

(No Model.)

J. A. GROEBLI.
JACQUARD MECHANISM.

No. 552,904.

Patented Jan. 14, 1896.

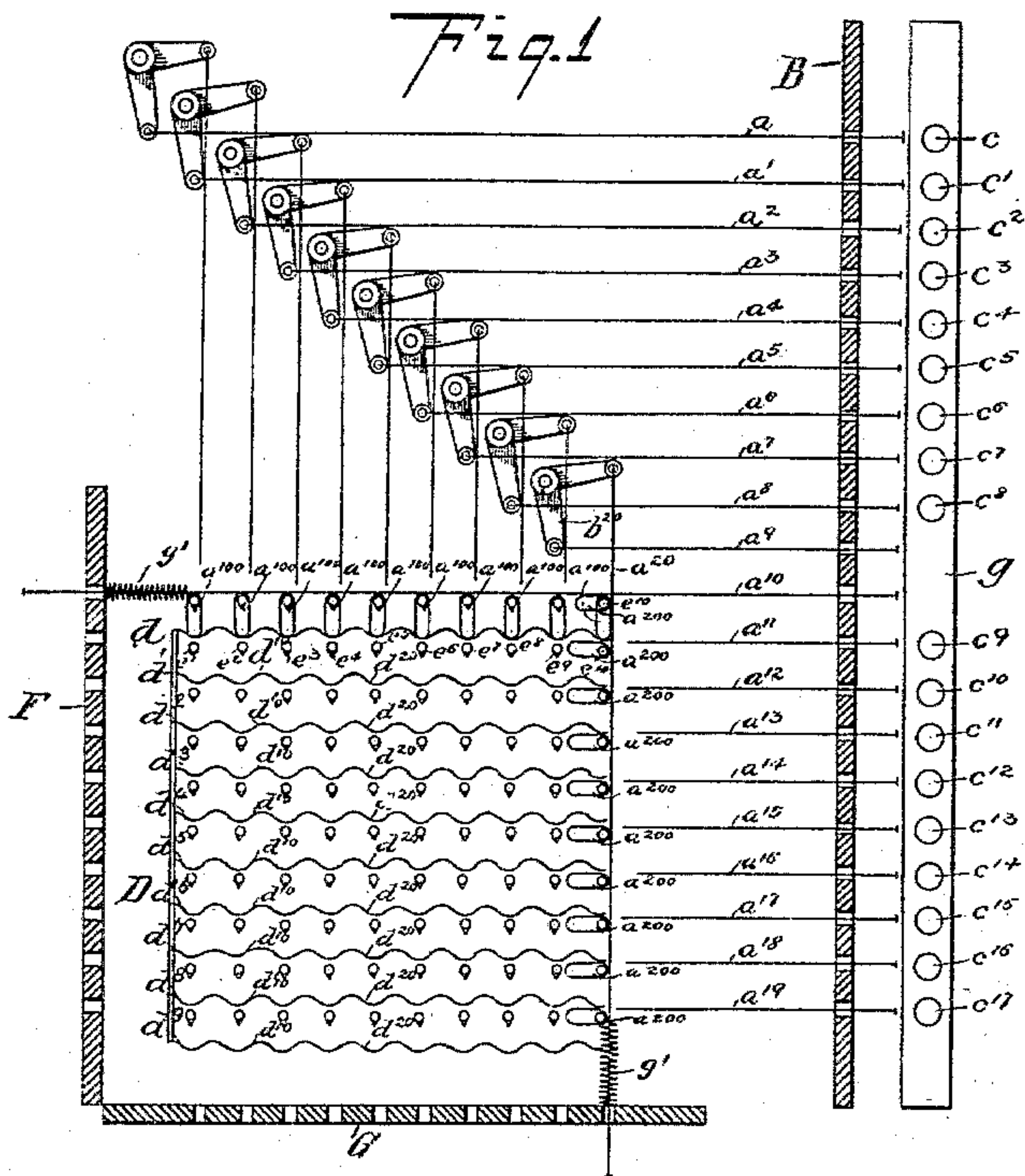


Fig. 2.

