

(No Model.)

2 Sheets—Sheet 1.

A. J. HARDING.
BOOK SEWING MACHINE.

No. 539,808.

Patented May 28, 1895.

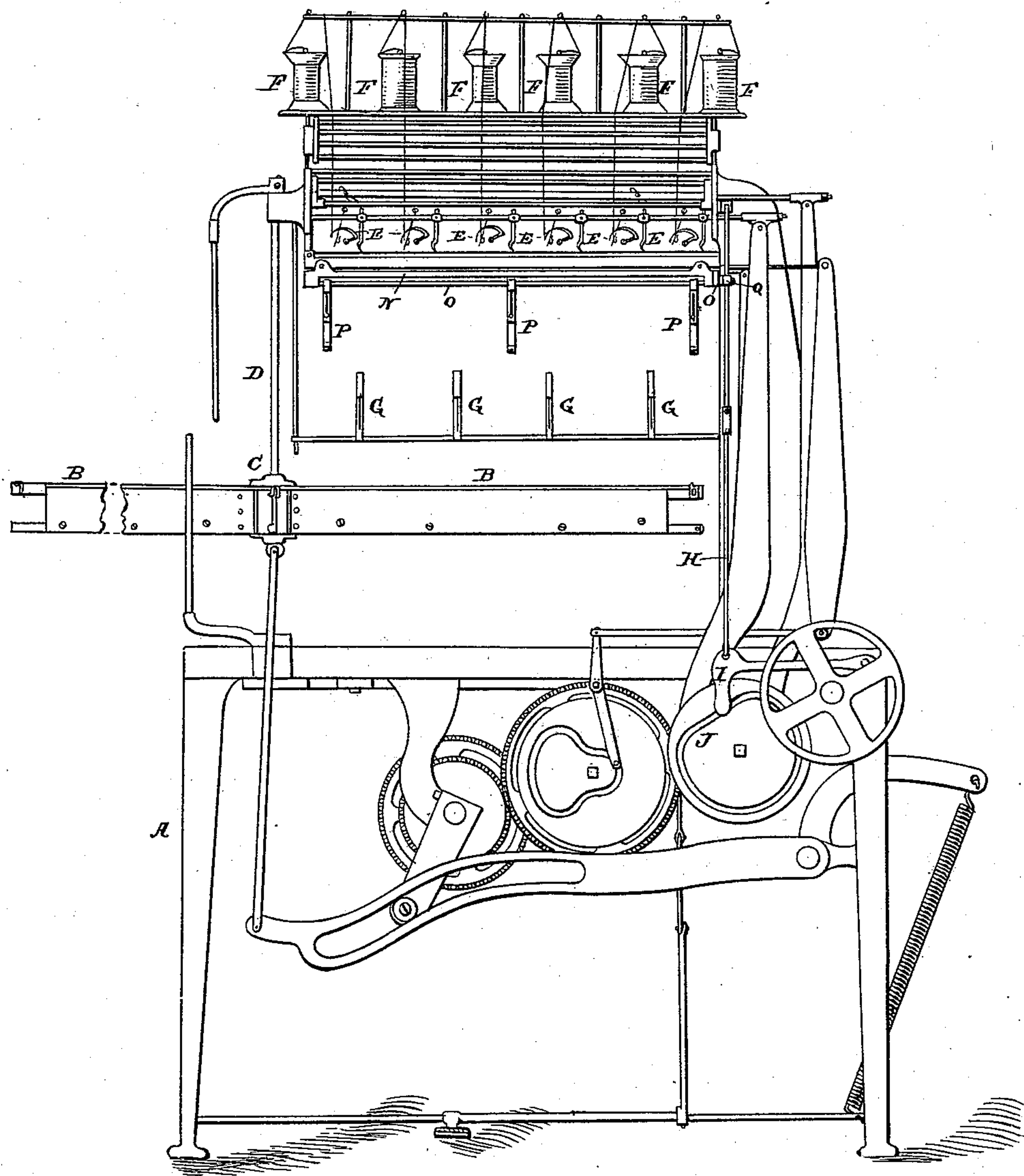


Fig. 1.

Witness
Iron Atterson
Geo. McWright

By Attorney

Inventor
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C. P. Humphrey

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2 Sheets—Sheet.2.

