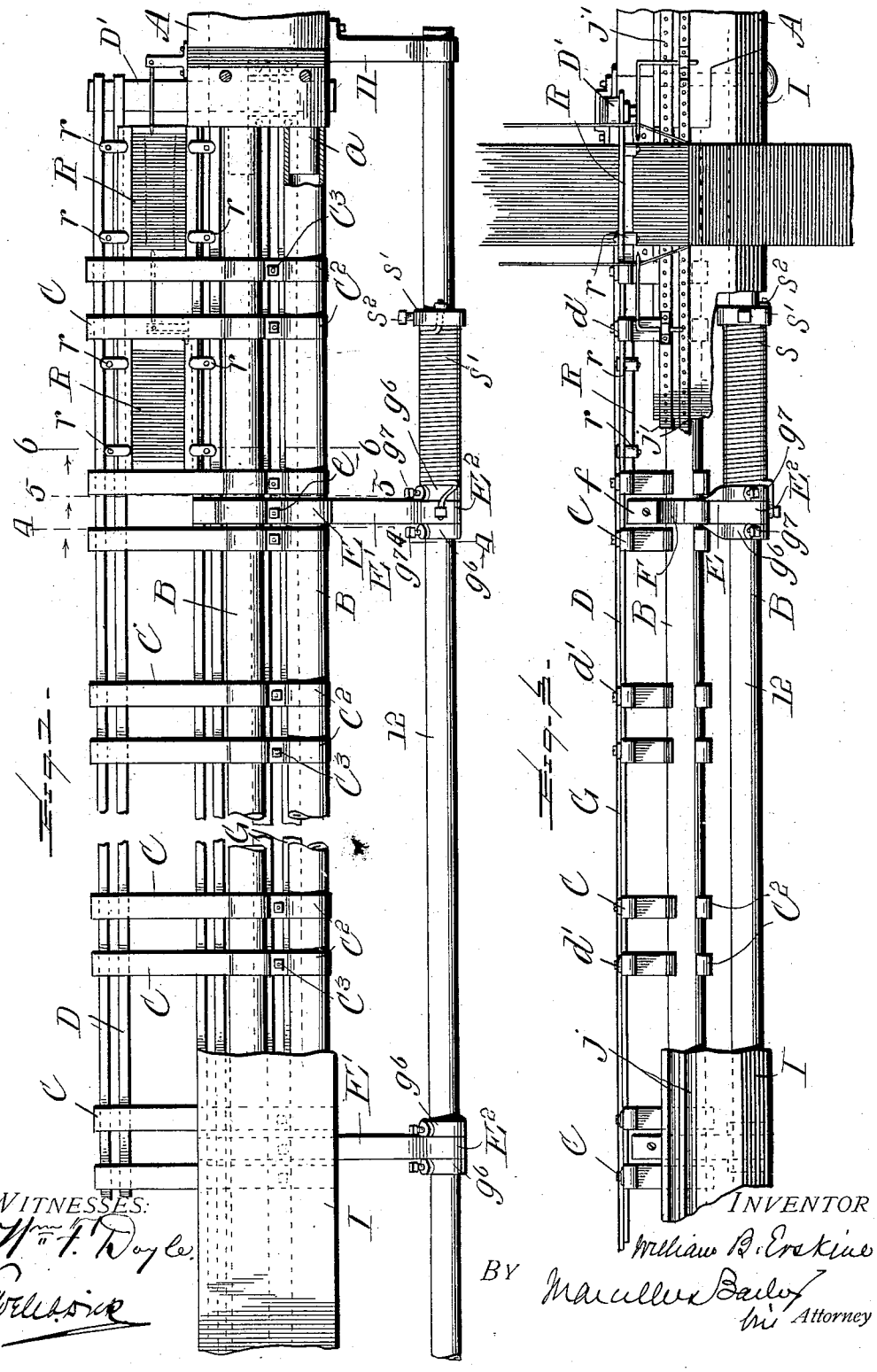
No. 715,772. Patented Dec. 16, 1902.

