

Feb. 26, 1929.

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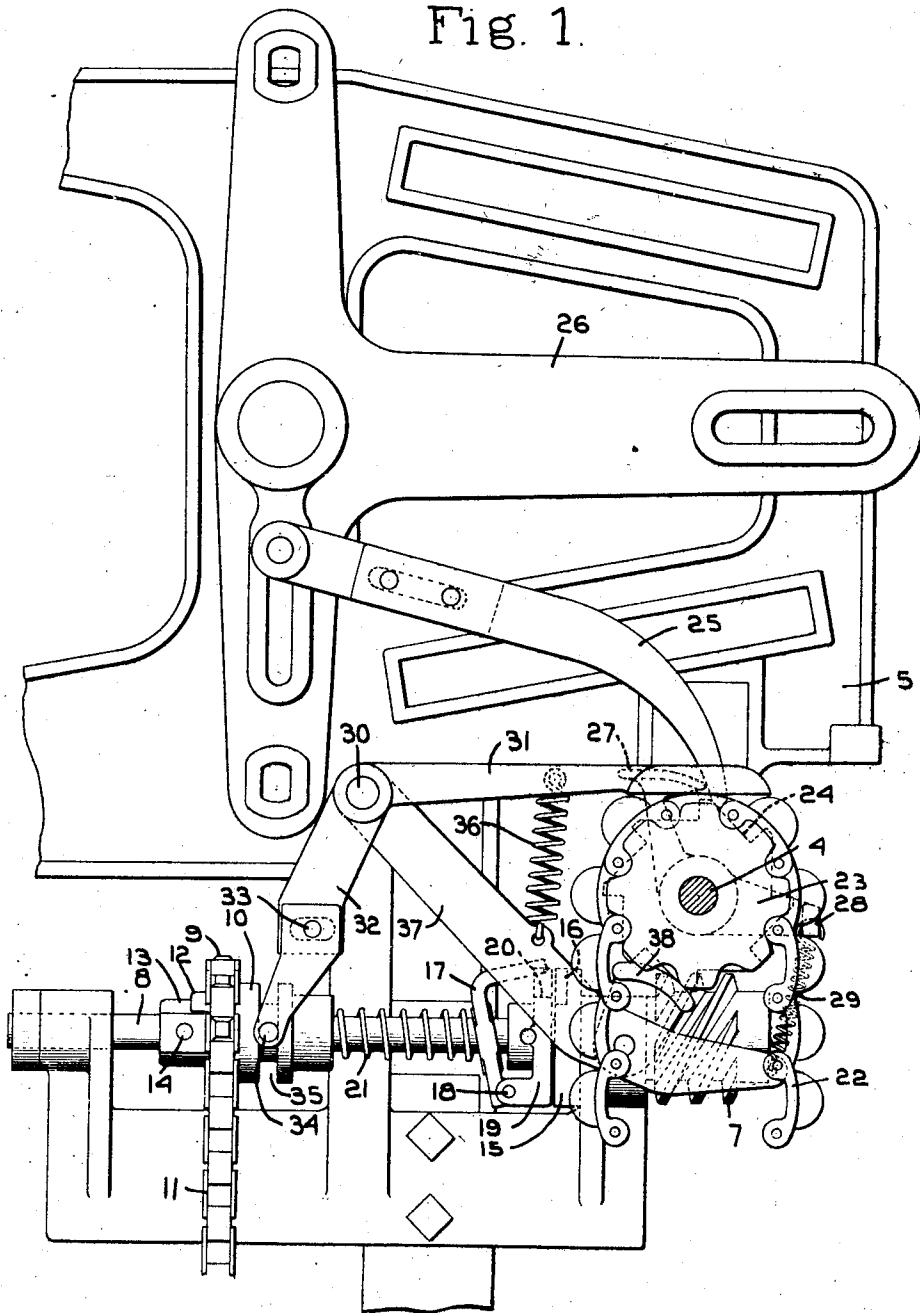
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DOBBY MECHANISM FOR LOOMS