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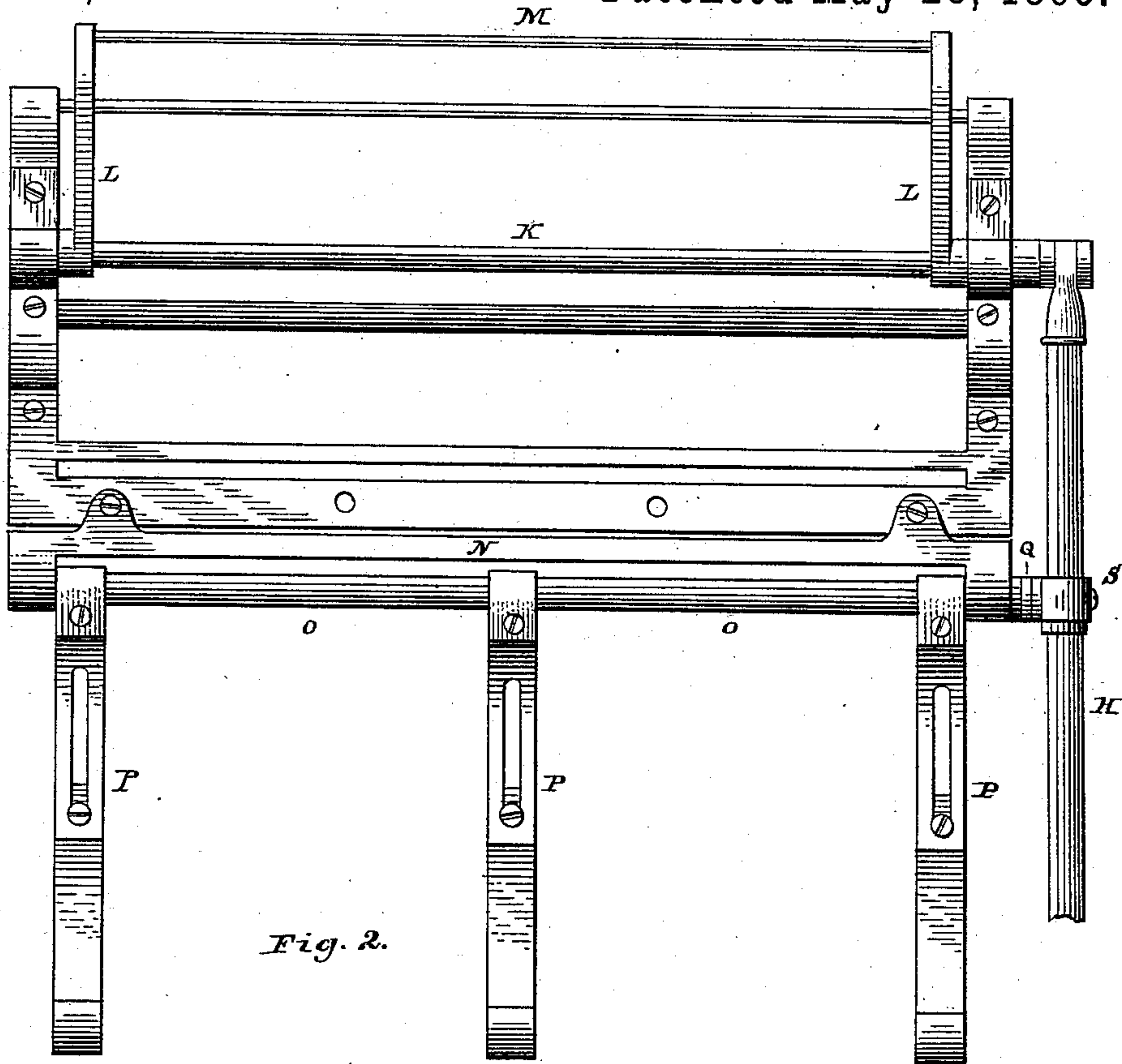


Fig. 2.

