No. 783,818. PATENTED FEB. 28, 1905.

A. BUCKLER.

LOOM FOR WEAVING PILE FABRICS.

APPLICATION FILED APR. 26, 1904.

3 SHEETS—SHEET 1.

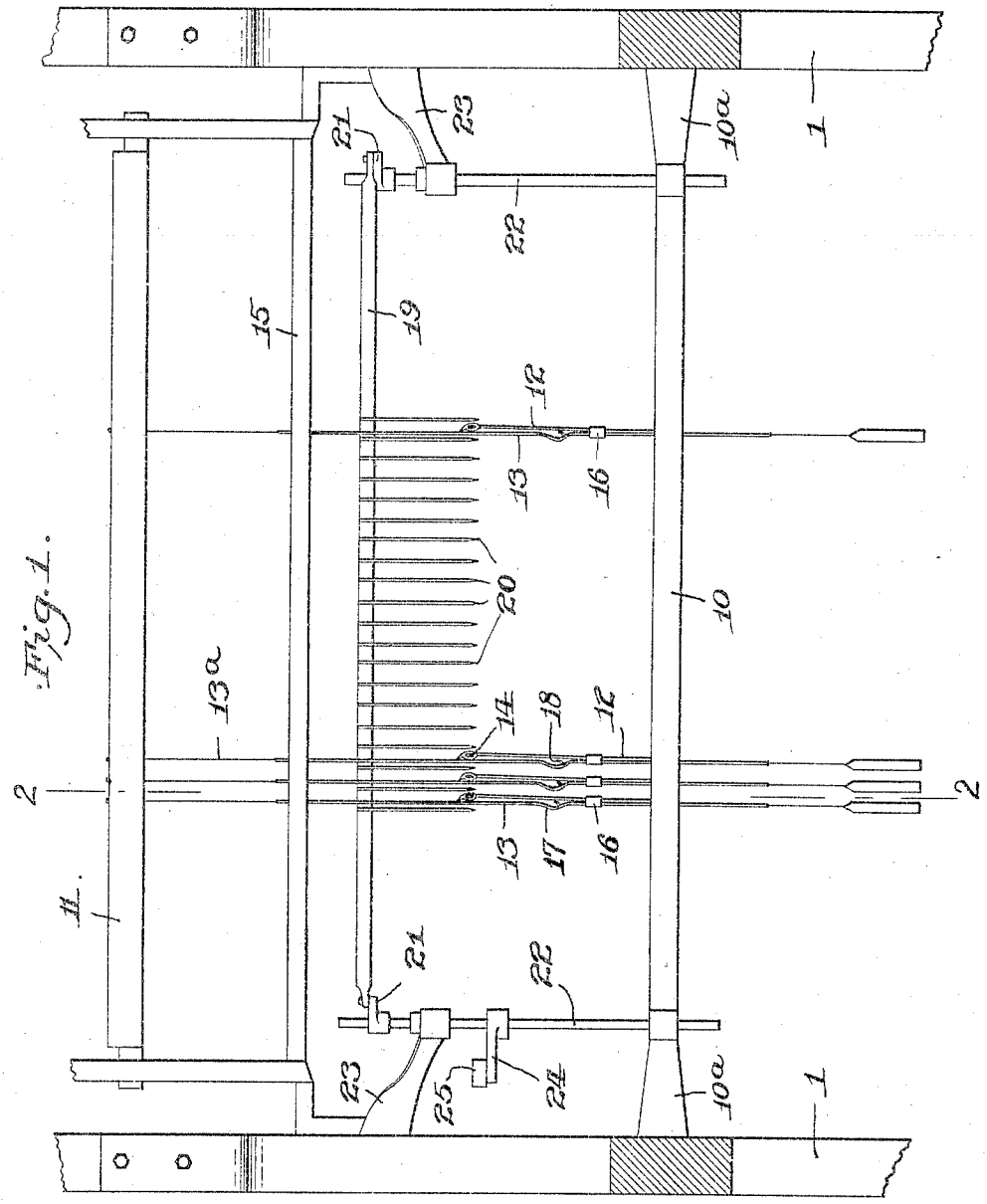


Fig. 1.

