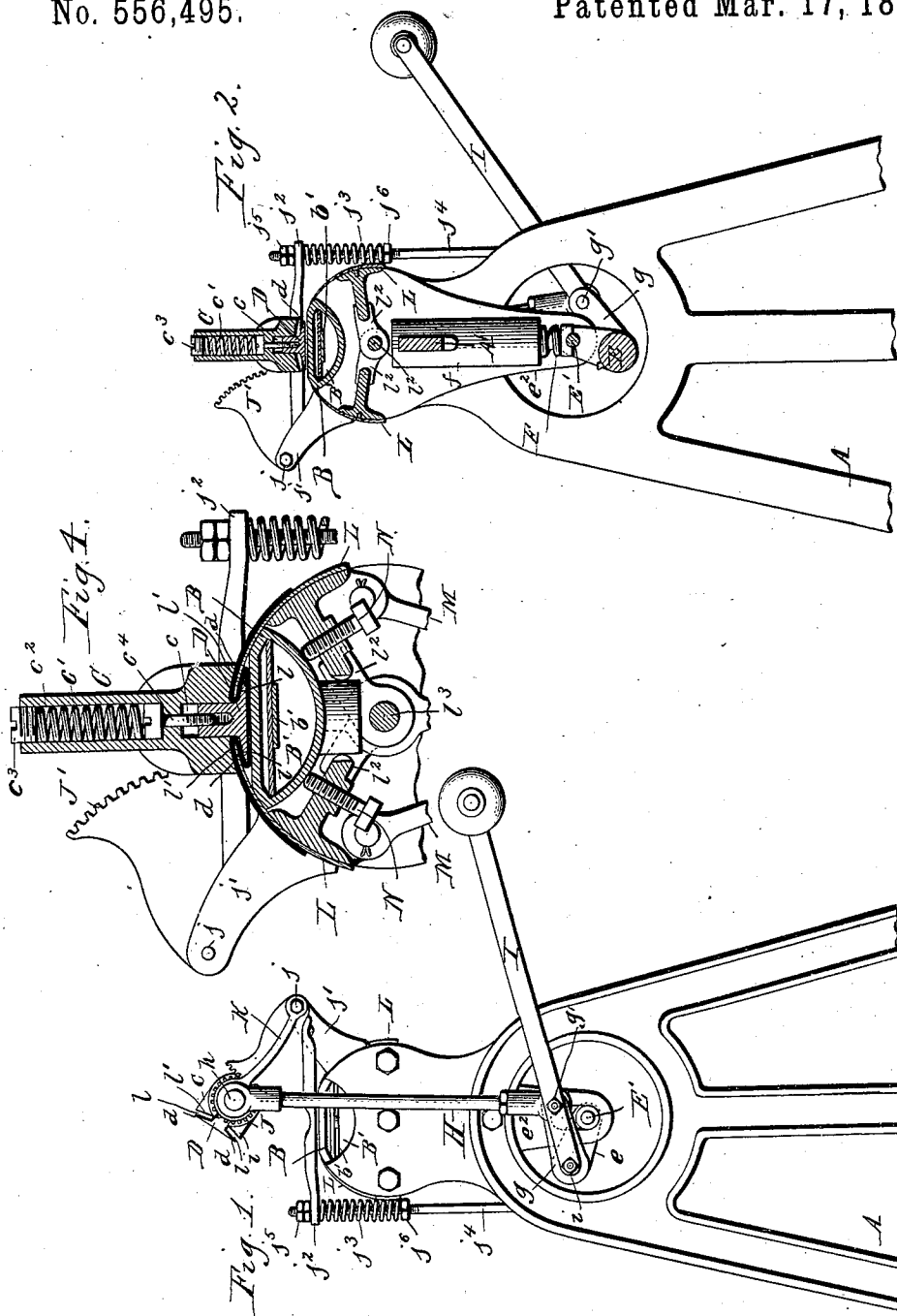


4 Sheets—Sheet 1.

No. 556,495.

Patented Mar. 17, 1896.



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(No Model.)

4 Sheets—Sheet 2.

J. DUMVILLE, Jr. & C. HOLLY.
PLAITING MACHINE.

No. 556,495.

Patented Mar. 17, 1896.

