

No. 715,391.

Patented Dec. 9, 1902.

J. H. KLERX.

MECHANISM FOR CONTROLLING LOOMS BY THE QUANTITY OF WEFT IN THE SHUTTLES.

(Application filed Sept. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

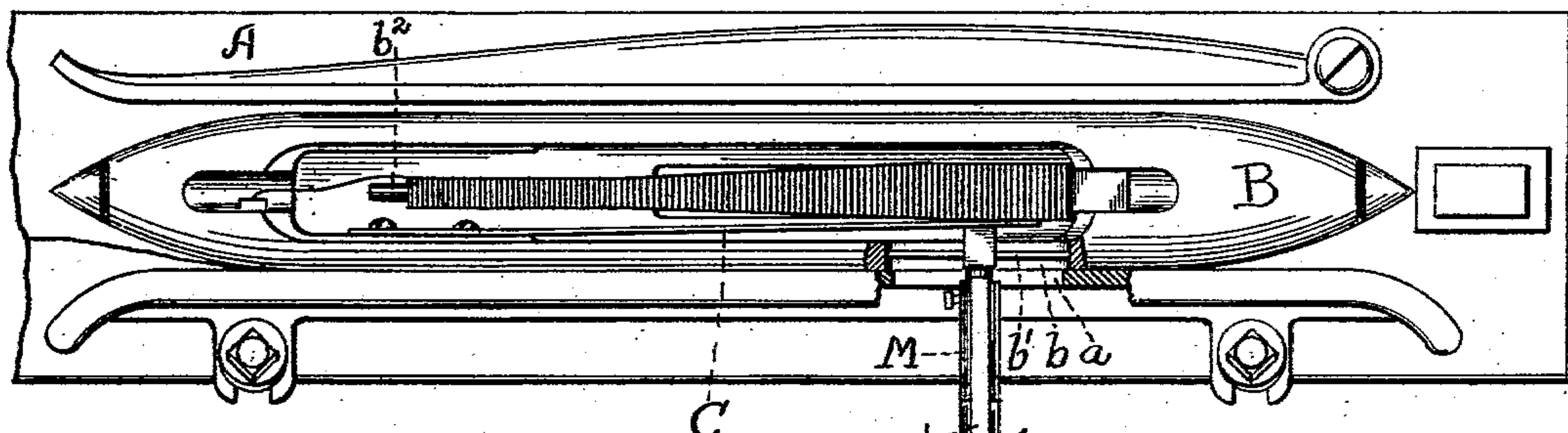


Fig. 3

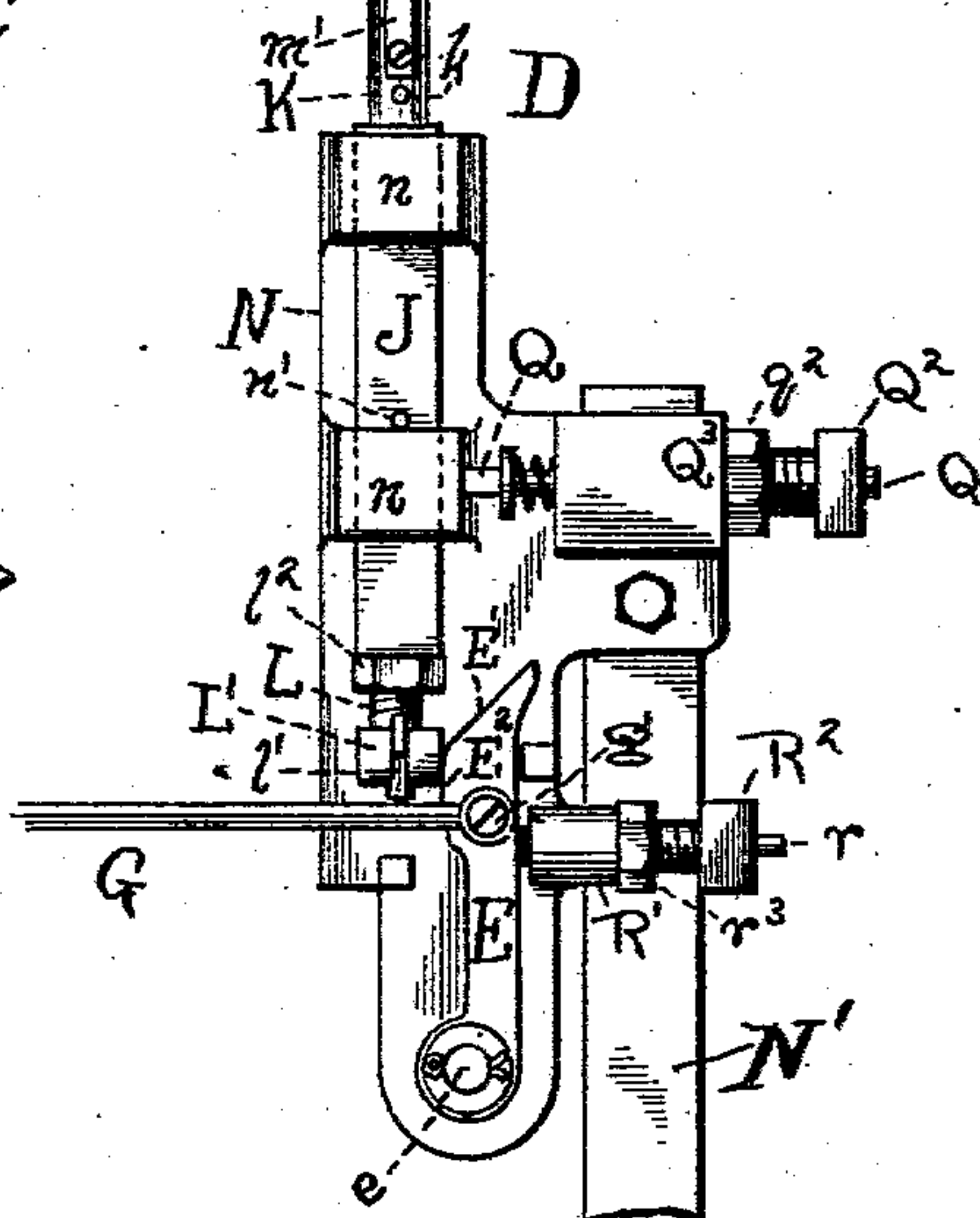
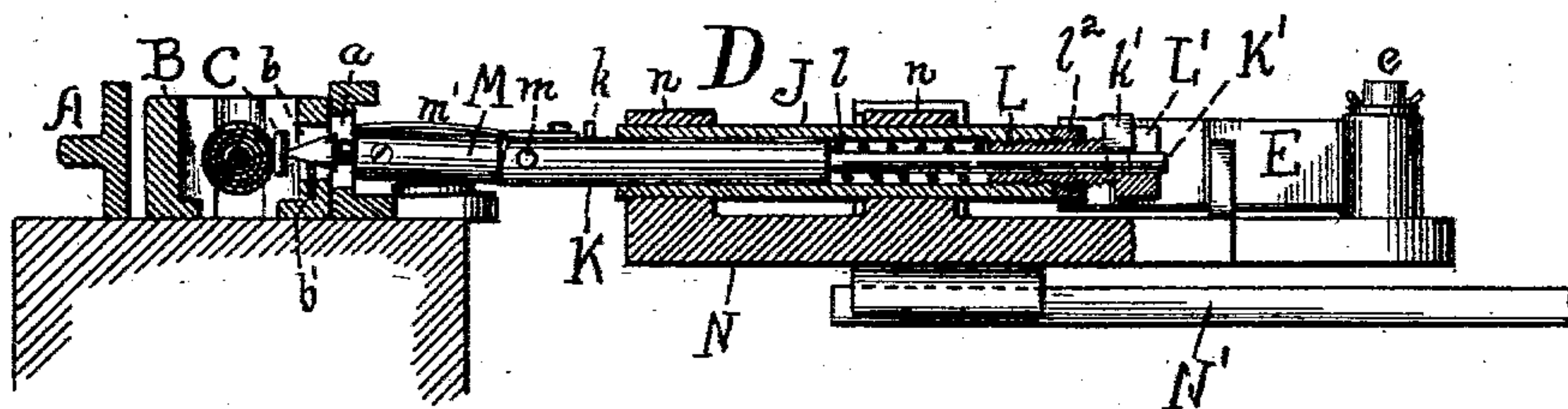


