

No. 660,926.

Patented Oct. 30, 1900.

T. ROWCROFT.

JACQUARD MECHANISM FOR LOOMS.

(Application filed Mar. 30, 1900.)

(No Model.)

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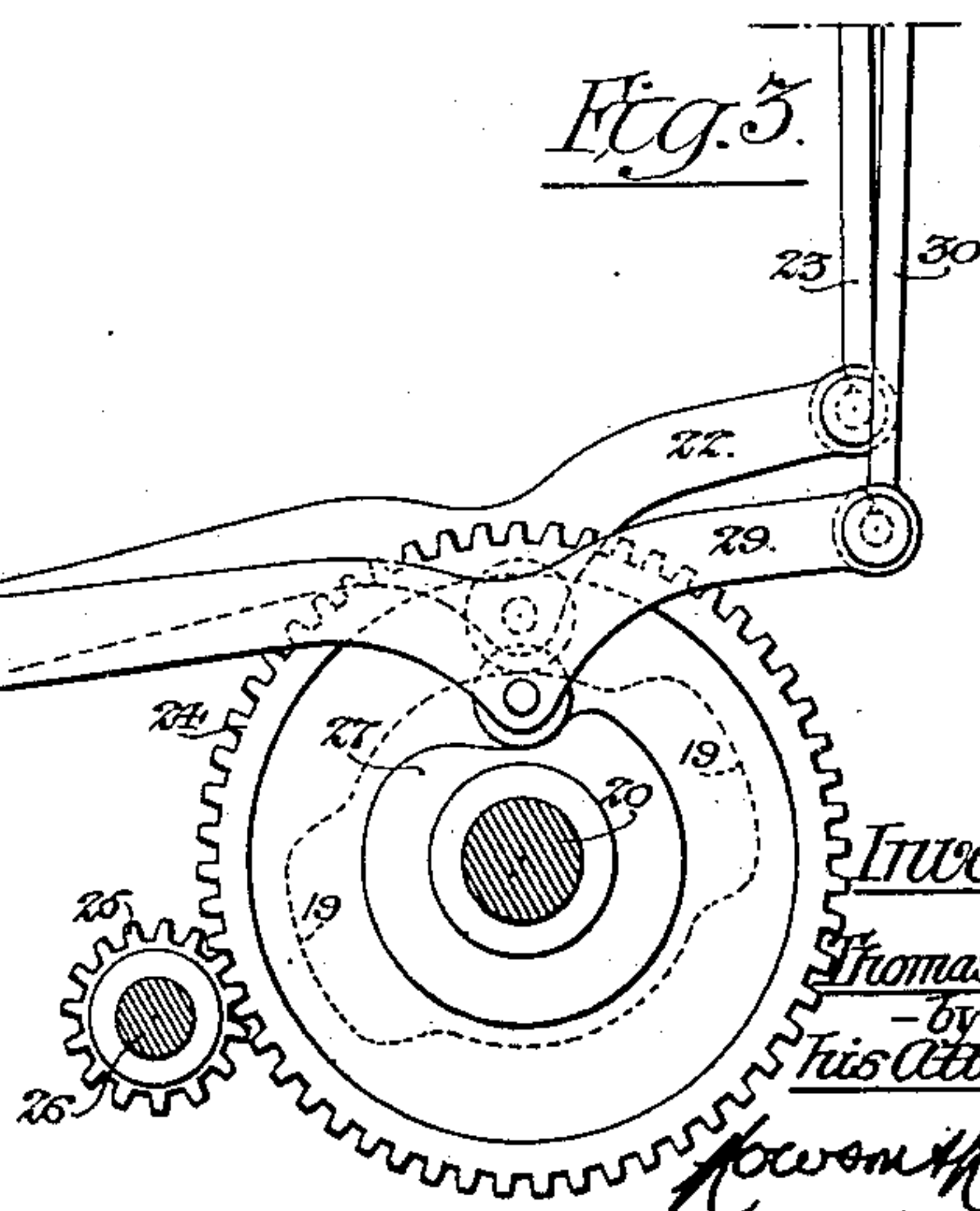
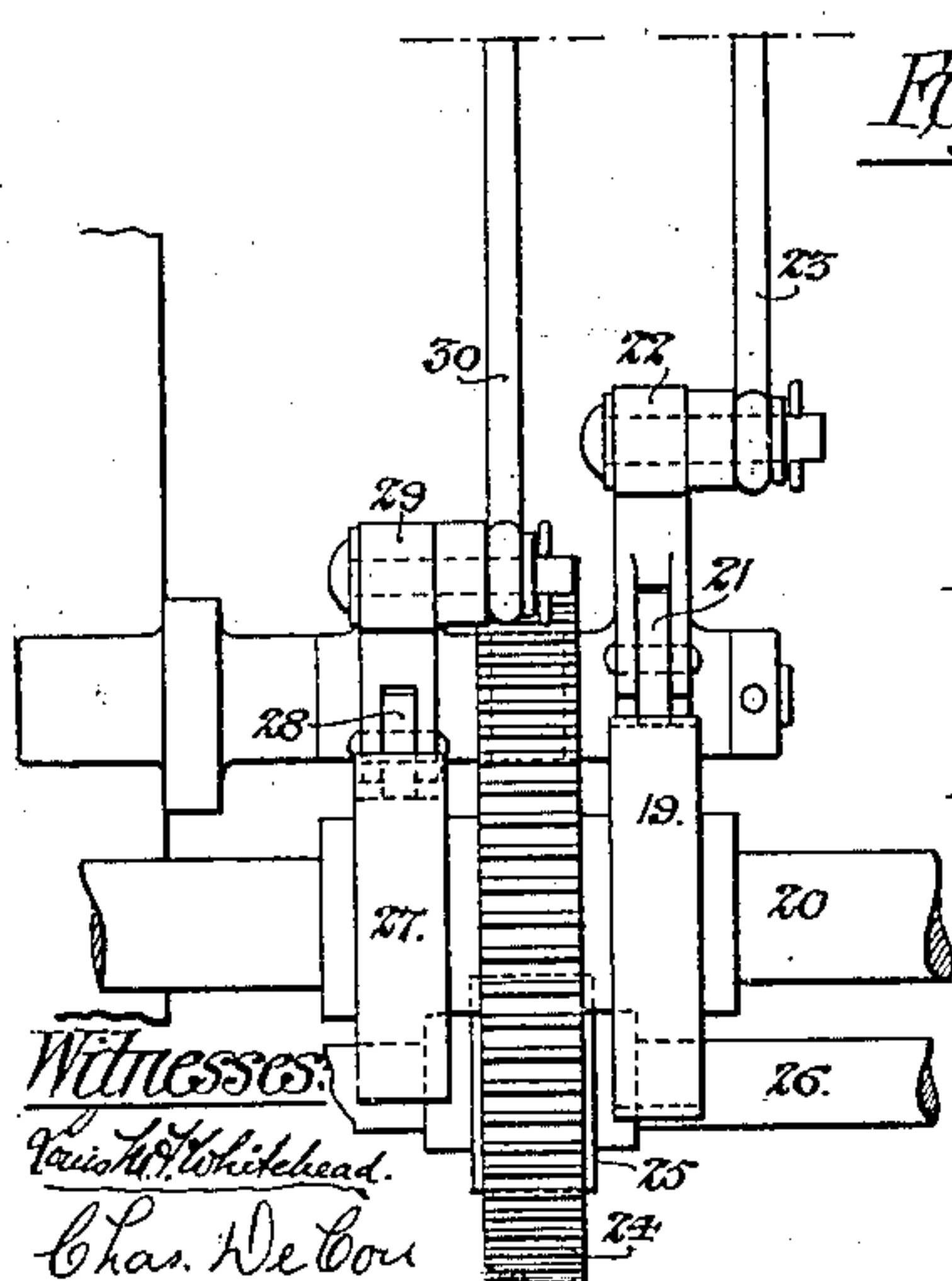
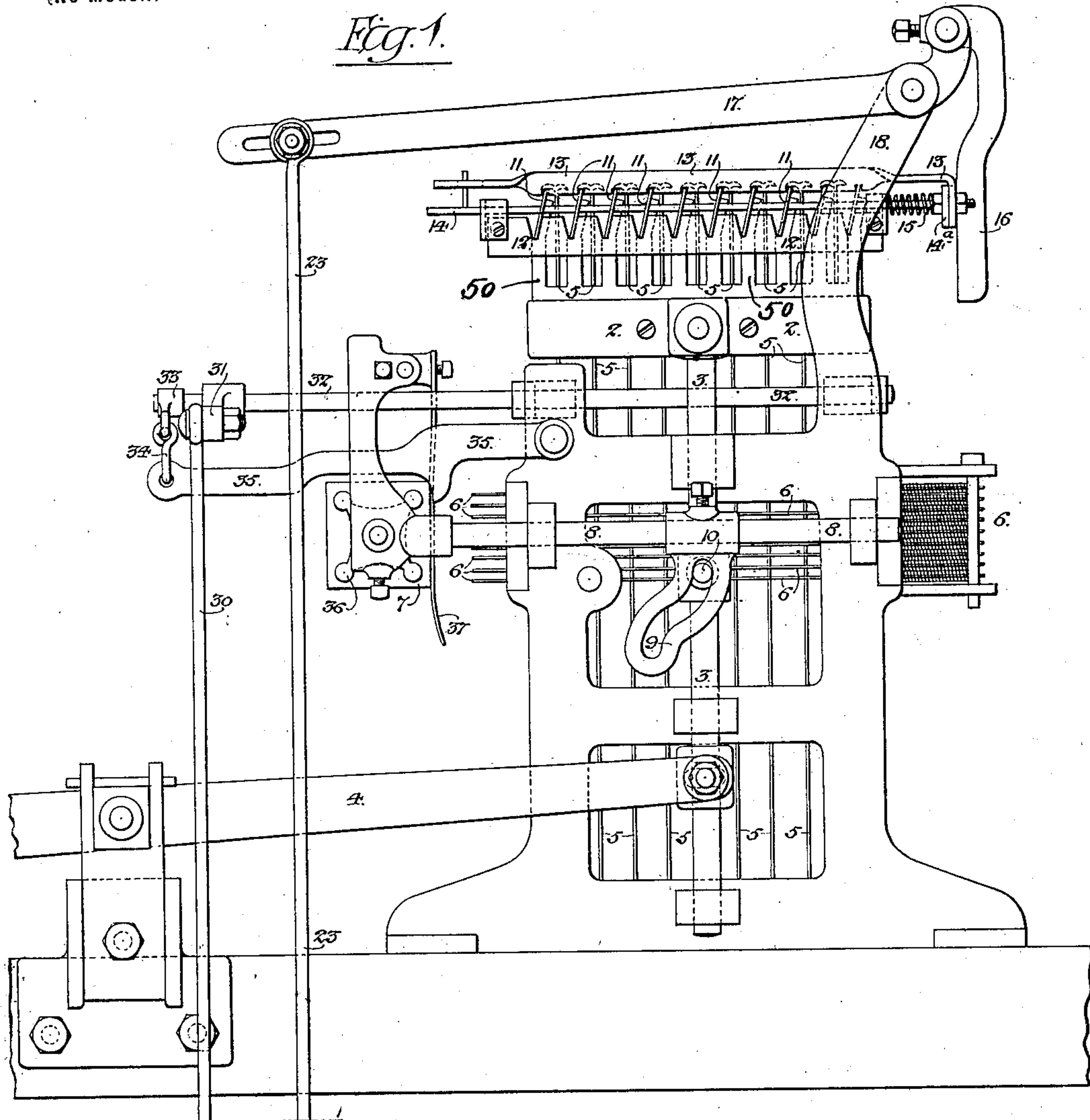