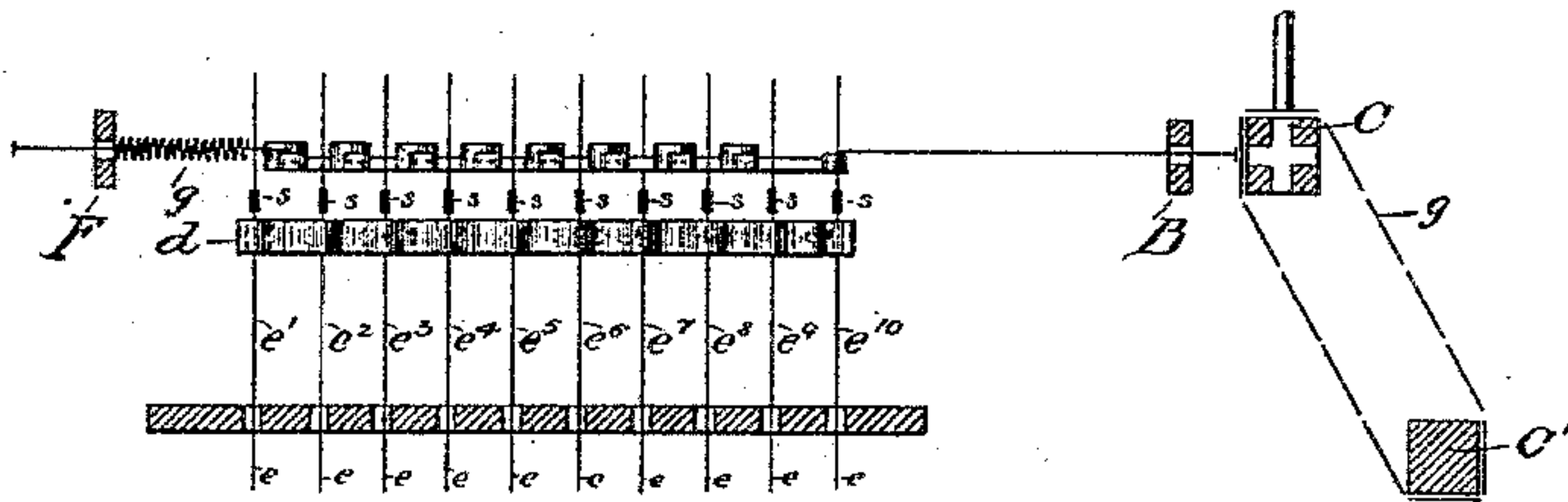


Fig. 3.

Fig. 4.

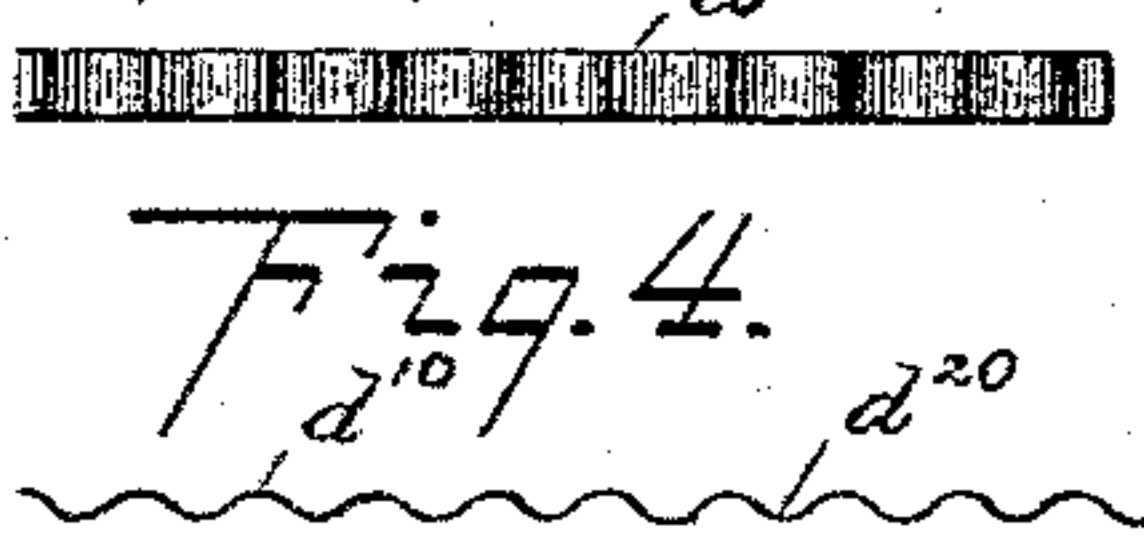


Fig. 5.

