4 Sheets—Sheet 1.

L. ONDERDONK.

GATHERING AND PLAITING ATTACHMENT FOR SEWING-MACHINES.

No. 192,183. Patented June 19, 1877.

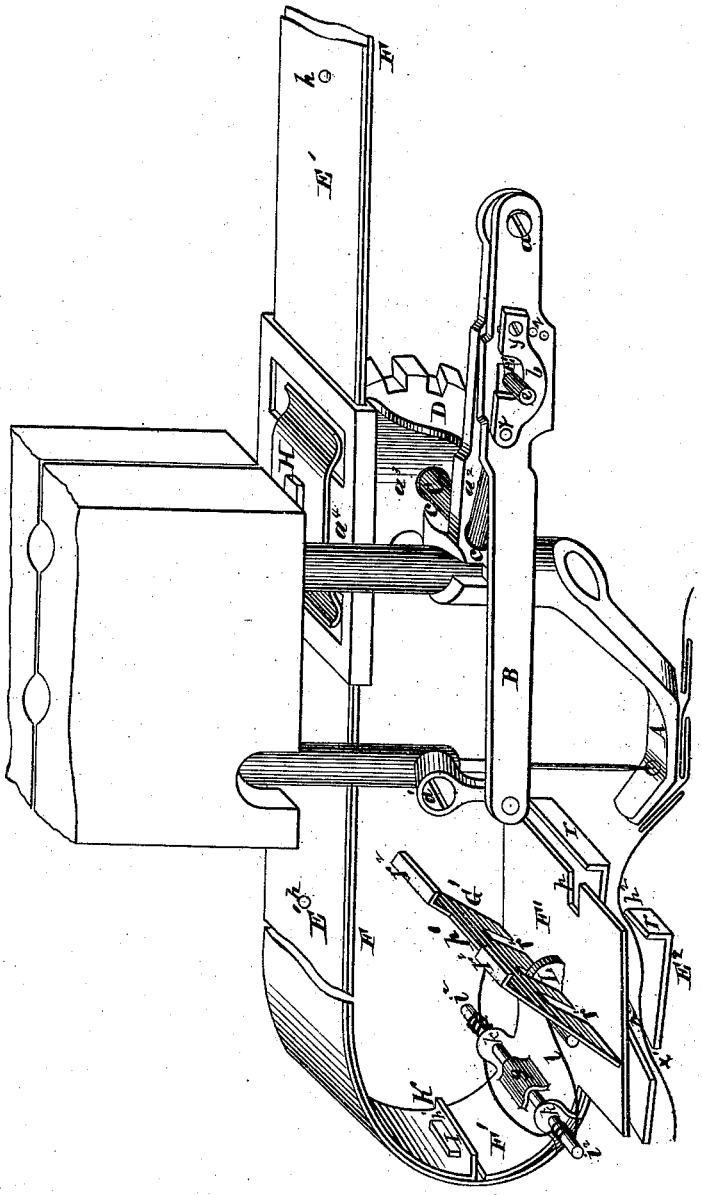

Fig. 1.

