Oct. 27, 1925. 1,558,969

E. J. ENTWISTLE ET AL

YARDAGE STOP MOTION FOR WARPERS

Filed June 11, 1924 2 Sheets-Sheet 1

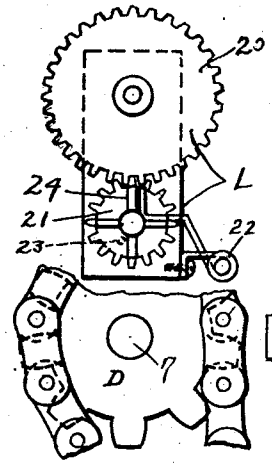


Fig. 1

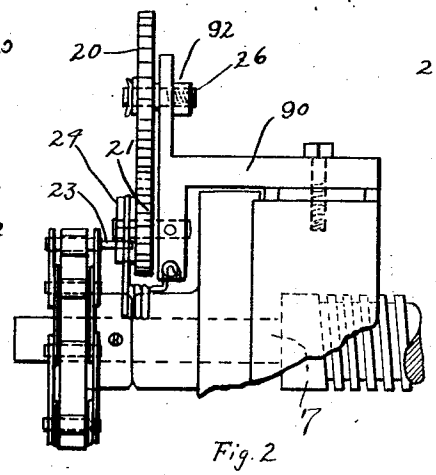


Fig. 2

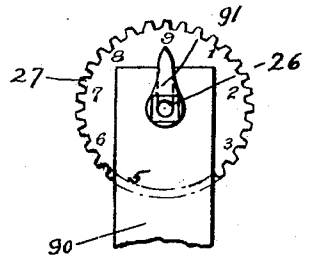


Fig. 3

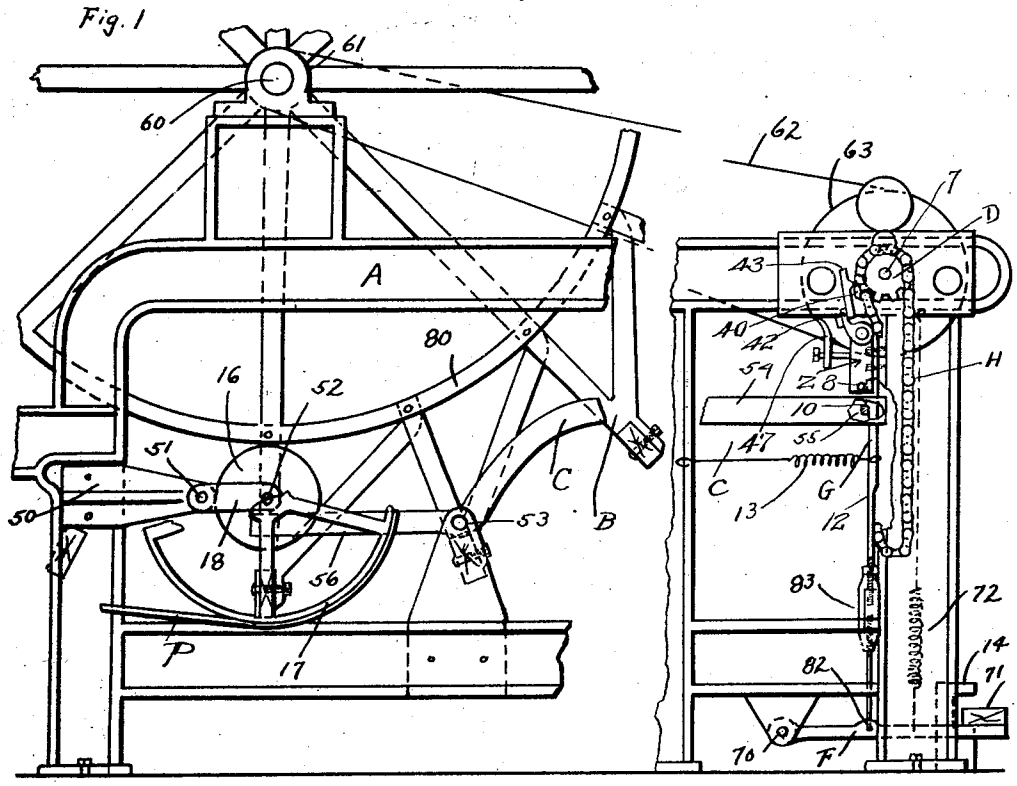


Fig. 4

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YARDAGE STOP MOTION FOR WARPERS

