

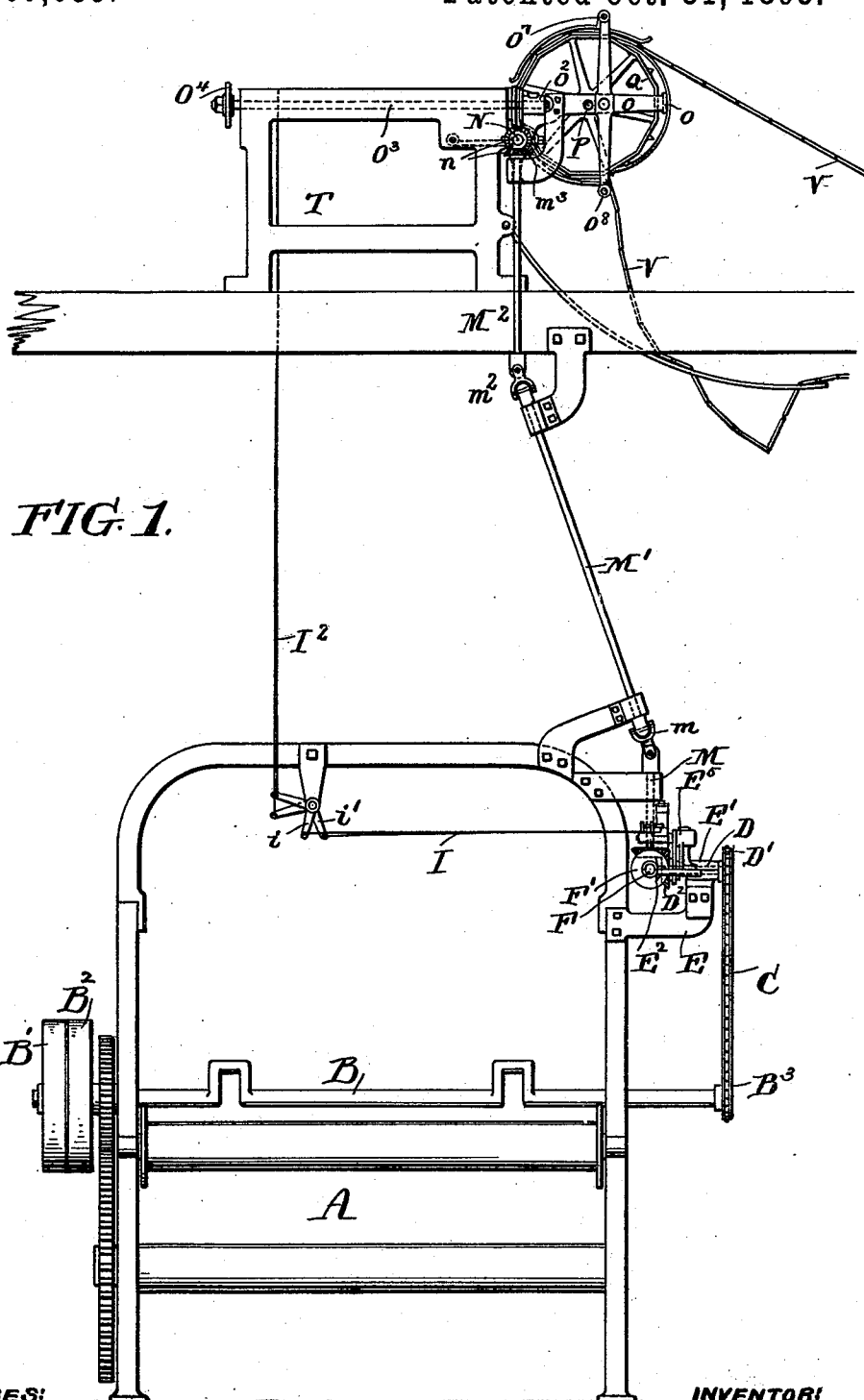
(No Model.)

4 Sheets—Sheet 1.

O. W. SCHAUM.
JACQUARD MECHANISM FOR LOOMS.

No. 507,635.

Patented Oct. 31, 1893.



WITNESSES:

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J. Stewart

INVENTOR:

Otto W. Schaum
by his atty.
Francis T. Chambers

(No Model.)

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FIG. 2.

