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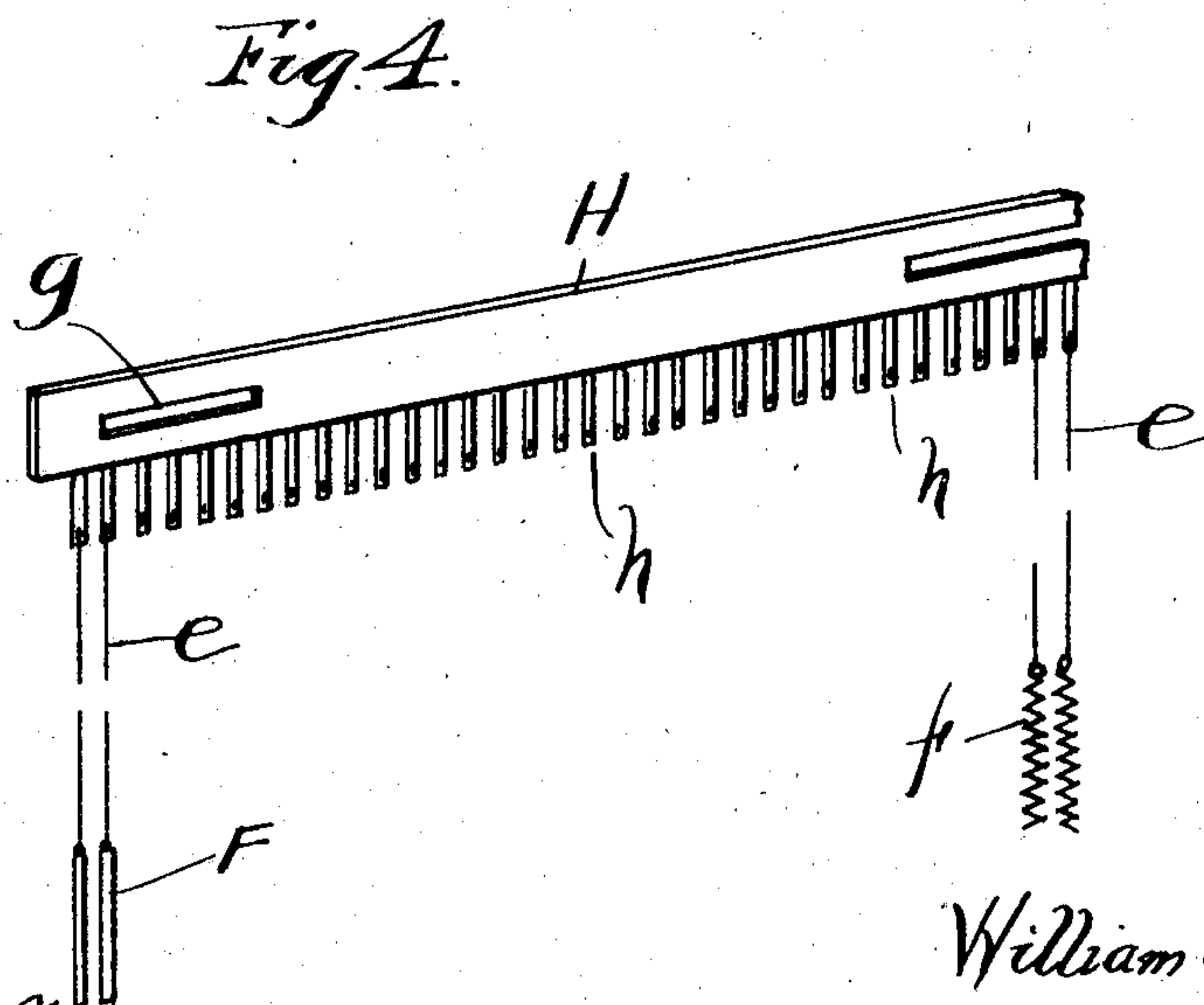
