

No. 751,384.

PATENTED FEB. 2, 1904.

J. H. CUNLIFFE & J. LAW.  
LOOM FOR WEAVING BORDERED FABRICS.

APPLICATION FILED JULY 23, 1900.

NO MODEL.

2 SHEETS—SHEET 1.

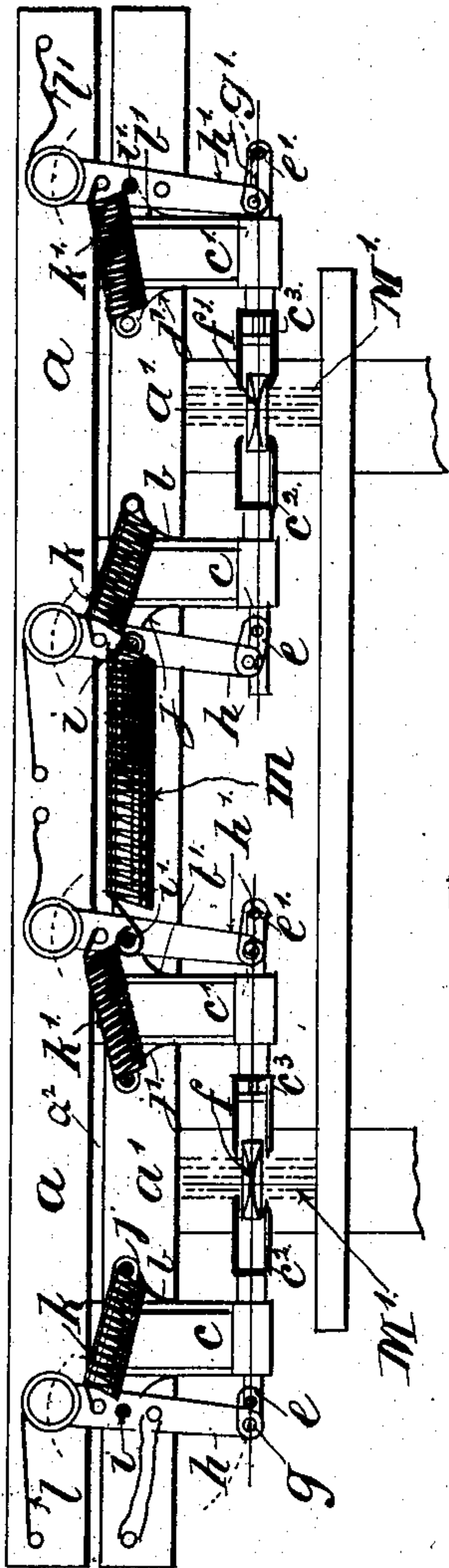


Fig. 1.

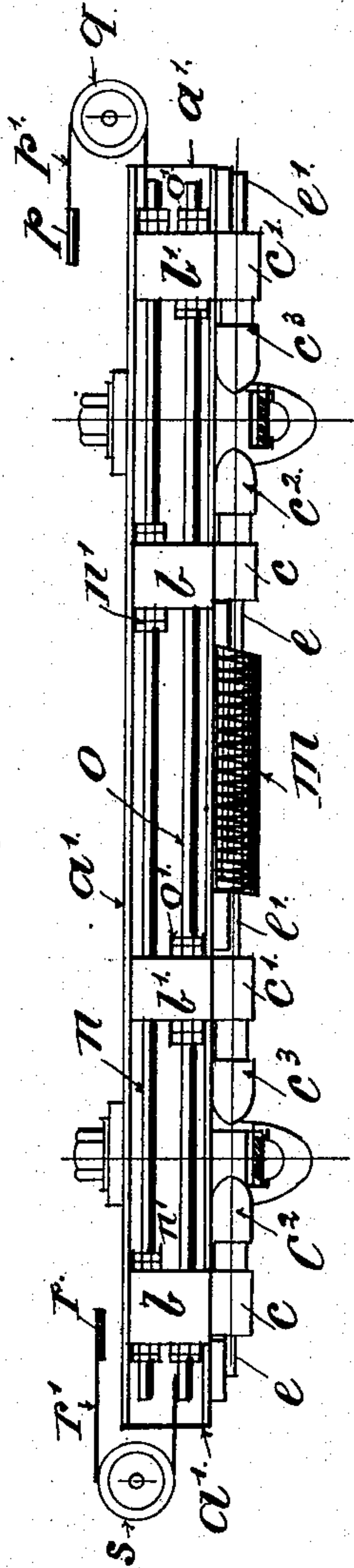


Fig. 2.

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2 SHEETS—SHEET 2.

