

No. 762,526.

PATENTED JUNE 14, 1904.

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

APPLICATION FILED MAY 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

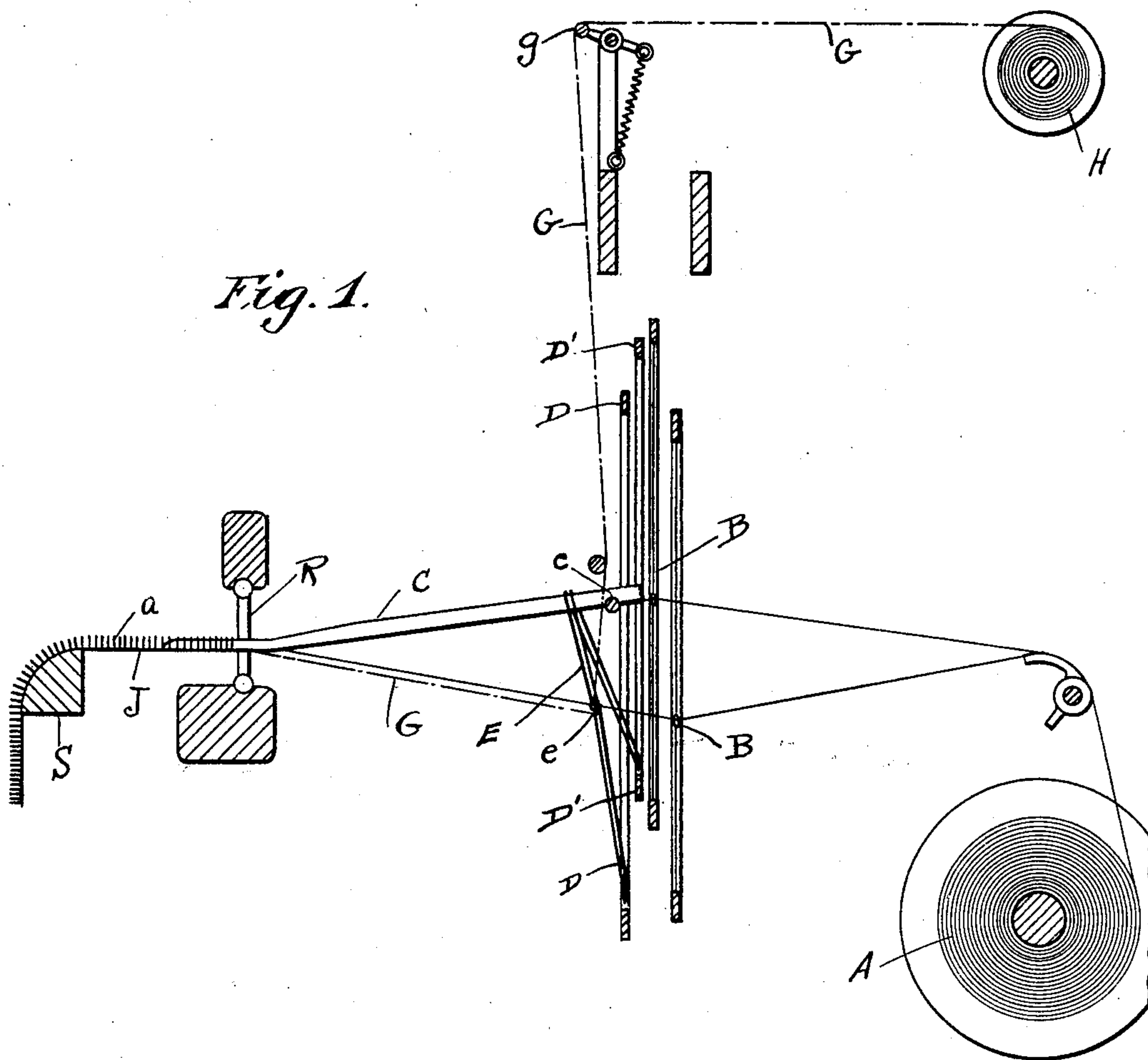
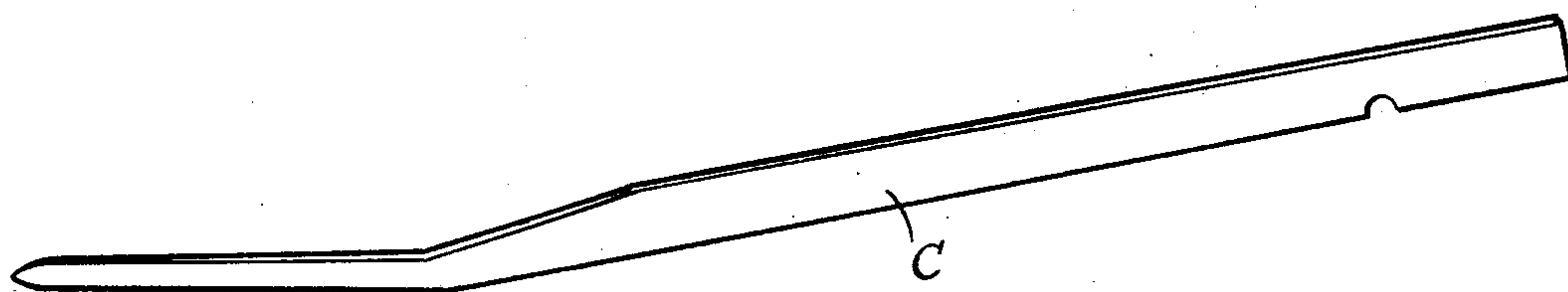