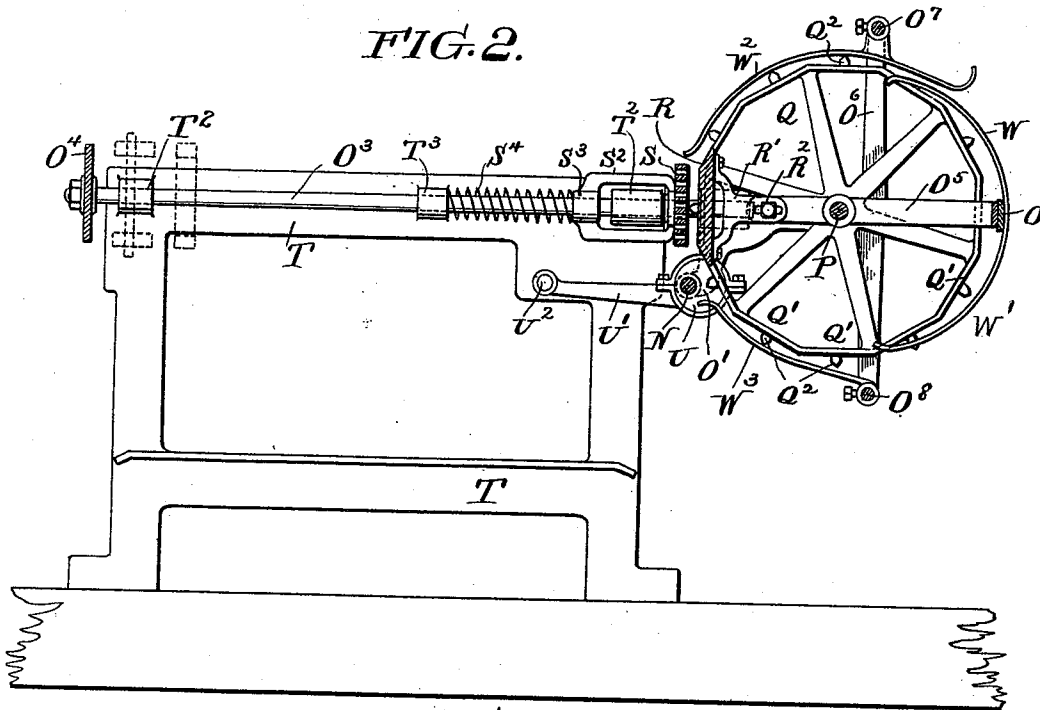


FIG. 3.

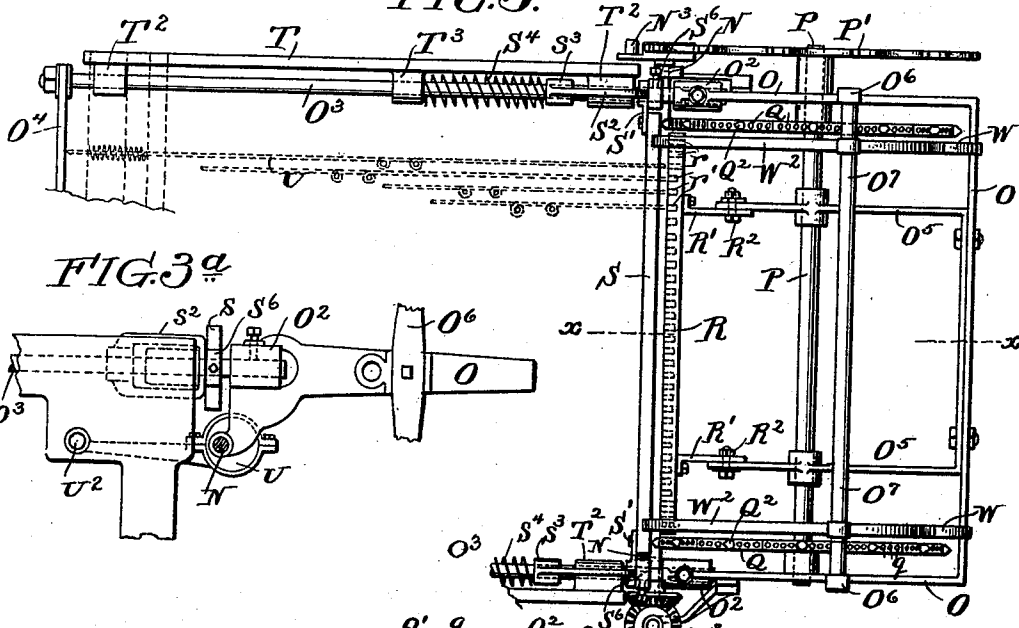
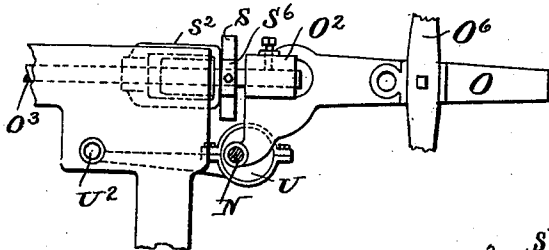