Fig. 2



WITNESSES:

Harry Goss.
Donald Campbell

INVENTOR

Johann H. Klerx

BY

Dickerson Brown & Shaffer
ATTORNEYS

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Fig. 4

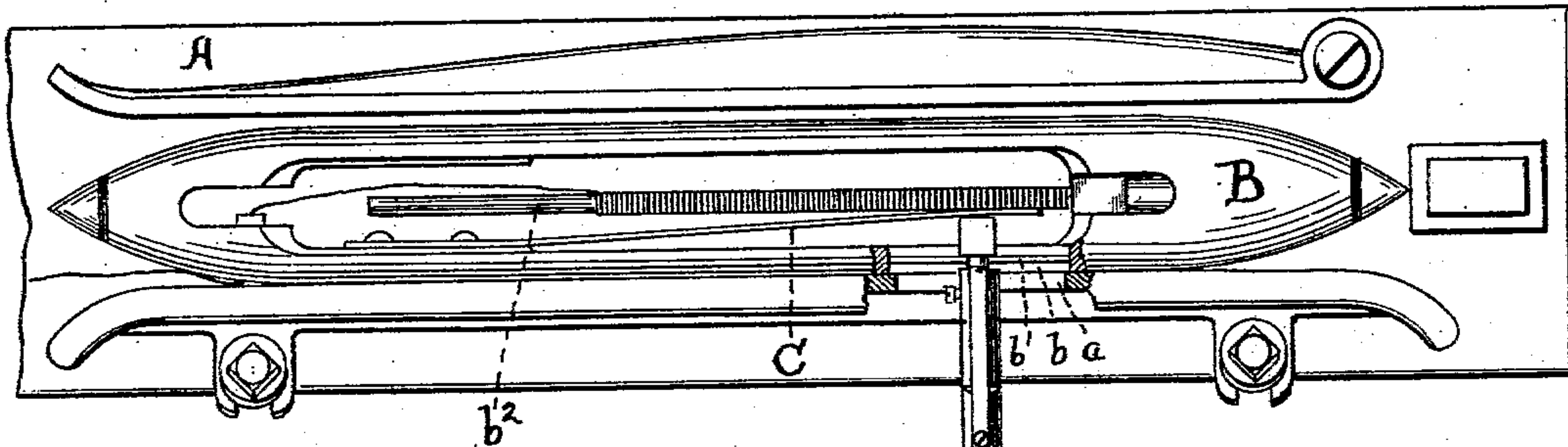


Fig. 6

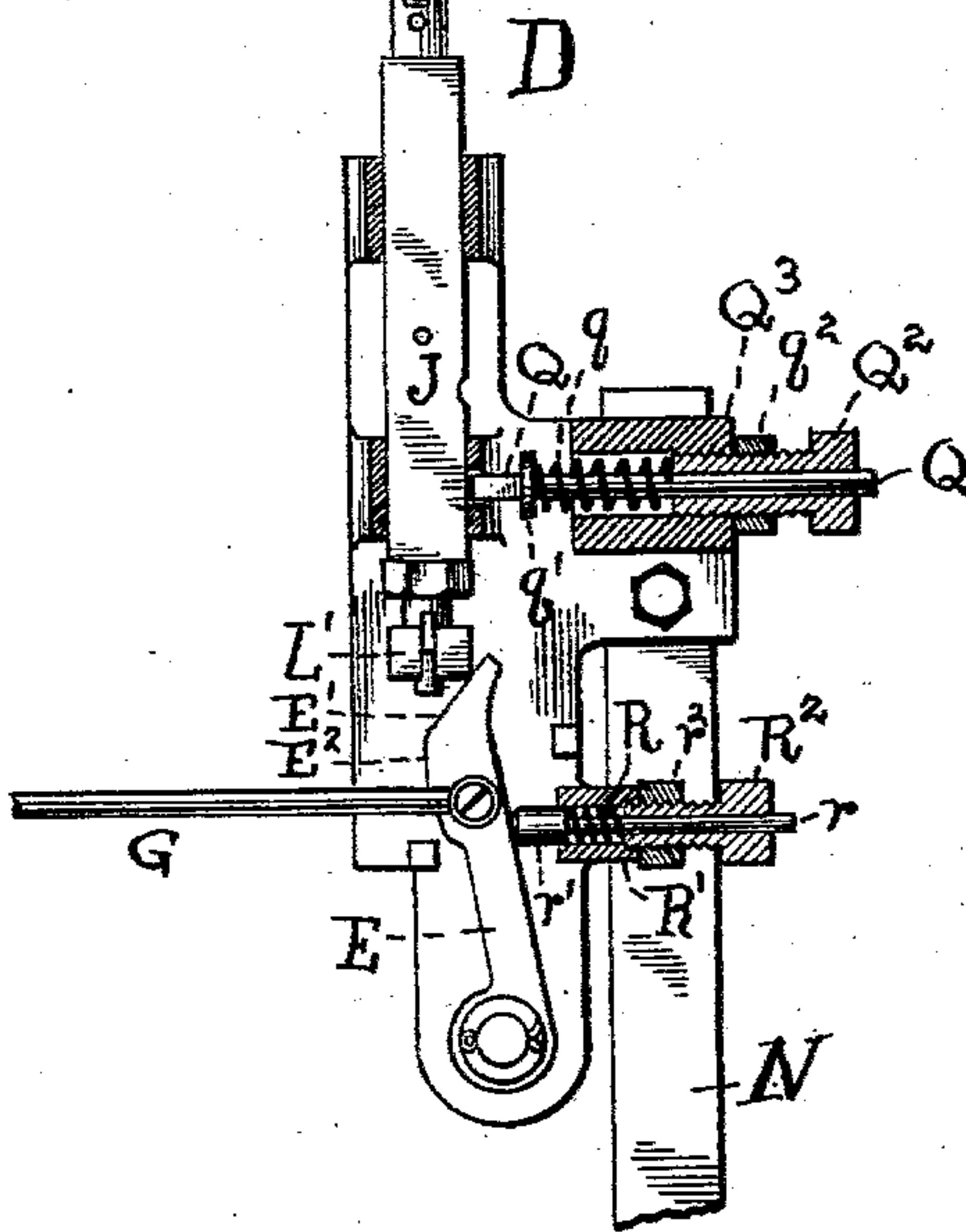
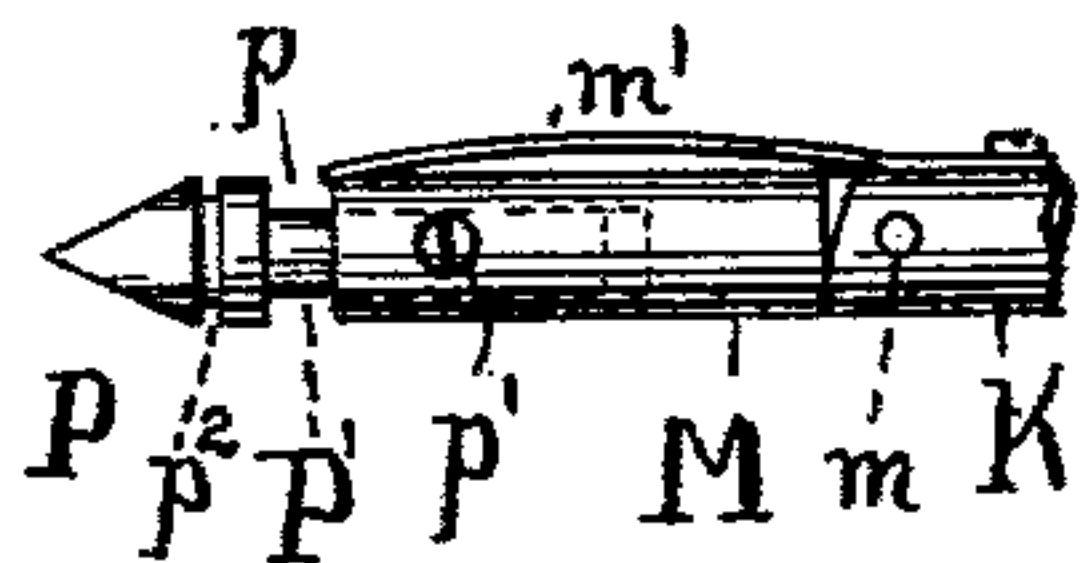
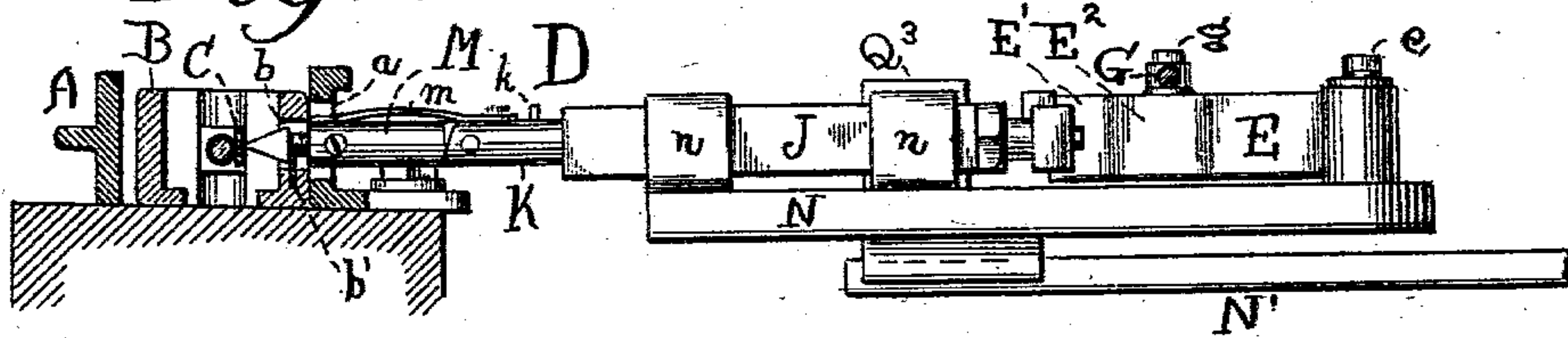