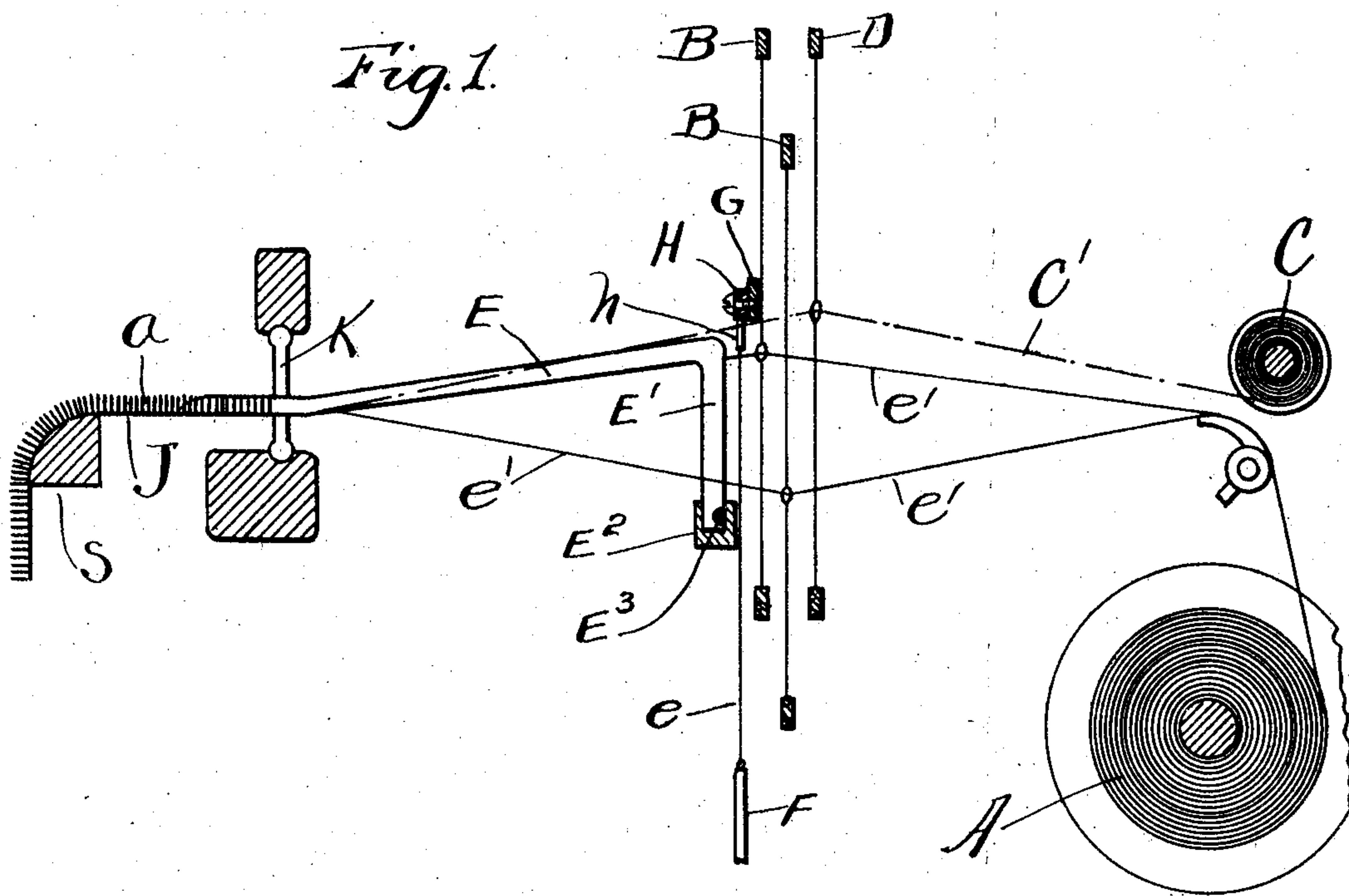
PATENTED AUG. 23, 1904.

