

No. 775,888.

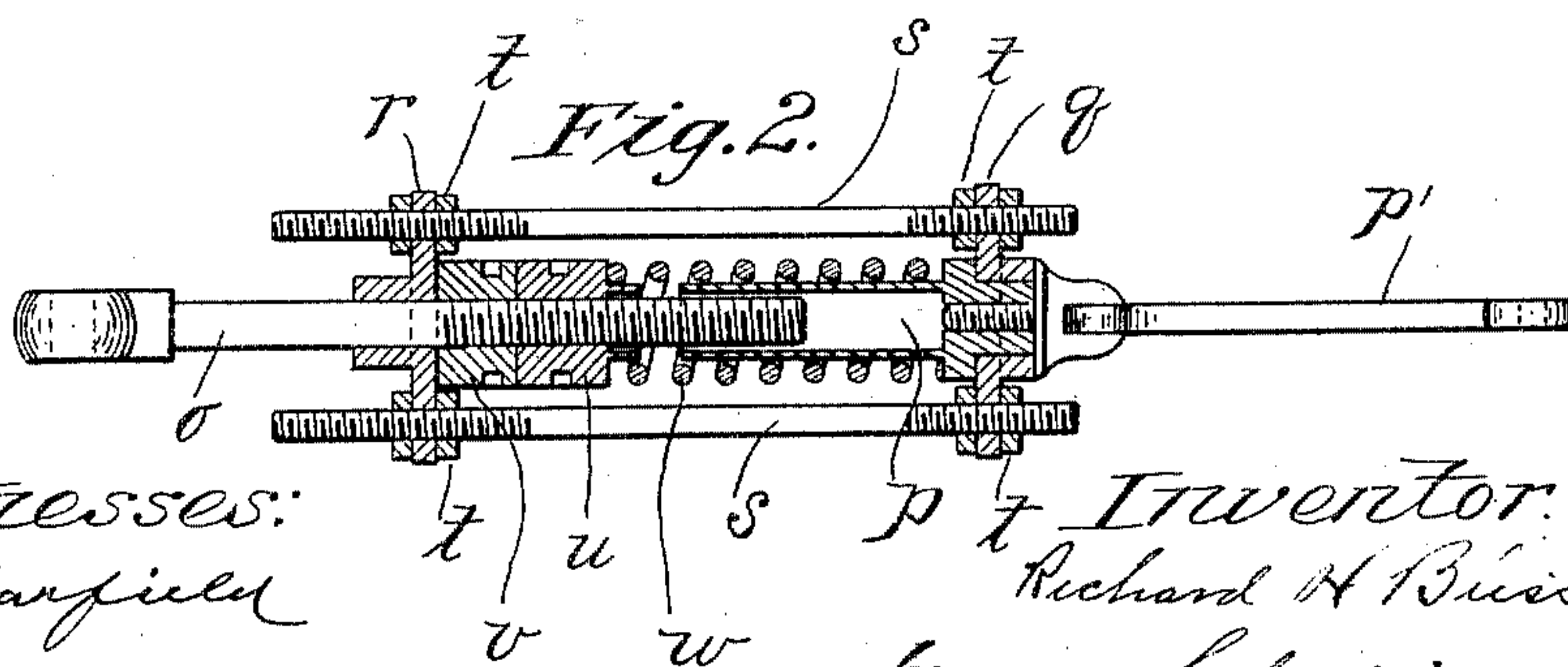
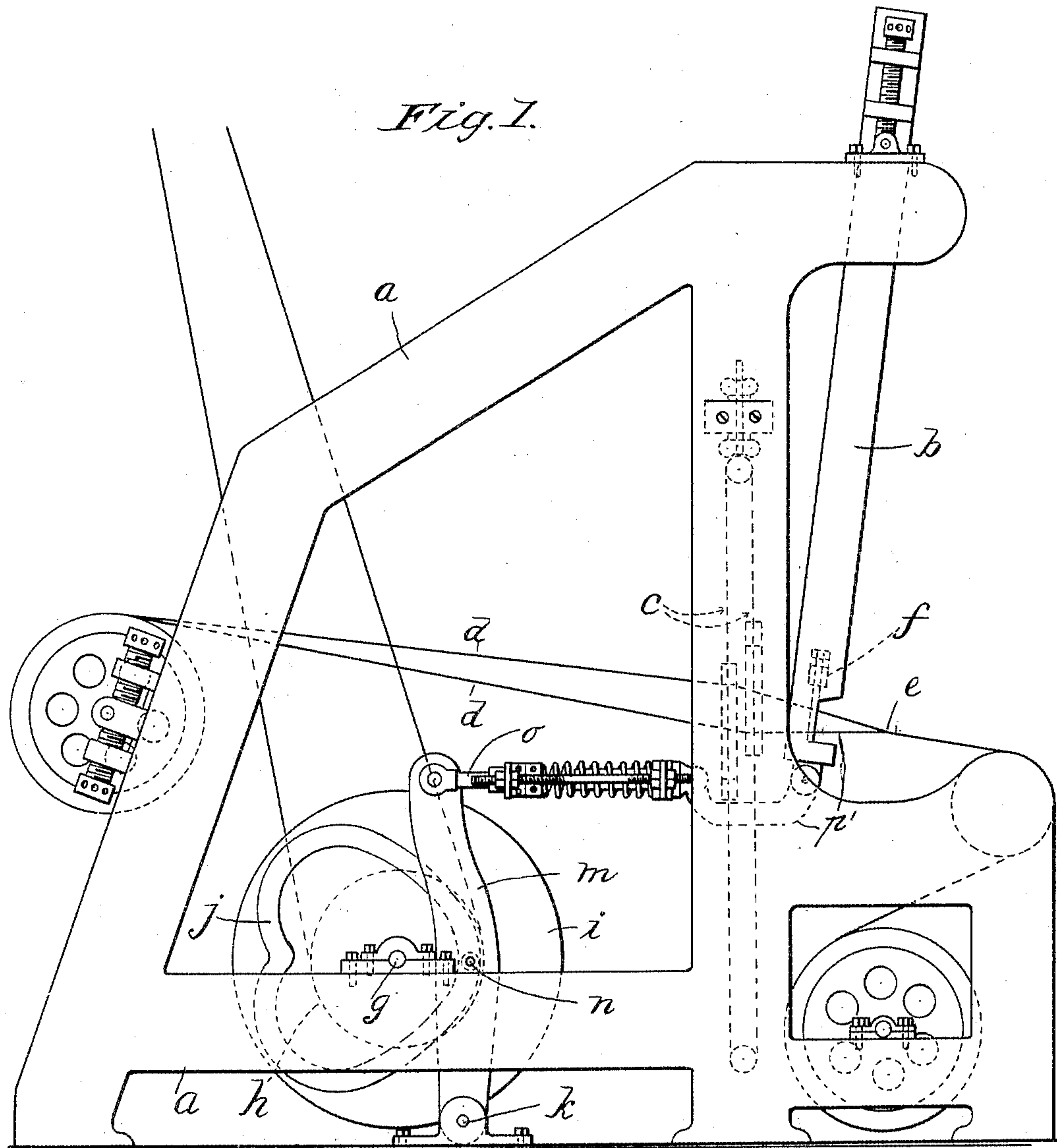
PATENTED NOV. 22, 1904.