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

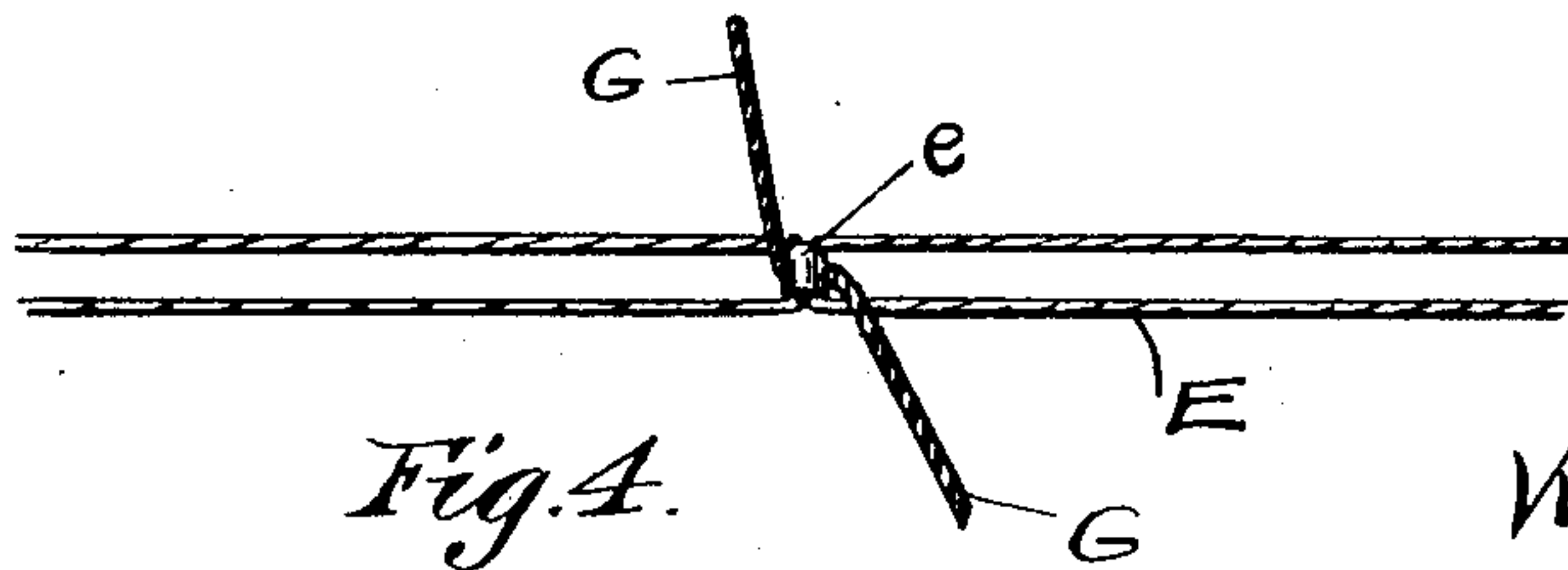
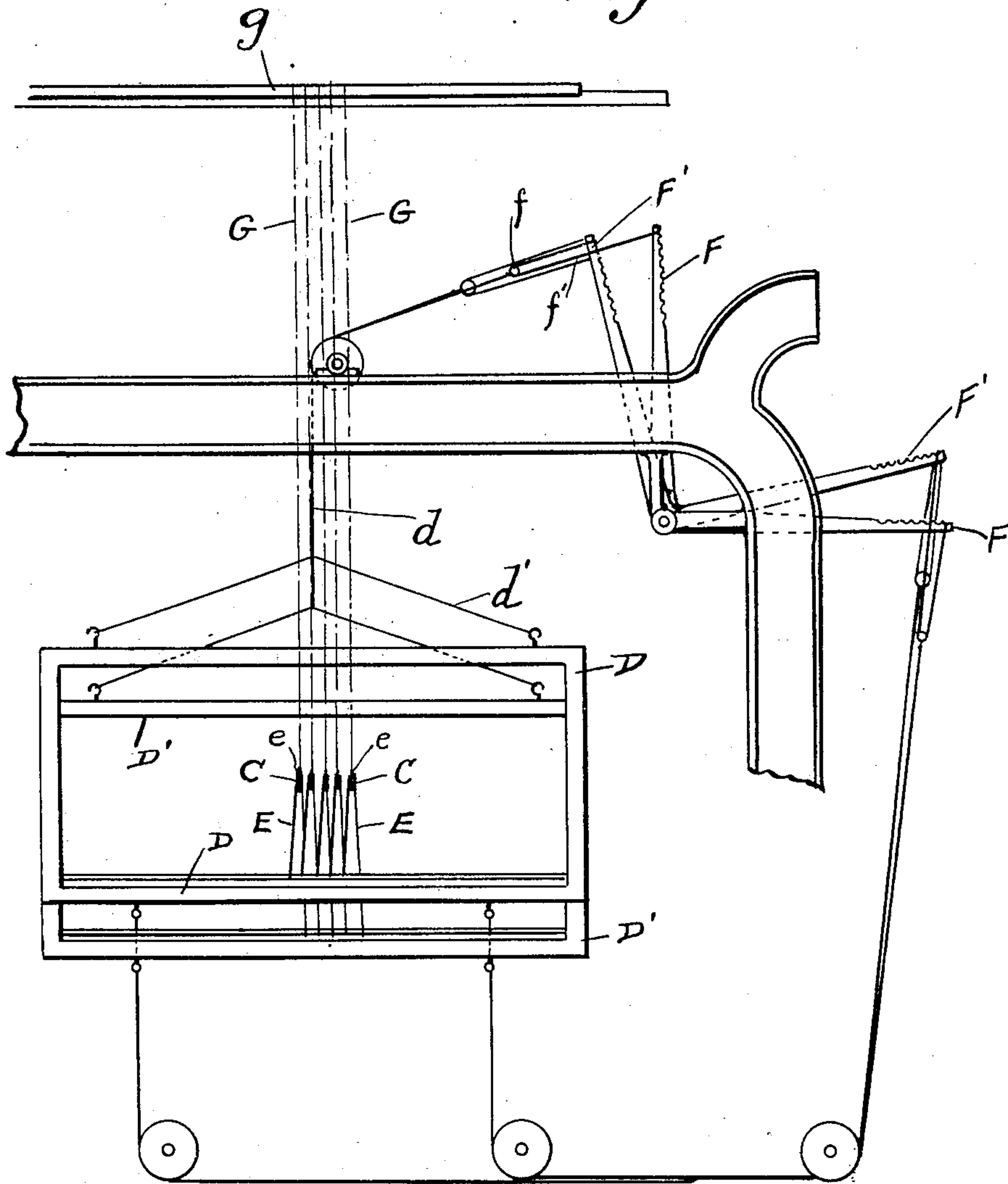


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM G. HARTLEY, OF AMESBURY, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HARTLEY LOOP WEAWE COMPANY, OF AMESBURY, MASSACHUSETTS.

LOOM FOR WEAVING PILE FABRIC.

SPECIFICATION forming part of Letters Patent No. 762,526, dated June 14, 1904.

