R. Reynolds.

Let-Off Motion.

No. 43,338. Patented Jun. 28, 1864.

Fig. 2

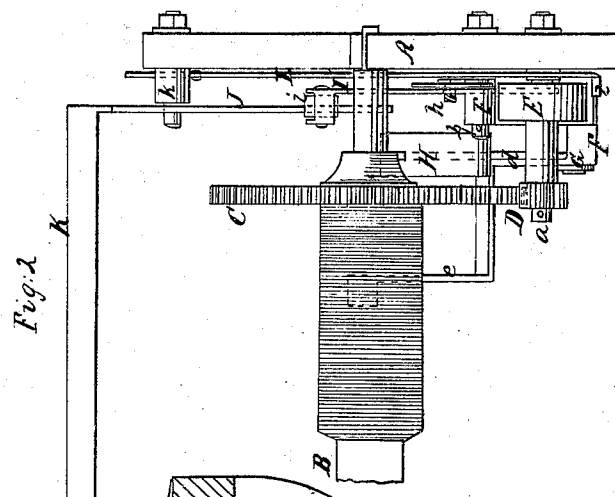
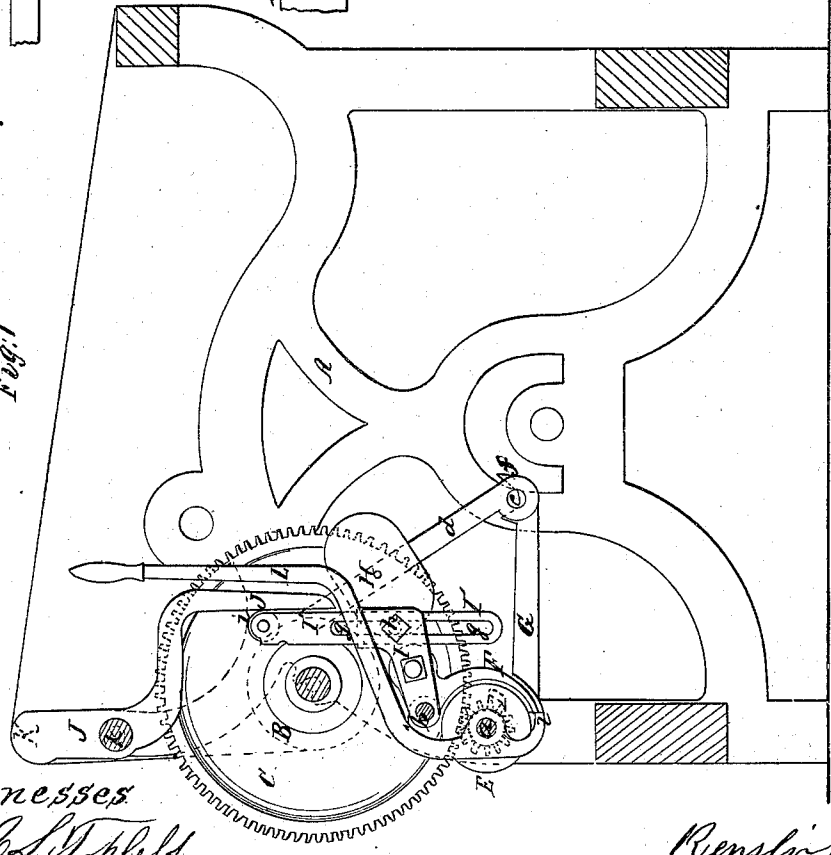


Fig. 1



Witnesses

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UNITED STATES PATENT OFFICE.

RENSSELAER REYNOLDS, OF STOCKPORT, NEW YORK.

IMPROVEMENT IN LET-OFF MOTIONS OF POWER-LOOMS.

Specification forming part of Letters Patent No. **43,338**, dated June 28, 1864.

To all whom it may concern:

Be it known that I, RENSSELAER REYNOLDS, of Stockport, in the county of Columbia and State of New York, have invented a new and useful Improvement in the Let-Off Motion of Power-Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a let-off motion and all the parts of a loom necessary to illustrate its application and operation. Fig. 2 is a back view of the let-off and part of the frame of the loom.

Similar letters of reference indicate corresponding parts.

This invention relates to let-off motions of what are termed the "friction" kind in contradistinction to those which have a positive action.

It consists in a certain novel mode of applying and operating the friction-brake in such a let-off motion, whereby the friction is caused to be always in proper proportion to the amount of yarn on the yarn-beam, and thereby caused to operate on the yarn with uniform effect.

It also consists in certain novel means by which the tension of the warp is made so to act upon the friction-brake as to govern the letting off of the yarn from the beam, which are adjustable for the weaving of a web of uniform texture with any number of picks of filling to the inch that may be desired, and which enables the same loom to be used for lighter or heavier fabrics without changing any of its parts.

It further consists in certain novel and convenient means of relieving the yarn-beam from the action of the friction-brake whenever desirable.

A is the framing of the loom.

B is the yarn-beam, arranged in the usual position, and having secured to it near one end a large spur-gear, C, which gears with a pinion D, secured to the brake-wheel E, which is fitted to rotate upon a fixed horizontal stud, *a*, secured in the side of the loom framing.

