

No. 607,848.

Patented July 26, 1898.

J. A. GROEBLI.
EMBROIDERING MACHINE.

(Application filed Jan. 15, 1898.)

(No Model.)

2 Sheets—Sheet 1.

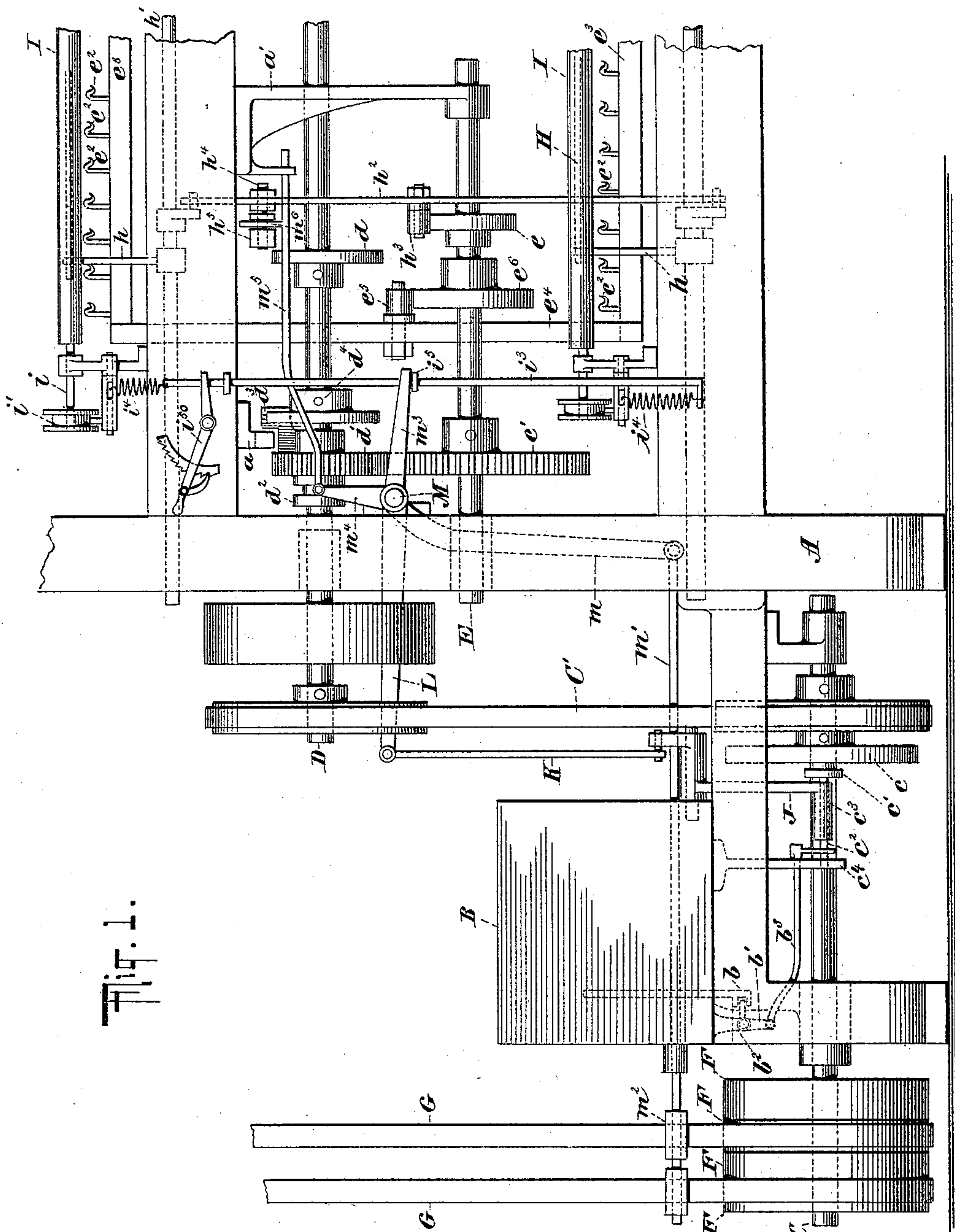


Fig. 1.