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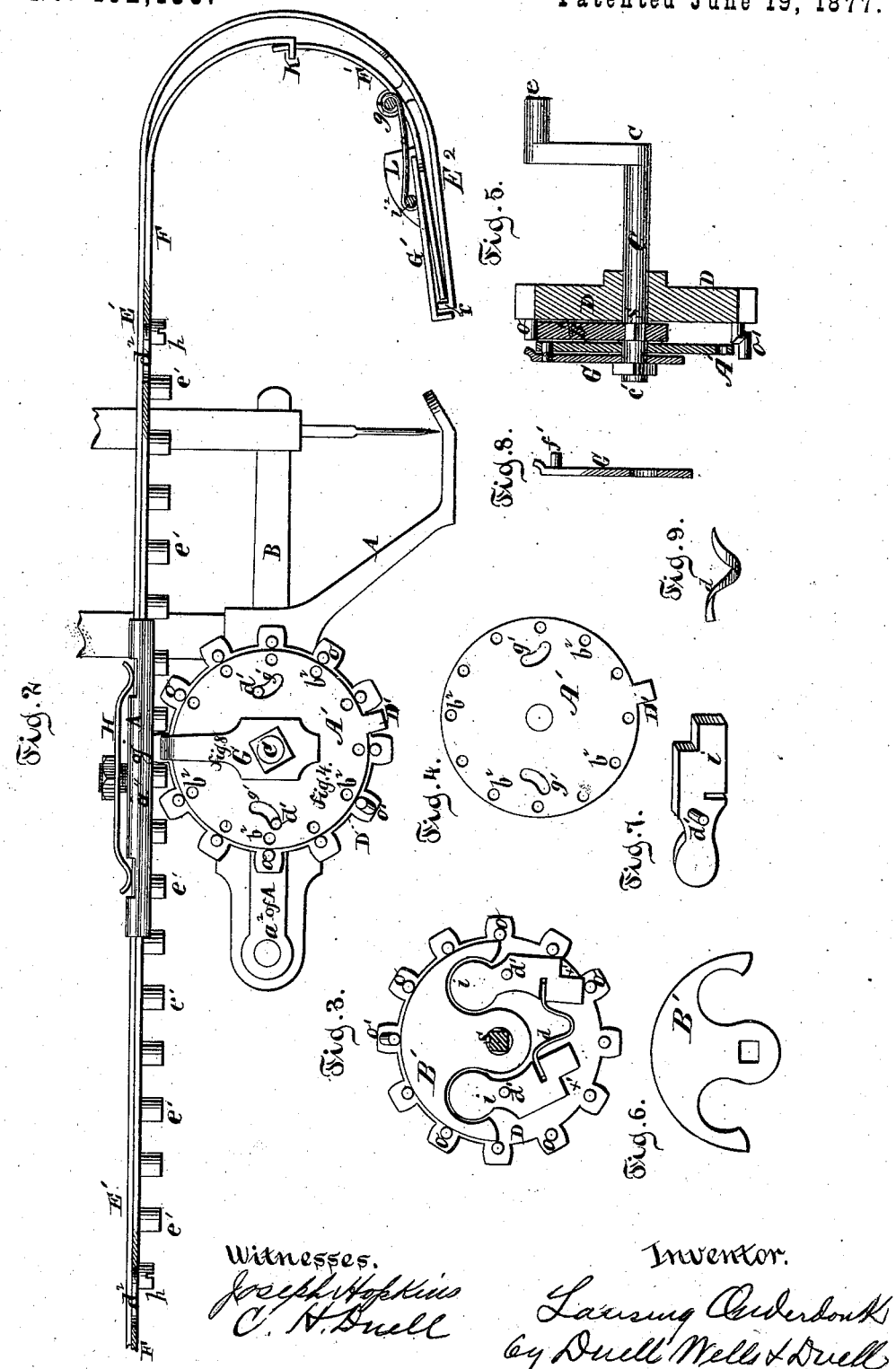

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Fig. 11.

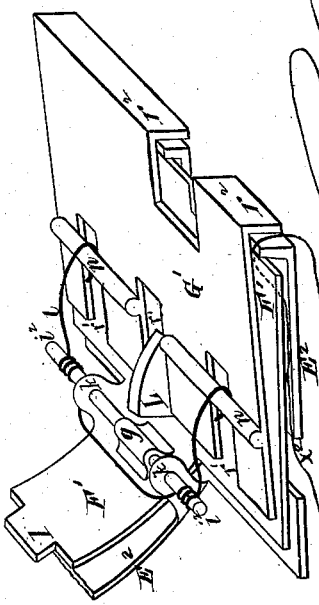
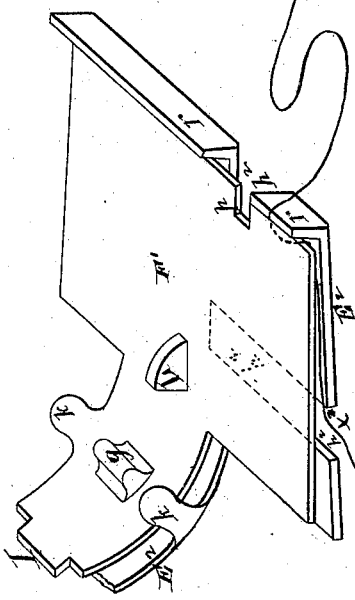


Fig. 21.

