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Patented Feb. 18, 1902.

W. R. HARDING.

HARNESS OPERATING MECHANISM FOR LOOMS.

(Application filed May 18, 1901.)

(No Model.)

2 Sheets—Sheet 2.

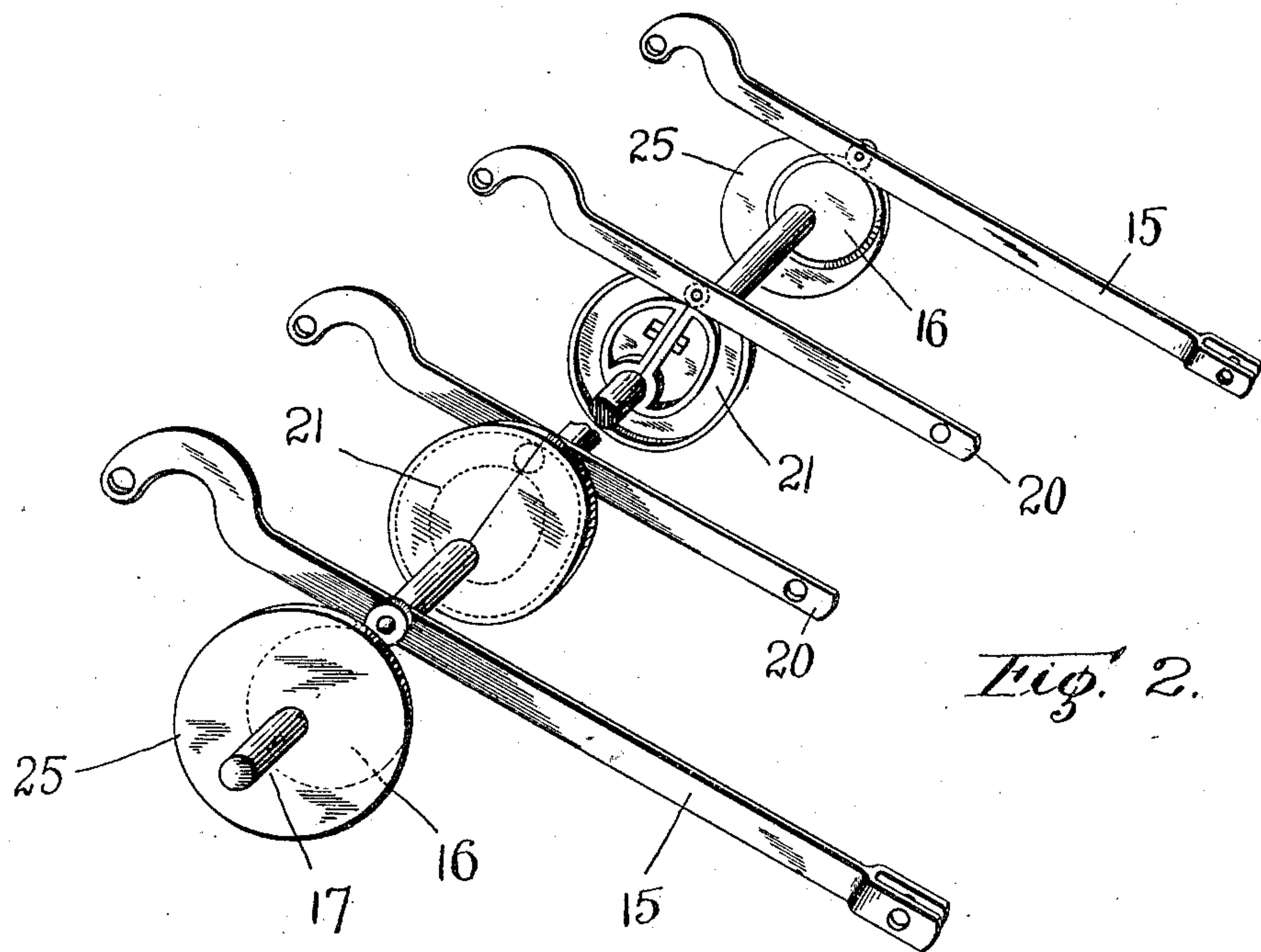


Fig. 2.

