

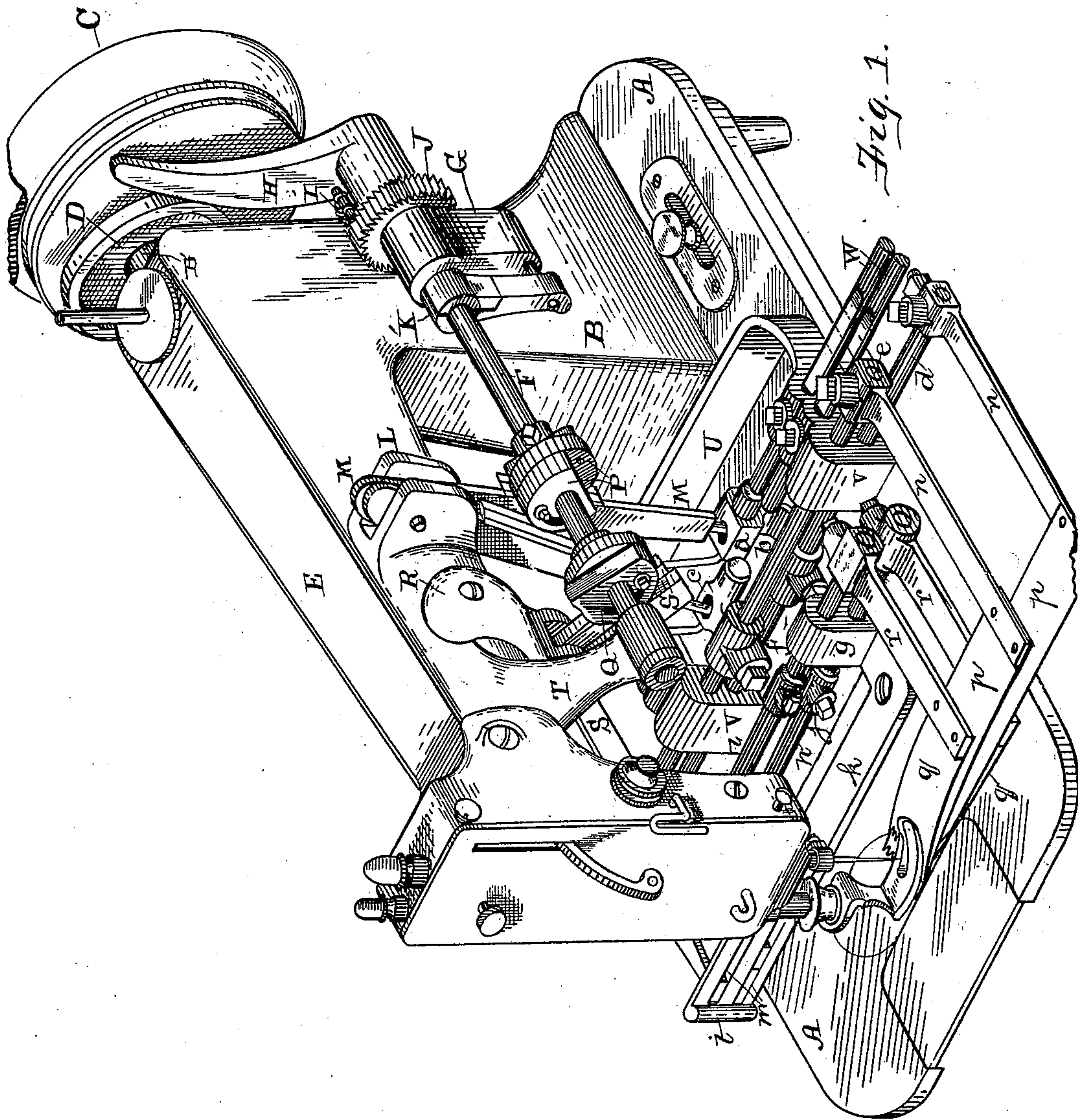
(No Model.)

3 Sheets—Sheet 1.

C. C. EMMONS.
PLAITING MACHINE.

No. 557,500.

Patented Mar. 31, 1896.



WITNESSES:

Geo. E. Frech.
Roland A. Fitzgerald.

INVENTOR

Charles C. Emmons

BY

Lehmann Patterson & Nesbit
ATTORNEYS.