Fig. 5

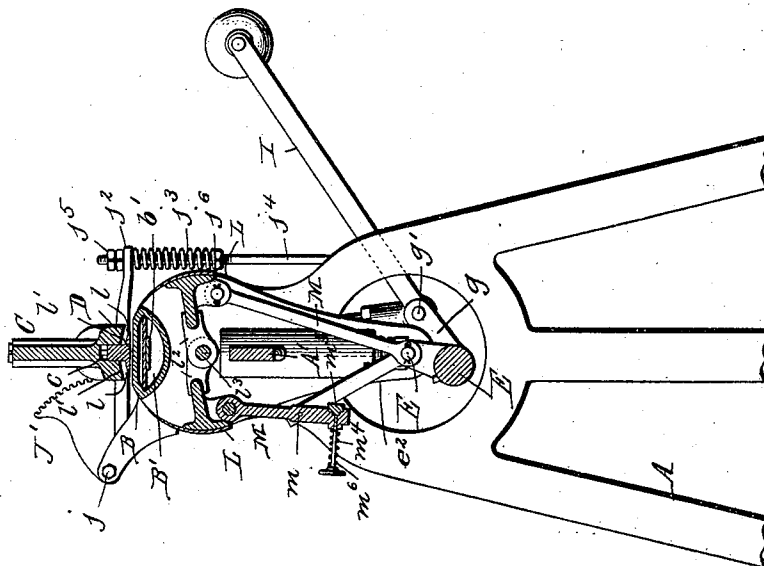
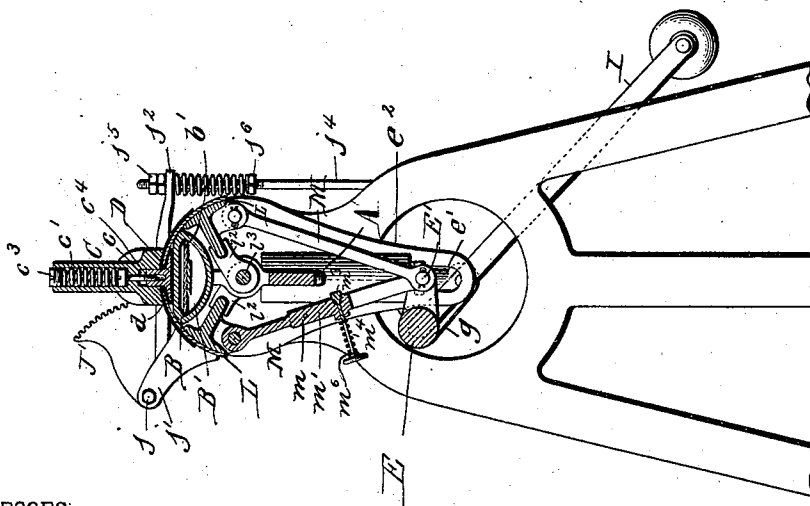


Fig 3.



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4 Sheets—Sheet 3.

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PLAITING MACHINE.

No. 556,495.

Patented Mar. 17, 1896.

Fig. 6.

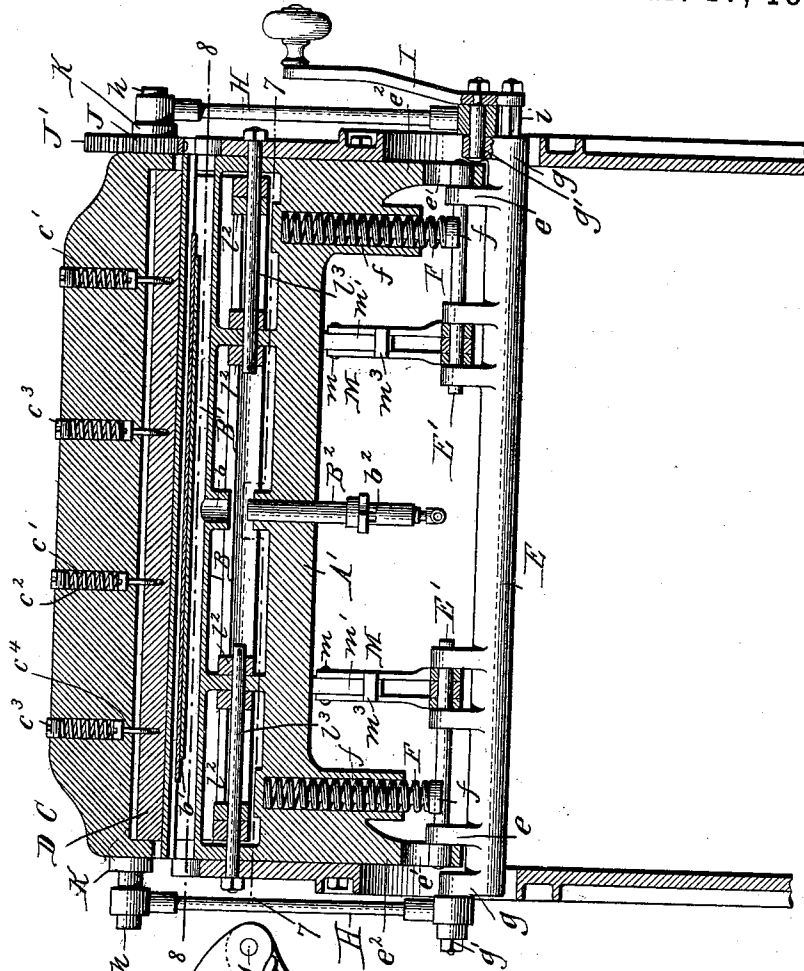
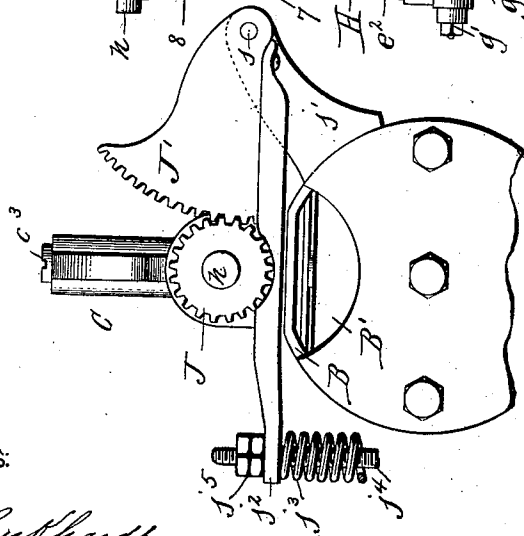


