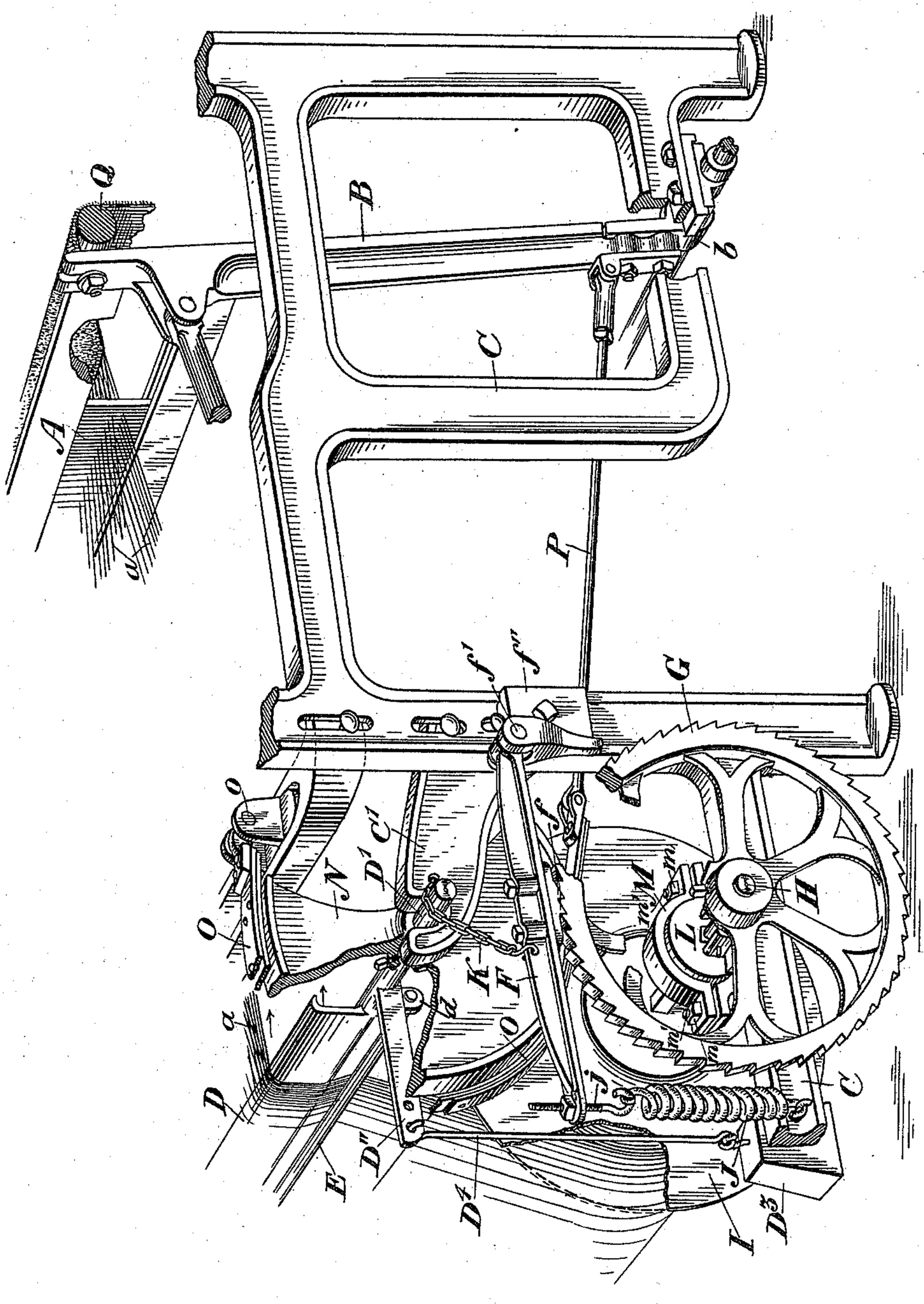
(No Model.)

# W. TALBOT.

## LET-OFF MECHANISM FOR LOOMS.

No. 537,867. Patented Apr. 23, 1895.

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# UNITED STATES PATENT OFFICE.

WILLIAM TALBOT, OF TORONTO, CANADA, ASSIGNOR OF ONE-HALF TO JAMES PETER MURRAY, OF SAME PLACE.

## LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 537,867, dated April 23, 1895.

Application filed April 25, 1894. Serial No. 509,043. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM TALBOT, master mechanic, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Let-Off Mechanism for Looms, of which the following is a specification.

This invention relates to certain new and useful improvements in carpet looms and relates more particularly to a means for effecting a positive and uniform tension on the warp threads without reference to the quantity of thread on the warp beam so that a carpet of even weight may be produced as a result of this tension; and the invention consists essentially of rigidly mounting a ratchet wheel on the end of the spindle of the warp beam and pivotally connecting to the frame of the loom a spring operated dog which is designed to normally engage with the teeth of the ratchet wheel and also connecting the dog with the spindle of the whip roll by means of a chain which is adapted to be partially wound upon the spindle of the whip roll during the operation of the machine in order that the teeth of the dog may be lifted out of engagement with the teeth of the ratchet wheel and the spindle of the warp beam to let off the warp threads; and also of an arm connected to or forming part of the spindle of the whip roll and extending outwardly therefrom and from which is suspended a weight to counteract the tension of the warp threads during their passage from the warp beam over the whip roll to the web beam; and also in providing the spindle of the warp beam with a friction device which will arrest the rapid revolution of the warp beam while the teeth of the dog are disengaged from the teeth of the ratchet wheel; the whole device being hereinafter more fully set forth and more particularly pointed out in the claims.