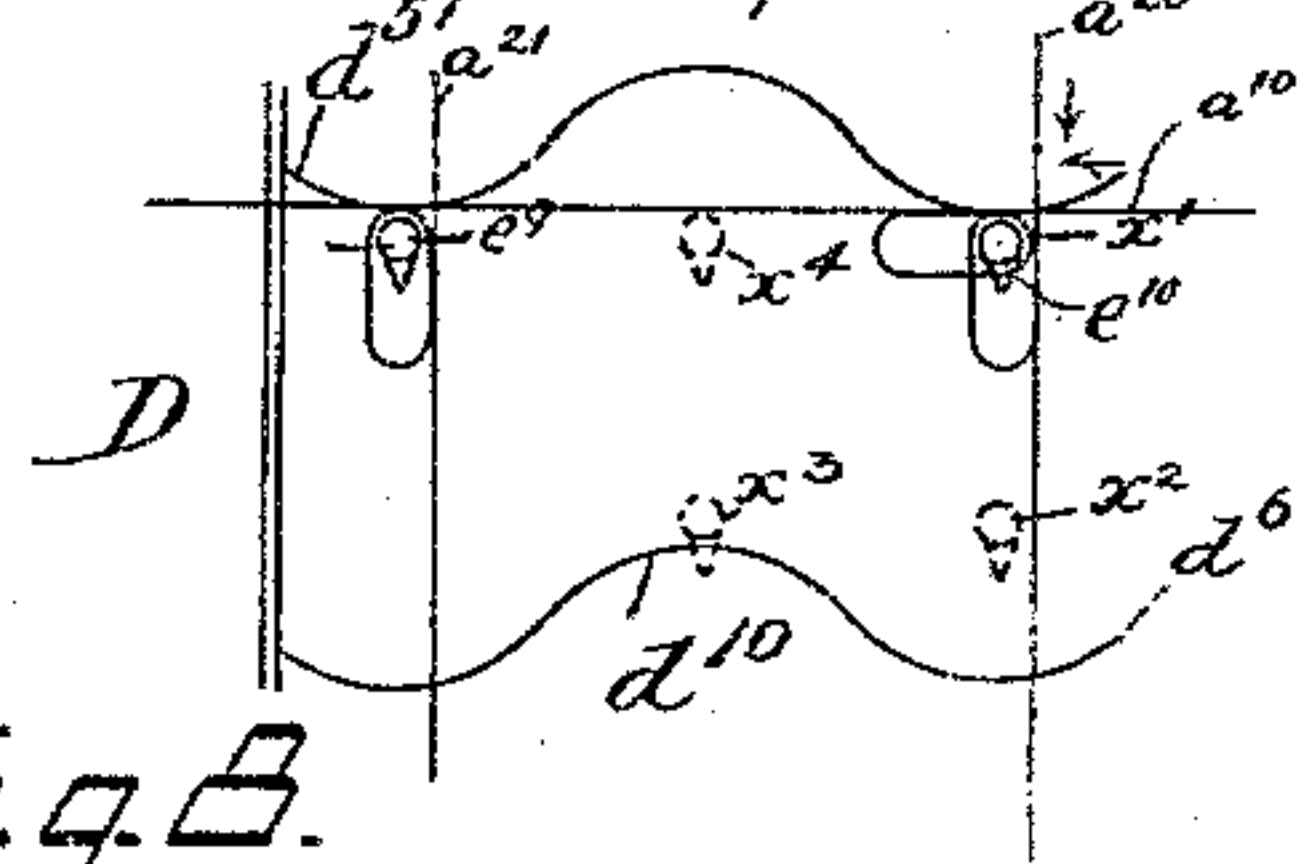


Fig. 6.