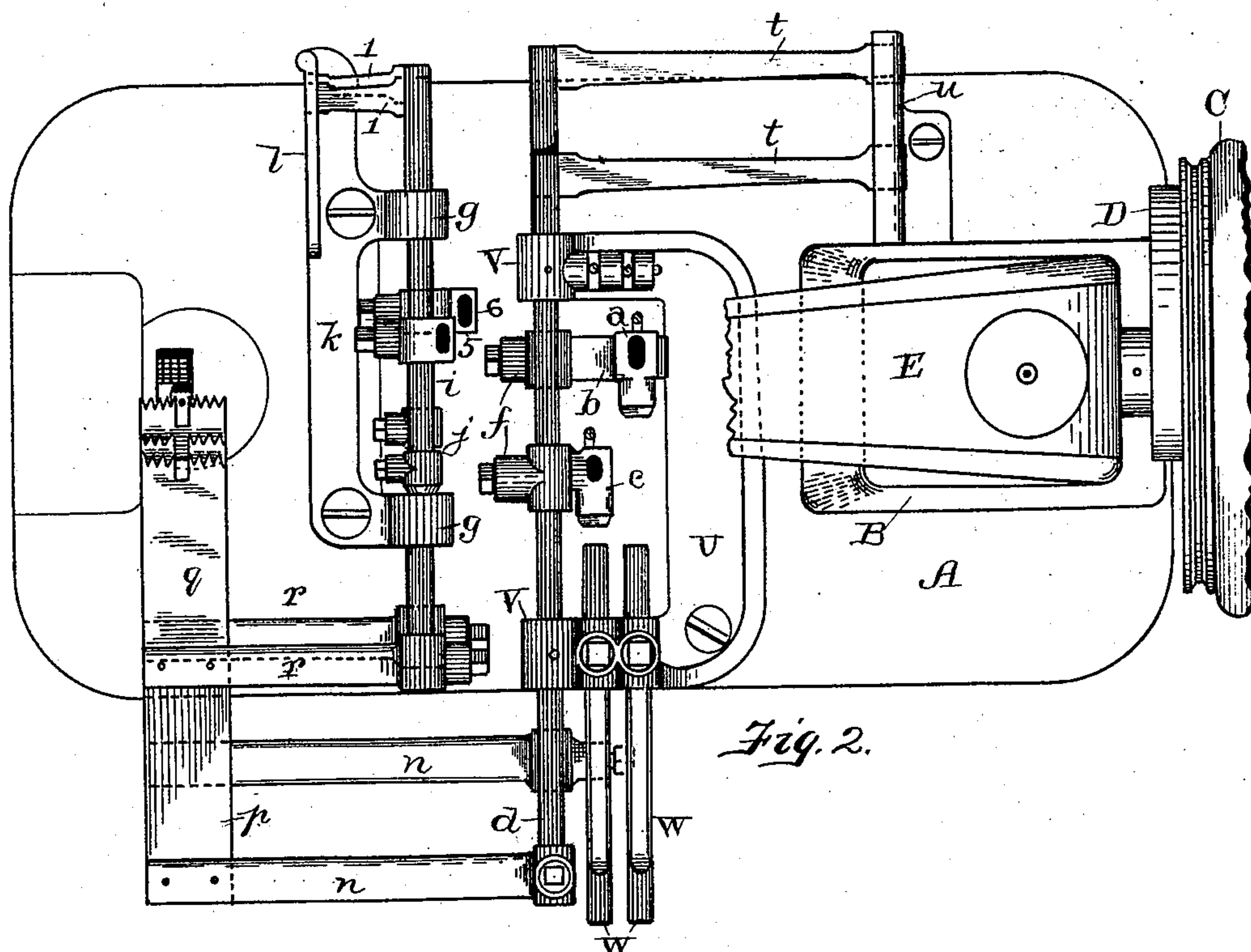
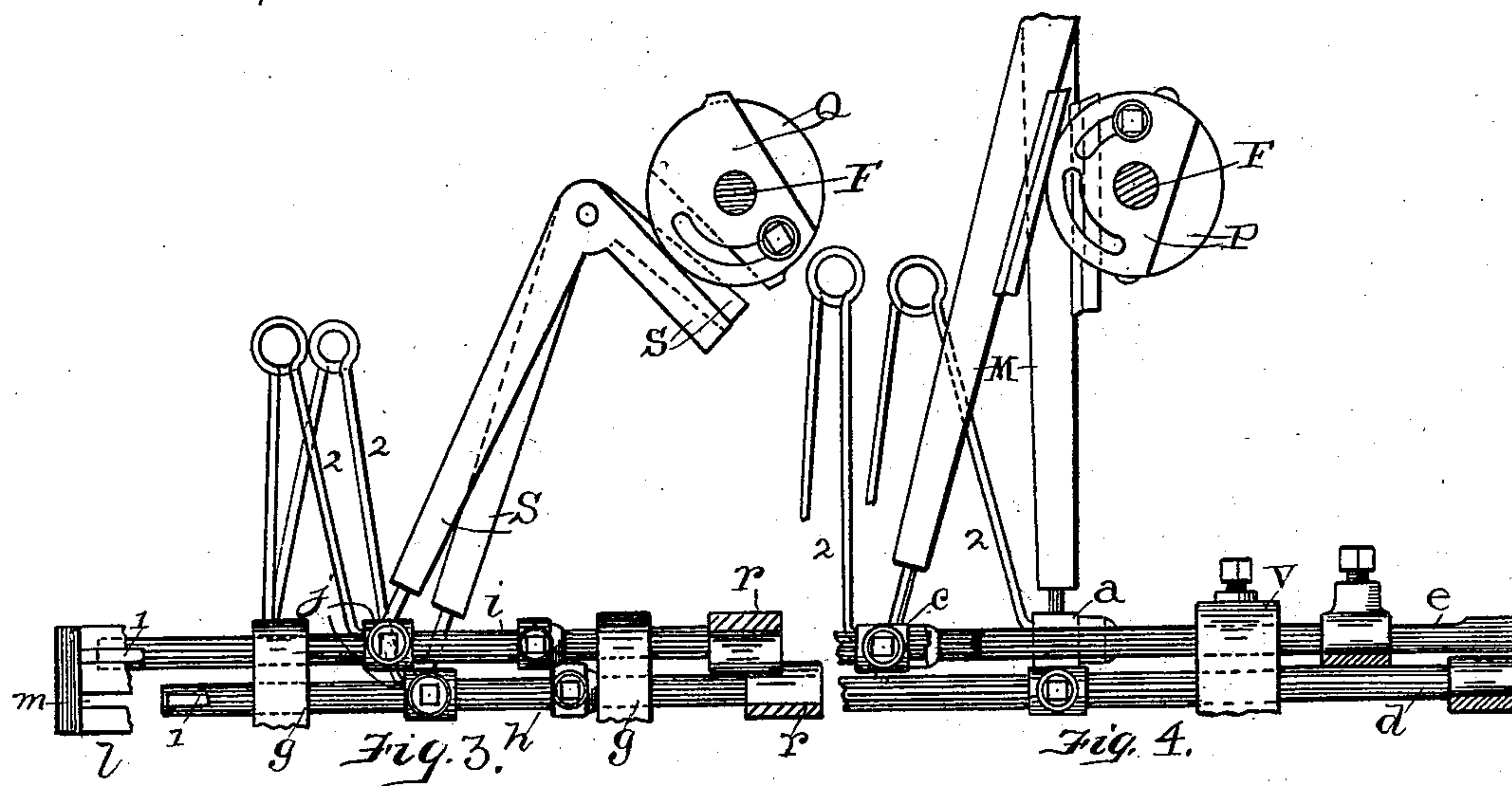
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WITNESSES:

Geo. C. Treck

Roland A. Fitzgerald

INVENTOR

Charles C. Emmons

BY

Lehmann, Attison & Nesbit

ATTORNEYS.

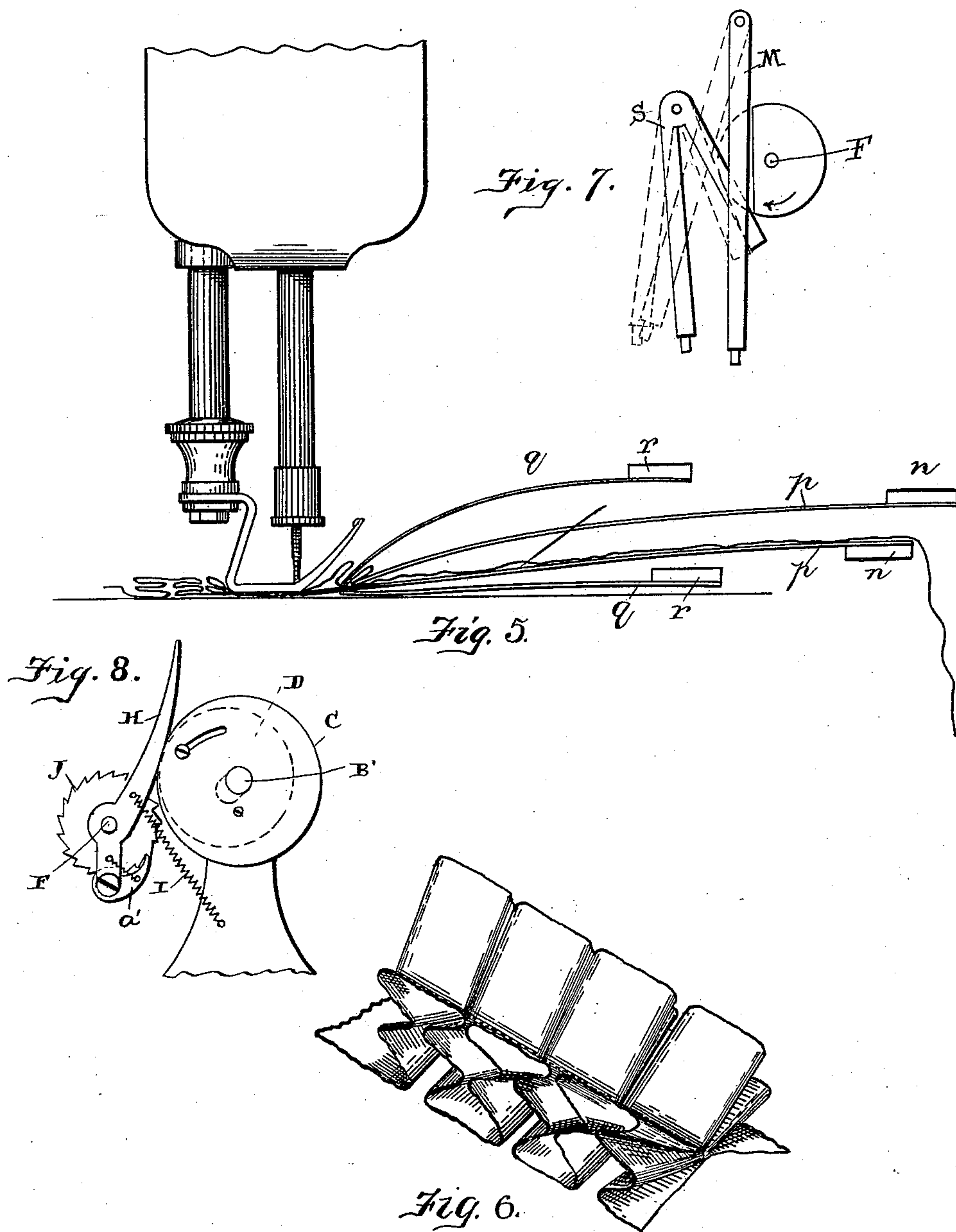
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PLAITING MACHINE.

No. 557,500.

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WITNESSES:

Geo. E. French.

Poland A. Fitzgerald

INVENTOR

Charles C. Emmons

BY

Lehmann Patterson Nesbit
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES C. EMMONS, OF PITTSBURG, PENNSYLVANIA.

PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 557,500, dated March 31, 1896.

Application filed January 13, 1892. Serial No. 417,986. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. EMMONS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain
5 new and useful Improvements in Plaiting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use
10 it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in machines for forming double box-plaits, which
15 will be fully described hereinafter and particularly pointed out in the claims.

The primary object of my invention is to produce a mechanism constructed to form a double box-plait in contradistinction to a
20 single box-plait, as has heretofore been done, by having four plaiter-blades which are arranged in upper and lower pairs in relation to a single-stitching mechanism, as will be hereinafter particularly specified.

25 In the drawings, Figure 1 is a perspective view showing my invention complete. Fig. 2 is a plan view of the same, the arm of the sewing-machine being removed. Fig. 3 is a side view of the short levers, the cams for operating them, and the plaiter-blade rods operated by the levers. Fig. 4 is a similar
30 view of the long levers. Fig. 5 is an end view of the plaiter-blades, showing them moving the goods to the needle. Fig. 6 is a perspective view of the double box-plait formed by the blades. Fig. 7 is a diagram showing how one set of blades is made to travel faster than the other. Fig. 8 is a detached view of the mechanism for revolving the cam-shaft F.

