

O. DALFOND.
 AUTOMATIC FRICTION LET-OFF.
 APPLICATION FILED JAN. 18, 1913.

1,064,294.

Patented June 10, 1913.
 2 SHEETS—SHEET 1.

Fig. 1.

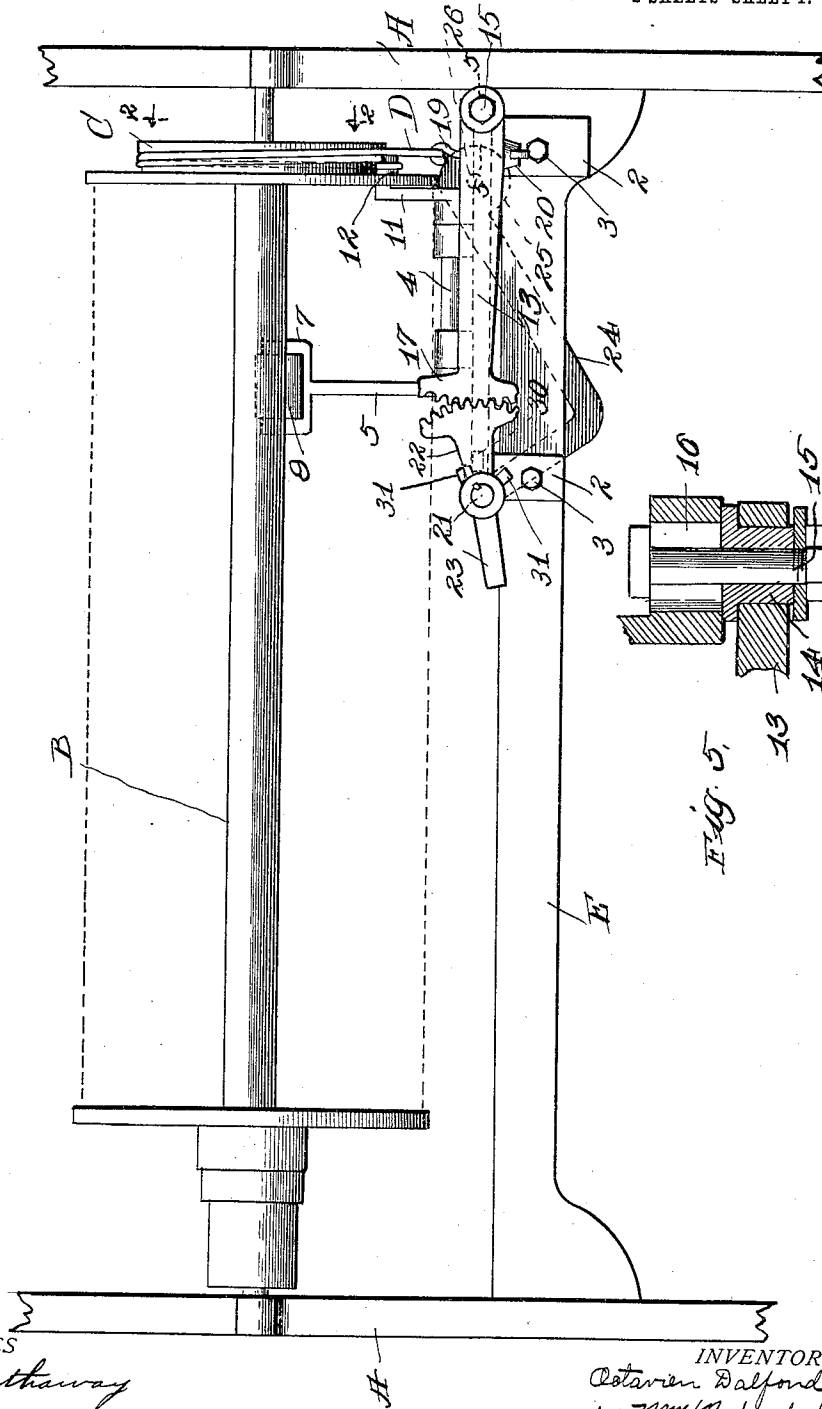
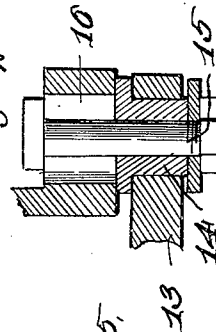


Fig. 5.



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1,064,294.

2 SHEETS—SHEET 2.

Fig. 4.

Oct 17/94

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UNITED STATES PATENT OFFICE.