W. B. ERSKINE.

LOOM.

(Application filed Mar. 10, 1902.)

(No Model.) 3 Sheets—Sheet 1.



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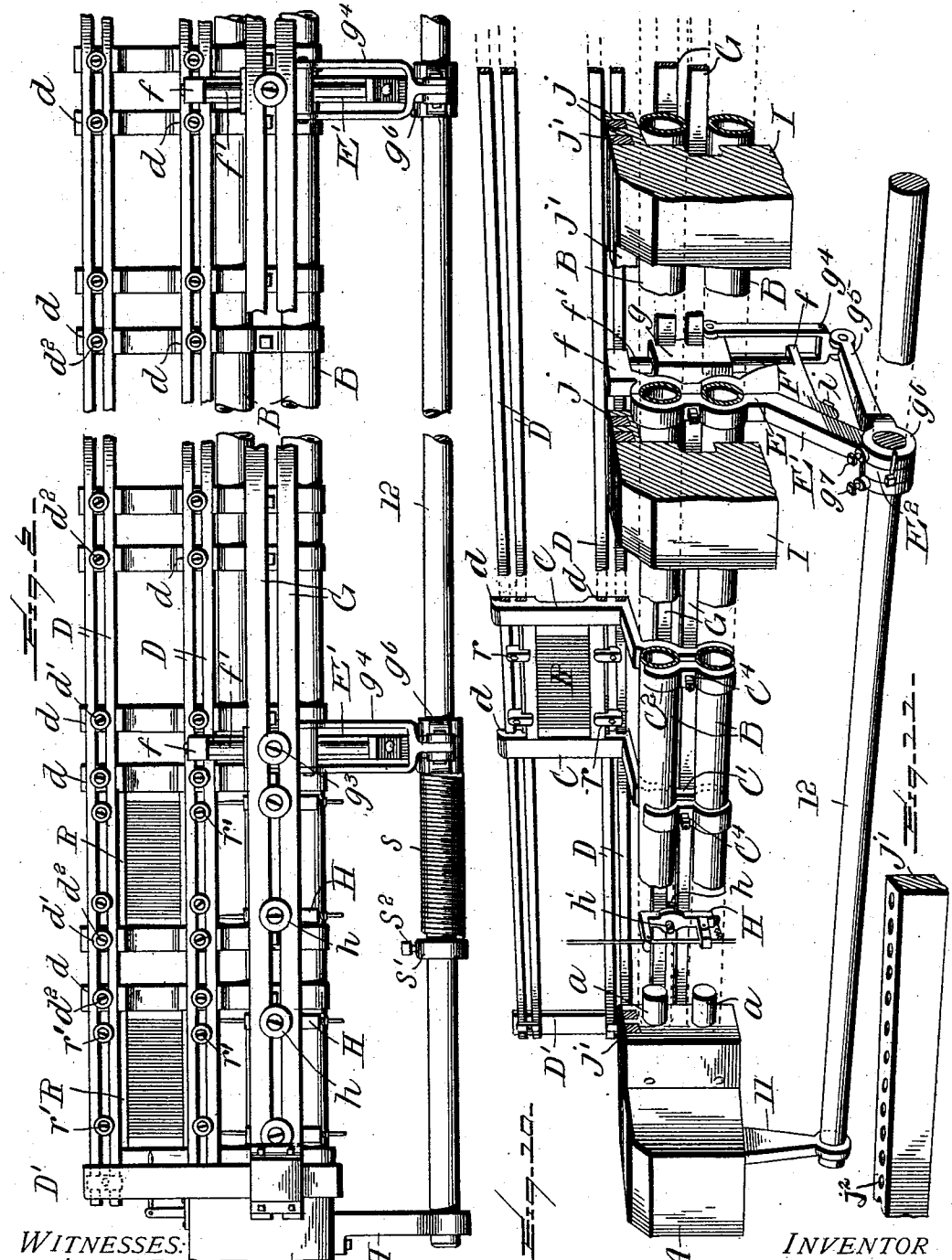
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(No Model.) 3 Sheets—Sheet 2.



