

June 29, 1937.

G. WIGET

2,085,459

PATTERN MECHANISM FOR LOOMS AND THE LIKE

Filed July 21, 1936

3 Sheets-Sheet 1

Fig. 1.

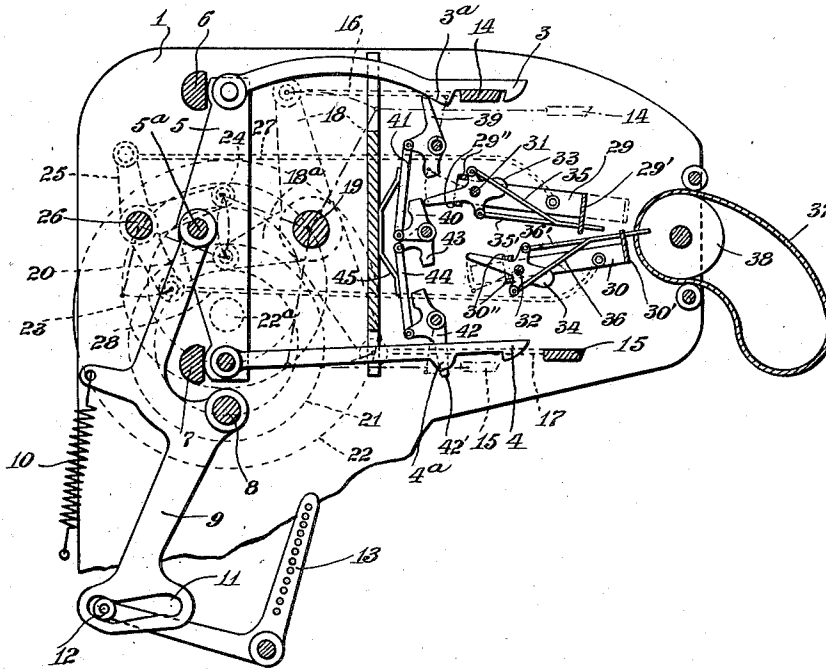
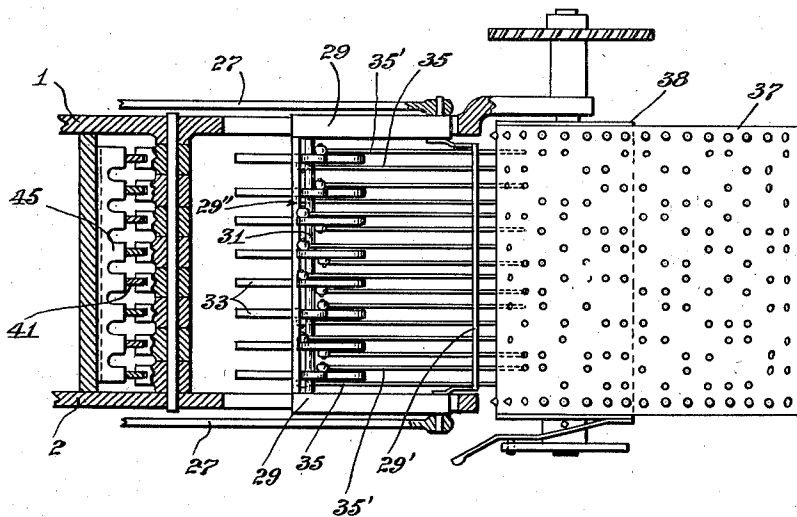


Fig. 2.