Fig. 12.



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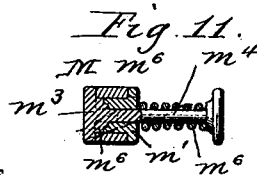
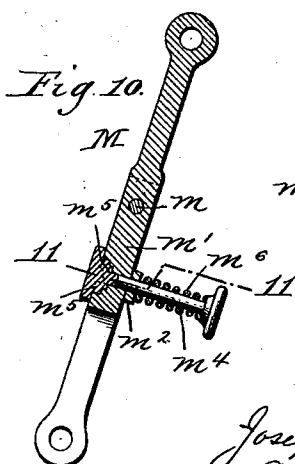
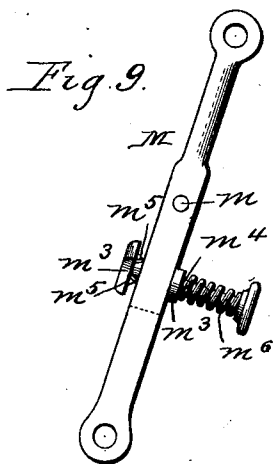
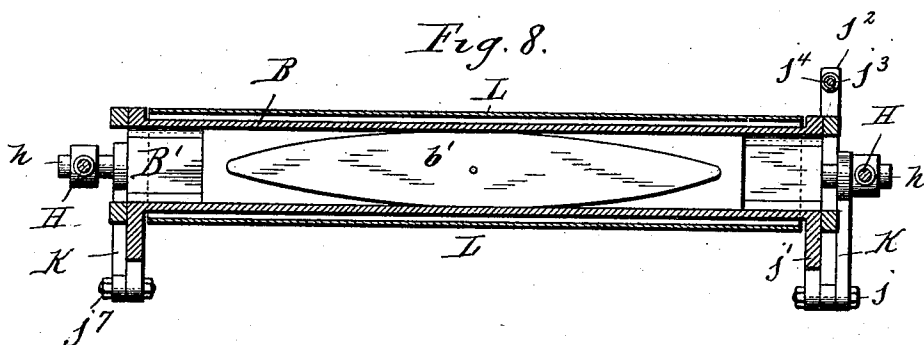
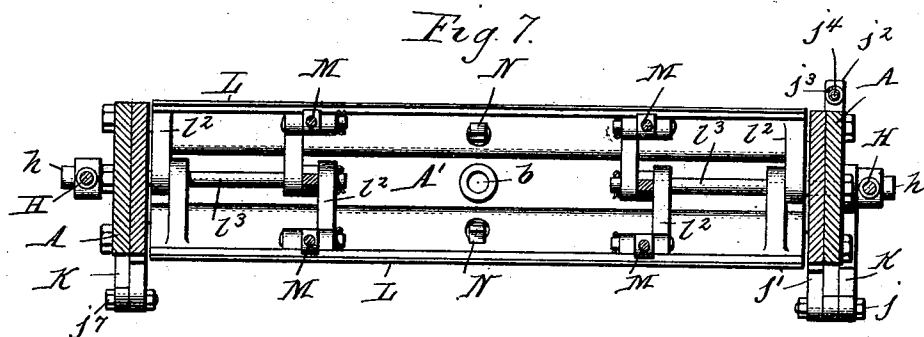
(No Model.)