FIG. 3a



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FIG. 4.

FIG. 5.

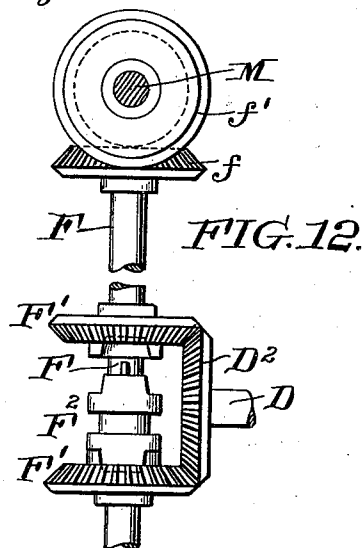
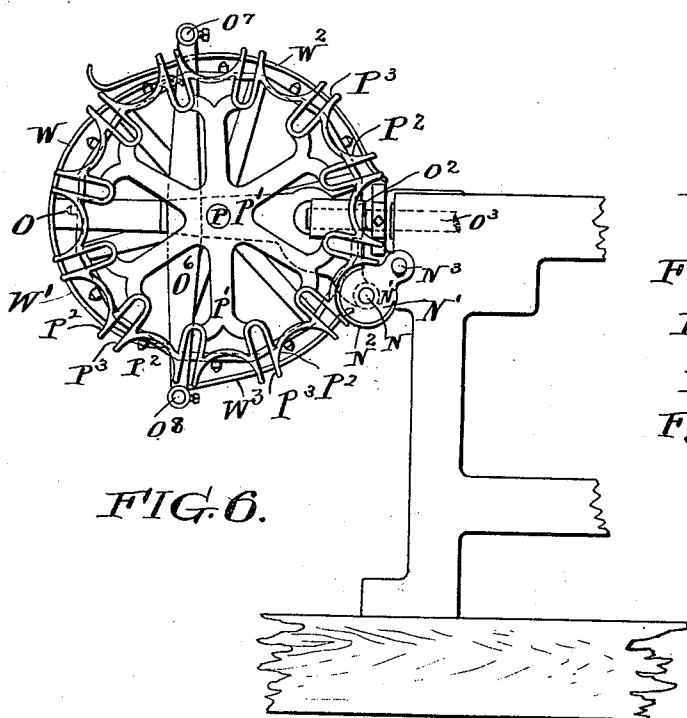
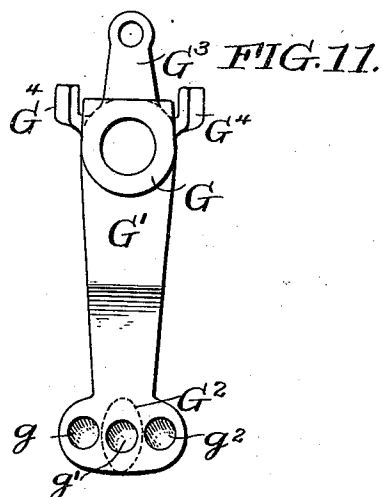
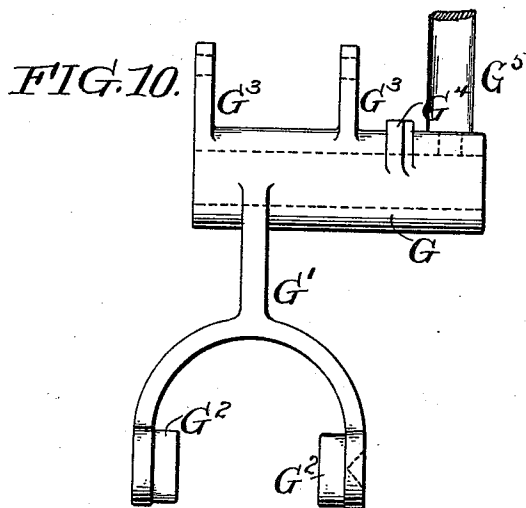