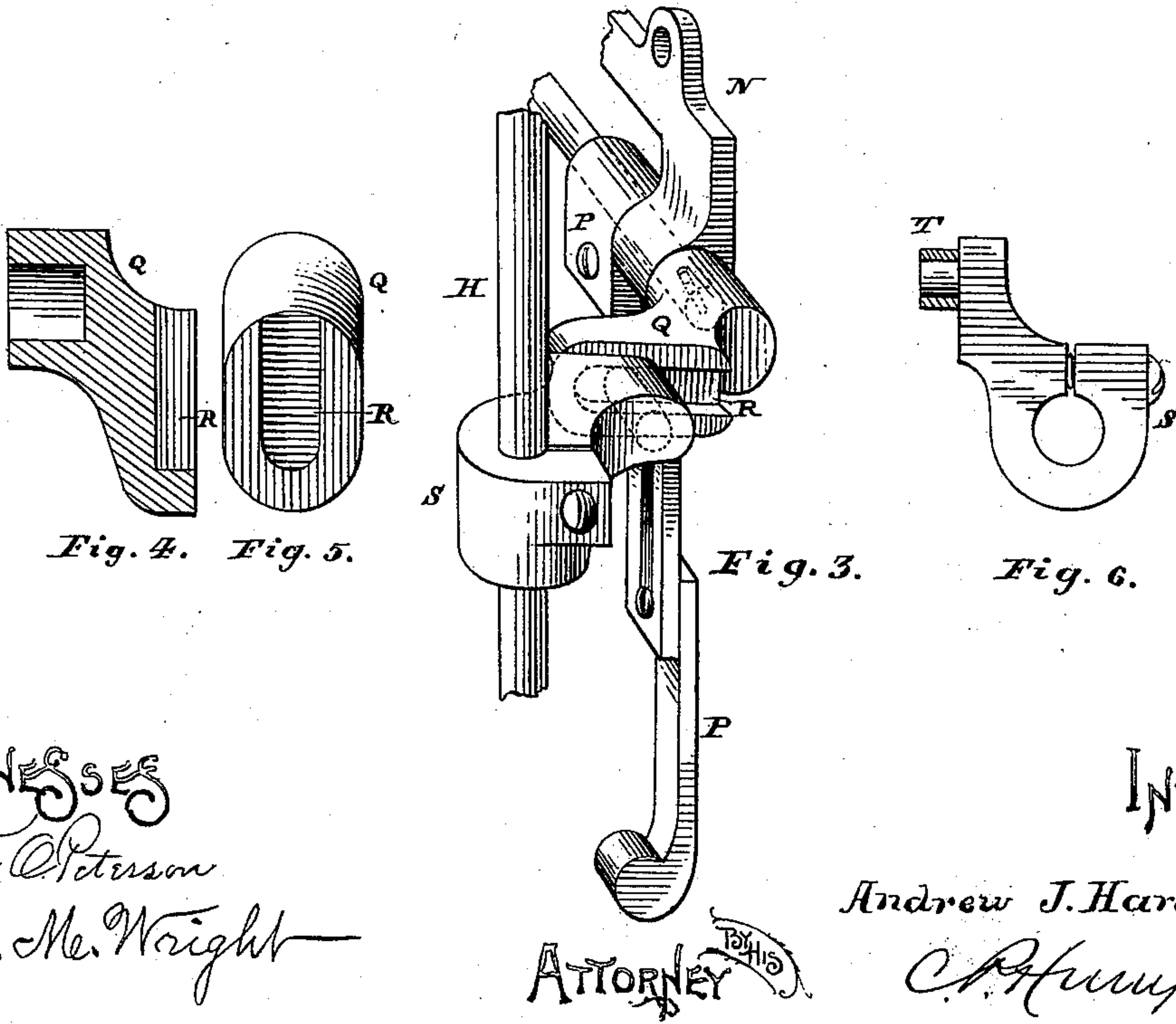


Fig. 4. Fig. 5.

Fig. 3.

Fig. 6.

WITNESSES
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Geo. Mc. Wright

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UNITED STATES PATENT OFFICE.

ANDREW J. HARDING, OF AKRON, OHIO.

BOOK-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 539,808, dated May 28, 1895.

Application filed January 3, 1893. Serial No. 457,097. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. HARDING, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Book-Sewing Machines, of which the following is a specification.

My invention has special relation to improvements in book-sewing machines in which the signatures are singly placed on horizontally-revolving arms, which by intermittent partial revolutions, carry the signatures successively to a position where they are subjected to the operation of curved, eye-pointed needles that sew with thread each successive signature as it is presented.

Many of the elements hereinafter shown and described have been illustrated in Letters Patent of the United States to David McC. Smythe, to which Letters Patent reference will be hereinafter made for fuller description than is thought necessary to repeat herein. As at present constructed and placed on the market, while embodying many of the elements secured by said Letters Patent, differ somewhat in their general appearance from the illustrations of said patents, and to these attention is hereinafter called. In the present construction, the folded edge of the leaves or signatures placed on the radial arms that are progressively turned, when forced upward to the needles, by the elevation of each successive arm, to their position to be sewed, pass between the last preceding signature, and a series of fixed, depending spring fingers. These spring fingers are located directly in front of the upper part of the last preceding signature, and their office is to retain each signature as it is raised to place against being pushed forward by a series of packing fingers which rock forward under the edge of each signature as it is added, and return to press or pack its lower half against those that precede it. In operation it is found, however, that the expansion of the packed signatures is such that the last added presses against these fixed spring fingers; and as the next signature is carried up on its radial arm, it is forced between these fingers and the last preceding signature, and rubbing against the latter causes in its contiguous leaves, what is termed "shuffling;"

that is, the friction of each signature as it is forced to place for sewing, causes the adjacent leaves of the preceding signature to bulge; thereby preventing the solidity of parts at the back, which is essential to perfect and durable work. Again, as the outer leaves of the first and last signatures of each book are coated with paste for further use in binding the volume, this arrangement also results in transferring a portion of the paste to the fixed spring fingers, which is thence distributed on other sheets, as they are successively brought to position.

