H. A. DAVIS.

TERRY WARP LET-OFF.

APPLICATION FILED OCT. 7, 1918.

1,322,671.

Patented Nov. 25, 1919.

3 SHEETS—SHEET 1.

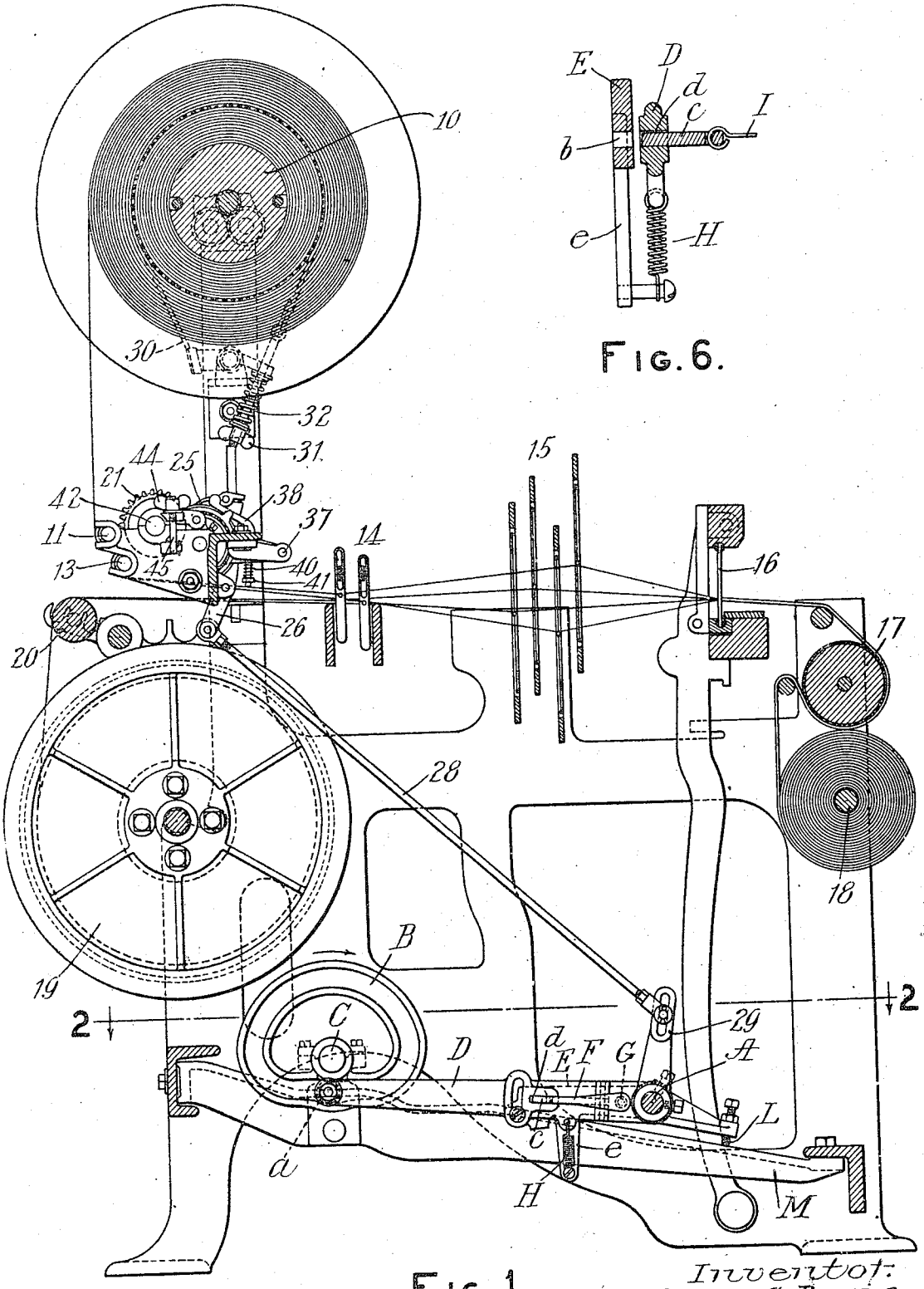


FIG. 1.

FIG. 6.

