Dec. 28, 1937. C. R. HOWARD 2,103,785

WARP BEAM

Filed Oct. 18, 1935

Fig. 1.

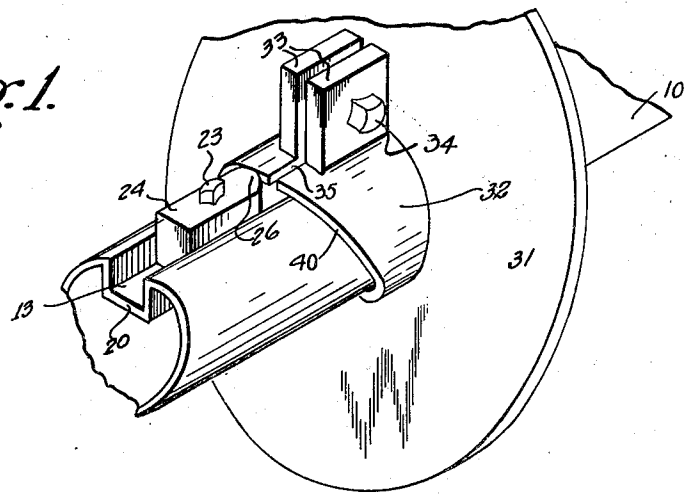
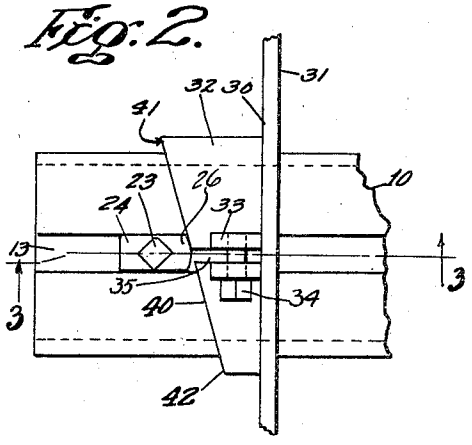


Fig. 2.



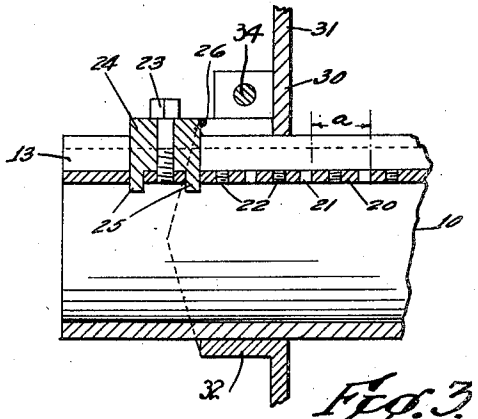


Fig. 3.

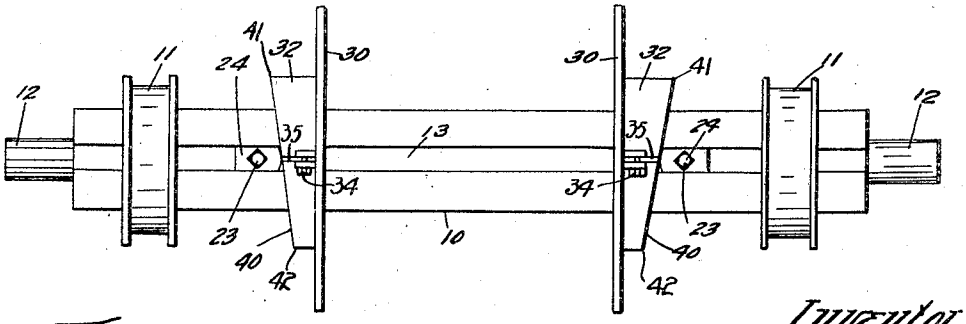


Fig. 4.

