G. ROWBOTTOM.

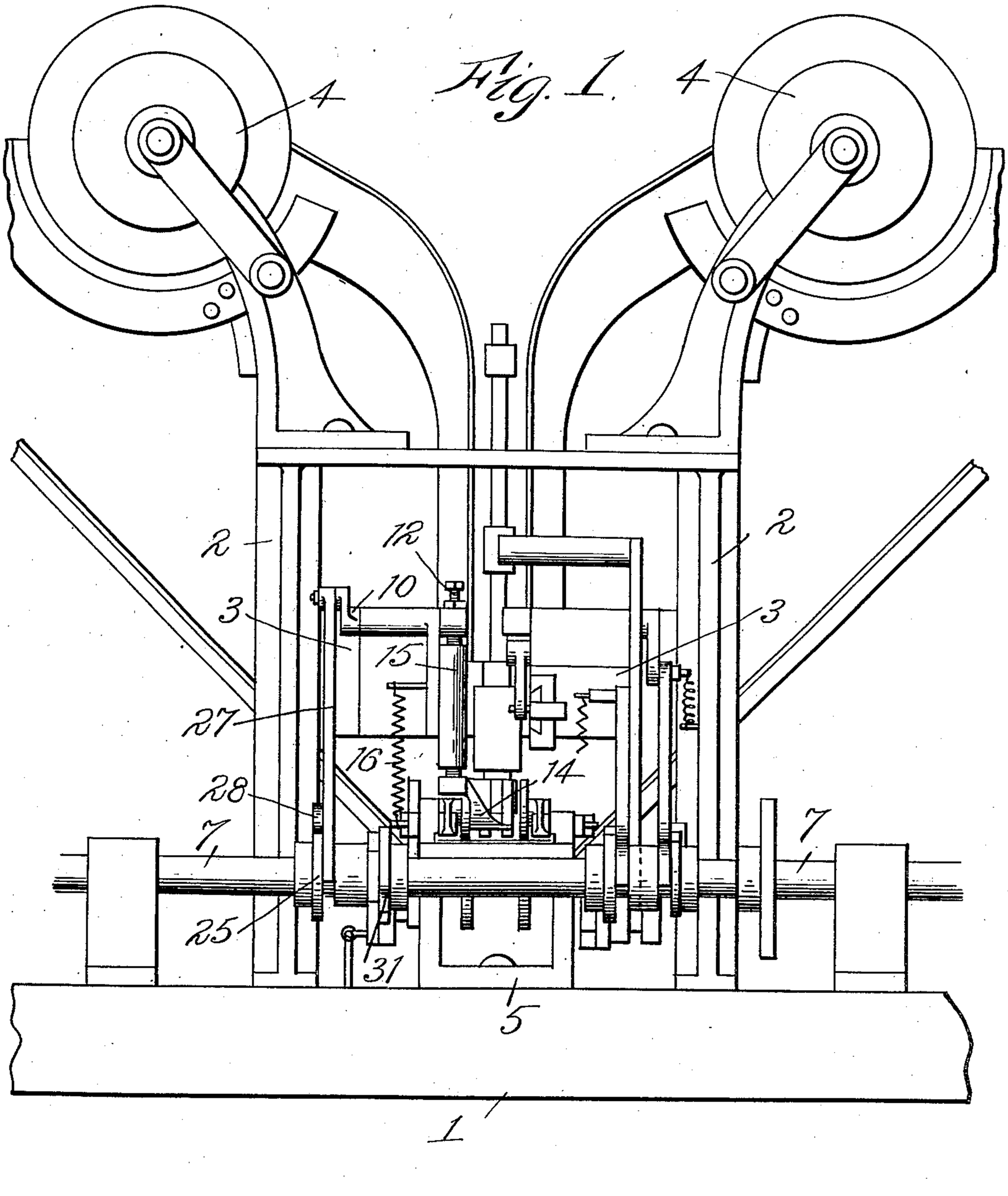
MACHINE FOR FASTENING HOOKS AND EYES ON CARDS.

APPLICATION FILED SEPT. 4, 1907.

903,784. **Patented Nov. 10, 1908.**

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

Fig. 3.