Fig. 3.

Inventor:

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This Attorneys:

~~Person to Person~~

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Fig. 8.

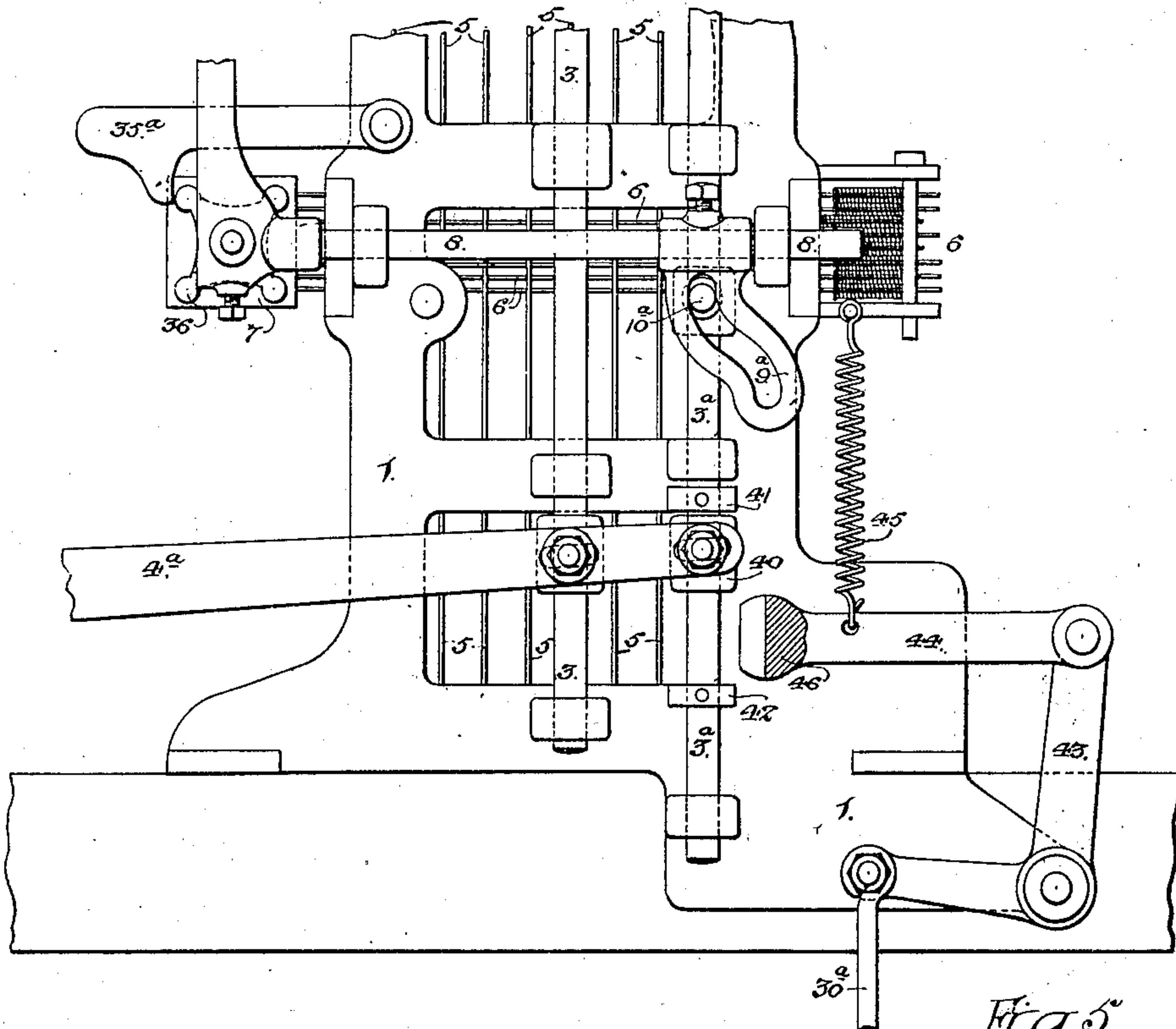


Fig. 5.

Fig. 4.