W. G. HARTLEY.
LOOM FOR WEAVING PILE FABRICS.

APPLICATION FILED JAN. 26, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

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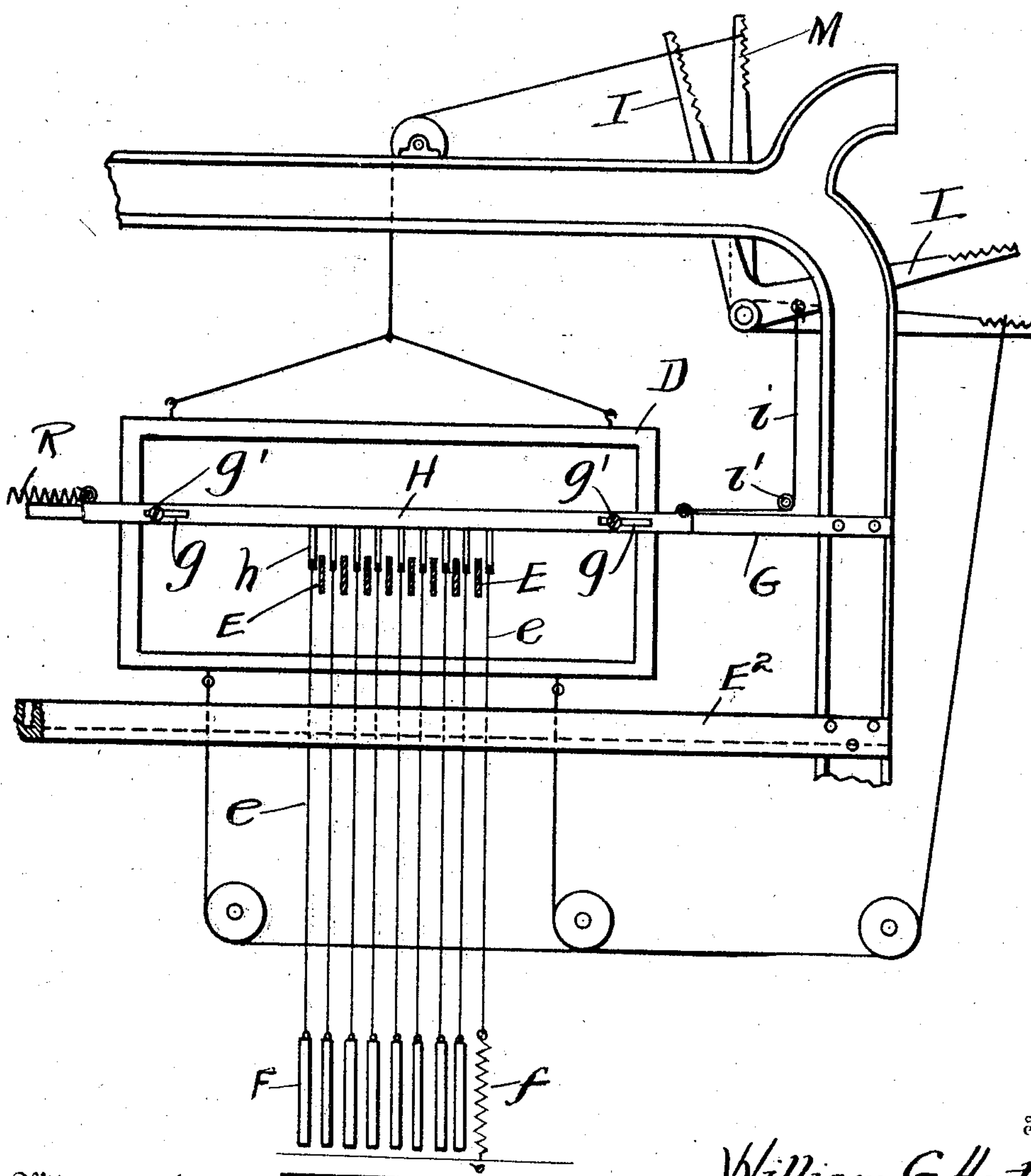
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3 SHEETS—SHEET 2.

Fig 2.



