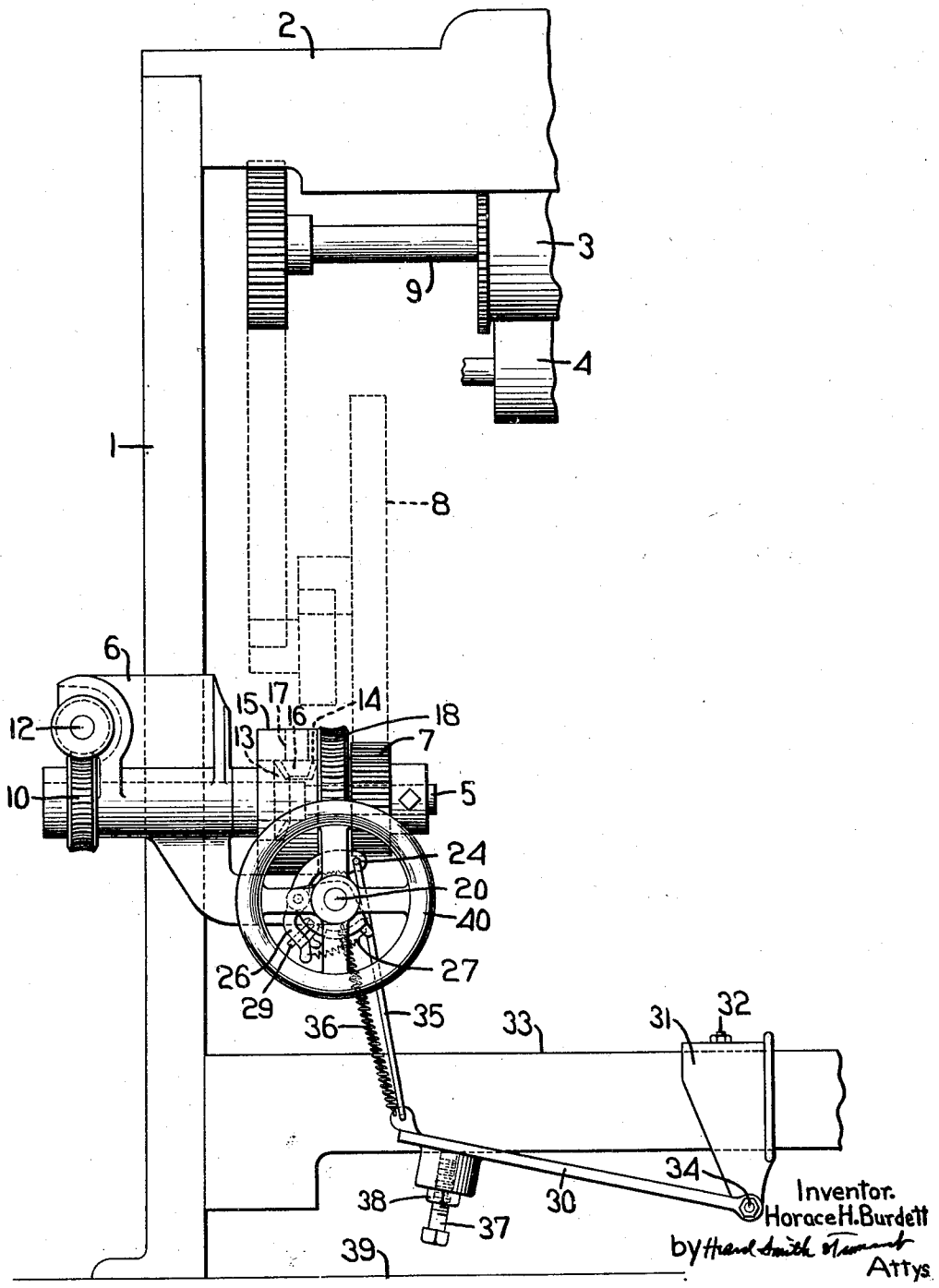
April 12, 1932. H. H. BURDETT 1,854,017

POSITIVE LET-BACK MECHANISM FOR LOOMS

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Fig. 1.



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POSITIVE LET-BACK MECHANISM FOR LOOMS

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Fig.2.

