

No. 753,547.

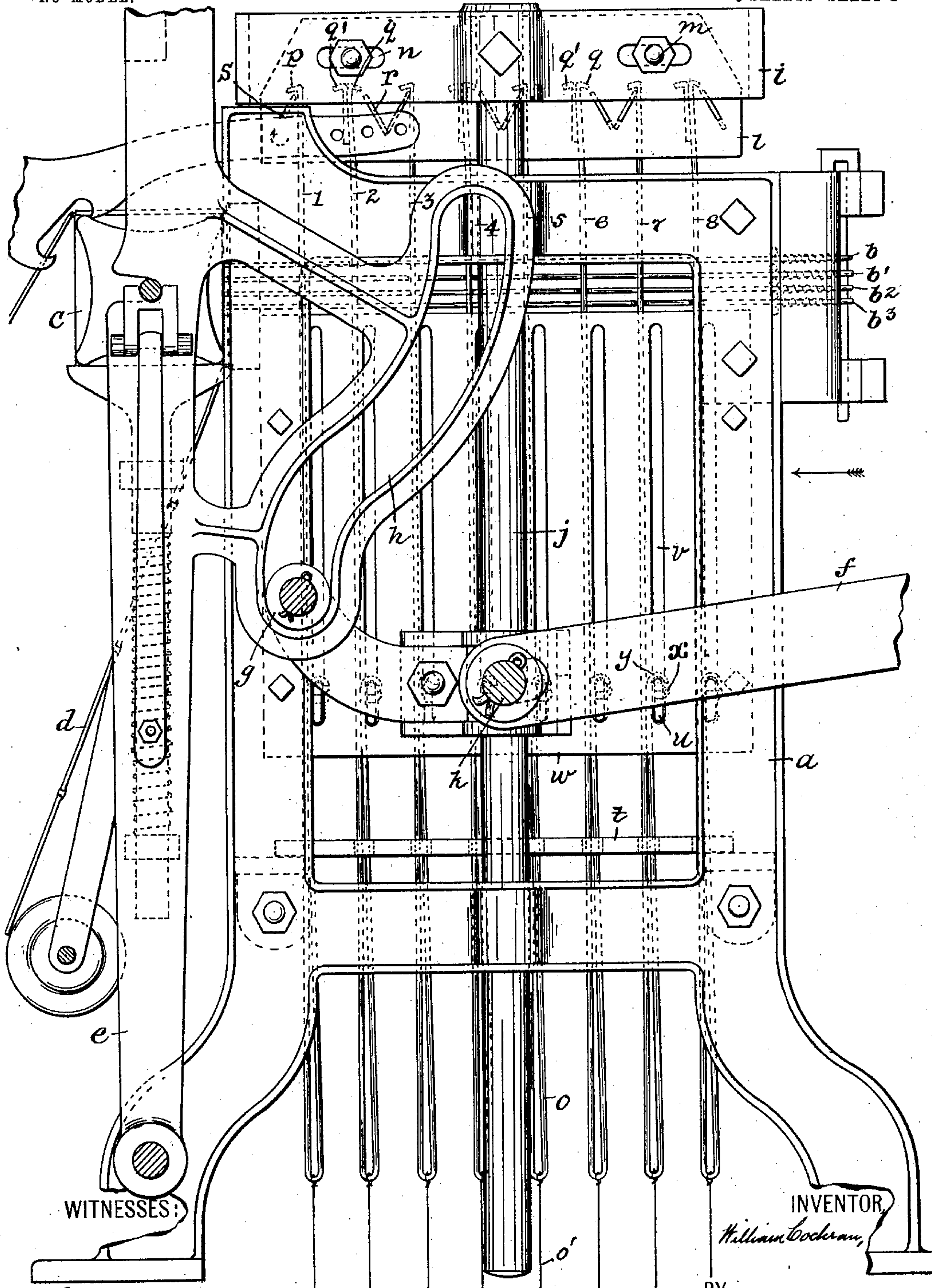
PATENTED MAR. 1, 1904.