Fig. 10.



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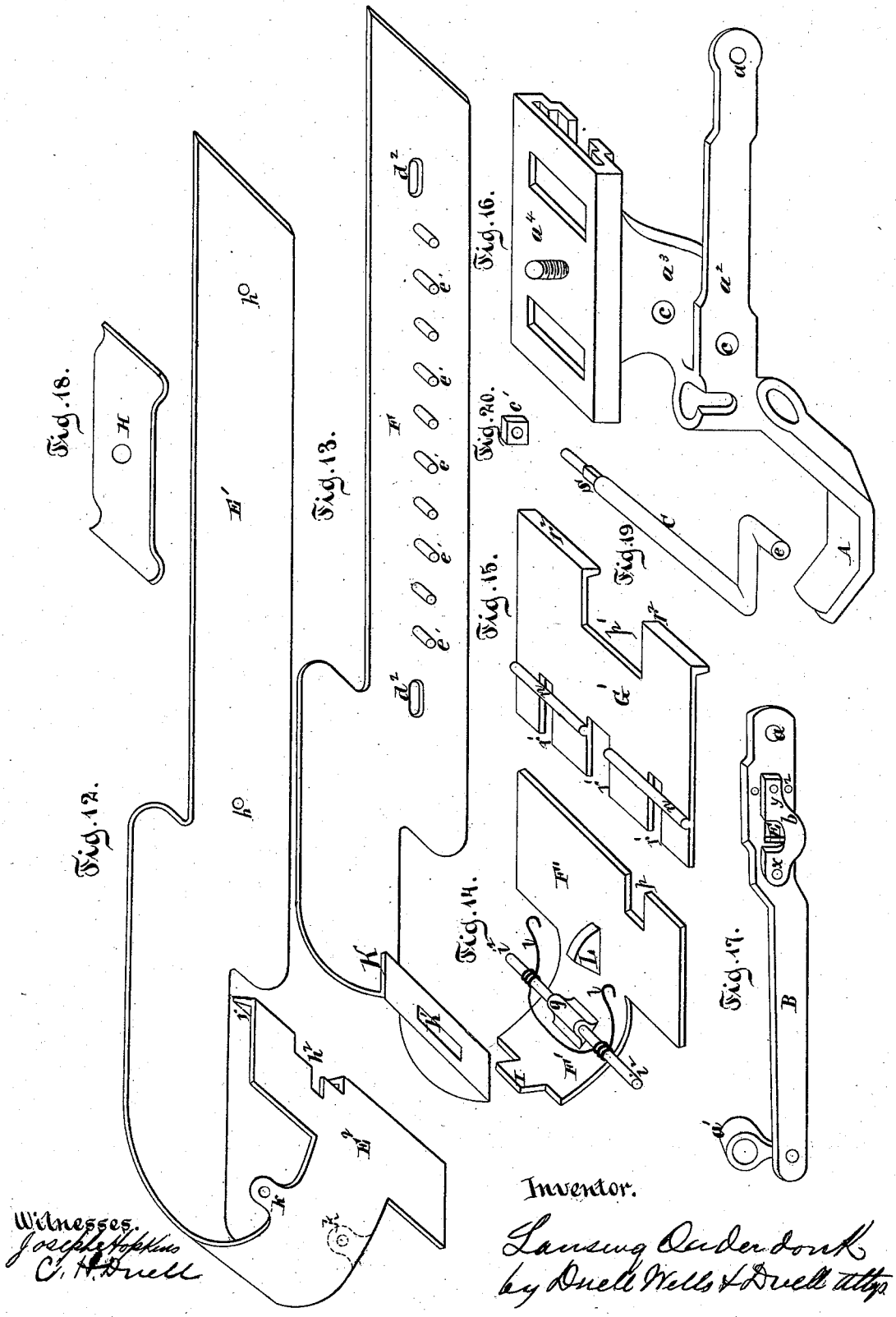

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UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF ADAMS' STATION, NEW YORK.

IMPROVEMENT IN GATHERING AND PLAITING ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **192,183**, dated June 19, 1877; application filed March 10, 1877.

