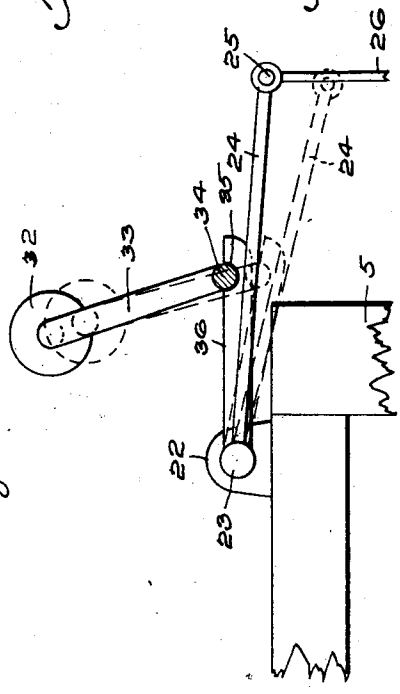


Fig. 4.

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Patented Jan. 15, 1929. 1,698,913

UNITED STATES PATENT OFFICE.

ROLAND M. HUGHES, OF GREENVILLE, SOUTH CAROLINA.

LOOM.

Application filed May 10, 1928. Serial No. 276,778.

My invention relates to improvements in looms, and has particular reference to the warp let-off mechanism.

An important object of the invention is to provide a warp let-off mechanism which will maintain the pull upon the warp thread substantially constant.

A further object of the invention is to provide means whereby a whip roll operates in conjunction with the warp let-off mechanism, without interfering with the operation of such mechanism, the resultant organization being simple and compact.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is an end elevation of a loom embodying my invention, parts omitted,

Figure 2 is a fragmentary side elevation of the same,

Figure 3 is a fragmentary plan view of the same, and,

Figure 4 is a detail section taken on line 4—4 of Figure 1.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 5 designates uprights or supports included in the frame work of the loom. Secured to the uprights 5 are bearings 6, rotatably holding trunnions 7 of a warp beam 8. This warp beam is equipped at its ends with grooved friction drums 9, rigidly secured thereto.

Wound about the friction drums 9 are flexible co-acting friction elements 10, preferably in the form of chains, the corresponding ends of which are attached to a horizontal beam 11 of the loom frame. The opposite corresponding ends of these friction elements are attached to vertically swinging levers 12, which are pivoted between their ends by bolts 13, or the like, carried by brackets 14, which are rigidly attached to the horizontal beam 11.

Secured to the depending ends of the brackets 14 are fixed pivots 15, upon which are pivotally mounted weight levers 16, extending inwardly, and carrying weights 17, adapted to be adjusted longitudinally thereof. These weight levers are provided at their pivoted ends with upstanding cranks 18, upon which are pivoted pawls or dogs 19, to engage with teeth formed upon discs 20, which are also pivoted upon the pivots 15. The teeth of the discs 20 are similar to ordinary gear teeth, and when the dogs 19 engage between them, the discs 20 are locked to the weight levers 16 to turn therewith in opposite directions. The discs 20 are provided with outwardly projecting horizontal arms or levers 21.

Arranged upon the upper portion of the loom frame are bearings 22, within which is pivoted a main horizontal transverse rock shaft 23. This rock shaft is provided near its outer ends with generally horizontal cranks or arms 24, rigidly attached thereto, and these cranks have pivotal connection at their free ends, at 25, with depending rods 26. These rods are provided at their lower ends with apertured heads 27, pivotally receiving the horizontal portions 28 of connecting links 29. The horizontal portions or extensions 28 also pass through apertures in the outer ends of the arms or levers 21, and the rods 26 are thereby pivotally connected with the arms or levers 21. At their upper ends, the links 29, have horizontal extensions 30, pivotally mounted within apertures 31, formed in the outer ends of the levers 12.

The numeral 32 designates a metal whip roll, carried by the upstanding crank portion 33 of a whip shaft, embodying horizontal ends 34. These ends 34, Figure 4, are pivoted within notches or recesses 35, formed in the top of horizontal cranks or arms 36, which are rigidly attached to the end portions of the main rock shaft 23. The whip shaft has vibratory or rocking movement by means of a crank or lever 37, rigidly secured thereto, and extending forwardly for engagement over a let-off cam 39, which is driven by a crank shaft 40, which has a turning or rocking motion.

