

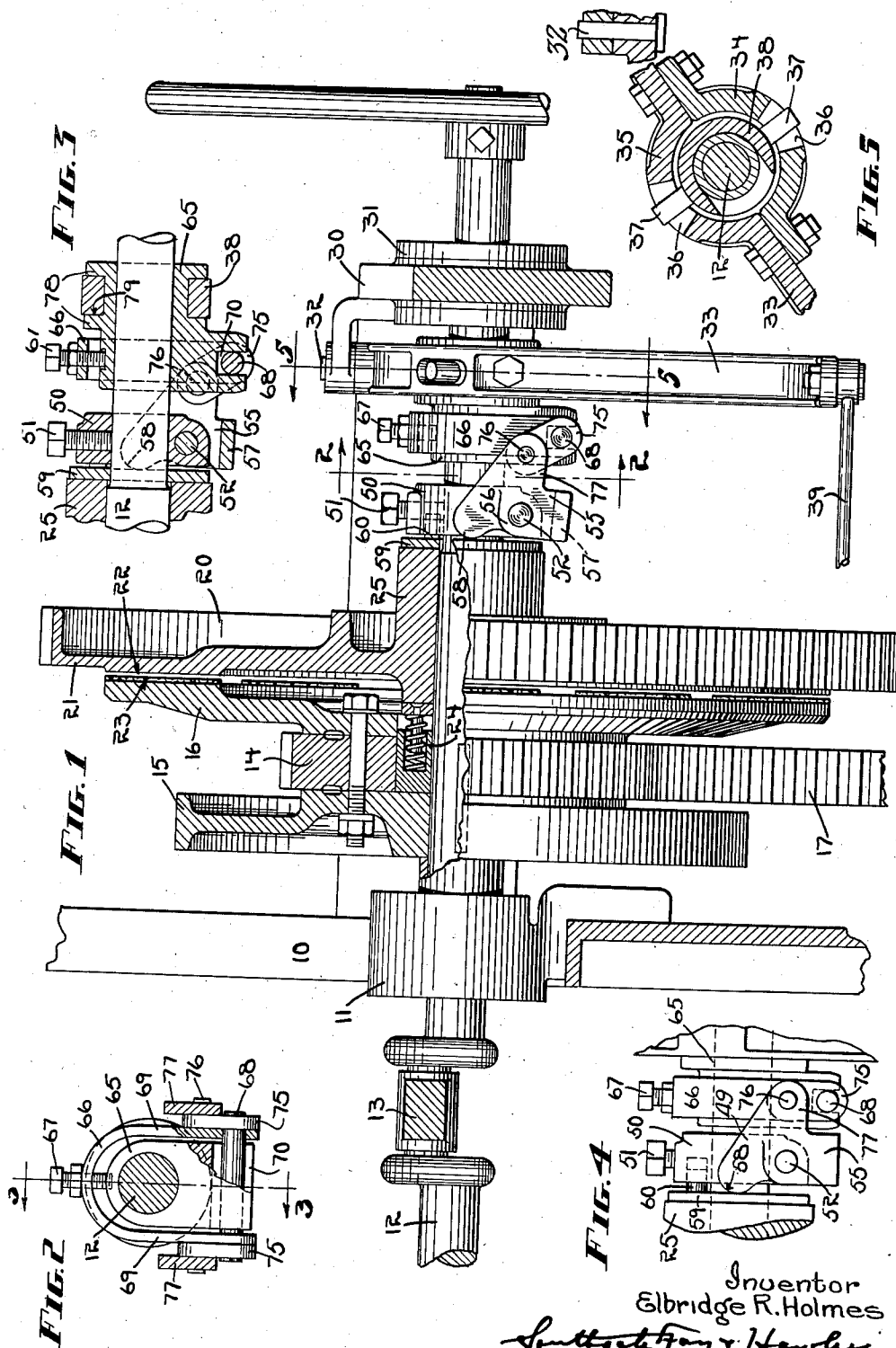
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DRIVING MECHANISM FOR LOOMS

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DRIVING MECHANISM FOR LOOMS

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5 Claims. (Cl. 192—99)

This invention relates to improvements in driving or shipping mechanisms for looms and it is the general object of the invention to provide an improved mechanism of this kind which shall permit the loom to be clutched to its driving motor with a minimum of effort on the part of the user.

In shipping mechanisms of certain types of looms as heretofore constructed the two clutch members on the driving shaft have been held together by a force which is exerted longitudinally of the shaft. With such an arrangement there results end pressure between the clutch controller and a stationary part of the loom which causes rapid wear. It is an important object of my present invention to provide means for clutching the loom to its driver through mechanism which exerts a force transversely of the shaft between two parts which are carried by the shaft. In this way the end thrust which is required to exert the transverse force can be reduced to a minimum.