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2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

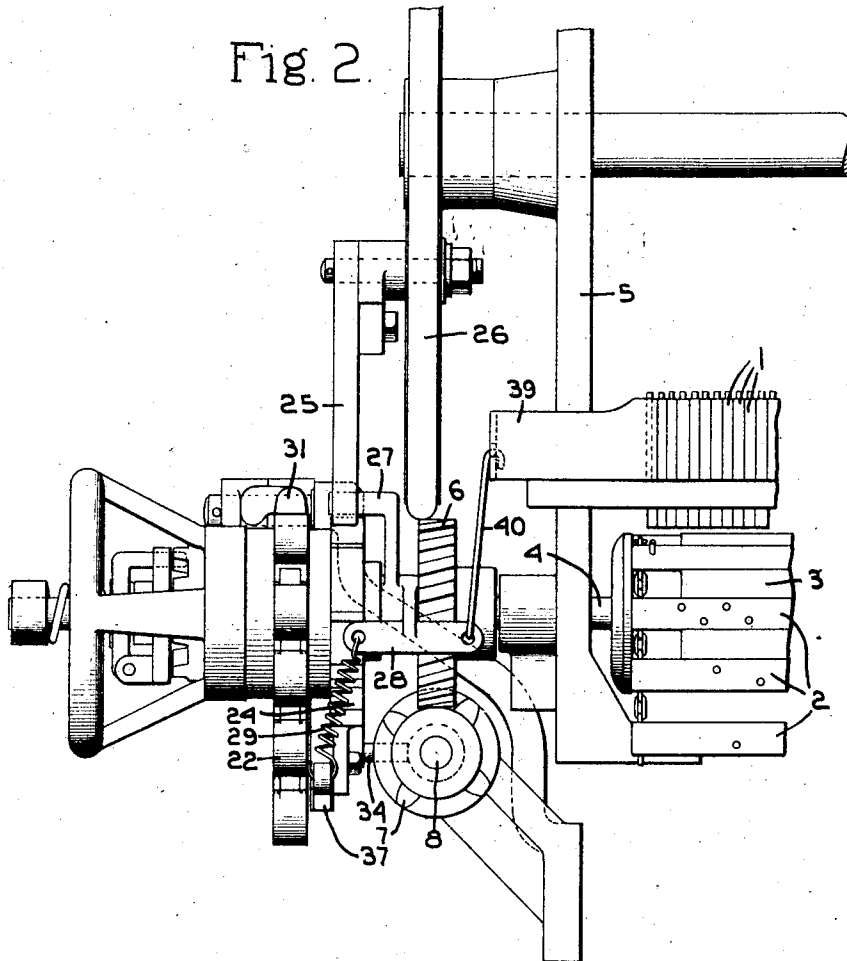
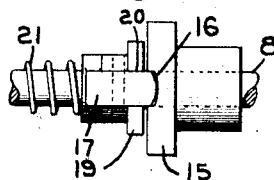


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DOBBY MECHANISM FOR LOOMS.

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This invention relates to the control of a pattern mechanism for a loom and more particularly for such a pattern mechanism as employed in connection with a loom dobby. In certain types of such mechanism the pattern cylinder, which usually also comprises a pattern chain carried thereby, is driven by a driving shaft and this driving shaft has journaled thereon a constantly driven element, such, for example, as a sprocket wheel, which is clutched to and unclutched from the shaft as required. In the case of a dobby pattern mechanism, for example, this driven element is unclutched from the shaft when a multiplier chain is active and the pattern cylinder is to remain at rest. During this period the constantly driven element, such as the sprocket wheel, is rotating idly on the shaft and thus has a constant tendency to rotate the shaft and therewith the pattern cylinder. When such undesired rotation takes place the pattern is shifted, destroying the proper repeat, and the goods being woven are spoiled. To prevent this it has been common heretofore to provide some such mechanism as a notched disk on the shaft with a spring pressed roller engaging this disk. Such a mechanism, however, acts to produce a drag on the main shaft when it is rotating and driving the usual pattern cylinder, thus resulting in an unnecessary expenditure of power and wear of the parts.

