

2 Sheets—Sheet 1.

No. 350,475.

Patented Oct. 12, 1886.

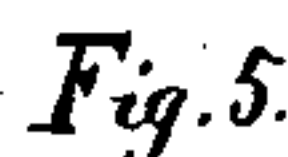
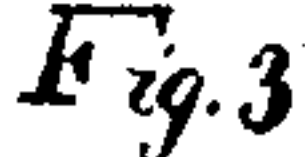
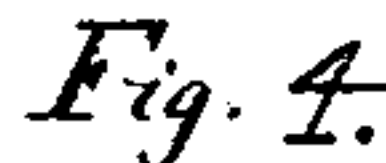
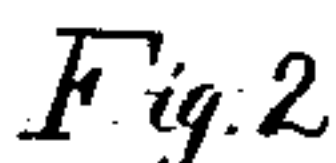


Fig. 1



Witnesses.

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(No Model.)

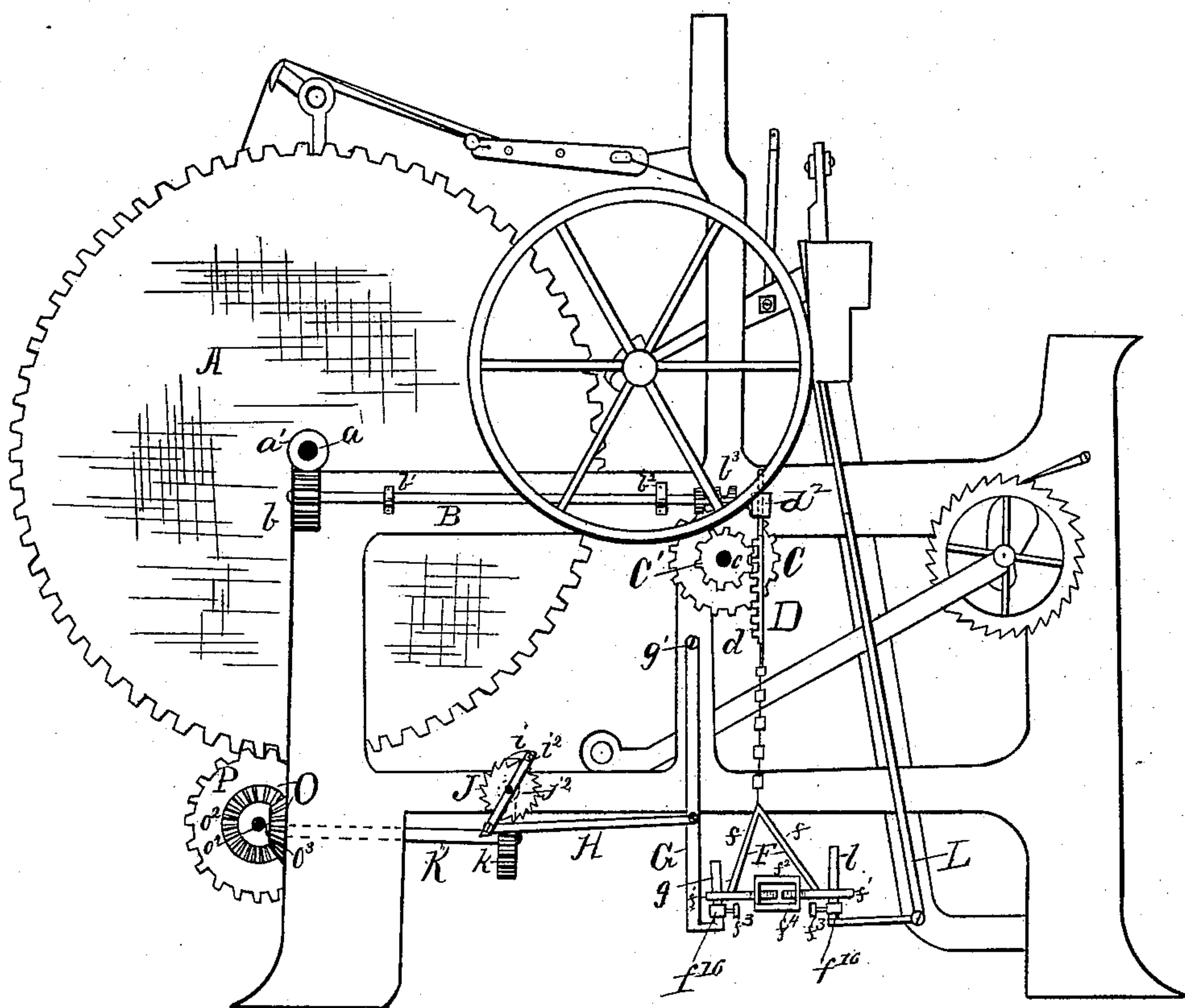
2 Sheets—Sheet 2.