It is a further object of my invention to provide a collar which is secured to the driving shaft in adjusted position and to pivot to it a yoke or setting lever having parts to exert a force longitudinally of the shaft and cause engagement of the clutch elements and having other parts which are acted upon by a toggle connection to move transversely of the shaft when a sliding collar on the shaft is moved by a shipper lever. The force which must be exerted between the driving and driven members of the clutch increases as they are pressed together and the effect of the toggle is to exert an increasing force as the sliding collar moves along the shaft, thereby relieving the weaver of the necessity to pull with increasing force on the shipper handle as the loom starts to run.

It is another object of my present invention to make the previously mentioned collar which is fastened to the shaft adjustable longitudinally to compensate for wearing of the clutch elements and also for variation in the pressure of the toggle.

It is a still further object of the invention to provide the previously mentioned sliding collar with a strap or pivot support which can be adjusted transversely of the shaft to vary one of the pivots of the toggle link and this adjustment together with the one mentioned in connection with the collar which is fastened to the shaft affords means for giving the toggle connection a variety of settings.

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 and set forth in the claims.

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

Fig. 1 is a front elevation, parts being in section, of the driving mechanism of a loom having my invention applied thereto,

Fig. 2 is a vertical section taken transversely of the driving shaft on line 2—2 of Fig. 1,

Fig. 3 is a longitudinal section taken vertically through the shaft along lines 3—3 of Fig. 2,

Fig. 4 is a diagrammatic view showing certain parts of Fig. 1 in a different position, and

Fig. 5 is a vertical section on line 5—5, Fig. 1, on a reduced scale.

Referring particularly to Fig. 1, the loom frame 10 supports a main bearing 11 for the top or crank shaft 12. The latter drives a lay through a connector 13 and may have one revolution for each pick of the loom. A top gear 14 is secured to the shaft and has bolted thereto at one side a brake wheel 15 and at the other side a driven clutch element 16. The parts 14, 15 and 16 rotate with the shaft at all times, the gear 14 meshing with a lower gear of twice the size shown at 17 and the brake wheel 15 cooperating with brake mechanism not shown to stop the loom quickly should a shuttle be caught in the shed of the warp.

Rotating loosely on the shaft 12 is a driving gear 20 which meshes with the driving pinion of a motor not shown. The driving gear has a web 21 having a friction face 22 against which the friction material, such as cork or leather 23, of the driven clutch element presses. The gear in effect is the driving clutch element and is normally spaced from the driven element by means of compression springs one of which is indicated at 24 in Fig. 1. These springs act on the hub 25 of the driving gear to press the latter away from the driven part of the clutch. The effect of these springs is to prevent dragging of the clutch surfaces when the loom is at rest.

Extending laterally from the loom frame is a shipper bearing support 30 having a bearing 31 in alignment with the bearing 11 and through which the outer end of the shaft 12 extends. The bearing and stand are held rigidly in place and support a pivot 32 around which a shipper lever 33 moves. As indicated in Fig. 5 the shipper lever is formed in two parts 34 and 35 which may have slots 36 through which the trunions 37 of a thrust collar 38 extend.

ally or to the left as
 3. This movement
 swinging around the pin
 ore nearly perpendic-
 ft by a motion trans-
 pivots 76 will therefore
 and transversely of
 cause rocking of the
 52 in a counter-clock-
 Fig. 1 to move the
 shaft 12 against washer
 r 33 has been moved
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 maintained very eas-
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 ment with each other
 municated from the

33 will be moved to
 at of collar 65 along
 will become oblique
 outwardly away from
 ved in Fig. 1, thereby
 from the driving gear
 clutch elements.

parts is desired, set
 and collar 50 adjusted
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 e had by setting the
 pin 68 can be moved
 the shaft. These ad-
 iation for wear of the
 59, and also the rate

be seen that I have
 connecting the clutch
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 d with a very small
 od 39. The mecha-
 ection the effect of
 65 is moved toward
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 ressure between the
 ements there will be
 ne power which must
 t complete shipping
 ng position. It will
 and U-shaped bear-
 adjustment of the
 udinally and trans-

invention it will be
 ations may be made
 he art without de-
 scope of the inven-
 mitted to the details
 claim is:

for a loom, a shaft to
 ments movable rel-
 ne of which moves

The matter thus far described may be of usual
 form and of itself forms no part of my present
 invention. A movement of rod 39 to the left as
 viewed in Fig. 1 will move the shipper lever 33
 to cause movement of the thrust collar 38 toward
 the clutch and driving gear for the purpose of
 causing loom operation, and when said rod is
 moved to the right the clutch elements are re-
 leased and will be separated by the springs 24.

