

(No Model.)

2 Sheets—Sheet 1.

G. KERR.
LET-OFF MOTION FOR LOOMS.

No. 420,158.

Patented Jan. 28, 1890.

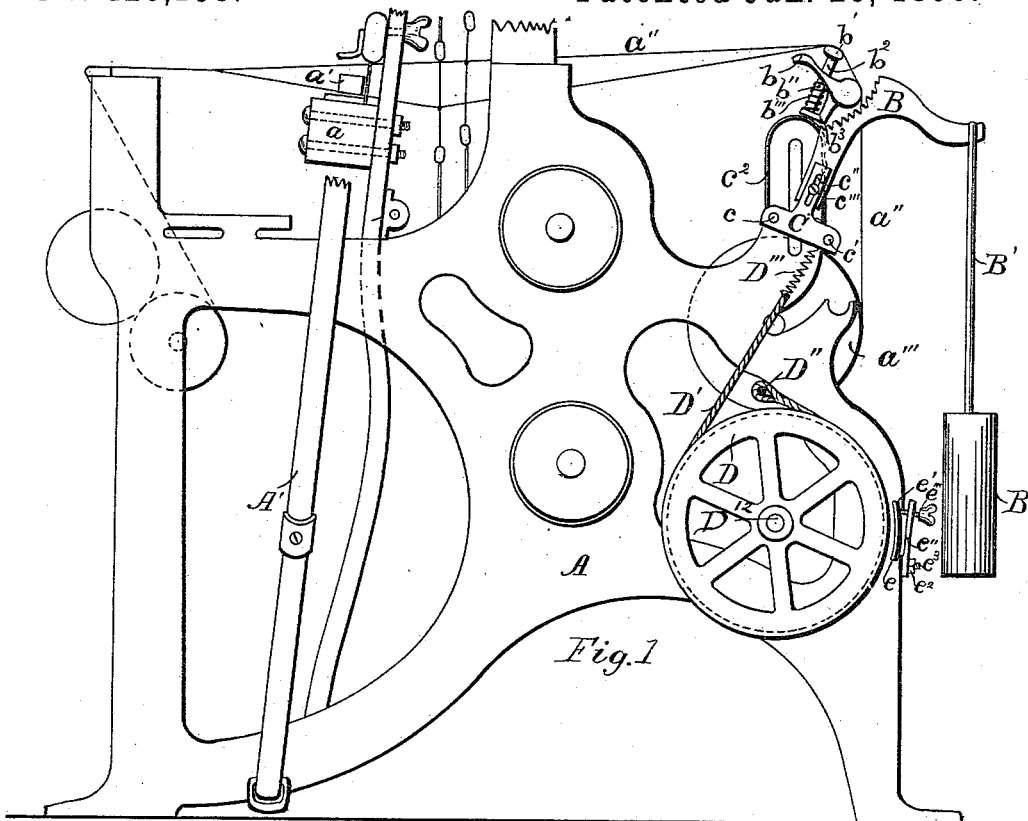


Fig. 1

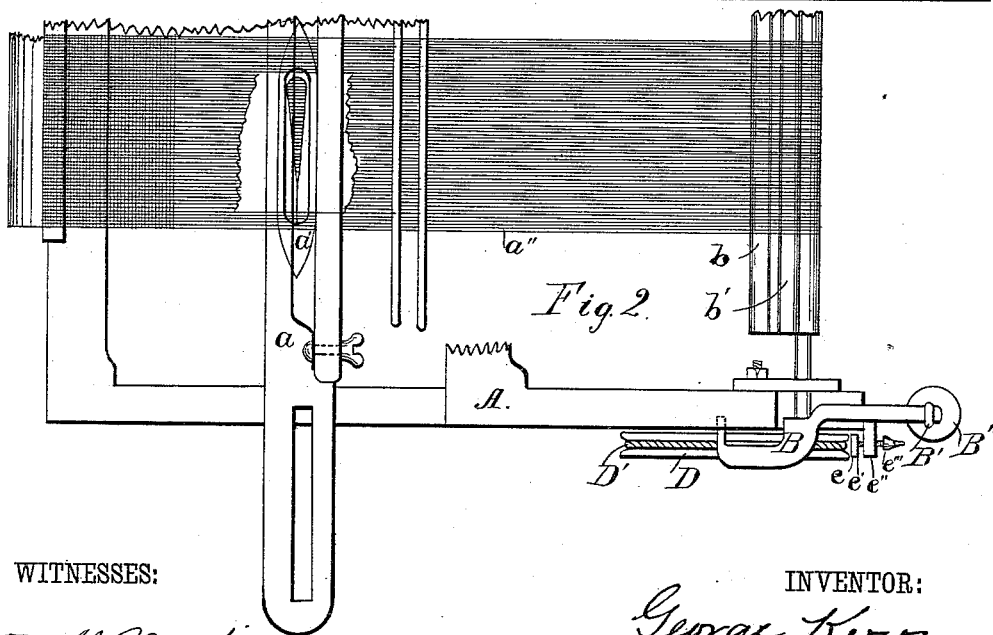


Fig. 2

WITNESSES:

Jonathan M. Wood
Charles L. Case

INVENTOR:

George Kerr.
By
Wm. Brown & Crossley
attys.

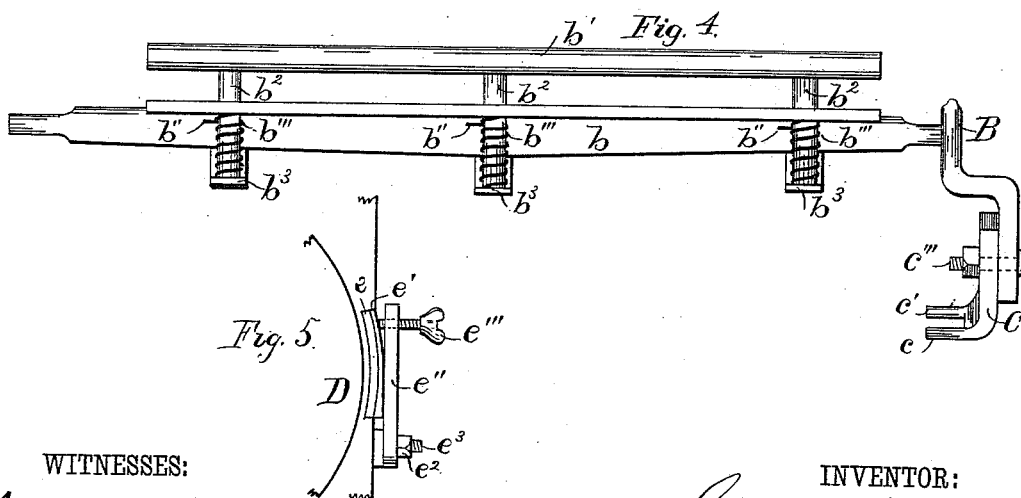
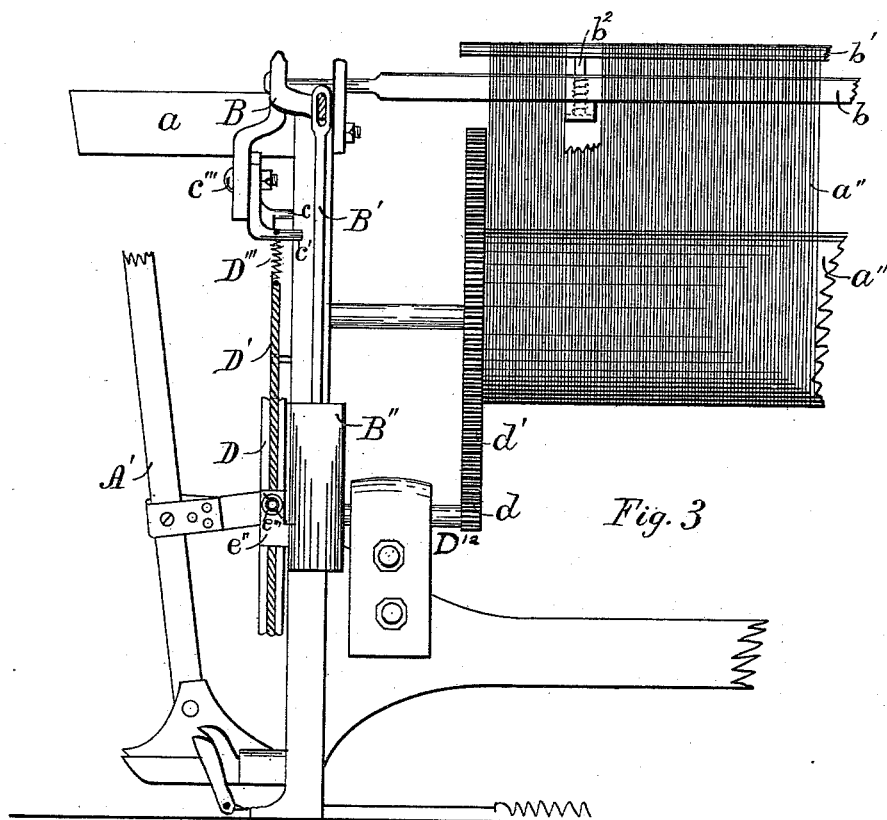
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INVENTOR:

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE KERR, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO CHARLES L. CASE AND L. ELMER WOOD, OF SAME PLACE.

LET-OFF MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 420,158, dated January 28, 1890.

Application filed August 4, 1888. Serial No. 281,960. (No model.)

To all whom it may concern:

Be it known that I, GEORGE KERR, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Let-Off Motions for Looms, of which the following is a specification.

It is the object of my invention to provide such improvements in let-off motions for looms as will allow of the delivery of warp in desired amount at each pick, and as will preserve an even tension upon the warp under all conditions and circumstances, so that the cloth produced may be without "cloud" or other defect and of regular texture throughout.

It is also the object of my invention to provide improvements in let-off motions for looms whereby the vibrator may act continuously and yieldingly upon the warps, thereby avoiding sudden and positive strain thereon, so that perfect weaving may be effected under a minimum tension on the warps, and breakage of the latter avoided.

It is also the object of my invention to provide such improvements in let-off motions for looms as that in case the shuttle should stop in the shed sufficient warp may be delivered or given out to compensate for the space occupied or taken up by the shuttle, and "smashes" be accordingly avoided.

It is also the object of my invention to provide such improvements in let-off motions for looms as will permit of the ready regulation of the letting-off of warp, so as to vary, as may be desired, the number of picks in a given quantity of cloth and, consequently, the weight or thickness of body of the cloth.

It is also the object of my invention to provide other improvements in let-off motions for looms incidental to the foregoing, which incidental improvements, as well also as those hereinbefore particularly specified, will be subsequently described and explained at length herein, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming a part of this specification, of which drawings—

Figure 1 is a side view (parts being broken away) of a loom, or so much thereof as it

is necessary to show, equipped with my improved let-off motion. Fig. 2 is a plan view of a portion of the loom shown in Fig. 1, parts being represented as broken away. Fig. 3 is a rear elevation of the parts shown in Fig. 2, with the addition of the picker-stick and its immediately-associated parts. Fig. 4 is a front elevation of my improved vibrator or whip-roll and its actuating-arm and governing-fork. Fig. 5 is a detail view designed to show the means for frictionally retarding the "let-off pulley," so called.

The same letters of reference designate the same parts in all of the views.

In the drawings, A designates the loom-frame; A', the picker-stick; *a*, the lay; *a'*, the shuttle; *a''*, the warp; *a'''*, the warp-beam. These things may be of common form and arrangement.