Application filed May 21, 1903. Serial No. 158,196. (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 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 relates to looms for weaving pile fabric—such as velvets, plush, or the like—the object being to form and produce the loops which when cut make the face or pile of the velvet or plush.

These loops are formed by drawing the pile-thread over a stationary wire by a looper or carrier, which carrier is controlled in its action by suitable cams, dobby-head, or jacquard mechanism. By the use of my device, which is extremely simple and practical, the weaving of this class of looped goods is greatly facilitated. It is capable of being operated in weaving velvets or the like on a plain or figured ground of the same or of a different material.

This invention is fully explained in this specification and illustrated in the accompanying drawings.

Figure 1 is a sectional diagram 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 an enlarged detail of one of the flat wires on which the loops are formed. Fig. 3 is a diagrammatic view illustrating the connections of the frames to which the carriers are attached to the jack-levers of a dobby-head. Fig. 4 is an enlarged detail of one of the flexible loopers or carriers extended, with a loop-thread rove through its eye.

Referring to the drawings, in Fig. 1, which represents the weaving as being done on plain or twill ground fabric, A 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, (see Fig. 1.)

which when cut produce the velvet or plush effect.

B B are the heddles or harnesses that control the warp-threads, and D D' are two frames similar in construction to the heddle-frames, but are for the exclusive purpose of carrying the looper or carrier E.

The principal feature of this invention is my improved method of forming the loop, which is performed by this looper or carrier E, that is constructed of a flexible cord, wire, leather, or any suitable material, and has an eye *e* at or near its middle portion. (See Fig. 4.) The bight or doubled portion of the carrier is passed over the loop-wire C and the ends secured to the lower side of the frame D and D', respectively.

These two frames D and D' are actuated to reciprocate alternately and in time with each other. Any suitable means—such as cams, jacquard mechanism, or dobby-head—may be employed to operate these frames. In Fig 3 I illustrate them as being controlled by the jack-levers F and F', which are attached to any ordinary dobby-head, the action of which jacks is well understood by those skilled in the art to which this device appertains.

In order to produce the required result, I prefer to use the first and second jacks to operate frame D and the third and fourth jacks to operate frame D', thus using two jack-levers for each of the carrier-frames. My method of connecting the frame to the jack-levers is a cord *d* or other suitable flexible connection attached to the bridle *d'* on the frame. On the upper end of this cord is a pulley *f*, through which is rove a cord *f'*, with its ends fast to the jacks F and F', respectively. Each frame is connected underneath in a similar manner to the lower arms of said jacks.

The pile or loop thread G is led from a spool H on the rear of the loom over a spring-tension bar *g* down in front of the harnesses and through the eye *e* in the looper or carrier E. Thence it runs through the reed R to the ground fabric, to which it is secured. By means of the looper or carrier this thread is

transferred alternately from one side of the loop-wire C to the other side and bound down by the passing of the shuttle over it. This thread is thus securely woven into the body of the fabric. The loops being formed over the wire, they are carried down by the beating up of the reciprocating reed R to the small end of said wire, where the loop is drawn to the proper size. This sequence of motion is repeatedly made, and a series of loops of the pile-warp α are formed over each wire C, which loops are drawn off of the front end of the wires as the cloth J is drawn forward over the breast-beam S by the take-up motion. (Not shown.) Any number of flattened wires C and corresponding loop-threads G may be used either in groups or otherwise, 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 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.

The operation of my device is further explained as follows: The flat loop-forming wires C are supported and fixed on a rod c at one end and extend forward through the reed with their front end (over which the loop is drawn) resting on the cloth. The flexible looper or carrier above described is shown as being connected to the ordinary heddle-frames, the heddles having been removed from these two frames, as said frames are used exclusively for operating these carriers. In the dobby-head shown I use two jack-levers to operate each of the two heddle-frames, each frame being drawn both up and down by the movement of the jack-levers by being connected, as shown, from both the top and bottom to each arm of said jack-levers. These connections are attached by each end of a flexible cord to each arm of two jack-levers, with the bight of said cord engaging a pulley held on the end of strap leading from one of the harness-frames. In operating these jack-levers thus connected by holding one jack up and letting one down, the frame being then in its center position, and when both jacks are either up or down the frames are in a corresponding position. The loop-thread is led from a spool on the rear of the loom over a tension-bar, carried down in front of the harness, threaded through the eye of the carrier, and led through the reed to the ground-warp, into which it is secured by the laying of the weft-threads. By properly pegging the links of the dobby-chain this pile-thread may be held up on top of the wire any number of picks, thus making any desired distance between the loops, or the thread may be drawn down on