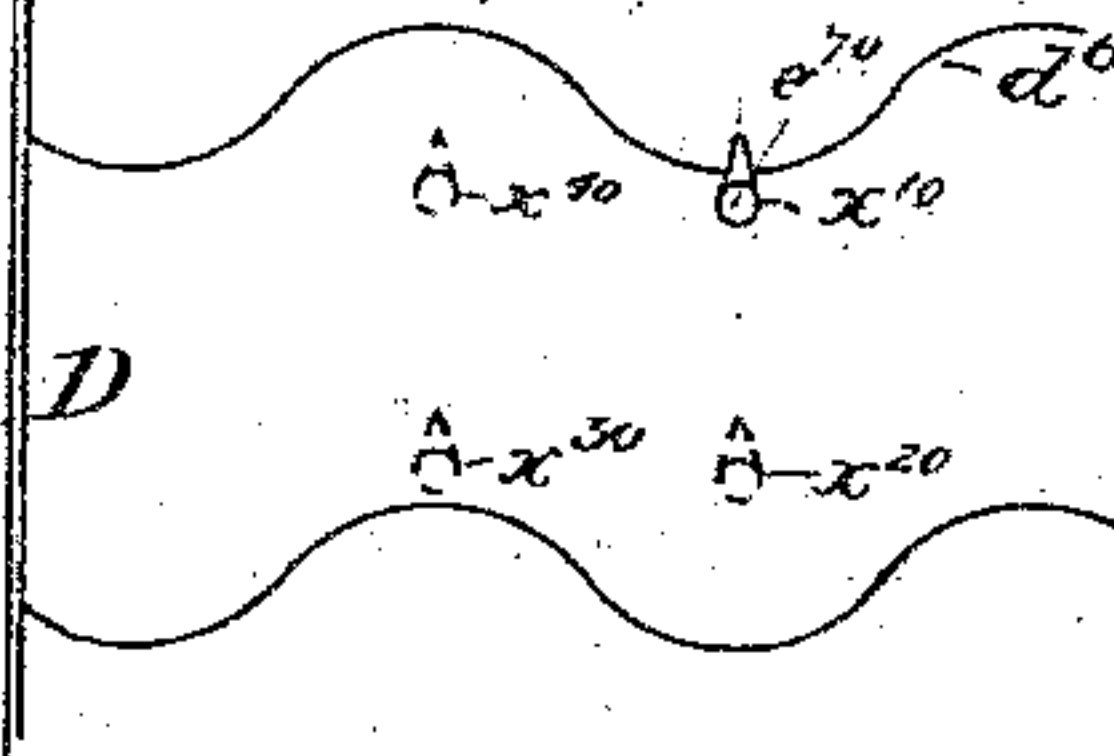
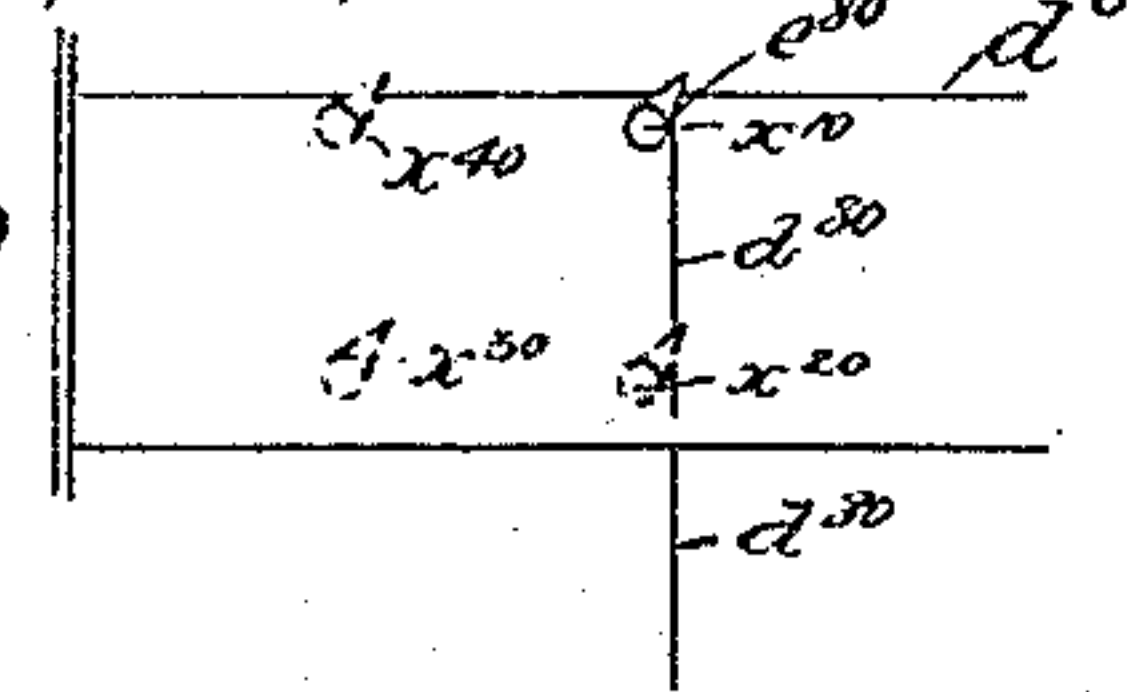


Fig. 7.