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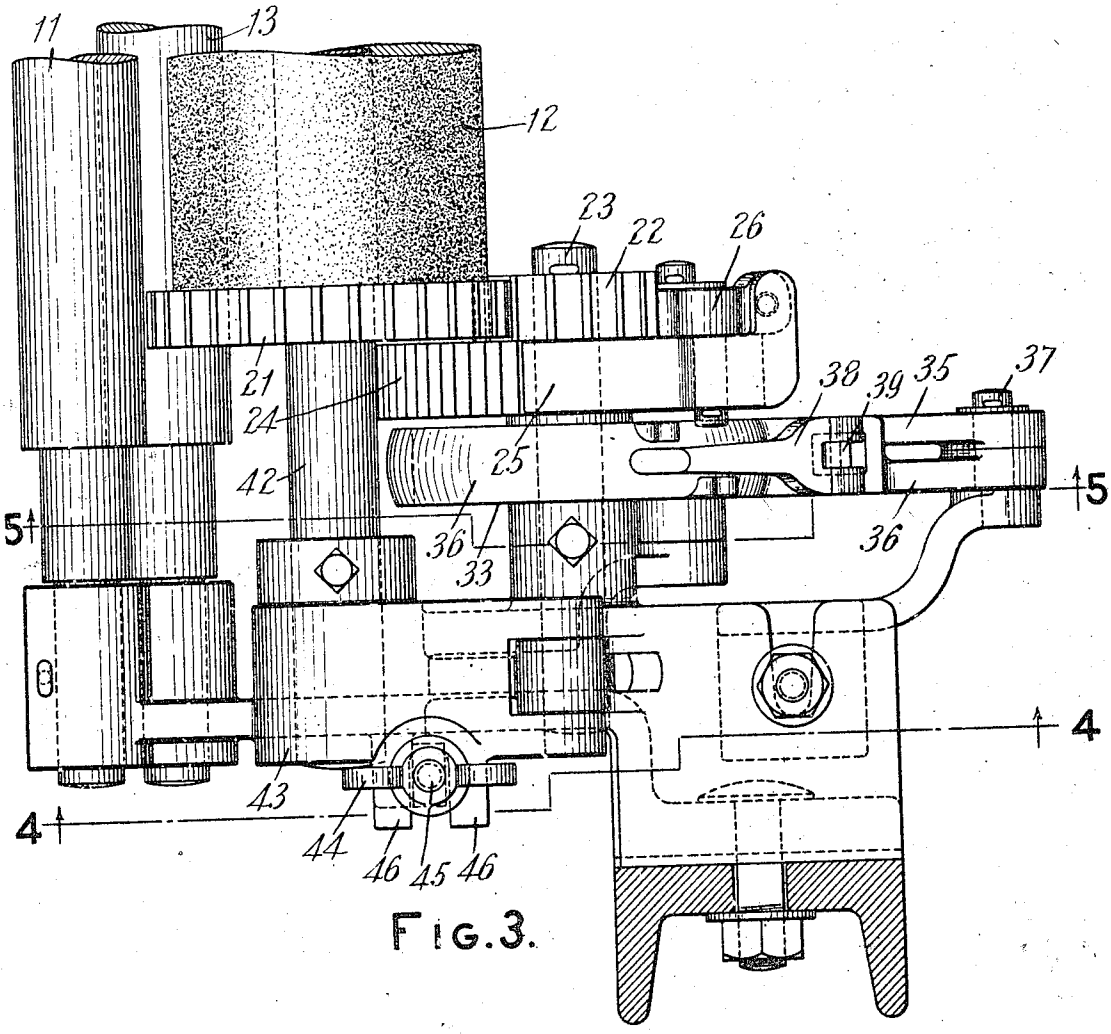


FIG. 3.