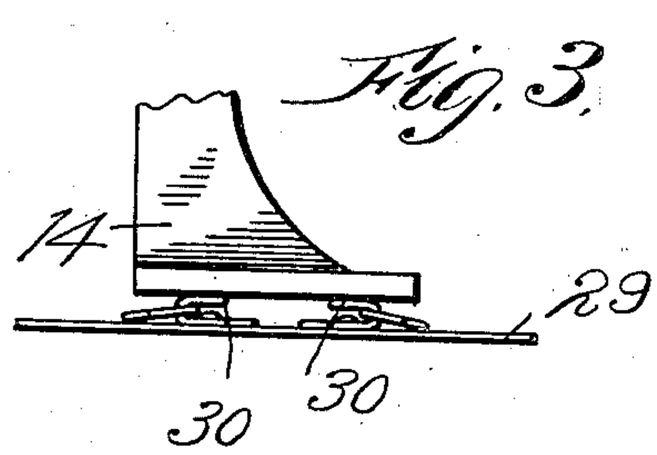

Fig 2.

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5 SHEETS—SHEET 3.

Fig. 4

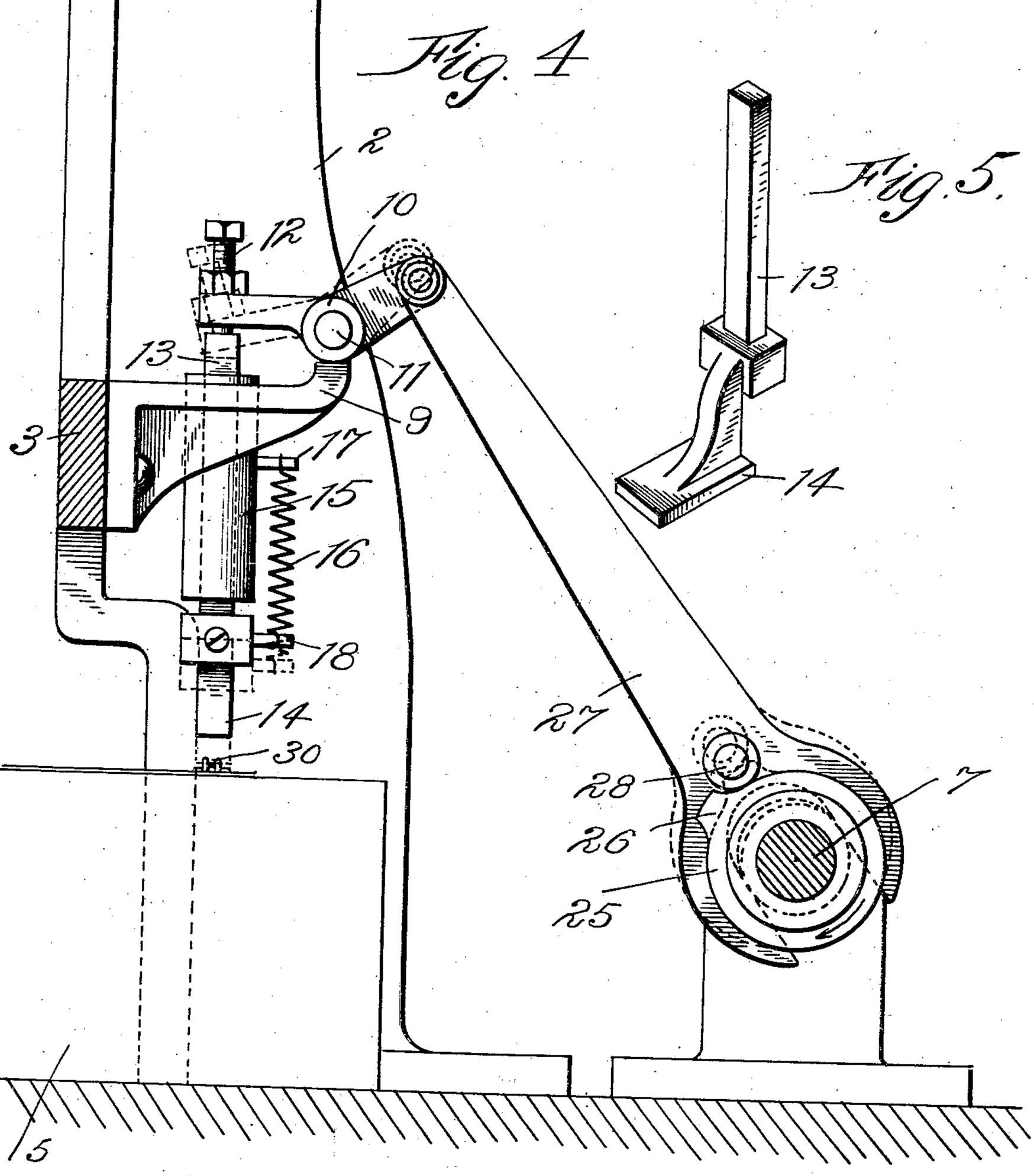