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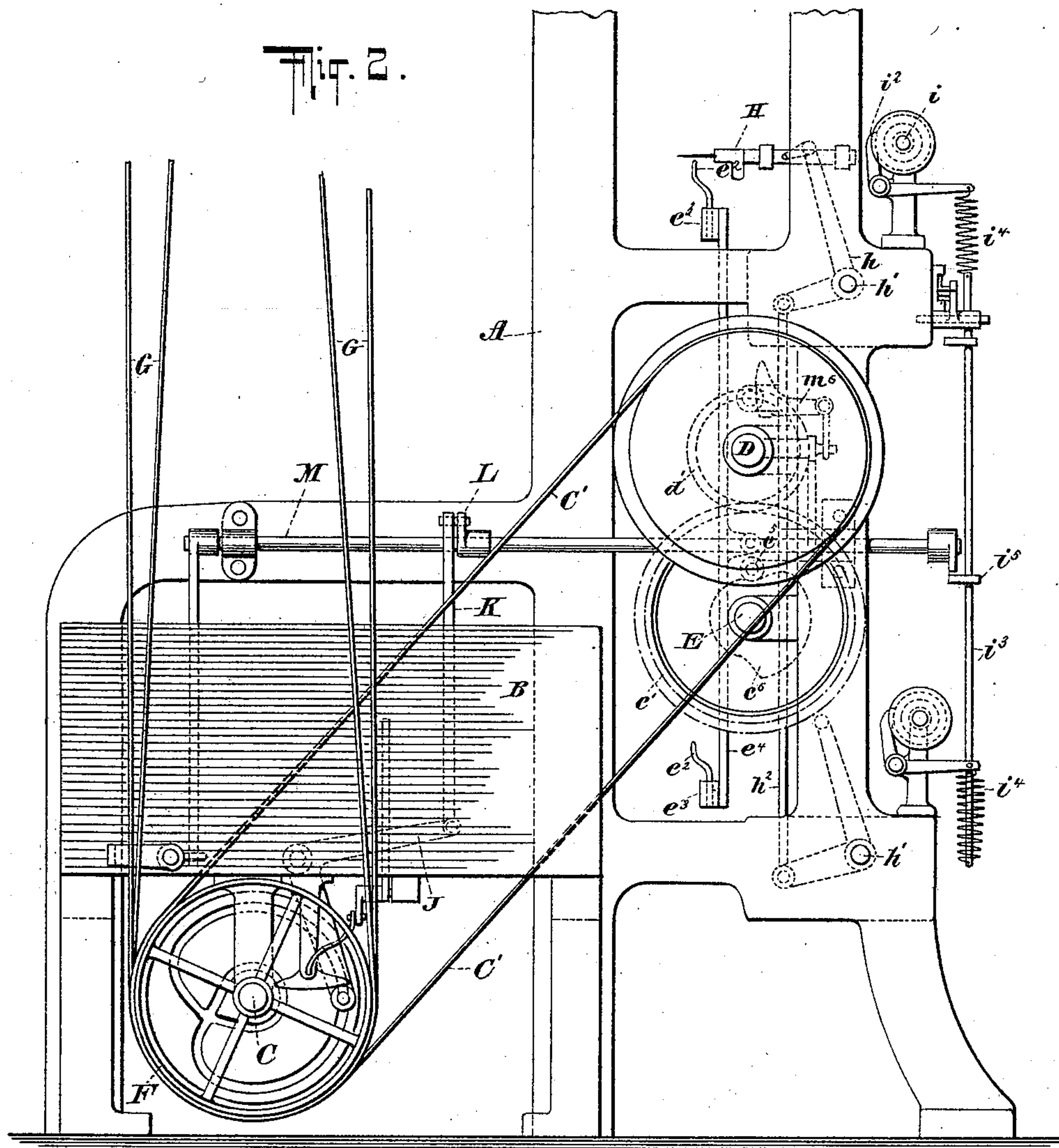
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOSEPH A. GROEBLI, OF NEW YORK, N. Y., ASSIGNOR TO THE KURSHEEDT MANUFACTURING COMPANY, OF SAME PLACE.

EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 607,848, dated July 26, 1898.

Application filed January 15, 1898. Serial No. 666,767. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. GROEBLI, residing in the city, county, and State of New York, have invented certain new and useful
5 Improvements in Embroidering-Machines, of which the following is a specification.

My invention relates to improvements in embroidering-machines, and has for its object to produce a mechanism whereby at pre-
10 determined times in the operation of the machine festoon or buttonhole-edge embroidery may be executed.

To this end my invention consists in the matters hereinafter claimed, reference being
15 had to this specification and to the drawings for an explanation thereof, it being understood that such equivalent structures are included in the terms employed in the claims as may be justified by the state of the art.

20 My invention will be understood by referring to the accompanying drawings, wherein I have shown one form of mechanism embodying my invention.

In the drawings, Figure 1 is a front elevation of one end of an embroidering-machine with the festoon mechanism and the jacquard mechanism for controlling the operations, and
25 Fig. 2 is an end elevation thereof.

In the drawings, A is the frame of the embroidering-machine, which carries the mechanism.

B is the jacquard.

C is the jacquard-mechanism-driving shaft, from which motion is taken by means of the
35 chain or belt C' and transmitted to the main driving-shaft D of the embroidering-machine.

E is the festoon-apparatus shaft, which drives the festoon apparatus at predetermined
40 times, as will be explained.

The shafts C and D may be geared together in any suitable manner. The shaft C carries fast and loose pulleys F, with which belts G engage, which belts are driven at different
45 rates of speed in order that by shifting the said belts at predetermined times determined by the jacquard various rates of speed may be imparted to the shaft C, as will be explained.

50 H H are the needle-bars of the embroider-

ing-machine. (See Fig. 2.) Each of these needle-bars H H is reciprocated in the usual manner by a crank-lever h , carried upon rock-shafts h' and connected by a link h^2 , provided with a bowl h^3 , extending into the path
55 of a cam e on the festoon-apparatus shaft E. The crank-lever h may actuate other parts of the machine. The link h^2 is likewise provided with a stud h^4 , on which the roller h^5
60 slides, which roller is at predetermined times brought into position to be engaged by the cam d on the main shaft D of the embroidering-machine. The main shaft D of the
65 embroidering-machine is likewise provided with a gear d' , which is loose thereon, and provided with a collar d^2 and a spur d^3 to enter a slot in a clutch member d^4 , fast on the shaft D. The gear d' meshes with a gear e' on the
70 festoon-shaft E, the gears d' and e' being so proportioned that when the spur d^3 engages the clutch member d^4 the gear d' is thereby driven and drives the shaft E at half the rate of speed at which the shaft D is rotating.

The festoon apparatus is shown in the present instance as a series of loop-forming hooks
75 e^2 , mounted upon universal bars e^3 , which are joined by side bars e^4 at each end of the machine, (only one of which is shown,) which side bars e^4 may be provided with a bowl e^5 , extending into operative relation with a cam e^6
80 on the festoon-shaft. The mechanism is provided with any usual thread braking or tension apparatus, shown in the present instance as the brake or tension cylinder I, around which the needle-thread is wound, carried
85 upon a shaft i , provided with a brake-wheel i' , against which a brake i^2 bears, the said brake i^2 being operated by an operating-rod i^3 , provided with a spring or springs i^4 , with
90 which may be combined an ordinary hand tension adjusting apparatus i^{50} . It will be understood that when the rod i^3 is pushed downward the tension will be increased, and when it is allowed to rise the tension will be
95 diminished.

