

P. Boylan.
Let-Off Motion.

N^o 42,638.

Patented May 10, 1864.

Fig. 1.

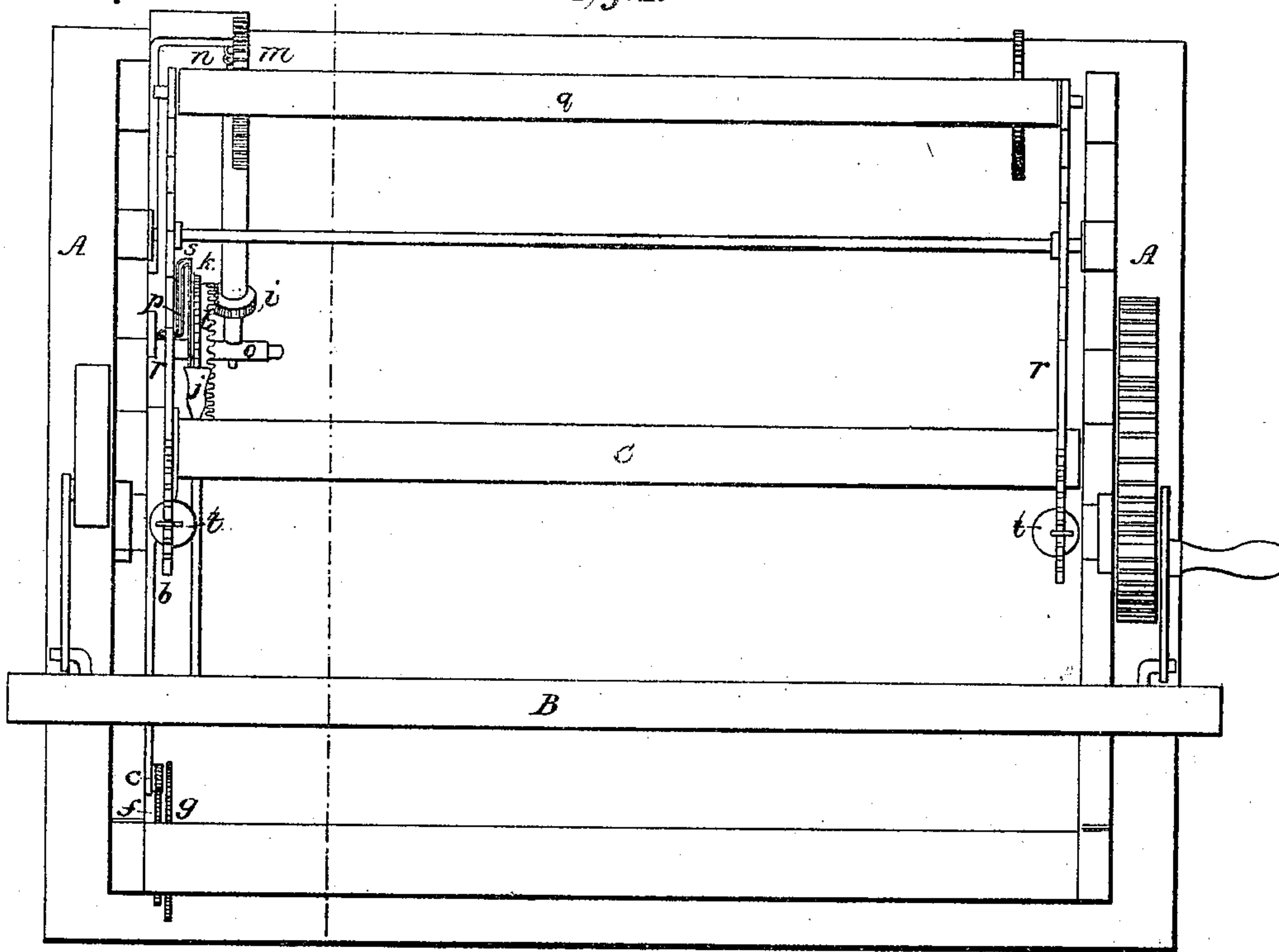
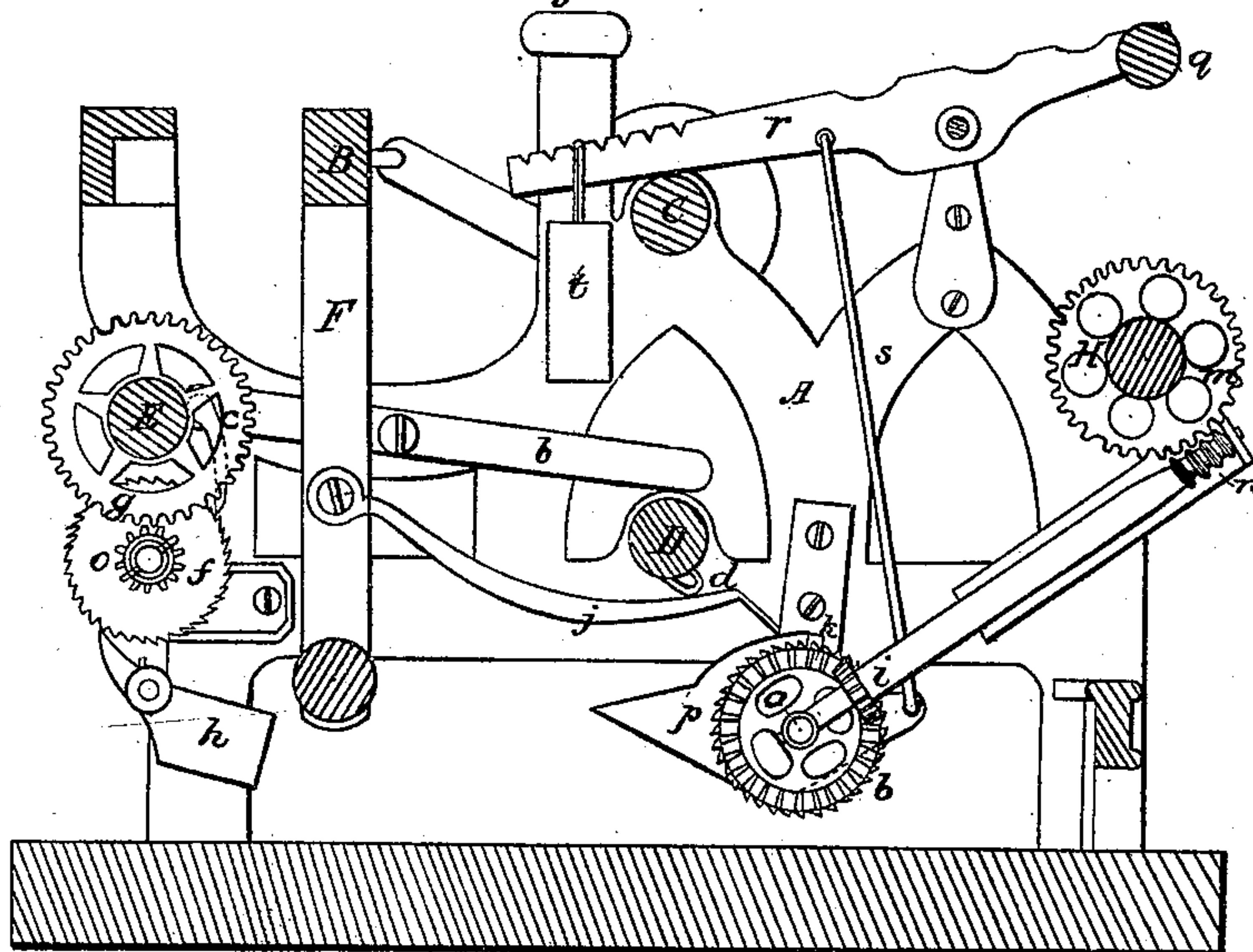


