No. 671,791. Patented Apr. 9, 1901.

D. L. CHANDLER.

PLAITING MACHINE.

(Application filed Dec. 11, 1900.)

(No Model.) 3 Sheets—Sheet 1.

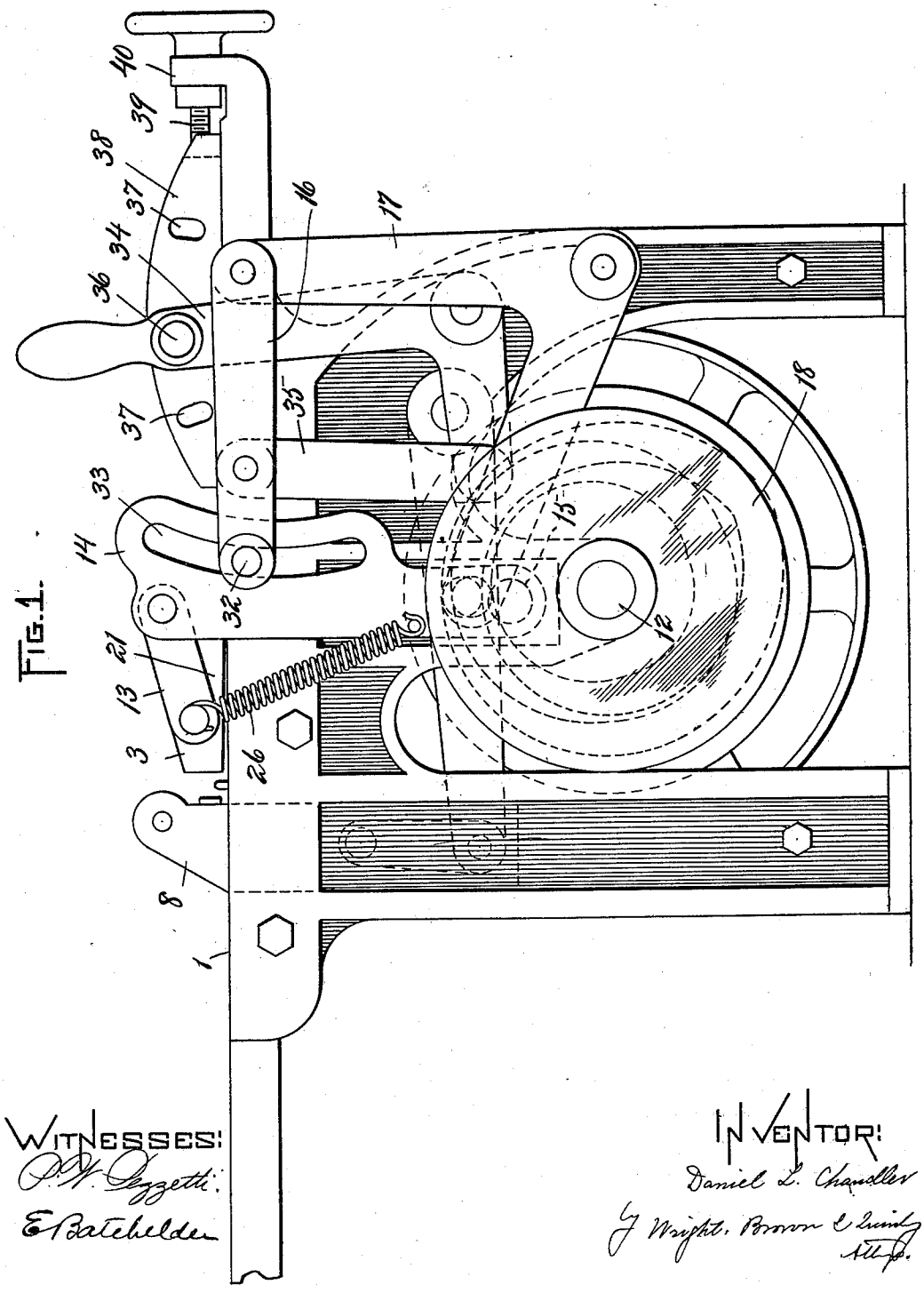


FIG. 1.