4 Sheets—Sheet 4.

J. DUMVILLE, Jr. & C. HOLLY.
PLAITING MACHINE.

No. 556,495.

Patented Mar. 17, 1896.



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PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,495, dated March 17, 1896.

Application filed October 17, 1895. Serial No. 565,953. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH DUMVILLE, Jr., and CARLOS HOLLY, citizens of the United States, residing at Lockport, in the
5 county of Niagara and State of New York, have invented a new and useful Improvement in Plaiting-Machines, of which the following is a specification.

This invention relates to a machine for
10 plaiting fabrics, and designed more especially for plaiting shirt-bosoms.

Our invention has for its object to produce an efficient machine of this character which is easily manipulated and which performs the
15 plaiting operation in an expeditious manner.

In the accompanying drawings, consisting of four sheets, Figure 1 is a fragmentary side elevation of our improved machine, showing the presser-head and former raised for clearing the bed or mandrel. Fig. 2 is a vertical
20 section of the machine, showing the presser-head and former swung down. Fig. 3 is a section of the upper portion of the machine, showing the presser-head and former lowered and in position to co-operate with the folders. Fig. 4 is a similar section of the machine on an enlarged scale. Fig. 5 is a view similar
25 to Fig. 2, showing one of the folders thrown out of gear for forming a single plait. Fig. 6 is a sectional elevation of the machine at right angles to Fig. 1. Fig. 7 is a horizontal section of the machine in line 7 7, Fig. 6. Fig. 8 is a similar section in line 8 8, Fig. 6, looking upward. Fig. 9 is a detached side
30 elevation, on an enlarged scale, of one of the links whereby motion is transmitted from the oscillating bar to the folders. Fig. 10 is a longitudinal section thereof. Fig. 11 is a cross-section thereof in line 11 11, Fig. 10. Fig. 12 is a side elevation of the gear-segment and gear-wheel of the presser-head and connecting parts.

Like letters of reference refer to like parts in the several figures.

45 A represents the upright side frames of the machine, which are connected at their upper ends by a bar or frame A'.

B is a horizontal bed or mandrel which is arranged above the frame A' and upon which
50 the shirt-bosom or other article to be plaited is placed. This bed is preferably formed in-

tegral with the connecting-frame A', as shown in Fig. 6, and is made hollow, so as to form a heating-chamber B' within the same. B² is a gas-burner of any ordinary construction
55 arranged underneath the middle of the chambered mandrel and supported on the connecting-frame A'. The chamber of the mandrel is provided on its under side, above the gas-burner, with an opening b, through which
60 the flame from the burner enters the chamber.

b' is a horizontal spreader or deflecting-plate arranged lengthwise within the heating-chamber, whereby the heat is directed toward
65 opposite ends of the chamber and distributed throughout the length thereof. The ends of the chamber are open to permit the escape of the products of combustion.

The gas-burner is supplied from a convenient source and is preferably provided with
70 an air-mixer b² of any common construction.

C is a vertically-movable presser-head arranged lengthwise above the mandrel B, and D is a former arranged at the lower end of the presser-head and carried by the latter.
75 This presser-head extends from end to end of the mandrel. The former D consists of a body or bar and flanges d arranged at the lower end of said body on its front and rear sides. The body of the former is guided in
80 a vertical groove or recess c formed lengthwise in the under side of the presser-head and is rendered yielding therein by springs c' arranged in vertical sockets c² formed in the presser-head and bearing at their upper
85 ends against screw-plugs c³, which close the upper ends of said sockets, and at their lower ends against the heads of vertical bolts or screws c⁴, secured to the upper side of the former and passing loosely through openings
90 formed in the bottom of said sockets, as shown in Figs. 2, 3, 4 and 6.

E is an oscillating bar or frame which is arranged lengthwise below the connecting-frame A' and from which the vertically-mov-
95 able presser-head and former are operated. This oscillating bar is hung by means of arms or hangers e from horizontal pivot rods or shafts E', which are arranged over the end portions of the oscillating bar E. These
100 pivot-rods are arranged at their outer ends in vertical slots e' formed in brackets e², de-

pending from the connecting-frame A', as shown in Figs. 1, 3 and 6. The pivot-rods E' are capable of sliding vertically in the slots e' and are yieldingly held in their depressed position by springs F. These springs are arranged in vertical sockets f formed in the lower portion of the connecting-frame A' and bear at their upper ends against the upper ends of the sockets and at their lower ends against the heads of vertical bolts f'. These bolts are surrounded by the springs and their heads bear upon the pivot-rods E'. The oscillating bar E is provided at opposite ends with cranks g, which extend rearwardly therefrom in the normal or initial position of the bar in which the presser-head is elevated, as shown in Fig. 1.