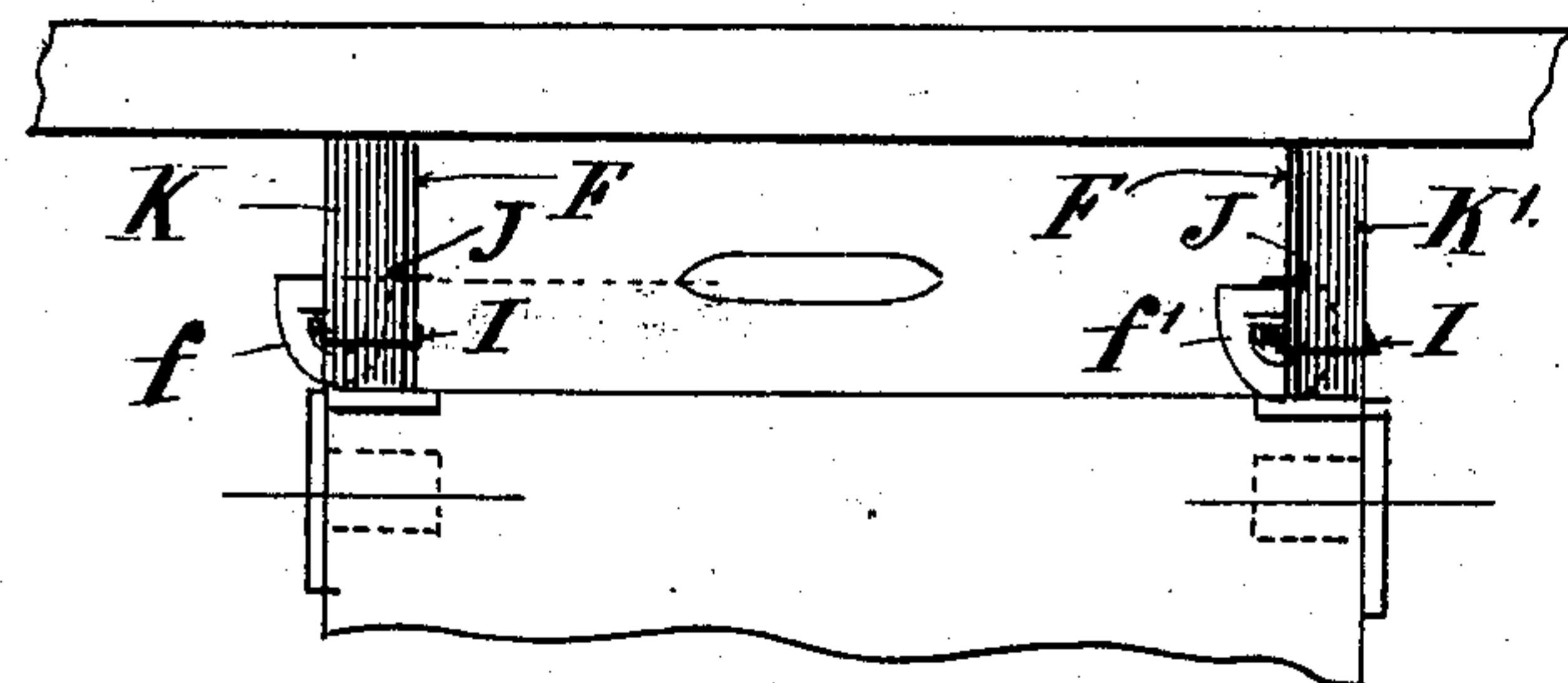


Fig. 3.

