

No. 762,525.

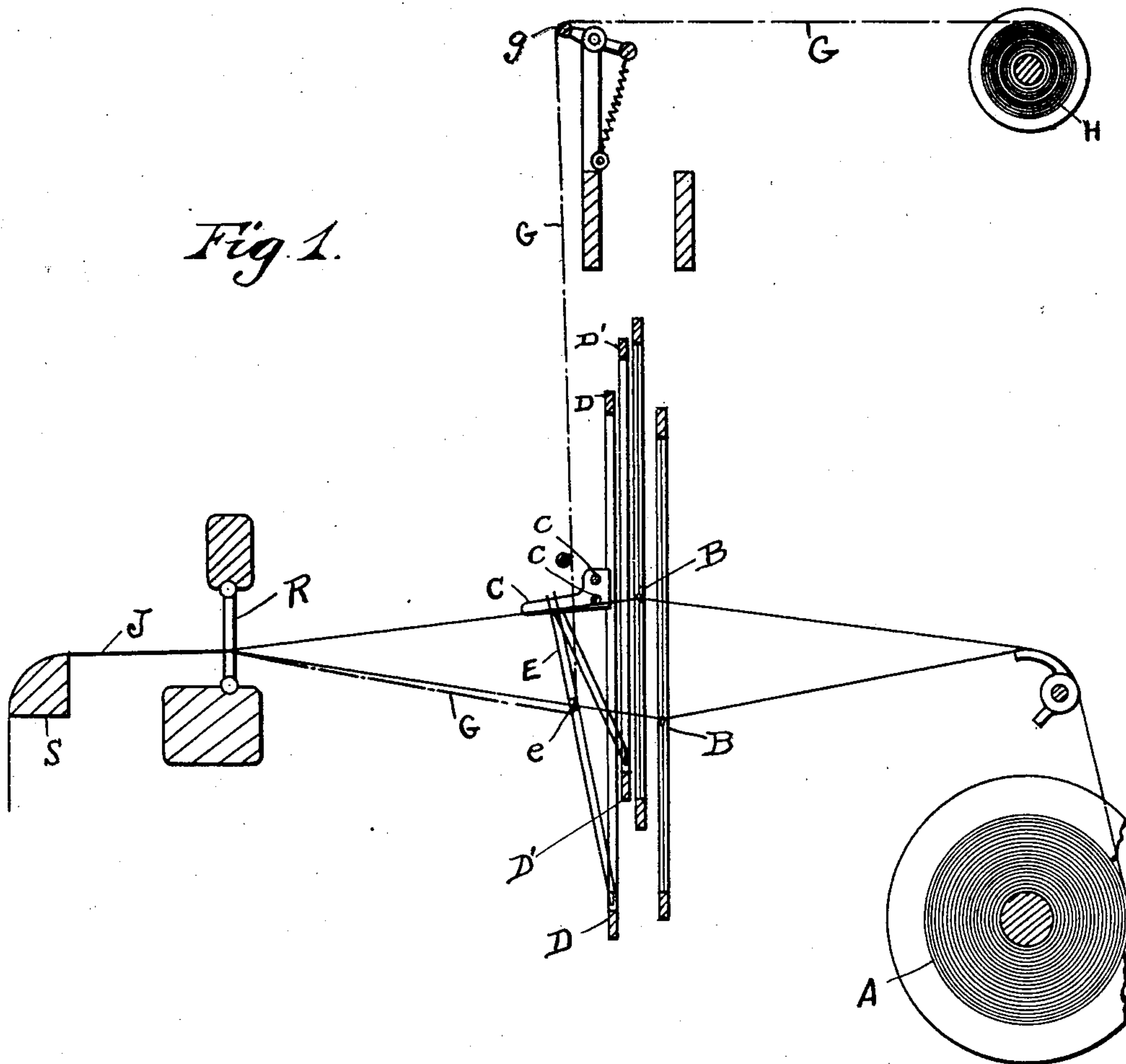
PATENTED JUNE 14, 1904.