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AUTOMATIC FRICTION LET-OFF.

1,064,294.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed January 13, 1913. Serial No. 742,818.

To all whom it may concern:

Be it known that I, OCTAVIEN DALFOND, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Automatic Friction Let-Offs, of which the following is a specification.

This invention relates to automatic friction let-offs for looms and has for its object to provide such a friction let-off that will gradually and uniformly decrease the tension in accordance with the gradual decrease in diameter of the loaded warp beam as the warp is taken therefrom, thus producing cloth of uniform goods throughout the length of the warp, without manual adjustment on the part of the operative.

Other objects are to obtain simplicity, to facilitate the adjustment of the device to various grades of counts and weights of cloths and to greatly reduce the cost of manufacture of these devices and to provide the widest range of adjustment of the various parts, all of which objects are attained by the construction, arrangement and combination of the parts hereinafter more particularly described, illustrated and claimed.

Heretofore it has been necessary for the operator to move or adjust by hand the weight or weights or to remove one or more of the latter as the warp was taken off and the diameter of the loaded warp beam decreased. This involves a little too free motion of the warp beam at first, consequently a thin place in the goods resulted, this thin place following a thick place caused by the action of the weight on the friction chain or rope just before said weight or weights were adjusted. Thus, even with an expert, it was impossible with the manually adjusted friction-let-offs to obtain a piece of cloth of uniform width and weight throughout the length of the warp.

In the accompanying drawings forming part of this application: Figure 1 represents a rear elevation of a loom with a device embodying my invention applied thereto, the beam being shown as loaded in dotted lines and the weight arm and gears being shown in their extreme outermost and uppermost positions; Fig. 2, a vertical cross-section on the line 2—2 of Fig. 1, showing in dotted lines the lowermost position of the

weight-arm; Fig. 3, a detail top plan view of a device embodying my invention; Fig. 4, a view broken away and corresponding to Fig. 1, with the beam shown as empty, the feeler-arm in its extreme innermost position and the gears and weight-arm shown in their extreme lowermost positions; and Fig. 5, a sectional view on line 5—5 of Fig. 1.

In this application, in which only one form is disclosed, the device is shown and described as applied to an average size cotton loom, though it may be applied to any size, kind or type of loom without departing from the spirit of this invention.

Referring now in detail to the drawings, A designates the usual loom sides; B the usual removable warp beam journaled therein; C the friction flange carried as usual by one head of said beam; D the usual friction chain or rope, being shown in the drawings as passed once around the friction flange C; and E the usual bottom girt.

1 designates a bracket having depending straps 2, through which and the girt E are passed bolts 3 for holding the bracket firmly in position on the girt. The office of this bracket is merely to hold the rock-shafts, lever and arc-segments, hereinafter described, in correct relation to each other and the device as a whole in correct position with relation to the warp-beam and friction flange. It is obvious that the exact shape of the bracket and depending lugs must depend on the size and shape of the bottom girt and to some extent on the position of the latter with relation to the warp-beam. Also, it is evident that this bracket is not essential to the practice of my invention. 4 designates a short rock-shaft journaled in said bracket longitudinally thereof and carrying a feeler-arm 5 on its inner end adjustable therearound by means of a friction bolt or screw 6, which is adapted to be screwed in and bind on said rock-shaft 4. Said arm 5 carries on its upper part a yoke 7, in which is mounted an anti-friction roller 8 on a pin or short shaft 9. This yoke 7 is longitudinally adjustable on the feeler-arm 5 by means of a friction bolt or screw 10, which is adapted to be turned through said yoke and bind on said arm. The anti-friction roller 8 bears directly against the warp wound on the warp-beam. In practice the yoke 7 should be so adjusted that at