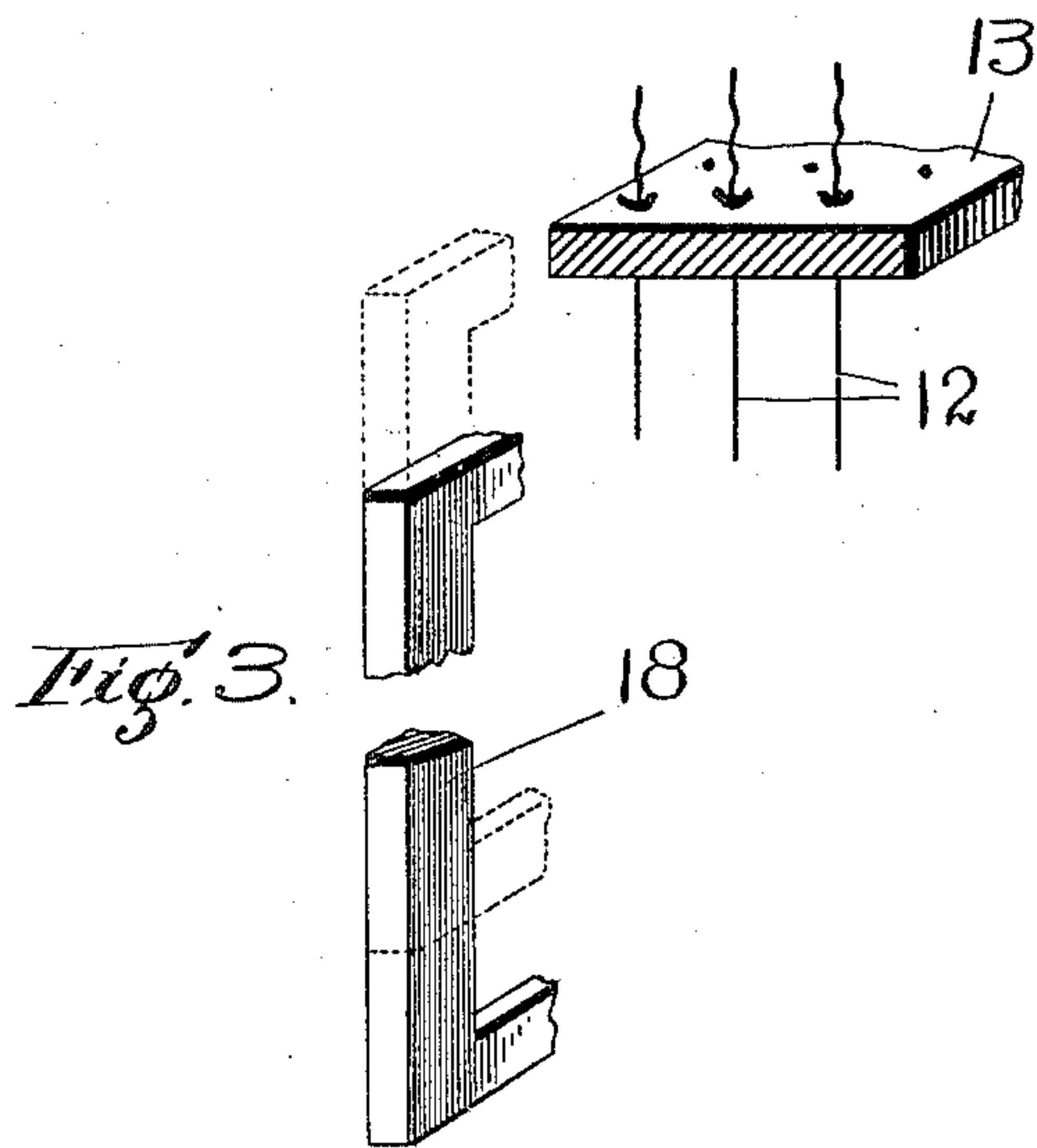


Fig. 3.

