2 Sheets—Sheet 1.

A. GARTENMANN.

LOOM.

No. 186,824. Patented Jan. 30, 1877.

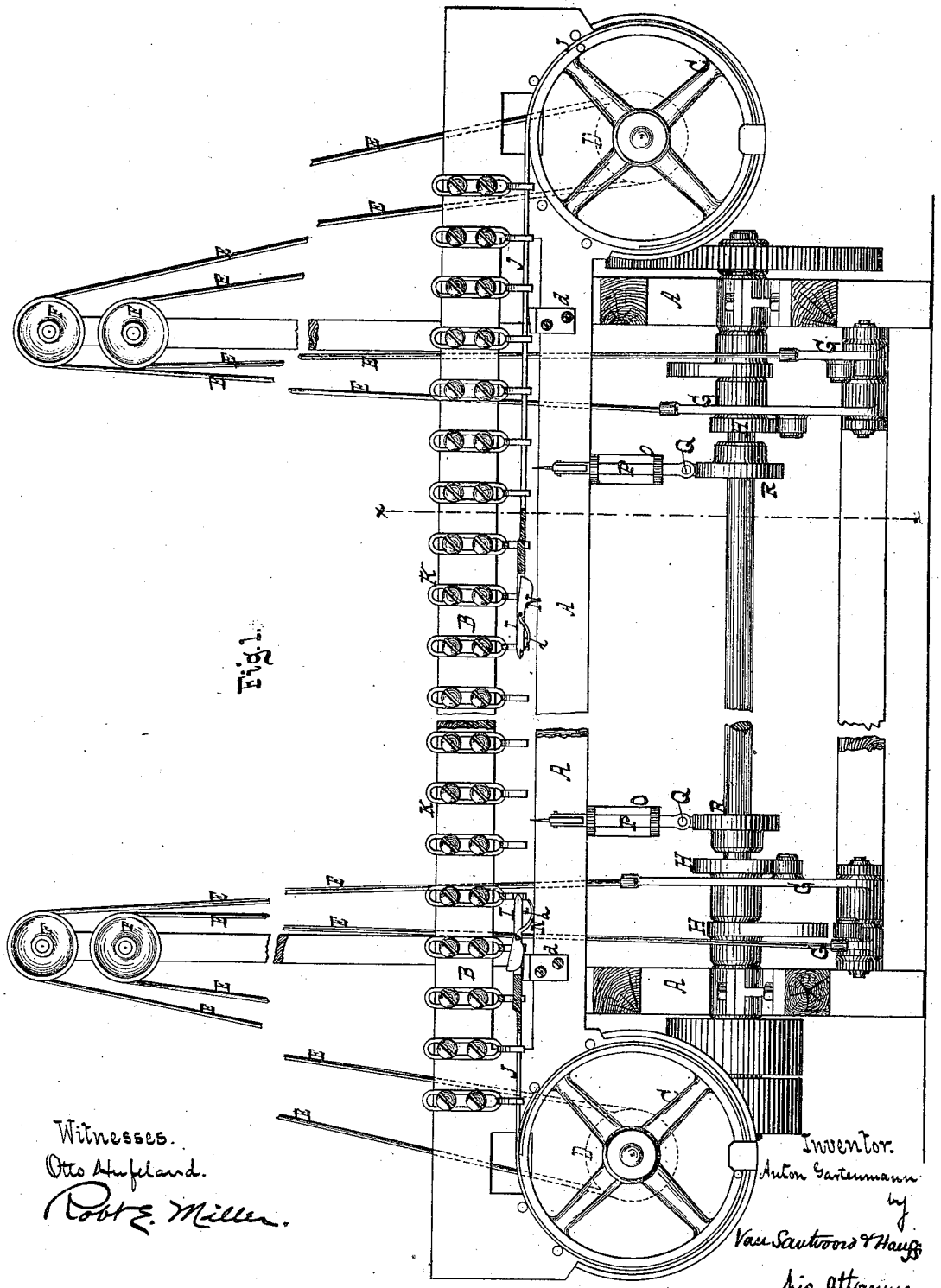

Fig. 1.

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2 Sheets—Sheet 2.

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Fig.3.