the extreme innermost position of the feeler-arm the anti-friction roller 8 will bear against the drum of the empty warp-beam B. Also, the feeler-arm 5 should be so adjusted on shaft 4 that at its extreme innermost position the crank 11, hereinafter mentioned, will be in a near vertical position, the tension be least at this point and the speed of rotation of the warp-beam greatest. The crank 11 above mentioned is shown as formed integral with the outer end of the rock-shaft 4, though this is a mere matter of choice, and is provided with a groove 12 in which will lie part of an S-hook connected to the end of the friction chain or rope D. 13 designates a lever arm having its hub pivotally mounted on the rear face of said bracket at the end thereof. 14 designates a friction sleeve having an integral annular flange or collar at its inner end and adapted to be passed through the hub of said lever. 15 designates a bolt passing through a longitudinal slot 16 in the side of said bracket and through said sleeve 14, the annular collar of the latter being interposed between the hub of the lever arm and the side of the bracket. A washer is then passed over the end of said bolt and a nut turned thereon. As the sleeve 14 is slightly longer than the thickness of the hub of the lever it is obvious that the lever will be secured firmly in place, yet free to move with a minimum of friction. Likewise, it is apparent, by reason of said longitudinal slot 16, that the hub or pivotal point of said lever 13 may be adjusted longitudinally to compensate for wear, to provide a tight intermeshing of the gear segments and to slightly limit the arc of travel of said arm. This lever arm 13 carries on its inner end a gear-segment, 17, which may be integral, as shown and has an enlargement near its hub through which passes the usual vertical bore 18, which receives a bolt hook 19. The hook portion of this bolt receives one end of the friction chain or rope D, the other end of which is connected to the crank 11 as above described, and the lower screw-threaded end is engaged by a winged or thumb nut 20, in order that, after adjustment of the other parts, any slack in the friction chain or rope may be taken up by tightening said nut on the bolt 19. 21 designates a transverse rock-shaft mounted in said bracket 1. On the rear end of this shaft is keyed or otherwise secured by ordinary means a gear segment 22, which meshes with gear segment 17 of lever arm 13. For the convenience of the operator I provide a handle or short arm 23, which may be integral with gear-segment 22, as shown. This handle 23 is to be depressed by the operator to slack the friction chain or rope in order that the warp may be adjusted. On the other end of the rock-shaft 21 is

mounted an abruptly curved weight-arm 24, having an enlarged disk-form outer end 25 which is centrally perforated at 26. A series of disk weights 27, corresponding in size and shape to part 25 and centrally perforated, is provided, said weights being secured to said arm by any usual and convenient means, for instance by a bolt 28 passing through said central perforations and a nut turned on the end of said bolt. Any number of these weights may be used according to the count and weight of cloth desired, but after being secured in position none of them are to be removed until all cloth that is desired of that particular grade is obtained.

The weight-arm 24 is adjustable around the rock-shaft 21 by means of the friction bolt or screw 29, which is adapted to be screwed through the hub of weight-arm 24 and engage the shaft 21, thus locking the weight-arm 24 in any position of adjustment desired.

From the above it will be seen that the feeler-arm 5, the yoke 7 carrying anti-friction roller 8 and the weight-arm 24 are adjustable by their respective friction bolts or screws to accommodate the various types of looms, the various diameters of loaded warp-beams and the various diameters of friction flanges; that the pivotal point of lever 13 is longitudinally adjustable to compensate for wear, to provide a tight intermeshing of gear-segments and to slightly limit the arc of travel of said lever arm 13; and that the action of weight-arm 24 will be transmitted through rock-shaft 21, gear-segments 22 and 17 to arm 13, depressing the latter and pulling on the friction chain or rope D, which chain or rope is also connected as stated to the crank 11.

In practice the device is adjusted to the type of loom with which it is to be used, the diameter of the loaded warp-beam thereof, the diameter of the brake or friction flange and the count and weight of the goods or cloth desired. After such adjustment any slackness in the friction chain or rope may be taken up by means of bolt-hook 19 and the winged nut 20, as usual. After such adjustment it is not to be further regulated unless it be desired to use it with a different type of loom, or a different size of loaded warp-beam, or different size of brake or friction flange or a different grade of cloth is desired. In the latter case one or more of the weights 27 will be added or removed, as the case may be.

The operation, after the device has been adjusted as above, is as follows: The arm 24, at the beginning of the unwinding of a warp beam B will be in its extreme uppermost position and at its extreme lateral point from the rock-shaft 21 and the anti-friction roller 8 will be bearing against the

