

No. 762,527.

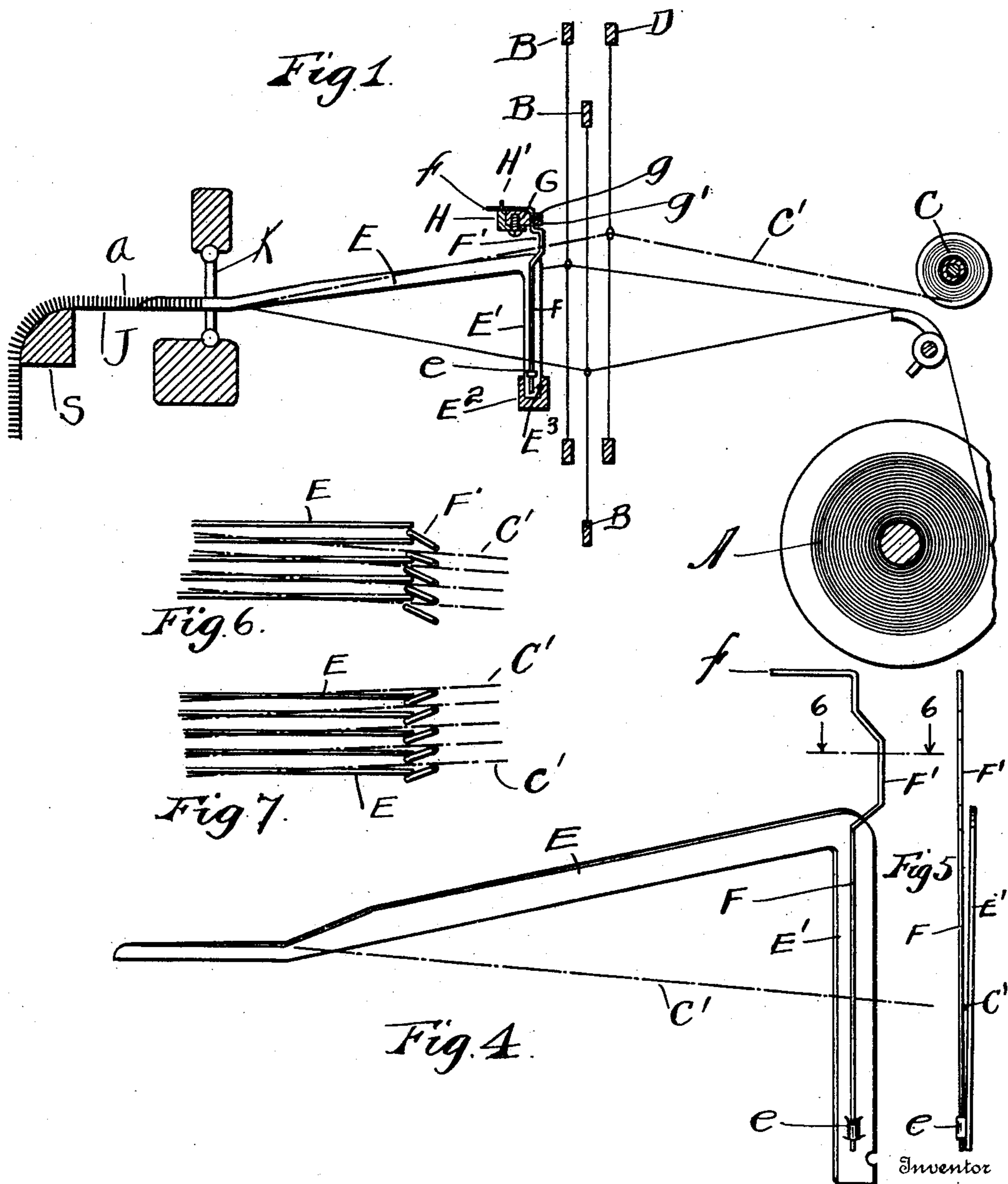
PATENTED JUNE 14, 1904.