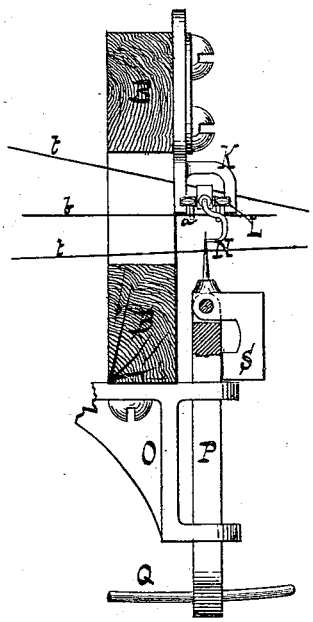


Fig.4.

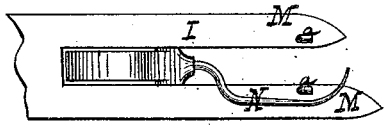


Fig.5.

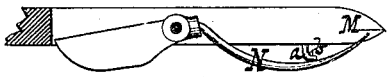
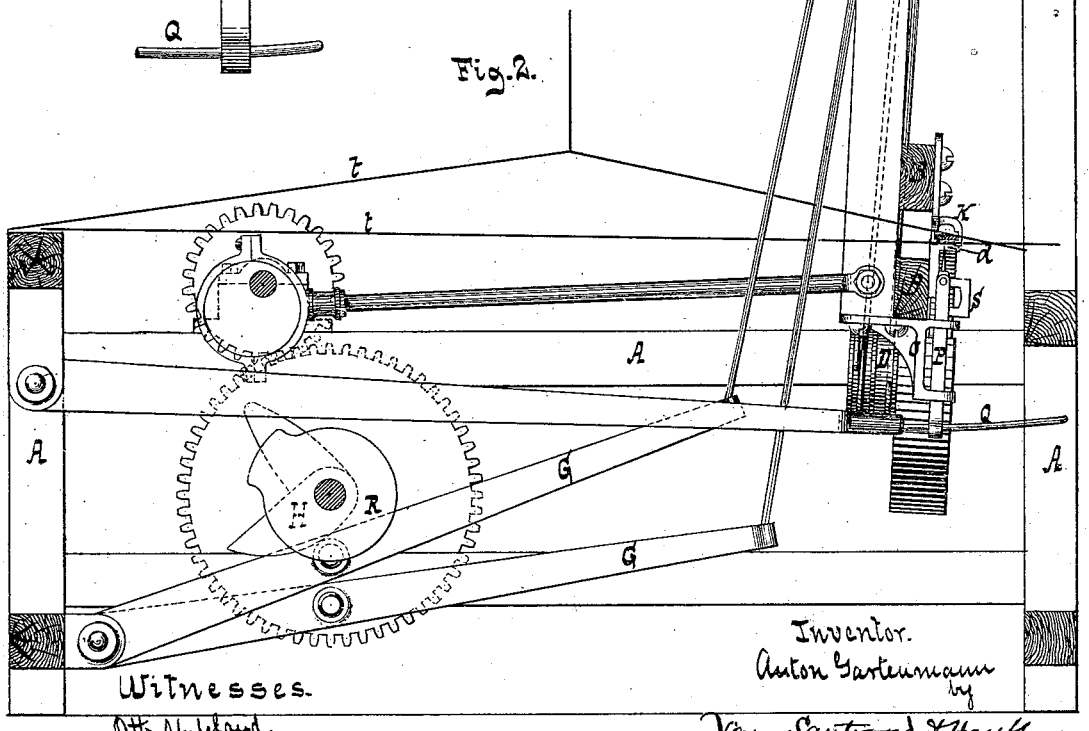


Fig.2.



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UNITED STATES PATENT OFFICE.

ANTON GARTENMANN, OF NEW YORK, N. Y.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. **186,824**, dated January 30, 1877; application filed June 15, 1876.