H represents rods which connect the vertically-movable presser-head with the cranks of the oscillating bar and whereby said head is raised upon swinging the bar forwardly and upwardly and lowered upon swinging the same downwardly and rearwardly.

The connecting-rods H embrace at their upper ends the journals or trunnions h at opposite ends of the presser-head, and at their lower ends the wrist-pins g' of the cranks of the oscillating bar, as shown in Fig. 6.

I is a hand-lever secured to one end of the oscillating bar E, preferably the right-hand end, whereby the bar is actuated. This bar is preferably provided at its end with an extension or reduced portion i, to which the inner end of the lever is rigidly secured.

In order to facilitate the removal of the plaited article from the former D, the movement of the former and of the presser-head is such that in elevating the presser-head these parts swing forwardly and upwardly, so that the former is inverted and presented in an upwardly-inclined position to the operator, as shown in Fig. 1. For this purpose the presser-head is provided with a gear-wheel J, which meshes with an upright gear-segment J', arranged at the top of the machine in rear of said gear-wheel. This segment is stationary relatively to the gear-wheel, whereby the wheel is caused to roll up on the segment as the presser-head is being raised, thereby causing the presser-head to turn forwardly and upwardly to the position shown in Fig. 1. The gear-segment recedes upwardly and rearwardly and the presser-head, in ascending, is therefore caused to move rearwardly as well as upwardly, thereby leaving the top of the mandrel unobstructed and giving the operator a clear view of the mandrel for centering or adjusting the bosom thereon.

The gear-segment J' is mounted upon a horizontal pivot j, secured to a lug j', projecting rearwardly from the adjacent side frame. The segment is provided with an arm j², which extends forwardly under the gear-wheel of the presser-head. The arm j² rests with its front portion upon a spring j³, which sur-

rounds a fixed upright rod j¹, extending upward from the side frame.

j⁵ are stop-nuts applied to the rod j¹ above the segment-arm and serving to limit the upward movement of the arm and segment, and j⁶ represents an adjusting-nut arranged on the rod j¹, against which the lower end of the spring j³ bears. The segment-arm is supported by the spring at such an elevation that the gear-wheel of the presser-head comes in contact with the upper side of the segment-arm as soon as the presser-head in its descent is turned into its perpendicular position and before the under side of the former comes in contact with the fabric placed upon the mandrel, as shown in Figs. 2 and 5. As soon as the gear-wheel of the presser-head strikes the segment-arm the latter and the segment move down with the presser-head as the latter continues its downward movement. This prevents the further rotation of the presser-head and causes the plait-former to move squarely upon the fabric placed on the mandrel. By this construction the turning movement of the presser-head ceases before the plait-former comes in contact with the fabric, thereby preventing the rear edge of the former from displacing or disarranging the fabric, which would occur if the former were allowed to brush over the fabric during the final part of its swinging movement.

K represents links on which the presser-head swings and which retain the gear-wheel of the presser-head in engagement with the gear-segment. These links are pivoted at their rear ends upon the segment-pivot j and upon a pivot j' at the opposite end of the machine (see Figs. 7 and 8) and at their front ends upon the journals of the presser-head.

L represents two folders arranged on opposite sides of the mandrel and adapted to fold the adjacent portion of the fabric around the flanges of the former and double the same in the longitudinal grooves or recesses l between the upper sides of said flanges and the opposing lower faces l' of the presser-head, as represented in Fig. 4. These folders consist of oscillating segmental plates or wings which extend from end to end of the former and are pivoted by radial arms l² upon horizontal pivot rods or shafts l³, which are supported in the connecting-frame A', as shown in Figs. 6 and 7. The outer or front edges of the folder-plates are arranged to register with and enter the recesses l between the former-flanges and the faces of the presser-head when the former is lowered. The marginal portions of the mandrel are chamfered or cut away to clear the folders, as shown in the drawings, and the upper faces of the former-flanges are beveled for the same purpose, as shown.

M represents rods or links which connect the folders with the vertically-movable pivot-rods of the oscillating bar E and whereby said folders are actuated from said pivot-rods.