R. BROWN.  
LET OFF MOTION FOR LOOMS.

No. 350,475.

Patented Oct. 12, 1886.

Fig. 6.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## LET-OFF MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 350,475, dated October 12, 1886.

Application filed August 20, 1884. Serial No. 141,061. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT BROWN, a citizen of the United States, residing at Springfield, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Let-Off Motions for Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains, to make and use the same.

My invention relates to let-off motions for looms; and its object is to provide cheap, simple, durable, and self-regulating devices for producing a certain positive and uniform unwinding of the warp-yarns from the beginning of the weaving until the warp is all run off the warp-beam. This object I attain by means of the devices illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of the devices detached. Fig. 2 is a plan view of the upper part of the devices. Fig. 3 is a plan view of the lower part thereof. Figs. 4 and 5 are detail views, Fig. 4 showing a modification. Fig. 6 is an end view of a loom with the invention applied thereto.

Similar letters indicate corresponding parts in all the figures.

A is a flange on the end of an ordinary warp or yarn beam, and  $a$  is a gudgeon at one end of the yarn-beam having a worm or endless screw,  $a'$ , formed thereon.

B is a shaft, preferably placed horizontal in suitable bearings,  $b'$   $b^2$ , which are attached to the end of the loom. Said shaft has at one end a cog-wheel,  $b$ , which is operated by the worm  $a'$ , and on its other end is a worm,  $b^3$ , which operates a cog-wheel, C, which is attached to the shaft  $c$ , carrying a second wheel, C'.

D is a rack supported at the end of the loom in a suitable guide,  $d^2$ , so as to permit of being raised and lowered. It has teeth,  $d$ , which engage the cog-wheel C', by which it is operated.

F is a traverse attached by any suitable means to the lower part of the rack. It has side pieces,  $f$   $f$ , and a base,  $f^4$ , which is provided with any ordinary device for shortening or taking up the same, preferably a swivel-link,  $f^2$ , which has threads to screw up on either or

both parts of the base  $f^4$ . The ends  $f'$   $f'$  of the base  $f^4$  are connected to the lathe-sword L and lever G, so as to enable them to be raised and lowered to change the distance of the traverse from the fulcrum of each. For this purpose the ends  $f'$   $f'$  may be provided, as shown in Fig. 4, with holes to receive perpendicular arms  $g$   $l$ , which are attached to and parallel with the lever G and lathe-sword; but I prefer connecting them as shown in Fig. 1, wherein the lever G has a suitable fulcrum-bearing,  $g'$ , upon the end of the loom, so as to permit the lever to vibrate back and forth, and attached to the said lever at or near its lower end is a rod, H. Said lever G is provided with a slot,  $g^2$ , in which works a headed bolt or rivet,  $f^5$ , on one end of the base  $f^4$ . The lathe-sword is provided with a plate, M, attached so as to work outside of the loom-frame at the end, and said plate has a slot,  $m^2$ , in which works a headed bolt or rivet,  $f^5$ , on the other end of the base  $f^4$ . This mode of connection permits the traverse to move up and down the plate M and lever G, to change the extent of the motion of the rod H.

In using the perpendicular arms  $g$   $l$  nuts or rings  $f^6$   $f^6$ , having thumb-screws  $f^3$ , are employed for setting the traverse at the desired heights for beginning the weaving of different kinds of cloth; but in using the slots  $g^2$   $m^2$ , bolts  $g^3$   $l^3$  having screw-threads or other equivalent stays, may be used to set the traverse. The higher the traverse is raised at the beginning of the weaving, with a given amount on the warp-beam, the more rapidly the warp is unwound, and consequently the less the number of picks to the inch in the woven cloth. The lower the traverse is placed in starting the slower the warp-beam turns, and consequently more picks are put in to the inch in the cloth. Rod H is connected to the lower ends of lever G and lever  $i^2$ , which lever  $i^2$  has a catch,  $i$ , placed on its upper end so as to drop into the notches of the wheel J and move the latter.

$j^2$  is a worm on the ratchet shaft  $j$ , which is placed horizontal, so as to obviate the necessity of friction bands and straps for holding the worm in place to drive the shaft K, which it does by engaging with its cog-wheel  $k$ . Shaft K has beveled gear  $o^3$ , that engages with



the beveled gear  $o^2$  on the shaft  $o^4$ , which shaft also carries the wheel P, that engages and drives the toothed flange or wheel A of the warp-beam. The relative sizes of these gear-  
 5 wheels  $o^2$   $o^3$  may be changed to increase or diminish the velocity of the warp-beam for making different kinds of cloth.