The present invention has for its object to provide a construction in which, when the constantly driven element is unclutched from the driving shaft, the driving shaft will simultaneously be locked against rotation so that the continued idle rotation of the driven element on the shaft cannot act to effect undesired rotation of the shaft and consequently of the pattern cylinder.

The further object of the invention is to provide a construction for securing this result which shall be inherently incapable of producing drag or retardation of the driving shaft when it is being driven by the constantly driven element to effect the rotation of the pattern cylinder.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings illustrate a simple and preferred form of the invention as applied to the pattern mechanism of an ordinary type of

loom dobby. As this type of dobby mechanism is well known and familiar to those skilled in the art and as the present invention relates only to a particular feature of control, it is only necessary to illustrate and describe in detail those parts of the mechanism with which the selected embodiment of the invention is associated.

In the drawings:

Fig. 1 is a side elevation of a portion of the dobby mechanism.

Fig. 2 is a view in end elevation looking toward the right of the construction shown in Fig. 1.

Fig. 3 is a detail in top plan view.

The loom pattern mechanism herein selected for a disclosure of a preferred form of the invention is that of a familiar type of loom dobby wherein the dobby indicating fingers are operated by risers carried by a pattern chain running over and driven by a cylinder and wherein a multiplier chain is employed under the control of which the pattern cylinder ceases rotation or dwells for predetermined periods in accordance with the character of the pattern being woven.

In the construction illustrated, the dobby indicating fingers 1 are controlled by risers on a pattern chain 2 running over and driven by the cylinder 3 mounted on the shaft 4 journaled in the frame 5. This shaft 4 has secured or clutched thereto a worm wheel 6 and this worm wheel, and consequently the shaft 4, is normally driven by a worm 7 secured to a shaft 8 journaled in the frame 5 and extending transversely of and beneath the shaft 4.

A constantly driven element such as a sprocket wheel 9 having a hub 10 is journaled on the shaft 8 and this sprocket wheel is constantly driven, as by a sprocket chain 11, from a suitable source such as one of the running shafts of the loom. A suitable clutch is provided between this constantly driven element 9 and the shaft 8. In the construction illustrated the sprocket wheel 9 is slidable longitudinally on the shaft 8 and the cooperating clutching elements are formed by a lug 12 projecting laterally from the sprocket wheel and a polygonal collar 13 secured at 14 to the shaft 8. It will thus be seen that when the sprocket wheel 9 and its hub 10 is slid to the left, viewing Fig. 1, to bring the lug 12 into engagement with the collar 13, the shaft 8 will be driven and will in turn drive the

pattern cylinder and when the sprocket wheel and hub are slid to the right to disconnect the clutch, that the rotation of the shaft 8, and consequently of the pattern cylinder, will cease, but this constantly driven sprocket wheel with its extended hub will continue to rotate idly on the shaft 8.

Such a disconnection of the driven element from the shaft 8 is what takes place when a multiplier chain is employed to enable the pattern cylinder to stand still at predetermined intervals for predetermined periods during which the pattern is not to be changed. But it will be observed that when this disconnection of the driven element from the shaft takes place, the driven element, such as the sprocket wheel, is constantly running, and often for an extended period of time, and necessarily with considerable friction on the shaft 8. This has a constant tendency to rotate the shaft 8 and thereby to rotate the pattern cylinder and shift the pattern with obvious undesirable results.