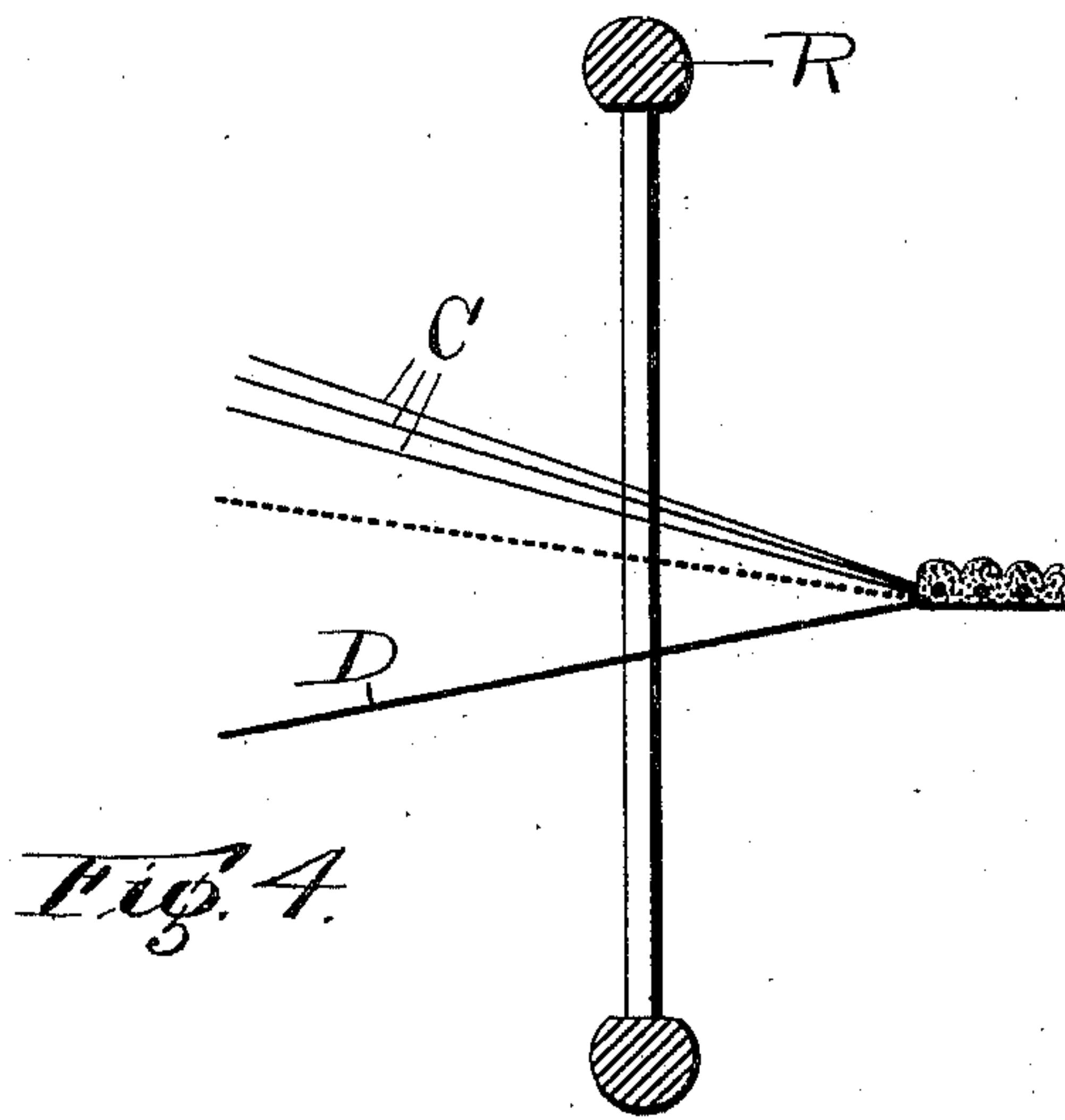


Fig. 4.