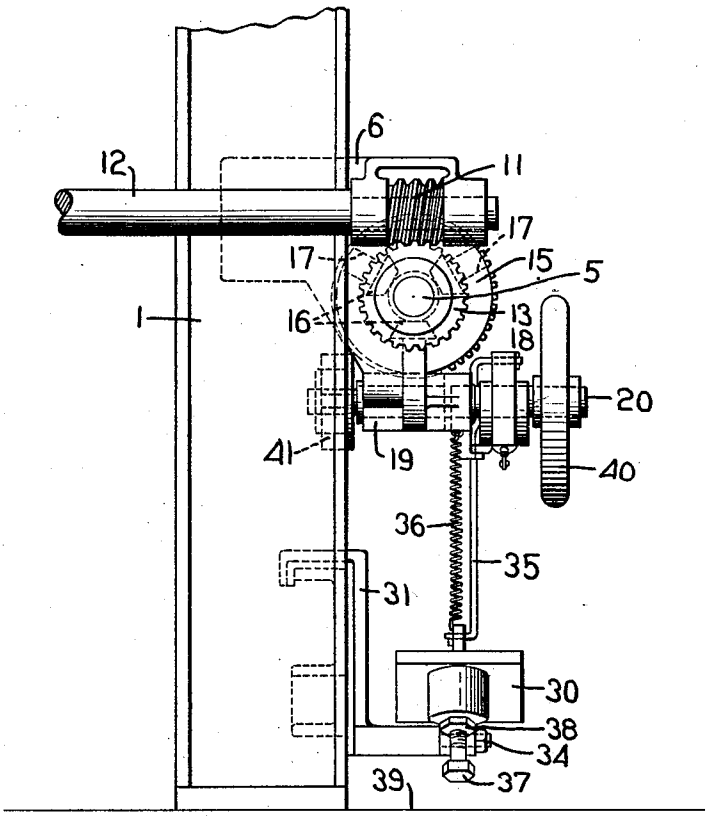
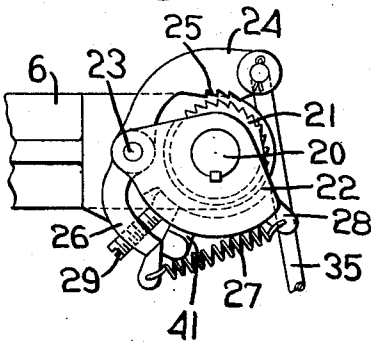


Fig.3.



Inventor.
Horace H. Burdett
by Hood Smith & Hermann
Attys.

Patented Apr. 12, 1932 1,854,017

UNITED STATES PATENT OFFICE

HORACE H. BURDETT, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE

POSITIVE LET-BACK MECHANISM FOR LOOMS

Application filed June 19, 1931. Serial No. 545,519.

This invention relates to means for manually, positively and to a predetermined extent effecting let-back with the take-up mechanism of the loom when required.

In the pending applications of Clare H. Draper, Serial No. 429,408, filed February 18, 1930, and of myself, Serial No. 471,702, filed July 30, 1930, there is disclosed a take-up mechanism for looms in which the connections from the driving element to the take-up roll are permanently maintained and in which these connections include a planetary or differential system of gears in which the revoluble gears are carried by a housing, in which, when the take-up roll is being driven to effect take-up, this housing is held against rotation, and in which, when let-back is required, this housing is positively rotated. The present invention makes use of the same type of construction thus shown in the aforesaid applications.

In the present invention, however, the let-back operation is not under the control of any automatic mechanism, such as a mechanism acting upon the occurrence of a filling fault, but on the contrary the amount of let-back is entirely under the control of the operator.

The present invention also enables the operator by a simple manual operation to effect let-back positively to a definite predetermined extent. The term "manual" or "manually" is here used in its broad sense and in the preferred embodiment of the invention this manual operation is secured by the depression of a treadle.

The invention therefore more specifically has for its object to enable the operator by the simple depression of a treadle to effect let-back a positive, definite and predetermined extent, as, for example, to the extent of one pick at each depression.

The invention thus enables an operator, whenever let-back is required, to watch the fell and by simple depression of a treadle with the foot to be assured that the exact required amount of let-back, for example, one pick, takes place at each depression of the treadle.

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

The drawings illustrated a construction similar in many respects to that shown in the aforesaid applications and it is therefore necessary only here to illustrate and describe in detail those features of construction with which a preferred embodiment of the present invention is particularly concerned.