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

APPLICATION FILED AUG. 20, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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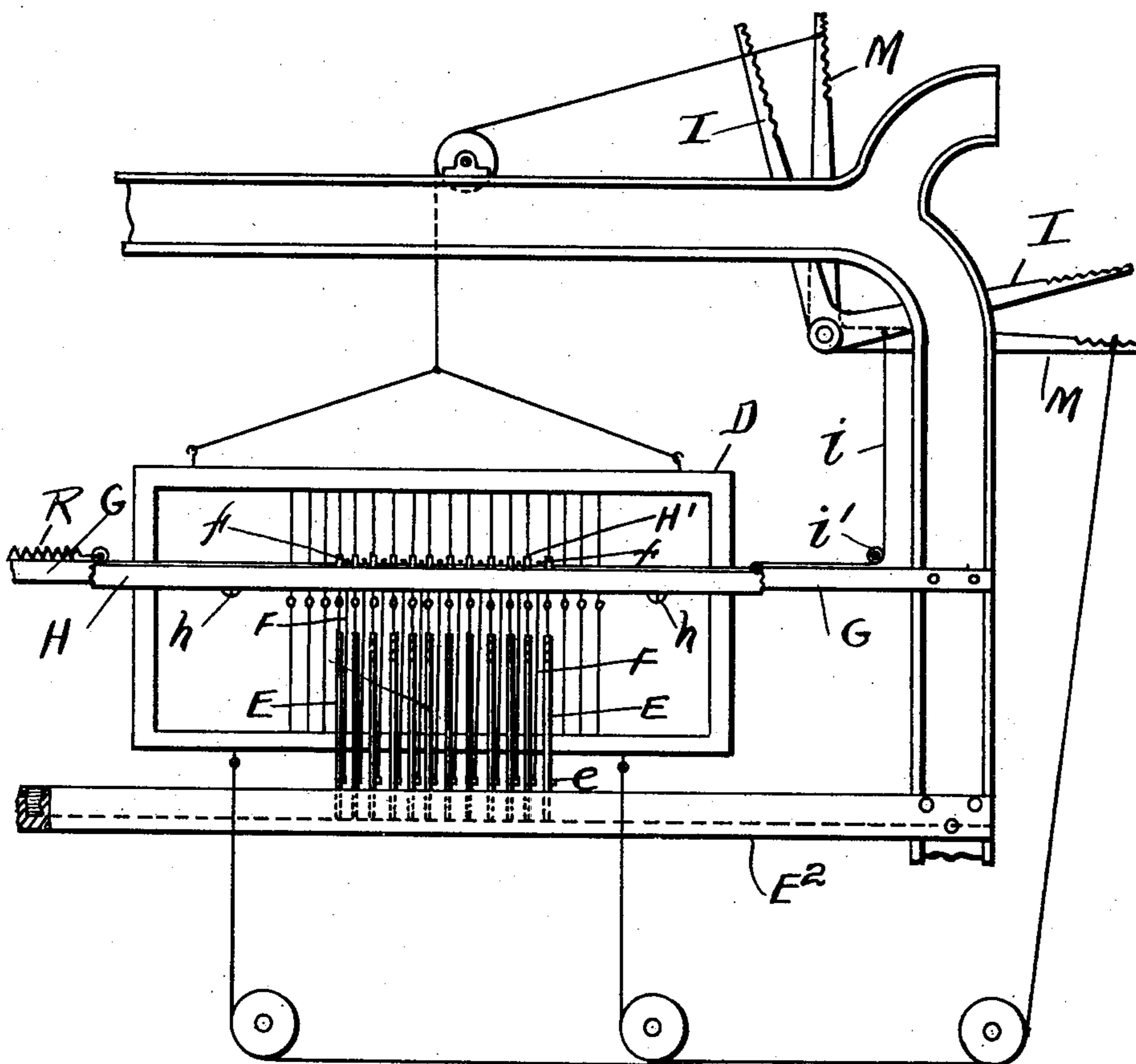
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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DIRECT AND MESNE ASSIGNMENTS, TO HARTLEY LOOP WEAVE COM-
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LOOM FOR WEAVING PILE FABRIC.

SPECIFICATION forming part of Letters Patent No. 762,527, dated June 14, 1904.