Fig. 5



WITNESSES:

Harry A. Goss.
Donald Campbell

INVENTOR

Johann H. Klerx

BY *Dickinson Brown*
Rogner
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHANN HEINRICH KLERX, OF SUNBURY, PENNSYLVANIA, ASSIGNOR TO
SUSQUEHANNA SILK MILLS, OF SUNBURY, PENNSYLVANIA, A CORPO-
RATION OF PENNSYLVANIA.

MECHANISM FOR CONTROLLING LOOMS BY THE QUANTITY OF WEFT IN THE SHUTTLES.

SPECIFICATION forming part of Letters Patent No. 715,391, dated December 9, 1902.

Application filed September 20, 1901. Serial No. 75,836. (No model.)

To all whom it may concern:

Be it known that I, JOHANN HEINRICH KLERX, of Sunbury, Pennsylvania, have invented a new and useful Improvement in
5 Mechanism for Controlling Looms by the Quantity of Weft in the Shuttles, of which the following is a specification.

My invention relates to mechanism for controlling a loom by the quantity of weft in
10 a shuttle thereof, and more particularly to mechanism intended for effecting or bringing about the operation of a loom stop mechanism or a weft-supplying mechanism upon the failure or substantial exhaustion of the weft.

15 In a prior application, filed May 22, 1901, resulting in Patent No. 689,550, dated December 24, 1901, I have illustrated a mechanism for a similar object and over which the present device may be said to constitute an ad-
20 vance.

I will describe a mechanism embodying my invention and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is
25 a top view of a mechanism embodying my invention, showing also a shuttle-box and shuttle. Fig. 2 is a side view, partly in section, showing the same parts and in the same position as in Fig. 1. Fig. 3 is a side view of
30 the right-hand end of the shuttle shown in Fig. 1. Figs. 4 and 5 are views corresponding to Figs. 1 and 2, with the parts in a different position. Fig. 6 is a detail-view illustrating a slightly-modified device for engag-
35 ing the shuttle.

Similar letters of reference designate corresponding parts in all the figures of the drawings.

40 A designates one shuttle-box of a loom of a usual type and mounted, as usual, upon the lay. It is provided with an opening at *a* on that side which is toward the breast-beam of the loom.