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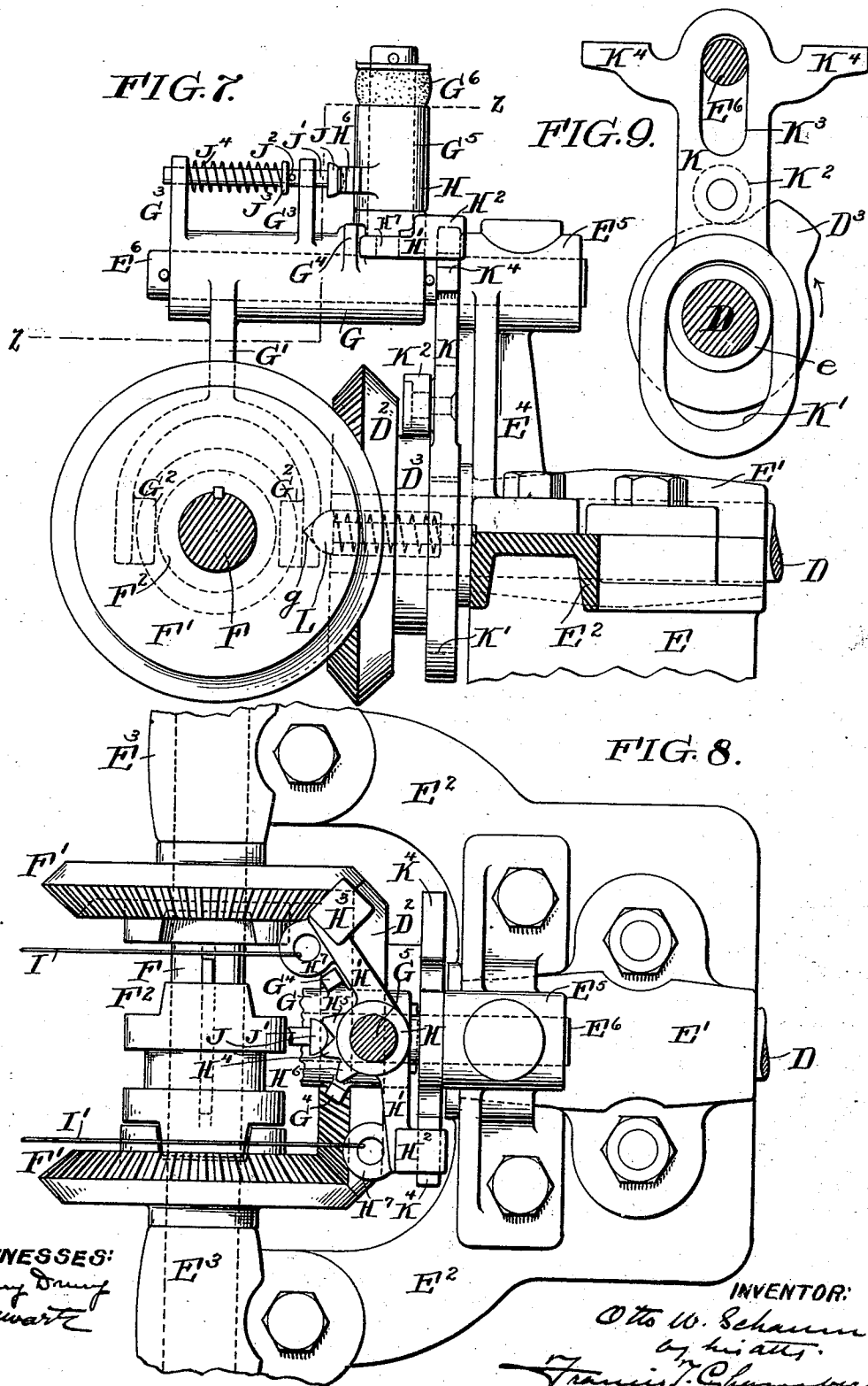
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JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 507,635, dated October 31, 1893.

Application filed February 4, 1893. Serial No. 461,007. (No model.)