warp on said beam. As weight-arm 24 is connected by means of rock-shaft 21, gear-segments 22 and 17, lever-arm 13, bolt-hook 19, friction chain or rope D, crank 11, and rock-shaft 4 with feeler-arm 5 which carries the roller 8, the said weight-arm will act on the friction chain or rope, putting it under tension and thus braking the warp-beam and will at the same time act on the feeler-arm through said connections to force it inward toward the warp thus holding the roller 8 firmly thereagainst. Likewise, the weight-arm 24, because of said connections, cannot swing downward excepting as the feeler-arm 5 moves inward. The weights 27 at the initial uppermost position and in their extreme lateral position with relation to the shaft 21 will exercise their greatest leverage at this point, hence their greatest braking action. As they travel downward through the arc described by the end of weight-arm 24 their leverage gradually decreases as they approach the vertical plane taken on the axis of said shaft 21 though they do not travel quite as far as this plane as it is desirable to have some tension on the brake chain or rope at the last. Thus, the feeler-arm 5 gradually moves inward at a uniformly increasing rate, the weights 27 and weight-arm 24 force feeler-arm to travel as above stated and in turn swing downward through an arc at a uniformly increasing rate as the feeler-arm 5 moves inward and the diameter of the warp-beam decreases, the tension on friction chain or rope gradually decreases at a uniformly increasing rate as the arm 24 and weights 27 move downward through their arc of travel and their leverage action diminishes, and the rate of speed of rotation of the warp-beam B gradually and uniformly increases as the tension on the friction chain or rope D decreases. It will thus be seen that the device is purely automatic in its operation.

If desired a lug 30 integral with segment 22 and cooperating with lugs 31 integral with bracket 1 and a finger 32 integral with the hub of feeler-arm 5 and cooperating with the under side of said bracket may be provided to keep the gear segments from being lifted, or from dropping, out of mesh and to keep the feeler-arm 5 from falling outwardly and downwardly when the friction chain or rope D is disconnected at the crank 11 for the removal of a warp-beam B.

It is obvious that minor changes may be made in the construction, arrangement, &c., of the various parts of this invention without departing from the spirit and scope thereof and it is my intention and desire to include all such changes and to otherwise fully protect this invention in the appended claims.

I have obtained United States Patents 1,024,064, dated April 23rd, 1912, and

1,035,324 for inventions relating to the same general class of devices as the present invention, only neither of said patents is for an automatic device. Patent No. 1,035,324 shows an arrangement of levers somewhat resembling the arrangement of levers in this application and I do not seek to cover these broadly now in this application, but

What I do claim and desire to secure by Letters Patent is:

1. A friction let-off comprising a pivotally mounted lever, a transverse rock-shaft, means mounted on said shaft to turn therewith and engaging said lever to turn the same on its pivot, and a weight-arm mounted on said shaft to turn therewith, in combination with a longitudinal rock-shaft, a feeler-arm adjustably mounted thereon, a crank integral with the latter shaft and connections between said lever and said crank for transmitting the action of the weight-arm to the friction flange and to said feeler-arm.

2. A friction let-off comprising a pivotally mounted lever having a gear segment on its free end, a transverse rock-shaft, a gear segment fixed to said shaft and meshing with the gear segment of the lever, and a weight-arm secured to said rock-shaft to move therewith, in combination with a longitudinal rock-shaft, a feeler-arm mounted on the latter shaft to move therewith, a crank integral with the latter shaft and a friction element connecting said lever and crank.

3. A friction let-off comprising a lever pivoted at one end and carrying a bolt-hook, a transverse rock-shaft, means carried on the end of said rock-shaft and turning therewith for engaging and moving said lever on its pivot, and a weight-arm secured to the other end of said rock-shaft to turn therewith in combination with another rock-shaft, a feeler-arm mounted thereon to turn therewith and connections for turning the latter shaft to move said feeler-arm toward the warp as the diameter of the latter decreases and the weight-arm falls, said connections including a friction element.

4. A friction let-off comprising a bracket adapted to be mounted on a loom frame, a lever pivotally mounted on said bracket, a transverse rock-shaft mounted in the bracket, means mounted on the end of the shaft for transmitting the motion thereof to the lever and a weight-arm mounted on the shaft, in combination with another rock-shaft mounted in the bracket, a feeler-arm mounted thereon to move therewith, a friction element connected to said lever and connections between the friction element and the last mentioned rock-shaft.

5. A friction let-off comprising a bracket adapted to be secured to a loom frame, a lever pivoted to said bracket, a transverse

rock-shaft mounted in the bracket, means
mounted on the end of this shaft to trans-
mit the motion of the same to the lever, and
a weighted-arm mounted on said rock-shaft
5 to move therewith, in combination with a
longitudinal rock-shaft mounted in the
bracket, a feeler-arm mounted on the latter
shaft to move therewith, a crank connected
to the latter shaft and a friction element
10 passed around the friction flange and hav-

ing its respective ends connected to the lever
and the crank.

In testimony whereof, I have signed my
name to this specification in the presence of
two subscribing witnesses.

OCTAVIEN DALFOND.

Witnesses:

JOHN T. SWIFT,

JOSEPH H. HATHAWAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