In the construction illustrated, there is provided a pair of cooperating locking members, one fixed on the dobby frame and the other rotatable with the shaft. These locking members are normally unlocked and thus have no effect whatever and produce no drag or retardation of the driving shaft and pattern cylinder. When, however, the clutch is disconnected to stop the rotation of the pattern cylinder, these locking members are automatically locked and remain locked so long as the clutch is disconnected and thereby prevent the undesired rotation of the driving shaft. The fixed locking member 15 is shown as a disk-like structure concentric with the shaft 8 and secured to or forming a part of the frame and having in its face, near its periphery, the notch 16. The cooperating locking member is shown as a dog 17 pivoted at 18 to a disk-like structure 19 concentric with and secured to the shaft 8 and facing the member 15. This disk 19 is provided at its periphery with a notch 20 to guide and support the free end of the dog 17. This dog straddles the shaft 8 and is so proportioned as to swing by gravity on its pivot into the unlocked position shown in Fig. 1. A helical compression spring 21 surrounds the shaft 8 between the hub 10 of the constantly driven element and the dog 17 and this spring is of such a length as to be inert when the locking elements are unlocked and the clutch is connected or with the parts in the position shown in Fig. 1. It will be seen therefore that if the constantly driven element 9 with its hub 10 be slid on the shaft 8 to disconnect the clutch elements 12 and 13, the spring 21 will be rendered active and will force the locking dog 17 against the disk 15 so that the free end of the dog will immediately or during the first rotation drop into the notch 16 and thus the locking mem-

bers will be locked and any rotation of the shaft 8 prevented. This will continue so long as the clutch members are disconnected. When the constantly driven element is slid in the opposite direction and the members of the clutch are re-engaged, the spring 21 will again be rendered inert and the dog 17 will swing out of locking engagement with the notch 16.

As this invention is particularly concerned with a dobby mechanism, the cooperating clutching elements and cooperating locking elements are under control of the pattern mechanisms of the dobby with the particular purpose in mind, as already pointed out, of insuring that the pattern cylinder which controls the dobby indicating fingers shall be prevented from shifting when stopped by a multiplier pattern chain and until its movement is to continue.

A multiplier chain 22 is shown running over a sprocket wheel 23 journaled on the shaft 4 and driven by a ratchet wheel 24 connected thereto, which ratchet wheel is actuated by a pawl 25 on the oscillating rocker 26 of the dobby. A shield 27 pivoted on the shaft 4 and having an arm 28 normally held depressed by a spring 29 stands normally in a position such as shown in Fig. 1 and prevents the pawl 25 in its retracting stroke from catching the teeth of the ratchet wheel 24 so that the multiplier chain stands idle.

In the construction illustrated, a bell crank lever fulcrumed on the dobby frame at 30 has one arm 31 resting on the multiplier chain and the other arm 32 formed in two parts adjustably connected together by the slot and bolt construction 33 and having at its lower end a pin 34 engaging a groove in the hub 10 of the constantly driven element. This bell crank lever normally has the arm 31 resting on a low point, as shown in Fig. 1, of the multiplier chain and with its arm 32 holding the constantly driven element clutched to the shaft 8. This bell crank lever is held in this position by a spring 36 connecting the arm 31 to another arm 37 pivoted at 30 and carrying a smooth-faced detent 38 riding against the teeth in the ratchet wheel 24. The spring 29 already referred to is connected to the free end of the arm 37. One of the dobby indicating fingers is provided with a laterally projecting arm 39 connected by a link 40 to the arm 28 of the shield 27.

With the parts in the position shown in Figs. 1 and 2, the pattern cylinder 3 is running in the usual manner. When it is desired that the pattern cylinder shall stop, a riser on the pattern chain 2 raises the finger having the arm 39. This throws back the shield 27 and the pawl 25 begins to actuate the sprocket wheel 23, bringing a high point on the multiplier chain beneath the arm 31 and consequently sliding the constantly driven element

9 on the shaft 8 unclutching the clutch members 12 and 13 and locking the locking members 17 and 15. The parts continue in this position as long as high points on the multiplier chain come under the arm 31 and during this period, although the constantly driven element 9 is rotating on the shaft 8, that shaft is locked against rotation and thus the pattern cylinder is held in the desired position without any danger of shifting therefrom. When the pattern cylinder is to continue its operation, a low point in the multiplier chain comes beneath the arm 31, allowing it to drop, and consequently the constantly rotating member is shifted back, the clutch members 12 and 13 re-engage, the locking member 17 falls out of the notch 16 in the locking member 15, the shaft 8 is rotated, the pattern cylinder moves the riser from beneath the indicating finger 39, the shield 27 is swung by the spring 29 into normal position preventing the pawl 25 from operating the ratchet 23 and the parts again stand in the position shown in Figs. 1 and 2.