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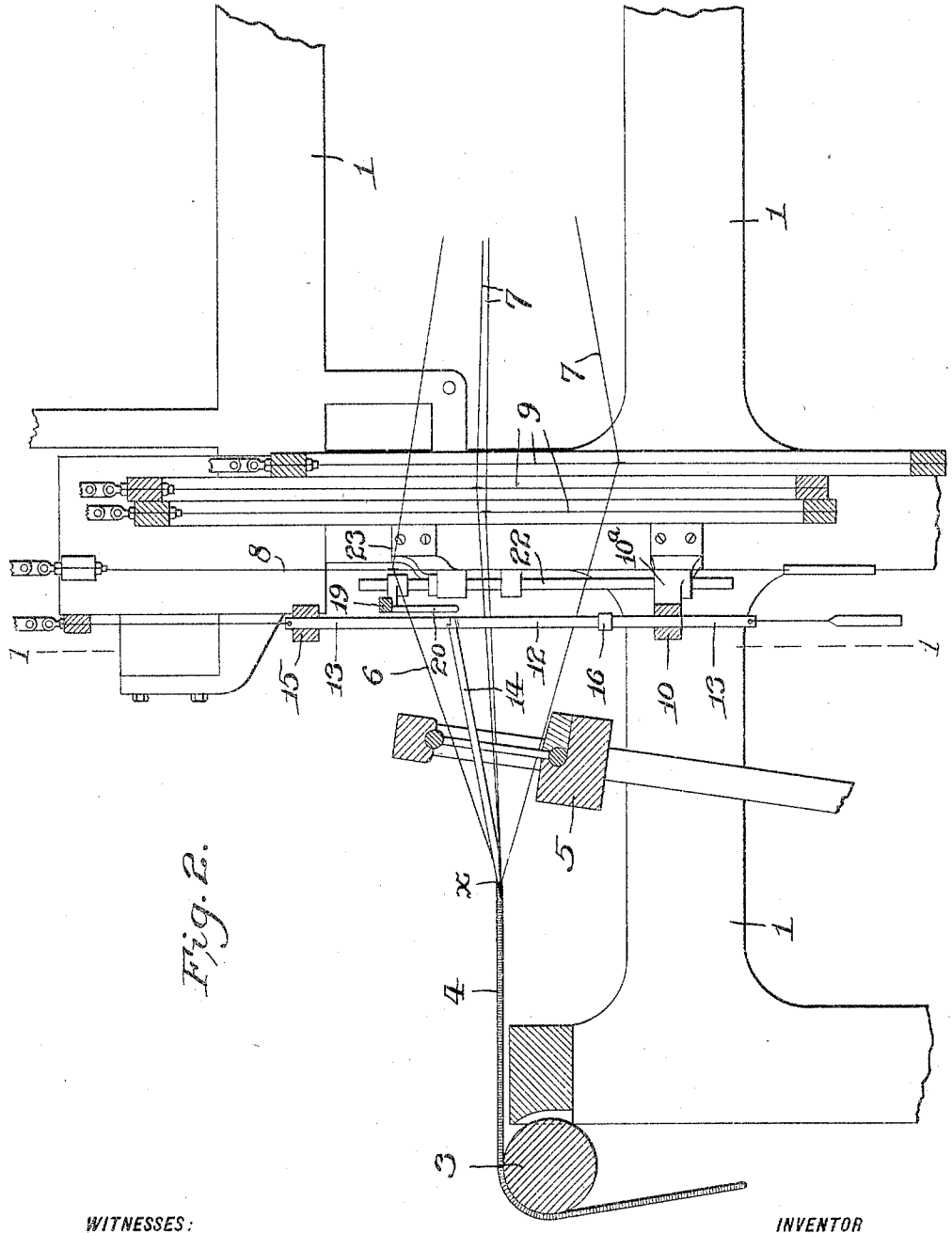


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 4.