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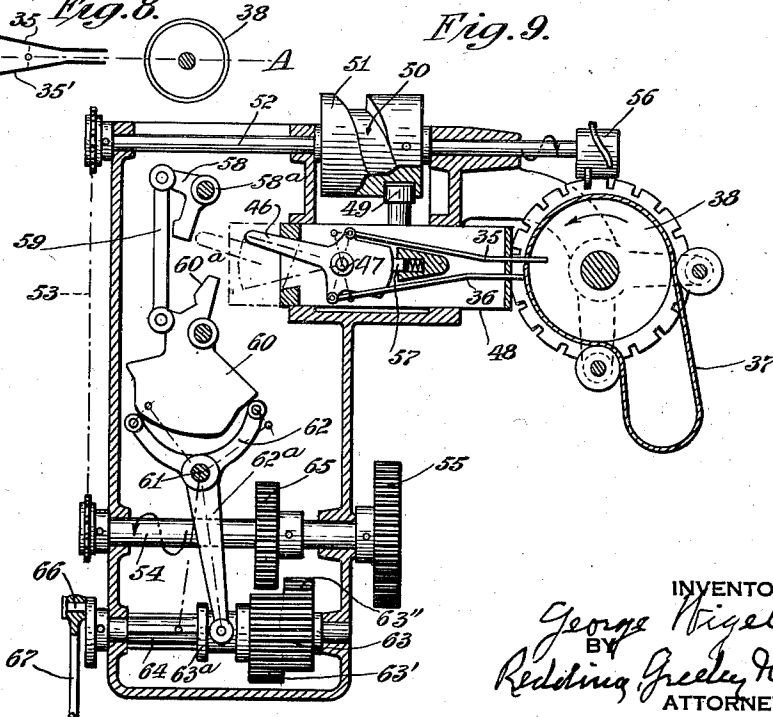
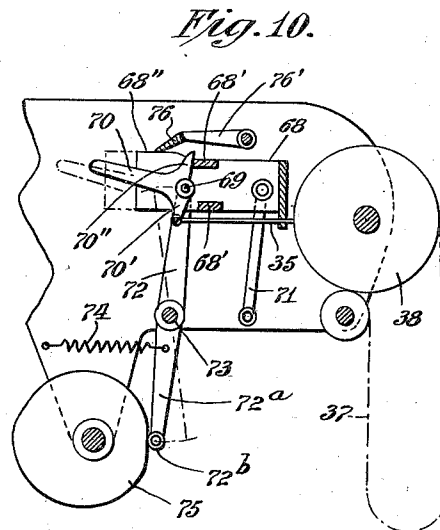
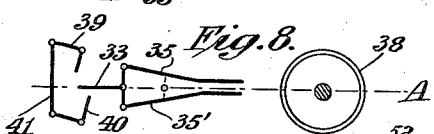
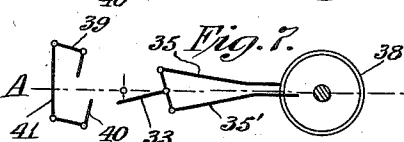
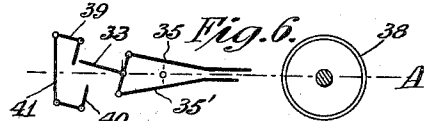
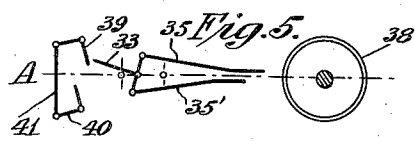
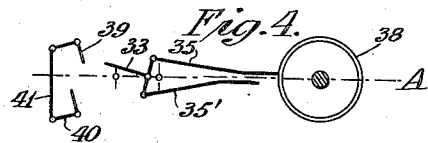
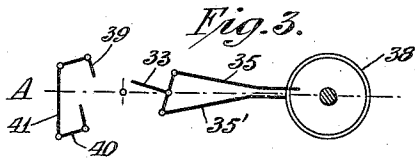
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 11.

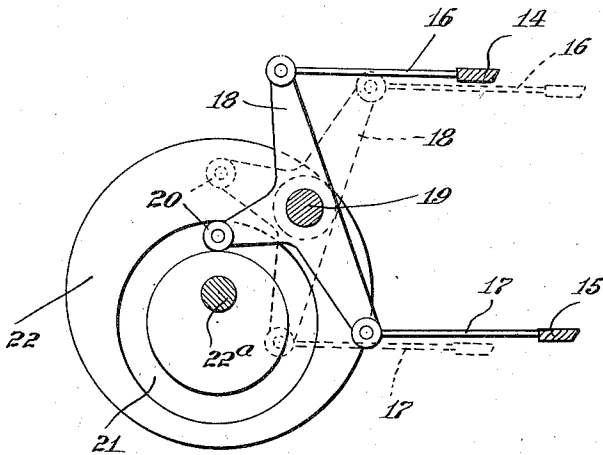
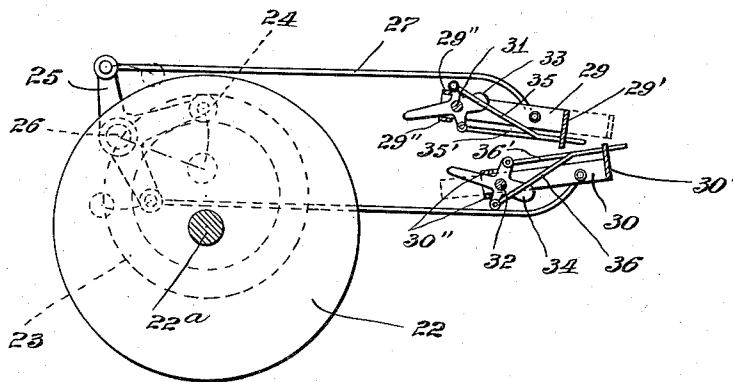


Fig. 12.