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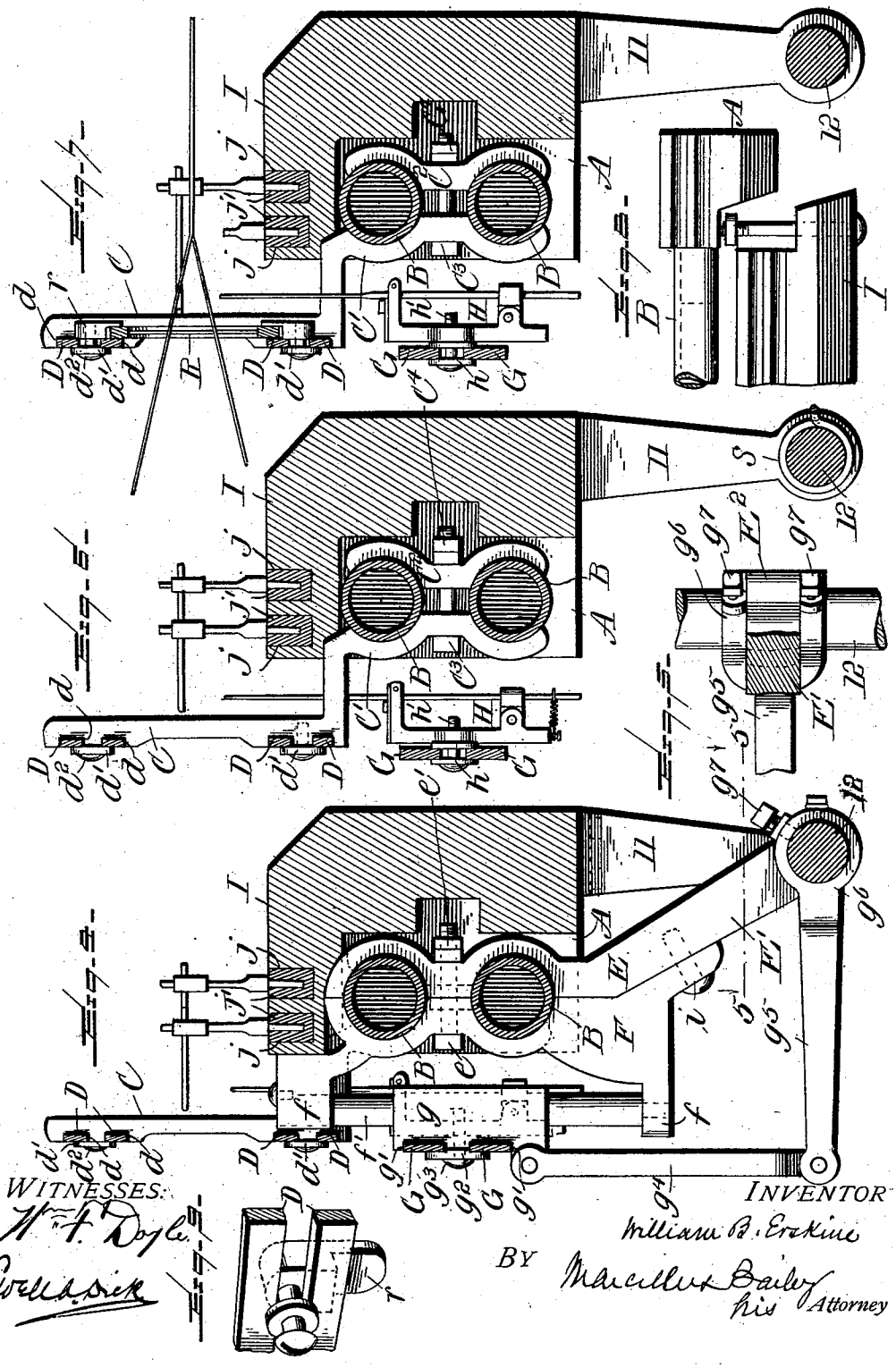
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UNITED STATES PATENT OFFICE.