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Patented Dec. 28, 1937 2,103,785

UNITED STATES PATENT OFFICE

2,103,785

WARP BEAM

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Application October 18, 1935, Serial No. 45,586

3 Claims. (Cl. 242—124)

This invention relates to improvements in warp beams and it is the general object of the invention to provide quickly adjustable means for permitting variation in the width of the warp space in a durable and inexpensive way which will present a smooth beam barrel surface to the warp threads throughout the extent of the adjustment.

In a warp beam it is customary to have adjustable heads which are movable lengthwise of the beam so that the space to be occupied by the warp threads can be varied. Usually there are other heads which are secured rigidly to the ends of the beam and provided for frictional engagement with a retarding device, such as a strap or rope, forming part of the loom let-off. As the depth of the warp increases during the winding operation there is considerable pressure exerted laterally against the adjustable heads and it is necessary to provide a non-slipping connection between the heads and the barrel. Because of this pressure there is a constantly acting force tending to move the adjustable heads toward the ends of the beam. It is a further object of the invention to utilize the warp pressure to hold the heads against adjustable stops held rigidly to the beam.

In many beams heretofore proposed the barrel has had screw threads cut thereon which are likely to damage the first layers of warp wound on the barrel and it is a further object of my present invention to provide a barrel which has a smooth surface throughout its length and mount thereon adjustable heads which include in their construction a surface inclined or oblique with respect to the axis of the barrel to have engagement with a stopping block or the like, turning of the head angularly about the barrel with the oblique surface in contact with the block effecting a longitudinal shift of the head along the barrel.

It is another object of my invention to provide the aforesaid block with interlocking connections with the barrel so located that the distance between successive positions of the block does not exceed the longitudinal length of the inclined surface. By this relation it is possible to set the block approximately in the desired position for the head and then turn the latter until the exact position is reached. I find it desirable to form the interlocking means so that successive positions of the block are spaced by a distance somewhat less than the longitudinal motion which can be effected by means of the oblique surface.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described.

In the accompanying drawing, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a perspective view of one end of a warp beam having my invention applied thereto, the aforesaid friction head being omitted,

Fig. 2 is a plan view looking down on the structure shown in Fig. 1,

Fig. 3 is a longitudinal section through the barrel and retaining block on line 3—3 of Fig. 2, and

Fig. 4 is a plan view of the complete beam.

Referring to the drawing, I have shown a tubular barrel 10 having any approved form of friction head 11 secured to each end thereof, see Fig. 4. Supporting gudgeons 12 extend from the ends of the beam and may be held to the latter in any desired manner. The beam barrel is preferably made of steel and has a generally smooth cylindrical surface extending throughout its length. A part of the barrel is recessed to form a longitudinal groove 13 extending preferably the whole length of the barrel and proportioned to receive a warp clamp rod or bar not shown. These parts of the beam as illustrated may be of usual form and of themselves form no part of my present invention.

In carrying my improvements into effect I provide the bottom or floor 20 of the groove 13 with a series of clear holes 21 which are preferably spaced by a distance *a* designated in Fig. 3, and although indicated as circular, yet they need not necessarily be so. Between these clear holes are threaded openings 22 which receive a screw 23 passing through a block 24. The block is proportioned to fit snugly in the slot 13 and has depending therefrom two spaced lugs 25 proportioned to fit closely to the clear holes 21. The block extends somewhat above the periphery of the barrel and when the screw is in the position shown in Fig. 3, said block is held very firmly to the barrel. One face 26 of the block may if desired be slightly rounded and should be smooth for purposes apparent hereinafter.

The barrel is provided with a pair of adjustable heads 30 as shown in Fig. 4, each head comprising a plate 31 having a hub 32 extending along the barrel a sufficient length to maintain the warp engaging surface of the plate 31 substantially perpendicular to the axis of the beam. The hub may be provided with a pair of spaced ears 33 through which extends a retaining bolt 34, and

slotted as at 35 to permit clamping of the hub on the barrel. When the bolt is slackened it is possible to slide the corresponding adjustable head along the barrel, and any desired adjusted setting of the head may be retained by tightening the bolt 34.