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

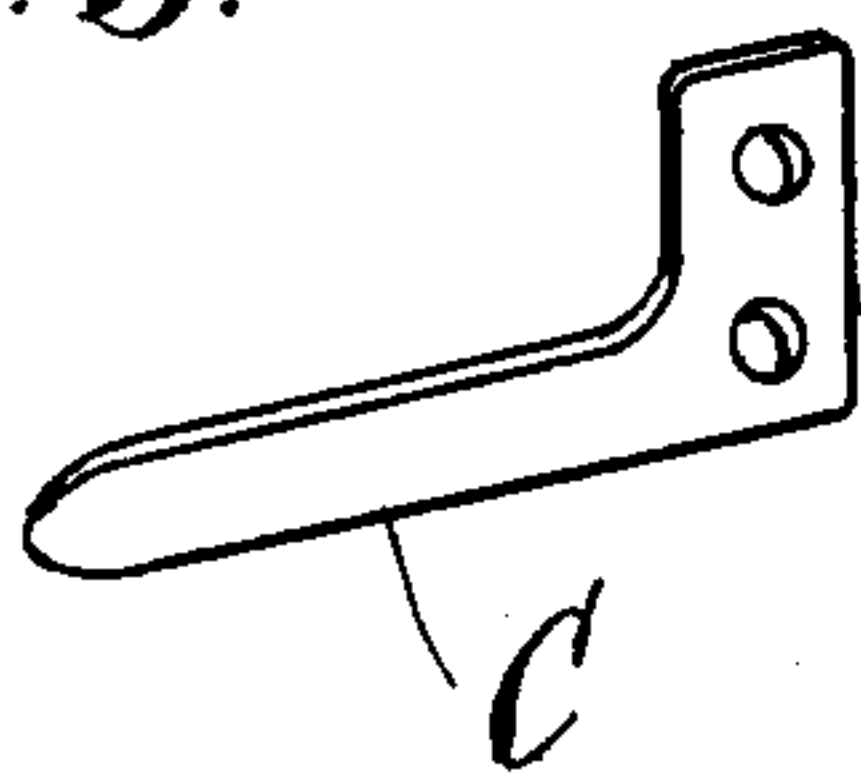
APPLICATION FILED MAY 21, 1903.

NO MODEL.

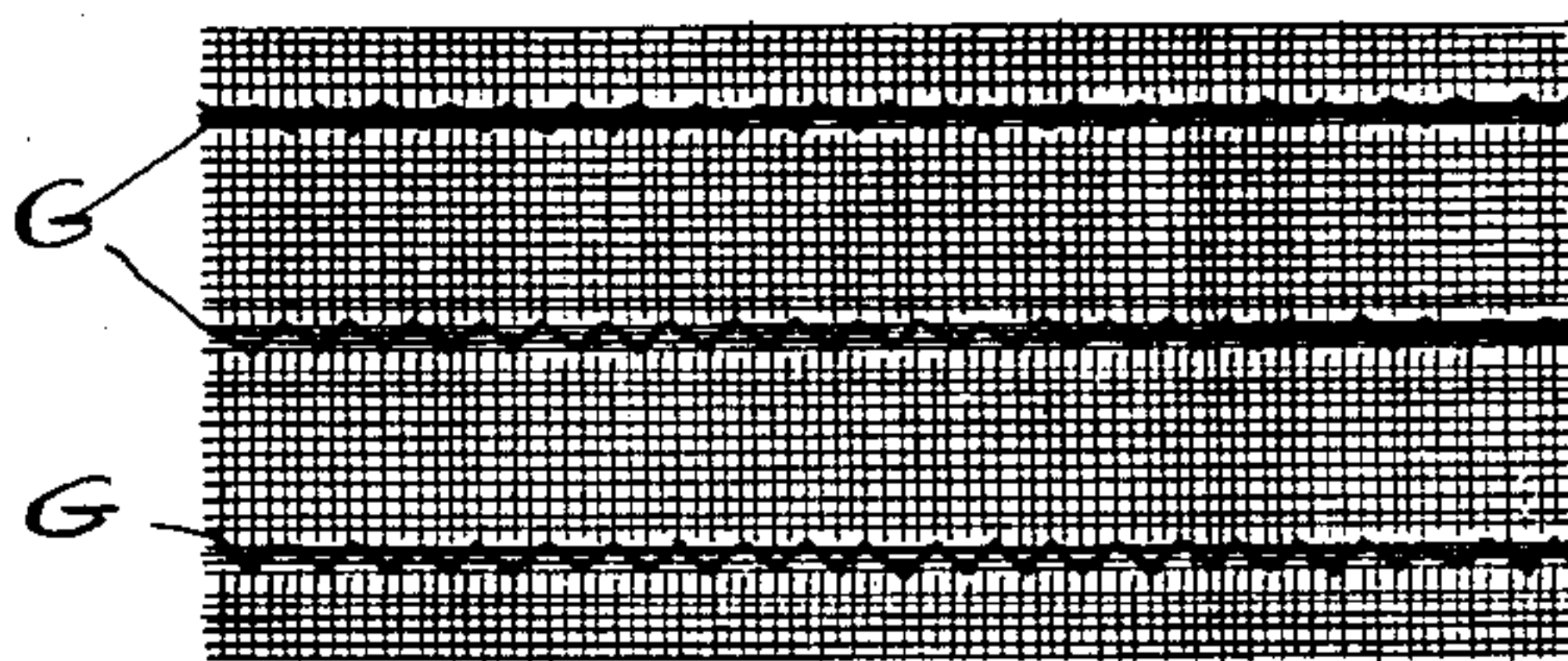
2 SHEETS—SHEET 1.