R. H. BLISS.

WIRE WEAVING LOOM.

APPLICATION FILED OCT. 10, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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WIRE-WEAVING LOOM.

SPECIFICATION forming part of Letters Patent No. 775,888, dated November 22, 1904.

Application filed October 10, 1902. Serial No. 126,697. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. BLISS, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Wire-Weaving Looms, of which the following is a specification.

This invention relates to an improvement in looms, and has special relation to looms employed in the weaving of wire fabrics, such as wire-cloth for paper-machines.

As is well known, no means have yet been devised for weaving wire-cloth fabrics automatically which will produce a cloth equal in quality to the fabric woven on a hand-operated loom.

One of the principal reasons why the mechanically-woven fabric is inferior is because it has been found impossible thus far to devise a beating-up mechanism for the lay-beam which can successfully imitate the peculiar action imparted to the lay-beam by hand, which is a sort of a double beat, the second of the two movements being relatively slight as compared with the impact of the first movement against the filler-wire.

By means of the invention forming the subject of this application I believe that the hand movement imparted to the lay-beam has been more closely approximated than heretofore; and the invention consists in providing some suitable mechanism, as a cam, to impart the necessary reciprocatory movements to the lay-beam to beat up the fabric and in interposing a connection between said mechanism and the lay-beam which is endwise yielding, whereby after the lay-beam has reached the batten-point the impact thereof will cause it to rebound against the spring which constitutes the above-referred-to yielding connection, the reaction of which spring will send the lay-beam forward again with reduced force against the fabric at the batten-point, and this return movement, as well as the primary movement, being imparted to the lay-beam through the referred-to yielding connection, imitates very closely the yielding movement imparted to the lay-beam by the arm of the operator.

In the drawings forming part of this application, Figure 1 is a side elevation of a wire-weaving loom, showing such parts thereof as are necessary to illustrate my invention. Fig. 2 is an enlarged horizontal plan view of the yielding connection interposed between the cam and the lay-beam of the loom.

It may be here remarked that the yielding connection shown between the lay-beam and the cam is very considerably enlarged for the sake of clearness.

Referring now to the drawings, *a* indicates the frame of a loom; *b*, the lay-beam, the harness being shown in dotted lines only and indicated by *c*. *d* indicates the wires constituting the warp of the fabric, and *e* the batten-point of the latter.

It has not been considered necessary to show the shuttle, as it is the same as used in this art everywhere.