40 A indicates the base or bed of a sewing-machine of any desired type, and B and E the arm thereof, through which a needle-operating shaft B' passes in the ordinary manner for reciprocating the needle-bar, all of which
45 is so common and well known as to need no further description, as it forms no part of my invention.

50 The front end of the horizontal portion E of the arm of the machine is provided with a laterally and downwardly extending arm T and the vertical portion B with an arm or pro-

jection G, in which is journaled a shaft F, which extends parallel with the portion E of the machine-arm, as shown.

Connected with the arm G is a suitable
55 brake K, which incloses the shaft F and is split and held in frictional contact with the shaft in any desired manner for the purpose of preventing the shaft from having any backward movement, as will hereinafter appear. 60 Secured upon this shaft F, between the bearings, are two pairs of cams P and Q, one of each pair of the cams being held to the shaft by means of a set-screw, so that they can be adjusted longitudinally upon the shaft and
65 turned thereon and secured to the shaft to have their cam-faces at any desired angle to each other or parallel to each other, if desired, as will be readily understood. The other cam of each pair is made adjustable in a rotary
70 direction upon the cams just described, which are secured to the shaft, so that they can be turned in any desired relation to each other and to the cams to which they are respectively secured. The object of this construction will be described farther on. 75

Secured to the right-hand end of the shaft F is a ratchet-wheel J, and placed loosely upon the shaft outside of the said wheel J is a ratchet-lever H, which has its inner face
80 curved, as shown, to engage a cam D, which is adjustably secured to the pulley C, that is fastened to the outer end of the shaft B'. This ratchet-lever H is held in contact with the face of the cam D by means of a suitable
85 spring I, that has one end secured to the lever and the other to the arm of the machine in any desired manner. A pawl a' upon the ratchet-lever is held in contact with the ratchet-wheel J by means of a suitable spring,
90 so that as the pulley C revolves the cam reciprocates the lever and revolves the shaft F through the medium of the ratchet-wheel and pawl, as will be understood. The amount of rotation given to this shaft F at each re-
95 ciprocation of the ratchet-lever is regulated by the adjustable cam D. By moving this cam farther away from or nearer to the center of the shaft B' the reciprocating movement of the ratchet-lever is regulated, and
100 thus the pawl carried thereby made to pass over one or several of the teeth of the ratchet-

wheel, and the shaft F made to revolve a short or long distance, as desired, thus regulating its speed of rotation, and thereby the speed of the plaiter-blades controlled and regulated.

5 Projecting laterally from the side of the horizontal portion E of the machine-arm are two lugs L, between which the upper ends of the levers M are pivoted. Also extending downward and inward from the arm E is a
10 projection R, which has its inner or lower end farther from the shaft F than the lugs L, and between the bifurcated ends of this projection R the bell-crank levers S are pivoted, as shown.

15 Secured to the base A of the machine near the vertical portion of the arm is a frame U, which is essentially U-shaped, as shown in Fig. 2, and provided at its ends with the bearings V, in which two reciprocating plaiter-
20 blade rods *d* and *e* move. Secured to the projecting ends of these rods are the plaiter-blade hangers *n n*, which carry at their outer ends the plaiter-blades *p p*. Secured to the rod *e* is a socket *c*, in which the lower end of one
25 of the long levers M loosely rests, and secured to the lower rod *d* by means of a curved portion *b*, to allow the passage of the socket *c* over it, is a socket *a*, which loosely receives the lower end of the other long lever M.
30 These levers M are engaged by the cams P, as shown, and force them inward, thus carrying the rods *d* and *e* with them and bringing the plaiter-blades *p* to the needle.

A second frame *k* is secured to the base A
35 near the presser-foot and is provided with the two bearings *g*, in which the plaiter-blade rods *h i* reciprocate. Secured to the outer ends of these rods *h* and *i* are the horizontal arms *l*, which engage slots *m*, made in a vertical por-
40 tion *l* of the frame *k*, and which prevent the rods *h* and *i* from having any turning movement in their bearings. The rods *d* and *e* are likewise provided with horizontal arms *t*, which extend in the opposite direction from
45 the arms *l* and engage horizontal slots made in a guideway *u*, secured to the rear portion of the base A. Connected to the opposite ends of the rods *h* and *i* are the plaiter-blade hangers *r*, which have attached to their outer
50 ends the plaiter-blades *q*. The rod *h* is provided with a socket *6*, in which the long end of one of the short bell-crank levers S loosely fits, and the rod *i* is provided with a socket *5*, which receives the long end of the other bell-
55 crank lever. The short ends of these bell-crank levers S engage the cams Q and are forced outward, carrying with them the rods *h* and *i* and the plaiter-blades *q*, connected therewith.