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UNITED STATES PATENT OFFICE.

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JACQUARD MECHANISM.

SPECIFICATION forming part of Letters Patent No. 552,904, dated January 14, 1896.

Application filed March 12, 1895. Serial No. 541,422. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ARNOLD GROEBLI, a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Jacquard Mechanism, of which the following is a specification.

My invention relates to Jacquard mechanism, and more particularly to a combination and arrangement of devices constituting a Jacquard mechanism by which the hooks or other harness-moving devices may be controlled by an aggregately less number of Jacquard pins or feelers than heretofore.

To this end my invention consists in the construction and arrangement of devices hereinafter set forth and claimed, together with such structures as may be justly considered equivalent structures in view of the prior art. I would also have it understood that I do not limit the use of my Jacquard mechanism to any particular machine or character of machine, but the Jacquard mechanism may be variously applied to various types, kinds and characters of machines.

In the drawings forming part hereof, Figure 1 is a plan view of a Jacquard mechanism embodying my invention. Fig. 2 is a side elevation thereof. Figs. 3 and 4 are detail views in elevation and plan of a part thereof hereinafter referred to. Fig. 5 is a detail view of one of the feelers. Fig. 6 is a fragmentary theoretical diagram of the motions of a single hook, and Figs. 7 and 8 show in diagram modified schemes of arrangement of the feelers and lifters, as will be hereinafter set forth.

It will of course be understood that these views are more or less in diagram, as the working parts of the mechanism may be varied, and the object and tenor of the invention will readily be perceived by those skilled in the art from an inspection of such diagrammatic views, so that a full disclosure of the invention is had by the said views.

Referring particularly to Fig. 1, a to a^{19} are feelers, commonly known as Jacquard needles or pins. These feelers are arranged in any suitable manner, shown in the present instance as two series a to a^9 inclusive, and a^{10} to a^{19} inclusive, and each feeler passes through a suitable apertured guide B and is

adapted for engagement with a pattern, shown in the present instance as a Jacquard card g , which passes around a pair of drums C C', but it will be understood, however, that the pattern may be of any preferred construction. Hooks e' to e^{10} , &c., or other harness-moving devices or contact-pieces are connected to harness-cords $e e$ and are adapted to engage with a lifter. The hook may be connected to other means for accomplishing its purpose than the harness-cord. I refer to the latter as being the most commonly used. These hooks are selected and engaged with the lifter at the proper times by the feelers with the aid of the pattern, as will be hereinafter set forth. In some instances these hooks in their normal positions are not engaged with the lifter, but are selected and positioned by the jacquard so as to be engaged by the lifters, and it is the object of my present invention to construct a means to effect the positioning of each hook by the conjoint action of two feelers.

Heretofore it has been customary to provide a feeler for each of the hooks and to provide connections between each feeler and its corresponding hook, whereby the hook will be engaged with or positioned for engagement with the lifter by the action of its feeler, so that by selecting any particular feeler or feelers the corresponding hooks and harnesses may be actuated. This, as before stated, necessitates the use of a separate feeler for each hook. By my invention I dispense with the necessity of using a separate and individual feeler for each individual hook. This I may accomplish in various ways, but my preferred construction is as set forth herein, which in the present instance consists in arranging the hooks in lateral and longitudinal transverse rows in the form of a square and connecting all the hooks in each lateral row to a single feeler and all the hooks in each longitudinal row to a single feeler. Each of these hooks, therefore, is acted upon by two feelers, one acting in a direction laterally of the square and the other in a direction longitudinally (up and down) of the square. Thus each hook is positioned by the conjoint action of two feelers, as it will be obvious that each feeler will be at the intersection of and will be one