Having described the various working parts of the mechanism, I will now proceed to describe a connection by which they may be governed from the jacquard B. It will be observed that the cam-shaft C is provided with
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a cam c , into which a crescent or bowl c' may be entered. This crescent or bowl c' is carried by a sliding rod c^2 , carried in a sleeve c^3 of a lever J . The tail of the rod c^2 is adapted to enter an aperture in a bracket c^4 in order to position the crescent for entry into the cam, the crescent being brought back to its initial position at the proper time, as will be readily understood.

b is a lifter or other element of the jacquard and controlled by the jacquard mechanism. This lifter b acts upon a lever b' , pivoted in a bracket b^2 and provided with a connector b^3 , which engages and moves the rod c^2 , thereby effecting the engagement and disengagement of the crescent c' with the cam c . The lever J is connected by a link K with a lever L , carried upon a shaft M . It will be understood that the jacquard apparatus enters the crescent c' into the cam c , and thereby rocks the lever J , thus rocking the shaft M . The shaft M is likewise provided with a lever m , which is connected by a link m' with a belt shipper or shifter m^2 , by which means the belts may be shifted to bring one or the other upon a fast pulley or a loose pulley *ad libitum*, so that different rates of speed may be imparted to the shaft C at predetermined times. The rock-shaft M is likewise provided with an arm m^3 , which contacts with a cross-head i^5 on the rod i^3 , whereby the tension is regulated from the jacquard. The rock-shaft M is likewise provided with an arm m^4 , which engages the sleeve d^2 and serves to shift the sleeve d^2 with the attached gear-wheel d' and spur d^3 laterally on the shaft D to engage the said spur with the clutch d^4 or to disengage it therefrom or to enter the spur into the stop-bracket a , which is provided to stop and hold the spur at a predetermined point when it is disengaged, so that the gear d' will be brought to rest at a predetermined point in order that the shaft E may likewise be brought to rest at a predetermined point. The arm m^4 or other arm of the rock-shaft M may be provided with a connection m^5 , which is guided by the bracket a' and is provided with a sector m^6 , which sector extends into a groove in the roller or bowl h^5 , so that the bowl may be shifted laterally by the connection m^5 .

Having described the elements of the mechanism in detail, I will now proceed to describe the detailed operation, it being understood that the embroidering-machine may be provided with the usual shuttle apparatus, which has been omitted for the purposes of clearer illustration. It will be premised at the outset that when the mechanism is producing festoon-work the operations take place at a slower rate of speed than when the apparatus is performing the ordinary embroidering operations and that the tension on the needle-threads is increased. Consequently in order to properly perform the festoon operations the jacquard and embroidery mechanisms must be slowed down, the festoon apparatus be thrown into operation, and the tension in-

creased, which operations are reversed when it is desired to shift the machine over from the festooning operation to the ordinary embroidering operation. When the machine is in the position shown in the drawings, it is doing festoon-work, the spur d^3 being engaged with the clutch d^4 , whereby the festoon-shaft E is driven from the main shaft D , whereby by means of the cams e^6 and e the festoon apparatus and the needle-bar are driven. At this point it is important to remember that by reason of the fact that the jacquard is being driven at the appropriate slow rate of speed the speed of the embroidering-machine will be correspondingly slow, the shaft E making, as before explained, but one rotation to two rotations of the shaft D . In view of the fact, however, that the cam e is provided with two lifting portions the needle-bar mechanism will be operated twice for every single operation of the festoon apparatus, the cam e^6 being a single-lift cam. At this point it is important to note that the bowl or roller h^5 is not in position to be acted upon by the cam d , which is on the shaft D . It will be noted that the arm m^3 is pressing down strongly upon the cross-head i^5 , so as to put a very strong tension upon the needle-threads, which, as before explained, encircle the tension or brake roller I on their way to the needles. From the foregoing it will be readily understood that the festoon apparatus and the needle-bars are operated at a proper rate of speed from the festoon-shaft E in harmony with each other. When now it is desired to throw the festoon apparatus out of operation to resume the normal embroidering functions, the lifter b is operated to enter the crescent into the cam, whereupon the cam will rock the lever J to pull down on the rod or link K and to thereby rock the rock-shaft M , so as to ship the belts G to change the speed of the shaft C , to shift the wheel d' and its connected sleeve and spur to the left, thereby disconnecting the shaft E , which is brought to rest at a predetermined point by the spur d^3 being entered into the slot in the bracket or stop a , to release the pressure of the arm m^3 on the rod i^3 , to thereby release the tension and likewise through the medium of the connection m^5 to shift the bowl or roller h^5 to the left to bring it into position to be actuated by the constantly-rotating fast cam d , so that the normal movement of the needle-bar will be resumed. It is to be observed that the stopping of the shaft E at a predetermined position is for the purpose of bringing its cams into such position where they will not interfere with the normal operation of the rod h^2 by the cam d .