To all whom it may concern:

Be it known that I, OTTO W. SCHAUM, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Jacquard Mechanism for Looms, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to Jacquard apparatus for looms and particularly to a Jacquard apparatus of the kind invented by John Zimmermann and described in his pending application, filed May 6, 1892, Serial No. 432,086, my present invention being an improvement upon the said Zimmermann machine, the object being to improve and perfect the same.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, said drawings illustrating a Zimmermann machine provided with my improvements and modifications.

In the drawings, Figure 1 is an elevation showing part of a power loom and the Jacquard apparatus connected therewith. Fig. 2 is a side elevation of the jacquard taken on the line $x-x$ of Fig. 3. Fig. 3 is a broken plan view of the jacquard; Fig. 3^a an enlarged view of one part of the Jacquard machine; Fig. 4 a face view of a portion of the peg wheel; Fig. 5 a side view of the same in section on the line $y-y$ of Fig. 4. Fig. 6 is an elevation showing the construction and mode of operation of the star wheel used in actuating the shaft which feeds the cards. Fig. 7 is a side elevation of a device used in transmitting motion from the loom proper to the jacquard; Fig. 8 a plan view of the same partly in section on the line $z-z$ of Fig. 7; Figs. 9, 10 and 11, detached views showing various portions of the said apparatus, and Fig. 12, a plan view, showing the shafts and gearing connecting the same.

A, indicates the loom proper, and B a rotating shaft thereof, said shaft as shown, being the driving shaft of the loom, and provided with fast and loose pulleys B' and B² and having at its end a sprocket wheel B³ which is connected to a sprocket wheel D' on a shaft D by means of a chain C. The shaft D, (see

Figs. 1, 7 and 8) is supported in a bracket E and has attached to its end a miter wheel D² which is engaged with miter wheels F', F' 55 journaled on a shaft F which said shaft is journaled in boxes E³ E³ secured to arms E² E² of the bracket E. The shaft F is in turn connected with a shaft N secured to the reciprocating frame O of the Jacquard apparatus; 60 while this connection can be made by any convenient device for communicating motion I have shown a particular device indicated in Figs. 1 and 12; a miter wheel f being secured to the end of the shaft F and engaged with a 65 miter wheel f' , on the end of a shaft M journaled in a bracket secured to the frame of the loom A and connected by a universal joint m with a shaft M' supported in brackets as shown in Fig. 1 and connected by a second universal 70 joint m^2 with a shaft M² which has a miter wheel m^3 at its end engaged with a miter wheel n on the shaft N.

Returning now to the particular construction of the mechanism; F², Figs. 8 and 12, indicates a clutch member turning with the shaft F but free to move along it, which can be made to engage either of the miter wheels F' with the shaft and as the said miter wheels are driven in opposite directions by the wheel 80 D² the shaft F is driven forward or backward at will by shifting the position of the clutch. The use of such mechanism for reversing the action of a driving shaft connected with the jacquard is shown and described in the Zimmermann application, but, by means of devices which I am about to describe, I have adapted this mechanism to be automatically actuated from the jacquard itself. To an arm 85 E⁴ rising from the top of the bracket E, I secure a bearing E⁵ for a pin or shaft E⁶ which extends out over the shaft F; upon this pin I journal a sleeve G having a downwardly extending arm G², the branches G² G² of which are engaged with the clutch member F² so as 95 to shift its position along the shaft F as the sleeve G is turned on its bearing. Preferably I form the sleeve G with arms G³ G³ extending upward and serving to support a latch pin J' having a head J and a collar J³ secured to 100 the latch pin by any means as by a pin J² against which collar J⁴ rests a spring J⁴ which tends to push the latch pin forward. I also prefer to provide the sleeve G with projec-

tions G^4 G^4 the function of which is to serve as a stop for a device to be hereinafter described, and I secure to the sleeve a pin or stud G^5 extending upward from the end of the sleeve and upon which pin is journaled a sleeve H; a spring G^6 being preferably employed to press upon said sleeve and prevent it from moving too readily upon its bearing. From each side of the sleeve H extend arms H' H' which as shown are provided with heads H^2 H^3 and from the face of the sleeve I extend a series of ratchet teeth H^4 H^5 H^6 in the path of the latch head J. Some convenient mode of attaching cords to the arms H' is also to be provided, for instance, the eyes H^7 H^7 .

K is a slide to which a reciprocating motion is given by means of a cam D^3 secured to the shaft D. As shown, this slide or plate K is formed with heads K' and K^3 which pass over a tubular extension e of the bracket E and the shaft or pin E^6 respectively.