The vibrator or whip roll, over which the warp passes from the warp-beam to the heddles, instead of being made as a single piece or part, as heretofore, is by me, as is here shown, constructed in a double or compound form—that is, the vibrator proper *b* has a supplemental part *b'* superposed upon or arranged over it and normally held yieldingly above it, so that the warp passing over the vibrator, when said warp is not subjected to more than normal tension, will be held up or supported on or by said part *b'*; but when more than normal tension is put on the warp the part *b'* will be pressed down and, as it were, become one with the vibrator proper *b*, which will then be to all intents and purposes the same as vibrators of common construction.

Various means may be employed for supporting the supplemental part *b'* in a yielding manner over or above the vibrator proper *b*, that here shown consisting of studs or pins *b²*, secured at their upper ends to the part *b'* and extending down through holes in the vibrator proper *b*, and lugs or brackets *b³*, secured to the latter, and spiral springs *b'''*, secured at their upper ends to the studs *b²*, and bearing at their lower ends on the lugs or brackets *b³*, serving to normally hold the part *b'* above the vibrator proper *b*.

In order to render the tension of the springs

b''' adjustable, I connect their upper ends with the studs b^2 by passing a pin b'' laterally through each of said studs between two coils of the spring, as clearly shown in Fig. 4, so that by turning the spring on the stud its relationship with respect to the pin b'' will be changed, as will be understood, and the tension with which it will bear up the part b' increased or diminished, as the case may be.

B designates the oscillating vibrator-arm, connected at its upper end, as shown in Fig. 4, to the vibrator, and provided at its lower end with an adjustable fork C, the prongs or pins c' of which are arranged to play or operate astride or on opposite sides of a rib c^2 of the loom-frame, said rib forming a vertical stop for the pins c' .

D designates a pulley secured to a shaft D^{12} , journaled in suitable bearings in the frame, the inner end of which shaft is provided with a small spur-wheel d , engaging a gear-wheel d' on the shaft of warp-beam a'' . (See Fig. 3.)

D' designates a cord or strap, one end of which is secured at D'' to the loom-frame, the other end being connected through the medium of a spring D''' to one arm or prong of the adjustable fork C, said cord or strap passing around or partly around the pulley D, as shown, and operating to frictionally retard the turning of said pulley.

B'' designates a weight hung on the lower end of a rod B' , the upper end of which is attached to the outer end of a rearwardly-extending part of the vibrator-arm B, so as to normally hold the vibrator back with the prong c' of fork C in contact with the rib c^2 of the frame.

The fork C is adjustable on the vibrator-arm B by means of a slot c'' formed in said fork and a bolt c''' passing therethrough and through the vibrator-arm, the bolt being secured by a nut of ordinary form.

e'' designates a bracket secured to the frame A opposite the wheel D by means of a bolt e^3 and nut e^2 , said bracket having a spring-brake e' , provided with a facing e , of leather or other frictional material, secured thereto, which brake is constructed and arranged to bear, if need be, on the periphery of pulley D, the adjustment of said brake being effected by means of the thumb-screw e''' , connected with bracket e'' and bearing at its inner end against the brake e' . In the drawings the brake e' is shown as standing off or away from the pulley D, and this is the position it will occupy excepting when a quite heavy or close fabric is being woven and it is desired to apply more frictional resistance to the rotation of pulley D than the cord or strap D' is capable of exerting.

Pulley D is grooved, as shown, so that the cord or strap D' rests therein, giving the brake e' opportunity to act on the edges of the periphery of the pulley without interfering with said cord or strap.