W. COCHRAN.
JACQUARD MACHINE.

APPLICATION FILED JUNE 22, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

INVENTOR

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3 SHEETS—SHEET 2.

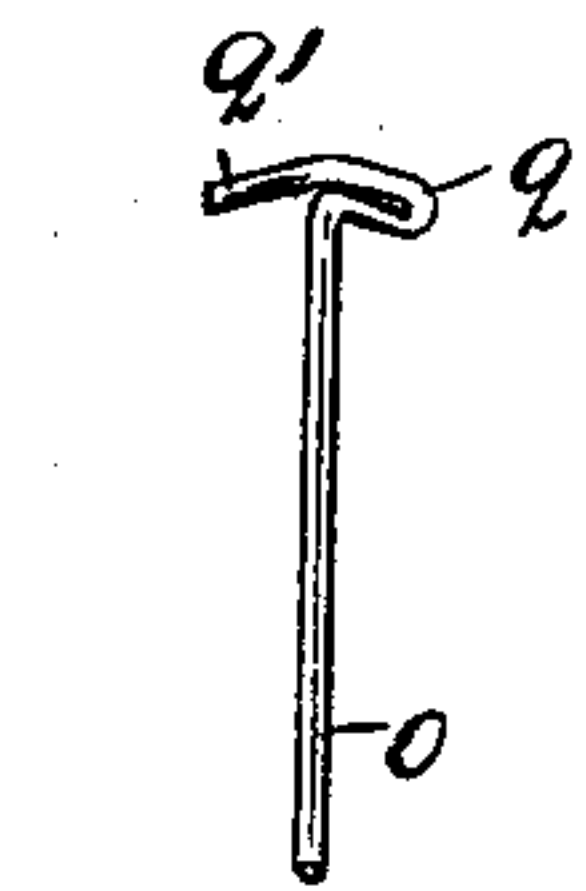
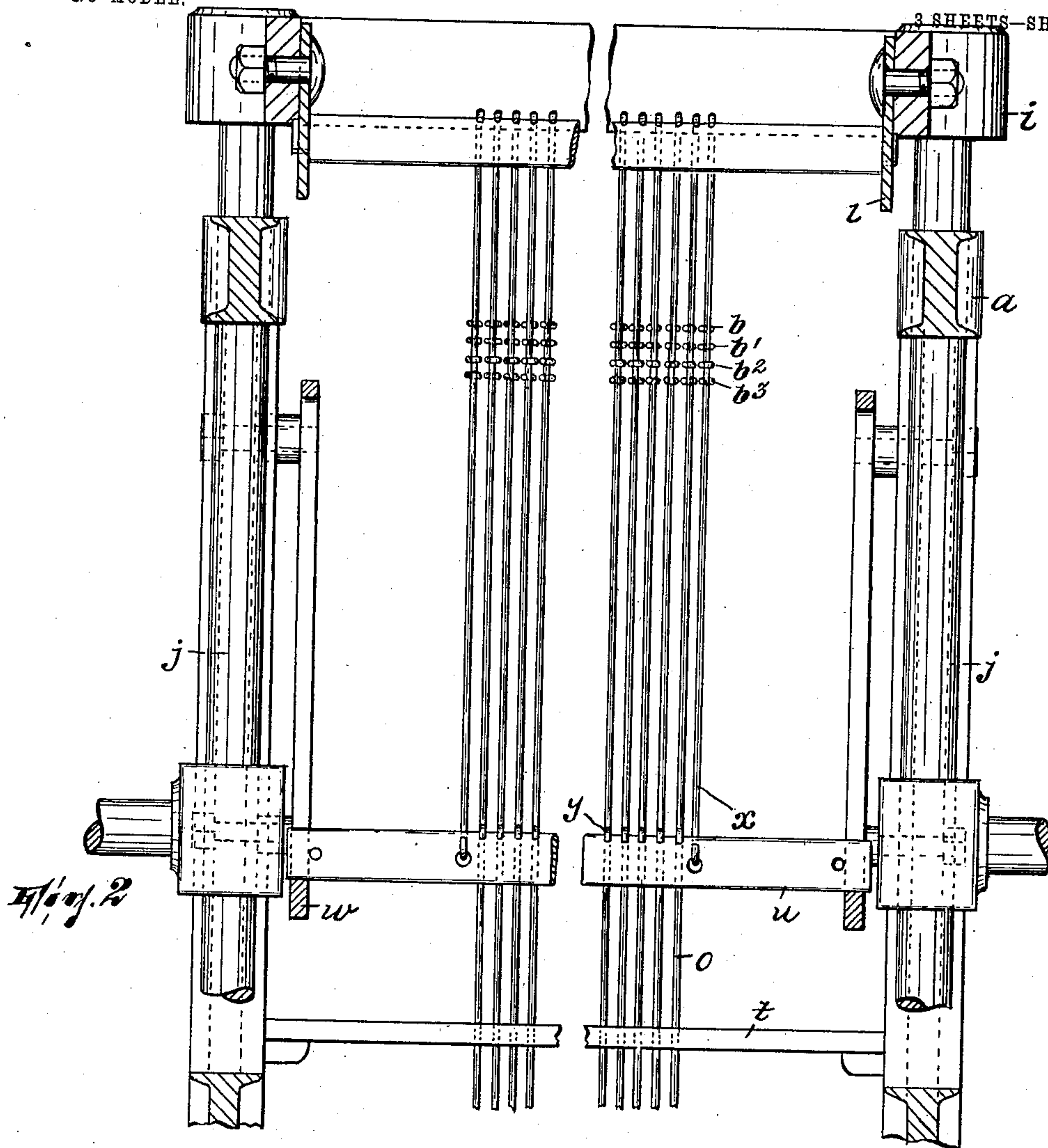