*Fig. 3.*



*Fig. 4.*



Witnesses

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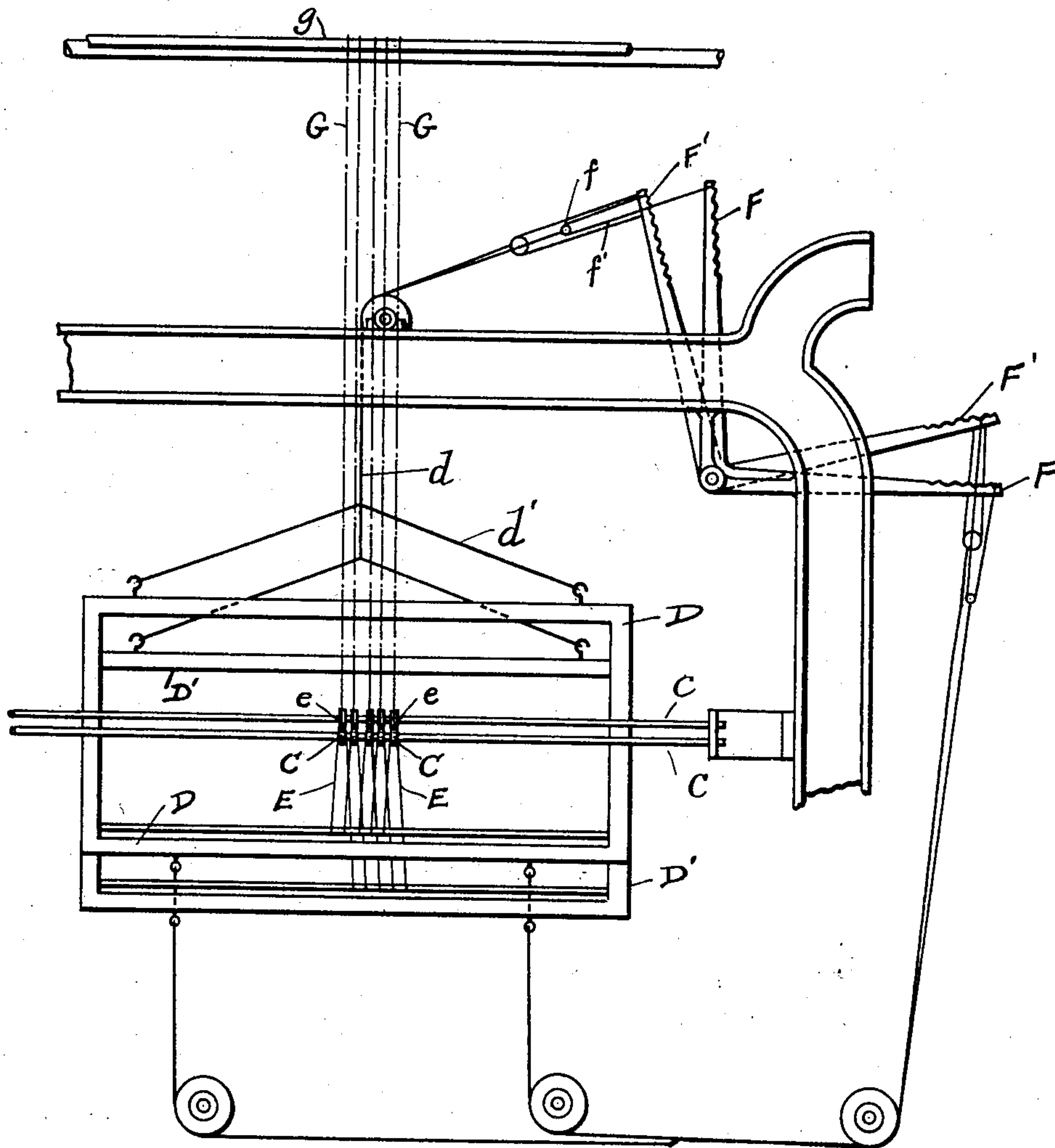
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2 SHEETS—SHEET 2.