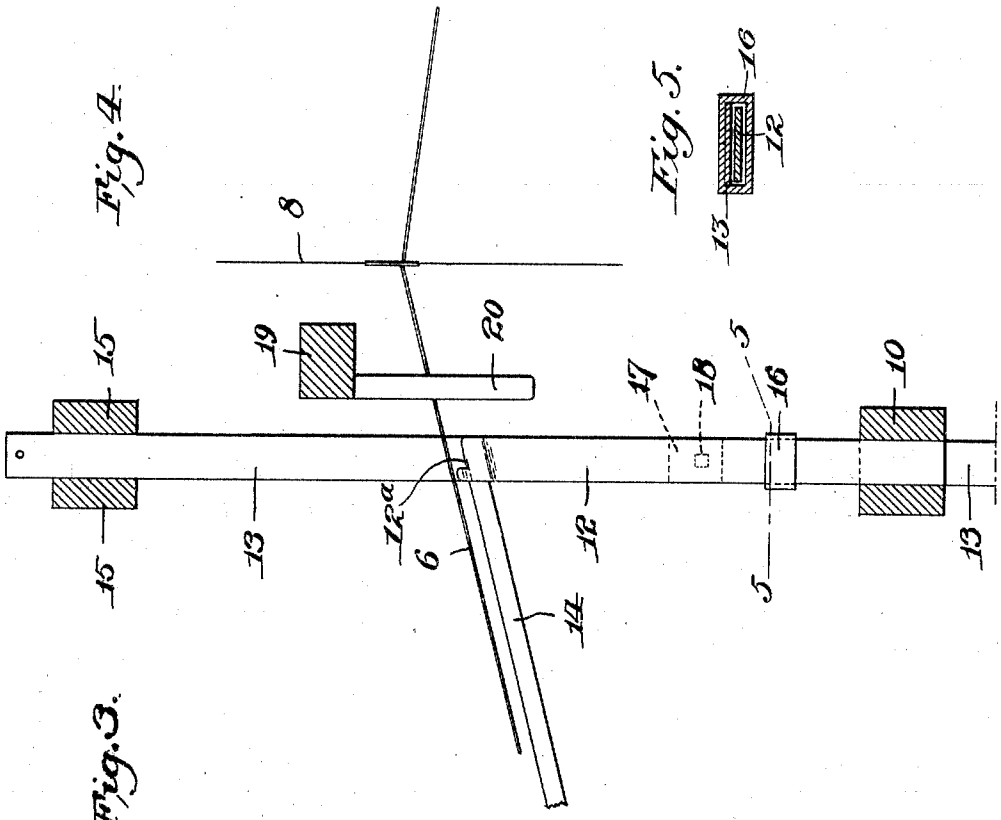
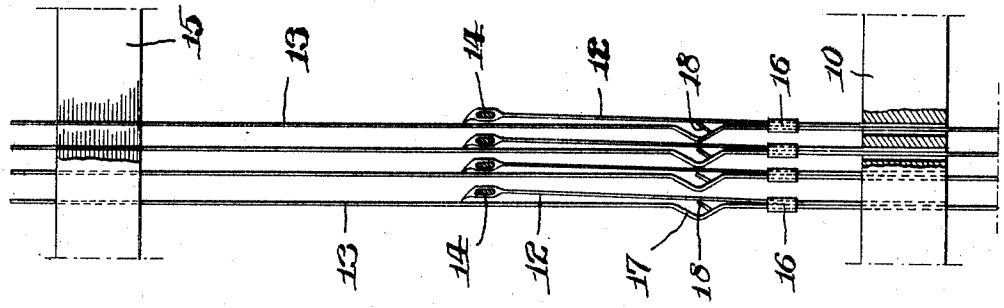


Fig. 5.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR BUCKLER, OF PHILADELPHIA, PENNSYLVANIA.

LOOM FOR WEAVING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 783,818, dated February 28, 1905.

Application filed April 26, 1904. Serial No. 204,936.

To all whom it may concern:

Be it known that I, ARTHUR BUCKLER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Looms for Weaving Pile Fabrics, of which the following is a specification.

This invention relates to that class of looms for weaving pile fabrics wherein a series of pile-wires are employed which are arranged parallel to the pile-forming warp-threads and over which the pile-warps are adapted to be passed to form the pile-loops during the weaving operation—such, for example, as that illustrated in Letters Patent of the United States No. 747,587, dated December 22, 1903, to which reference may be had. In machines of this character the pile-wires are supported at one of their ends by a series of heddles in a manner to permit the passage of the pile-warps from side to side of the pile-wires to form loops thereon as said warps are raised and lowered by a jacquard mechanism or other means to form sheds. The other or free ends of the pile-wires are supported by the fabric being produced and extend a slight distance into the pile-loops thereof, the fabric being drawn off of the pile-wires by the take-up roller as rapidly as it is produced, as is well known in this art.

The object of the invention is to provide an improved series of heddles having advantages not heretofore attained for supporting the pile-wires and insuring the proper operation of the pile-forming threads with relation thereto.