In dotted lines the reeds *f* are shown at the lower end of the lay-beam as in their customary position. There may be mounted anywhere on the frame of the machine—as, for example, at the point shown in Fig. 1—a shaft *g*, having thereon a driving-pulley *h*, and on this shaft is a cam-wheel *i*, having cut in its side a cam-groove *j*, and pivotally supported, as at *k*, is an upstanding arm *m*, having thereon a stud *n* to engage with the cam-groove *j*, which stud is provided in the usual manner with a roller. The upper end of this pivoted arm *m* is substantially on a line horizontally with the lower end of the lay-beam and behind the latter. Between the upper end of the arm *m* and the lower end of the lay-beam and pivotally connected with each is the yielding connection or pitman. (Illustrated in Fig. 2.) This pitman consists, essentially, of two telescoping parts, *o* indicating one of said parts, which is attached to the arm *m*, and *p* indicating the other of said parts, which by means of a rigid extension *p'* is attached to the lay-beam. One of these parts is bored out to receive the other telescopically. In this instance the member *p* has been shown bored out at one end to receive the member *o*.

For the purpose of determining the limit

of the movement of these telescoping members away from each other they are adjustably united by means of a yoke-frame, which consists in a cross-head *q*, rigidly secured to the member *p*, and a cross-head *r*, having a sliding movement on the member *o*. These two cross-heads are united adjustably by the screw-threaded side bars *s*, these bars being provided with suitable nuts *t*, one being located on each side of each cross-head for each of said bars. That end of the member *o* which slides into the end of the member *p* is screw-threaded, a nut *u* being run onto said threaded end and provided with a check-nut *v* between it and the cross-head *r*, and between the nut *u* and the cross-head *q* there is interposed a coiled spring *w*, the expansive action of which tends to separate the two members *o* and *p* of the connection extending to the lay-beam.

In the drawings the forward end *p'* of the telescoping member *p* is shown as made of a separate piece; but this is only resorted to as a convenience in construction, it being fixedly attached to the member *p*. It is bent downwardly, as shown in Fig. 1, only to make the drawing consistent, as this downward bend is necessary to allow the proper vertical play to the heddles, the connection being attached to the center of the lay-beam instead of the ends.

By means of the nut *u* the tension of the spring *w* may be varied, and by means of the cross-heads *q* and *r* and the bars *s* the distance between the outer extremities of this yielding connection may be varied, whereby the reeds *f* may be so adjusted relative to the batten-point *e* of the fabric as to strike the latter with the desired force, and thus permitting also a change in the location of the batten-point relative to the breast-roll. This provision of means to vary the position of the batten-point permits the application of this device to looms already constructed, and as the distance between the heddles and the breast-rolls varies somewhat in looms of different makes it is essential that this yielding connection between the lay-beam and the arm *m*, by which the beam is operated, should be endwise adjustable. This adjustability is furthermore extremely advantageous in wire-weaving for the reason that some grades of woven-wire fabric require a harder beating up than others, and this effect may be attained by adjusting the length of the yielding connection between the lay-beam and the arm *m*, whereby the movement of the lay-beam will be arrested at the batten-point either at the extreme limit of forward movement of the lay-beam or at any point in its movement just prior thereto. In this way the beating-up effect may be made extremely delicate by adjusting the parts so that the contact takes place at the very termination of the forward movement of the lay-beam, in which case also the rebound movement will be proportionately light. Obvi-

ously the reverse of this adjustment will result in driving the lay-beam against the batten-point with increasing force.

It will be observed that the cam-groove *j* has been laid out to impart to the lay-beam two beating-up movements, after each one of which comes the second weaker movement imparted by the spring connections above described. These means for imparting the double movement to the lay-beam have been thus shown for the reason that it is generally necessary in wire-weaving to use this double movement. I have found in practice that the approximation to the hand movement obtained by the use of this yielding connection between the lay-beam and its operating mechanism is so close that I am able to do away entirely with the hand-operated lay-beam in weaving wire-cloth such as is used, for example, on paper-making machines and still maintain the quality of the fabric. This result to my knowledge has not been attained before.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a loom, a lay-beam, means for imparting a reciprocating movement to the latter, a yielding connection between the lay-beam and the moving means therefor, and means to adjust said yielding connection lengthwise.
2. In a loom, a lay-beam, mechanism, as a cam, for imparting reciprocatory movements to the latter, and a connection between said lay-beam and said moving mechanism, consisting of a suitably-supported spring, and means for adjusting said spring to vary its resistance to compression, together with adjusting means for said connection whereby the extent of the forward swinging movement of the lay-beam may be varied.
3. In a loom, a lay-beam and suitable reciprocating mechanism therefor, a yielding endwise adjustable connection between said lay-beam and its reciprocating mechanism consisting of a member attached to the lay-beam, and a member attached to said mechanism, a spring located between said members to normally press them in opposite directions, and adjusting means for said spring.
4. In a loom, a lay-beam and suitable reciprocating mechanism therefor, a yielding connection between said lay-beam and its reciprocating mechanism consisting of one member attached to the lay-beam, and another member attached to the said mechanism; an adjustable yoke-frame secured by one end to one of said members and having a sliding movement on the other member; a nut on one of said members, and a spring interposed between said nut and one end of said frame.

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