*Fig. 2.*



Witnesses

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# UNITED STATES PATENT OFFICE.

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## LOOM FOR WEAVING ORNAMENTAL FABRICS.

SPECIFICATION forming part of Letters Patent No. 762,525, dated June 14, 1904.

Application filed May 21, 1903. Serial No. 158,195. (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 Ornamental 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 looms for weaving ornamental fabrics.

The object of the invention is to do away with the ordinary wire doup-heddles in weaving this class of fabric and form the loop by the simple method of carrying the loop-thread over a stationary finger by means of a flexible reciprocating looper or carrier.

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

Figure 1 is an end sectional diagrammatic view 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 connections of the frames to which the carriers are attached and the jack-levers of a dobby-head, which are arranged to operate said frames. Fig. 3 is an enlarged detail of one of the fingers or guide-hooks which guides the flexible carrier as it conducts the binding-thread over the warp-threads. Fig. 4 illustrates one form of fabric which may be woven with this attachment.

Referring to the drawings, Fig. 1 represents the weaving as being done on plain cloth. In this figure, A is the usual yarn-beam that carries the warp-threads from which the ground fabric is woven. 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 engaging the ends of the carriers E, and through which said carriers are all actuated in time with each other.

The principal feature of this invention is

the stationary finger or hook and my improved method of carrying the loop-thread, by means of said finger, over a predetermined number of warp-threads by a flexible looper or carrier E. This carrier is constructed of a flexible cord, wire, leather, or any suitable material and has an eye *e* at or near its middle portion. The bight of the carrier is passed over the loop-finger C and one end secured to the lower bar of each of the frames D and D'. This loop-finger or hook C is a short piece of flat wire located near the harnesses and preferably fixed just above the shed at its extreme upward stroke. These fingers project longitudinally forward a short distance and may be rigidly supported in position by the two rods *c c*, to which they are secured, or by any other convenient method. Any number of these fingers may be employed, according to the pattern desired to be woven.

The 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. 2 I illustrate the frames as being controlled by the jack-levers F F', which are attached to any ordinary dobby-head, the action of which jacks may be controlled in the manner well known 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 connections 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 two ends fast to the jacks F and F', respectively. Each of said frames is also connected underneath in a similar manner to the lower arms of said jack-levers.