WITNESSES:
P. F. Pezzetti.
E. Batchelder

INVENTOR:
Daniel L. Chandler
by Wright, Brown & Quinby
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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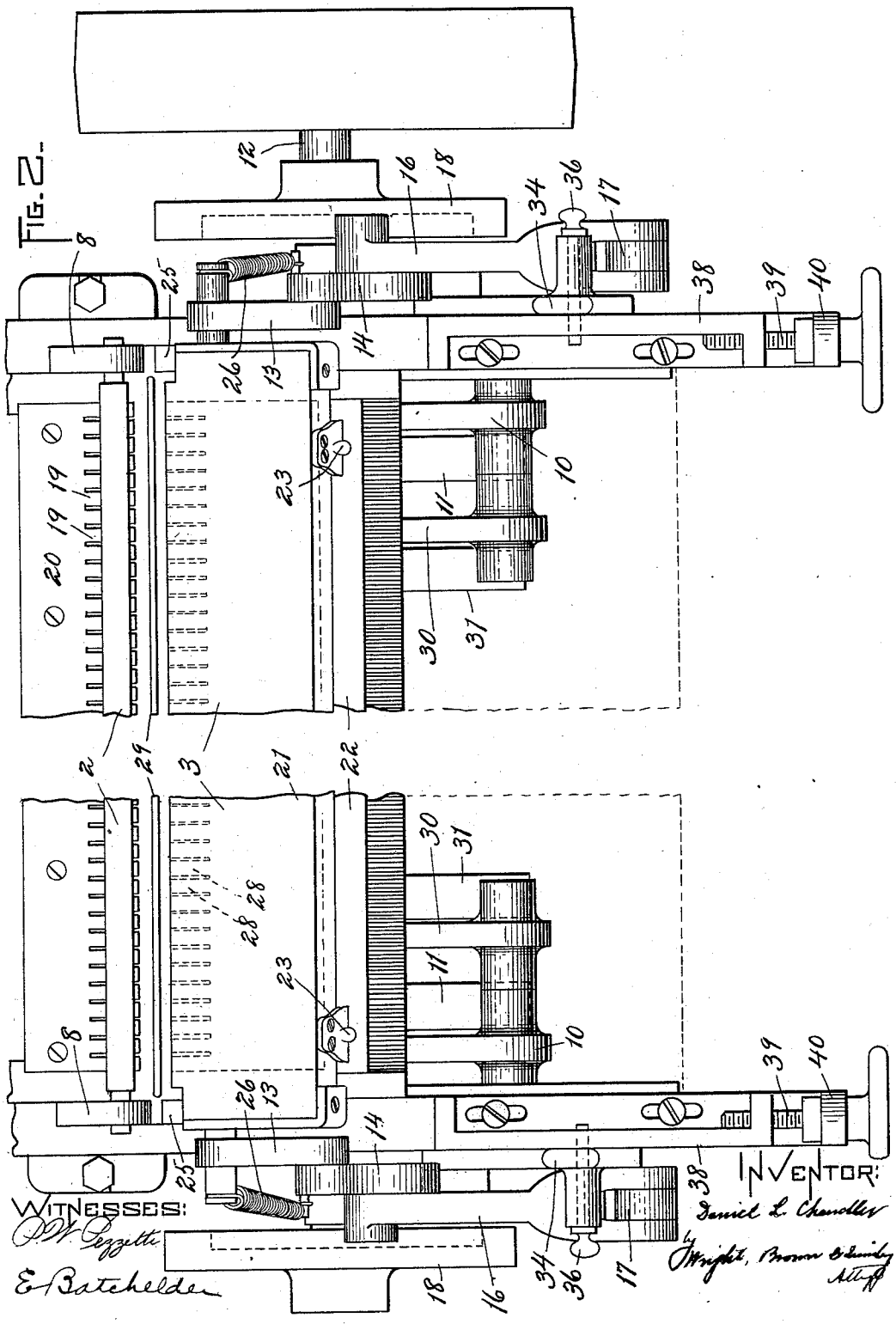
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(No Model.) 3 Sheets—Sheet 2.

FIG. 2.