B designates a shuttle, which may be of or-
45 dinary form, except that it is provided with a side opening *b*, corresponding to the opening *a* in the shuttle-box, and having a rib *b'* projecting upwardly from its lower surface. The upper portion of this rib may advanta-
50 geously be rounded or inclined at that side

which is toward the interior of the shuttle, and the rib will preferably be made of a metal plate. The spindle *b*² of the shuttle may be of ordinary form and is shown as hinged at one end of the body of the shuttle by means
55 of a pin, its hinged end fitting into a mortise in the shuttle-body, and the bottom of the mortise prevents the spindle from being swung down into the body of the shuttle below a horizontal position. As usual, a spring may
60 be employed for holding the spindle in a horizontal position, but so as to permit it to be swung upwardly when necessary.

C designates a detector or feeler secured within the body of the shuttle and in such
65 manner as to be free to swing toward and from the spindle *b*² of the shuttle. I preferably employ spring-action tending to move the detector one way or the other. For this purpose I have for convenience made the detector re-
70 silient for some portion of its length and fastened it, as by screws, at that end which is farthest from the opening *b* in the shuttle sides.

Mechanism hereinafter to be described is employed to act periodically upon the detec-
75 tor to press it toward the filling or weft upon the spindle in the shuttle B, the quantity of filling or weft determining or controlling the movement of the detector by limiting the ex-
80 tent of its inward movement.

As the filling or weft is exhausted in weaving the innermost position or limit of move-
ment of the detector C advances progressively toward the spindle. The purpose of
85 the detector is to bring about or control the operation of mechanism for replenishing fill-
ing or weft when the supply upon the spindle *b*² is exhausted to a predetermined extent or to bring about the operation of a loom stop
90 mechanism.

D designates what will hereinafter be termed for convenience an "engaging" de-
vice, and it is adapted to constitute a hook or catch for the purpose of engaging the rib
95 *b'* of the shuttle B.

In this particular example of my invention the engaging device D is shown to consist of an outer sliding part J, hollow, and with
which are combined the following parts: K represents an inner sliding bar engaging the
100

part J, with which is also engaged the screw-threaded sleeve L, having the head L', and bored out for the reception of the rod K', integral, preferably, with K. Within J and intermediate of sleeve L and bar K is a spring l , operating to force K outwardly or toward the lay. k' represents a stop mounted on rod K' and fitted into the slotted part l' of sleeve L and its head L', the stop k' permitting the bar K to slide inwardly from the normal position illustrated, but preventing movement in the other direction. A lock-nut l^2 on sleeve L serves to fix the sleeve in place when properly adjusted, so that it is, in effect, integral with the part J. A stop-pin k on bar K limits its inward movement, so that its sliding within the part J is limited to a reciprocation between the stops k and k' . On the outer end of bar K, pivoted at m , is an extension M, adapted normally to take a horizontal position, but movable upward against the resistance of a spring m' intermediate of bar K and extension M. (See more particularly Fig. 6.) The outer end of extension M is receded and provided with a set-screw p' for the reception and retention of the shank P' of a catch or hook P, whose front edges are inclined, and having a shoulder p , adapted to hook or catch upon the rib b' of the shuttle and formed either as in Figs. 1, 2, 4, and 5 or by means of the groove p^2 , Fig. 6.

The part J is fitted to slide in the following manner: Upon a plate N, suitably attached to a fixed part N' of the loom, are bearings n , in which the part J slides. A stop-pin n' on J abuts against one bearing n to limit the movement of part J away from the lay. To prevent too much play of the parts J in the bearing n farthest from the lay, the bearing is provided with a block Q, passing through an aperture in the side of the bearing and pressed into contact with part J by means of a spring q , (see particularly Fig. 4,) acting upon a collar q' , located upon a sliding rod Q', which carries also the block Q. The rod Q' slides within a threaded sleeve Q², which is supported and adjusted in a standard Q³ and secured or locked by means of nut q^3 .

Combined with the engaging device D and adjacent the head L', connected so as to move with the part J thereof, is a lever E, fulcrumed upon a pin e , rising from the plate N. The lever E is thus free to swing horizontally. At its end which coacts with the engaging device D this lever is provided with a bearing-surface adapted to engage the head L', the extreme portion of the bearing-surface being inclined longitudinally, as at E', so as to form a cam. The head L' is normally in contact with the other part of the bearing-surface, which, as shown at E², is approximately parallel with the direction of movement of the part J and head L'.