WILLIAM B. ERSKINE, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN AUTOMATIC LOOM COMPANY, A CORPORATION OF NEW JERSEY.

LOOM.

SPECIFICATION forming part of Letters Patent No. 715,772, dated December 16, 1902.

Application filed March 10, 1902. Serial No. 97,605. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. ERSKINE, a citizen of the United States, and a resident of New York city, in the State of New York, have invented a new and useful Improvement in Looms, of which the following is a specification.

My invention relates to narrow-ware looms, and more particularly to that type known as "needle-looms," such as set forth, for example, in Kuett's Patent No. 653,249, of July 10, 1900, or in my Patent No. 669,916, of March 12,1901. In these looms, as is well known, a number of fabrics are woven simultaneously and the batten is divided up lengthwise into reed-spaces, each designed to accommodate one strip of ribbon or other fabric, all the reed-spaces on any one batten being of the same dimensions. What I have termed the "reed-spaces" are the intervals between the reed-supporting standards or brackets, which latter are made fast to the batten at certain intervals apart and are designed to furnish lateral support to the reeds, there being usually a pair of these brackets for each reed, of which one is located upon one side and the other is located on the opposite side of the reed. This support is essential, as otherwise the reeds would lack the necessary strength and stiffness to withstand the shock of the "beat-up." The intervals between the two brackets of each pair are what I term the "reed-spaces." The reed-spaces will vary in number according to the width of the fabric to be woven. In a batten, say, between eighteen and nineteen feet in length over all and having a working length of about fifteen feet (intermediate between the two end portions) devoted to the reeds there will be, for example, some twenty-eight reed-spaces for the weaving of ribbons of ten lines width, while for ribbons of one hundred and one lines width there will be only eight reed-spaces, and, again, a batten having reed-frame brackets set for a given width of fabric cannot be used to make a wider width, and while it can be used within limits for weaving narrower widths, yet this cannot be done economically, as it means loss of space. For example, a batten having reed-spaces adapted for a three-inch width at the outside cannot be used to make a four-inch width, and while it can perhaps be used to make a two-inch width, yet this is done at a loss, because for a two-inch width the reed-brackets could be closer together, and there consequently would be more reed-spaces.

There are from fifteen to twenty different standard widths of ribbon, and as manufacturers to be well equipped for business must carry or be prepared to make all or nearly all of these widths in various lines of color it will be seen that it is indispensable for them to carry in stock a large supply of extra battens adapted for the different widths. In many instances under existing conditions at least three or four battens are provided for each loom, and even with these on hand it happens not infrequently that still other battens must be ordered to make some special width of goods in demand. Inasmuch as in many narrow-ware mills there are one hundred, one hundred and fifty, two hundred, or more looms, and as the battens cost from, say, sixty dollars to one hundred dollars or one hundred and twenty-five dollars each, it will be seen that a large amount of capital is invested and locked up in battens alone. It is my object to obviate the necessity for this outlay and to provide a batten for narrow-ware needle-looms in which the reed-spaces and other parts can be varied and adjusted at will, so that one and the same batten can be used for producing any called-for width of fabric. This I believe to be broadly new with me. It is my object also to so arrange things that the various adjustments necessary or convenient to this end can be readily made without removing the batten from the loom.