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PATTERN MECHANISM FOR LOOMS AND
THE LIKE

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In Germany August 3, 1935

14 Claims. (Cl. 139—331)

In various forms of textile machines, such as looms with mechanisms for effecting change of shuttle boxes, jacquard mechanisms, etc., the automatic control of such mechanisms, to effect changes in the pattern of the goods to be produced, is commonly accomplished through the interaction of an endless perforated pattern card or chain of pattern cards and needles. Such pattern mechanisms as heretofore designed are complicated and intricate in design and construction and consequently involve many possible sources of error which often result in errors or even breakdowns in operation. It has been the object of the present invention to accomplish simplification in design of such mechanisms, as compared with conventional designs, with a view to obtaining the greatest possible measure of assurance of uninterrupted operation. In accordance with the invention the needle or needles which coact or coact with the pattern card is or are connected to a wippen or selector member pivoted on a carrier which is reciprocated toward and from the pattern card in order that the needle or needles in the forward movement of the carrier may enter the holes in the pattern card or, contacting with an unperforated portion of the card, may cause the wippen or selector to be turned on its pivot and to actuate in the backward movement of the carrier a control lever by which the engagement of a hook member, such as a lifting hook, with a reciprocating member, such as a lifting bar, is determined.

The invention will be more fully explained hereinafter with reference to the accompanying drawings in which several embodiments of the invention are illustrated, and in which:

Figure 1 is a view in sectional elevation of one embodiment of the invention, some parts being shown in broken lines, in order that other parts may be more clearly presented.

Figure 2 is a view, partly in plan and partly in horizontal section and on a larger scale, of some of the parts shown in Figure 1.

Figures 3, 4, 5, 6, 7, and 8 are diagrammatic views illustrating the operation of the needles, the selectors, and the control levers, two needles being shown in each figure and for clearness as separated somewhat at their free ends whereas in fact both needles, when two are used, generally meet the plane of the pattern card in the same line.

Figure 9 is a detail view in sectional elevation and on a larger scale than that of Figure 1 illustrating a different embodiment of the invention.

Figure 10 is a detail view in sectional elevation

and partly diagrammatic, illustrating a further embodiment of the invention.

Figures 11 and 12 are views in sectional elevation, on planes parallel with the plane of Figure 1, but showing in full lines some parts of the mechanism shown by broken lines in Figure 1.

In the embodiment of the invention illustrated in Figures 1, 2, 11, and 12, upper and lower hook members 3 and 4, which, in a heddle mechanism are commonly called lifting hooks and are adapted to have operative engagement with lifting bars, 14, 15, are arranged for movement between side plates 1 and 2. They are pivotally mounted on the respective ends of a two-armed lever 5 which is pivotally mounted at its middle point, as at 5^a, on an auxiliary lever 9, abutments 6 and 7 being provided to limit the movement of the lifting hooks. The auxiliary lever 9 is pivotally mounted on a fixed axis 8 and is subject to the action of a tension spring 10 which tends to move the lever 9 in a counterclockwise direction, as seen in Figure 1. At its lower end the lever 9 is slotted for operative engagement with a roller 12 of a bell crank lever 13 which in this instance stands as the member or device to be operated. It may be assumed to be one of the levers by which, in a heddle mechanism, the corresponding heddles are raised and lowered.

The lifting bars 14 and 15 are arranged for reciprocation in a conventional manner, being shown by broken lines in Figure 1 and by full lines in Figure 11 as connected by links 16 and 17 with a rocker arm 18, pivotally mounted on a shaft 19 and having a third arm 18^a provided with a roller 20 for engagement with a cam groove 21 formed on one side of a disc 22 which is mounted on a drive shaft, as at 22^a.

The disc 22 has on its other side a cam groove 23 for engagement with a roller 24 of a rocker lever 25 mounted on a drive shaft 26. The ends of the rocker lever 25 are connected severally by links 27, 28 with carrier frames 29, 30 arranged to reciprocate in guides 29', 30' in right lines toward and from the perforated pattern card 37 which is mounted on the driving roller 38 as usual.