The devices operate thus: As the lathe-sword moves forward, the lever G by means  
 10 of the traverse is also drawn forward, and the rod H moves the lever-catch  $i$  so as to turn the ratchet-wheel. The length of the stroke of rod H, lever I, and catch  $i$ , is regulated by the height of the traverse, for as the  
 15 traverse is raised it moves farther from the pivotal point or fulcrum of the lathe-sword, and thus receives a greater motion, and to this increased stroke is added the increased movement of the lever G as the traverse nears its  
 20 fulcrum  $g'$ . The increased motion or stroke communicated to the rod H causes the catch  $i$  to move over more teeth at each stroke of the lathe-sword. The motion of the ratchet-wheel J is conveyed to the warp-beam, preferably as  
 25 above set forth, by means of a worm,  $j^2$ , driving a cog-wheel,  $k$ , which is connected to the flange or wheel A by the shafts, beveled gears, and cog-wheel above set forth. The height of the traverse and consequent speed of unwinding of the warp-beam is regulated thus: The  
 30 worm  $a'$  gives a very slow motion to the shaft B by engaging the cog-wheel  $b$ , and said shaft gives a slow motion, by worm  $b^3$ , to the cog-wheel C, and thus turns the shaft  $c$  and pinion C', which engages and raises the rack D.  
 35 Thus, when the warp-beam is full of yarn, to begin weaving in closely-woven cloth the traverse is placed nearly or quite at the bottom of the slots  $g^2$   $m^2$ , which causes the warp-beam to move very slowly, as the catch  $i$  will  
 40 then be caused to take up but one notch of the ratchet-wheel at a time; but as the warp is unwound the traverse is gradually raised by its connection with the gudgeon of the warp-beam, so that as the diameter and circumference of the warp-beam are diminishing its velocity is increasing in a corresponding ratio  
 45 through the catch, which at first caught each notch in the ratchet-wheel, being caused to take two, three, four, or more teeth at a time, as the traverse is raised and the warp unwound. Thus I have a perfect and accurate  
 50 let-off motion that is self-regulating without the use of springs, which so frequently get out of order. The worms  $a'$   $b^3$   $j^2$  all being upon  
 55 horizontal shafts, friction-straps, &c., to hold the

machinery in position, are unnecessary. The catch  $i$ , I place above the wheel J, which makes it positive in its action, and as the entire devices receive their power by means of connection to the lathe-sword I obviate all friction  
 60 on the yarn, and thus avoid breakage of the same. These simple devices can be regulated and adjusted to different kinds of cloth, so that when once started as desired they require no further alteration. 65

Having thus described the construction and use of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A warp-beam having a worm,  $a'$ , on the gudgeon thereof, combined with a movable  
 70 traverse, F, rack D, cog-wheels C C', the shaft  $c$ , and shaft B, having a worm,  $b^3$ , and cog-wheel  $b$ , substantially as and for the purpose set forth.

2. A let-off motion for looms, comprising a lathe-sword, a vibrating lever, a movable traverse, a ratchet-wheel, J, a rod, H, lever  $i^2$ ,  
 75 catch  $i$ , shaft  $j$ , which has a worm,  $j^2$ , shaft K, having the cog-wheels  $k$  O', shaft  $o^4$ , having wheels  $o^2$  P, a warp-beam having a toothed flange, A, and a worm,  $a'$ , on the gudgeon thereof, shaft B, having cog-wheels  $b$  and worm  $b^3$ , wheels C C', shaft  $c$ , and rack D, substantially as and for the purpose set forth. 85

3. A let-off motion for looms, composed of a lathe-sword having a slotted piece, M, a traverse, F, a lever, G, a rod, H, ratchet J,  
 90 lever  $i^2$ , having a catch,  $i$ , ratchet-shaft having a worm,  $j^2$ , wheels  $k$  P, and beveled gears  $o^2$   $o^3$ , shafts K  $o^4$ , a warp-beam having a toothed flange, A, and a worm,  $a'$ , on its gudgeon, shaft B, having wheel  $b$  and worm  $b^3$ , shaft  $c$ , having cogs C C', and rack D, all substantially as shown and described. 95

4. The combination of a warp beam having a toothed flange and a worm,  $a'$ , on the gudgeon thereof, a horizontal shaft having a cog-wheel,  $b$ , and worm  $b^3$ , a shaft,  $c$ , having cog-wheels C C', a rack, D, and attached traverse  
 100 F, and a lathe-sword with a lever, a rod, a ratchet-wheel, catch, and lever carrying said catch, a shaft having a worm, shafts having wheels and bevel-gear, substantially as shown and described. 105

In testimony whereof I affix my signature in presence of two witnesses.

ROBT. BROWN.

Witnesses:

S. A. HAZELTINE,  
 J. D. VAN BIBBER.