To all whom it may concern:

Be it known that I, ANTON GARTENMANN, of the city, county, and State of New York, have invented a new and useful Improvement in Looms, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 is a front elevation of my improvement, the front of the loom being removed to show the lay. Fig. 2 is a vertical cross-section in the line *x x*, Fig. 1. Fig. 3 is an enlarged view of a cross-section through the lay, at *x x* of Fig. 1. Fig. 4 is an inverted view of the weft-carrier. Fig. 5 is a longitudinal section of the weft-carrier in the line *y y* of Fig. 4.

This invention relates to a method of inserting the filling or weft in the shed of the warp without the aid of a shuttle or shuttle-boxes. A weft-carrier is arranged at the free end of a spring-blade, which winds upon a disk attached to the end of the lay, and adjacent to the face of the lay. Each end of the lay is provided with a weft-carrier.

The back of the disk is provided with a pulley, to which are fastened cords, which are wound around the pulley in such a manner that by drawing the cords off the pulley the disk will be turned in the direction in which the cords are drawn off, one cord winding on when the other is winding off. The weft-carrier blade is fastened at its inner end to the periphery of the disk, which is grooved or made with a flanged rim, to prevent the blade from getting off the disk as it is being wound or unwound.

When the disk is turned in the proper direction the blade is unwound, and the carrier, at its free end, is consequently projected along the front of the lay, across the fabric which is being woven, and through the shed, for the purpose of laying in the shed a weft-thread, which the carrier has caught in beginning its movement.

The weft-carrier is guided in this movement by a series of double fingers, which are adjustably attached to the front of the lay, and between which fingers it takes its course, the inner sides of the fingers being grooved to receive the edges of the weft-carrier and spring-blade in their grooves, so that the fingers both guide and support the carrier and blade. The fingers perform these offices for both the weft-carriers.

The weft-threads are stretched in the same general direction as the warp-threads; but they are arranged outside of the ends of the reed, between its ends and the disks of the weft-carrier, and lower than the top of the disk, so as to be out of the way of the weft-carrier, except when it is desired that any of the weft-threads shall be engaged by the carrier, at which time such weft-thread is raised and brought in front of the carrier, so as to be caught by it and carried through the shed across the fabric to the selvage on the other side, where it is detained and held by a needle which is raised up through the mouth of the carrier, and behind the weft-thread, the needle being held up while the weft-carrier retires, so that the weft-thread is stripped from the carrier by the needle, and held by it until the change of the shed locks the weft-thread in the warp.

The movements of the carriers and needles are derived from cams on the driving or cam shaft of the loom, which will be pointed out as the description proceeds.

The letter A designates the frame of the loom, and B is the lay, on the front of which, near its ends, are arranged disks C C, which are so connected to the lay that they are free to turn on their journals. The rear sides of the disk are provided with grooved pulleys D D, in whose grooves are cords E, which are secured to the pulleys and wound around them in opposite directions, so that when the cords are drawn in one or the other direction, the pulleys and the disks on which they are formed will be rotated accordingly, the arrangement being such that while one cord is winding off the pulley and turning the disk, the other cord is winding on the pulley.

The cords E are carried up over pulleys F F, placed on the upper part of the frame of the lay, and are conducted thence downward and fastened to the free ends of levers G G, whose other ends are hinged to the back part of the frame in such positions that they can be operated by cams H H on the driving or cam shaft of the loom—one set of said cams operating to rotate the disks so as to unwind the

spring-blades and project the weft-carriers across the loom, and the other to wind them up and withdraw the carriers. The cams are so made and arranged that these movements of the weft-carriers will not interfere with each other, nor with the opening or closing of the sheds of the warp.

The weft-carriers I are forked blades formed on the free end of spring-blades J, which are sufficiently elastic to allow them to be wound and unwound upon the disks C, to which one end is secured, and are also sufficiently stiff and strong to project the carriers forward across the loom. The spring-blades are guided on the disks by grooves or pins, or other convenient means, and may be incased, if desired, so that they will not be interfered with while wound on the disks, and the friction of the springs in winding and unwinding on the disks is lessened by anti-friction rollers; but I have not shown such anti-friction rollers in the drawing.

The carriers pass from the disks through a series of double fingers, K, which are arranged so as to allow the carriers to pass between them, the inner sides of the fingers being grooved, as shown most clearly in Fig. 3, to allow the edges of the carriers to ride in the grooves L. The fingers K are adjustably attached to the front of the lay, so that they can be set at any desired height thereon, the bodies of the fingers being slotted to receive set-screws, which go through the slots into the lay.