By this connection when the pivot-rods rest at the lower ends of their guide-slots the folders are drawn downward to the position shown in Figs. 2 and 5, thereby withdrawing the folders from the recesses between the former and the presser-head, as shown in said figures, while when the pivot-rods are raised in their guide-slots the folders are swung upwardly to the position shown in Fig. 3, thereby causing their front edges to enter the recesses *l* and fold the adjacent portions of the fabric around the former-flanges.

N represents adjustable stops or bolts arranged on the inner sides of the arms of the folders and adapted to strike the adjacent sides of the mandrel, so as to limit the inward movement of the folders. By adjusting these stops inwardly or outwardly the folders are permitted to advance into the recesses *l* to a greater or less distance, thus producing correspondingly wide or narrow plaits.

The wrist-pin *g'* of the crank *g* on the right-hand side of the machine passes loosely through an opening formed in the hand-lever I, near its inner end, as shown in Fig. 6, so as to form a secondary or supplemental fulcrum for the hand-lever. When the presser-head is lowered and the plait-former bears upon the fabric on the mandrel, the further downward movement of the connecting-rods H and the wrist-pin *g'* is arrested, and during the next succeeding portion of the downward movement of the hand-lever the latter swings upon the adjacent wrist-pin *g'* as a fulcrum, causing the inner arm of the lever to move upwardly. As the oscillating bar E is secured to the inner end of the hand-lever, it is compelled to move upward with said inner arm of the hand-lever, and as the pivot-rods of the oscillating bar are connected with the hangers of said bar the pivot-rods are compelled to slide upward in their slots, thereby forcing the connecting-links M in the same direction and causing the same to swing the folders upwardly and inwardly to the position shown in Figs. 3 and 4. During this upward movement of the pivot-rods the return-springs F of the latter are compressed, and in order to prevent the presser-head from descending upon the flanges of the former during such upward movement the resistance of the springs *c'*, which project the plait-former, must exceed the resistance of the return-springs of the pivot-rods. As soon as the stops of the folders strike the sides of the mandrel, the ascending pivot-rods are arrested, and upon continuing the downward movement of the hand-lever its fulcrum is shifted from the wrist-pin *g'* back to the pivot-rods of the oscillating bar through the medium of the latter, thereby drawing the connecting-rods H farther downward and depressing the presser-head to its lowermost position against the resistance of the former-springs, whereby the plaits are compressed between the lower faces of the presser-head and the

upper faces of the former-flanges, thus flattening the same.

It will now be understood that during the first and final portions of its stroke the hand-lever finds its fulcrum upon the pivot-rods E' through the medium of the oscillating bar E, and that during the intermediate portion of its stroke it finds its fulcrum upon the wrist-pin *g'* of the adjacent crank of the oscillating bar.

The resistance of the supporting-spring of the segment-arm *j*² should be less than the resistance of the return-springs F of the pivot-rods, so as to allow the plait-former to descend upon the fabric before the pivot-rods are elevated for advancing the folders.

The operation of our improved machine is as follows: In the normal or initial position of the parts the former and presser-head are elevated to the position shown in Fig. 1 and the folders are retracted so that their front edges lie below the flat top surface of the mandrel, the parts being held in this position by swinging the hand-lever rearwardly and downwardly beyond the dead-center, as shown in said figure. The shirt-bosom or other article to be plaited is placed upon the mandrel and properly centered or aligned thereon by suitable marks made on the top of the mandrel, and the hand-lever is then swung upwardly, forwardly, and downwardly to the position shown in Fig. 3. At the beginning of this movement of the hand-lever the former and presser-head face upwardly and forwardly, as shown in Fig. 1. As the movement of the hand-lever continues the former and presser-head are moved downwardly and are at the same time turned until they reach the position shown in Fig. 2, in which the bottom of the former is substantially parallel with the top of the mandrel. Immediately after the presser-head completes its turning movement and before the former touches the fabric the gear-wheel of the presser-head comes in contact with the arm *j*² of the gear-segment, thus depressing the latter and the presser-head and allowing the plait-former to bear upon the fabric, so as to hold the portion of the fabric which lies directly under the former against displacement. During these movements the hand-lever has swung upon the depressed pivot-rods E' of the oscillating bar as a fulcrum. During the next portion of the downward movement of the hand-lever the fulcrum of the lever is shifted to the adjacent wrist-pin *g'* of the oscillating bar and the pivot-rods of the bar are raised in their guide-slots, thereby swinging the folders inwardly through the medium of the connecting-links M and causing the folders to fold the adjacent loose portions of the fabric inwardly over the upper sides of the former-flanges and double the material between the said flanges and the opposing lower faces of the presser-head, as shown in Fig. 4, whereby two parallel plaits are formed in the fabric.