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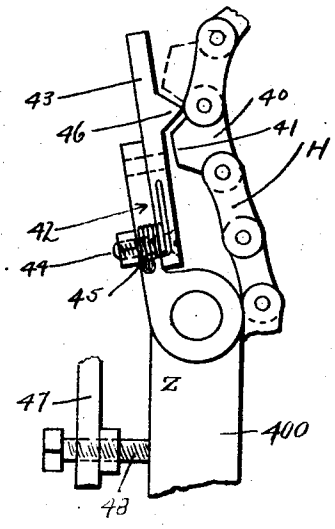


Fig. 5

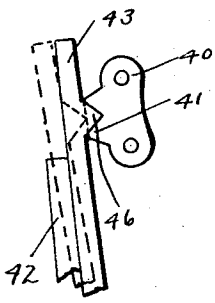


Fig. 6

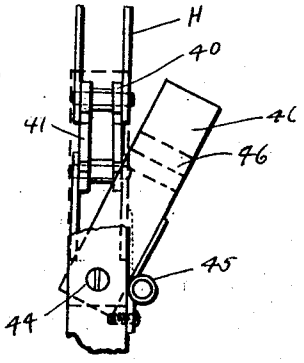


Fig. 7

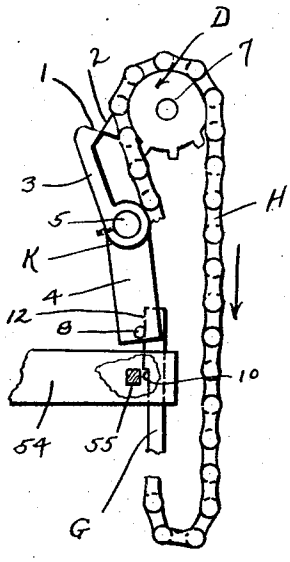


Fig. 8

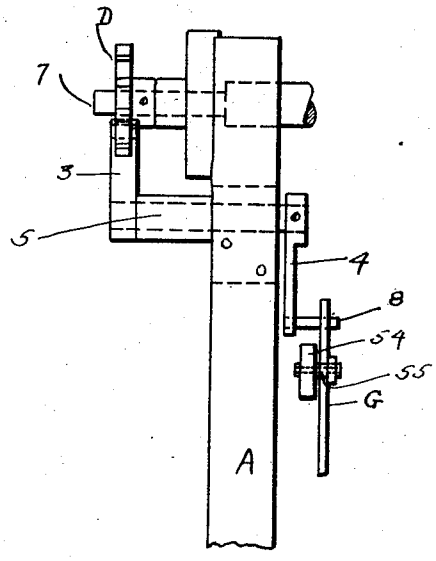


Fig. 9

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UNITED STATES PATENT OFFICE.

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YARDAGE STOP MOTION FOR WARPERS.

Application filed June 11, 1924. Serial No. 719,336.

To all whom it may concern:

Be it known that we, EDWARD J. ENTWISTLE and RALPH W. DOEG, citizens of the United States, residing at Lowell and Exeter, respectively, in the counties of Middlesex and Rockingham and States of Massachusetts and New Hampshire, have invented certain new and useful Improvements in Yardage Stop Motions for Warpers, of which the following is a specification.

This invention relates to machines for winding warp threads from spools, upon a reel or drum, known in the manufacture of silk as a mill, such machines being known as warpers.

It has special reference to silk warpers wherein the silk threads are wound upon a reel, perhaps six feet in diameter, in successive strips, circumferentially.

It is the custom in preparing such silk warps, at predetermined distances to stop the machine and to pass between the shed or lease of the warp, what are known as lease-cords.

In the common form of warper to which this invention is applicable, the large reel is at the back while the operator is between this and the spools, her attention being taken up in watching and piecing threads as they pass from the spools to the reel.

The reel is driven by a friction pulley which is held in position by a foot lever on which the operator places one foot when it is desired to have the machine operate, and from which she takes her foot when it is desired to stop.