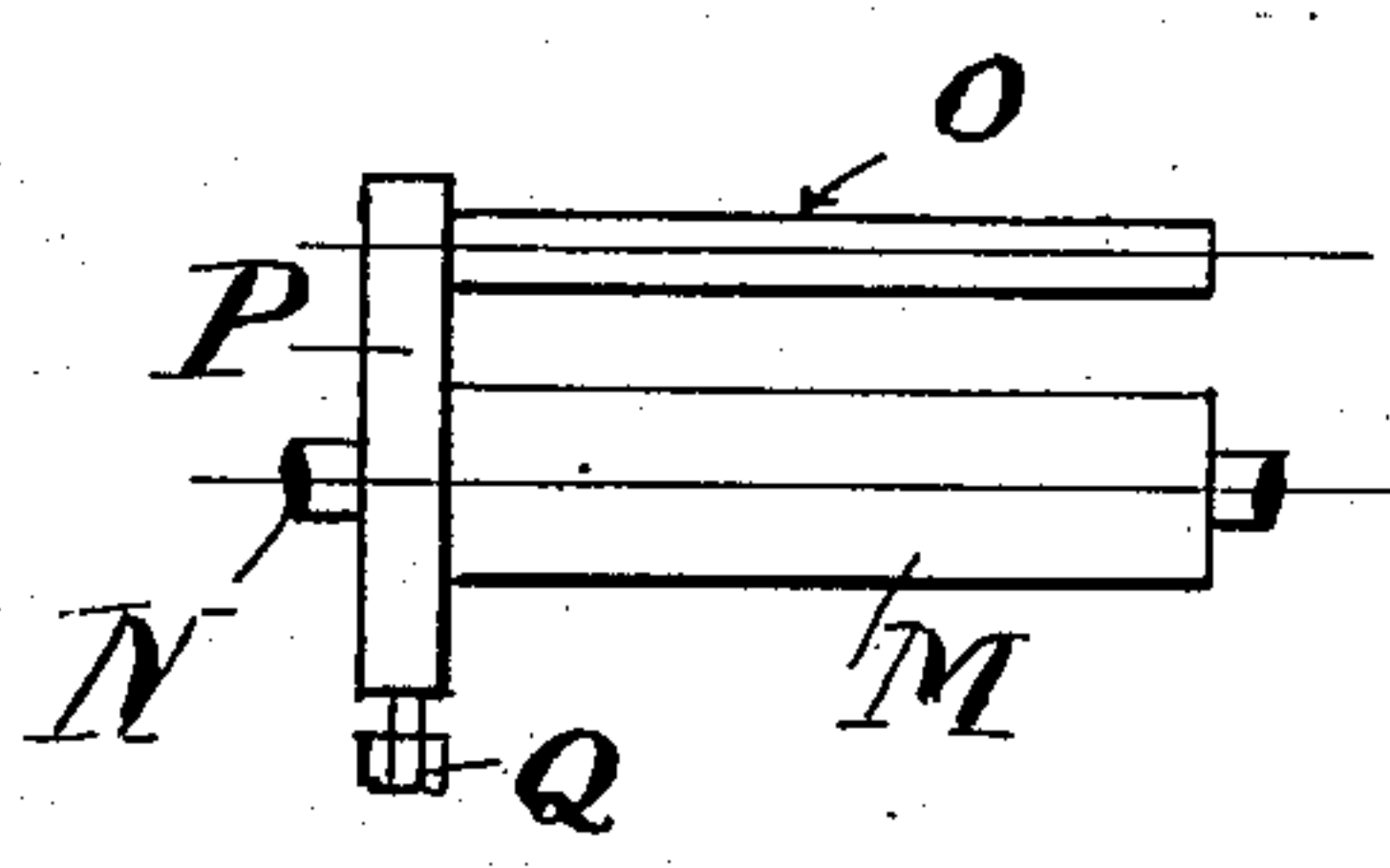


Fig. 10.