In the preferred construction illustrated the high point in the multiplier chain holds the clutch elements clutched and the locking members disengaged while the low point holds the clutch disengaged and the locking members locked but the invention in its broader aspects is not to be limited to the particular type of multiplier chain nor otherwise than as required by the claims.

The sequence of operations which take place in either stopping or starting the pattern cylinder follow each other with such rapidity that they may be recorded for practical purposes as occurring simultaneously. The drag on the shaft 8 by a single idle rotation of the constantly driven element 9 is usually insufficient to rotate the shaft and consequently but one notch 16 is shown in the locking member 15 so that the locking members are locked within the period required for one rotation of the element 9, but even this period may be shortened by increasing the number of notches.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. In a loom dobby mechanism of that type wherein the driving shaft for the usual pattern chain is driven by a constantly rotating element journaled thereon and connected thereto and disconnected therefrom by a clutch, and wherein a multiplier chain is employed, the combination therewith of normally disengaged cooperating locking members, one fixed on the machine frame and the other rotatable with the driving shaft, and means for securing the locking engagement of said locking members during the period the multiplier chain is active and the clutch is unclutched and the driven element is rotating idly on the shaft, thereby to prevent unde-

sired movement of the usual pattern chain.

2. A pattern mechanism for looms comprising a pattern cylinder, a driving shaft acting when rotated to rotate the cylinder, a constantly driven element journaled on the shaft, a clutch for connecting said driven element to, and disconnecting it from, the shaft, normally unlocked means for locking the shaft against rotation, and automatically controlled means for simultaneously disconnecting the clutch and effecting the locking of the locking means and for simultaneously effecting the unlocking of the locking means and connecting the clutch whereby, when the clutch is disconnected, the rotation of the driven element on the shaft cannot act to rotate the shaft and thus shift the position of the pattern cylinder and, when the clutch is connected, the shaft and therewith the pattern cylinder will be rotated.

3. In a loom pattern mechanism, a driving shaft, a constantly driven element journaled and longitudinally slidable on the shaft, cooperating clutch members on the shaft and driven element connected and disconnected by sliding the driven element on the shaft, cooperating normally unlocked locking members, one fixed on the frame and the other rotatable with the shaft, a spring on the shaft extending between the driven element and the locking member on the shaft and inert when the shaft is running and when rendered active acting to effect the locking of the locking members, and automatically controlled means for sliding the driven element on the shaft into unclutched position and thereby rendering the spring active to effect the locking of the locking members whereby the continued idle rotation of the driven element on the shaft cannot act to give an undesired rotation to the shaft.

4. A pattern mechanism for a loom dobby comprising a pattern cylinder, a driving shaft acting when rotated to rotate the cylinder, a constantly driven element journaled on the shaft, a clutch for connecting said driven element to, and disconnecting it from, the shaft, normally unlocked means for locking the shaft against rotation, a multiplier pattern chain, normally inactive means for driving the multiplier pattern chain and means controlled by the pattern cylinder for simultaneously rendering active the driving means for the multiplier pattern chain, disconnecting the clutch and moving the locking means into locking position and after a predetermined interval controlled by the multiplier pattern chain for simultaneously moving the locking means into unlocking position, connecting the clutch and rendering inactive the driving means for the multiplier pattern chain.

In testimony whereof, I have signed my name to this specification.

CARL D. BROWN.