Fig. 1.

WITNESSES:

Wm. Bell.
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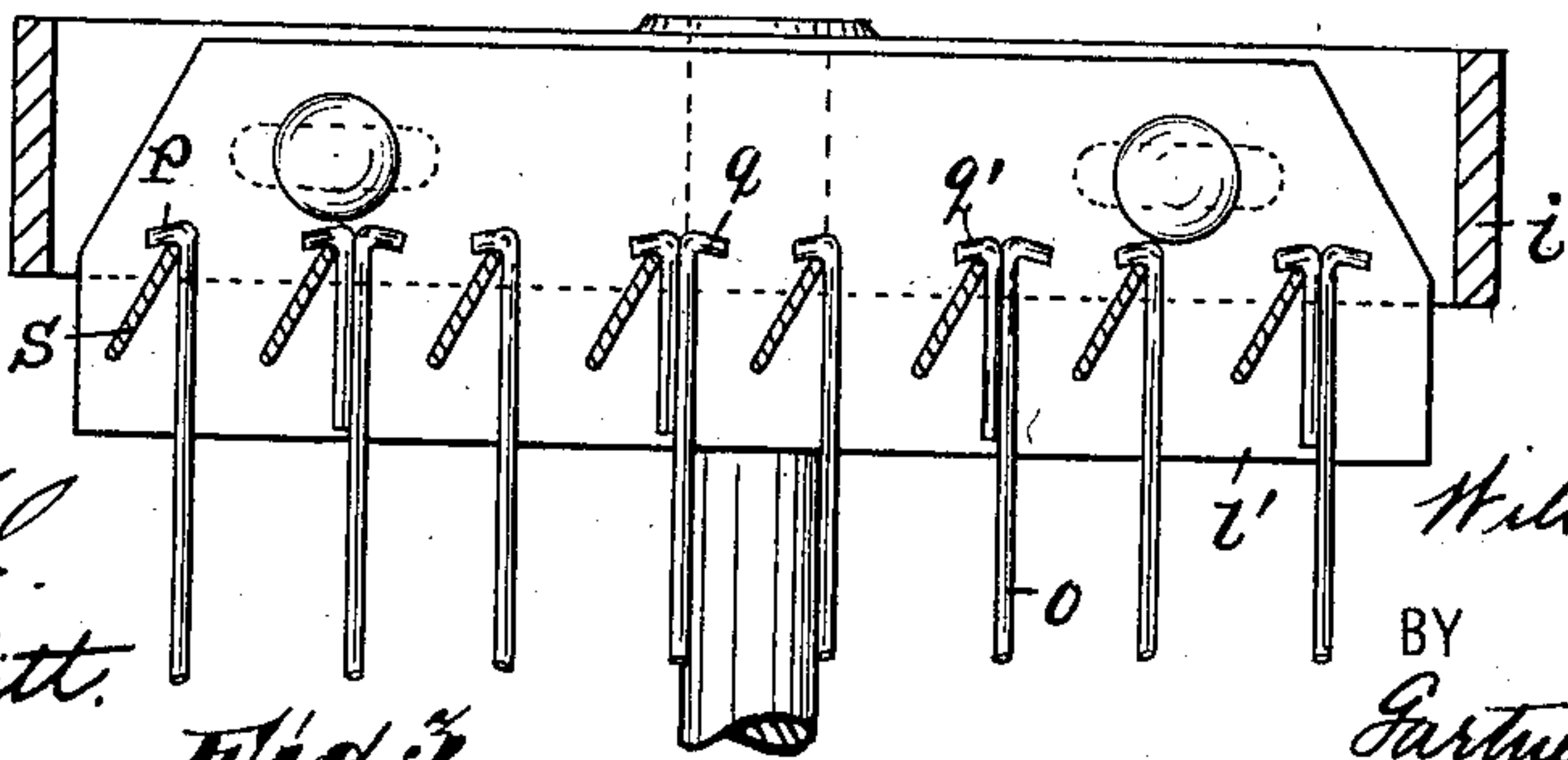