The lever E is for bringing about or controlling the operation of a filling or weft renewing mechanism or a loom stop or other mechanism, and for this purpose it is provided

with a connecting-rod G, pivoted at g to the lever E and extending to mechanism (not shown) for effecting the desired object. That the lever E may actuate the rod G when permitted by the movement of the head L' a spring R is provided, acting upon the lever E to press the lever against the head L'. (See Figs. 1 and 4.)

R' represents a standard supporting the spring R within a recess, the spring surrounding a rod r and acting upon the head r' of the rod to press it outwardly against the lever E. The usual threaded sleeve R² and nut r^2 serve to guide the rod r , and the spring R abuts against the sleeve R².

During the operation of the loom the reciprocation of the lay causes the detector C on each beat up to contact with the adjacent portion of the extension M of the bar K, that is fitted to slide to and fro within the part J of the engaging device D, and thereby move backward or against the resistance of the spring l , the bar K, and extension M thereof, the actual contact being made between the detector C and the hook or catch P when the latter extends through the opening in the shuttle side, as clearly illustrated in Figs. 1 and 4. The normal position of the engaging device is illustrated in Figs. 1 and 2, and in said figures the position of the lay is such as it would occupy when about to actuate the bar K, as described. When the lay recedes after beating up, the spring l will cause the bar K to move in the same direction as the lay until the normal position is again attained.

It will be understood that the shoulder p of the hook P is adapted to catch or hook upon the rib b' of the shuttle B, but that when during the running of the loom the shuttle is well supplied with filling or weft, as shown in Figs. 1 and 2, the pressure of the filling or weft prevents the engagement by preventing the hook or catch P entering sufficiently into the shuttle to allow its shoulder to drop within the rib b' , and it will be seen that the detector C is a mere convenience and not necessary, as the weft may act directly upon the nose of the catch or hook P, which for convenience is made pointed, but may be blunt or rounded, if desired. It will also be seen that a controlling feature is the distance between the nose of the catch or hook P and the shoulder p thereof, since if this distance be decreased the engagement of shoulder p and rib b' will take place at an earlier stage in the exhaustion of the weft, and this distance should be so arranged that such engagement may take place when there is but one layer of weft remaining upon the spindle or, if desirable, where there is no weft remaining adjacent to the hook or catch P or where there are two or more layers or other amount, this depending upon circumstances. To permit when desirable a regulation of the distances between the nose of the catch or hook P and its shoulder p , I have caused the catch to be removable from the part M that

another size may be substituted, and the catch may thereby also be set and clamped in the proper position in the part M.

When the filling or weft is exhausted to the predetermined point, on the next beat up of the lay the hook or catch P will enter the shuttle B sufficiently to permit the shoulder *p* dropping down over and engaging the rib *b'* on the shuttle, thereby catching or hooking the bar K to the shuttle. When the lay again recedes, it will carry with it not only the hook P, but the bar K and of necessity the part J and the head L' of the sleeve L, all the parts being comprised in the engaging device D. This state of affairs is illustrated in Figs. 4 and 5. The movement of the head L', which is in engagement with the cam-surfaces E' and E² of the lever E, permits the latter to be swung to its full extent under the influence of spring R, as shown in Fig. 4, and thereby, through the rod G, bringing about or controlling the operation of a filling changing or renewing mechanism or a loom stop or other mechanism. After the reverse or receding motion of the lay is continued sufficiently the further movement thereof will cause a disengagement of the lay or shuttle from the engaging device D. This will be facilitated because of the rounded or inclined inner edge or side of the rib *b'*, or a more or less resilient character may be given it for that purpose. The purpose of said rib is to afford attachment between the hook or catch P and the lay, so that the former may be moved at proper times with the latter, and therefore the rib must be connected with some part of the lay to vibrate with the lay. I have shown the rib *b'*, as well as the detector C, mounted on the shuttle, which momentarily forms part of the lay, this being the preferred arrangement. On the succeeding beat of the lay after a fresh supply of filling or weft or a fresh shuttle has been properly substituted for the exhausted one the detector C will strike the catch P, thereby actuating and returning to normal position the so-called "engaging" device D, thus constituting a convenient and preferred means to reset the parts in position for a new operation.