In the drawings:

Fig. 1 is a front elevation of a portion of the front end of a loom with a preferred form of the present invention embodied therein.

Fig. 2 is a left-hand side elevation of a portion of the construction shown in Fig. 1.

Fig. 3 is an enlarged detail partially in vertical cross section of the ratchet and operating mechanism therefor.

The loom comprises the usual side frames of which a portion of the left-hand frame 1 is shown with the breast beam 2 extending therefrom to the opposite side frame. A usual form of take-up roll 3 is journalled in the side frames under the breast beam and usually presents a roughened surface to grip the cloth which is wound on the cloth roll 4 by frictional engagement with the take-up roll. A shaft 5 is journalled in a bearing bracket 6 supported on the bottom of the frame and this shaft has journalled thereon a gear 7. A train of gearing which may be of any suitable arrangement and indicated generally at 8 extends from the gear 7 to the shaft 9 of the take-up roll so that any rotation imparted to the gear 7 will in turn be positively and definitely imparted to the take-up roll. But it will be understood that the particular driving connections between the element 7 and the shaft 9 of the take-up roll may be of any suitable construction so long as they act to impart positively, directly and accurately the rotation of the take-up roll in either direction according to the direction of rotation of the element 7.

The shaft 5 has keyed thereto a worm wheel 10 and this worm wheel meshes with and is driven by a worm 11 keyed to a shaft 12 journalled in the bearing bracket 6 and extending rearward in the loom frame and positively driven from one of the usual loom shafts.

The shaft 5 has keyed thereon a driving element in the form of a bevelled gear 13.

A driven element in the form of a bevelled gear 14 is journalled in axial alignment with the bevelled gear 13 and is preferably, for that purpose, journalled on the shaft 5. This driven element 14 is the one which imparts a direct driving connection to the take-up roll and for that purpose is preferably formed rigid or integral with the gear 7 and thus acts through the train of gearing 8 to drive the take-up roll.

A differential system of gearing is illustrated including the beveled gears 13 and 14 and comprises a cylindrical housing 15 with one or more intermediate bevelled gears 16, herein shown as three in number, having their shafts 17 journalled radially therein and so arranged that the bevelled gears 16 mesh with both of the bevelled gears 13 and 14.

The outer cylindrical surface of the housing 15 is formed to present a worm wheel 18 and this worm wheel meshes with a worm 19 secured to an auxiliary or transverse shaft 20 journalled in the bearing bracket 6.

It will thus be seen that under normal conditions with the shaft 20 immovable, the worm 19 will lock the housing 15 against rotation so that as the shaft 13 is rotated, a direct positive drive will be imparted from the driving element 13 through the intermediate gears 16 to the driven element 14 and therefrom to the take-up roll to effect take-up. The take-up roll will then be driven positively from the driven element at a fixed ratio of speed depending upon the proportions of the driving connections therebetween. It will also be seen that if rotation be imparted to the auxiliary shaft 20, the housing 15, which is the intermediate element of the differential gearing, will be positively rotated and such rotation, according to the direction in which it is imparted, will effect a relative rotary shift of the take-up roll in the one direction or the other without in any way disturbing the permanency of the connections extending from the driving element to the take-up roll.

If, therefore, the loom is stopped and this auxiliary shaft 20 is rotated, the position of the fell of the cloth may be shifted with great accuracy in either direction. Consequently if let-back is required, all that it is necessary to do is to rotate the shaft 20 in the required direction to the extent required to effect the desired amount of let-back.

In the preferred embodiment of the present invention, a ratchet wheel 21 is keyed to the shaft 20. A pawl carrier in the form of a sector-shaped casing 22 is journalled on the shaft 20 surrounding the ratchet wheel and has pivoted thereto at 23 a pawl 24 having one or more teeth 25 adapted to cooperate with the teeth of the ratchet wheel. The pawl is provided with an extension 26, the end of which is connected by a coiled spring 27 to a lug 28 on the pawl carrier. This spring acts to hold the pawl normally out of engagement with the ratchet wheel. A set screw 29 in the extension 26 adjustably abuts the periphery of the pawl carrier to limit the outward movement of the pawl. Thus it will be seen that the pawl is normally held out of engagement with the ratchet wheel, the shaft 20 remains stationary, and the only action of the mechanism is to effect take-up when the loom is in operation.