Fig. 3.

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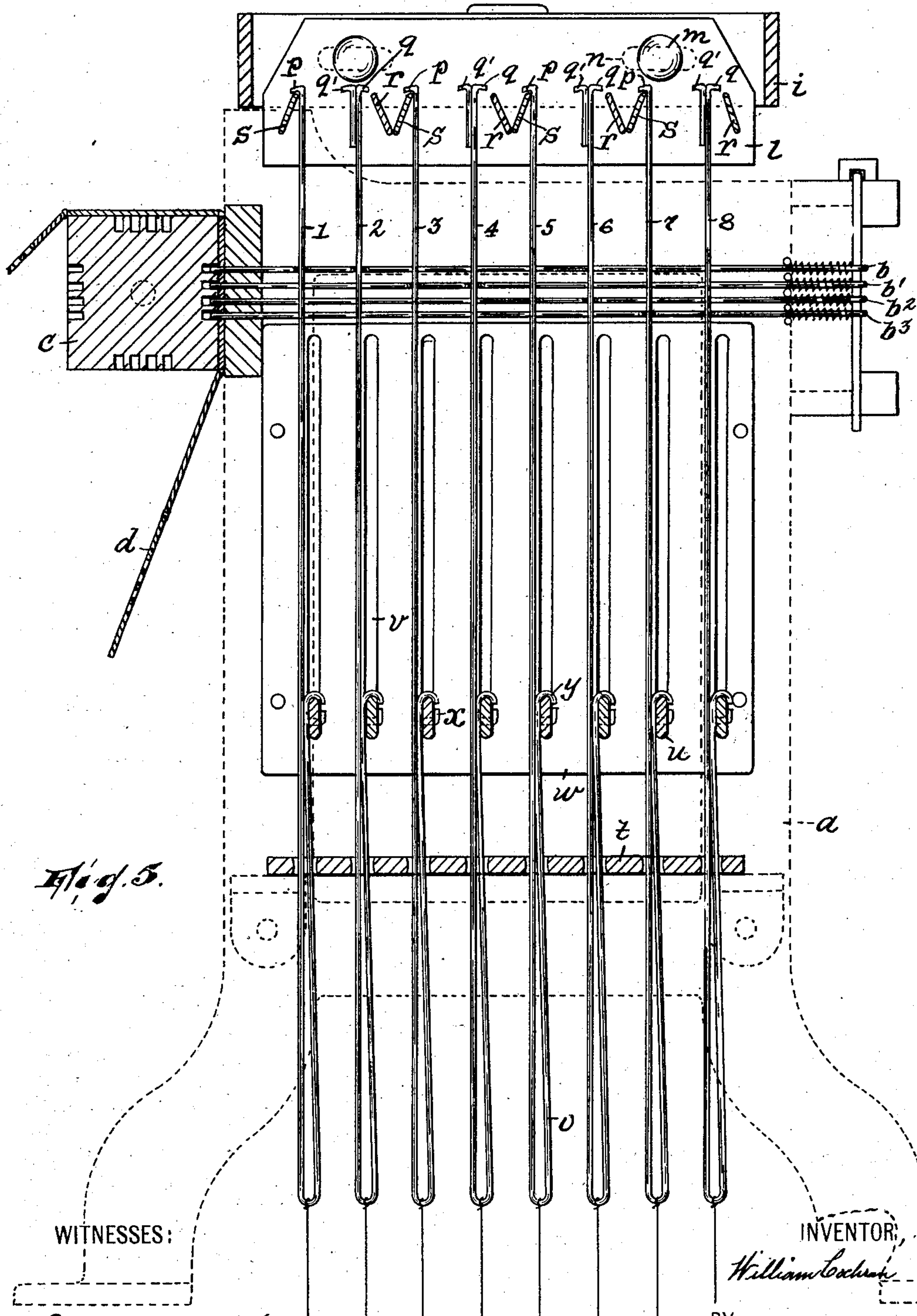
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3 SHEETS—SHEET 3.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM COCHRAN, OF PATERSON, NEW JERSEY.

JACQUARD-MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,547, dated March 1, 1904.

Application filed June 22, 1903. Serial No. 162,544. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM COCHRAN, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Jacquard-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to shedding mechanisms for looms; and it has reference particularly to the type of shedding mechanism known as "jacquard-machines."

One object of the invention is to so construct a jacquard-machine that the number of needles required to operate the hooks may be reduced to just one-half the number of hooks or, in other words, one-half the number of needles required in ordinary machines where the machine is to be used in the weaving of what is known as "end-and-end" goods—that is to say, goods where the ground is formed by alternately raising and lowering the individual warp-threads. The change which I have made will effect not only a saving in the number of needles required, but in the area of each card. Consequently the cards can be made smaller, as can also the card-cylinder.

My improved jacquard-machine will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a view in side elevation of the same. Fig. 2 is a transverse vertical sectional view looking in the direction of the arrow in Fig. 1. Fig. 3 is a longitudinal vertical sectional view of the grid and hooks of my machine as arranged for use where the machine is doing ordinary jacquard-work. Fig. 4 illustrates a modified form of one of the hooks, and Fig. 5 is a vertical sectional view of the machine.

In said drawings, *a* designates the frame; *b*, *b'*, *b*², and *b*³ the needles; *c*, the card-cylinder, controlled in any well-known manner; *d*, the cards; *e*, the pivoted frame in which the cylinder revolves; *f*, the main operating-lever of

the machine, the same carrying a roller *g*, working in a cam-shaft *h* in frame *e*, so as to oscillate the latter; *i*, a grid-frame supported by vertically-movable rods *j*, guided in the frame and pivotally connected at *k* to the operating-lever; and *l*, the grid, the same being secured in the grid-frame *i* by bolts *m*, penetrating horizontal slots *n* in the grid-frame.