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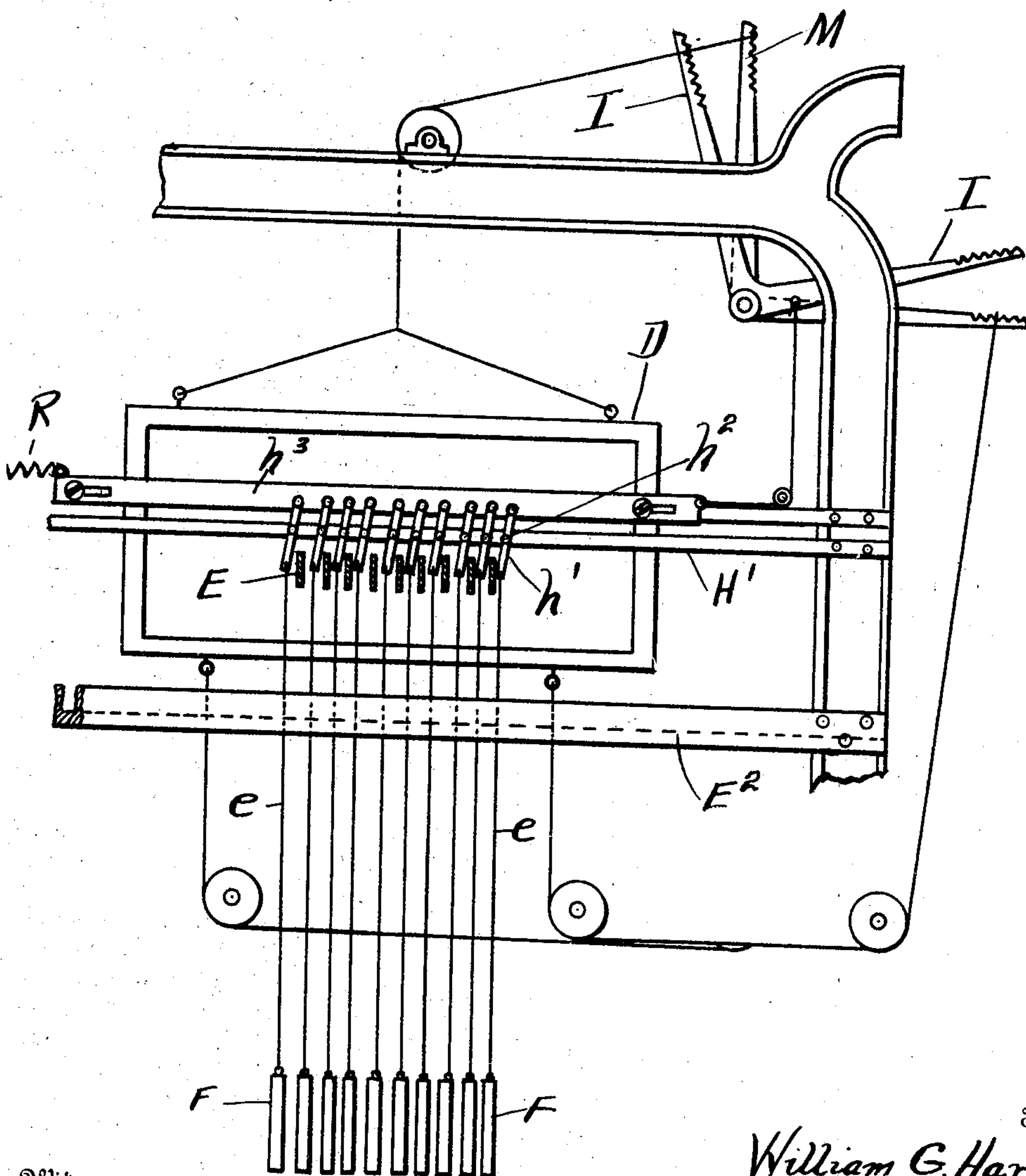
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3 SHEETS—SHEET 3.

Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM G. HARTLEY, OF AMESBURY, MASSACHUSETTS, ASSIGNOR, BY
DIRECT AND MESNE ASSIGNMENTS, TO HARTLEY LOOP WEAVER COM-
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LOOM FOR WEAVING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 768,223, dated August 23, 1904.

Application filed January 26, 1904. Serial No. 190,649. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. HARTLEY, a resident of Amesbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Looms for Weaving Pile Fabrics; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in weaving pile fabric, and has for its object the construction of a simple and positive mechanism for forming loops over pile-wires and is adapted more particularly for use in weaving carpets.

A further object of the invention is to provide means, including a comb or bar, having a set of downwardly-projecting teeth or fingers, each finger projecting between the series of pile-threads, the whole being capable of being moved transversely or in the direction of the width of the fabric and carrying the pile-threads over the pile-wires.