In the operation or use of my improve-

ments the warp passes from the yarn-beam over the double or compound vibrator $b b'$ to the heddles and other cloth-forming devices. As the lay moves forward and strikes the cloth at the fell the yielding part b' of the vibrator will first be depressed, so as to practically become one with the vibrator proper, and then the latter will rock or move forward slightly, the lay, in addition to beating up the weft, operating to draw off from the yarn-beam a sufficient amount of warp to compensate for the space occupied by the weft, such space being dependent upon the amount of friction that is exerted upon pulley D—that is to say, if a great amount of frictional resistance is exerted on pulley D the turning of the yarn-beam will be correspondingly resisted. Consequently the weft will be beat up more closely than when little frictional resistance is offered to the turning of the pulley, and the yarn is more easily drawn from the yarn-beam. If a very open weave is desired, the fork C will be adjusted downward on the vibrator-arm B, so as to put as little tension as possible on the spring D''' and cord D' . If a close weave is wanted, the fork C will be adjusted in the opposite way or direction, and, if need be, the friction-brake e' will be applied to the pulley D to the requisite degree or extent. As the lay moves back the vibrator will be rocked or moved backward by the operation of the weight B'' acting on the rearwardly-extending portion of the vibrator-arm B, and the supplemental part b' of the vibrator will rise, taking up all of the "slack" of the warp.

It is to be particularly observed that by my improvements the operation of the vibrator on the warp is gradual, the supplemental part b' acting first in a comparatively light or easy manner, and the vibrator proper then being brought into play or action with greater firmness. This fact, in connection with that, that after the vibrator goes back the supplemental part b' acts to keep the warp under an even tension at all times, enables me to operate the vibrator with a lighter weight B' than heretofore, and to reduce the breakage of warps to a minimum.

By delivering the requisite amount of warp at each pick and keeping the warp under even tension at all times I am enabled to produce perfectly even and "cloudless" cloth throughout.

The calculation in the construction of the fork C is such that if the shuttle should stop in the shed, by the rocking of the vibrator to its fullest extent, or so that the stop or prong c of the fork will be brought into contact with the rib c^2 of the loom-frame, enough warp will through this means be given up or paid out to compensate for what will be taken up by the shuttle or for the space the shuttle will occupy in the shed, thus avoiding a smash or breakage of the warps over the shuttle.

It is obvious that changes may be made in

the form and arrangement of parts comprising my improvements without departing from the nature or spirit of the invention.

Having thus explained the nature of my invention, I would have it understood that what I claim is—

1. A vibrator for looms, consisting of the vibrator proper and a supplemental part yieldingly supported over said vibrator, combined with a vibrator-arm attached to said vibrator, having pins or stops on the lower end thereof, and the loom-frame having a stop for engagement with the pins or stops on said arm, all as set forth.

2. A vibrator for looms, consisting of the vibrator proper, a supplemental part yieldingly supported over said vibrator, springs interposed between the vibrator proper and the supplemental part, in combination with a vibrator-arm attached to said vibrator, having pins or stops on the lower end thereof, and the loom-frame having a stop for engagement with the pins or stops on said arm, all as set forth.

3. A vibrator for looms, consisting of the vibrator proper provided with holes and with lugs or brackets, a supplemental part arranged over the vibrator proper and provided with studs extending through said holes, and spiral springs surrounding said studs and connected with said studs and bearing on said lugs or brackets, substantially as set forth.

4. A vibrator for looms, consisting of the vibrator proper provided with holes and with lugs or brackets, a supplemental part arranged over the vibrator proper and provided with studs extending through said holes, spiral springs surrounding said studs and bearing on said lugs or brackets, and pins extending transversely through said studs between two coils of said springs, substantially as set forth.

5. The combination, with the loom-frame provided with a rib, of a vibrator and a vibrator-arm provided with a fork C, having prongs or studs *c* and *c'* extending on opposite sides of the rib of the loom-frame, substantially as set forth.

6. In combination with the loom-frame, the pulley, its friction cord or strap, and the spring *D'''*, as described, the oscillating vibrating arm provided with the pins *c c'*, and a fixed stop or rib *c²*, serving to arrest and limit the movements of the vibrating arm, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of July, A. D. 1888.

GEORGE KERR.

Witnesses:

ARBA N. LINCOLN,
L. ELMER WOOD.