K^2 indicates a cam roller secured to the plate or slide K and lying in the path of the cam D^3 . At the upper end of the slide K are formed outwardly extending arms K^4 K^4 .

I I' indicate cords which are connected as through bell crank levers $i i'$ and cords i^2 (see Fig. 1), with appropriate hooks of the Jacquard apparatus.

The operation of the mechanism above described is as follows: Assuming the clutch member F^2 to be in the position indicated in Fig. 8 and the pattern calling for a reversal in the action of the jacquard, the card I^2 is pulled by the appropriate hook and acting upon the arm H' of the sleeve H to which it is attached turns the sleeve on its pivot pin G^5 , the head H^2 being thus drawn from above one of the arms K^4 of the plate K and the head H^3 connected with the other arm moved to a position above the other arm K^4 the latch pin J' yielding to the pressure and being forced in so as to pass over the tooth H^4 and to set itself between the said tooth and the tooth H^6 . The extent of the motion of the sleeve is limited and regulated by the stop G^4 against which the arm H' comes, stopping further motion in the sleeve at the proper time. Now, the plate K is constantly moving up and down and on its next upward movement after this change in the position of the sleeve G it comes in contact with a head H^3 and pushing upward on said head and acting through the arm H' the sleeve H and the pin G^5 upon the sleeve G it causes said sleeve to turn on its supporting stud and to move through its arm G' G^2 the clutch member F^2 so as to leave its engagement with the lower wheel F' and engage the upper wheel F' (Fig. 8). in consequence of which the motion of the shaft is reversed. It will be noticed (see Figs. 7 and 11) that I have provided a number of shallow pin holes g g' g^2 on the outside of one of the arms G^2 . These are engaged by a spring pressed latch pin L shown in Fig. 7 which serves to steady and hold the clutch member in position. When in engagement with the

pin hole g' the latch pin holds the clutch member out of contact with both gear wheels, thereby stopping the motion of the jacquard, and when the clutch member is moving, the pin L, which has a rounded head as shown, is readily forced back out of one hole and when the clutch is sufficiently moved falls into the next. The desired motion of the sleeve G and the engagement of the latch pin L with any one of the holes g g' g^2 can of course be accomplished by suitable connections with the jacquard.

Referring now to the Jacquard apparatus proper, T indicates a stationary frame used to support the needles and hooks in the usual way; O, is a reciprocating frame, which as shown is connected with bars O^3 O^3 which slide in brackets T^3 T^2 on the frame T and to the ends of which is secured a needle dressing plate O^4 , the bars O^3 being preferably adjustably secured in brackets O^3 on the frame O by means of screws as shown in Fig. 3^a. On the frame O is journaled the shaft N, which is kept in constant rotation by the action of the driving mechanism previously described, and a shaft P which is given an intermittent rotation through the mechanism best shown in Fig. 6, that is to say, a star wheel P' is secured to the shaft P and a corresponding wheel N' to the shaft N, the wheel P' having rests or recesses P^2 interposed between pin holes P^3 and the wheel N' having a circular portion N^2 which feeds into the recesses P^2 and a pin N^3 which engages the pin holes P^3 . The action of the pin N^3 is to turn the shaft P through a certain determined arc of revolution while the action of the circular portion N^2 is to hold the shaft P stationary during the intermission between the actions of the pin upon the wheel P' . This combination of the two shafts and their connecting mechanism is the same as that described in the Zimmermann application. On the shaft P is supported mechanism for feeding the cards of the jacquard and I prefer to employ as does Zimmermann in his machine, two peg wheels indicated at Q Q, said peg wheels being secured to the shaft P and adapted to engage the peg holes on the opposite sides of the cards; instead however, of using circular rims on my peg wheels as does Zimmermann I construct the rims of polygonal form, each face being of substantially the breadth of a card and having a peg Q^2 at or near its center, the flat faces being indicated by the letter Q' . In this way I provide a level bearing for the card and prevent it being strained and bent and also avoid undue strains on the lacing connecting the cards. Another improvement in the construction of the peg wheels is to form each wheel with its rim of substantially the same breadth as the peg. This is advantageous, first, because it prevents the lacing along the outer edge of the cards from bearing and rubbing against the peg wheel, and also because it enables me to carry the needle holes closer to the pegs;

still another mode consists in forming between the pegs a series of holes indicated at q , properly spaced to correspond with partial rows of holes in the cards, the needle passing through such holes in the cards and into the face of the peg wheel. Obviously, this construction enables me to use a peg wheel or wheels of any desired breadth as holes can be formed in its face at proper intervals, but I prefer to use the narrow peg wheels having holes q only between the pegs.