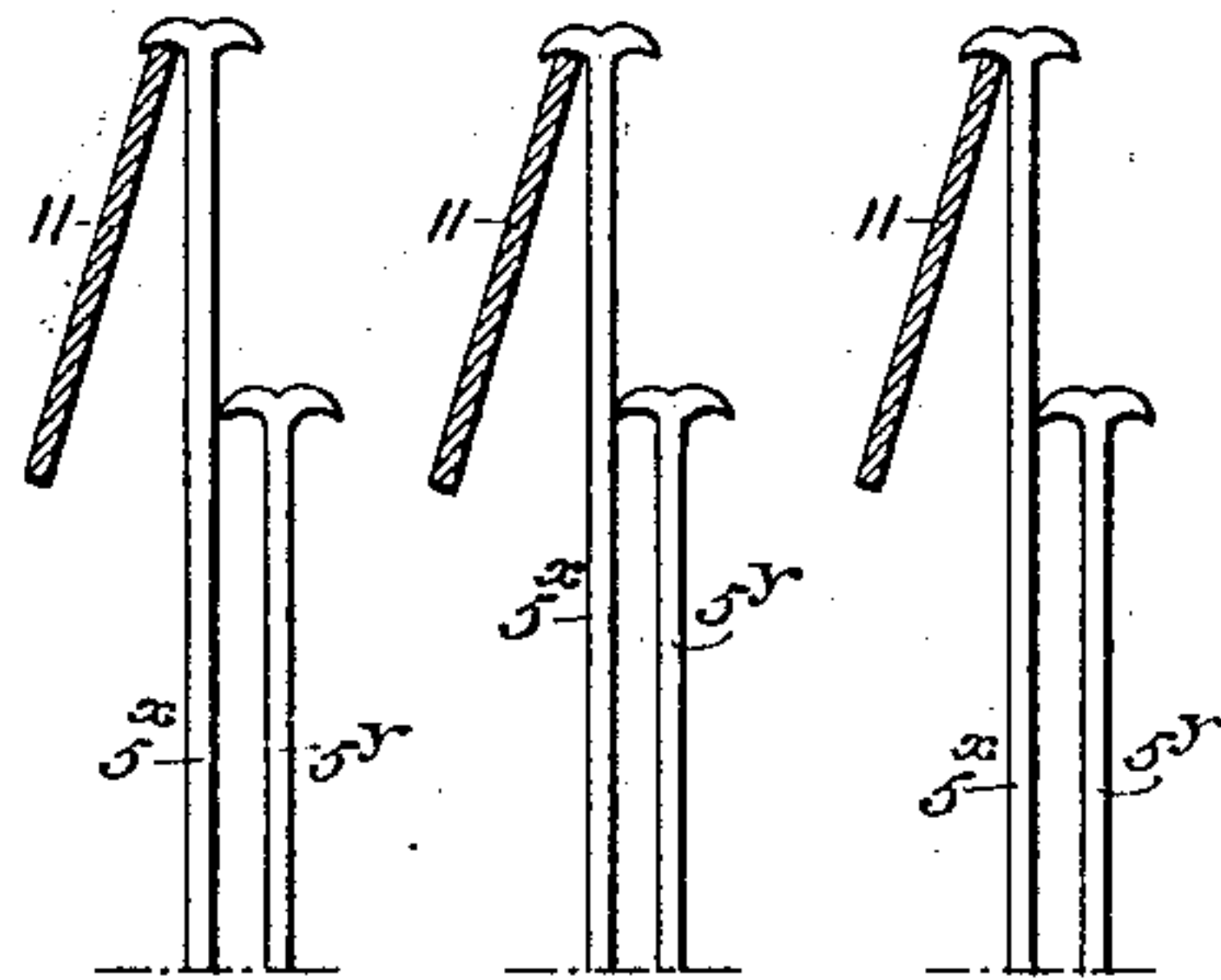
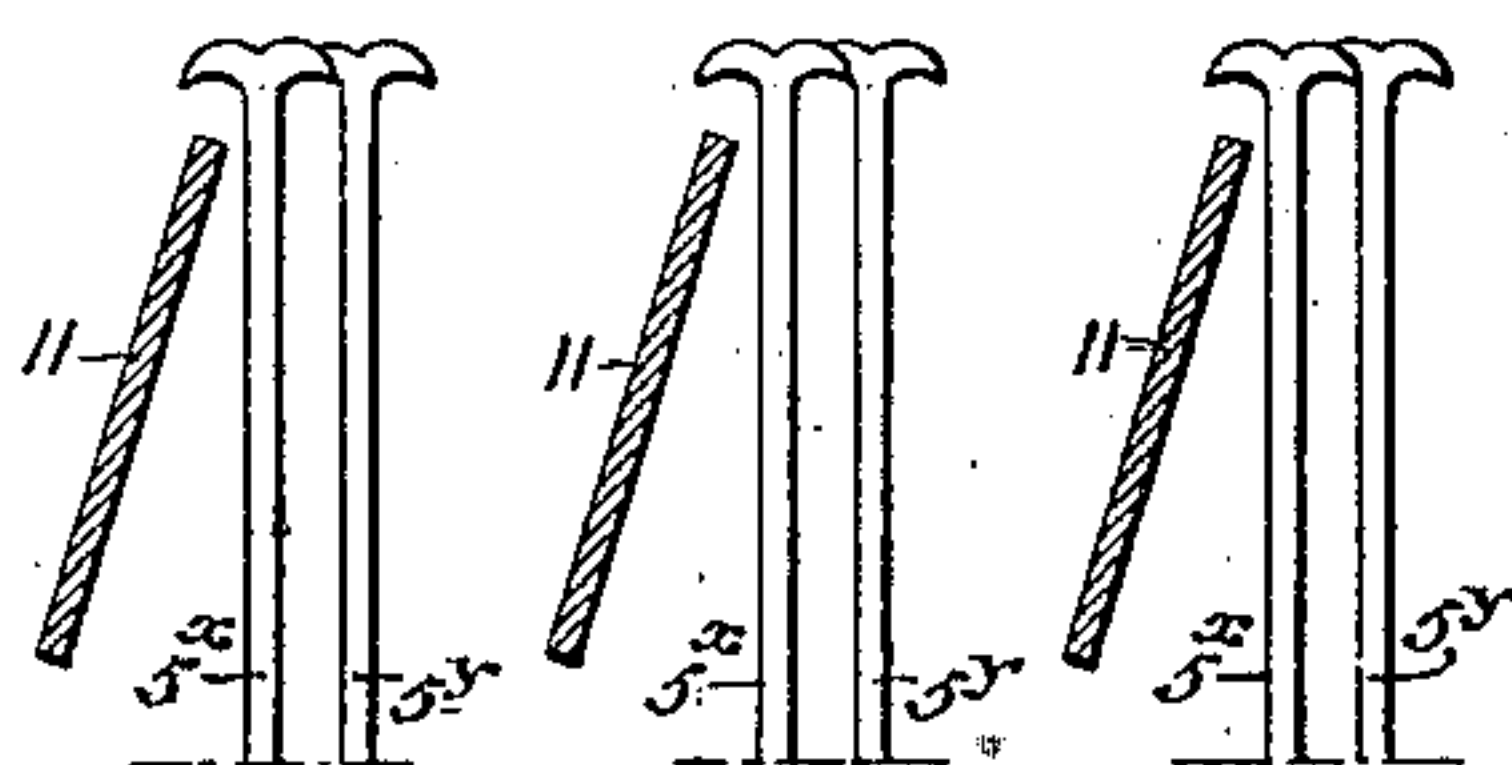