In doing end-and-end work on an ordinary jacquard-machine, inasmuch as this class of work involves first raising the alternating hooks in each row for one or more picks of the looms, then the remaining hooks for the next pick or picks of the loom, then the alternating hooks again, and so on, it becomes necessary to have the cards punched, so that with respect to any two adjacent cards one card will control said alternating hooks, while the other card controls the remaining hooks. In the present instance instead of providing the hooks *e* with rests all projecting in the same direction every other hook in each row has its rest *p* projecting in one direction, while the rests *q* of the remaining hooks project in the opposite direction, and the grid instead of having all the knives parallel has some, *r*—*i. e.*, adjacent the rests *q*—set reversely to the others, *s*. Moreover, the arrangement is such that the odd hooks in each row will be engaged by the odd knives whenever the needles stand idle—*i. e.*, opposite holes in the card—while the even hooks will be engaged by the even knives whenever their controlling-needles are actuated by the card. Thus when the odd hooks are lifted the even hooks will stand idle, and vice versa. This effect is the result of so arranging each two hooks with respect to their controlling-needle that the extremity of the rest *q* of each hook in the pair is spaced from that side of the shank of the other which is adjacent the rest thereof less than the distance between the meeting edges of the corresponding knives. Hooks 1 and 2 in Figs. 1 and 5 are controlled by needle *b*, hooks 3 and 4 by needles *b'*, hooks 5 and 6 by needle *b*², and hooks 7 and 8 by needle *b*³. Thus no matter which position any one needle has one of the two hooks which it controls will be in line to be raised by the adjoining knife. It will be understood that each hook is connected

to an individual harness-cord o' . For instance, in weaving a taffeta ground in end-and-end work (and not considering the figure) it is only necessary to punch alternate cards, the others remaining blank. So far as the ground is concerned the punched card is punched for every needle. Therefore when a punched card is presented all the needles stand idle, and when the grid rises it lifts the odd hooks.

When the plain card is presented, all the hooks are pressed back, so that the even hooks are elevated by their knives when the grid rises. The hooks are guided in the usual grate t and in their rest or lowermost position are supported by bars u , seated in the bottoms of parallel vertical slots v , formed in plates w , secured to the sides of the frame a . These bars are made to be elevatory, so that when it is desired in the working out of certain designs any transverse row of hooks may be elevated, said bars being at this time for this purpose adapted to be guided in the slots v and to be raised by hooks x , controlled from some of the needles. By thus making the lower rest for the hooks in the form of individually-movable supports for the several transverse rows and providing means for raising and lowering said supports individually I avoid the necessity for knotting the heddle-cords and providing special perforated slats receiving them. The hooks are sustained on the bars u by having their free ends bent into hook form, as at y , and are thus adapted to rest on the bars.

It should be understood that my machine is convertible from a machine doing end-and-end work to one capable of doing general jacquard-work. In order to so convert it, it is only necessary to remove the grid l , above described, from the grid-frame i and substi-

tute a grid of the ordinary pattern. (See Fig. 3, at l' .) To this end the hooks having the relatively reversed rests q should be provided with additional rests q' , projecting in the same direction as the rests p . In that case the hooks may either have the form illustrated in Fig. 3, where the rests q' are soldered in place, or that illustrated in Fig. 4, where the two rests are formed by a double rebend in the wire.

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

The combination of a frame, the harness-cords, two sets of hooks, each hook being connected with an individual harness-cord and the hooks in one set having their rests extending oppositely to those in the other, needles, said hooks being fixed to said needles, against appreciable movement to and from each other, in pairs corresponding to the needles and comprising one hook from each set of hooks, and the hooks of each pair being adjacent each other, and a grid comprising a plurality of parallel pairs of contiguous knives, each pair of hooks being adapted to project between an individual pair of knives when the grid is at one of its limits of movement and the acting edges of said knives being spaced farther apart than the extremity of the rest of each hook in a pair is from that side of the shank of the other hook which is adjacent the rest thereof, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of June, 1903.

WILLIAM COCHRAN.

Witnesses:

JOHN W. STEWARD,
ROBERT J. POLLITT.