

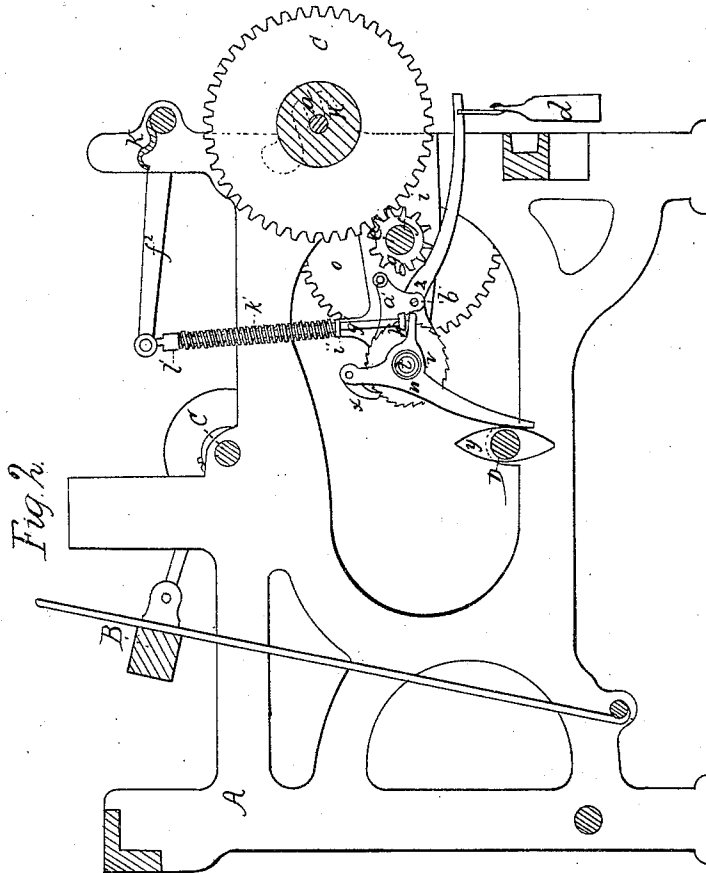
Sheet 2, 3 Sheets

Cottrell & Draper

Let-Off for Loom.

N^o 69,320.

Patented Oct. 1, 1867.



Witnesses.

*Samuel W. Piper
Geo. W. Andrews.*

Inventors

Jesse D. Cottrell and George Draper.