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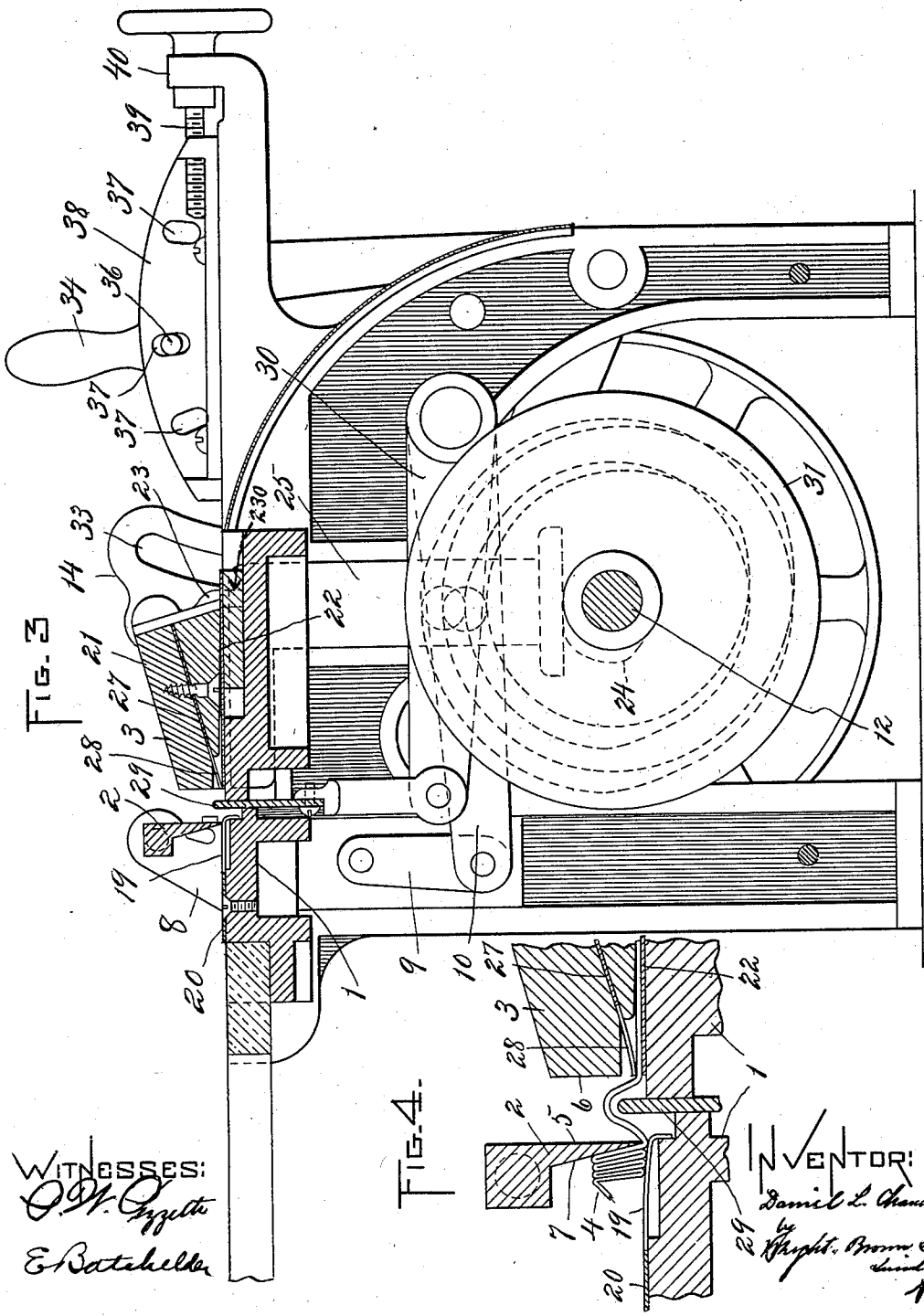


FIG. 3.

FIG. 4.

WITNESSES:
O. M. Gazette
E. Batchelder

INVENTOR:
Daniel L. Chandler
by Wright, Brown & Quinby
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DANIEL L. CHANDLER, OF AYER, MASSACHUSETTS, ASSIGNOR TO GEORGE J. BURNS, OF SAME PLACE.

PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,791, dated April 9, 1901.

Application filed December 11, 1900. Serial No. 39,487. (No model.)

To all whom it may concern:

Be it known that I, DANIEL L. CHANDLER, of Ayer, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Plaiting-Machines, of which the following is a specification.

This invention relates to plaiting-machines for forming a web of cloth or other fabric into a series of plaits or folds, and it is in part an improvement on the machine described in a copending application, Serial No. 23,196, filed by me July 11, 1900.

The principal object of the present invention is to handle with greater facility hemmed or seamed fabrics or those having an ununiform thickness in different parts, such fabrics being difficult to plait or fold properly in prior machines on account of the imperfect action of the plaiting-jaws on a seamed or hemmed fabric.