Fig. 2.



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PATRICK BOYLAN, OF GLOUCESTER, NEW JERSEY.

IMPROVEMENT IN LET-OFF MECHANISM FOR POWER-LOOMS.

Specification forming part of Letters Patent No. 42,638, dated May 10, 1864.

To all whom it may concern.

Be it known that I, PATRICK BOYLAN, of the town of Gloucester, in the county of Camden, State of New Jersey, have invented a new and peculiar arrangement in loom mechanism, for the purpose of uniformly letting off the warp-yarn from the beam; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification.

Figure 1 represents a top view or plan of the working parts of the apparatus of a power-loom. Fig. 2 shows a section through of the end view of the loom, to which the self-regulating mechanism for uniformly letting off the warp-yarn from the beam and the operating of the cloth-beam is attached.

The object of my invention is to accomplish that which has long been sought after, but never before attained to my knowledge; and it consists in self-regulating or an adjusting mechanism by which the uniformity of the tension of the warp-yarn is kept the same throughout, from the beginning to the end of the piece without the application or aid of a spring or brake, or friction in any manner, so that whether the yarn beam be full or nearly all run off no difference in the strain of the warp is perceptible.

To enable others skilled in the art to make and use my invention, I will proceed to describe the parts and their operation and the functions performed more fully in detail, referring to the drawings and the letters marked thereon.

The loom-frame A may be made of cast-iron to patterns in any desired form and put together by bolts or screws in the ordinary manner, the lay B being attached to the frame and put in motion by short pitmen or connecting rods attached to wheels or the ends on a counter-shaft, C, which is driven by a spur-gear pinion and wheel on the main shaft, D, which has on or near its end a cam, *d*, which operates to lift at each revolution of the shaft D, a balance-lever, *b*, which has connected to its small or outward end a pawl, *c*, the same working in a ratchet-wheel, *f*, connected by a pinion, *e*, and cog-wheel *g*, to give motion to the cloth-beam E, so that by its action a continuous motion is effected at every two strokes of

the lay B, the balanced dog *h* holds all that has been taken up as the weaving progresses.

To one of the arms F of the lay I attach a long dog or pawl, *j*, which extends back under the main shaft D, so as to operate on a ratchet-wheel, *l*, the same having on its side a bevel gear, *b*, into which a pinion, *i*, is fitted, the shaft of which has a screw or worm, *n*, near its rear end, into which the cog-wheel *m* operates, making a worm-gear to move the yarn-beam, so that by the action of the gear and ratchet *k*, put in motion by the lay B, the warp is let off gradually, when the dog or pawl *j* can get a hold on tooth of the ratchet.

On the same shaft or pin *o* on which the bevel-gear and ratchet-wheel turn I place an oscillating plate, *p*, one portion of it extending a little above the periphery of the teeth or notches of the ratchet *k*, and this portion abruptly terminating in another portion sunk below the teeth of the ratchet, so that when the projecting part of the plate *p* is in a certain position the pawl *j* is lifted out of the teeth of the ratchet, and moves back and forward on this plate, thus leaving the yarn-beam motionless until such time as the pressure of the warp upon the whip-roll *q* raises the levers *r*, the same being connected to the plate *p* by a rod, *s*, which allows the plate to move back, so that the pawl *j* will take a hold on the ratchet *k*, and thus continue to operate the worm gear, and let off the warp from the yarn-beam just as fast as is necessary to keep the tension uniform, and no faster, for as soon as the web or warp becomes slack the whip-roll *q*, being balanced by weights *t*, which are adjustable on the levers *r*, will depress and bring the plate *p* in a position to lift the dog or pawl *j* out of the ratchet, so that the tension of the warp operates on the plate *p*, and makes a perfect self-acting regulator of the yarn-beam, which is effected by the tension of the yarn, which is left off with as much uniformity and certainty as the opening and closing of a gate for letting water onto a water-wheel, or the opening and closing of the valve of a steam-engine is regulated by the speed of the fly-wheel.

The importance of a uniform, perfect, self-acting let-off of the warp from the yarn-beam is only known to those who have experienced the difficulties attending it, and there has

been much study, time, and labor spent in the effort to obtain such a result, and there has been much complex mechanism applied as well as the more simple devices, such as friction springs, brakes, detent-levers, whip-rolls, &c. On none of these devices do I claim to have made any improvements; nor do I propose to use any of them except the whip-roll *q*.

It will readily be seen that by my invention as above described, there being no spring or brake nor friction applied to any portion of the loom, the power required to operate the let-off mechanism is very trifling, and the regulator being operated in so easy, a manner much less power is required to run the loom; but the greatest advantage is in the quality of the fabric woven, there being at no time too great a tension or too much slack in the web.

The texture will be the same from the beginning to the end of the piece.

Having thus fully described my invention and its operation, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the yarn-beam *H*, the worm-gear *m n*, the bevel-gear ratchet-wheel, *k l i*, and the oscillating plate *p*, the same working on the shaft *o*, and being connected with the balanced levers *r r*, and whip-roll *q*, all arranged and operating in the manner as described, for the purposes herein specified.

PATRICK ^{his} × BOYLAN.
mark.

Witnesses:

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