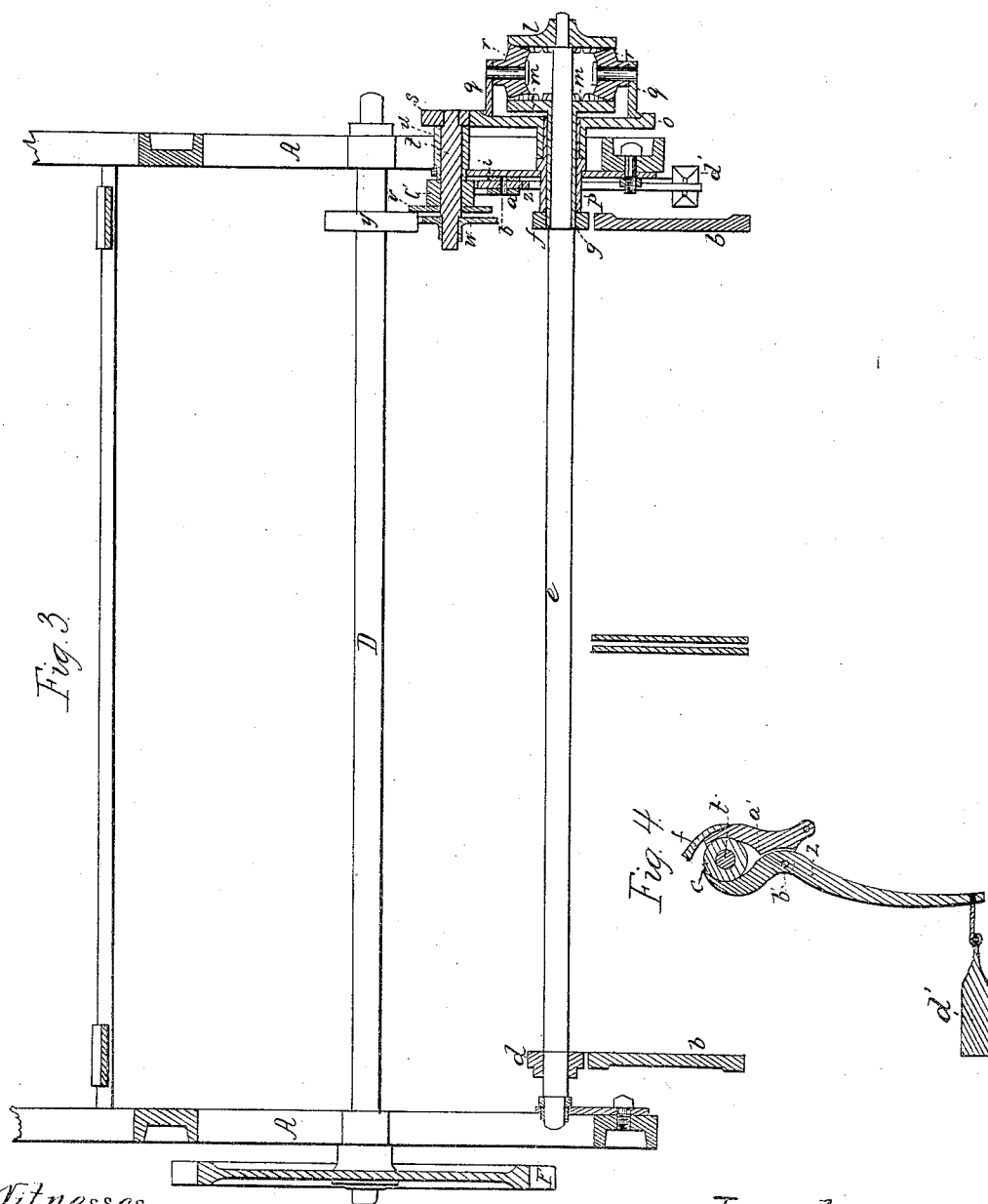
*By his attorney,
N. W. Wiley.*

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United States Patent Office.

JESSE D. COTTRELL AND GEORGE DRAPER, OF MILFORD, MASSACHUSETTS.

Letters Patent No. 69,320, dated October 1, 1867.

IMPROVEMENT IN LOOM.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that we, JESSE D. COTTRELL and GEORGE DRAPER, of Milford, in the county of Worcester, and State of Massachusetts, have made a new and useful invention having reference to Looms for Weaving Cloth; and we do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view of a loom-frame with our said invention applied thereto.

Figure 2 is a vertical and transverse section taken through one of the yarn-beams, and representing the mechanism applied to the next adjacent end of the frame.

Figure 3 is a horizontal section taken through the shafts carrying the pinions for actuating the main gears of the two yarn-beams, to be hereinafter described.

The invention may be said to consist of the combination as well as the arrangement of a "let-off mechanism," two yarn-beams, and certain mechanism applied to such beams for the accomplishment of the result, or results for which the mechanism of Benjamin G. Dawley, described in Letters Patent No. 16,306, dated December 23, 1856, is calculated to effect.

In weaving very wide cotton cloth it has been customary to employ in a loom two or more yarn-beams, the reason of their employment being to obviate the difficulty which, were but one beam used, the attendants on the "dresser-frame" would experience in reaching far enough to piece up the yarn during the process of sizing or dressing it.

As the amounts of yarn wound on the two beams will vary, that is, as one will be somewhat more than the other, the diameters of such masses of yarn will vary more or less during the process of weaving them in a loom. This causes them to unwind or deliver the yarn unequally, whereby the weaving of one portion of the cloth will be caused to be looser than that of the other. For this reason wide cloths so made are not valuable for certain uses, as one selvage will be loose, while the other may be drawn tight.

To obviate the disadvantages resulting from the variations in the sizes of the masses of yarn on the two beams, the said Dawley combined with the beams a friction-wheel to run on their shaft, and between them also a pinion and two gears, the same being arranged together as exhibited in the patent hereinbefore mentioned. These devices were to effect equality of tension and delivery of the two warps.

For various reasons it is very desirable to have the delivery of the warps effected by a "let-off motion or mechanism" acting in concert with the two beams and the mechanism of Dawley, or its equivalent, and therefore we have effected as much, and have also made a valuable and useful construction of the warp-equalizing apparatus and application of it to the two beams, whereby we are enabled to bring the two main heads of the beams close together, and thus avoid the space which must necessarily exist between them when the equalizing mechanism is placed between them, as is shown in the patent hereinbefore mentioned.

In the drawings, A denotes the frame and B the lay of a loom. C is the driving-shaft of the lay. This shaft imparts motion to another shaft, D, or receives motion from it by means of two gears, E F, fixed to such shaft. The two yarn-beams are exhibited at G and H. They are to revolve freely and independently of each other on one common rod, a, their inner heads being close together. Each of such beams has a gear-wheel, b or c, at its outer end or confining its outer head. One of these gears (viz, b,) engages with a pinion, d, fixed on a long horizontal shaft, e, arranged with respect to the yarn-beams in manner as represented. The other of the said gears (viz, c,) engages with a pinion, f, fixed on a tubular shaft, g, which receives and supports the shaft e, and is supported by, and so as to be capable of revolving together, a tubular bearing, which is upheld by a bracket, i, projecting from one of the posts of the loom-frame. A bevel-gear, l, is fixed on the end of the shaft e, and there is another such gear, m, fixed on the shaft g, such gears being arranged with respect to each other as shown in the drawings. Furthermore, a large spur-gear, o, is placed alongside of the inner bevelled gear m, and runs loosely on a tubular journal, p, projecting from the brackets. From the said gear o two arms, q q, project and support the spindles of two bevelled pinions, r r, which are arranged between and engage with the bevelled gears l m, and are placed on opposite sides of the shaft e, the whole being as represented in the drawings. The gear o engages with a pinion, s, fixed on one end of another shaft, t, supported in a bearing, u, projecting from the bracket i. A ratchet, v, is also fixed on the shaft t. A tri-armed lever, w, formed as shown