A further object of the invention is to provide flexible cords or connections depending from the end of each tooth or finger, which cords extend down through the ground-warp of the fabric, said flexible connections being held in place from below by weights, springs, or other suitable means. These connections from the ends of the teeth are for the purpose of guiding the vertically-reciprocating pile-threads so that when they are carried down and out from between the teeth on their descent through the ground warp-threads they will be sure to find their way back again between the teeth whence they came.

With these and other objects in view the invention consists of certain novel features of construction, combinations, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

Figure 1 illustrates the pile-threads as being operated by the heddles, the view being a dia-

gram in section showing parts of the loom and the relative position of the new device to the usual parts looking in the direction of one end of the loom. Fig. 2 is a front view showing a portion of the lower frame with my improved device attached thereto, showing the comb-bar and the flexible connections depending from its teeth. Fig. 3 shows a modified construction of the device for moving the pile-warps transversely across the pile-wires. Fig. 4 shows a detail of a portion of the comb-bar with the flexible connections depending therefrom.

Referring to the drawings, A in Fig. 1 is the usual yarn-beam that carries the warp-threads from which the ground fabric is woven. On this ground fabric is formed the pile-loops, which when cut produce the velvet or plush effect such as form the face of carpeting or other pile fabric.

B B are the heddles or harnesses that control the ground warp-threads, and D is the heddle that controls the vertically-reciprocating movement of the pile-threads C', these latter threads being led from the spools C on the rear of the loom. When it is desired to weave plain carpeting, this heddle D may be used, and it may be operated by the ordinary jack-levers in a dobby-head; but when it is desired to weave a figured carpeting or the like the jacquard mechanism (not shown) may be used in the manner well known by those skilled in the art of weaving.

At E is the pile-wire, one end of which lays on the woven fabric, such end being drawn down to the size of the loops desired to be formed over it. The main arm of this pile-wire may be set on an angle a little less than that of the upper shed of the ground warp-threads when open and is supported in position by the depending leg E', the lower end of which leg rests in the supporting-box E² and is held firmly in position by the locking-pin E³, which passes through all of said pile-wires. This supporting-box E² passes across the loom and is fixed to the end frames.

To carry the pile-warps C' over the pile-

wires E first to one side and then the other in the formation of loops over said wire, I preferably use a comb or bar H, having downwardly-projecting teeth *h*, which teeth engage the pile-warps C' to move them laterally when said pile-warps are in their up position, as shown in Fig. 1. This comb-bar is shown to be slotted at *g* and is movably supported on a fixed bar G by the screws *g'*, which screws pass through said slots into the fixed bar G. This comb-bar may be moved endwise in one direction by the harness-lever I, to which it is connected by cord *i* over pulley *i'*, which harness-lever is operated by the dobby-head in the usual way and for the exclusive purpose of drawing this bar in one direction. The spring R is for the purpose of returning said bar when released by said jack-lever. I have shown and described this bar as being hung to slide on a fixed bar and being operated by a jack-lever; but this comb-bar may be held in any suitable way and operated to reciprocate by connecting it to any suitable motion of the loom.

The main object of my invention is the providing of means for insuring the return of each pile-thread back into the space between the same teeth of the comb where it was before it was carried down by the heddle. This is accomplished by the use of a flexible cord, wire, or other suitable flexible connection *e*, which is connected to the lower end of each tooth of the comb. These cords pass down through the ground warp-threads *e'*, and at their lower ends are hung weights F or light springs *f*, (see Fig. 4,) which springs or weights are simply for the purpose of holding the said flexible cords in place and at the same time allowing their upper ends the necessary lateral movement. The object of these flexible cords is to guide the pile-threads back where they came from between the teeth of the comb after they have been forced down and out of said comb-teeth into the ground-warp, where they are fastened in the usual way. By making the cords flexible they allow the comb-bar to move laterally without affecting the ground warp-threads, through which threads these flexible cords pass.

Instead of the comb device above described and shown in the drawings any other suitable device for moving the pile-warps transversely over the pile-wires to form the loops may be employed—for example, the device shown in Fig. 3, which consists of a series of levers *h'*, pivoted at *h''* on a stationary bar H', with their lower ends extending down below the upper portion of the pile-wires E and their upper ends pivoted to a transversely-moving bar *h'''*, having a reciprocating motion corresponding to the motion of the comb H. At the lower ends of each of these levers *h'* is also hung the flexible cord or connection *e*, the same as those shown on the comb.