In carrying my present invention into effect I
 interpose between the shipper lever 33 and the
 driving gear a set of parts which convert the
 longitudinal movement of the shipper lever
 along shaft 12 first into a force transverse of
 the shaft and then back to a force longitudinal
 of the shaft, the transverse component being of
 considerable power so that comparatively slight
 force is required to be exerted on the shipper
 lever to drive the loom. A collar 50 is fixed in
 adjusted angular and longitudinal position on
 the shaft 12 to rotate with the latter by means
 of a set screw 51 and there is extending through
 said collar a pivot pin 52 which passes to one
 side of the shaft 12.

A setting yoke or lever 55 has spaced bearings
 56 lying on opposite sides of the collar 50 and
 through which the pin 52 extends. These bear-
 ings are connected by a web 57 and the bearings
 have projecting therefrom arms 49 having thrust
 nose pieces 58. The latter bear against a pres-
 sure washer 59 which is in engagement with the
 right hand end of hub 25 as viewed in Fig. 1 and
 is renewable when worn. The washer 59 has pro-
 jecting therefrom a pin 60 which enters the fixed
 collar 50 so that the washer 59 is held normally
 against rotation. This is shown more particu-
 larly in Fig. 4, but I do not wish to be limited to
 use of the pin 60 or washer, although the latter
 takes wear which would otherwise be caused on
 the hub 25 by the noses 58.

A sliding collar 65 is mounted to move freely
 along and angularly with respect to the shaft 12
 and has fitted thereover a U-shaped strap or
 yoke 66 through which extends a set screw 67
 which projects as shown in Fig. 2 into the collar
 65. A second pivot pin 68 passes through the
 parallel sides 69 of the strap 66 and that por-
 tion of said pin 68 between the sides 69 lies in a
 slot 70 formed in the collar 65. By reason of
 the slot the pin is required to move in a radial di-
 rection only with respect to the collar 65 when
 adjustments are made by the set screw 67.

Loosely pivoted at each end of the pin 68 is a
 toggle link 75 and each toggle link in turn is
 pivoted as at 76 to an arm 77 projecting from the
 setting element 55 in a direction substantially
 longitudinally with respect to shaft 12. As shown
 in Fig. 3 the sliding collar 65 is slotted to receive
 the thrust collar 38 and the latter is C-shaped
 so that it may be fitted between the shoulders 78
 defined by the groove 79 in collar 65 into which
 collar 38 fits.

In operation, with the loom idle, the parts
 will be in the position shown in Fig. 1 with the
 driven and driving clutch elements separated.
 Shipper lever 33 tends to move to the right by
 yielding means not shown but old, and the arms
 or noses 58 will be subjected to a slight force
 derived from lever 33 tending to

to move collar 65 longitudinally. As viewed particularly in Fig. 1, the movement of rod 39 will cause the links 75 to swing about the pivots 76 and assume positions men-
 68 and assume positions men-
 ular to the axis of the shaft 12, the movement being transverse of the latter. The pivots 76 will move toward the center of the shaft or upwardly and downwardly, depending on the position of the setting lever 55 around pin 52. The movement is in the same direction as viewed in Fig. 1. The noses 58 longitudinally of shaft 12. When the shipper lever 33 is moved to its full position the parts are in the position indicated diagrammatically in Fig. 4, the pivots 68 and 76 in a line perpendicular to the axis of the shaft, the loom in a stable condition and can be held in this position easily with slight holding force on the shipper lever 33, which is yieldingly locked in this position, handle, not shown, but which is shown in copending application filed June 18, 1919, No. 731,073 filed June 18, 1919, the parts are in the position indicated diagrammatically. The members are in tight engagement with the driving gear 20 and driving force will be communicated to the shaft 12.

To unship the loom, lever 33 is moved to the right to cause movement of the shipper lever 33 and the links 75 to swing about the pivots 76 and move the collar 65 toward the axis of the shaft as viewed in Fig. 1, thereby moving the noses 58 away from the washer 59 to permit separation of the clutch elements.

If an adjustment of the setting element 55 is desired, the set screw 51 may be loosened and the setting element 55 either angularly or longitudinally adjusted. A further adjustment may be made by the set screw 67 so that the pivot pin 68 is moved toward or from the axis of the shaft, thereby the adjustments permit compensation for wear of the clutch elements and washer 59 and extent of clutching.