60 The rods *d* and *e* and *h* and *i* are returned to position by means of the springs 2, which have one end engaging therewith and their opposite ends connected to a stationary portion of the machine. Placed upon the rods
65 *h* and *i* are the collars *j*, which are adjustably held thereon by means of a set-screw, and

these collars engage the bearings *g* of the frame *k* and regulate the outward movement of the said rods under the pressure of the springs 2. So, also, the inward movement of
70 the rods *d* and *e* is regulated by the adjustable rods W, which engage with the sockets *c* and *a*.

The sockets *c* and *a* and the collars *j* are each provided with rawhide to deaden the
75 sound when they are stopped. Owing to this adjustment of the movement of the rods *d* and *e* and the rods *h* and *i* the amount of inward movement thereof by the cams, through the medium of the levers, can be regulated at
80 will, and thus the width of the plait regulated. This is so because by the adjustment of the collars *j* and the rods W the plaiter-blades can have their resting-point brought
85 nearer to or farther from the needle, and as each blade is moved to the needle each time the width of the plait is regulated by adjusting the distance of their movement under the pressure of the springs.

The direction of rotation of the shaft is in-
90 dicated by the arrow in Fig. 7, and by reference to this figure it will be seen that the pivotal points of the levers M are considerably above the pivotal points of the levers S, and the pivotal points of the last-named le-
95 vers are farther in a horizontal direction from a vertical line drawn through the operating-shaft than the pivotal points of the levers M. As the lower periphery or edge of the cams is revolving toward the levers, it
100 will be seen that the lower ends of the levers M move faster than the lower ends of the levers S, and yet they are both moved at the same time, as will be plainly seen by reference to the above-named figure. Owing to
105 this arrangement, as shown in Fig. 7, the upper blade *q*, operated by the rod *i*, and the upper blade *p*, operated by the rod *e*, can be started at the same moment, each making a plait, and reach the needle at the same time,
110 since the blade *p* travels faster than the blade *q*, which is operated by the short lever S. From this description it will be seen that one of the upper blades is moved by one of the long levers M and the other upper
115 blade moved by one of the short levers S. Thus it is that the blades are arranged in pairs, one blade of each pair being above and below the goods, respectively, so that a fast and a slow blade operate together both above
120 and below the fabric. The goods being operated upon pass between the two blades *p*, which are operated by the long levers M, as shown in Fig. 5.

By means of the above-described construc-
125 tion a double box-plaiting like that shown in Fig. 6 is formed, instead of a single box-plaiting, as has heretofore been the case.

By means of the adjustment of the cams P and Q the blades above the goods can be
130 moved alternately and the blades below the goods made to operate in unison therewith,

or the cams can be adjusted in any desired relation, so that the blades will operate successively one after the other or in any desired relative movement, as will be understood.

Having thus described and ascertained the nature and object of my invention, what I claim, and desire to secure by Letters Patent, is—

10 1. A plaiting device comprising four reciprocating plaiter-rods, arranged in pairs, a stitching mechanism, one pair of the rods being farther from the said stitching mechanism than the other, a means for operating the
15 said rods, and hangers secured to the rods which are of different lengths to reach to the said stitching mechanism, and plaiter-blades secured to the free ends of the said hangers, substantially as specified.

20 2. A plaiting device comprising four blades arranged in upper and lower pairs, four levers for operating the said blades, a shaft carrying an operating means which engages the said levers, two of the said levers being
25 shorter than the other two, and the shorter levers being pivoted farther from the said

shaft than the two long levers as and for the purpose described.

3. A plaiting device comprising four blades, four levers for operating the said blades, two 30 of the levers being bell-crank levers, and the other two straight levers, and an operating-shaft carrying cams which engage the said straight levers and the short ends of the said bell-crank levers, substantially as specified. 35

4. A plaiting device comprising a blade, a lever for operating the same, a shaft for operating the lever carrying a ratchet-wheel, a ratchet-lever for operating the said wheel, combined with a sewing-machine shaft carry- 40 ing a cam adjustable eccentrically in relation to its shaft which cam engages the said ratchet-lever, whereby the amount of movement given the ratchet-lever is regulated, and thereby the rotation of the said operating- 45 shaft regulated, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. C. EMMONS.

Witnesses:

H. C. AVERY,
L. F. M. WYATT.