The operation of my device is further explained as follows: When it is desired to weave a plain pile fabric, the pile-threads are led from the spools C in the rear of the loom through the harness D, thence through the reed K to the ground fabric J, to which latter it is secured. This harness D is actuated by a jack-lever M in the dobby-head to raise the pile-threads at the required time above the pile-wires E. The harness-lever I is then called into action in the usual manner and draws the sliding bar H endwise, the movement of which bar causes the teeth *h* of the comb-bar H to press against the pile-threads C', causing them to be carried down on the opposite side of the pile-wires E and form a loop when the harness D descends. On the next stroke up of the pile-thread-actuating harness D the sliding bar H is released and allowed to be carried back by the tension of the spring R to its inward position, causing the teeth *h* to engage the opposite side of each adjacent thread and press or guide them over the next pile-wire, so they may be drawn down on the opposite side of said pile-wires, again forming a loop. By a slight movement of comb-bar, the teeth of which are placed between adjacent pile-threads, said threads are guided to be carried down alternately first on one side and then on the other of the pile-wire E and bound down in the usual way by the passing of the shuttle over them. This thread is thus securely woven into the body of the fabric, the loops being formed over the wire, said loops being carried down by the beating up of the reciprocating reed K to the small end of the wire, where they are drawn to the proper size. This sequence of motions is repeatedly made, and a series of loops *a* of the pile-threads are formed over each wire E, which loops are drawn off of the front end of the wires as the cloth is drawn forward over the breast-beam S by the take-up motion. (Not shown.)

Any number of flattened wires E and corresponding pile-threads C' may be used, and any number of harnesses or shuttles may be employed, according to the style of goods desired. Only enough of the loom is shown to illustrate the operation of my invention.

I have shown the pile-threads C' as being operated by the harness-levers in a dobby-head; but I do not wish to confine myself to any particular method of operating these pile-threads, as they may be actuated by cams, jacquard mechanism, or any of the various methods known to those skilled in the art of weaving.

This device is not confined to weaving of carpets alone, but may be used in weaving any plain or figured velvet or other pile fabric.

The mechanisms for operating the different parts are not shown or described, as they are

all well known, and no particular way is claimed. Any of the several varieties may be employed that may upon trial be found advisable.

5 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom of the character described, means over which loops are formed by the pile-threads, laterally-movable means for engaging and guiding or pressing said pile-threads to one side so that when said threads are carried down they will form loops over said pile-forming means and flexible connections depending from said pile-thread-moving means for guiding the pile-threads when they ascend.

2. In a loom of the character described a series of pile-wires over which loops are formed by the pile-threads, guide-fingers, means for laterally moving said guide-fingers to guide or press said pile-threads to one side so that when said threads are carried down they will form loops over said pile-wires, and flexible connections depending from said guide-fingers for guiding the pile-threads when they ascend.

3. In a loom for weaving pile fabrics, pile-wires, over which the loops are made by the pile-threads, a laterally-movable comb or toothed guide-bar, the teeth of which engage the pile-threads to guide or press them laterally, whereby said threads will form loops over said pile-wires, means for moving said

bar, and flexible guides for the ascending pile-threads, said latter guides being held at their lower ends. 35

4. In a loom for weaving pile fabrics, pile-wires over which the loops are made by the pile-threads, a laterally-movable comb or toothed guide-bar, the teeth of which guide-bar engage the pile-threads to guide or press them laterally from side to side so that when said threads are carried down they will form loops over said pile-wires, means for moving said bar laterally and flexible connections depending from the teeth of said guide-bar for guiding the pile-threads when they are carried up by the harnesses. 45

5. In a loom for weaving pile fabrics, pile-wires over which loops are made by the pile-threads, a laterally-reciprocating toothed bar the teeth of said bar engaging the pile-threads to guide or press said pile-threads laterally so they will be carried down alternately first on one side of the pile-wires and then on the other making loops over said pile-wires and a flexible connection depending from each tooth of said bar, said connection being for the purpose of guiding the pile-thread back into its space between said teeth after having been carried down by the heddles. 55 60

In testimony whereof I have hereunto set my hand this 23d day of January, A. D. 1904.

WILLIAM G. HARTLEY.

In presence of—

ROBERT C. CLARK,
DELL W. DOLBIER.