The invention consists in the novel construction and combinations of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a longitudinal vertical section of a loom provided with my invention on line 1 1, Fig. 2. Fig. 2 is a transverse section thereof as on the line 2 2 of Fig. 1, certain parts being omitted. Fig. 3 is an elevation, partly broken away and enlarged, of several of the heddle-blades and adjuncts. Fig. 4 is a view of the heddle-blades and adjuncts as seen at right angles to Fig. 3. Fig. 5 is a sectional detail as on the line 5 5 of Fig. 4.

1 designates the main frame; 3, the take-up roller; 4, the fabric being produced, and 5 the lay movable toward and from the point marked *x*, where the fabric is being produced.

6 designates the pile-forming warp-threads, and 7 the binder and stuffer warp-threads. The pile-forming threads 6 and the binder and stuffer threads 7 are engaged with the heddles 8 and 9, respectively, to be raised and lowered thereby in the usual well-known manner.

Thus far the construction and operation of the machine are well known and need no detailed description herein.

10 designates a fixed horizontal bar, which is supported at its respective ends by brackets 10^a, extending inwardly from the sides of the main frame 1. Fixed to this bar are the lower ends of a series of short blades or heddles 12. Attached to the upper ends of these blades are a series of pile-wires 14, which extend from the blades to and slightly beyond the point *x*. Arranged adjacent to each short blade 12 is a long blade or heddle 13, the lower portion of which is slidingly fitted to the bar 10, so as to be vertically movable therein and at the same time be held against lateral motion. The upper portions of the long blades 13 extend between a pair of fixed parallel bars 15, so as to permit lateral motion of said upper portions and prevent edgewise motion thereof, and the upper ends of the long blades 13 are connected by cords 13^a to a horizontal bar 11, which when raised and lowered by the jacquard or other suitable mechanism will bodily raise and lower the long blades 13 for a purpose hereinafter explained.

The upper end of each short blade is inclined laterally, so as to rest normally in engagement with the adjacent long blade 13, as shown, and each long blade 13 has affixed thereto a band 16, which extends around the adjacent short blade 12 to maintain the latter blade in close contact with the adjacent long blade 13 as said long blade is raised and lowered.

The long blade 13 rests normally in the down position, and each long blade 13 is provided with an offset 17 below the top of the adjacent short blade 12, and each offset is

provided with a centrally-arranged projection 18, which extends toward the adjacent short blade 12. One side of the upper end of the short blade 12 is cut away, as at 12^a, to permit the passage thereby of the projection 18 without disturbing the engagement of the free end of the short blade with the body portion of the long blade as the long blade is raised and lowered.

Arranged adjacent and parallel to the upper portion of the series of heddles 12 is a bar 19, provided with a series of downwardly-projecting blades 20, corresponding in number and position with the heddles 12 and extending to a position slightly below the tops thereof. The respective ends of the bar 19 are pivotally connected to arms 21, projecting from vertically-arranged rock-shafts 22, which are mounted in the brackets 10^a and brackets 23, projecting from the sides of the main frame 1. One of the shafts 22 is provided with a projecting arm 24, which is connected by a bar 25 with suitable mechanism, (not shown,) by means of which the shafts 22 and bar 19 may be rocked from side to side in alternate succession at certain predetermined intervals.

The warp-threads 6 and 7 extend between the heddle-blades, and during the formation of the sheds in the weaving operation the pile-forming warp-threads 6 are raised to a position between the blades 13 and above the short heddle-blades 12 and pile-wires 14. Each time the pile-threads 6 are raised to this position the bar 19 is moved to one side, thereby causing the blades 20 to engage said threads and move them laterally in one direction after one raising and in the reverse direction after the next raising, and so on in alternate succession.