each side of the wire and held as long as desired, in which position the loop-thread lies on the back of the web, or this thread may be carried up and down on the same side of the wire, thus forming a plain weave. It will be observed that by the use of my device only two harnesses are required to weave any pattern, while by the old method three or more are employed.

By running the loop-threads in front of the harnesses the work is much more accessible and easier to operate. This arrangement also causes less friction and wear than by the old method, where these threads had to be passed through the heddles. One very important feature is my carriers remain in their place between the warp-threads and are sure to work without catching and becoming easily destroyed, as has heretofore been the case by the use of the old method in doup-weaving. The wear of these carriers is reduced to the minimum in working back and forth over the loop-wires by the tension of the loop-threads which engage them.

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

1. In a loom for weaving pile fabric, a flexible carrier, a loop-former, means for automatically reciprocating said carrier over said loop-former to carry the pile-thread, substantially as described.
2. In a loom for weaving pile fabric, a loop-former, a flexible carrier having means for engaging the pile-thread, means actuated by the motion of the loom for reciprocating said carrier over said former to carry the pile-thread, substantially as described.
3. In a loom for weaving pile fabric, a loop-former, a flexible carrier, means for drawing said carrier alternately over said former first one way and then the other to carry the pile-threads and form loops over said former, substantially as described.
4. In a loom for weaving pile fabric, a flexible carrier, a fixed loop-former, means for actuating said carrier to reciprocate over said former and carry the pile-thread from one side to the other alternately making loops in said pile-thread, substantially as described.
5. In a loom of the character described, a former over which the pile-threads are looped, a flexible carrier, an eye in said carrier through which the pile-thread is rove, means for drawing the carrier alternately first one way and then the other to carry the pile-thread from one side to the other of said former making loops in said thread over said former, substantially as described.
6. In a loom for weaving pile fabric, a former over which the pile-thread is looped, a flexible carrier the bight of which engages said former, an eye in said carrier, a pile-thread engaging said eye, means for recipro-

cating said carrier to transfer said pile-thread alternately from one side to the other of said former to produce a loop in the fabric, substantially as described.

5 7. In a loom for weaving pile fabric, a former over which the pile-thread is looped, a flexible carrier the bight of which engages said former, an eye in said carrier through which the pile-thread is rove, two alternately-reciprocating frames, each end of said carrier being fast to each separate frame for carrying the pile-thread from one side to the other of said former, producing loops to be woven into the fabric, substantially as described.

15 8. In a loom for weaving pile fabric, a wire over which the loops are formed, a flexible carrier, the bight of which engages said wire, an eye in said carrier approximately intermediate between its two ends, said eye being for the purpose of engaging the pile-thread, means for drawing said eye intermittently from one side of said wire to the other, substantially as described.

25 9. In a loom for weaving pile fabric, a wire over which the loops are formed, a flexible carrier containing an eye, a pile-thread engaging said eye, means for reciprocating said carrier to carry said pile-thread intermittently

from one side to the other of said wire, substantially as described.

10. In a loom for weaving pile fabric, a wire over which the loops are formed, a flexible carrier containing means for engaging the pile-thread the bight of said carrier being attached to means for reciprocating said carrier, so as to carry said pile-thread first on one side and then on the other side of said wire, substantially as described.

11. In a loom for weaving pile fabric, a former over which the pile-threads are looped, said former having one end supported near the harnesses with its opposite end resting on the woven cloth, a flexible carrier the bight of which is arranged to be drawn over the upper edge of said former, said pile-thread, an eye in said carrier through which said pile-thread is rove, two reciprocating frames, to each of which one of the ends of said carrier are fast, substantially as described.

In testimony whereof I have hereunto set my hand this 19th day of May, A. D. 1903.

WILLIAM G. HARTLEY.

In presence of—

RICHARD E. BRIGGS,
HENRY F. CAREY.