In the approved batten to-day in use in needle-looms the rock-shaft which actuates the reciprocating vertical loop-engaging needle-frame is mounted on and carried by the batten. This shaft is of considerable length—usually about eighteen feet long—and the vertically-movable needle-frame is also quite long, and both the shaft and the frame as well at intervals throughout their length require to be supported in bearings connected mediately or immediately to the batten. It is my object also to provide for the adjustment of the brackets—the "needle-frame" brackets, as

I term them—which furnish this support, so that they may be moved lengthwise of the batten whenever necessary to accommodate their position to any changes in the number and spacing of the reed-frame brackets.

To these ends my invention consists of the parts and combinations, which will first be described by reference to and in connection with the accompanying drawings, forming part of this specification, and will then be more particularly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of part of a batten embodying my invention, a portion of the removable wooden cap or front being broken away to expose to view the structural details in rear of it. I remark here that in this figure, as well as in Figs. 2, 3, and 10, only a portion of the length of the batten from one of its ends is shown, the length of the batten precluding its being represented upon the sheet on a scale adequate to illustrate its structural details. Each end A of the batten, however, is the same as the other, so that an illustration of one will answer for both. Fig. 2 is a rear elevation, and Fig. 3 is a plan, of the same. Fig. 4 is a cross-section of the batten, on an enlarged scale, showing in side elevation one of the needle-frame brackets. Fig. 5 is a view of a detail, hereinafter referred to, relating to the parts shown in the preceding figure. Fig. 6 is an enlarged cross-section, showing in elevation one of the reed-frame brackets. Fig. 7 is a like cross-section, showing also in section one of the reeds in place in the reed-frame and the warp-shed pertaining to that reed. Fig. 8 is a plan view of a detail illustrative of the joint between the ends A of the batten and the removable batten cap or front I. Fig. 9 is a perspective view of one of the clips for holding the reed in the reed-frame. Fig. 10 is a perspective view of a part of the batten with a portion of the cap or front I removed. Fig. 11 is a view of part of one of the filling-needle carrier bars or racks.

At each end the body of the batten is composed of a wooden end piece A of customary or suitable shape and contour. To these end pieces are to be attached the usual lay-swords and also the appliances for operating the horizontal filling-needle carrier bars or racks. To their under side are also attached the end hangers 11, in which is mounted the longitudinal rock-shaft 12, which takes its movement from the main shaft of the loom through the intermediary of suitable connections—such, for example, as fully illustrated and described in my Patent No. 669,916, of March 12, 1901—and is designed to be connected to and to operate the vertically-reciprocating frame which carries the vertical loop-engaging needles, as also set forth in said patent. Extending between and attached firmly to the two end pieces is the longitudinal support which carries the reed-frame and the vertical needle-frame and helps to sustain the rock-shaft. This support, which constitutes the main part of the batten, may be of any suitable construction. In the present instance it consists of two parallel wrought-metal pipe-rods B, placed vertically one above the other, with an interval between them sufficient for the passage of the bolts by which the brackets for the vertical needle-frame and the reed-frame are clamped and secured in place upon said pipe-rods. I prefer the use of pipe-rods for this purpose, because they are strong and can conveniently be attached to the end pieces A of the batten, said pipes at their ends (as shown in Fig. 1) fitting and being secured in place on tenons a, formed for them on the interior opposite faces of the ends A.

The reed-frame brackets consist each of a main part composed of a standard C, (to which the reed-frame is secured,) a hanger C′, arranged and adapted to fit against and partly around one face of the pipe-support B B, and a cap C^2, arranged and adapted to fit against and partly around the opposite face of the pipe-support, and these parts are drawn together and clamped tightly upon said support by a headed bolt C^3, which passes through the cap C^2 and the hanger C′ in the interval between the two pipes B and has on its screw-threaded end a lock and jam nut C^4. This nut is on the front face of the support B B.