Referring now to Fig. 1, when the pile-threads 6 are raised and moved to the left-hand side by the blades 20 said threads engage the long heddle-blades 13, which yielding to the pressure of the threads are moved from engagement with the short heddle-blades 12, and as the threads are then lowered they pass down the faces of the long heddle-blades 13 and between them and the short blades 12, the long blades 13 being held from engagement with the short blades 12 until the threads pass below the tops of the short blades 12, whereupon the pile-threads 6 escape the blades 20 and the long heddle-blades 13 return to their normal position. When the pile-threads 6 are next raised by the jacquard mechanism, the bar 11, and therewith the long heddle-blades 13, are also raised. This operation causes the projections 18 to engage the pile-threads 6 and raise them above the short heddle-blades 12 independently of the independent connection of each pile-thread 6 with the jacquard mechanism. Thus it will be seen that if for any reason the jacquard mechanism should fail to raise any of the threads 6 the raising of all pile-forming threads 6 at this particular time is insured by the action of the projections 18 on the long heddle-blades 13. The blades 20, and therewith the pile-threads 6, are now moved to the right, and while they remain in engagement with the projections 18 they are drawn slightly away from the body portion of the long heddle-blades 13. Therefore when the threads 6, and therewith the long heddle-blades 13, are again lowered the upper ends of the short heddle-blades 12 will pass between the pile-threads 6 and the long heddle-blades 13, thereby freeing said threads from the projections 18 and causing them to pass down the right-hand side of the short blades 12 to their original position. Thus it will be seen that every second time the pile-threads 6 are raised by the jacquard mechanism to be passed over the pile-wires 14 they are also raised by the long heddle-blades 13, thereby insuring the raising of all pile-threads 6 above the short heddle-blades 12 every second time that they are raised by the jacquard or other mechanism. This is an important feature, as the jacquard mechanism frequently fails to raise all the threads for various reasons.

Another important feature of my invention is the arrangement of parts to permit the free lateral movement of the upper portions of the long heddle-blades 13 not only for the more efficient operation of the machine, but also to permit the heddle-blades to be parted in repairing broken threads, &c.

From the hereinbefore-described construction and operation it will be seen that as the pile-threads 6 are raised and lowered the pile-loops are formed on the pile-wires 14, which loops are beat into the fabric by the lay 5 in the usual manner.

I claim—

1. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, pile-wires extending from said blades and a series of long heddle-blades adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally.

2. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, pile-wires extending from said blades, a series of long heddle-blades adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally and the free ends of said short heddle-blades being inclined laterally and into engagement with the long heddle-blades.

3. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-

wires supported by said blades, and a series of long heddle-blades adjacent to the short heddle-blades, the free ends of said short heddle-blades being inclined laterally and into engagement with said long heddle-blades.

4. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wire supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, and means carried by the long heddle-blades for engaging and raising said warp-threads.

5. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades provided with offset portions and arranged adjacent to said short heddle-blades, and means carried by the long heddle-blades and arranged within the offset portions thereof for engaging and raising said warp-threads.

6. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally, and means carried by the long heddle-blades for engaging and raising said warp-threads.

7. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades provided with offset portions and arranged adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally, and means carried by the long heddle-blades and arranged within the offset portions thereof for engaging and raising said warp-threads.

8. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, the free ends of said short blades being inclined laterally and into engagement with the long heddle-blades, and means carried by the long heddle-blades for engaging and raising said warp-threads.

9. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades provided with offset portions and arranged adjacent to the short heddle-blades, the free ends of said short heddle-blades being inclined laterally and into engagement with the long heddle-blades, and means carried by the long heddle-blades and arranged within the offset portions thereof for engaging and raising said warp-threads.

10. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades arranged adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally, said short heddle-blades having their free ends inclined laterally and into engagement with the long heddle-blades, and means carried by the long heddle-blades for engaging and raising said warp-threads.

11. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades provided with offset portions and arranged adjacent to the short heddle-blades, said long heddle-blades being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally, said short heddle-blades having their free ends inclined laterally and into engagement with the long heddle-blades, and means carried by the long heddle-blades and arranged within the offset portions thereof for engaging and raising said warp-threads.

12. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, means carried by the long heddle-blades for engaging and raising said warp-threads, and means carried by the long heddle-blades and engaged with the short heddle-blades.

13. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, means carried by the long heddle-blades for engaging and raising said warp-threads, and bands carried by the long heddle-blades and surrounding the short heddle-blades.

14. In a loom for weaving pile fabric, the combination of the pile-forming warp-threads, a series of short heddle-blades, a series of pile-wires supported by said blades, a series of vertically-movable long heddle-blades adjacent to the short heddle-blades, said long heddle-blades

being supported against lateral movement below the supporting-point for the pile-wires and having their upper ends free to move laterally, means carried by the long heddle-blades for engaging and raising said warp-threads, and means carried by the long heddle-blades and engaged with the short heddle-blades.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR BUCKLER.

Witnesses:
ANDREW V. GROUPE,
RALPH H. GAMBLE.