in fig. 2, turns on the shaft *t* as a fulcrum. The upper arm of this lever carries a pawl, *x*, which engages with the ratchet. In front of the longer arm of the said lever is a cam or wiper, *y*, which is fixed on the shaft *D*. A friction-clamp composed of two jawed levers, *z a'*, formed as represented in vertical section in Figure 4, is applied to the bracket *i*, and turns on a pin, *b'*, extending therefrom and through the shorter arm of the upper of the said two jawed levers. The jaws of the said levers grasp the periphery of a friction-wheel or cylinder, *c'*, fixed on the shaft *t*. A weight, *d'*, is hung on the longer arm of the lower jaw-lever. Furthermore, a small arm, *e'*, projects from the pawl *x* over another arm, *f'*, extending from the upper jaw of the friction-clamp, the purpose of the two arms being to enable the pawl to be raised out of connection with the ratchet by simply raising the weighted arm of the friction-clamp high enough. When the said arm is so raised the jaws of the clamp will be thrown apart and out of bearing upon the friction-wheel. Consequently, under this state of things, either of the yarn-beams may be revolved by hand, in case it may be desirable to turn it for the purpose of either loosening or tightening its warp. The yarn or warps, on passing from the yarn-beams, extend over the upper surface of a whip-roller or guide, *K*, and thence through the harnesses and to and through the reed of the lay, thence to and over the breast-beam and to the cloth-roller or beam. From one journal of the guide *K* a bent arm, *f²*, extends directly over the middle arm of the tri-armed lever *w*. A rod, *g'*, jointed to the end of the said arm *f²*, has a foot, *h*, which is arranged directly over and close to the said middle arm of the tri-armed lever. The rod *g'* goes through an extension, *i'*, of the bracket *i*, on which rests a helical spring, *k'*, which encompasses the rod. The upper end of the spring bears against a shoulder, *l'*, formed on the rod. The yarn-beams, by the friction of the jawed levers *z a'* on the wheel *c'*, will be kept from turning around so as to let off the yarn improperly. The cloth, as made, is to be supposed to be wound on the cloth-roller by means of what mechanics term a "positive take-up motion" or mechanism.

The weighted friction-clamp and its wheel *c'*, the shaft *t*, the gears *s o r r l m*, the shafts *e g*, the pinions *d f*, and the gears *b c*, constituting an improved "friction and equalizing apparatus," are, in some respects, an equivalent for the compound motion or apparatus described in the patent of the said Dawley, and they are for performing like effects; but their combination and arrangement render them far superior in operation, and productive of new effects or advantages. We have combined with them a "let-off" mechanism, composed of the ratchet *v*, the tri-armed lever *w*, its pawl *x*, cam *y*, rod *g'*, spring *k'*, guide *K*, and bent arm *f'*, the whole being supported, arranged, and applied to the loom-frame and the bracket *i* substantially as set forth.

In the process of weaving, the harnesses open and close the warps, causing, in the mean time, an inequality of strain on the warps of the beams. When the lay is forward, and the filling is being driven home, the strain on the lever-guide *K* will be prevented, by the cam *y*, from depressing such guide and its arm *f'* so as to turn the tri-armed lever on its fulcrum, and thus set the pawl back on its ratchet, the lower arm of the tri-armed lever being in the path of revolution of the cam *y*. The said cam, in revolving, will act against such arm, so as to move the tri-armed lever and cause its pawl to turn the ratchet, whereby the two shafts *e* and *g* will be put in motion, so as to effect, by means of the pinions *d f* and the gears *b c*, a rotary movement of the two yarn-beams sufficient to cause some delivery of yarn to take place. The spiral spring *k'* regulates the tension of the warp and takes up the slack of the warps while being crossed by the harnesses. When the lay is back the tension on the warp, if sufficient, will press down the guide *K* and set the pawl back upon its ratchet. The "let-off" mechanism causes delivery of yarn when the lay is forward, the pawl is set back when the lay is back, and the strain on the warp is sufficient to effect depression of the guide and a consequent movement of the tri-armed lever.

We claim the combination of the "let-off" mechanism, two yarn-beams, and a friction and equalizing apparatus, substantially as described.

We also claim the "let-off" mechanism made and arranged with the friction-equalizing apparatus, substantially as described.

We also claim our improved arrangement of the two yarn-beams and the equalizing and friction apparatus, substantially as described, the two beams, under such an arrangement, being placed close together, and the equalizing and friction apparatus being arranged outside of rather than between them, as explained.

We also claim our improved friction and equalizing apparatus or mechanism, substantially as described.

We also claim the arrangement of the gears *o, r, m*, and *l*, constituting the "compound motion."

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Witnesses:

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GEO. H. ANDREWS.