of both a lateral and a longitudinal transverse row. This arrangement of feelers is illustrated in Fig. 1, wherein it will be observed the feelers are arranged in lateral and longitudinal transverse rows in the form of a square. For the purpose of avoiding confusion the connections of some only of the hooks with their feelers have been shown, the top and right row of hooks being shown as connected to or engaged with the feeler a^{10} by means of loops a^{100} , one of which surrounds each hook and moves it laterally of the square when the feeler a^{10} is actuated by the pattern. The right-hand-side up-and-down (longitudinal) row of hooks is shown as connected to or engaged with the auxiliary feeler a^{20} by similar loops a^{200} , which feeler is actuated from the feeler a^9 by the bell-crank or other suitable connection b^{20} . It will thus be observed that the hook e^{10} in the upper right-hand corner of the square is connected to both feelers a^9 and a^{10} and is adapted to be moved laterally of the square by the feeler a^{10} and longitudinally (up and down) of the square by the feeler a^9 and its auxiliary feeler a^{20} . By carrying out these connections throughout the square of hooks each hook will be adapted to receive a motion laterally of the square by one of the series of feelers a^{10} to a^{19} and longitudinally of the square by one of the series of feelers a to a^9 . Arranged below the hooks and adapted to engage with the hooks or shoulders thereof when raised is a moving mechanism for the harness-moving devices consisting of a lifting-frame or lifter comprising bars d to d^9 of suitable configuration, which run between the rows of hooks laterally of the square. One of these bars d is shown in elevation in Fig. 3 and plan in Fig. 4, and has elevations d^{10} and depressions d^{20} constituting the undulations. Each of these bars d to d^9 co-operates with a lateral row of hooks when the hooks are properly positioned by the pattern, as will be hereinafter set forth.

Referring to Fig. 6, which shows a fragmentary diagram, it will be observed that four points x' x^2 x^3 x^4 have been designated. These are the four positions which the hook e^{10} will occupy when moved by the feelers—that is to say, actuating the feeler a^{10} alone will cause the hook e^{10} to move from x' , its normal position, to x^4 ; actuating the feeler a^{20} alone will move the hook e^{10} from x' to x^2 , and actuating both feelers a^{10} and a^{20} will move the hook e^{10} to the resultant position x^3 . When in this position x^3 , the hook is in position to be lifted by its co-operating bar d^6 of the lifter-frame D. When in the other positions x' , x^2 , and x^4 , it will not be engaged by such bar, this for the reason that an undulation d^{10} of the bar d^6 lies under the point x^3 and there is no undulation of this bar d^6 under the points x' , x^2 , or x^4 , so that when the lifter is raised it will carry with it only such hooks as are in the position x^3 . It will be understood that the feelers are moved by the pattern against the tension of springs g' bearing against the

rear guide-plates F and G, or other suitable means, and returned to position by the spring when the pattern is returned to its initial position. The positioning of each hook of the square of hooks is effected in a similar manner to that described for the hook e^{10} , so that any hook may be selected and positioned by the pattern for engagement with the lifter.

In order that the operation may be fully understood I will proceed to describe the detailed operation of the device with the aid of Fig. 1, supposing that it is desired to position the hook e^{10} . In order to position the hook e^{10} for engagement with the lifter it must be moved from its normally inoperative position x' to the position x^3 . This motion must be effected by compounding the motions imparted to the feeler a^{10} by the two feelers a^9 and a^{10} , at whose intersection the hook e^{10} is located—that is to say, the feelers a^9 and a^{10} must be selected and moved conjointly in order to position the hook e^{10} , as either acting alone will not move it into the position x^3 , but both feelers must be used. The Jacquard card g is shown as punched to effect this motion. When this card thus punched is brought up to the feelers, all the feelers will enter apertures c to c^{17} , except the feelers a^9 and a^{10} , for which no holes have been punched. Hence as the card moves the feelers for which there are holes will be left behind, and the feelers a^9 and a^{10} coming against the card will be pushed by the card in the direction of the arrows and will jointly act to move the hook e^{10} into the position x^3 . When the hook e^{10} has been moved into the position x^3 , the lifter is raised and engaging with shoulders s of the hook e^{10} lifts it and its connected harness. When this motion has been effected, the lifter is lowered and the Jacquard card moved away from the feelers, which are returned to their initial positions by the springs g' . Then the card is shifted and another card takes its place and is moved up to the feelers to select another hook or hooks, it being understood that one or more hooks may be selected and positioned, the selection and positioning of any hook being effected by moving the feelers at whose intersection the particular hook is located. Of course all the hooks in engagement with each moved feeler will also be moved, but only that hook which lies at their intersection and which receives the double motion will be properly positioned for lifting by the lifter.