Fig. 6.

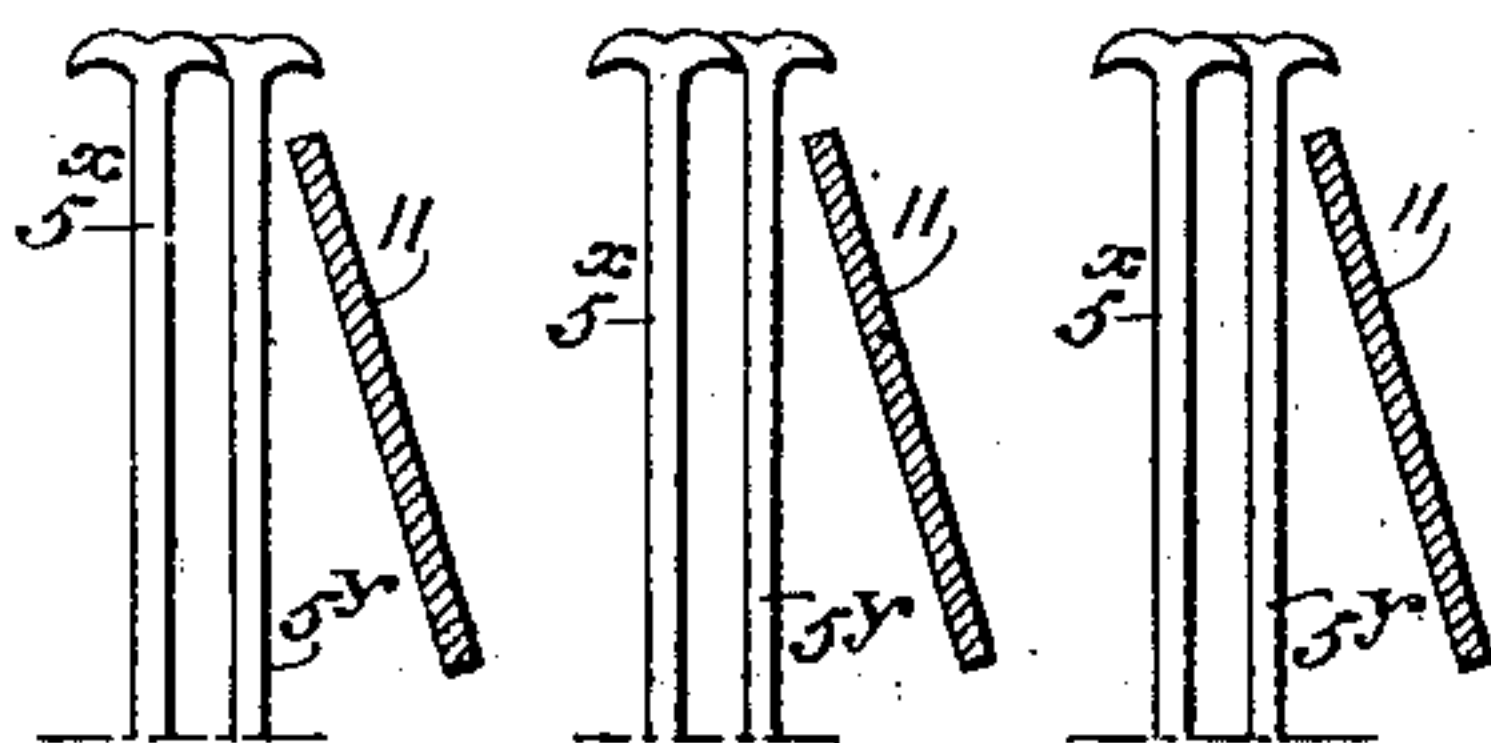
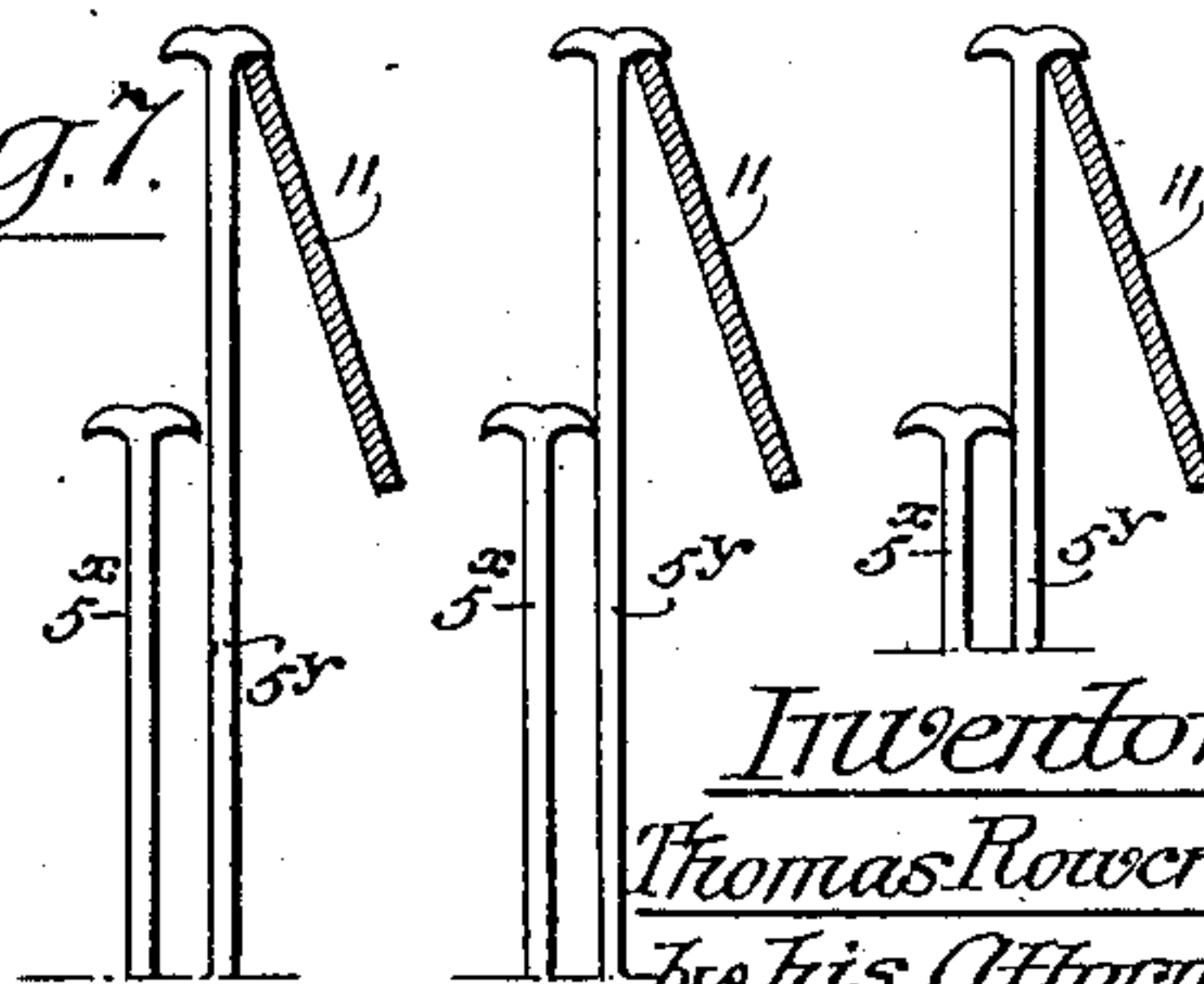


Fig. 7.



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UNITED STATES PATENT OFFICE.

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JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 660,926, dated October 30, 1900.

Application filed March 30, 1900. Serial No. 10,761. (No model.)

To all whom it may concern:

Be it known that I, THOMAS ROWCROFT, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Jacquard Mechanism for Looms, of which the following is a specification.

The object of my invention is to construct a simple, economical, and effective form of
10 repeating jacquard-machine for looms in order to materially lessen the number of cards required—an object which I attain by providing the lifter-wires of the machine with double hooks and movably mounting the griffs
15 in respect to the lifting devices so that they may be caused to engage with either of said hooks, the position of the card-cylinder being changed only after a series of picks of the loom instead of after every pick and the
20 griffs being moved between successive picks, whereby one shed may be formed by lifting warp-threads corresponding to the openings of a card and the next shed may be formed by lifting warp-threads corresponding to the
25 blank spaces of said card, and so on until as many successive picks have been shot as the pattern will permit the one card to serve.