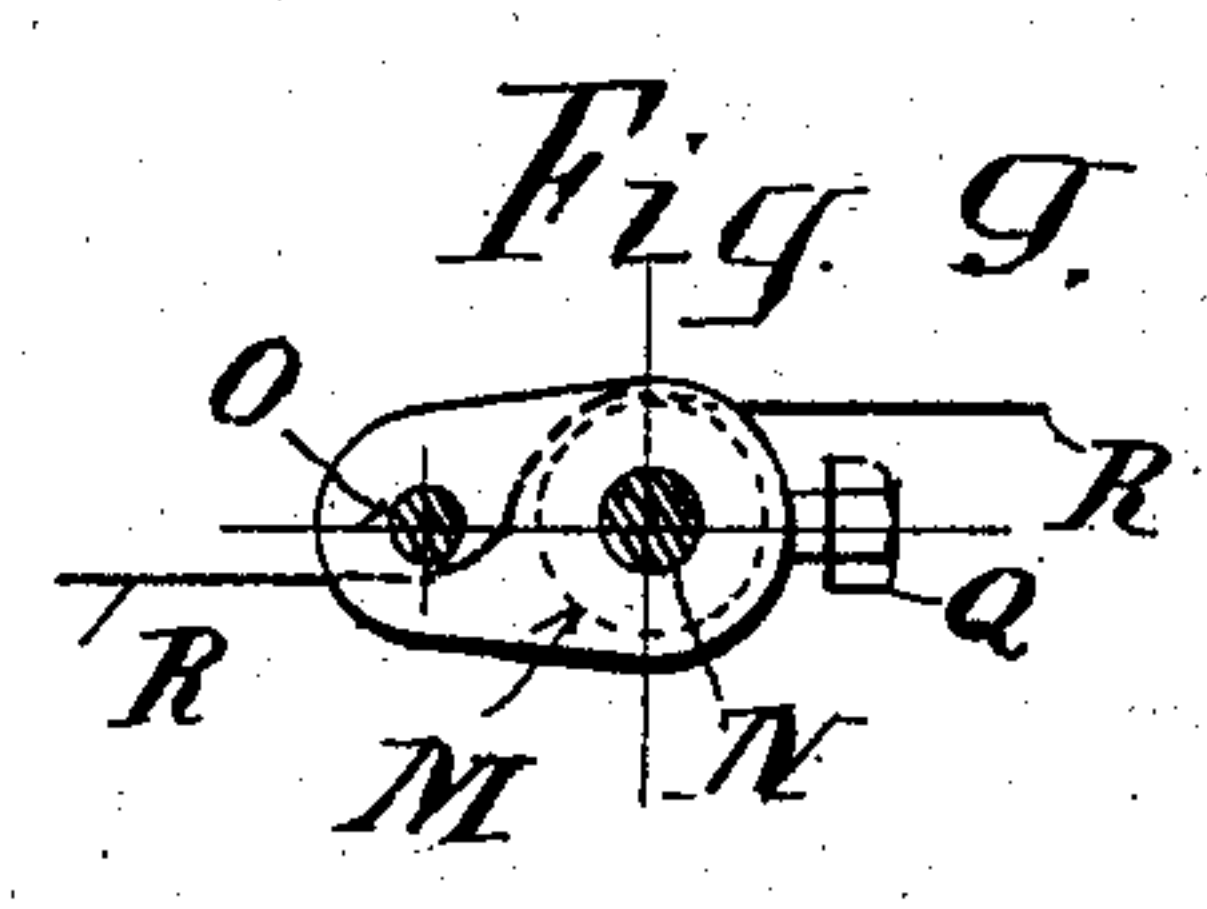


Fig. 9.

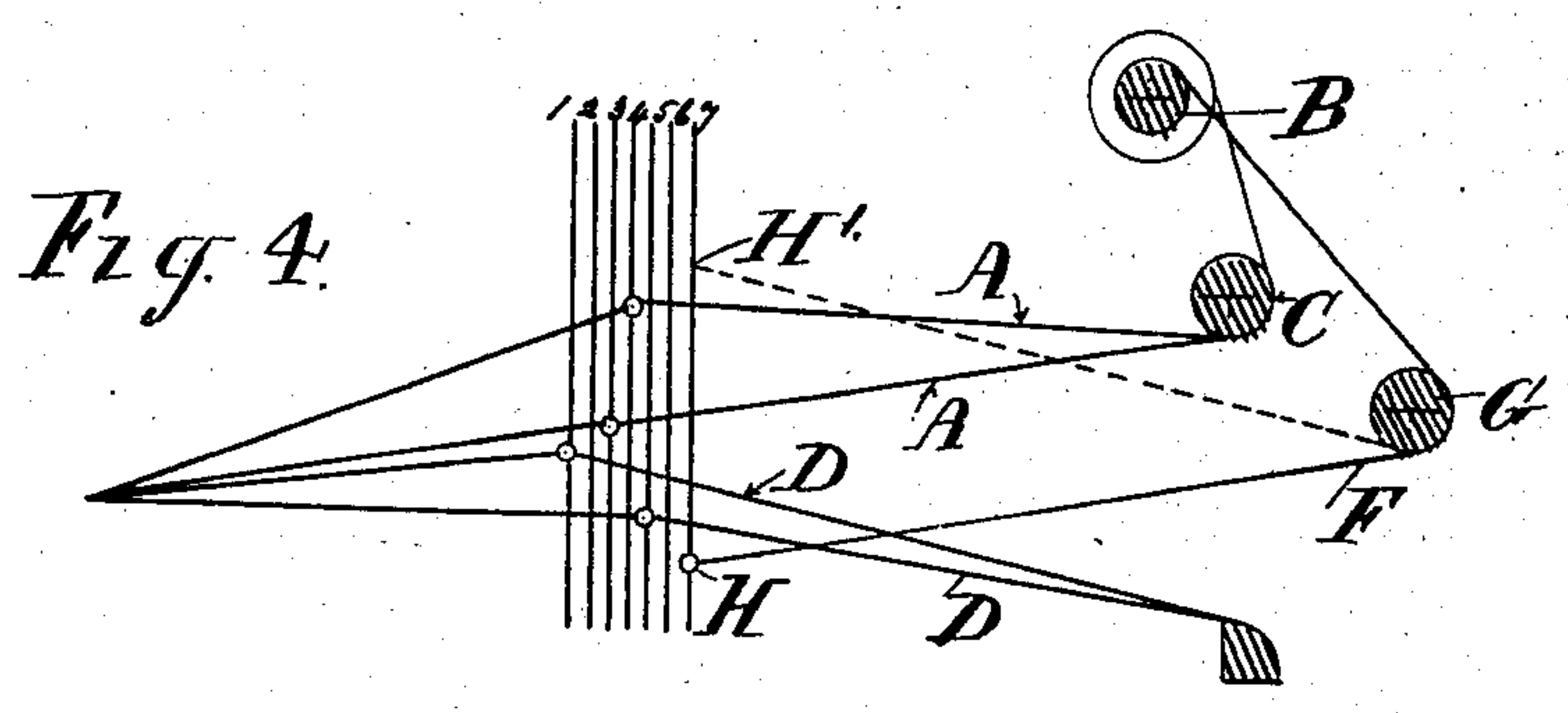


Fig. 4.