The purpose of our device is to provide adjustable means by which, when a pre-determined length of the warp known as a cut has been wound the reel will be automatically stopped by a trigger action, but will be almost instantly set for starting the next cut and before the operator again steps on the foot lever.

An additional purpose of our device is to connect with this mechanism a type of recording mechanism which will count the number of cuts which can be set for any pre-determined number, as 7, 8 or 9, in such manner that the indicator will make a complete circle for such number of cuts.

In the drawings, Fig. 1 is a detail in elevation of the recording device.

Fig. 2 is a view from the right of Fig. 1.

Fig. 3 is a view of the dial from the back of Fig. 1.

Fig. 4 is an elevation from the side of a silk warping machine of the type to which our device is especially applicable.

Fig. 5 is a detailed elevation from the side of a modified form of latch lever.

Fig. 6 is a detail showing the latch or detent in another position.

Fig. 7 is a view from the left of Fig. 5.

Fig. 8 is a detailed elevation of the measuring chain and latch lever.

Fig. 9 is an elevation from the right of Fig. 8 with the chain removed.

In the drawings, A represents the frame of a silk warper in which there is a large reel or mill B which is freely revoluble on or with shaft 60 carried in suitable bearings by the frame.

C represents a control lever pivoted on the frame at 53. It has on its long arm 54 a square stud 55 which projects sidewise therefrom, and at its short end 56 carries a friction drive roll 16.

This drive roll 16 is fixed to a shaft 52 on which is also fixed a drive pulley 17 driven by a suitable belt P, or in any other way whereby power is transmitted to friction drive roll 16.

Shaft 52 is revoluble in bearings carried by suitable supports 18 pivoted at 51 on a bracket 50 whereby, when the end 54 of lever C is depressed end 56 carrying shaft 52 and roll 16 are raised, roll 16 drives reel B through contact with a ring 80 fixed thereto.

7 is a cross shaft which in such machines is usually a worm and carries a pulley or sprocket 63 which is driven from the reel B through a pulley or sprocket 61 revoluble therewith, by means of a belt of chain 62.

F is a foot lever pivoted at 70 to the frame and having a foot rest 71 for the operator's foot. It is normally pulled upward by a spring 72 and its upward movement is limited by a stop 14.

The above parts are all old. Ordinarily there is a rod extending from foot lever F to the end of C by which control lever C is operated.

In our device, we provide a latch G pivoted at one end 82 to lever F, and preferably having a turn-buckle 83 by which its length can be regulated.

In its back face 12 is a square notch 10

in position to engage stud 55 when foot lever F is raised, as it normally is by spring 72.

An engaging spring 13 normally presses the face 12 against stud 55.

D is a sprocket carried by the end of cross-shaft 7, and around this sprocket passes an endless chain H, the links of which can be removed and replaced, whereby the chain can be lengthened or shortened.

In Figs. 8 and 9 is shown a simple form of knock-off lever in co-operation with a chain such as H in which is a link having a diamond shaped projecting tooth 2.

K is a knock-off lever medially pivoted at 5, having an arm 3, at the end of which is a pointed nose 1 which normally is in engagement with chain H, and at the end of its other arm 4 a knock-off pin 8 normally in engagement with the back face 12 of latch G.

The length of chain H is adjusted for the length of cut desired, and tooth 2 is started just beyond nose 1. The chain moves around with the reel B until the tooth 2 engages the nose 1, which forces it back and thus pushes knock-off pin 8 forward whereby stud 55 is released from notch 10 and the weight of reel 16, pulley 17, etc. causes roll 16 to drop away from rim 80. Reel B quickly stops from friction, but usually not before tooth 2 passes beyond nose 1 a short distance.

If this occurs when the operator's foot is on rest 71, the weight causes rest 71 to drop, and she is instantly aware that the machine has stopped. As soon as she removes her foot, spring 72 lifts lever F while spring 13 causes the re-engagement of notch 10 with stud 55, and the machine is all set ready for action. She then again places her foot on rest 71.

To operate recording mechanism L, we can use a pin 23 fixed on chain H in a suitable position ahead of tooth 2 so that when nose 3 is disengaged, pin 23 will strike one of the fins 24 of a small gear 21 and make it turn one-fourth. The spring 22 will be pushed out and will snap in, in a well known manner.