The reed-frame consists of two pairs of parallel longitudinal flat irons or bars D D, which extend the working length of the batten—that is to say, the length devoted to reed-spaces—which irons fit into notches or recesses d, formed in the back of the standard portions C of the reed-frame brackets, and are held in place by a washer d' and a clamp-screw d^2 for each pair, the clamp-screw serving to press the washer up against the pair of irons. The two irons D D of each pair are separated by an interval and form, in effect, a single longitudinally-slotted bar, the slot being designed for the passage of the binding-screw r', which clamp in place the holders r for the individual reeds R, Figs. 1, 9, 7.

At each end the two pairs of irons D D are fixed to a standard or upright D′, permanently attached to some suitable part of the rear of the batten. These end uprights always occupy the same position and require no adjustment. These uprights, together with the longitudinal irons or bars D, constitute the reed-frame, which as a whole is a fixture on the batten. The reed-frame brackets between these end standards or uprights and which determine the number and width of the reed-spaces are each of them both longitudinally adjustable upon the reed-frame and upon their support and also bodily removable from said frame and support. By loosening the clamp-screws d^2 and the lock and jam nut C^4 the reed-frame bracket to which these parts pertain can be slid along the reed-frame irons D and the pipes B and then by tightening the clamp-screw and the nut can be again secured in their adjusted position to both the reed-frame and to the

movable from, the needle-frame G, so that the number of holders may be varied, and the individual holders actually required may be adjusted to conform to the number and width of the reed-spaces. As a cover and shield for the working parts, the batten is provided with a removable cap or front I, which extends between and is bolted to the ends A, and in practice it is also bolted at one or more intermediate points to the pipe-support B B. In the top of this cap or front are formed the longitudinal grooves *j j* for reception of the reciprocating racks or slide-bars *j' j'*, upon which the horizontal filling-needles are mounted. These bars have in their tops a series of holes j^2, Fig. 11, for reception of the screws by which the horizontal needle-stands are secured in place, this being for the purpose of permitting the longitudinal adjustment of the needles. The needles can be adjustably attached to the slide-bars for this purpose, not only in the way indicated, but also in any other known or suitable way. The grooves *j j* are prolonged, as shown, into the end pieces A, and the slide-bars *j' j'* may be actuated to move by any of the well-known mechanisms known and used for this purpose.

The throw of the slide-bars *j'* and the length of the horizontal filling-needles mounted on said slide-bars must of course be varied to conform to variations in width of the reed-spaces; but for this purpose it will be necessary only to provide a suitable number of interchangeable cams of proper sizes for actuating the slide-bars and a suitable assortment of needles of different lengths, and the expense of this will be trifling.

To adjust the batten to a different width and number of reed-spaces, the batten cap or front I is removed. This will expose to view and bring within easy reach all the working parts which require removal or adjustment, the fastening devices, which for this purpose must be loosened or taken off, being for the most part on the front of the batten, and the batten can readily be changed over to any desired width of reed-spaces without removing it from the loom and in a comparatively short time.

Upon the rock-shaft 12 I place one or more springs, which, like the weights used for a similar purpose in my Patent No. 669,916, serve to counteract the weight of the needle-frame. One of such springs is shown at *s* in Figs. 1, 2, 3. It is a spiral spring surrounding the rock-shaft, having one of its ends fast to the adjoining needle-frame bracket and its other end fast to a collar *s'*, loose on the shaft and secured in place thereon by a set-screw s^2. By turning the collar *s'* the spring can be wound up to any desired tension, and then by tightening the set-screw s^2 the collar can be held to the rock-shaft. In adjusting the needle-frame bracket all that is needed, so far as the spring is concerned, is to loosen the set-screw s^2, and then the spring and its collar will slide along the rock-shaft and follow the movement of the bracket.

In conclusion I state I am aware that in a "narrow-ware needle-loom"—by which phrase I intend a needle-loom in which two or more fabrics are woven side by side simultaneously—the individual reeds, vertical needle-holders, and horizontal needle-stands have heretofore all of them been made adjustable within limits upon and lengthwise of the batten, and this I do not claim. These adjustments (which are retained also in my new batten) were, however, all of them provided with reference to a certain predetermined and invariable width and number of reed-spaces for which the batten was designed and which could not be departed from.