Witnesses.

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HARNESS-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 693,796, dated February 18, 1902.

Application filed May 18, 1901. Serial No. 60,860. (No model.)

To all whom it may concern:

Be it known that I, WALTER ROBERT HARDING, a citizen of the United States, residing at Palmer, in the county of Hampden and State of Massachusetts, have invented a new and useful Harness-Operating Mechanism for Looms, of which the following is a specification.

This invention relates to that class of Jacquard looms which are employed for weaving Brussels and Wilton carpets or similar fabrics; and the especial object of this invention is to provide an improved construction for introducing stuffer-threads into the fabric to stiffen and thicken the body portion thereof.

To this end this invention consists of the parts and combinations of parts as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a diagrammatic view of sufficient parts of a loom to illustrate the application of my invention thereto. Fig. 2 is a detail perspective view of the cams for operating the lifter-board and stuffer-frame, respectively. Fig. 3 is a fragmentary perspective view illustrating the relative motion of the lifter-board and stuffer-frame, and Fig. 4 is a diagrammatic view illustrating the position of the threads as they pass through the reed.

In manufacturing Brussels and Wilton carpets or similar fabrics the backs or foundations of the fabrics are formed from cotton warp-threads controlled by heddle-frames alternately raised and lowered by the ordinary shedding mechanism. The face of the fabric is formed by worsted yarns or facing-threads controlled from a jacquard mechanism, which acts to select or raise the desired worsted threads up into position to be woven over wires forming the pile of the fabric. Between each operation of the jacquard mechanism all the worsted threads are lifted by a common lifter board or frame.

Heretofore in manufacturing the class of carpets to which this invention relates it has

been found desirable to make the body portion of this class of fabrics much stiffer and heavier than can be conveniently done by simply using the warp-threads which form the chain or foundation for the fabric and the worsted threads which form the face or surface of the fabric, and to accomplish this object it has now become customary to introduce into the fabric heavy jute, cotton, or similar threads, which lie with the unused worsted threads and are therefore never brought to the surface of the fabric. To introduce these so-called "stuffer-threads," it has heretofore been the practice to control these stuffer-threads from a heddle-frame, which is attached to and moves up and down with the lifter-board. In practice I have found that this method of introducing the stuffer-threads into Brussels or Wilton carpets to be objectionable, because when the stuffer-threads are moved up and down simultaneously with the worsted threads they are apt to crowd the worsted threads when passing through the reed, so that the worsted threads are more or less crumpled thereby and so that the reed itself is apt to scrape off more or less of the worsted fibers, which would otherwise be woven into the fabric. To overcome this objection, I have provided an independent frame for introducing the stuffer-threads into the fabric, which frame is moved up and down independently of the lifter-board and which is so timed that the stuffer-frame does not rise with the lifter-board, but rises at a slight interval after the lifter-board and commences its downward movement at a slight interval before the lifter-board, thus preventing the stuffer-threads from interfering with the free passage of the worsted threads through the reed and avoiding the crumpling or snarling of the worsted threads heretofore caused by introducing stuffer-threads in the ordinary manner.

Referring to the accompanying drawings and in detail, A and B designate the ordinary cotton warps which form the chain or foundation of the fabric.

C designates the worsted threads which are

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woven over wires to form the pile or surface of the fabric, and D designates the comparatively heavy stuffer-threads which are introduced to thicken and stiffen the body of the fabric.

The chain-threads A and B are controlled by heddles in heddle-frames 10 and 11, respectively, which are alternately moved up and down by any of the ordinary shedding devices, which need not be herein shown or described.

The worsted threads C are controlled by lingos 12, operated from a jacquard mechanism, between each operation of which all the worsted threads are lifted by a lifter-board 13. The lifter-board 13, as herein illustrated, is operated by links 14, connected at their lower ends to levers 15, each of which is provided with a roll or stud engaging a substantially round or heart-shaped cam 16, secured on the bottom shaft 17 of the loom by being bolted to the side of one of the picking-disks 25.