In a preferred embodiment of the present invention, a treadle 30 is pivotally mounted in a convenient position to be reached by the foot of the operator and to be connected with the pawl carrier 24. For this purpose a supporting bracket 31 is shown adjustably connected by a set screw 32 to a cross girt 33 at the bottom of the loom frame. The treadle 30 is pivoted at 34 to this bracket 31 and at its opposite end is connected by a link 35 to the free end of the pawl carrier 24. A spring 36 extending from the free end of the treadle 30 to the bracket 6 assists in maintaining the treadle normally elevated. A set screw 37 threaded into the bottom of the treadle and provided with a lock nut 38 is adapted to engage with the floor 39 or other suitable stop and thus adjustably and accurately limit the depressing movement of the treadle.

A hand wheel 40 is secured to the end of the shaft 20 to enable this shaft to be rotated in either direction when desired. A suitable friction brake indicated generally at 41 of the type shown in the aforesaid application of Draper may be provided to prevent any lost motion, overthrow, or slippage of the shaft 20.

There is thus presented by this invention a simple and effective mechanism by means of which the operative is readily enabled manually to effect let-back when required to a definite predetermined extent and preferably by the depression of a treadle with each depression acting to effect the same definite amount of let-back as, for example, to the extent of one pick.

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

1. A take-up and let-back mechanism for looms comprising a driving element, a take-up roll, a train of permanent connections between said driving element and roll, a normally stationary rotatable element for holding one of said connections against movement and to permit the rotation of the take-up roll to effect take-up when take-up is required, manually operated means normally disconnected from said rotatable element and operable when connected thereto to rotate said element and thereby the said connection to rotate the take-up roll in a reverse

direction to effect let-back, and means for limiting the amount of rotation of said element by said manually operated means and consequently the amount of let-back effected thereby.

2. A take-up and let-back mechanism for looms comprising a driving element, a take-up roll, a train of permanent connections between said driving element and roll, a normally stationary rotatable element for holding one of said connections against movement and to permit the rotation of the take-up roll to effect take-up when take-up is required, and treadle operated means normally disconnected from said rotatable element and operable upon depression of the treadle to connect with and rotate said element and thereby the said connection to rotate the take-up roll in a reverse direction to effect let-back.

3. A take-up and let-back mechanism for looms comprising the construction defined in claim 2, together with means for limiting the depression of the treadle and consequently the amount of let-back effected thereby at each depression thereof.

4. A take-up and let-back mechanism for looms comprising the construction defined in claim 2, together with a hand wheel on said rotatable element operative when the said manually operated means is normally disconnected from said element to enable the take-up rolls to be turned in either direction to adjust the position of the fell.

5. A take-up and let-bock mechanism for looms comprising a shaft normally held stationary and acting when rotated to shift the position of the fell, treadle operated means normally held out of operative engagement with the said shaft and acting when the treadle is depressed operatively to engage the shaft and positively to rotate the same in the direction to effect let-back, and means for limiting the depression of the treadle and consequently the amount of let-back effected thereby at each depression thereof.

6. A take-up and let-back mechanism for looms comprising a shaft normally held stationary and acting when rotated to shift the position of the fell, a ratchet wheel secured to the shaft, a pawl carrier on the shaft, a pawl pivotally mounted on the pawl carrier, means acting normally to hold the pawl out of engagement with the ratchet wheel, a treadle, a connection from the treadle to the pawl acting upon depression of the pawl to swing the pawl into engagement with the ratchet and rotate the ratchet and hereby the shaft a predetermined extent thereby to effect a predetermined amount of let-back, and adjustable means on the treadle for limiting the amount of depression thereof.

7. A take-up and let-back mechanism for looms comprising a take-up roll, means for rotating the take-up roll to effect take-up, manually operated means for rotating the take-up roll in the reverse direction to effect let-back, and adjustable means for limiting the reverse rotation of the take-up roll when manually operated thus to limit the amount of let-back.

8. A take-up and let-back mechanism for looms comprising a take-up roll, means for rotating the take-up roll to effect take-up, a treadle and connections therefrom to the take-up roll rotating means acting upon depression of the treadle to rotate the take-up roll in the reverse direction to effect let-back, and means for limiting the depression of the treadle and consequently the amount of let-back effected thereby at each depression thereof.

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

HORACE H. BURDETT.