Fig. 5.

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5 SHEETS—SHEET 4.

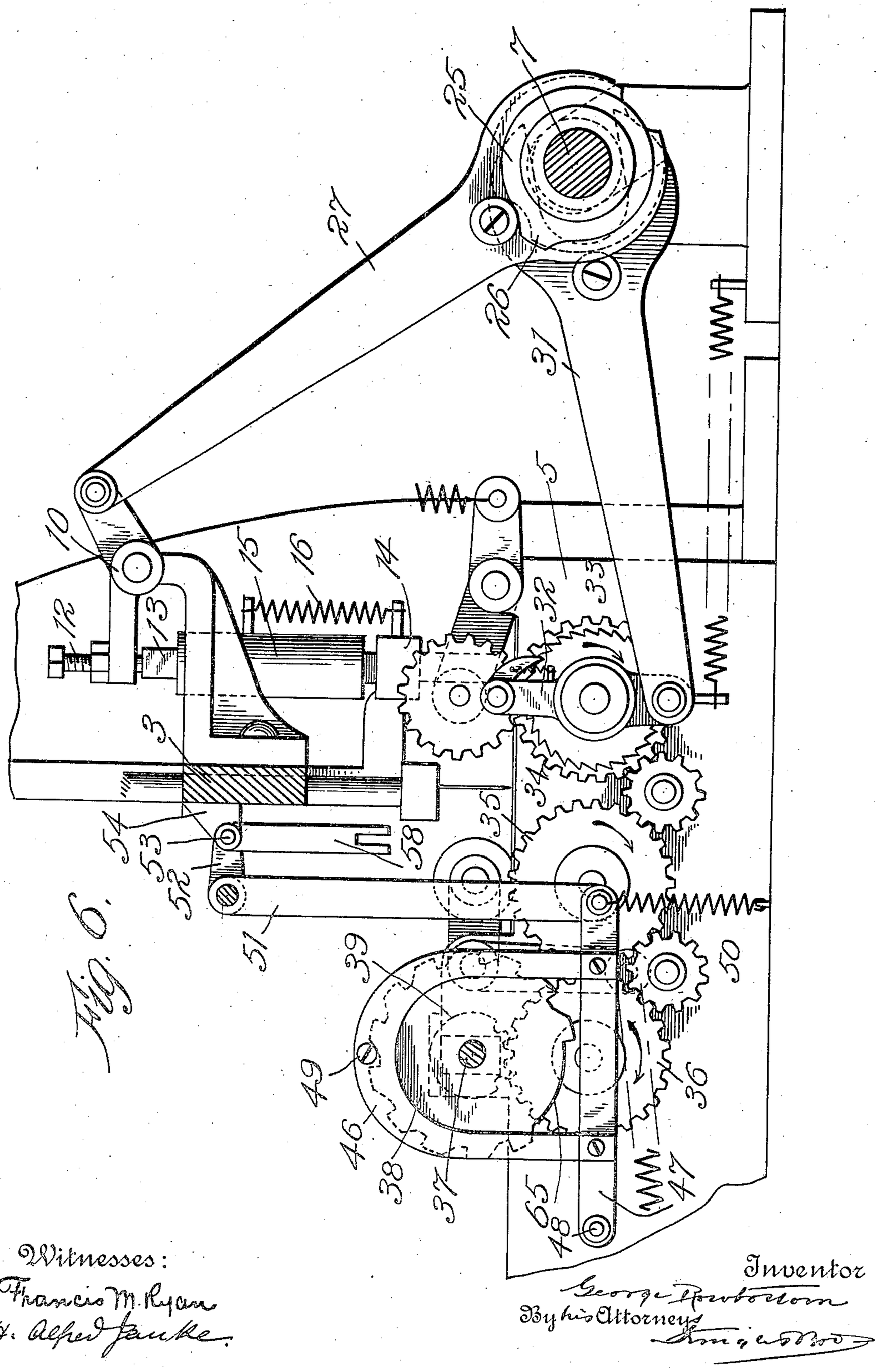

Fig. 6.