As soon as the advancing movement of the folder-plates is arrested by their stops striking the sides of the mandrel, the fulcrum of the lever again shifts back to the pivot-rods of the oscillating bar, as hereinbefore described, and during the final portion of the downward stroke of the lever the presser-head is depressed, thus flattening the plaits between the faces of the presser-head and the upper side of the former-flanges. By moving the hand-lever downwardly beyond the dead-center, as shown in Fig. 3, the same is locked, and the parts are retained in this position until the plaits have become sufficiently set by the heat of the mandrel. The lever is then again swung upwardly and rearwardly to its former position, which movement allows the presser-head to ascend under the reaction of the springs of the plait-former and causes the folders to be retracted and the presser-head and former to be swung backwardly and upwardly to the position shown in Fig. 1. In this position the ends of the former are free and unobstructed and the plaited bosom can therefore be stripped lengthwise from the former.

The front portions of the folders bear against the mandrel in their idle or retracted position and are heated by the same, thus operating upon the fabric in a heated condition and more effectually setting the plaits.

It will be observed that the operations of swinging the presser-head and former into their operative position, lowering the plait-former, advancing the folder-plates, and finally depressing the presser-head for flattening the plaits are performed by one continuous stroke of a single hand-lever, and the plaiting of the bosom or other article is therefore effected expeditiously and without any further attention on the part of the operator after the article has been centered on the mandrel.

The flanges of the plait-former are located at a sufficient distance below the lower faces of the presser-head to admit the two thicknesses of the folded material and the folders between the same.

In order to enable a single plait to be formed in the bosom, if desired, means are provided for rendering one of the formers inoperative or throwing the same out of gear with the actuating devices. In the construction shown in the drawings this is effected by jointing the links *M* of one of the folders and providing the joint with a locking device which permits the parts of the link to be locked in their straightened position for rendering the link rigid and operative, as shown in Fig. 3, or to be deflected for shortening the same and rendering the folder-plate inoperative, as shown in Fig. 5. The lower member of each jointed link is bifurcated, as shown in Figs. 9, 10 and 11, and the upper member is provided below the joint *m* of the link with a downward extension *m'*, which enters between the jaws of the lower member when the link is straight-

ened. This extension is provided on its rear side with a cross-head *m³*, which bridges the rear side of the jaws of the lower member, so as to arrest the forward movement of the extension when the same stands in line with the lower member.

m³ is a turn-button arranged on the front side of the extension *m'* and adapted to bridge the front side of the jaws of the lower member, so as to lock the extension of the upper member against rearward movement. The turn-button is formed on or secured to the front end of a spindle *m⁴*, which is capable of sliding lengthwise in an opening formed in the extension *m'*, the spindle being provided at its projecting rear end with a knob for manipulating it. The turn-button is provided in its rear side with locking-teats *m⁵*, which enter recesses formed in the front side of the extension, as shown in Figs. 10 and 11, so as to hold the button against turning both in its locked and unlocked positions.

m⁶ is a spring which surrounds the button-spindle between its knob and the rear side of the extension and which tends to draw the button against the front side of the extension, so as to confine its locking-teats in the recesses of the extension. In the rigid normal position of the members of the link the upper member is held against movement on the lower member by the cross-head and turn-button of the extension, which parts extend transversely across the front and rear sides of the lower member, respectively. When it is desired to break the joint for deflecting the link, the spindle is pressed forwardly against the pressure of the spring *m⁶*, as shown in Fig. 9, so as to disengage the locking-teats of the button from their recesses, and the button is then turned in line with the extension of the upper link member, thereby permitting the extension and the button, which latter is as narrow as the extension, to pass rearwardly between the jaws of the lower member and deflecting the link, as shown in Fig. 5. The link members are locked in their straightened position by simply pressing the spindle forwardly, so as to unlock the button, and then turning the button at right angles to the extension.

While our improved machine is especially desirable for plaiting shirt-bosoms, it may obviously be used for plaiting other articles.

We claim as our invention—

1. In a plaiting-machine, the combination with a supporting-bed, of a movable presser-head arranged above the bed, means for moving the presser-head toward and from the bed, a former movably mounted in said presser-head and having below the same a laterally-projecting flange forming with the under side of the head a plaiting-recess, a folder adapted to enter said recess, and means for causing the folder to enter said recess, substantially as set forth.

2. In a plaiting-machine, the combination with a supporting-bed, of a presser-head and

former, vertically-movable supports in which the presser-head and former are capable of turning, means for moving said supports vertically, and automatic mechanism connected
5 with the presser-head for inverting the same during its vertical movement, substantially as set forth.