The forward end of the carrier is forked, so as to form two fingers, M, between which the weft-needle is made to enter. One of the fingers is made longer than the other, so as to lead the other in going through the shed, and the longer finger is on the side toward the fell of the cloth, so as to guard the shorter finger and prevent any of the warp-threads from catching in the fork of the carrier, the longer finger operating to keep any warp-threads which may be slack from falling under or becoming engaged with the shorter finger. The under side of the carrier is provided with hooks *a a*, one on each finger, which catch the weft-thread *b* when the thread is lifted for that purpose by the jacquard or other means.

The weft-carrier is also provided with a guard to prevent its fingers from catching in any warp-threads which may not be in proper position. This guard consists of a two-armed lever, N, pivoted to the under side of the carrier, and so made that its forward end is curved, and its point masks and closes the mouth of the carrier, in which position it is kept by the weighted shorter end of the lever; but when the weft-carrier has been withdrawn back to the disk the weighted end of the lever N strikes against a projection, *d*, placed on the lay for that purpose, and is lifted so as to lower the front end of the lever away from the mouth of the carrier, and leave the carrier open to receive on its hooks *a a* the weft-thread *b*, which may have been brought by the jacquard or other apparatus into the required position in front of the carrier; but as soon as the carrier has advanced and taken the weft-thread the lever is released, and its front end resumes its normal position and closes the mouth of the carrier. The guard-lever N is seen clearly in Figs. 4 and 5.

On each side of the reel is a bracket, O, which hangs down from the lay, and carries a slide, P, the lower part of which is perforated to receive the forward end of a lever, Q, which is raised by a cam, R, on the driving cam-shaft at the time when that weft-carrier which starts from the opposite side of the loom has got across the fabric.

The slide P carries at the top a two-armed lever, S, working on a joint, as shown in Figs. 1 and 2. The upper arm of the lever S is a needle, and the lower arm is weighted, so that it has a tendency to keep the needle in a vertical position. The needle (there is one at each side where the selvage is formed) is placed in such a position as to be directly under the slot of the weft-carrier when it completes its throw, at which time the cam R raises the lever Q, and forces the needle up into the fork or slot of the carrier, so as to engage the weft-thread, which remains on the needle when the carrier retires. It is necessary that the needle hold the weft-thread until the reed is very close to the fell of the cloth, and it is desirable to hold it until the reed has beaten up the last filling-thread, and, therefore, the needle is formed in the manner described, so that its end which holds the weft-thread can stay in the selvage, while the slide which supports the needle is carried forward with the lay when it is beating up, the needle turning on its hinge-joint, so as to prevent injury to it or to the fabric, and then the cam R allows the lever Q to drop by its own weight and pull down the slide P, and draw the needle S out of the cloth.

Fig. 3 represents a shed composed of warp-threads *t t*, and also one of the weft-threads raised to a position where it can be seized by the hooks *a a* of the weft-carrier.

Fig. 5 shows a weft-thread, *b*, lying in the hook *a* of the carrier.

What I claim as new, and desire to secure by Letters Patent, is—

1. The weft-carriers I J, in combination with guides K, between which they are projected in laying in the weft-thread, substantially as described.

2. The rotating disks C, operated as described, and the weft-carriers I J mounted thereon, in combination with the lay B and the guides K, substantially as set forth.

3. The weighted guard-lever N, in combination with the weft-carrier I, substantially as described, the same being adapted to close the mouth of the carrier automatically by the fall of its weighted end, and to open the

same by abutting against the projections *d*, substantially as herein set forth.

4. The combination of the disk C, spring weft-carrier I J, and guard-lever N, substantially as described.

5. The hinged needle S, operated through the medium of the lever Q and slide P by the cam R, in combination with the weft-carrier I J, substantially as described.

6. The weft-carrier I, provided with weft-hooks *a*, for catching hold of the weft-thread, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 14th day of June, 1876.

ANTON GARTENMANN. [L. S.]

Witnesses:
W. HAUFF,
CHAS. WAHLERS.