In the accompanying drawings, Figure 1 is a side view of sufficient of a jacquard-machine to illustrate my invention. Fig. 2 is
30 an end view of certain cam mechanism for operating those parts of the jacquard-machine to which my invention particularly relates. Fig. 3 is a side view of said cam mechanisms. Figs. 4, 5, 6, and 7 are sectional
35 views on an enlarged scale, illustrating the purpose of my invention; and Fig. 8 is a side view of part of the jacquard-machine, illustrating another method of carrying out my
40 invention.

Referring first to Figs. 1, 2, and 3, it will be noted that 1 represents the framework of an ordinary jacquard-machine; 2, the lifter-frame of the machine; 3, one of the side rods
45 of said lifter-frame passing through guides on the frame 1, as usual; 4, the lever whereby vertical reciprocating motion is imparted to the lifter-frame; 5, the lifter rods or wires; 6, the needles controlling the same; 7, the
50 pattern-card cylinder or drum; 8, one of the side rods of the same, and 9 the cam on said

side rod engaged by a pin 10 on the side rod 3 of the lifter-frame, so that as the latter rod reciprocates vertically the card-cylinder rod 8 will be reciprocated horizontally. All of
55 these parts are similar to those of an ordinary jacquard-machine and form no part of my invention; but instead of providing the lifter-wires 5 with single hooks at their upper ends I provide each of said lifter-wires with a double hook—that is to say, with one hook facing to the right and the other to the left—and I so mount the griffs 11 upon the lifter-frame 2 that they can be moved laterally, so
60 as to engage with either of the hooks of the 65 lifter-wires.

In the present instance each of the upright griff-supporting bars 50 is bent at the upper end at an angle corresponding to one extreme
70 angle of inclination of the griffs, and secured to each of the ends of said bars is a side plate 12, having in its upper edge V-shaped notches, one side of each notch corresponding with the angle of the bent upper end of the griff-supporting bar and the other side of the
75 notch corresponding with the opposite extreme angle to which the griff is moved, the end portions of the griffs resting in the notches, so that said griffs can be swung back and forth from one extreme position to the other.
80 My invention in its broader embodiments, however, is not limited to swinging griff-bars.

In the present instance the swinging of the griffs is effected by means of a notched bar 13, engaging with the upper edges of the
85 griffs, or there may be a pair of these notched bars, one at each end of the series of griffs. The bar 13 is secured to a rod 14, suitably guided on the framework of the machine and acted upon by a coiled spring 15, tending to
90 move it to one extreme position, movement in the other direction being effected by the action upon a cross-bar 14^a of a vibrating arm 16, carried by a lever 17, which is hung to an upwardly-projecting portion 18 of the
95 frame 1 and is vibrated at the proper times by means of a cam 19 on a shaft 20 of the loom, said cam acting upon an antifriction-roller 21, carried by an arm 22, which is hung to a suitable bearing on the loom-frame and
100 is connected to the lever 17 by means of a rod 23. The shaft 20 has a spur-wheel 24,

which meshes with a spur-pinion 25 on that shaft 26 of the loom from which the swinging movement of the lay and the rocking movement of the lever 4 are derived, the spur-wheel 24 and pinion 25 being so proportioned that the shaft 20 will rotate once while the shaft 26 is making a number of rotations, the relative speed of the two shafts being dependent upon the character of the work which the loom is intended to perform and upon the desired pattern to be produced.

In the present instance the gears bear the relation of four to one, and the cam 19 has two high portions and two low portions, so that there will be two vibrations of the lever 17 for each rotation of the shaft 20, and the griffs 11 will during each rotation of said shaft 20 be twice changed from one extreme position to the other, so that the cycle of operations will comprise four picks of the loom. On the shaft 20 is another cam 27, which acts upon an antifriction-roller 28 on an arm 29, hung to a fixed bearing on the loom in the same manner as the arm 22 and connected by a rod 30 to an arm 31 on a shaft 32, free to turn in suitable bearings on the jacquard-frame 1, said rock-shaft having another arm 33, which is connected by a link 34 to the hooked arm or pawl 35, which engages with the quadrangular ratchet 36 on the end of the pattern-card cylinder 7 and serves to effect a partial rotation of the same as the cylinder is reciprocated, the usual spring 37 bearing on the flat side of the card-cylinder and insuring the complete quarter-turn of the same whenever the hooked arm 35 engages with and turns the ratchet 36.

Usually the hooked arm 35 engages the ratchet 36 of the card-cylinder on each inward stroke of the latter, so that there is a change of card for each pick of the loom; but by placing the hooked arm 35 under cam control I am enabled to throw the same out of operative relation to the ratchet 36, and can thus permit a number of reciprocating movements of the card-cylinder without any turning of the latter, and consequently without any change in the position of the cards, the lifter-wires 5 consequently having the same lateral adjustment for a number of successive picks. This, however, does not result in a number of successive similar sheddings of the warp, for the shifting of the griffs 11 between successive picks causes a change in the successive sheddings of the warp, as will be understood on reference to Figs. 4, 5, 6, and 7.