The object of my invention is to overcome these objections by arranging the fixed spring fingers to be operated by the machine mechanism and automatically rock outward to permit each successive signature to freely rise to place; and return to hold it while being sewed.

To the aforesaid purpose my invention consists in the peculiar and novel construction, arrangement and combination of parts hereinafter described and then specifically pointed out in the claim, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a front elevation of the Smythe book-sewing machine as now manufactured, shown in outline, and embodying my improvement; Fig. 2, an enlarged front elevation of my invention, including such parts of the machine shown in Fig. 1 as are necessary to an understanding of its relation thereto; Fig. 3, a perspective, further enlarged, of portions of my invention and parts of said machine; and Figs. 4, 5, and 6, details of mechanism hereinafter described.

Referring to the drawings, A, is the book-sewing machine and as at present manufactured, and in which, B, B, are the horizontally-revolving arms on which the signatures are placed, on which arms are mounted a hub, C, which, actuated by the connected mechanism, slides on the vertical shaft, D, and intermittently presents one arm, carrying a signature, to the curved needles, E, fed with thread from the spools, F.

Thus far, the machine is substantially the

same as shown in Fig. 2, in the patent granted to D. McC. Smythe, dated October 7, 1879, No. 220,312, and its operation is similar.

G, G, are the packing fingers hereinbefore referred to, that rest against the signature last sewed, and back of the next succeeding signature as it is raised and until the horizontal arm that carried it has descended; when they rock forward under its lower edges, and, by a return movement, press or "pack" it to place. The stitch is then taken by the curved needles and the adjacent "looper" *a*; (the construction and operation of which are similar to that described in United States Letters Patent No. 250,991, granted to D. McC. Smythe December 13, 1881.) A shaft, H, pivotally connected with a rocking lever, I, which has a finger that runs in a cam groove, J, rocks a shaft, K, on which are two crank arms, L, L, carrying between their outer ends a rod, M. The threads from the spools, F, pass over the rod, M, to the needles, E, and the function of this part is, at each recession of the needles, to draw sufficient thread from the spools for the next stitch.

Thus far I have described such parts of the machine as they are now manufactured and as incident, and necessary to an understanding of my improvement.

Across the frame, A, in front of, and below the needles, is a bar, N, having at each end bearings, in which is journaled a shaft, O, bearing a number of depending fingers, P. These fingers consist of two pieces, arranged to be adjusted in length by means of a set-screw of one, sliding in a slot in the other; the lower part having a rounded end, as shown, to prevent abrasion of the paper. At the outer end of this shaft, O, is a crank-arm, Q, provided with an elongated groove, R. A yoke, S, is clamped on the shaft, H, and bears a wrist, T, that fits and slides in the groove, R; so that when the shaft, H, rises, it will cause a partial revolution of the shaft, O, and rock the fingers, P, outward; and by its return movement, rock them inward. These parts

are so adjusted that at the moment one of the horizontal arms, B, is brought in position to rise, and carry its signature to the needles, the shaft, H, by means of the groove in the wheel, J, is, for the purpose of drawing thread from the spools, as hereinbefore stated, raised; and so remains for a short interval, during which the horizontal arm, B, rises, carrying its signature to the needles.

By the movement of the shaft, H, just described, and during the interval stated, the fingers, P, are, by the mechanism hereinbefore described, rocked outward, permitting the signature, carried by the horizontal arm, to rise, without rubbing against the one that preceded it. When the signature has been thus raised and the stitch taken, the shaft, H, descends; thereby rocking the fingers, P, against the signature, on which they press, and retain it as the packing fingers, G, rock outward under its lower edge.

I have adopted as a convenient means of rocking the fingers, P, the shaft, H; but I do not wish to limit my invention to this exact construction, as it will be apparent that they may be connected with, and operated by some other part of the mechanism.

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

The combination, in a book-sewing machine, with the rock-shaft, O, carrying fingers, P, to engage the upper part of the signature, and the vertical shaft, H, to actuate the thread-feeding mechanism, of the grooved crank-arm, Q, attached to the rock-shaft, O, and the yoke, S, attached to the vertical shaft, H, bearing a wrist, T, arranged to run in said grooved crank, and rock said finger-carrying shaft, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand.

ANDREW J. HARDING.

Witnesses:

C. P. HUMPHREY,
C. E. HUMPHREY.