Pivotally mounted on a rod 31 of the carrier frame 29 and arranged in juxtaposition are several wippens or selectors 33 formed as three-armed levers. The needles 35, 35', which coact with the pattern card 37, are pivotally connected to the shorter arms of the selectors 33 and are guided in the guide plate 29', being bent so that, in the movement of the carrier, they meet the surface plane of the pattern card 37 in the same

longitudinal line. The longer arm of each selector 33 which is positioned by the coaction of the needles 35, 35' and the pattern card 37, as will be clearly understood, coacts with a corresponding control lever 39 or a reversing lever 40, in the rearward movement of the carrier, as represented in Figures 3-7, or occupies a middle position, as shown in Figure 8. Each control lever 39 and the corresponding reversing lever 40 are connected by a link 41, so that they move together and a spring 45, bearing against the link, serves to prevent accidental movement of the levers 39 and 40. The lever 39 coacts with a cam-like portion 3^a on the underside of the hook member 3, so that movement of the control lever 39 disengages the latch 3 from the bar 14.

Similarly the carrier frame 30 has mounted on a rod 32 a plurality of wippens or selectors 34 to each of which are operatively connected needles 36 and 36', the long arm of each selector 34 coacting with a corresponding control lever 42 and a reversing lever 43 which are connected by a link 44 against which bears the spring 45. The hook member 4 has on its underside a cam-like projection with which cooperates an offset 42' at the lower end of the control lever 42 whereby the latch member is disengaged from the bar 15 in the operative movement of the control lever.

Stops 29'' and 30'' are provided for the purpose of limiting the movement of the selectors 33 and 34 respectively.

It will be understood that through the interaction of the needles 35, 35', 36, 36' with the pattern card 37, when the slides or carriers 29, 30 move to the right in Figure 1, the wippens or selectors 33, 34, one or both, will be swung on their pivots either in a clockwise direction or in a counterclockwise direction to cause the long arm of each to be positioned for coaction with the corresponding control lever 39, 40, or with the corresponding reversing lever 40, 43. Then when the slide or carrier is moved to the left, the long arm of the selector will strike the control lever or the reversing lever, as the case may be. If it is so positioned as to contact the control lever the latter will be caused to move in a direction to disengage the corresponding lifting hook 3 or 4 from the corresponding lifting bar 14 or 15 and if the selector is so positioned that its long arm will contact, in the movement of the slide or carrier to the left, with the corresponding reversing lever 40 or 43, the corresponding control lever, through its connection with the reversing lever, will be caused to swing in a direction to permit the lifting hook 3 or 4, as the case may be, to engage the corresponding lifting bar 14 or 15. It will also be understood that if in the movement of the slide or carrier to the right hand both needles 35, 35' contact an unperforated portion of the pattern card 37, the corresponding selector will be swung to an intermediate position and in the movement of the slide or carrier toward the left hand the long arm will pass between the ends of the corresponding control and reversing levers and no action on the lifting hooks will take place. It will be observed that the connecting rods 41 and 44 serve each as a stop to limit the movement of the corresponding reversing lever 40, 43 and consequently to limit the swing of the corresponding control lever 39, 42.

The embodiment of the invention illustrated in Figure 9 is particularly designed for use with a change shuttle box mechanism. In this instance the needles 35, 36, here shown as separated, co-operate with the pattern card 37 mounted on the

driving roller 38 as usual and are pivotally connected, as before, to selectors 46, a plurality of which are mounted in juxtaposition on a rod 47 of a reciprocating carrier frame 48. In this instance the carrier frame is reciprocated through engagement of a roller 49 mounted on the frame with a spiral groove 50 formed in a drum 51 which is mounted on a shaft 52 driven through a chain 53 from a shaft 54 which receives motion through a gear 55. In this instance the shaft 52 carries also at its other end a spiral, as indicated at 56, which engages a peripheral notched gear of the pattern roller 38, a spring-loaded pressure bolt 57 coacting with the selector 46 to restrain it from accidental movement. When, through the coaction of the needles 35, 36 with the pattern card, the selector 46 is swung upward, as shown in Figure 9, and then in the rearward movement of the carrier frame is moved rearwardly its long arm coacts with a control lever 58 pivoted, as at 58^a, and connected by a link 59 with a cam-shaped lever 60 which is formed with an arm 60^a to constitute also a reversing lever. With the cam-shaped portion of the control lever 60 coacts a Y-shaped lever 62 pivoted at 61, the long arm 62^a of which engages a peripheral slot in the hub 63^a of a gear 63 formed with offset segments 63' and 63'' and splined on a shaft 64, so that through longitudinal movement of the gear 63 on the shaft 64, by the control lever 62, one segment or the other of the two segments 63', 63'' is moved into engagement with a gear 65 on the driven shaft 64. Motion is thereby imparted to the shaft 64, under control of the lever 60, as determined by the coaction of the needles and the pattern card, and is transmitted from the shaft 64 through a crank pin 66 and link 67 to the member to be operated, which, in this instance, may be taken to be represented by the link 67.