3. The combination with a supporting-frame, of a bed secured therein, a presser-
10 head and former arranged above said bed and mounted on links or rock-arms, a gear-segment attached to the frame, and a gear-wheel attached to the presser-head and meshing with said segment, substantially as set forth.

15 4. The combination with a supporting-frame, of a bed secured therein, a presser-head and former arranged above said bed and mounted on links or rock-arms, a gear-segment pivoted concentric with said presser-
20 head and provided with a yieldingly-supported arm, and an intermeshing gear-wheel which is attached to the presser-head and which strikes the arm of the gear-segment and depresses the latter during the last portion
25 of the downward movement of the presser-head, substantially as set forth.

5. The combination with a supporting-frame, of a bed secured therein, an oscillating bar arranged below said bed and hung
30 upon a movable pivot, a presser-head capable of movement toward and from said bed and operated from said oscillating bar and a folder movable toward and from said presser-head and actuated from the movable pivot of the
35 oscillating bar, substantially as set forth.

6. The combination with a supporting-frame, and a bed secured therein, of a presser-head movable toward and from said bed, an oscillating folder movable toward and from
40 the side of the presser-head, a vertically-movable actuating-rod arranged below said bed, and a link connecting the oscillating folder with said vertically-movable rod, substantially as set forth.

45 7. The combination with a supporting-frame and a bed secured therein, of a vertically-movable pivot-rod arranged below said bed, an oscillating bar hung upon said pivot-rod and provided with cranks, a presser-head
50 movable toward and from said bed, rods connecting the head with the cranks of the oscillating bar, a folder movable toward and from the side of the presser-head, a link connecting the folder with said vertically-movable
55 pivot-rod, and a hand-lever secured to said oscillating bar and fulcrumed upon the wrist-pin of the adjacent crank of the oscillating bar, substantially as set forth.

8. The combination with a supporting-frame and a bed secured therein, of a vertically-movable pivot-rod arranged below said
60 bed, a spring whereby said rod is held in its depressed position, an oscillating bar hung upon said pivot-rod and provided with cranks, a presser-head movable toward and from said
65 bed, rods connecting the head with the cranks of the oscillating bar, a folder movable toward

and from the side of the presser-head, a link connecting the folder with said vertically-movable pivot-rod, and a hand-lever secured
70 to said oscillating bar and fulcrumed upon the wrist-pin of the adjacent crank of the oscillating bar, substantially as set forth.

9. The combination with a fixed supporting-frame and bed, a presser-head movable
75 toward and from said bed, a former arranged in said head and springs whereby said former is depressed, of a vertically-movable pivot-rod arranged below said frame, a spring mounted in said frame and tending to depress
80 said pivot-rod, an oscillating bar hung from said pivot-rod, mechanism whereby said oscillating bar is connected with said presser-head, and a folder operated from said pivot-rod, substantially as set forth.

10. The combination with a supporting-frame and a bed secured therein, of a vertically-movable pivot-rod arranged below said
85 bed, an oscillating bar hung upon said pivot-rod and provided with cranks, a presser-head movable toward and from said bed, rods connecting the head with the cranks of the oscillating bar, a folder movable toward and from
90 the side of the presser-head, a link connecting the folder with said vertically-movable pivot-rod, a hand-lever secured to said oscillating bar and fulcrumed upon the wrist-pin of the adjacent crank of the oscillating bar, and a stop which limits the advancing movement of the folder, substantially as set forth.

11. The combination with a supporting-frame, and a bed secured therein, of a presser-head movable toward and from said bed, a folder movable toward and from the side of
105 the presser-head, a vertically-movable actuating-rod arranged below said bed, a jointed link connecting the folder with said vertically-movable actuating-rod, and having a locking device for retaining the same in its straightened position, substantially as set
110 forth.

12. The combination with a supporting-frame, and a bed secured therein, of a presser-head movable toward and from said bed, a folder movable toward and from the side of
115 the presser-head, a vertically-movable actuating-rod arranged below said bed, a jointed link connecting said folder with said vertically-movable actuating-rod and consisting of a bifurcated member, a member pivoted to
120 the latter and having an extension adapted to enter between the jaws of the bifurcated member and provided on one side with a cross-head, and a turn-button arranged on the opposite side of the extension, substantially as set forth.

Witness our hands this 26th day of September, 1895.

JOSEPH DUMVILLE, JR. [L. S.]
CARLOS HOLLY. [L. S.]

Witnesses:

WM. W. BREIN,
ABNER T. HOPKINS.