I prefer to use the device described in the Zimmermann application for supporting the cards in front of the needles, that is to say, a card supporting plate R , supported as upon bars O^5 firmly attached to and forming part of the frame O ; instead however, of attaching the plate R rigidly to the arms O^6 I provide in the rear of the plate R , arms or brackets R' which in turn are secured to the ends of the bars O^5 by clamps as indicated at R^2 . By making the plate R adjustable by this or a similar device I gain an important advantage and am enabled to adjust the plate with great accuracy to correspond with the position of the needles. This adjustment is also facilitated by the device which consists in carrying the needle holes r r or at least a portion of them completely through the plate R , so that in adjusting the plate, the operator can look through said holes and see the points of the needles. For practical use, it will be sufficient to carry, say, two end rows of holes through the plate.

As in the Zimmermann machine, I employ a needle board S , which is free to move backward and forward under pressure. Instead however of effecting the backward motion of the needle board by the pressure of the card support transmitted through the card to the needle board I provide special appliances which, as the card supporting device advances, moves the needle board back in front of it; the arrangement being such, that the card support and needle board while they approach close together, will not actually pinch the card between them. In the plan shown, this result is accomplished by providing the needle board S with lugs S' S' extending over the rods O^3 upon which the needle board is thus supported. From these lugs S' , arms S^2 in the construction shown, extend over the bearing T^2 and at their rear ends are secured to sleeve S^3 . Against this sleeve S^3 presses a spring S^4 which abuts at its other end against the bearing T^3 or any convenient stop. A collar S^6 , preferably adjustable, is secured to the bars O^3 in front of the lugs S' and it will be seen as the frame O and its connected bars O^3 move toward the stationary frame T , the collars S^6 will, at a determined time press against the lugs S' carrying them and the needle board S along in front of the advancing card support and preventing the card from being squeezed between these two plates. As the frame O moves backward, the plate S will move with it until the sleeves S^3 come in

contact with the bearings T^2 which arrest the motion, holding the plate S stationary, while the card support moves backward and opens the space into and from which the cards are fed.

In the use of the Zimmermann apparatus, I have found that it is of great importance that the card should be engaged and disengaged by the pegs on the peg wheels with a smooth even motion, and I have ascertained that this can be secured by forming and arranging the stripper and feeder plates W' and W which may be conveniently formed, as shown in Figs. 2 and 6, of one piece of metal, so that they will lie nearly perpendicular to the pegs from and to which they lift or lead the cards. The angle formed at the operative point is very slight, as shown in the drawings, and a twisting of the card is thus avoided. In Fig. 2, these plates W , W' are shown secured in proper position to the frame O of the Jacquard which affords a convenient support.

It is important that the cards should be held on the face of the peg wheels between the feeding and stripping plates and particularly between the feeding plate and the card support in front of the needles, and still more particularly is it necessary to press the card down without twisting it upon the peg to which the feed plate delivers it. I accordingly provide a guard plate W^2 , one end of which extends over and lies parallel to that portion of the feed plate W which delivers the card to the peg wheel. This guard plate and the guard plate W^3 , which prevents the cards from leaving the peg wheel too soon, are secured in place as shown in the drawings; that is to say, arms O^6 are secured to the frame O extending up and down therefrom, above and below the peg wheels and the ends of these arms are connected together by means of bars O^7 and O^8 to which bars the guide plates W^2 and W^3 are attached as shown.

While reciprocating motion can be given to the frame O and the parts supported upon it in any convenient way, I prefer to use the device described by Zimmermann, to wit, a cam U secured to the shaft N and operating through a link U' pivoted at U^2 to the frame T . Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the needles of a Jacquard apparatus and a reciprocating frame carrying card feeding mechanism, of a card supporting plate supported on the reciprocating frame independent of the card feeding mechanism, and formed with one or more rows of needle holes extending entirely through it, and means for adjusting the card supporting plate to bring the holes therein opposite the ends of the needles.

2. In combination with the needles of a Jacquard apparatus and a reciprocating frame, a constantly rotating and an intermittently rotating shaft supported on said frame, and means for driving the intermittently rotating,

from the constantly rotating shaft, and a peg wheel supported on the intermittently rotating shaft having a series of flat faces of substantially the breadth of a card.