The loop or binding-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 har-



nesses and through the eye *e* in the looper or carrier E. Thence it run through the reed R to the ground fabric J, to which it is secured. By means of the looper or carrier this thread is carried over any desired number of warp-threads, according to the pattern to be woven, and 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.

To produce this open-work or lace effect, the binding-thread is led up over the short finger C and carried over the required number of warp-threads by the flexible carrier E and down on a lever with the lower shed and properly bound in place by the passing through of the shuttle carrying the weft-thread. This binding-thread is then beat up with the weft-thread by the reciprocating reed R and drawn up tightly around these warp-threads, over which it has been carried, binding them tightly together into a strand or cord. The binding of these warp-threads together leaves open spaces between the remaining warp-threads and those bound together, forming an open-work or lace effect in the fabric. This strand or cord of warp-threads is firmly held in place by the weft-threads in the fabric. This open-work may be woven in the fabric in stripes as close together as desired by simply regulating the number of fingers, corresponding carriers, and binding-threads. Any variety of colors and styles of weaves may be produced by this simple mechanism.

Any number of flattened wires C and corresponding binding-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. The fabric as fast as woven is drawn over the breast-beam S by the take-up motion. (Not shown.) Only enough of the loom is shown to illustrate the operation of my invention.

The mechanism for operating the different parts is not shown or described, as they are all well known, and no particular way of operating the same is claimed. Any of the several varieties of looms may be employed for this work that may upon trial be found advisable.

The operation of my device is further explained as follows: The flat loop-forming fingers C are supported and fixed at one end and extend forward a short distance. The flexible looper or carrier above described is attached to two frames, which are used exclusively for the operation thereof. In the dobby-head shown I use two jack-levers to operate each of the two heddle-frames, each frame being drawn alternately up and down by the movement of the jack-levers because of the connections between the top and bottom of each frame with each arm of the jack-levers. These connections are effected by attaching each end of a flexible cord to said

arms, 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 is in its center position, and when both jacks are either up or down the frames are in a corresponding position. The binding-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 chain in the dobby-head this binding-thread may be held up on top of the wire any number of picks, whereby any desired length of fabric may be woven before said binding-threads will be caused to cross the warp-threads engaged thereby, or the thread may be drawn down on each side of the wire and held as long as desired, in which position the binding-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 without binding the warp.

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 binder-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 at all times 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 fingers or guides as they are raised from and practically carried over said guide-fingers by the tension of the binder-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 of the character described, a short rigidly-supported outwardly-extending finger or guide located approximately in line with the warp of the open shed, means by which the binding-threads may be carried over said finger or guide and any predetermined number of warp-threads, and means located beyond the end of said guide or finger and adapted to beat up said binding-threads when said binding-thread leaves said finger.

2. In a loom of the character described, a short rigidly-supported outwardly-extending guide or finger located approximately in line with the warp of the open shed, means by



which the binding-thread may be carried over said guide or finger and any predetermined number of warp-threads, and a reciprocating reed located beyond the end of said finger or guide and adapted to beat up said binding-threads when said binding-thread leaves said finger or guide.

3. In a loom of the character described, a short outwardly-extending guide or finger located approximately in line with the warp of the open shed, a flexible carrier arranged to carry the binding-thread over said guide or finger and any predetermined number of warp-threads, and means located beyond the end of said guide or finger and adapted to beat up said binding-threads when said binding-thread leaves said finger or guide.

4. In a loom of the character described, a guide or finger located near the harness, skeleton frames through which the warp-threads are free to pass, means for reciprocating said

frames, a flexible member connected at its ends and passed over said guide or finger, said flexible member serving as a carrier for the binding-thread, and means located beyond the end of said guide or finger and adapted to beat up the binding-threads when said binding-thread leaves said guide or finger.

5. In a loom of the character described, a framework, rods rigidly supported thereby, a short, outwardly-extending guide or finger rigidly supported by said rods and located approximately in line with the warp of the open shed, and means by which the binding-threads may be carried over said guide or finger and any predetermined number of warp-threads.

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.