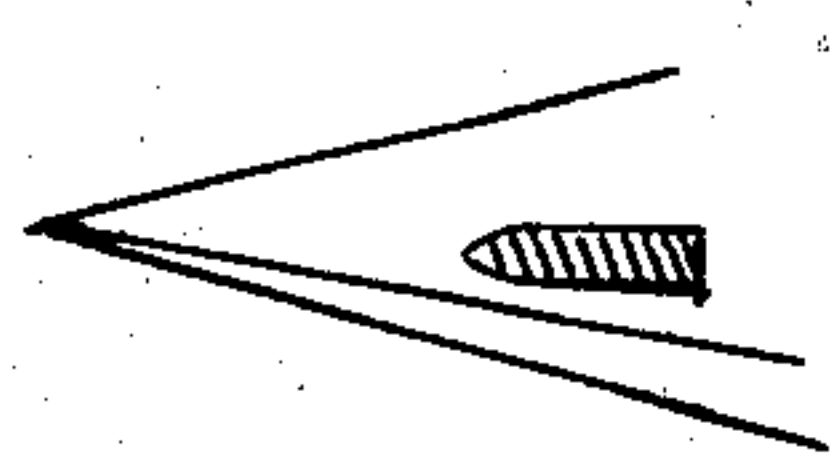


Fig. 6.

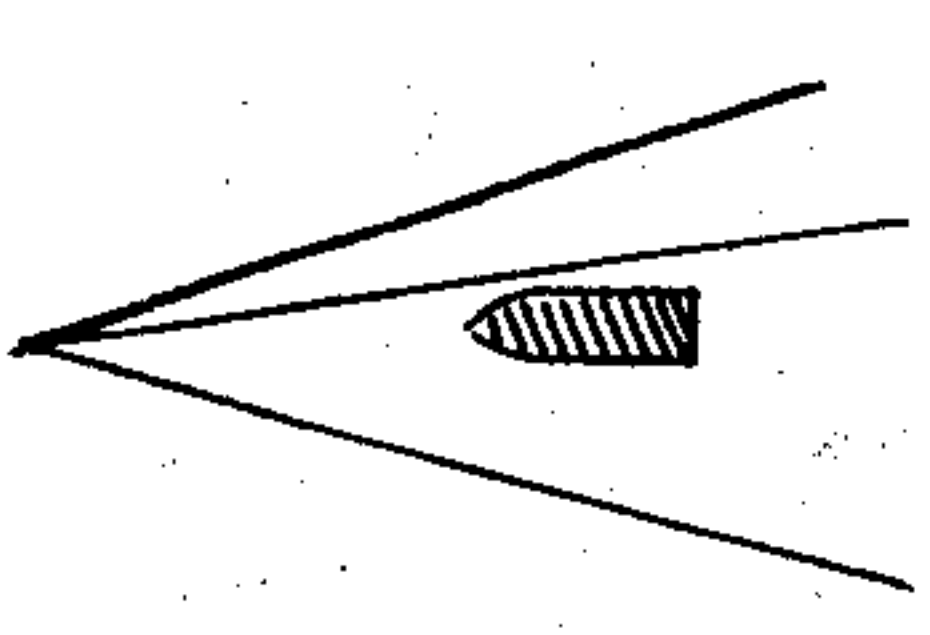


Fig. 5.



Fig. 7.

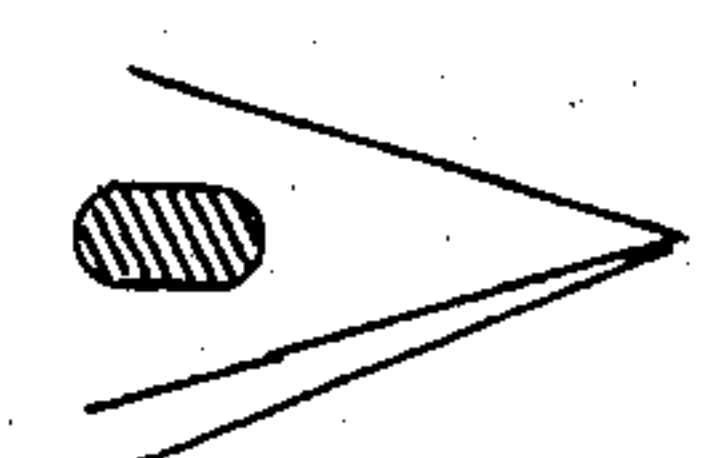


Fig. 8.

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# UNITED STATES PATENT OFFICE.

JOSEPH H. CUNLIFFE AND JOHN LAW, OF ROCHDALE, ENGLAND.

## LOOM FOR WEAVING BORDERED FABRICS.

SPECIFICATION forming part of Letters Patent No. 751,384, dated February 2, 1904.

Application filed July 23, 1900. Serial No. 24,497. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH HENRY CUNLIFFE, a resident of Bankside Mills, Rochdale, and JOHN LAW, a resident of Albert Hotel, Spotland Road, Rochdale, in the county of Lancaster, England, subjects of the Queen of Great Britain, have invented a new and useful Apparatus for Improvements in and Relating to Looms for Weaving Bordered Fabrics, of which the following is a specification.