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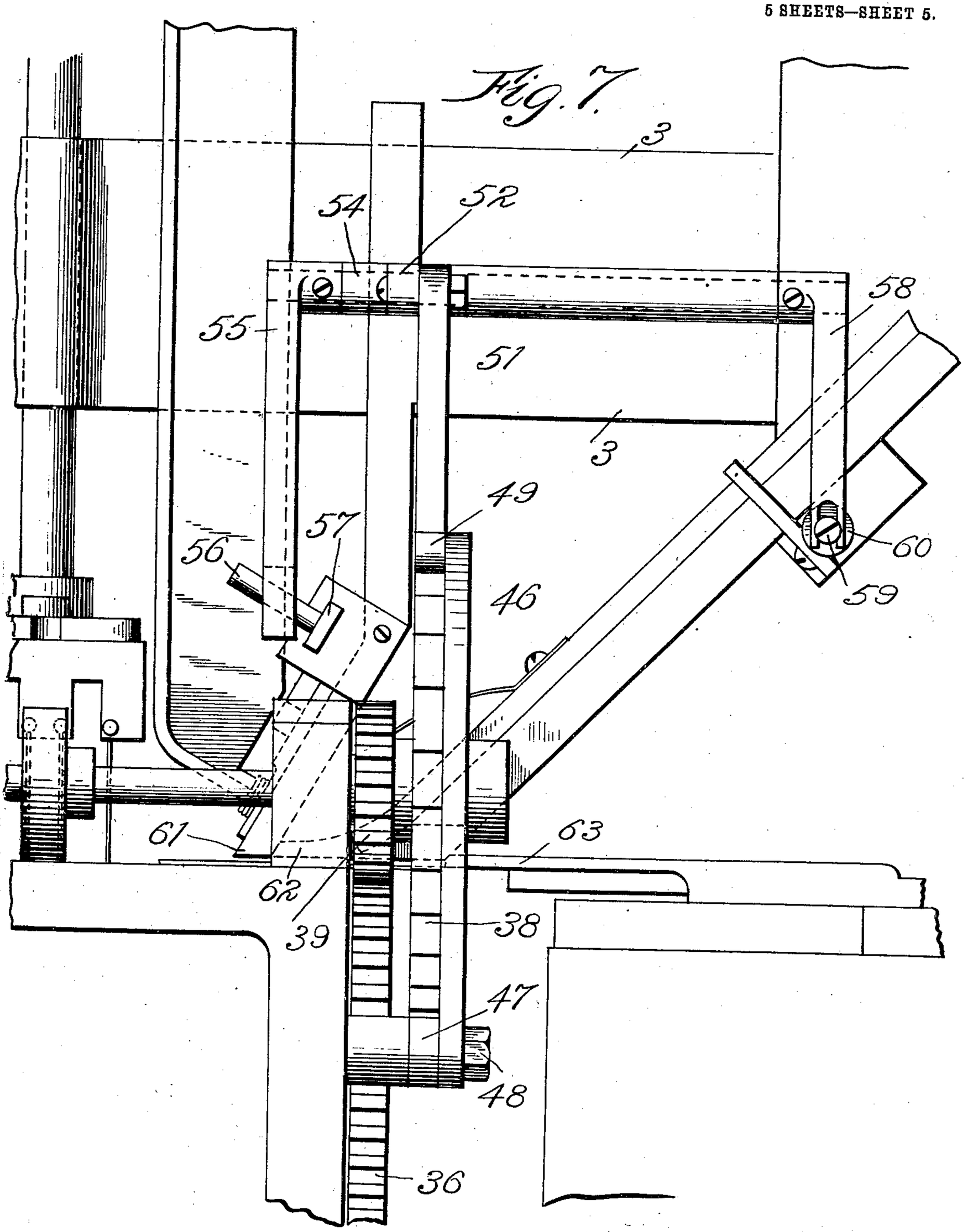
5 SHEETS—SHEET 5.

Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE ROWBOTTOM, OF WATERBURY, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE CONNECTICUT HOOK & EYE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

MACHINE FOR FASTENING HOOKS AND EYES ON CARDS.

No. 903,784. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed September 4, 1907. Serial No. 391,309.

To all whom it may concern:

Be it known that I, GEORGE ROWBOTTOM, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Machines for Fastening Hooks and Eyes on Cards, of which the following is a specification.

This invention relates to improvements in machines for fastening hooks and eyes on cards, the general type of machine being that described in Letters Patent Nos. 710,517, 710,518, and 710,519 granted to me on October 7th, 1902.

In particular my invention relates to improvements in the control of the hook and eye feeding means by the card feeding means, and furthermore, to an improvement for finishing the form of the hooks after they have been sewed on the card.

In the accompanying drawing only those parts of the machine are shown as are directly connected with the improvements and necessary to show their operation; the general arrangement of the machine is otherwise substantially the same as shown and described in the patents above referred to.

Referring to the drawings: Figure 1 is a rear view of the central part of the machine, showing the presser foot for finishing the hooks; Fig. 2 is a detail rear view to a larger scale of the presser foot, showing the foot in elevated position ready to finish the pair of hooks which has just been sewed on the card; Fig. 3 is a detail rear view to a still larger scale of the lower portion of the presser foot showing its position when it has finished the form of the pair of hooks, shown in Fig. 2 in unfinished state; Fig. 4 is a side view of the presser foot showing the manner in which it is operated from the universal shaft of the machine; Fig. 5 is a perspective view of the presser foot; Fig. 6 is a side view of a part of the card feeding mechanism, showing the manner in which it controls the hook and eye feeding means; and Fig. 7 is a part of the front view of the machine, showing the manner in which the hook and eye feeding means are operated and controlled by the card feeding means.

It has been found that in sewing the so called "hump" hooks on cards considerable difficulty is encountered causing the machine to pull the eye, when engaged by the hook, past the hump of the hook, when same is in its normal shape, that is, having the bill in parallel to the body. For this reason hump hooks sewed on the cards by means of the machine described in the patents above referred to are used in unfinished state, that is, with the bill slightly pointing upward, so that when a hook engages an eye while being conveyed to the card by the grippers, as described in these patents the eye will slide without difficulty past the hump. In this unfinished state the hooks are sewed on the card, and I provide the following means for bending the bills of the hooks down after the sewing process, so that they will be in parallel to the body of the hook and the hook will leave the machine in the normal shape in which it is used.

In Fig. 1, 1 is the main supporting table of the machine on which the sewing table 5 is disposed in the middle within frame 2 which is also fastened on table 1. Transversely to sewing table 5 is disposed universal shaft 7, from which the different devices comprising the machine are operated. On cross bar 3, which is fastened on frame 2, is fixed bracket 9 (Fig. 4) on which bell crank 10 is pivoted by pivot pin 11. On the left hand arm of bell crank 10 is disposed set screw 12 to abut against the upper end of bar 13 of presser or stamp foot 14 which bar is slidingly disposed in a guide sleeve 15 suitably mounted on bracket 9. A spring 16 is provided between pin 17, and pin 18, fastened on sleeve 15 and presser foot 14, respectively, tending to hold the foot in elevated position.

On universal shaft 7 which is suitably driven is disposed cam disk 25, provided with a cam 26. Near disk 25 is mounted forked arm 27 to have its forked end guided between disk 25 and disk 19, the latter also mounted on shaft 7. Near its forked end is fastened on arm 27 cam roller 28, which is adapted to roll on cam disk 25. The other end of arm 27 is connected to the right hand arm of bell crank 10, so that when cam 26 engages and lifts roller 28, arm 27 will be thrown into the position indicated by dotted lines in Fig. 4, thus also rocking bell crank 10 and throwing same into the position indicated by dotted lines. This will move the presser foot 14 downward into the position indicated by dotted lines.