In this embodiment of the invention the control lever is restored to initial position in the backward movement of the carrier 48, that is, to the left hand in Figure 9, when, through the coaction of the needles and the pattern card, the selector is swung downward or in a counterclockwise direction so that its long arm coacts with the reversing arm 60^a of the control lever 60. It will be further understood that when, through the coaction of the needles and the pattern card, the selector 46 is swung to an intermediate position its long arm, as represented in Figure 8, passes between the ends of the control lever 58 and the reversing arm 60^a of the cam-shaped member 60, so that no movement of the operated part is effected. It will be observed that through the action of the cam-shaped member 60 one of the segments 63', 63'' is moved out of engagement with the driving gear 65 and the other segment is moved into position for engagement with the gear 65. It will also be understood that if by reason of any imperfection in the pattern card 37 both needles 35, 36, in the right hand movement of the carrier 48, strike an imperforate part of the pattern card the selector 46 will be moved to an intermediate position and no movement of the operated member 67 will be effected.

In the embodiment of the invention illustrated in Figure 10 the slide or carrier 68, on which are pivotally mounted, as at 69, a plurality of selectors 70, is shown as supported by two levers 71, 72, one of which, as 72, mounted at 73, has an arm 72^a with a roller 72^b which, by a tension spring 74, is pressed against the periphery of an actuating cam 75. In this instance each selector 70 has connected to its downwardly extended arm 75

70' only one needle 35, for coaction with the pattern card 37 mounted on the roller 38. Stops 68' on the carrier 68 limit the swinging movements of the selectors 70. A bar 76, carried by pivoted arms 76', rests on the upper edge of one of the side plates of the carrier frame, the left hand portion 68'' of which is slightly raised, as shown in Figure 10. In this figure the carrier frame 68 is shown at its extreme right hand position and the needle 35 is represented as having contacted an imperforate portion of the pattern card 37 so that it has been pushed to the left with respect to the carrier frame 68 and the selector 70 has been swung in a counterclockwise direction with its upper arm against the upper stop 68'. If the slide or carrier frame 68 is then moved to the left the upwardly extended arm 70'' of the selector lifts and passes under the bar 76. Then in the next movement of the slide or carrier frame 68 to the right the upwardly extended arm 70'' strikes the bar 76 and the selector is thereby caused to swing in a counterclockwise direction, pushing the needle 35 to the right hand with respect to the carrier 68. In such right hand movement of the carrier 68 the upper arm 70'' of the selector 70 slips under and to the right of the bar 76. In such movement of the carrier to the right each needle either enters a hole in the pattern card, the selector remaining in its left hand position, or strikes an imperforate part of the pattern so that the selector is swung to its upper position as shown in the drawings. It will be understood without further illustration that the selector cooperates with a control lever or a reversing lever, as shown in Figure 1 and Figures 3-8, and through connections, as shown in Figure 1 and above described, effects the engagement or disengagement of a hook member 3, with or from the lifting bar 14.

It will be understood that various changes in construction and arrangement can be made to suit different conditions of use and that, except as pointed out in the accompanying claims, the invention is not restricted to the constructions shown and described herein.

I claim as my invention:

1. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move in a right line toward and from the pattern card, means to reciprocate the carrier, a wippen or selector pivoted on the carrier, a needle pivotally connected to the wippen or selector and movable in a right line therewith to cooperate with the pattern card, a lever arranged for contact with the wippen, a guide for the needle, a part to be operated, and an operative connection from the lever to the part to be operated.

2. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the third arm of the wippen in the movement of the carrier when the wippen is in position therefor, a part to be operated, and an operative connection from the lever to the part to be operated.

3. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier,

a three-armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a control lever arranged for contact with the third arm of the wippen in the rearward movement of the carrier when the wippen is in one position, a reversing lever arranged for contact with the third arm of the wippen in the rearward movement thereof when the wippen is in position therefor, a rod connecting said levers whereby each lever is moved with the other, a part to be operated, and an operative connection from the control lever to the part to be operated.

4. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a wippen or selector pivoted on the carrier, a needle connected to the wippen or selector to cooperate with the pattern card, a control lever arranged for contact with the wippen in the rearward movement of the carrier when the wippen is in one position, a reversing lever arranged for contact with the wippen in the rearward movement thereof when the wippen is in position therefor, a rod connecting said levers whereby each lever is moved with the other, a spring bearing against the rod, a part to be operated, and an operative connection from the control lever to the part to be operated.

5. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, a wippen or selector pivoted on the carrier, a needle connected to the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the wippen, a part to be operated, an operative connection from the lever to the part to be operated, a spirally grooved drum, means to rotate the drum, and a roller mounted on the carrier and engaged with the spiral groove of the drum.

6. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a wippen or selector pivoted on the carrier, a needle connected to the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the wippen, a cam-shaped lever, a rod connecting the two levers, a lever coacting with the cam-shaped lever, a driving gear, a shaft, a part to be operated in operative connection with the shaft, and a gear mounted for longitudinal movement on the shaft and having two offset segments for engagement severally with the driving gear and having a grooved hub engaged by an arm of the last named lever.

7. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a wippen or selector pivoted on the carrier, a needle connected to the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the wippen, a part to be operated, an operative connection from the lever to the part to be operated, and a movably mounted stop which yields to permit the passage of the selector with the carrier in its backward movement and engages the selector in the forward movement of the carrier to swing the selector on its pivot.

8. In a pattern mechanism for looms and the

like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a wippen or selector pivoted on the carrier, a needle connected to the wippen or selector to co-
 5 operate with the pattern card, a stop to limit the movement of the wippen or selector, a lever arranged for contact with the wippen, a part to be operated, and an operative connection from
 10 the lever to the part to be operated.

9. In a pattern mechanism for looms and the like having a pattern card, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a
 15 wippen or selector pivoted on the carrier, a spring loaded pressure bolt bearing against the wippen or selector, a needle connected to the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the wippen, a
 20 part to be operated, and an operative connection from the lever to the part to be operated.

10. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the
 25 lifting bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a wippen
 30 or selector pivoted on the carrier, a needle connected to the wippen or selector to cooperate with the pattern card, and a lever arranged for contact with the wippen in the rearward movement of the carrier when the wippen is in position
 35 therefor, and arranged to coast with the lifting hook to disengage it from the lifting bar.

11. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the
 40 lifting bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-
 45 armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, and a lever arranged for contact with the third arm of the wippen in the
 50 rearward movement of the carrier when the wippen is in position therefor and arranged to coast with the lifting hook to disengage it from the lifting bar.

12. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the
 55 lifting bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a car-
 60 rier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the third arm of the wippen in the rearward movement thereof when the wippen is in position therefor, and a rod connecting said levers whereby each lever is moved with the other.

13. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the lifting
 20 bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-
 25 armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the third arm of the wippen in the rearward movement of the carrier when the wippen is in one position and arranged to coast with
 30 the lifting hook to disengage it from the lifting bar, a reversing lever arranged for contact with the third arm of the wippen in the rearward movement thereof when the wippen is in position therefor, and a rod connecting said levers
 35 whereby each lever is moved with the other.

14. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the
 40 lifting bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-
 45 armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the third arm of the wippen in the rearward movement of the carrier when the wippen
 50 is in one position and arranged to coast with the lifting hook to disengage it from the lifting bar, a reversing lever arranged for contact with the third arm of the wippen in the rearward movement thereof when the wippen is in position therefor, and a rod connecting said levers whereby each lever is moved with the other.

15. In a pattern mechanism for looms and the like having a pattern card, a part to be operated a lifting bar, means to reciprocate the
 60 lifting bar, a lifting hook, and means connected therewith to effect desired movement of the part to be operated, the combination of a carrier mounted to move toward and from the pattern card, means to reciprocate the carrier, a three-armed wippen or selector pivoted on the carrier, two needles connected severally to two arms of the wippen or selector to cooperate with the pattern card, a lever arranged for contact with the third arm of the wippen in the rearward movement thereof when the wippen is in position therefor, and a rod connecting said levers whereby each lever is moved with the other, and a spring bearing against the connecting rod to prevent accidental movement of the levers.

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