Application filed August 20, 1903. Serial No. 170,162. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. HARTLEY, a resident of the town of Amesbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Looms for Weaving Pile Fabric; 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 pertains to mechanism for weaving pile fabric, and has for its object the construction of a simple mechanism for forming loops over pile-wires and is adapted more particularly for use in weaving carpets. This mechanism consists in guide-wires set in between the pile-threads, which wires are operated automatically to press the pile-threads laterally and guide them to be carried down alternately first one side of the pile-wire and then to the other, forming loops over said pile-wire.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 illustrates the pile-threads as being operated by the heddles, the view being a diagram 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 diagrammatic view illustrating the connection of the heddle-frames and guide-wire-operating plate to the harness-levers of a dobby-head. Fig. 3 is a diagrammatic view illustrating the manner of operating the pile-threads and the guide-wire-operating frame by a jacquard mechanism. Fig. 4 is a detail of one of the pile-wires with one of the guide-wires in position thereon, also showing the position of a pile-thread when drawn down between a guide-wire and a pile-

wire. Fig. 5 is an end view of a pile-wire, showing the space between it and the guide-wire, into which space the pile-thread is drawn when carried down by the heddles. Fig. 6 is a top view showing the guide-wires F in position to guide the pile-threads C' over the pile-wires E to form a loop, the guide-wires being sectioned on line 6 6 of Fig. 4. Fig. 7 is a top view like Fig. 6, but showing the guide-wires F set in the opposite direction and in position to guide the pile-threads C' over the next adjacent pile-wires. Fig. 8 illustrates the sliding bar H as being operated by a jacquard-hook.

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

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 illustrated in Fig. 3 may be used in the manner hereinafter described.

At E is the pile-wire, one end of which lies 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 is set on an angle a little greater than that of the upper shed of the 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.

Pivoted in the eye *e* near the lower end of each leg E' of the pile-wires is the carrier or

guide-wire F, which extends up from the eye, leaving a space for the pile-thread along the side of the leg. (See Fig. 5.) The wire is bent out near its upper end at F', forming an offset or crank. Above this offset the wire is brought back in a line with the main portion and rests against a fixed bar G. The end f' of the wire is then bent approximately at a right angle and extends forward over and beyond said bar G. At g are guide-pins extending laterally outward from bar G, between which the wires F are supported to turn and are retained in position by the bar g', which bar extends along the fixed bar G for the purpose of holding the pin in place.

The sliding bar H is made of right-angle iron with one leg engaging the under side of the fixed bar G and is held in position thereon to slide endwise by screws h h through slots in this leg. On the upper edge of this bar are a series of pins H', extending upward, and between which the end f' of the guide-wire extends. This bar H is moved endwise in one direction by the harness-lever I, to which it is connected by cord i, over the 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.

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 throws the offset portions of the guide-wires F over 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 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 offset in each guide-wire to engage the opposite side of each adjacent pile-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 these guide-wires, 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 a 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.

The modification shown in Fig. 3 of the drawings illustrates my device as being actuated by a jacquard mechanism and is used when it is desired to obtain figured work in weaving carpeting. The principle of using the guide-wires F to press the pile-threads alternately from one side to the other of the pile-wires E is the same in both cases, the different-colored pile-threads used in making the figures being called, as desired, in the usual way by the guide-wires over the pile-wire E and down on the opposite side, forming the loops in the manner described above. In place of using the harness-lever I to operate the sliding bar H, I connect the same cord i to a jacquard-hook, (see Fig. 8,) and thus operate this slide-bar H and the guide-wires F in the proper time, the same as was done by the harness-levers in the dobby-head.

By the use of my device for weaving carpets the loom may be run at a much higher speed than by the old method and greater productions obtained. This construction, also, is extremely simple and practical and by the arrangement of the mechanism the parts are made very accessible. 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 mechanism for operating the different parts is not shown nor 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.

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

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, pile-wires over which loops are formed by the pile-threads, guides for the pile-threads, the warp-threads also being passed between said guides

and means whereby said guides will move said pile-threads only.

2. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, guides for the pile-threads extending through the warp-threads, and means whereby said guides will move the pile-threads only.

3. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, guiding means adapted to move said pile-threads only, said guiding means being supported below the warp-threads and also adapted to guide the pile-threads vertically.

4. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, guides for the pile-threads supported below the warp-threads and extending there-through, and means whereby said guides will move the pile-threads only.

5. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, means for engaging the pile-threads only, whereby they are carried laterally over the pile-wires, said means being provided with members held from reciprocating and adapted to guide said pile-threads vertically.

6. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, oscillating guide-wires arranged to engage the pile-threads only and move them laterally, and provided with means held from reciprocating for guiding said pile-threads vertically.

7. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, oscillating guide-wires arranged to engage the pile-threads only and move them laterally, and provided with means held from reciprocating for guiding said pile-threads vertically, and reciprocating means for actuating the oscillating guide-wires.

8. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, guide-wires pivotally hung, a portion of said guide-wires being arranged to swing and press the pile-threads laterally to form loops over the pile-wires, the lower end of said guide-wires being pivoted at a point below the warp-threads, and means for actuating said guide-wires.

9. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, guide-wires, a portion of each guide-wire being arranged to move laterally and press the pile-threads from side to side, a non-reciprocating portion of the guide-wires extending down through the warp-threads for the purpose of guiding said pile-threads vertically, and means for moving a portion of each guide-wire laterally.

10. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, offset oscillating guide-wires, said offset portion being arranged to engage the pile-threads and move them laterally, and

means held from reciprocating for guiding said pile-threads vertically.

11. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, upright guides adapted to guide the pile-threads vertically, said guides being provided with means for engaging and pressing the pile-threads laterally.

12. In a loom of the character described, pile-wires over which loops are formed by the pile-threads, upright guides adapted to guide the pile-threads vertically, said guides being provided with oscillating members adapted to engage the pile-threads and move them laterally, and means for oscillating said members.

13. In a loom of the character described, a pile-wire over which the loops are formed by the pile-threads, guide-wires pivotally hung and means for laterally moving said guide-wires 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.

14. In a loom for weaving pile fabric, a wire over which the loops are formed, guide-wires pivotally hung to oscillate and guide the pile-threads first on one side and then on the other of said pile-wire to make loops, and means for automatically actuating said guide-wire to oscillate, substantially as described.

15. In a loom for weaving pile fabric, a pile-wire over which the pile-threads are looped, said pile-wire having one end supported near the harnesses with its opposite end resting on the woven cloth, offset guide-wires, said offset portion to engage and guide the pile-threads alternately first on one side and then on the other of said pile-wire to make loops, and means for automatically actuating said guide-wires, substantially as described.

16. In a loom for weaving pile fabric, a pile-wire over which the pile-threads are looped, means for supporting said pile-wire, offset guide-wires pivotally hung to oscillate, said offset portion arranged to engage and guide the pile-threads first on one side and then on the other of said pile-wires to make loops, means for automatically actuating said guide-wires to oscillate, substantially as described.

17. In a loom for weaving pile fabric, a pile-wire over which the pile-threads are looped, said pile-wire having one end supported near the harnesses with its opposite end resting on the woven cloth, guide-wires pivotally hung to oscillate and guide the pile-threads first on one side and then on the other of said pile-wire to make loops, means for automatically actuating said guide-wire to oscillate, substantially as described.

18. In a loom for weaving pile fabric, a pile-wire over which the pile-threads are looped, said pile-wire having one end supported in front of the harnesses from a leg the opposite end of said former resting on the woven cloth, guide-wires pivotally hung to oscillate and

guide the pile-threads first on one side and then on the other of said former to make loops, a reciprocating bar having means for engaging said guide-wires and means for re-
5 ciproating said bar, substantially as described.

19. In a loom of the character described, pile-wires over which pile-threads are looped each of said pile-wires having one end supported from a downwardly-turned leg, the op-
10 posite end of said pile-wire resting on the woven cloth, offset guide-wires pivotally hung on said downwardly-turned leg and held to

oscillate, said offset portion to engage and guide the pile-thread alternately first on one
15 side and then on the other of said pile-wire and make loops, means for automatically actuating said guide-wires, substantially as described.

In testimony whereof I have hereunto set
20 my hand this 18th day of August, A. D. 1903.

WILLIAM G. HARTLEY.

In presence of—

EDWARD P. WALLACE,
H. F. CAREY.