Our invention relates to improvements in looms for weaving textile fabrics—such as dhooties, sarries—also for every description of bordered fabrics in which a colored or other weft differing from the weft of the body of the cloth is required or employed.

This invention is adapted to weave borders or stripes of any desired width and fancy patterns or designs with colored warp and weft differing from the warp and weft employed in the body of the cloth.

In order that our invention may be clearly comprehended, we now proceed to describe our apparatus by means of the accompanying drawings, in which like letters of reference throughout the figures therein shown indicate like parts.

Figure 1 is an elevation of our invention. Fig. 2 is a plan of Fig. 1. Fig. 3 is a plan representing the border-shuttles passing through the sheds of the border-warps. Fig. 4 is an elevation showing the relative positions of the sheds of the border and the body of the cloth, also threads which we term "linking-threads," which will be hereinafter more particularly described. Fig. 5 represents the linking-threads in a position relatively to the border-sheds when the shuttle, with its weft, is passing through the said sheds and below or under the said linking-threads. Fig. 6 represents a position of the linking-threads relatively to the border-sheds when the shuttle, with its weft, is passing through the said sheds and above or over the said linking-threads. Fig. 7 represents a position of the linking-threads relatively to the shed of the body of the cloth when the shuttle, with its weft, is passing below or under the said linking-threads. Fig. 8 represents a position of the linking-threads relatively to the shed of the

body of the cloth when the shuttle, with its weft, is passing above or over the said linking-threads. Fig. 9 is an elevation of the temple used with our invention. Fig. 10 is a plan of Fig. 9.

The hand-rail or lay-top is composed of two parts *a* and *a'*, between which is provided a slot *a<sup>2</sup>*, extending lengthwise thereof and to which lay-top our invention or apparatus is applied.

The lower part *a'* of the lay-top is formed hollow or is provided with a cavity, space, or channel, within which are located two connecting-rods, to which latter pairs of slide-blocks are attached, which we will now proceed to describe. Within the slot *a<sup>2</sup>* are two pairs of blocks or slide-pieces *b b* and *b' b'*, to which are conveniently attached brackets or carriers *c c c'*, carrying forked-shaped extremities or "forks" *c<sup>2</sup> c<sup>2</sup> c<sup>3</sup> c<sup>3</sup>*, which are provided with hollow parts or barrels, within which is adapted to operate sliding spindle-rods *e e* and *e' e'*, between which pairs of forks shuttles *f f'* of peculiar form are adapted, respectively, to pass to and from each other of the pair during the process of weaving in manner as hereinafter described. The ends of the said spindle-rods *e e* and *e' e'* are connected by suitable links *g g* and *g' g'* to the lower extremities of levers *h h* and *h' h'*, mounted or supported upon studs *i i i' i'*, on which the said levers are free to oscillate intermittently. The studs are fixed upon carrier-brackets *j j* and *j' j'*, mounted upon the slide-blocks *b b* and *b' b'*, respectively. The said levers *h h* and *h' h'* have also connections with the carrier-brackets *j j* and *j' j'* by means of coils or springs *k k k' k'*.

The one extremity of the carrier-brackets *j* and *j'* of the apparatus—i. e., those situated nearest to the outer parts or ends of the lay-top—are provided with check-straps *l l'*, and between the other extremity of each of the carrier-brackets *j j'* of the other corresponding pair of the apparatus is provided a coiled spring *m*, as shown in Figs. 1 and 2, which might be placed in any other suitable position. These straps are provided in order to allow of the blocks carrying the forks to be moved or slid forward their proper distances,



so that the pairs of forks  $c^2 c^2$  or  $c^3 c^3$  shall respectively be suitably near and opposite to each other during the passing of the shuttle from one pair of forks to the other.

5 The function of the check-straps is to control the movements of the blocks carrying the forks  $c^2 c^3$  in order that they may have the required or predetermined picking limit or movements toward the opposite forks  $c^3$  and  $c^3$ ,  
10 respectively, (see Fig. 1,) for the purpose of placing the forks carrying the shuttles  $f$  and  $f'$  in proper positions with relation to the opposite forks ready to receive the border-shuttles when the same are picked across or  
15 through the border-warp sheds.

The slide pieces or blocks  $b b$  and  $b' b'$  are respectively connected together in pairs by means of rods  $n$  and  $o$ —i. e., the blocks  $b b$  are connected to the rod  $n$  by means of nuts  
20  $n'$ , provided in screwed parts of the said rod, the said rod passing loosely or is free to slide through the blocks  $b' b'$ —but the blocks  $b' b'$  are connected to rod  $o$  by means of nuts  $o'$ , provided on screwed parts of the said rod, the  
25 rod passing loosely or is free to slide through the block  $b$ . The said rods, it will be observed, are situated in a trough or channeled shaped “slay-top.” The rod  $n$  is connected to the picking-lever  $p$  by means of the strap or band  
30  $p'$ , which passes around the circular pulley-block  $q$ , and the rod  $o$  is connected to the picking-lever  $r$  by means of the strap or band  $r'$ , which passes around the circular block  $s$ , or, if desired, may be connected or operated  
35 by any other equivalent means for the purposes of effecting slide motions to the blocks.