The invention consists in certain novel features of construction and arrangement, which I shall now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a plaiting-machine constructed in accordance with my invention. Fig. 2 represents a plan view thereof, partly broken away. Fig. 3 represents a longitudinal vertical section. Fig. 4 represents a detail sectional view showing the action of the folded jaws.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 represents a fixed bed or table. 2 represents an abutment-jaw, having a reciprocating movement at right angles to the upper surface of the table 1, and 3 represents a pushing-jaw, having a movement parallel to the surface of the table. The fabric 4 to be folded or plaited is fed in a direction parallel to the surface of the table and is folded by the action of the jaws 2 3, each successive fold or plait being subjected to pressure between the opposed vertical pressing-faces 5 6 of the two jaws. The abutment-jaw 2 stays in its depressed or projected position, so that its lower edge will hold the fabric during the time that the pushing-jaw 3 makes a retracting stroke to gather material for a new fold and moves forward to raise the fold and subject it to pressure between the pressing-faces of the two jaws. The abutment-jaw then rises to release the fold which has been made and again descends to hold or clamp the fabric. The rear face 7 of the abutment-jaw is beveled or inclined and forms a sharp edge with the front face 5 of said jaw, the said inclined face serving to feed the folded or plaited fabric forward.

Mechanism is provided as follows for operating the abutment-jaw 2 and pushing-jaw 3: The abutment-jaw is mounted between two vertically-moving slides 8 8, connected by links 9 with pivoted levers 10, which are oscillated by means of cams 11 on a power-shaft 12. The pushing-jaw 3 is connected by links 13 with oscillatory levers 14, pivoted at 15 to the machine-frame, said levers being connected by links 16 with bell-crank levers 17, oscillated by cams 18 on the power-shaft 12.

In accordance with my present invention I provide underneath the lower edge of the abutment-jaw 2 a bed composed of a series of spring-fingers 19 19, formed upon a comb-plate 20, secured to the upper surface of the table 1. The fabric passes over this comb-plate, and the lower edge of the abutment-jaw 2 coöperates with the spring-fingers 19 in gripping or holding said fabric. These yielding fingers being independently movable insure that the fabric will be held at all points throughout its width. Uniform pressure or holding action is important in the case of fabrics which are longitudinally ribbed or seamed, for with a rigid abutment-jaw in the bed such a seamed fabric would not be properly held on the portions adjacent to the seam or hem, owing to the extra thickness of cloth at the seam or hem. In my improved construction when there is a seam or hem it will depress the spring finger or fingers immediately underneath it, while the remaining ones will be unaffected.

The pushing-jaw 3 is shown as composed of an upper reciprocating part 21 and a lower reciprocating part 22, between which the fabric passes. The lower part 22 is a plate connected with the upper part 21 by lugs 23, en-

tering holes 230 in said plate, whereby the two parts of the jaw are reciprocated in unison. The lugs 23 and holes 230 constitute a vertical sliding connection between the two parts. On the retracting stroke of the pushing-jaw this upper portion 21 is raised from the fabric by the action of cams 24, Fig. 3, on vertically-moving slides 25, whose upper ends are adapted to support the two ends of the said jaw member 21. Said jaw member is normally depressed upon the fabric by means of springs 26. In my pending application hereinbefore referred to the roughened under surface of the pushing-jaw was relied on to feed the fabric forward in forming the plait. In place of said construction I now provide a comb-plate 27, fixed to the upper jaw member 21 in an inclined position and having a series of independent spring-fingers 28 28 formed on its forward end, the free ends of said fingers being adapted to come in contact with the fabric and grip the same in conjunction with the plate or member 22 underneath the fabric. The independent movability of these spring-fingers insures the proper engagement of the pushing-jaw with a seamed or hemmed fabric throughout the width of said fabric and prevents the slipping of the fabric and the consequent irregular folding. These two features of construction—namely the two parts of the pushing-jaw and the spring-fingers on the pushing-jaw—by their individual action and coöperation insure the proper folding or plaiting of seamed or hemmed fabrics and also of double fabrics, as where a web of paper is folded with the web of cloth, in order to prevent the cloth part when seamed from "tumbling" or losing the shape of its plaits or folds after being formed. The coöperating members 21 22 of the pushing-jaw grip the cloth and the paper firmly and prevent either of the two from slipping, while the spring-fingers 28, coöperating with the forward end of the under member 22, insure an even pressure at all points throughout the width of the fabric.