Gear 21 revolves another indicating gear 20, the face 27 of which corresponding with the gear teeth is divided into numbers such as 1 to 9, the purpose being to indicate the number of cuts desired.

By using a larger or smaller gear 27, with correspondingly greater or fewer teeth the number can be changed to 9 or 8 or 7, or to 11 or 12, etc.

By attaching this to a bracket 90 in which is a slot 91, through which the pivot 26 for gears 20 passes, and by means of nut 92 different diameters of gears can be used.

As the operator stops the machine from time to time to piece ends, it is possible she might be releasing the foot lever just before the nose reached the tooth and it might then coast past, and therefore not stop the machine at the decided yardage.

To avoid the possibility of this, we may use the device shown in Figs. 4, 5, 6 and 7.

Instead of a diamond shaped tooth, we may use on a link 40 a face 41 which is flat and elongated to correspond with the normal coasting distance which the reel runs after pulley 16 is disengaged from its rim 80.

On knock-off lever Z is an arm 42 to which at 44 so as to swing laterally is pivoted a detent 43 having a nose 46 and returning spring 45.

There is also on an arm 47 fixed to the frame, a stop screw 48 to limit the movement of Z, nose 46, and arm 400 which is the same as arm 4, and carries a knock-off pin 8 as in the other construction.

As shown in Fig. 6 by the full lines, nose 46 when pushed aside by hand, on account of spring 13 acting on arm 400, will slip in beside face 41 of link 40 but when this link passes to the position of the dotted lines in Fig. 5, nose 46 will spring back to its normal position shown by the dotted lines in Fig. 7.

We claim:

1. The combination in a warping machine having a frame, a reel revoluble therein, a control lever pivoted in the frame, a stud carried by one end thereof, a friction drive roll carried by the other end proximate and adapted to drive the reel, a cross worm shaft, means to drive said shaft from the reel, a foot lever, and means to keep said foot lever normally raised; of a latch pivoted to said foot lever and having a notch in engagement with the stud; a spring adapted to keep the notch and stud in engagement; a sprocket carried by the cross shaft; an endless chain carried by the sprocket having a projecting tooth; a medially pivoted knock-off lever having at one end a nose in engagement with said chain and at the other end a knock-off pin in engagement with said latch; recording mechanism; and a pin carried by the chain so positioned as to operate said recording mechanism.

2. The combination in a warping machine having a frame, a reel revoluble therein, a control lever pivoted in the frame, a stud carried by one end thereof, a friction drive roll carried by the other end proximate and adapted to drive the reel, a cross worm shaft, means to drive said shaft from the reel, a foot lever, and means to keep said foot lever normally raised; of a latch pivoted to said foot lever and having a notch in engagement with the stud; a spring adapted to keep the notch and stud in engagement; a sprocket carried by the cross shaft; an endless chain carried by the

sprocket having a projecting tooth with a flattened face; a medially pivoted knock-off lever having at one end a knock-off pin in engagement with said latch, and at the other end an arm; a detent with a nose in engagement with the chain pivoted to said arm and having a returning spring; recording mechanism; and a pin carried by the chain so positioned as to operate said recording mechanism.

3. The combination in a warping machine having a frame, a reel revoluble therein, a control lever pivoted in the frame, a stud carried by one end thereof, a friction drive roll carried by the other end proximate and adapted to drive the reel, a cross worm shaft, means to drive said shaft from the reel, a foot lever, and means to keep said foot lever normally raised; of a latch pivoted to said foot lever and having a notch in engagement with the stud; a spring adapted to keep the notch and stud in engagement; a sprocket carried by the cross shaft; an endless chain carried by the sprocket having a projecting tooth; a medially pivoted knock-off lever having at one end a nose in engagement with said chain and at the other end a knock-off pin in engagement with said latch.

4. The combination with a warping machine in which is a revoluble, endless measuring chain having a projecting tooth with a flattened face; of a medially pivoted knock-off lever having at one end means to stop the warping machine, and at the other end an arm; and a detent pivoted laterally to said arm, said detent having a nose in engagement with the chain, and a returning spring.

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