The chief characteristic of my new batten is that the reed-spaces themselves are variable and can at will be increased or decreased both in width and number, thus adapting one and the same batten to take the place of the large and expensive assortment of battens heretofore required for each loom in order to permit the manufacturer to supply narrow fabrics of the various widths required from time to time by the public, and that the reed-frame brackets, which define the width of the individual reed-space subdivisions on the batten, are for this purpose detachably secured to and longitudinally adjustable upon the batten. This, as hereinbefore stated, I believe to be broadly new with me.

What, therefore, I claim, and desire to secure by Letters Patent, is as follows:

1. In a narrow-ware needle-loom, the combination with the batten, of reed-frame brackets which define the width of the individual reed-space subdivisions on the batten and are detachably secured to, and longitudinally adjustable upon, the batten for the purpose of varying the width and number of said reed-space subdivisions, substantially as herein-before set forth.

2. In a narrow-ware needle-loom, the combination, substantially as hereinbefore set forth, of a batten, a reed-frame mounted thereon, and reed-frame brackets, detachably connected to, and adjustable lengthwise upon the batten and the reed-frame.

3. In a narrow-ware needle-loom, the combination substantially as hereinbefore set forth, of a batten; a reed-frame mounted thereon; reed-frame brackets detachably connected to and adjustable lengthwise upon the batten and reed-frame; a needle-frame mounted and adapted to move up and down upon the batten; needle-frame brackets secured to and adjustable lengthwise of the batten; guides carried by said brackets; and sliding blocks on said guides detachably connected to the needle-frame.

4. In a narrow-ware needle-loom, the combination, substantially as hereinbefore set forth, of a batten, a reed-frame thereon; a vertically-movable needle-frame also mounted thereon; a rock-shaft mounted on the un-

pipe-support. By removing the clamp-screws and the nut the bracket can be bodily taken out away from the batten. Both of these conditions are essential, because in varying the number and width of reed-spaces on the batten the number of pairs of brackets, as well as their spacing, must be correspondingly varied. In changing over the batten, for example, from twenty reed-spaces to ten reed-spaces the number of pairs of reed-frame brackets must be correspondingly reduced, while the adjustment of those pairs of brackets which remain must be varied, so as to secure reed-spaces of the increased width called for. This I believe to be new with me beyond its particular structural embodiment illustrated in the drawings. I know of no batten for a narrow-ware needle-loom in which the intermediate brackets that support the reed-frame and divide the same up into reed-spaces are removable from and adjustable lengthwise upon said frame to vary the number and width of the reed-space subdivisions of that frame.