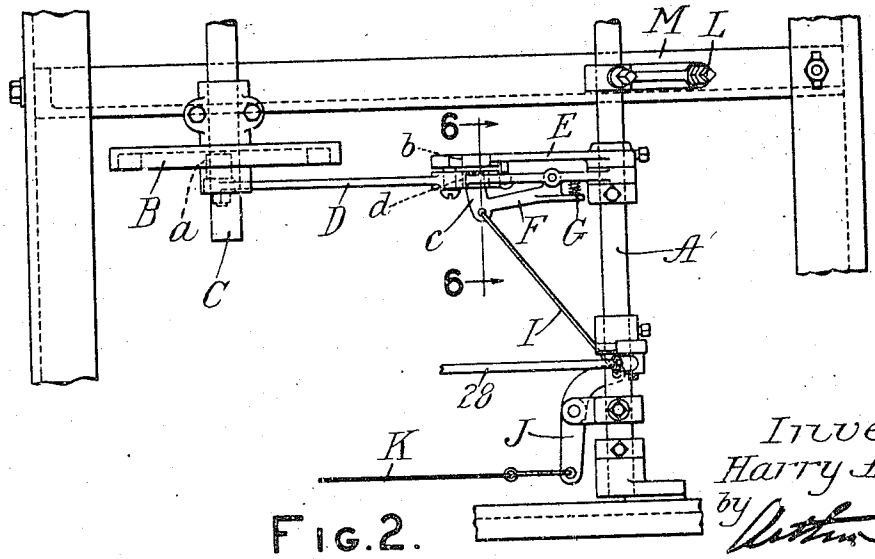


FIG. 2.

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3 SHEETS—SHEET 3.

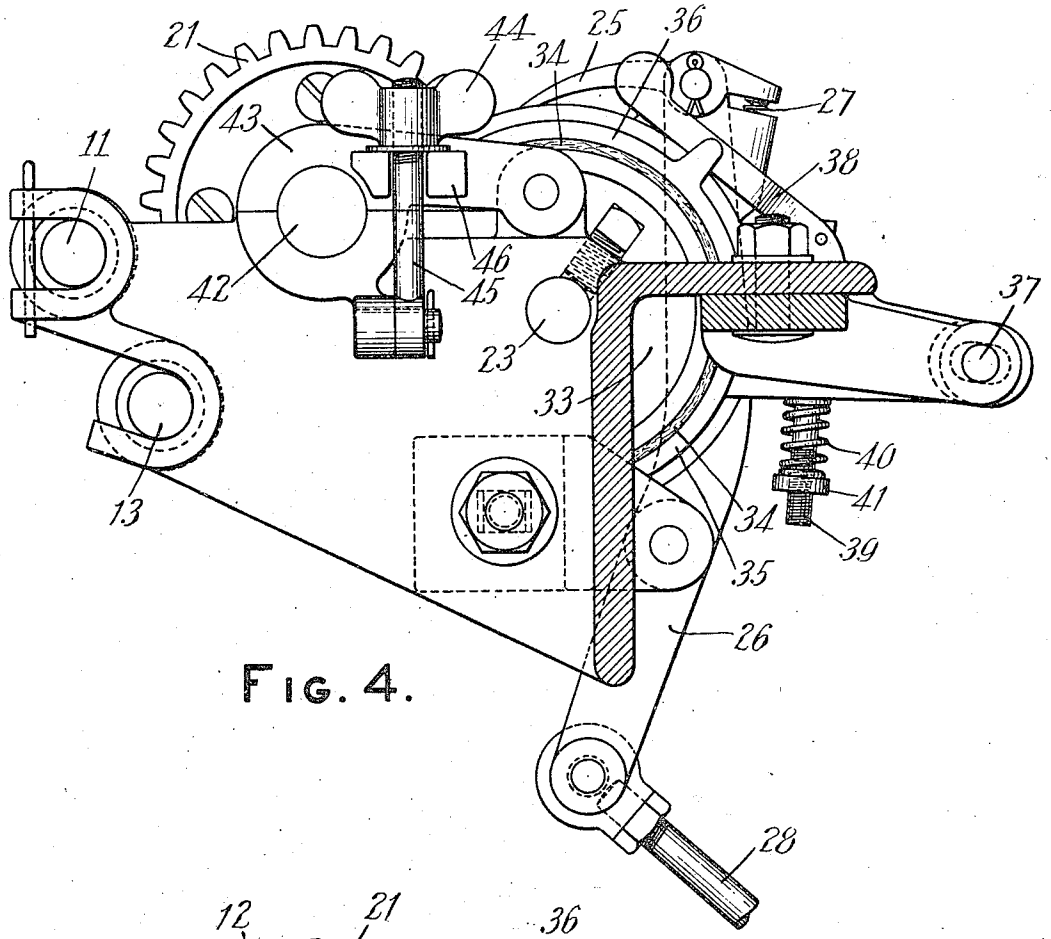


FIG. 4.