According to the disposition and arrangement of the part in accordance with our invention we arrange the sheds of the border-  
40 warps at a higher working level or plane than the shed of the body of the cloth. (See Fig. 4.)

The warps  $A A$  for the borders are wound upon and pass from a reel  $B$  and then pass around a guide-roller  $C$  and through the  
45 healds Nos. 3 and 4. (See Fig. 4.)

The main warp  $D$  for the body of the cloth passes from the warp-beam  $E$  in the ordinary manner and through the healds 1 and 5.

50 The threads  $F F$ , which are interposed between the border-warps and the warp, are termed “linking-threads” and are inserted for the purposes of uniting the borders to the body of the cloth. These threads may pass from a reel fixed in any suitable position.

55 In connection with the invention we employ a novel form of loom-temple, which, as is well known, is used at each side of the cloth, being woven for the purpose of stretching out or maintaining the same at its full or proper  
60 width and which is especially adapted for the purpose of this invention of allowing the border-shuttles immediately in front of the reed  $M'$  when moved toward the fell of the cloth to effectually clear the said temples,  
65 thus obviating obstructions at such parts as

would be in the case were loom-temple of ordinary construction employed.

According to our construction we employ a hollow tubular piece or roller  $M$ , provided with needles, or the surface of the said roller  
70 may be provided with any other means or device as is now usually employed in order to effect the adhesion of the cloth therewith. The said roller is mounted on a temple-rod  
75  $N$ , attached to the loom-frame in the ordinary manner. On the said rod we mount a suitably-formed shield or cover or may be a spindle bar or rod  $O$  parallel to the surface of the temple-roller, which cover or spindle  
80 bar or rod, as the case may be, is provided with an end piece  $P$ , having a set-screw  $Q$ , by which the said cover, bar, rod, or spindle may be fixed or adjusted in any desired position to the temple-rod  $N$  with relation to the temple-  
85 roller. The spindle  $O$  or the cover, as the case may be, thus forms a guide under which the cloth  $R$  being woven may pass in close contact with and over the temple-roller when  
90 a cover is employed. This is also for the purpose of protecting the pins from injury, as is well known. (See Fig. 9.) As the cover or spindle just described is capable of being  
95 turned or moved or adjusted about the axis of its support  $N$ , consequently as the cover or spindle is more or less moved about the axis of its support the cloth may be more or less maintained in close contact with the temple-roller as more or less pressure is put on the cloth.

The cover or spindle of the temple just described is arranged to be in close proximity  
100 to the temple-roller. This construction of the temple enables the shuttles of this our invention during the operation of weaving the borders to effectually clear the said temple,  
105 which object could only with difficulty be attained by the employment of temples of the ordinary form.

The operation of our invention is as follows: During the process of weaving the body  
110 of the cloth—i. e., the portion between the borders—the shuttles for weaving the same pass to and fro through the shed in the ordinary and well-known manner, and simultaneously the shuttles for weaving the borders are  
115 caused to pass to and fro through the border-sheds in the direction of the arrow, the weft carried by the respective shuttles passing around or engaging with the linking-threads which  
120 are interposed or situated between the border-warps and the main warp of the cloth, hereinafter particularly described. (See Fig. 3.) The linking-threads, as before mentioned, pass from a suitable reel  $G$  and threaded  
125 through heald No. 7. (See Fig. 4.) The healds through which the linking-threads pass are operated by a suitable jack-lever, which is adapted to alternately actuate the same or said linking-threads between points  $H$  and  $H'$ .  
130 (See Fig. 4.) Consequently the positions of



the border-sheds and the shed of the cloth, respectively, become alternately or periodically situated below and above the positions of the linking-threads, accordingly as the said threads are operated or caused to assume the positions H or H', respectively. Figs. 5 and 7, respectively, represent the positions of the shuttle of the border-warps and the shuttle of the main warp when in the act of passing underneath the linking-threads. Figs. 6 and 8 represent the positions of shuttles of the border-warps and the shuttles of the main warp when in the act of passing over the linking-threads, respectively. Consequently the respective loops I I and J J are formed, (see Fig. 3)—i. e., the loops formed by the border-shuttles and the loops formed by the shuttle for weaving the body of the cloth. Thus by this means the borders K K' are connected with the main warp or the body of the cloth.

The border-shuttles may be actuated or operated in the same or opposite directions with or relative to the main shuttle. The main warp-shed being at a lower level than the border-warp sheds allows the main shuttle to be picked across the "slay" and under the border-warp sheds. Consequently the main shuttle does not interfere with the operation of the border-weaving shuttles, the operation of which latter we now proceed to describe.