From the foregoing it will be seen that I have provided a simple means for connecting the clutch elements of a loom by means of a toggle mechanism which can be operated with a small amount of force exerted on the shipper lever 33. The mechanism includes a toggle connection which increases as the collar 65 moves toward the driving gear and since the driving gear and driven clutch elements are in tight engagement, an increase in the pressure between the driving and driven clutch elements will cause no objectionable increase in the tension of the strap or yoke 66 exerted on rod 39 to effect the clutching. It will also be seen that the collar 50 is fixed in adjusted position by the strap or yoke 66 permitting the toggle connection both longitudinally and transversely of the shaft.

Having thus described my invention, I claim that changes and modifications therein by those skilled in the art, without departing from the spirit and scope of the invention, are within the scope of the claims herein disclosed, but what I claim is:

1. In driving mechanism for a loom, a pair of clutch elements in tight engagement with each other and

transversely of the shaft, a link transverse of the shaft connected to the second arm and the other collar, relative movement of the collar causing movement of the second arm transversely of the shaft to effect driving relation between the clutch elements, and a pivotal support for the link on one of the collars movable to any one of a plurality of fixed positions transversely of the shaft.

2. In driving mechanism for a loom, a shaft to be driven, a pair of clutch elements movable relatively to each other one of which moves with the shaft at all times and the other of which is loose on the shaft, a collar fastened to the shaft, a setting lever pivoted to the collar and having an arm part of which is movable longitudinally with respect to the collar into engagement with the element loose on the shaft, a second collar loose on the shaft but movable longitudinally along the shaft, a yoke carried by the second collar and capable of assuming a plurality of positions relatively to the second collar and transversely of the shaft, a link one end of which is pivotally supported by the yoke and the other end of which is connected to the setting lever, movement of the second collar longitudinally of the shaft causing relative movement between the link and setting lever to effect rocking of the latter in a direction to move the said arm of the setting lever into engagement with the loose element to move the latter into operative relation with respect to the other element.

3. In driving mechanism for a loom, a shaft to be driven, a driven element fixed to the shaft, a driving element loose on the shaft, a collar fixed to the shaft, a setting lever pivoted to the collar and having an arm extending transversely of the shaft and positioned for engagement with the second named element, the setting lever having a second arm extending longitudinally of the shaft, a second collar loose on and slidable longitudinally along the shaft, a yoke carried by the second collar, means to give the yoke a plurality of positions relatively to the second collar and transversely of the shaft, a link pivotally mounted to the yoke and normally oblique with respect to the axis of the shaft, a pivotal connection between the setting lever and the link, and means to move the collar longitudinally along the shaft, movement of the sliding collar longitudinally of the shaft causing the link to assume a position approximately perpendicular to the shaft and effecting rocking of the setting lever to move the first named arm of said setting lever into operative relation with respect to the

loose element and move the latter against the element tight on the shaft, the degree of force exerted by the first named arm of the setting lever on the loose element varying with the transverse setting of the yoke relatively to the shaft.

4. In driving mechanism for a loom, a shaft to be driven, a pair of clutch elements movable relatively to each other and one of which moves with the shaft, a sliding collar on the shaft, a fixed collar on the shaft, a setting lever pivoted to the fixed collar and having an arm part of which is normally in non-pressure-transmitting relation with respect to the elements but movable longitudinally of the shaft into engagement with one of the elements to operatively relate the clutch elements and having another arm part of which is movable transversely of the shaft, a toggle link extending transversely of the shaft and interposed between the sliding collar and the second named arm of the setting lever to cause rocking movement of the latter when the sliding collar moves longitudinally of the shaft, and means carried by and restrained against movements longitudinally of the shaft relatively to the sliding collar by the latter and pivotally connected to the link and movable relatively to the sliding collar transversely of the shaft to vary the position of the link transversely of the shaft.

5. In driving mechanism for a loom, a shaft to be driven, a pair of clutch elements movable relatively to each other and one of which moves with the shaft, the other element being movable along the shaft to have driving relation with the first element, a setting lever, means rigid with the shaft defining a pivotal connection for the setting lever, said lever having two arms a part of one of which moves longitudinally of the shaft when in engagement with said other element to effect driving relation between the elements and the other arm of which has a part movable transversely of the shaft, a collar slidable on the shaft, spaced walls on the collar defining guides extending transversely of the shaft, a strap between the walls and held by the latter against relative movement with respect to the sliding collar in a direction longitudinally of the shaft, adjustable means interposed between the strap and the sliding collar to vary the transverse setting of the strap relatively to the shaft, and a toggle link pivotally connected to the strap and also to the second named arm of the setting lever.

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