In folding a web of paper with the web of cloth it is sometimes found that the two will not break or start the fold properly when the pushing-jaw moves forward on account of the stiffness of the combined webs. This results in imperfect plaiting and puts an undue strain on the jaws. In order to properly break the fabric or start the fold, I have introduced a blade 29, which operates from the under side of the table 1 in front of the pushing-jaw 3. This blade I term a "fold-starter." It is actuated by means of pivoted levers 30 30, oscillated by cams 31 31 on the power-shaft 12. When the pushing-jaw starts to move forward from its retracted position, the blade 29 starts upwardly and rises a sufficient distance to bend the fabric upwardly, as shown in Fig. 4, and then descends out of the way of the pushing-jaw before the latter reaches the abutment-jaw 2. It will be seen that the blade 29 is not a jaw or instrumentality coöperating with the abutment-jaw to fold and press the fabric, but is merely a fold-starter, whose function is entirely performed after the folding operation has begun and before the fold is finished.

The links 16, which connect the bell-crank levers 17 with the oscillating levers 14 on opposite sides of the machine, are pivotally connected at 32 with said levers 14, and elongated slots 33 are formed in the levers 14 to accommodate the pivot-studs 32 and enable the pivot connection to be shifted toward or away from the fulcrums 15 of the levers 14. Since the bell-crank levers 17 have a constant throw, this shifting of the ends of the links 16 will have the effect of varying the arc of movement of the levers 14, and hence the stroke of the pushing-jaw 3 and the width of the plaits or folds in the fabric. The links 16 are shifted by means of bell-crank levers 34 34, pivoted on opposite sides of the machine and having handles at their upper ends, whereby they may be grasped and operated. The lower arms of said levers are connected by links 35 with the links 16. This form of connection enables the links 16 to be shifted while the machine is in motion. The levers 34 are provided with pins 36, adapted to fit in any one of a series of holes 37 37, formed in two slides 38 38 on opposite sides of the machine, whereby the levers 34 may be fixed at different positions to correspond with different widths of plait.

It is often difficult to feed a fabric, and particularly a double fabric of cloth and paper, properly into the machine, keeping both of them straight. In order to overcome this difficulty, I provide for independently adjusting the throw of the two ends of the pushing-jaw 3. As herein shown, this is accomplished by allowing a certain amount of freedom of movement in the link connections 13 and furnishing a screw adjustment for the slides 38, comprising screws 39 39, mounted or rotated in ears 40 40 on the machine-frame and engaged with each of the slides 38. By independently manipulating the screw on either side of the machine the length of stroke of the corresponding end of the pushing-jaw may be varied without varying the length of stroke of the other end.

I claim—

1. A plaiting-machine comprising a pushing-jaw and an abutment-jaw adapted to form a fold between them, and a bed opposed to the abutment-jaw and adapted to coact therewith in holding the fabric during the retraction of the pushing-jaw, said bed being composed of independently-movable yielding sections adapted to individually coact with the abutment-jaw across the width of the fabric.

2. A plaiting-machine comprising a pushing-jaw and an abutment-jaw adapted to form a fold between them, and a bed opposed to the abutment-jaw and adapted to coact there-

with in holding the fabric during the retraction of the pushing-jaw, said bed being composed of a series of independently-movable spring-fingers coextensive with the acting portion of the abutment-jaw.

3. A plaiting-machine having a pushing-jaw composed of upper and lower opposed portions adapted to grip the fabric between them, mechanism connected with the upper portion for reciprocating the whole jaw and for raising and lowering the said upper portion, and a vertical sliding connection between said portions.

4. A plaiting-machine comprising a reciprocating pushing-jaw, an oscillatory lever adapted to reciprocate said jaw, a lever-oscillating device having a constant throw and a connection with said lever movable toward and from the fulcrum of the lever to vary the stroke of the pushing-jaw, a stationary controlling member adapted to shift said connection while the jaw is in motion, and means to fix said controlling member in different positions corresponding to different lengths of stroke of the jaw.

5. In a plaiting-machine, a pushing-jaw, and mechanism to reciprocate the same, said mechanism having provisions for imparting different lengths of stroke to the opposite ends of said jaw.

6. In a plaiting-machine, a pushing-jaw, mechanism to reciprocate the same and means to independently vary the length of stroke of the two ends of said jaw.

7. In a plaiting-machine, a pushing-jaw, mechanism to reciprocate the same, devices adapted to independently vary the stroke of the two ends of said jaw, and independent screw adjustments for said devices.

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

DANIEL L. CHANDLER.

Witnesses:
WARREN H. ATWOOD,
C. A. BATCHELDER.