The rock-shaft 12 for operating the vertically-reciprocating needle-frame is, as before said, carried by the batten and extends lengthwise of and under the batten, being supported in bearings in end hangers 11 and being actuated from the main shaft of the loom by a mechanism—such, for example, as illustrated in my Patent No. 669,916, of March 12, 1901. This shaft is about as long as the batten—say some eighteen feet—and is usually of comparatively small diameter—say one inch. In order to prevent it from springing and to stiffen it and insure efficient and accurate work, it becomes necessary to furnish it with support at several points throughout its length between the end hangers 11. The same is true also of the vertical needle-frame. It, too, is nearly as long as the batten, and it requires to be stiffened and connected by operating appliances to the rock-shaft at intervals throughout its length in order to prevent it from sagging and cramping and binding in or on its guides or ways. To this end I provide a number of what I term "needle-frame" brackets, which are secured to the batten and furnish support to both the rock-shaft and the needle-frame at intervals throughout its length. In practice I employ six of these brackets; but a greater or less number may be employed. Each one of these brackets, as shown clearly in Fig. 4, is a two-part bracket, the two parts E F clasping the pipes B B between them and being clamped upon said pipe by a bolt e and lock and jam nut e', as shown, the lock and jam nut being on the front side. The part E has an extension E', which terminates in a tubular bearing or hub E^2, Fig. 5, for the rock-shaft 12, which latter passes through said hub and can rock freely therein. The part F (which lies on the rear side of the pipe-support B B) is provided with top and bottom rearwardly and horizontally projecting lugs f, in which are fixed the ends of a vertical guide-rod f', on which is mounted a block g, adapted to slide up and down on said guide-rod. The block, on its rear face, is provided with recesses or notches g', in which fit the twin longitudinal bars or irons g, that constitute the vertical needle-frame. These bars or irons are secured together rigidly at their ends, where they are supported, so as to be capable of vertical movement in or on end guides fixed to the batten, and they are separated from one another by an interval, as shown, so as to constitute, in effect, a single longitudinally-slotted bar through the slot, in which pass the screws which bind the individual vertical needle-holders to the frame, as shown, for example, in Fig. 6, where H is one of the individual vertical needle-holders constructed and having the vertical needle mounted in it substantially as shown and described in Kuett's Patent No. 653,249, of July 10, 1900, and adjustably secured in the needle-frame G G by a washer h and clamping-screw h', which passes through the washer and the longitudinal slot in frame G G into the holder H.

Each sliding block g is detachably connected to the irons G by a washer g^2 and clamp-screw g^3, and it is also connected to the rock-shaft 12 by a link g^4, pivoted at one end to the block and at the other end to a rearwardly-projecting radial arm g^5, mounted on the rock-shaft 12 by means of a divided hub g^6, which straddles the hub E^2 and is secured tightly to the rock-shaft by set-screws g^7, as seen in Figs. 5 and 10.

It may be found desirable to secure the heel or lower part of the bracket portion F to the extension E', and for this purpose a screw i or other equivalent connection may be used.

It is desirable that the needle-frame brackets E F should not be opposite the reed-spaces or a prolongation of those spaces, but should be located so as to be opposite to or in line with the intervals between the spaces, so as to permit them to clear the reeds and be out of the way of the weaving, as well as to avoid throwing grease or oil on the fabrics. They are shown thus located in the drawings; but manifestly if the width and number of the reed-spaces be changed then the needle-frame brackets—one or more of them—may be brought opposite to the new reed-spaces. For this reason each of said brackets is made longitudinally adjustable upon the pipe-support B B, the rock-shaft 12, and the needle-frame G G. All that is needed is to loosen the lock and jam nut e', the screw g^3, the set-screws g^7, and the screw i, (when one is used,) and the bracket as a whole, together with the parts which it carries, can be shifted bodily lengthwise of the needle-frame, the rock-shaft, and the pipe-support until it reaches the right position, after which it can be resecured to said parts by tightening the screws and nut.

The individual vertical needle-holders H are longitudinally adjustable in, as well as re-

der side of and extending lengthwise of the batten; reed-frame brackets detachably connected to and adjustable lengthwise upon the batten and reed-frame; needle-frame brackets secured to and adjustable lengthwise of the batten, and provided with supporting-hubs which encircle and can slide on the rock-shaft; guides carried by the needle-frame brackets, sliding blocks on said guides detachably connected to the needle-frame; and operative connections between the sliding blocks and the rock-shaft detachably secured to and adjustable lengthwise of said rock-shaft.

5. In a narrow-ware needle-loom, the combination, substantially as hereinbefore set forth, of a batten the body of which is composed of end pieces connected by an intermediate longitudinal support, reed-frame brackets, and vertical needle-frame brackets, adjustably mounted on and secured to said support, and a removable batten cap or front extending between and detachably connected to the end pieces of the batten.

In testimony whereof I have hereunto set my hand this 8th day of March, 1902.

WILLIAM B. ERSKINE.

Witnesses:

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ANNA F. FITZGERALD.