What I claim as my invention is—

1. In a loom the combination of a part vibrating with the lay, an engaging device comprising a part normally stationary but adapted to be moved in unison with the lay, and a reciprocating part adapted to engage and be actuated by said part vibrating with the lay, the said engagement being controlled by the quantity of weft in the shuttle; means comprised in said engaging device connecting said reciprocating part and said normally stationary part whereby when the weft is exhausted to a predetermined point, the said reciprocating part may effect a movement of said normally stationary part, and mechanism operated by the movement of said normally stationary part for bringing about or

controlling the operation of a suitable loom stopping or filling-renewing mechanism.

2. In a loom the combination of a part vibrating with the lay, an engaging device comprising a part normally stationary but adapted to be moved in unison with the lay, and a reciprocating part constructed to mechanically engage and be actuated by said part vibrating with the lay, the said engagement being controlled by the quantity of weft in the shuttle; means comprised in said engaging device connecting said reciprocating part and said normally stationary part whereby when the weft is exhausted to a predetermined point, the said reciprocating part may effect a movement of said normally stationary part, and mechanism operated by the movement of said normally stationary part for bringing about or controlling the operation of a suitable loom stopping or filling-renewing mechanism.

3. In a loom the combination of a part vibrating with the lay, an engaging device comprising a part normally stationary but adapted to be moved in unison with the lay, and a reciprocating part constructed to mechanically engage and be actuated by said part vibrating with the lay; a movable detector, intermediate the reciprocating part and the weft in the shuttle, and adapted to contact the weft, for controlling the engagement of said reciprocating part and the part vibrating with the lay; means connecting said reciprocating part and said normally stationary part whereby when the weft is exhausted to a predetermined point, the said reciprocating part may effect a movement of said normally stationary part, and mechanism operated by the movement of said normally stationary part for bringing about or controlling the operation of a suitable loom stopping or filling-renewing mechanism.

4. In a loom the combination of a part vibrating with the lay, an engaging device comprising a part normally stationary, but adapted to be moved to and from the lay, and a catch or hook adapted to engage and be actuated by said part vibrating with the lay, the said engagement being controlled by the quantity of weft in the shuttle, means comprised in said engaging device connecting said catch or hook and said normally stationary part whereby when the weft is exhausted to a predetermined point, the said hook or catch may effect a movement of said normally stationary part, and mechanism operated by the movement of said normally stationary part for bringing about or controlling the operation of a suitable loom stopping or filling-renewing mechanism.

5. In a loom, the combination of a part carried by the shuttle and vibrating with the lay, an engaging device comprising a slide, and a catch or hook movable in harmony with the lay and adapted to engage and be actuated by said part vibrating with the lay, means car-

ried by the shuttle whereby the engagement of said part and said catch or hook is controlled by the quantity of weft in the shuttle, means comprised in said engaging device intermediate of said catch or hook and said slide whereby when the weft in the shuttle is exhausted to a predetermined point the said hook or catch may bring about a movement of said slide, a lever for controlling or bringing about the operation of a loom stopping or filling-renewing mechanism, and means operated by said slide for actuating said lever.

6. In a loom the combination of the rib *b'* vibrating with the lay, the hook or catch *P* for engaging said rib, the engaging device *D* comprising the slide *K* moving with said hook or catch, and the slide *J* coacting with slide *K*, and the lever *E* coöperating with the engaging device *D* substantially for the purpose described.

7. In a loom the combination with two reciprocating members, of means carried by the lay for reciprocating the first of two members, means including a cam-faced member controlled by the second member for operating a loom stopping or weft-renewing mechanism and means whereby the said second member is engaged and actuated by the said first member when the weft in the shuttle is exhausted to a predetermined point.

8. In a loom the combination with two members fitted to reciprocate in parallel directions, of means vibrating with the lay for reciprocating the first member, means controlled by the second member for operating a loom stopping or weft-renewing mechanism, and means whereby the said second member is actuated by the said first member when the weft in the shuttle is exhausted to a predetermined point.

9. In a loom, the combination with two reciprocating members, of means carried by the lay for reciprocating the first of the two members, a part carried by the lay for engaging said first member to draw it out of normal position when the weft in the shuttle is exhausted to a predetermined point, means controlled by the second member for operating a loom stopping or weft-renewing mechanism, and means whereby the said second member is engaged and actuated by the said first member when the said first member is drawn out of normal position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN HEINRICH KLERX.

Witnesses:

PAUL N. WENRICH,
PETER S. GASS.