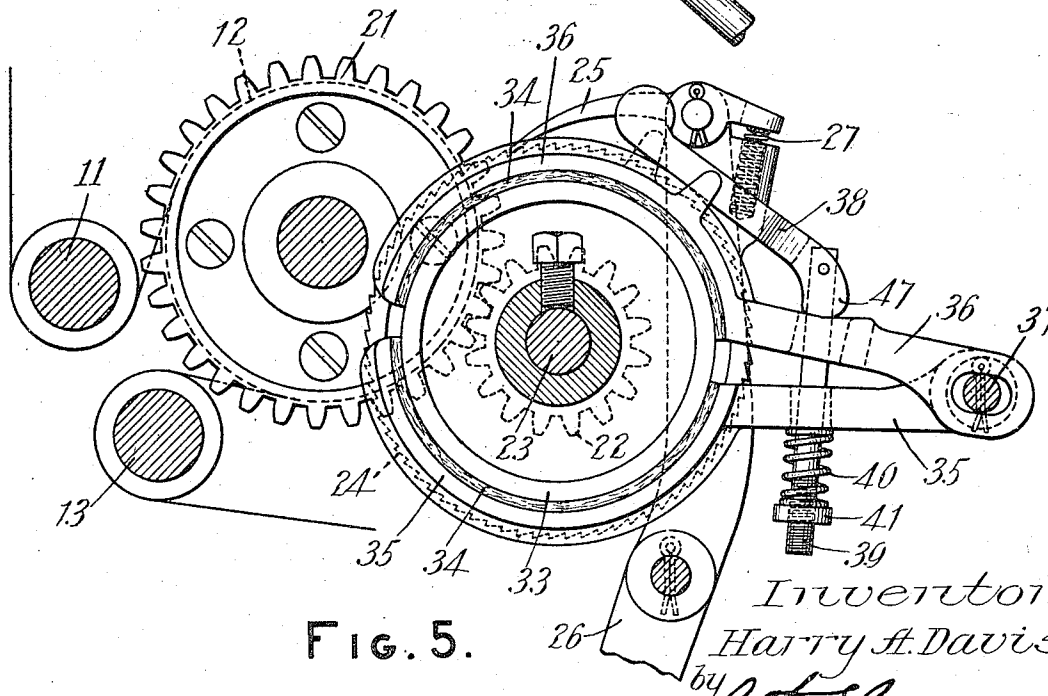


FIG. 5.

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UNITED STATES PATENT OFFICE.

HARRY A. DAVIS, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

TERRY-WARP LET-OFF.

1,322,671. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed October 7, 1918. Serial No. 257,168.

To all whom it may concern:

Be it known that I, HARRY A. DAVIS, of Hopedale, in the county of Worcester, in the State of Massachusetts, have invented certain new and useful Improvements in Terry-Warp Let-Offs, of which the following is a specification.

In terry looms for weaving double pile fabrics for making Turkish towels it is important that the terry warp should be positively fed forwardly during the formation of the terry loops but, when plain weaving is done, the positive action of the let-off should be discontinued.

The present invention consists of an improved let-off mechanism for this purpose.

The improvements are illustrated in the accompanying drawings in which—

Figure 1, is a vertical longitudinal section of a loom equipped with the present improvements. Fig. 2, is a plan view of the terry beat-up motion. Fig. 3, is a plan view of the terry warp let-off. Fig. 4, is a section in the plane indicated by the line 4—4 in Fig. 3. Fig. 5, is a section in the plane indicated by the line 5—5 in Fig. 3. Fig. 6, is a section in the plane indicated by the line 6—6 in Fig. 2.

The terry warp threads proceed from the terry beam 10, partly around an idle roll 11, thence nearly completely around a terry let-off roll 12, as indicated in Fig. 5, and thence around an idle roll 13. From thence the terry warp threads pass through usual warp stop motion detectors 14, the harnesses 15, and the reed 16, to the take-up roll 17, and the cloth beam 18. The ground warp threads proceed from the ground warp beam 19, over the whip roll 20, and thence through the detectors, the harnesses and the reed to the take-up roll and the cloth beam.

The let-off roll 12, as shown in Fig. 4, has a roughened surface which may be of sand paper or of roughened metal. Rigid with the let-off roll is a gear 21, which meshes with a pinion 22, turning on a fixed stud 23. Connected to the pinion is a ratchet wheel 24, with which coöperates a pawl 25. This pawl is pivoted to a pivoted pawl lever 26, (Figs. 4 and 5) and its point is maintained in engagement with the ratchet wheel by a spring 27. Connected to the lower end of the pawl lever 26, is a rod 28, which at its forward lower end is adjustably connected to a crank arm 29, on the beat-up motion rock-shaft A.