The drawing represents a perspective view of a portion of a carpet loom exhibiting parts involved in this invention.

A represents the reed of the loom supported and carried by the lathe, the sword B of which is pivoted at *b* to the lower portion of the frame C. Connected to each side of the rear of the frame C are brackets C′ and journaled in the brackets C′ is the spindle D′ of the whip roll D. Connected to the spindle D′ of the whip roll D are two lugs *d* in which is mounted the tension rod E rigidly connected to the spindle D′, and located one at either end of the whip roll D are two outwardly extending arms D″. A weight $D^3$ is suspended from each of the arms D″ by means of a rod $D^4$. A dog F provided with two teeth *f* is pivoted at *f′* to the bracket *f″* which is rigidly connected to the frame C. Connected to the frame C below the dog F is one end of a spiral spring J while the opposite end of the spiral spring J is connected to an adjustable hook *j* extending through the outer end of the dog F. The normal tendency of the spiral spring J is to draw downward the said outer end of the said dog to bring the teeth *f* of the dog F into engagement with the teeth of the ratchet wheel G. The ratchet wheel G is rigidly mounted on the end of the spindle H of the warp beam I. Connected to the dog F at or about the middle thereof is one end of a chain K while the other end of the said chain extends partially around spindle D′ of the whip roll and is securely fastened thereto.

During the operation of the machine the tension of the warp threads draws the whip roll in the direction indicated by arrow and causes a partial revolution of the spindle D′ of the whip roll D. The partial revolution of the spindle D′ causes the chain K to be partially wound on the said spindle so that the dog F will be lifted to disengage the teeth *f* from the teeth of the ratchet wheel G and allow of the unwinding revolution of the ratchet wheel G and spindle H. Rigidly mounted on the spindle H is a friction collar L, made of wood, iron or other material (but made preferably of wood). Surrounding the collar L is a divided strap M, the sections of which are connected together by means of bolts and nuts *m′* and *m* respectively, the lower section of the divided strap M being secured to the frame of the loom. By means of the bolts and nuts *m′* and *m* the diameter of the strap can be increased or diminished to respectively diminish or increase the friction on the collar L.

Rigidly mounted on the spindle D′ of the whip roll D is a sector N and pivoted to the

frame C is one end *o*, of a brake shoe O. The brake shoe O extends around the sector N and the opposite end of the brake shoe O is connected to the lathe sword B by a pitman P. The brake shoe O holds the sector N during one portion of the movement of the lathe sword B.

Wound on the warp-beam I are the warp threads *a* which pass from the warp beam I under the tension rod E over the whip roll D and through the reeds A to the cloth beam Q.

Having described the principal parts involved in this invention I shall now proceed to describe the operation and the advantages arising from the use of the improvements.

The ratchet wheel G it will be remembered is rigidly mounted on the spindle H of the warp beam I and the unwinding revolution of the warp beam I and spindle H is prevented until the teeth of the dog F are disengaged from the teeth of the ratchet wheel G. When the whip roll D has been moved in the direction indicated by the arrow the spindle D′ of the whip roll D is partially turned to partially wind the chain K on the said spindle D′ and lift the dog F sufficiently to disengage its teeth *f* from the teeth of the ratchet wheel G. When the teeth *f* of the dog F have been disengaged from the teeth of the ratchet wheel G then the ratchet wheel G, the spindle H and the warp beam I are free to turn. The tension of the warp threads *a* as the carpet is wound on the cloth beam Q is sufficient to move the whip roll D into a forwardly inclined position. This position of the whip roll D may if desired be reached every third stroke of the lathe and it is when the whip roll D is in its forwardly inclined position that the dog F is lifted to disengage the teeth *f* from the teeth of the ratchet wheel G. The whip roll D during its return from its forwardly inclined position to its upright position draws on the warp threads *a* and causes the unwinding revolution of the warp beam I, the spindle H and the ratchet wheel G. When the whip roll D has returned to upright position the dog F is drawn back into its normal position and its teeth *f* engage with the teeth of the ratchet wheel G. The normal tendency of the spring J is to draw downward the outer end of the dog F so that a quick return of the teeth *f* into engagement with the teeth of the ratchet wheel may be effected. To regulate the tension of the spring J on the dog F the adjustable hook *j* is connected to the dog F and by lengthening or shortening the hook *j* the tension of the spring J can be respectively diminished or increased as required. It is by means of the weight $D^3$ that the quick return of the whip roll D from its forwardly inclined position to upright position shown in the drawings is effected and the weight $D^3$ counteracts to a large extent the tension of the warp threads *a* on the whip roll D, and also holds the whip roll D at all times firmly against the warp threads so that the said warp threads will be kept perfectly taut from the top of the whip roll D to the reeds A. To prevent the possibility of more than the required quantity of warp thread unwinding from the warp beam I, during the disengagement of the teeth *f* on the dog F from the teeth of the ratchet wheel G, I provide a friction collar L and friction strap M. The friction collar L and friction strap M prevent the free revolution of the spindle H and yet allow the spindle H to be turned to unwind sufficient warp threads to allow the whip-roll D to return to its normal position.