F is the brake-shoe, faced with leather or other suitable material, fitted to the periphery of the wheel E, and hung on a fixed stud, *b*, secured in the side of the framing. This shoe has rigidly attached to its bottom part a lever-arm, G, which projects forward in a horizontal, or nearly horizontal, direction some distance beyond the back of the yarn-beam. To the extremity of this arm there is pivoted, by a pin, *c*, an arm, *d*, to the upper end of which is attached the weight H, which acts upon the rigid arm G to produce the pressure of the brake-shoe upon the front part of the wheel E.

To the arm *d*, which supports the weight H, there is secured rigidly another arm, *e*, the extremity of which is made with a broad, smooth surface to bear against the yarn upon the yarn-beam B, in front of the said beam. The said arms *d* and *e* have a backward inclination from the pivot *c* toward the beam when in operation, and the weight H is thereby caused to hold the arm *e* against the yarn on the beam, and it will be understood that the said arm will hold the weight in a more or less backward position and farther from or nearer to the stud *b*, which is the fulcrum of the brake, thereby making it produce a greater or less pressure upon the brake, according as there is more or less yarn on the beam, and if the parts be properly proportioned the pressure of the brake will be in proportion to the distance of the surface of the yarn from the center of the beam, and the tension produced upon the yarn by the brake, while the latter is allowed to remain in undisturbed operation, at all times uniform.

When it is desired to place the arm *e* out of the way of the beam as to permit the removal of the beam, or for any other purpose, the arm *d* and weight may be moved back to bring their center of gravity a little in front of the pin *c*, in which position the arm *d* will bear against a small stop, *f*, provided on the end of the lever-arm G. By applying this brake in this way to a wheel geared with the yarn-beam by a small pinion and a large gear, it is made to effect the desired result by the application of a comparatively small weight or pressure.

The brake-shoe has rigidly attached to it, in front of its fulcrum *b*, another arm, I, to which is rigidly attached by a slot-and-screw connection, *g h*, an upright adjustable arm, I′, the upper end of which is furnished with a fric-

tion-roller, *i*. These arms I I′ are, however, strictly speaking, parts of one arm of variable length. The front of the friction-roller *i* serves as a bearing for a lever, J, which forms part of a vibrating frame, which carries a bar, K, occupying the position and performing the duty of what is commonly called the "whip-roll" and the place of which might be supplied by a roll.

The whole arrangement of the frame J and bar K is, in fact, substantially like what is used when the whip-roll is made to vibrate, as it is in many looms.

k are the fixed studs upon which the said frame vibrates, secured in opposite sides of the framing of the loom, one of the said studs being the fulcrum of the lever J. The tension produced upon the warp by the take-up exerts a tendency to press forward the bar K or friction roll, and so to force back the lower arm of the lever J against the friction-roll *i*, exerting a backward pressure upon the lever-arm I I′, thereby counteracting in a greater or less degree the action of the weight H, and so diminishing in a greater or less degree the pressure and friction of the brake-shoe upon the wheel E, according to the amount of tension produced; and when a certain degree of tension is produced it will in this way so far reduce the pressure and friction of the brake as to make the beam let off a sufficient quantity of yarn to reduce the tension to the degree at which it is desired to weave, when the pressure on the bar K or whip-roll being reduced, the brake again stops the let-off.

The degree of tension at which the weaving is performed and the closeness of the weft are regulated by raising and lowering the portion I′ of the lever-arm I I′, so as to bring the friction-roller farther from or nearer to the fulcrum *k* of the lever J. By raising the portion I′ of the said arm and the attached friction-roller the tension of the warp is caused to have a greater effect on the brake, and the weaving will be performed at a lower degree of tension and the weft will be looser, and by lowering the said portion I′ and the friction-roller the opposite effect and result are produced.

In case of the shuttle failing to box and the lay striking it, the tension to which the warp will then be subject will not fail to draw forward the bar K or whip-roll far enough to remove the brake entirely from the wheel E, and so permit the yarn-beam to turn freely and prevent the breakage of the warp.

L is a hand-lever, applied inside of the loom-frame to work upon the stud *a* as a fulcrum, and having at its lower end a lateral projection, *l*, which is situated behind the lower edge of the brake-shoe. The upper arm of this lever is of such length and so situated that it can easily be reached by one hand of the weaver and pushed or pulled back for the purpose of pressing forward the projection *l* against the brake-shoe and so pressing forward the brake-shoe clear of the brake-wheel, and thereby permitting the yarn beam to be turned in either direction, as may be required, by the other hand.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The brake F, combined with the yarn-beam by means of a brake-wheel, E, a rigid lever-arm, G, and a pivoted stem, *d*, to which is attached a weight, H, and arm *e*, the whole applied to operate substantially as and for the purpose herein described.

2. The combination of the brake with the vibrating bar K or whip-roll by means of a lever-arm, I I′, attached to the brake, and a lever, J, attached to or forming part of the vibrating frame which carries the said bar K or roll, substantially as herein set forth.

3. The hand-lever L, applied and arranged in combination with the brake-shoe, substantially as and for the purpose herein specified.

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Witnesses:

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