The parts thus far referred to, as herein illustrated, are of the ordinary form employed in double-shed looms, in which one shed for receiving the shuttle is formed between the threads A and B and the second shed for receiving the pile-wires is formed between the threads A and the selected worsted threads C.

The stuffer-threads D are controlled by heddles mounted in an independent heddle-frame 18, which is operated by links 19, which, as most clearly illustrated in Fig. 2, may be connected to levers 20, each of which is provided with a stud or roll engaging the groove of a box-cam 21. As herein illustrated, the box-cams 21, which operate the stuffer-threads, are set on the shaft 17, so as to operate at a slight interval behind the cams 16, which raise the lifter-board. The lifting curve of each box-cam 21 is the same as that of the cams 16, while the descending curve of each box-cam 21 is made slightly flatter than the corresponding parts of the cams 16. This permits the lifter-board to rise or move up slightly in advance of the stuffer-frame, while the stuffer-frame moves down slightly in advance of the lifter-board. By means of this construction the lifter-board will have reached its upward limit of travel slightly in advance of the stuffer-frame. For example, as illustrated in Fig. 3, the lifter-board 13 may have reached the upward limit of its travel while the stuffer-frame 18 occupies the position indicated in full lines and before the same has moved up to its highest position, as indicated by the dotted lines. This results in preventing the worsted threads from being crowded or crumpled by the stuffer-threads as they pass through the reed. For example, as illustrated in Fig. 4, R designates the reed or grating through which the threads of the fabric pass.

In weaving a five-frame Brussels or Wilton

carpet eight separate strands or threads are passed through each section of the reed—that is to say, passing through each section of the reed are the five variously-colored worsted threads, the two cotton warp-threads, and the coarse or heavy stuffer-thread. These threads are all more or less crowded on passing through the spaces of the reed; but by the use of my improvement, as illustrated in Fig. 4, the worsted threads C may first be raised to their highest position before the heavy stuffer-thread D is raised to its highest position, as illustrated by dotted lines, and by thus avoiding the crumpling or snarling of the worsted threads by the heavy stuffer-thread I have found by actual test that I am enabled to save in some cases nearly an ounce of worsted in each yard of carpet in addition to preventing a considerable amount of worsted fibers from being scraped off by the reed.

I am aware that numerous changes may be made in applying my invention to carpet-loom by those who are skilled in the art and that many different forms of connection may be devised for operating the stuffer-frame. I do not wish, therefore, to be limited to the construction I have herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a carpet-loom, the combination of the lifter-board for raising the worsted facing-threads, a stuffer-frame for introducing stuffer-threads which lie with the worsted threads not brought to the surface of the completed fabric, and means for raising and lowering the stuffer-frame independently of the lifter-board.

2. In a carpet-loom, the combination of the lifter-board for raising the worsted facing-threads, a stuffer-frame for introducing stuffer-threads which lie with the worsted threads not brought to the surface of the completed fabric, and operating connections for raising the lifter-board slightly in advance of the stuffer-frame, and for lowering the stuffer-frame slightly in advance of the lifter-board.

3. In a carpet-loom, the combination of the lifter-board for raising the worsted facing-threads, a stuffer-frame for introducing stuffer-threads which lie with the worsted threads not brought to the surface of the fabric, and cams connected to operate said parts, so that the lifter-board will rise slightly in advance of the stuffer-frame and so that the stuffer-frame will descend slightly in advance of the lifter-board.

4. In a carpet-loom, the combination of the lifter-board for raising the worsted facing-threads, a stuffer-frame for introducing stuffer-threads which lie with the worsted threads not brought to the surface of the fabric, cams connected by levers and links to operate the lifter-board, and box-cams set to act at a slight interval behind the lifter-board

cams, and having flattened descending curves, and being connected through levers and links to operate the stuffer-frame, so that the lifter-board will rise slightly in advance of the
5 stuffer-frame, and the stuffer-frame will descend slightly in advance of the lifter-board.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing witnesses.

WALTER ROBERT HARDING.

Witnesses:

CHAS. B. FISKE,
A. FINNEY.