When the parts have been restored to their normal embroidering positions, as just explained, the jacquard operates to remove the crescent c' from the cam c and to enter its tail-rod or tailpiece c^2 into the aperture in the bracket c^4 , so that the crescent will be positioned for reentry into the cam. The

jacquard controls all these shifting operations, so that the recurrence of the ordinary embroidering operations and the festooning operations may be regulated in a predetermined manner from the jacquard, which, as explained, effects the shifting of the parts, regulates the tension, and determines the speed of operation, so as to insure harmonious action.

10 Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an embroidering mechanism, the combination of embroidering means including needles and their cooperating means, of a festoon apparatus and pattern-controlled mechanism for operating the embroidering means and the festoon apparatus in harmony with each other.

20 2. In an embroidering mechanism, the combination of embroidering-needles and means for cooperating therewith to form a stitch, of a festoon apparatus with operating means therefor and pattern-controlled mechanism for bringing the festoon apparatus into operative relation with the work at predetermined times.

3. In an embroidering mechanism, the combination of means for driving the needles at a normal rate of speed, means for driving the needles at a speed different from the normal, combined with a festoon apparatus and means for driving the same in harmony with the needles, and pattern mechanism for controlling the interaction of the parts, whereby the needle operations will be changed to harmonize with the operation of the festoon apparatus.

4. In an embroidering mechanism, the combination of embroidering-needles and a festoon apparatus, pattern-operated means for bringing the festoon apparatus into harmonious operation with the embroidering-needles and means for bringing the festoon apparatus to rest at a predetermined point.

5. The combination of embroidering-needles and means cooperating therewith to form a stitch, tension apparatus for the threads of the embroidering-machine and a festoon ap-

paratus, all combined with pattern-controlled mechanism for bringing the festoon apparatus into and out of operation.

6. The combination in an embroidering mechanism, of embroidering-needles, a festoon apparatus and automatic means for varying the operation of the embroidering-needles to harmonize with the operations of the festoon apparatus, as and for the purposes set forth.

7. In an embroidering mechanism, the combination of a shaft for giving the embroidering-needles a normal movement, a shaft for giving the embroidering-needles an abnormal movement, and automatically-operated means for connecting the embroidering-needles with either shaft for operating the same by the said shaft.

8. In an embroidering mechanism, the combination of embroidering-needles and automatic means for driving the same, of pattern mechanism, means for driving the embroidering-machine at different rates of speed and means controlled by the pattern mechanism for effecting the driving of the machine at different rates of speed.

9. In an embroidering mechanism, the combination of embroidering-needles and their actuating mechanism, a festoon apparatus and its actuating mechanism and pattern-controlled means for driving the embroidering-needle-actuating mechanism independently of the festoon apparatus.

10. In an embroidering mechanism, the combination of embroidering-needles and their actuating mechanism, a festoon apparatus and its actuating mechanism, and a tension device and its adjusting mechanism, and pattern-controlled means for increasing the tension when the festoon apparatus is in action, and for allowing it to assume its normal tension as determined by the adjusting mechanism when the festoon apparatus ceases to operate.

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