This shaft A, is rocked during the terry weaving for each full forward beat of the reed; but it is not rocked during the partial forward beats of the reed nor during the plain weaving. This shaft A, may be rocked in the manner described either by the mechanism of United States Letters Patent of Bardsley No. 937,139, October 19, 1909, or by the means disclosed in the pending application for Letters Patent of the United States of Charles F. Merrill, Serial Number 250,043, filed August 15, 1918.

When the shaft A, is rocked in producing the full forward beat of the reed during terry weaving the upper end of the crank arm 29, moves forwardly thereby moving the pawl 25, rearwardly and positively rotating the let-off roll 12, in the proper direction to feed the terry warp threads intermittently and forwardly and to the extent required to produce the terry loops.

During the partial forward strokes of the reed during terry weaving and also during the full forward strokes of the reed during plain weaving, the terry warp threads are fed forwardly by the take-up action of the take-up roll. During this action the ratchet wheel 24, rides freely under the pawl 25, and the let-off roll 12, and the terry warp beam 10, rotate and the positive action of the terry let-off does not occur.

It is desirable that the let-off beam should not overrun. Accordingly friction is maintained upon it by the band 30, extending around the drum on the warp beam. The tension of this band is adjustable by means of the thumb nut 31, and spring 32.

It is also desirable that there should be at all times frictional resistance to the free turning of the let-off roll 12. For this purpose a drum 33, is fixed to the ratchet 25. Coöperating with this drum are two friction shoes 34, of leather or felt carried respectively by levers 35, and 36, loosely pivoted upon the fixed stud 34. Adjustable pressure is given to the shoes by means of the hand controlled lever 38, pivoted to a rod 39, surrounded by a spring 40, at its lower end, the tension of which can be adjusted by means of a nut 41. This spring bears on the lower lever 35. The lever 38, has a cam 47, which bears on the upper lever

36. By throwing the lever 38, forwardly by hand the action of the cam 47, may be relieved.

The shaft 42, carrying the let-off roll 12, and gear 21, is removably mounted in bearings at opposite sides of the loom. As shown in Fig. 4, the upper bearing 43, is pivoted and is held in place by a thumb nut 44, screwing upon the upper end of a pivoted rod 45. This rod 45, extends between spaced lugs 46, on the upper bearing 43. By releasing the thumb nut 44, the rod 45, can be swung outwardly and away from the lugs 46. Thereupon the bearing 43, can be swung forwardly out of the way and the let-off roll can be removed.

Sufficient of the mechanism of the aforesaid Merrill application is here illustrated to enable the rocking of the beat-up motion shaft A, to be understood. During the terry weave the shaft A, is rocked by a cam B, on the back shaft C. This shaft, as common in terry looms, is geared to the cam shaft of the loom so as to run continuously and so that the desired speed ratio is secured to correspond with the number of picks for each full forward beat of the reed. This ratio may be any desired. A common ratio is such that the reed moves partly forward for two picks and then beats up to its full extent following the third pick.

A cam lever D, at its front end is loosely hung on the rock shaft and at its rear end has a roll *a*, traveling in the groove of cam C. The lever D, is adapted to be coupled and uncoupled from the shaft A. During the terry weave it remains coupled to the shaft A, and hence the shaft is rocked back and forth at every revolution of the cam. The cam is so shaped that the shaft is rocked for every full beat-up stroke of the reed, in the illustrated instance at every third forward beat of the lay.

In order to do plain weaving the cam lever D, is uncoupled from the shaft A. When thus uncoupled the cam lever at its forward end simply turns idly on the shaft A, and the shaft is maintained in such position that the reed at every forward beat makes its full stroke. Fast on the beat-up motion shaft is a crank arm E, having a slot *b*. A latch F, is pivoted to the main lever. Its latching tooth *c*, always occupies a slot *d*, in the cam lever. The latch is swung in one direction by a spring G. When this spring is free to act it projects the latch tooth into the slot *b*, in the arm E, thereby locking the cam lever to the arm so that said shaft is then under the control of the cam. In order to stop the cam actuation of the shaft it is simply necessary to withdraw the latch from the slot in the arm E, by moving the latch against the stress of the spring G. As shown in Fig. 2, of the drawings the latch is connected by a link I, with a lever J, pivoted at its middle upon the shaft A. A wire K, extends from the lever J, to the pattern mechanism, as set forth in said Merrill application, so that the coupling and uncoupling of the cam lever to the shaft A, is automatically effected.