3. In combination with the needles of a Jacquard apparatus and a reciprocating frame, an intermittently rotating shaft supported on said frame, a pair of flat faced peg wheels supported on said shaft having faces of substantially the breadth of the pegs, affixed thereto and needle holes drilled in their faces between the pegs and a card supporting plate also supported on the frame.

4. The combination with the needles of a Jacquard apparatus and a reciprocating frame carrying card feeding mechanism, of supports O^5 O^5 secured to the frame, a card supporting plate secured to said supports and lying in front of the needles and means for adjusting the card supporting plate to bring the holes therein opposite the needle ends.

5. In combination with the needles of a Jacquard apparatus and a reciprocating frame, an intermittently rotating shaft carried on said frame, a card supporting plate, peg wheels carried on said shaft adapted to carry cards and a curved stripper plate W' independent of the card support arranged to lie nearly perpendicular to the pegs from which it lifts the cards and so as to lift said cards without twisting them on the pegs.

6. In combination with the needles of a Jacquard apparatus and a reciprocating frame, an intermittently rotating shaft carried on said frame, a card supporting plate, peg wheels carried on said shaft and adapted to carry suitable cards, and a curved stripper, and a curved feeder plate independent of the card support, arranged to lie nearly perpendicular to the pegs from which and to which they lift and feed the cards and so as to lift and deposit said cards without twisting them on the pegs.

7. In combination with the needles of a Jacquard apparatus and a reciprocating frame, an intermittently rotating shaft carried on said frame, peg wheels carried on said shaft, a curved feeder plate W arranged to lie nearly perpendicular to the pegs to which it feeds cards, and a guard plate W^2 arranged to hold the cards to the peg wheels and having its end lying substantially parallel to the end of the feeder plate which it overlaps.

8. In combination with the needles of a Jacquard apparatus and a reciprocating frame, an intermittently rotating shaft carried on said frame, peg wheels carried on said shaft, arms O^6 secured to the frame and projecting above and below it and guard plates secured to said arms.

9. The combination with a frame T supporting the needles of a Jacquard apparatus and a reciprocating frame O , mechanism carried on said frame for supporting and feeding the cards, a needle board supported in

front of the card supporting device and mechanism independent of the opposing faces of the card supporting device and needle board for moving said needle board back in advance of the forward motion of the card support.

10. In combination with a frame T supporting the needles of a Jacquard apparatus, a reciprocating frame O , mechanism carried on said frame O for supporting and feeding the cards, rods O^3 extending from the reciprocating frame along the needle supporting frame, a needle board supported on said rods but free to move along the same, springs acting to hold the needle board at a fixed position in front of the card supporting device, and stops operated in accordance with the movement of the card support and arranged to engage and push the needle board back with the rods when the card support advances toward it for a determined distance.

11. The combination in a loom of a Jacquard apparatus having a reciprocating frame, a shaft N and a shaft P supported on said frame, and connecting mechanism whereby a constant rotation of shaft N is transmitted as an intermittent rotation to shaft P , a shaft D driven by a rotating part of the loom, a shaft F and means for driving it in either direction from shaft D , a shaft M driven from shaft F , a shaft M^2 arranged to drive shaft N , and a connecting shaft M' coupled to shafts N and M^2 by universal joints.

12. The combination in a loom, of a Jacquard having a reciprocating frame supporting shafts N and P geared together substantially as described, a shaft driven by a rotating part of the loom, a countershaft having loose gears thereon driven by said shaft in opposite directions, a clutch arranged to engage said gears at will with the countershaft, connections with the jacquard to actuate said clutch and a connection from the countershaft to shaft N .

13. The combination in a loom, of a Jacquard apparatus having a reciprocating frame and card actuating mechanism supported on said frame, of a shaft D driven by a rotating part of the loom, a countershaft F having loose gears F' F' engaged with a gear D^2 on shaft D , a clutch F^2 splined to shaft F and arranged to engage either gear F' therewith, a pivoted sleeve G having a clutch actuating arm G' and a stud G^5 , a sleeve H having arms H' pivoted on said stud, a reciprocating plate K a connection from the Jacquard needles to each arm H' to throw them at will in the path of plate K a shaft N in frame O and means for conveying motion from shaft F to shaft N .

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