The operation of the apparatus is as follows:

The warp thread, from the warp beam 8, is carried upwardly and is passed over the vibratory whip roll 32 and then forwardly for connection with the harness of the loom. The

roll 32 is given a vibratory movement, and is supported by the cranks or arms 36. The weights 17 are adjusted for placing the desired tension upon the warp threads, and by virtue of the adjustable connection between the weight levers 16 and the discs 20, the elements are adjustable whereby the weight levers will assume a substantially horizontal position, in operation. The weights 17 tend to swing the weight levers 16 downwardly whereby the arms or levers 21 will be swung upwardly. This movement is transmitted to the levers 12, through the medium of connecting links 29, whereby the inner ends of the levers 12 are moved downwardly and pull is applied to the friction elements 10. When the pull upon the warp threads tends to increase, above the desired point, the warp threads acting upon the whip roll 32, force the same downwardly, which swings the cranks 36 downwardly, turning the rock shaft 23, and swinging the cranks 24 downwardly. The rods 26 are moved downwardly and the arms or levers 21 are swung downwardly. The downward movement of the levers or arms 21 swings the levers 12 upon their pivots to elevate the inner ends thereof, and reduce the pull upon the flexible friction elements 10. The friction upon the drums is accordingly reduced and the warp beam may turn with a correspondingly reduced friction. Due to this operation, the pull upon the warp thread is maintained substantially constant. The operation is entirely automatic and the vibratory movement of the whip roll 32 does not interfere with this automatic operation.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a loom, a frame, a warp beam rotatably mounted thereon, friction devices carried by the ends of the warp beam, levers pivoted between their ends to the frame and having their inner ends connected with the friction devices, weight levers pivoted upon the frame near the first named levers and provided with cranks, weights mounted upon the weight levers, discs pivotally carried by the pivots of the weight levers and having teeth, dogs carried by the cranks and engaging the teeth, levers carried by the discs, a rock shaft mounted upon the upper portion of the frame, cranks carried by the rock shaft, a warp thread engaging element mounted upon the cranks, cranks secured to the rock shaft, rods pivotally connected with the second named cranks and extending downwardly for pivotal connection with the levers carried by the discs, and pivotal connection means between the last named levers and the friction device levers.

2. In a loom, a frame, a warp beam pivotally mounted thereon, friction devices carried by the ends of the warp beam, levers pivoted between their ends to the frame and having their inner ends connected with the friction devices, weight levers pivoted upon the frame near the first named levers and provided with cranks, weights mounted upon the weight levers, discs pivotally carried by the pivots of the weight levers and having teeth, dogs carried by the cranks and engaging the teeth, levers carried by the discs, a rock shaft mounted upon the upper portion of the frame, cranks carried by the rock shaft, a warp thread engaging element mounted upon the cranks, cranks secured to the rock shaft, rods pivotally connected with the second named cranks and extending downwardly, and connecting links having their upper ends pivotally connected with the friction device levers and their lower ends pivotally connected with the disc levers and the rods.

3. In a loom, a frame, a warp beam pivotally mounted thereon, friction devices carried by the ends of the warp beam, levers pivoted between their ends to the frame and having their inner ends connected with the friction devices, weight levers pivoted upon the frame near the first named levers and provided with cranks, weights mounted upon the weight levers, discs pivotally carried by the pivots of the weight levers and having teeth, dogs carried by the cranks and engaging the teeth, levers carried by the discs, a rock shaft mounted upon the upper portion of the frame, cranks carried by the rock shaft, a whip shaft pivotally mounted upon the cranks and embodying a crank portion to engage with the warp threads, means to vibrate the whip shaft, cranks secured to the rock shaft to turn with the same, rods pivotally connected with the second named cranks and extending downwardly, connecting means between the rods and disc levers, and connecting means between the disc levers and the friction device levers.

4. In a loom, a frame, a warp beam pivotally mounted thereon, friction devices carried by the ends of the warp beam, levers pivoted between their ends upon the frame and having their inner ends connected with the friction devices, weight elements connected with the levers, a rock shaft mounted upon the frame, cranks carried by the rock shaft, a whip shaft pivotally supported by the cranks and embodying a crank portion to engage the wrap threads, means to vibrate the whip shaft, and connecting means between the rock shaft and the weight carrying lever.

5. In a loom, a frame, a warp beam pivot-

ally mounted thereon, friction devices connected with the ends of the warp beam, weight devices carried by the frame and connected with the friction devices, a rock shaft mounted upon the frame, cranks carried by the rock shaft, a whip shaft pivotally mounted upon the cranks and embodying a crank portion to engage with the warp threads, and driving connecting means connecting the rock shaft and the weight devices whereby the turning movement of said rock shaft will influence the action of the weight devices.

In testimony whereof I affix my signature.

ROLAND M. HUGHES.