I have spoken of the hooks as being in their normal position not engaged with the lifter. This arrangement may, however, be varied, so that the hooks are normally engaged. In this case only that harness-lifting device is raised by the lifter which by the combined inaction of the two feelers controlling its position remains in the normal position. In Fig. 7 the hooks e^{70} are normally in position for engagement with the lifter, (bar d^6), so that a hook e^{70} will be engaged with the lifter only when both of its feelers are not moved by the

Jacquard devices—that is to say, the hook is normally in the position x^{10} , and should it be moved to the position x^{20} or x^{40} by either feeler or the position x^{30} by both feelers it will not be in position for engagement with the lifter. In fact any one of the four positions which the hooks may under the influence of two feelers assume can be accepted as the active one; or the arrangement may be still further varied in this wise that any three out of the four positions may engage with the lifter, while only one will not engage. In this case the configuration of the lifter-blade d^8 is changed accordingly—that is, by providing each blade with a spur d^{80} . This is shown in Fig. 8, wherein x^{10} , x^{20} and x^{40} are all active positions, and the hook may be brought to any of these positions by the inaction of both feelers or the action of either of them. Action of both feelers will move the hook into the position x^{30} , where it will not be in position for engagement by the lifter. Under the conjoint influence of two feelers any hooks may also be brought to any one of four positions. Any one or any three of the four positions may be the active one.

It must also be understood that while I have shown and described harness-moving devices, I do not mean to limit myself to such devices, but wherever I use the term “harness-moving devices” I wish to be understood as meaning all analogous structures, and to this end I have employed the term “contacting pieces” herein to designate such generic class of devices.

It will also be obvious from the foregoing that the underlying idea of this invention is capable of many mutations and variations which will readily occur to those who may desire to enjoy the fruits of my invention, so therefore I would have it understood that I do not limit myself to the construction and schemes of arrangement of parts shown and described; but

What I claim, and desire to secure by Letters Patent, is—

1. In a Jacquard mechanism, the combination of a harness moving device, moving mechanism therefor, a plurality of feelers acting upon the harness moving device, and means for effecting the positioning of the harness moving device for engagement with its moving mechanism by the conjoint action of two feelers.

2. The combination of a lifter, a harness moving device, a plurality of feelers engag-

ing the harness moving device, and means for effecting the positioning of the harness moving device for engagement with the lifter by the conjoint action of a plurality of feelers.

3. In a Jacquard mechanism in combination, a harness moving device, a moving mechanism therefor, a plurality of feelers and means for causing the said feelers to act upon the harness moving device conjointly to displace the said harness moving device to position the same for engagement with its moving mechanism.

4. In a Jacquard mechanism in combination, a harness moving device, a moving mechanism therefor, a plurality of feelers, one of which will act to displace the harness moving device on a certain line, and another of the feelers acting to displace the harness moving device on a line at an angle to the first, whereby the positioning of the harness moving device may be effected by the conjoint action of a plurality of feelers, and a pattern for effecting the motions of the feelers.

5. In combination a harness moving device, a moving mechanism therefor, a plurality of feelers connected to the harness moving device and acting to displace the said harness moving device upon lines at an angle to each other, whereby the position of said harness moving device may be effected by the conjoint action of a plurality of feelers, and a pattern for effecting the motions of the feelers.

6. In a Jacquard mechanism, a movable pattern in combination with a number of contact pieces and a less number of feelers, a single feeler cooperating with a plurality of contact pieces, and a single contact piece cooperating with a plurality of feelers, to determine the action of the contact piece, substantially as described.

7. In a Jacquard mechanism, the combination of contacting pieces, a plurality of feelers co-operating individually with a plurality of contacting pieces and with a single contacting piece and means for moving the feelers to render them effective, whereby a contacting piece is selected for action by the conjoint action of a plurality of feelers.

8. In a Jacquard mechanism, a contacting piece combined with a plurality of feelers, and means for selecting a contacting piece by the conjoint action of a plurality of feelers.

JOSEPH ARNOLD GROEBLI.

Witnesses:

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HARRY M. TURK.