The shuttles  $f$  and  $f'$  are, as shown in Fig. 2, in the act of being passed from one pair of forks to the opposite pair of forks and through the border-sheds—i. e., from the forks  $c^3 c^3$  to the opposite forks  $c^2 c^2$ —which is effected by the following means: The blocks  $b b$  are actuated by the picking-lever  $p$ . Consequently the forks  $c^3 c^3$  are caused to travel forward in the direction of the arrows, as shown in Fig. 2, carrying the shuttle  $f f'$ , which movements cause the forks to approach near the forks  $c^2 c^2$ , and vice versa.

The extent of the movement of the forks  $c^2 c^2$  are controlled by the check-straps  $l l'$ , which may be of any suitable lengths as may be desired for the purpose of allowing the forks from which the border-shuttles are in the act of being ejected to be brought into proper positions with relation to the opposite forks suitably, so that they may receive the said shuttles when passed through the border-sheds, as hereinafter described.

The office or function of the slide-spindles  $e' e'$  is to expel or eject the shuttles from between the forks, as from the forks  $c^3 c^3$  to the opposite forks  $c^2 c^2$ . The slide-spindles are operated through the medium of the levers  $h' h'$  in the following manner:

The levers  $h h$  and  $h' h'$  are each, respectively, connected at their upper ends to fixed points or studs on the hand-rail  $a$  by means of straps. When the rods  $n$  or  $o$  are actuated by the levers  $p r$ , the blocks  $b b$  or  $b' b'$  are caused to slide or move forward, one pair of blocks moving at a time only, as  $b b$  or  $b' b'$ , the other

pair remaining in the meantime stationary. Afterward the blocks are pulled back to their normal position by the coiled spring  $m$ , as hereinbefore indicated. Consequently the levers  $h h$  or  $h' h'$ , which are respectively mounted on the said blocks, are caused, as shown with regard to the levers  $h' h'$ , to expel or eject the shuttles  $f$  and  $f'$  from the forks  $c^3 c^3$  into the opposite pair of forks  $c^2 c^2$ , which is effected by the aid of the straps becoming tight and effecting a pull on the levers, the springs actuating or reversing the position of the spindles  $e' e'$  by means of the tension created thereon consequent upon the pull of the levers through the medium of the straps, as hereinbefore described.

Immediately after the picking action or movement of the shuttles just described the whole of the apparatus or forks  $c^3 c^3$ , with their connections, is then caused to return to its normal position, which is effected by means of the springs  $m$  or other suitable appliance attached thereto in any suitable manner, such movement causing the straps or bands to become slack. Consequently the springs  $k' k'$  close and pull back levers  $h' h'$ , thus causing the sliding spindles  $e' e'$  to be brought back also to their normal position. The similar operation of the other pair of apparatus  $c^2 c^2$  completes the process for weaving the borders.

Having now particularly described and ascertained the nature of this our invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a loom for weaving bordered fabrics, means for interposing linking-threads between the main cloth and the border to be attached thereto, means for looping the border-weft to said linking-threads for securing the border thereto, and means for looping the weft of the main cloth around said linking-threads for securing the main portion of the cloth thereto.

2. In a loom, a lay-top, two pairs of alternately-operating sliding blocks suitably connected with said lay-top, operating means for said blocks, forks carried by said blocks and adapted to alternately engage a shuttle, and means operating through the forks for operating the shuttles to cause their alternate engagement with the forks.

3. In a loom, a lay-top, two pairs of alternately-operating sliding blocks suitably connected with said lay-top, operating means for said blocks, forks carried by said blocks and adapted to alternately engage a shuttle, spindles operating through said forks for releasing the shuttle from engagement therewith, and means for operating said spindles.

4. In a loom, a lay-top, two pairs of alternately-operating sliding blocks suitably connected with said lay-top, operating means for said blocks, forks carried by said blocks and adapted to alternately engage a shuttle, spindles operating through said forks for releasing the shuttle from engagement therewith,



and spring-actuated levers for alternately operating said spindles.

5. In a loom for weaving bordered fabrics, a lay-top, a pair of rods arranged in the said  
5 lay-top, a pair of blocks carried by each of the said rods, forks carried by the said blocks and adapted to engage a shuttle, spindles operating through said forks for releasing the shuttles therefrom, spring-actuated levers for operating the said spindles, and means for limiting the movement of said levers.

6. In a loom for weaving bordered fabrics, a lay-top, two pairs of alternately-operating sliding blocks suitably connected with said  
15 top, operating means for said blocks, forks carried by the blocks and adapted to alternately engage the shuttles, means operating through the forks for causing the alternate

engagement of the shuttles therewith, and a temple arranged in suitable relation to said forks. 20

7. In a loom for weaving bordered fabrics, means for interposing linking-threads between the main cloth and border, means for looping the border-weft to said linking-threads for securing the border thereto, and means for looping the weft of the main cloth around said linking-threads and below the looped weft of the border for securing the main portion of the cloth to the linking-threads. 25

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