Accordingly, the shaft A, is not rocked during plain weaving. Hence, since the pawl 25, is actuated from the shaft A, the positive terry warp let-off does not act during plain weaving. During plain weaving as well as during the partial forward beats of the reed occurring during terry weaving, the friction let-off for the terry warp is effective.

The present invention thus provides a combined intermittently active positive and constantly acting friction let-off for the terry warps. This combination let-off is effective at the full forward stroke beat of the reed in forming the terry loops. At each partial forward beat of the reed during the terry weave and also during the entire plain weave the positive let-off is idle but the friction let-off is effective.

The shaft A, as described in said Merrill application, is held in place during plain weaving by a spring H, and by an adjustable stop L, carried by the shaft A, abutting against a fixed girt L.

The drum 33, might be connected directly to the let-off roll instead of indirectly through the ratchet, pinion and gear. The important relation is that the drum should be operatively connected to the let-off roll.

I claim—

1. A terry loom having a reed, a terry warp beam, a rough surfaced let-off roll, a roll around which the terry warp threads pass between said beam and let-off roll, a second roll around which the terry warp threads pass between said let-off roll and the reed, a gear on the let-off, a pinion meshing with said gear, a ratchet wheel connected to said pinion, a friction drum operatively connected with the let-off roll, and friction shoes bearing continuously and yieldingly on said drum, in combination with a beat-up motion shaft, a continuously rotating cam, connections between said shaft and cam for rocking said shaft intermittently to effect the full forward beat-up movement of the reed, a pawl lever having a pawl engaging said ratchet wheel, and connections between said beat-up motion shaft and pawl lever so that said let-off roll is rotated positively to feed the terry warp at each full forward movement of the reed during terry weaving.

2. A terry loom having a reed, a terry warp beam, a let-off roll, a gear on the let-off roll, a pinion meshing with said gear, a ratchet wheel connected to said pinion, a friction drum operatively connected to the

let-off roll, and adjustable friction shoes bearing continuously and yieldingly on said drum, in combination with a beat-up motion shaft, a continuously rotating cam, connections between said shaft and cam for rocking said shaft intermittently to effect the full forward beat-up movement of the reed, a pawl lever having a pawl engaging said ratchet wheel, and adjustable connections between said beat-up motion shaft and pawl lever so that said let-off roll is rotated positively to feed the terry warp at each full forward movement of the reed during terry weaving.

3. A terry loom having a reed, a terry warp beam, a rough surfaced let-off roll, a gear on the let-off roll, a pinion meshing with said gear, a ratchet wheel connected to said pinion, a friction drum operatively connected to the let-off roll, and means frictionally engaging said drum, in combination with a beat-up motion shaft, a continuously rotating cam, connections between said shaft and cam for rocking said shaft intermittently to effect the full forward beat-up movement of the reed, a pawl lever having a pawl engaging said ratchet wheel, and connections between said beat-up motion shaft and pawl lever so that said let-off roll is rotated positively to feed the terry warp at each full forward movement of the reed during terry weaving.

4. A terry loom having a reed, a terry warp beam, a let-off roll, a gear on the let-off roll, a pinion meshing with said gear, a ratchet wheel connected to said pinion, a friction drum operatively connected to the let-off roll, and means frictionally engaging said drum, in combination with a beat-up motion shaft, a pawl lever having a pawl engaging said ratchet wheel, and connections between said beat-up motion shaft and pawl lever so that said let-off roll is rotated positively to feed the terry warp at each full forward movement of the reed during terry weaving.

5. A terry loom having a reed, a terry warp beam, a rough surfaced let-off roll, a gear on the let-off roll, a pinion meshing with said gear, and a ratchet wheel connected to said pinion, in combination with a beat-up motion shaft, a continuously rotating cam, connections between said shaft and cam for rocking said shaft intermittently to effect the full forward beat-up movement of the reed, a pawl lever having a pawl engaging said ratchet wheel, and connections between said beat-up motion shaft and pawl lever so that said let-off roll is rotated positively to feed the terry warp at each full forward movement of the reed during terry weaving.

6. A terry loom having an intermittently acting positive let-off and a constantly acting adjustable friction let-off for the terry warp, in combination with an actuator for the positive let-off which acts only on the full forward beat-up movements of the reed during the terry weave.

7. A terry loom having an intermittently acting positive let-off and a constantly acting friction let-off for the terry warp, in combination with an actuator for the positive let-off which acts only on the full forward beat-up movements of the reed during the terry weave.

In witness whereof, I have hereunto signed my name.

HARRY A. DAVIS.