In order to further facilitate the making of a carpet of uniform weight throughout I provide as hereinbefore described the sector N, and brake shoe O, which are operated immediately upon the forward movement of the lathe-sword and reed so that the whip-roll is held stationary during the period that the weft-threads are being forced home into the main body of the web.

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

1. In a loom, a means for effecting a tension on the warp threads, consisting of the warp beam, a whip-roll, a ratchet-wheel mounted on the spindle of the warp-beam, a dog pivotally connected to the frame of the loom normally engaging with the ratchet-wheel, and the chain connecting the dog with the spindle of the whip-roll for lifting the dog from engagement with the ratchet-wheel during the partial revolution of the said spindle, substantially as specified.

2. In a loom, a means for effecting a tension on the warp-threads, consisting of the combination of the warp-beam, a ratchet-wheel mounted on the spindle of the warp-beam, a spring-operated dog pivotally connected to the frame of the loom and normally engaging with the teeth of the ratchet-wheel, the whip-roll, weighted arms rigidly connected to the whip-roll to hold it in and return it to normal position, a chain between the spindle of the whip roll and the dog to intermittently lift the dog out of engagement with the ratchet-wheel, substantially as specified.

3. In a loom, a means for effecting a tension on warp-threads, consisting of the combination of the warp-beam journaled to the loom-frame, a ratchet-wheel mounted on the spindle of the warp-beam, a dog pivotally mounted to normally engage with the ratchet-wheel, a spring to hold the dog in engagement therewith, the whip-roll, a chain having one end connected to the spindle of the whip-roll and the other to the spring-actuated dog to intermittently lift the dog from engagement with the ratchet-wheel, a sector on the spindle of the whip-roll, a brake on the sector, the lathe sword, and a pitman connection between the brake and the lathe-sword, substantially as and for the pupose specified.

4. In a loom a means for effecting a tension in the warp threads, consisting of the combination of the warp-beam, the spindle of the

warp-beam, a ratchet-wheel mounted on the spindle of the warp-beam I, a spring operated dog pivotally connected to the frame of the loom normally engaging with the teeth of the ratchet wheel, the whip-roll, a connection between the whip-roll and spring-operated dog to intermittently lift the dog out of engagement with the ratchet-wheel during the operation of the loom, a tension-rod connected to the whip-roll and means for automatically returning the whip-roll to its normal position during the disengagement of the dog from the ratchet wheel, a brake for the spindle of the warp-beam to prevent its rapid revolution during the disengagement of the said dog from the said ratchet-wheel, substantially as specified.

5. In a loom, the combination with the whip-roll and warp-beam, of a ratchet-wheel secured on the end of the spindle of the warp-beam, a pivoted spring-operated dog engaging the ratchet wheel a chain to connect the dog to the spindle of the whip roll, and a friction-brake acting on the warp-beam spindle; substantially as specified.

6. In a loom, the combination with the whip-roll having an arm, and the warp-beam, of a ratchet-wheel secured on the end of the spindle of the warp-beam, a spring operated dog, a chain-connection between the dog and the spindle of the whip roll, a friction-brake acting on the warp beam spindle, and a weight attached to the arm of the whip roll substantially as specified.

7. In a loom, the combination with the whip-roll, the tension-rod E rigidly connected to the spindle of the whip-roll, and the warp-beam I, of the ratchet-wheel G, mounted on the spindle of the warp-beam, a spring-operated dog F, provided with teeth to engage the ratchet-wheel, and pivotally mounted on its support, a chain K connected to the dog and passing partially around the spindle of the whip-roll, the friction-collar L fixed on the spindle of the warp-beam, the divided friction-strap M on the friction collar, clamping means to adjustably hold the friction-strap on the collar, arm $D^2$ connected to the spindle of the whip-roll, and a weight $D^3$ suspended from the arm $D^2$, substantially as specified.

8. In a loom, the combination with the whip-roll and warp-beam, of the ratchet-wheel G mounted on the spindle of the warp-beam, the dog F hinged to the frame of the machine and provided with teeth to engage the teeth of the ratchet wheel, a chain K connecting the spindle of the whip-roll and the dog F, an arm $D^2$ on the whip-roll and having a weight $D^3$ connected therewith, the adjusting-hook *j* in the free-end of the dog, the spring J connected at its upper end to the hook *j* and at its lower end to the frame of the loom, the sector M secured on the end of the whip-roll, a brake-shoe bearing on the sector, the lathe-sword B, and the pitman-rod P between the lathe-sword and the brake-shoe, whereby the brake is drawn into engagement with the periphery of the sector in the forward movement of the lathe-sword, substantially as specified.

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Witnesses:
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