After a pair of hooks and eyes has passed

the sewing mechanism, and been sewed to the card 29, the card feeding mechanism passes this pair of hooks and eyes underneath presser foot 14 (Fig. 2). At this instant the bills 30 of the hooks are still bent upwards. As soon as the hooks arrive under the presser foot, cam 26 lifts roller 28 and causes presser foot 14 to descend, and to flatten the bills of the hooks down so that they stand in parallel to the hook body, as shown in Fig. 3.

The machine is timed so that a stitch is made by the sewing apparatus every half revolution of shaft 7. Furthermore two stitches are required to sew one pair of hooks and eyes on the card. Since only one cam 26 is provided on disk 25, the presser foot 14 will descend after every other stitch of the machine, that is to say, after one pair of hooks and eyes has been sewed on the card.

As described and shown in my patents above referred to, the hooks and eyes are fed individually to the grippers by means of the hook chute and eye chute, from the end of which chutes the hooks and eyes are removed and conveyed to the card, and put in sewing position by means of the gripper arms. Furthermore, the feeding of the hooks and eyes, as shown in Patent No. 710,517, takes place singly near the end of both chutes; that is to say, means are provided near the end of each chute which will feed one single hook and eye at the time when required by the machine. I have now provided novel means by which these single hook and eye feeds are controlled by the device feeding the cards to the sewing line of the machine. These means are illustrated in Figs. 6 and 7. There is shown in Fig. 6, the sewing table 5 on which and within which the card feeding mechanism is mounted. This mechanism, which may be of any suitable kind, such as, for instance, described in my Patent No. 710,519, is suitably operated by universal shaft 7 and arm 31, which causes through its rocking motion lever 32 to move ratchet wheel 33 in the direction indicated by the arrow, which wheel in turn transmits its step by step motion to toothed wheels 34, 35 and 36, by which the card feed rollers are driven. From tooth wheel 36, the step by step motion is also transmitted by means of tooth wheel 39 to shaft 37, on which the toothed wheel 38 is fixed, (side view of which is shown in Fig. 7). Near and parallel with toothed wheel 38 is disposed the yoke 46, which is part of lever 47 fulcrumed at 48 on sewing table 5. On yoke 46 is provided screw 49 of suitable size to engage in the notches of toothed wheel 38 when lever 47 is drawn downward by tension spring 50. To the free end of lever 47 is pivoted bar 51, which in turn is pivoted at its upper end to arm 52. Arm 52 is fastened on rocking shaft 53, journaled in bracket 54 fixed to cross bar 3 of the machine frame 2. At one end of shaft 53 is further fastened downward pointing arm 55 engaging with its slotted free end pin 56 of slide 57, which may control the eye feed in any suitable manner, such as for instance described in my Patent No. 710,517, while at the other end of shaft 56 is fixed downward pointing arm 58 engaging with its slotted free end pin 59 of slide 60, which controls a single hook feed of any suitable kind, such as for instance also described in my patent above referred to.

It will now be seen that if toothed wheel 38 revolves with shaft 7 in the direction indicated by the arrow (Fig. 6) yoke 46 and its lever will perform a rocking motion owing to the screw 49 dropping into the different notches of toothed wheel 38, which rocking motion is transmitted by bar 51 to shaft 53 and arms 55 and 58 (Fig. 7). This will cause the slide 57 to operate the eye feeding device, and slide 60 to operate the hook feeding device, the timing of both devices being such that at the same time when an eye is fed to the end of the eye feeding apparatus 61, a hook is fed to the end 62 of the hook chute into the proper position to be received by the gripper 63, described and shown in detail in my Patent No. 710,517.

The gearing from the card feeding mechanism to toothed wheel 38 is such that when ratchet wheel 33 has been moved forward two teeth in the direction of the arrow by lever 32 and its pawl, toothed wheel 38 moves one tooth in the direction of the arrow, so that rocking arms 55 and 58 operating the hook and eye feeds, as described above, will complete each one full feeding stroke, within which time, owing to the gearing of the card feed rollers, the card has made two feeding steps, one step for each sewing eye of the hook and eye. The result of this is that one single hook and eye has been fed by the hook and eye feeding devices into position to be placed by the gripper on the card.