As indicated more particularly in Fig. 3, the hub 32 is not formed with the usual end which is customarily perpendicular to the axis of the beam, but is inclined as at 40. The surface 40 will have a high point 41 a relatively long distance from the plate 31 and will have a low point 42 nearer said plate. The pitch of surface 40 may be of any desired angle but the difference between the high and low points 41 and 42, respectively, should be at least equal to the space *a* between the clear holes 21. The surface 40 is adapted for engagement with the smooth and preferably rounded surface 26 of the block 24.

In assembling the beam the blocks 24 will be applied to the slot with the lugs 25 extending through the openings 21 which are chosen to give the heads 31 their approximate setting, after which the heads are turned, the inclined surfaces 40 moving the heads longitudinally of the barrel to the desired positions. The bolts 24 are then tightened and the bolts 34 tightened to clamp the beam in proper position to begin the winding operation. The tightening of the bolts 34 tend to relieve the blocks of some of the longitudinal pressure on the heads, but the blocks also assist in holding the heads 31 in their proper positions along the barrel, holding the heads should the bolts 34 become slightly loosened. The pitch of surface 40 is comparatively slight, so that very little if any camming action tending to turn the heads 30 results from end pressure of the warp threads.

From the foregoing it will be seen that I have provided a very simple and durable means for adjusting the heads 30 longitudinally of the beam barrel. This result is accomplished by an inclined surface which in the present instance is carried by the head, but I do not wish to be limited to this construction, since the essential feature is that there shall be an inclined surface between a part corresponding to the block 24 clamped to the barrel and the head. By this adjustment, which is as delicate and satisfactory as heretofore obtained by screw threads on the barrel, I have been able to eliminate the threads and thereby wind the warp threads on a smooth surface of the barrel extending the entire distance between the adjustable heads without regard to the longitudinal position of the latter along the barrel. It will further be seen that by spacing the lugs 25 and holes 21 a distance not greater than and preferably somewhat less than the pitch of surface 40 I have been able to obtain a continuous adjustment of the heads 31.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a warp beam, a barrel having a smooth warp thread engaging surface, a warp space defining head movable along the barrel, a member to be secrued to the barrel along the length thereof, a second member carried by the head to engage the first member, one of said members having two cam faces each oblique with respect to the axis of the barrel, the cam faces extending from a low point on one side of the barrel around opposite sides of the barrel to a high point diametrically opposite the low point, rotation of the head about the barrel in one direction when one cam face engages the first member causing the head to move along the barrel in a given direction, and rotation of the head in the opposite direction when the other cam engages the first member also causing the head to move along the barrel in said given direction.

2. In a warp beam, a barrel having a smooth warp thread engaging surface, a warp space defining head movable along the barrel, a member projecting from the head along the barrel, a second member to be secured to the barrel at any one of a plurality of positions along the length thereof, means on the first member defining a cam surface having two parts extending from a low point adjacent the head around opposite sides of the barrel to a high point remote from the head and substantially diametrically opposite the low point, rotation of the head in one direction when one part of the cam engages the first member causing the head to move in a given direction and rotation of the head in the opposite direction when the other part of the cam engages the first member also causing the head to move in said given direction, and means to clamp the head to the barrel in adjusted position.

3. In a warp beam, a barrel having a smooth warp thread engaging surface, a hub extending along the barrel and secured to the head, means on the hub defining a pair of substantially similar cam surfaces which extend in opposite directions around the barrel from a low point adjacent the head to a high point remote from the head, a member to be fixed to the barrel in any one of a plurality of positions and to have engagement with either of the cam surfaces, rotation of the head about the barrel in one direction when the member engages one cam surface causing the head to move in a given direction and rotation of the head in the opposite direction when the member engages the other cam surface also causing the head to move in said given direction, and means to secure the head to the barrel in adjusted position.

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