In the present instance the cam 27 is so formed as to drop the arm 35 and cause a change of card once in every four picks. Supposing, therefore, that on the first pick the cards occupy the position shown in Fig. 4, so as to engage with the left-hand hooks of the lifter-wires. In this case only those wires which correspond to the openings in the card will be lifted—that is to say, those wires represented at 5^x in Figs. 4 and 5—the other wires—

that is to say, those represented at 5^y—corresponding to the blank spaces of the card having been pushed over by the needles 6, so that their hooks are out of the path of the griffs 11. Hence when said griffs rise said wires 5^y will remain down, as shown in Fig. 5. When the griffs descend, however, they will be shifted to the left, as shown in Fig. 6, so as to engage with the right-hand hooks of the lifter-wires, and when the griffs again rise the wires 5^y will be engaged and lifted thereby, the hooks of the wires 5^x now occupying a position between the griffs, so that they will not be engaged by the latter as they rise. (See Fig. 7.) On the next descent of the griffs they will be shifted back to the position shown in Fig. 4, and on their next rise the hooks 5^x will be lifted. When the griffs again descend, they will be shifted to the position shown in Fig. 6, and on their next rise there will be a second lift of the wires 5^y, and when the griffs again descend there will be a change in the position of the card-cylinder 7; a new card will be brought into action, and there will be a new adjustment of the lifter-wires; but it will be evident that the operation of the lifter-wires alternately with one adjustment of the pattern-cards may be continued for as many picks as desired, depending upon the cam formation which controls the movement of the hooked arm or pawl 35. For instance, there may be a change of cards only after every six picks or after every eight picks, or, on the other hand, the cards may be changed after every other pick, depending upon the requirements of the pattern. If the cards are changed after every other pick, but half the number of cards need be used as would be required if the cards were changed after every pick, while if the cards are only changed after every fourth, sixth, or eighth pick only one-quarter, one-sixth, or one-eighth as many cards as usual will be needed.

Although I prefer to retain the same card in action by turning the card-cylinder only once in a number of picks, the same result may be attained by arresting the reciprocating movement of the cylinder, so that it will only make one stroke for a certain number of picks. One means of accomplishing this result is represented in Fig. 8, on reference to which it will be observed that the card-cylinder rod 8 has a cam 9^a for engaging with a pin 10^a upon a rod 3^a supplementary to the lifter-rod 3, the said cam 9^a being the reverse of the cam 9 shown in Fig. 1, so that the card-cylinder will be drawn inward or toward the ends of the needles 6 on the rise of the rod 3^a and will be moved outward or away from the ends of the needles on the downward movement of said rod. The hooked arm or pawl 35^a is also the reverse of the hooked arm 35 shown in Fig. 1, so that it will turn the cylinder as the same moves outwardly. The lever 4^a operates a sliding collar 40 on the rod 3^a, and the latter has fixed collars 41 and 42, located, respectively, above and be-

low the collar 40 and bearing such relation to the movement of the lever 4^a that said collar 40 can play freely between them without imparting any movement to the rod 3^a when the latter is at the limit of its upward movement. Hung to the frame of the jacquard-machine, however, is a lever 43, which can be vibrated at intervals by the rod 30^a, which is intended to be actuated by a suitable cam taking the place of the cam 27 on the shaft 20. To this lever 43 is hung an arm 44, normally supported in the position shown in Fig. 8 by a spring 45 and having a block or enlargement 46, which when the arm is projected will be inserted between the sliding collar 40 and the fixed collar 42 of the rod 3^a when the sliding collar is raised. When thus inserted the downward movement of the collar 40 will be transmitted to the collar 42 of the rod and the card-cylinder 7 will be projected by the action of the pin 10^a and cam 9^a, so as to be turned in order to change the card. The collar 40 acting in its upward movement upon the collar 41 restores the rod 3^a to its normal position, as shown in Fig. 8, and if the block 46 is then withdrawn from between collars 40 and 42 the subsequent movements of the collar 40 will have no effect in moving the rod 3^a until the block has been again inserted between the two collars. In some of the claims, therefore, I have adopted the term "series-pick card-cylinder" to indicate a cylinder which is either rotated or reciprocated only once in a series of picks of the loom and in other claims I have used the term "series-pick rotating cylinder" to indicate the preferred construction—that is to say, the one in which the card-cylinder reciprocates constantly, but is rotated only once in a series of picks.

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

1. The combination in jacquard mechanism for looms, of double-hooked lifter-wires, a lifter-frame having movable griffs adapted, when in one position, to engage one set of

hooks and when in the other position to engage the other set of hooks of the lifter-wires, means for moving said griffs between successive picks, and a series-pick card-cylinder whereby the successive sheddings of the warp are different but the adjustment of the lifter-wires by the needles is changed only after a succession of picks has been made with the use of the same card, substantially as specified.

2. The combination in jacquard mechanism for looms, of double-hooked lifter-wires, a lifter-frame having movable griffs which, when in one position, engage with one set of hooks and when in the other position engage with the other set of hooks of the lifter-wires, means for moving said griffs between successive picks, and a series-pick rotating card-cylinder whereby the successive sheddings of the warp are different but the adjustment of the wires by the needles is changed only after a succession of picks has been made with the use of the same card, substantially as specified.

3. The combination in jacquard mechanism for looms, of double-hooked lifter-wires, a lifter-frame having movable griffs, a controlling device whereby all of said griffs may be simultaneously moved, a cam for actuating said controlling device, and a series-pick card-cylinder, substantially as specified.

4. The combination in jacquard mechanism for looms, of the double-hooked lifter-wires, the lifter-frame having movable griffs, cam mechanism for effecting movement of said griffs, a card-cylinder and mechanism for reciprocating the same, a cylinder-rotating device, and cam mechanism for acting upon the latter so as to render it operative only once in a series of picks, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. ROWCROFT.

Witnesses:

ROBT. G. WHITE,
F. E. BECHTOLD.