Since in this machine twelve pairs of hooks and eyes are to be sewed in one row on one side of the card, toothed wheel 38 is provided with twelve teeth. After one row of hooks and eyes has been sewed to the card, two closing stitches have to be made idle by the machine into the card; and furthermore, two more idle stitches have to be made at the beginning of the next card, all of these idle stitches for the purpose of properly fastening the thread in the card. The four feeding steps of the card feeding mechanism necessary for these idle stitches (one step for each stitch) have to be made without operating the hook and eye feed. Since now four feeding motions of the card feed correspond with the feeding of two pairs of hooks and eyes on one row, I provide on toothed wheel 38 a notch 65, equal in its size to the space which two teeth occupy on the circumference

of wheel 38, so that while screw 49 passes through this notch 65, the hook and eye feeding devices will remain at rest, while the card feed moves the card four steps for the four idle stitches mentioned above. The position of notch 65 of wheel 38 is timed relatively to the position of the card in the card-feeding mechanism described in my patents so that in coöperation with the first two of the four idle stitches, the card-feed performs the last two feeding steps for one card, while in coöperation with the following two idle stitches, the card-feed performs the first two feeding steps for the next card. Thus, two idle stitches will be made at the end of the first card and two at the beginning of the following card.

I claim:

1. In a machine of the character described, the combination of means for engaging and attaching engaged hooks and eyes on cards, and means for bending the bill of the hook after engagement with the eye.

2. In a machine of the character described, the combination of means for attaching engaged hooks and eyes on cards, a stamp or presser foot and means for operating the same to bend the bill of the hook after its engagement with the eye.

3. In a machine of the character described, the combination with means for feeding hooks and eyes singly, the hooks supplied to said feeding means having their bills bent upward, means for feeding cards, means for engaging one eye by one hook and conveying the hook and eye in engaged position to the card, means for attaching the engaged pair of hooks and eyes on said card and means for operating said card feeding means; of means for bending the bill of the hook in paralled to its body after the attaching process.

4. In a machine of the character described, the combination with means for feeding hooks and eyes singly, the hooks supplied to said feeding means having their bills bent upward, means for feeding cards, means for engaging one eye by one hook and conveying the hook and eye in engaged position to the card, means for attaching the engaged pair of hooks and eyes on said card and means for operating said card feeding means; of means operated at suitable intervals by the card feed operating means for bending the bill of each hook in parallel to its body after the attaching process.

5. In a machine of the character described, the combination with means for feeding hooks and eyes singly, the hooks supplied to said feeding means having their bills bent upward, means for feeding cards, means for engaging one eye by one hook and conveying the hook and eye in engaged position to the card, means for attaching the engaged pair of hooks and eyes on said card and means for operating said card feeding means; of a presser foot reciprocatingly disposed behind said attaching means in the feeding direction of the cards adapted by its motion to bend the bill of each hook in parallel to its body after the attaching process.

6. In a machine of the character described, the combination with means for feeding hooks and eyes singly, the hooks supplied to said feeding means having their bills bent upward, means for feeding cards, means for engaging one eye by one hook and conveying the hook and eye in engaged position to the card, means for attaching the engaged pair of hooks and eyes on said card and means for operating said card feeding means; of a presser foot reciprocatingly disposed behind said attaching means in the feeding direction of the cards and operated at suitable intervals by said card feed operating means, said presser foot adapted by its motion to bend the bill of each hook in parallel to its body after the attaching process.

7. In a machine of the character described, the combination with card feeding means, means for attaching hooks and eyes to the cards, means for feeding the hooks and eyes to the cards; of a toothed wheel suitably operated having a continuous number of notches and teeth equal to the number of hooks and eyes to be placed in one row on the card, a lever mechanism adapted to operate said hook and eye feed, having a pin engaging in the notches of said toothed wheel to operate said hook and eye feeding means as required.

8. In a machine of the character described, the combination with step by step moving card feeding means, means for attaching hooks and eyes to the cards and means for feeding the hooks and eyes to the card; of a toothed wheel suitably operated step by step, said steps coinciding with the steps of said card feeding means, said toothed wheel having a continuous number of notches and teeth equal to the number of hooks and eyes to be placed in one row on the card, a lever mechanism adapted to operate said hook and eye feed, having a pin engaging in the notches of said toothed wheel to operate said hook and eye feed, said operating steps coinciding with the card feeding steps, and said toothed wheel having one of said notches larger than the remaining number and of suitable size to cause said feeding means to remain at rest during a predetermined number of card feeding steps.

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