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, of Adams' Station, Albany county, State of New York, have invented a new and useful Attachment to be applied to Sewing-Machines for the purpose of Gathering, Plaiting, and Box-Plaiting; and I do declare the following to be a full, clear, and exact description of my invention, and such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, forming part of this specification, in which—

Like letters of reference mark the corresponding parts in all the figures.

Figure 1 is one side of my attachment ready to operate. Fig. 2 is the opposite side. The remaining figures represent the component parts detached and separate.

The parts are described, as far as possible, in the order in which they operate, beginning with the source of motion.

A is a presser-foot, as commonly used in sewing-machines, excepting extensions a^2, a^3, and a^4. B is a lever connecting with extension a^2, at a, by screw or pin, and to the needle set-screw on the needle-bar by loop a^1, or other suitable device; thus a horizontal movement of the lever is obtained from the perpendicular movement of the needle-bar.

Slot E in lever B is to admit crank e of crank-shaft C.

Plate b of lever B is a piece of spring metal hinged at x, and with a fixed pin at y, so that that end may be sprung away from lever B, the piece moved, and the pin placed in any one of the sockets z, thus modifying at will the size of slot E, and thereby lessening or increasing the movement of crank e.

The crank-shaft C runs through extensions a^2 and a^3 at c c, and passes through slot E in lever B, which gives it (C) motion; it also passes through cog-wheel D, and the parts attached thereto, and connects with plate B′ of said wheel by a square shoulder, S, as shown in Figs. 5 and 19. The cog-wheel D, with its parts attached, is represented in Figs. 1 and 2 as it appears in operation.

Figs. 3, 4, 6, 7, 8, and 9 represent the component parts thereof, and Fig. 5 is a sectional view of the same. This wheel connects with slides E^1 and F by cogs or pins e', and its office is to cause the aforesaid slides to move alternately forward and backward.

Note, that in the absence of its attachments cog-wheel D should turn freely on crank-shaft C. In Fig. 5, A′ is the shifting-plate represented by Fig. 4. G is an adjustable arm, represented by Fig. 8. B′ is a plate, represented by Fig. 6. D is the cog-wheel itself.

Inserted in that surface of cog-wheel D upon which its attachments are superposed and perpendicular, and near its periphery, are small pins o o o, against which operate dogs i i, causing cog-wheel D to move alternately back and forth to the extent of a revolution or less. Plate B′ of cog-wheel occupies position as shown in Fig. 5. This plate is securely connected to crank-shaft C by the square shoulder S, causing it to act as a unit with that shaft. Connected to plate B′, by a semicircular socket into which they fit, are two dogs, i i; against these dogs, and between them, a spring, d, acts, which tends to force each dog to bear continuously upon pins o o o of cog-wheel D, to avoid passing said pins in the forward movement of said dogs. The notches x' in said dogs are so arranged that instead of the dog being compelled to move back a full space between pins o o o of cog-wheel D, it (the dog) will act on the pins if moved half that distance, then engaging in the notch instead of on the end. Upon each of said dogs are fixed pins d^1, and which, in Fig. 2, may be seen in the curved slots g' in shifting-plate A′. The shifting-plate A′, represented by Fig. 4, and seen in operative combination in Figs. 2 and 5, is a circular plate in which are holes b^2, and also two curved slots, g'; also a projection, D′.

The object of this plate is to cause a change in the position of the dogs i i, alternating at certain points, which may be varied within the points of one complete revolution of the wheel, at the will of the operator; or, in other words, to draw back one of the dogs from contact with pins o o o of cog-wheel D, while the other operates upon them, giving to the cog-wheel a motion in one direction, (which moves slides E^1 and F,) say forward, to the extent of one complete revolution or less, until the projection D′ strikes pin o' in cog-wheel D.

The motion of the shifting-plate A′ is then arrested, while plate B′, being fixed to crank-shaft C, continues to move, dragging with it the two dogs *i i*, and consequently moving each of pins d^1 fixed to dogs, through the slots *g′*, in shifting-plate A′, to the other end of its slot. Thus the dog, which has been driving the cog-wheel, is withdrawn from service, and as a result the cog-wheel D reverses its motion, and carries with it the slides E^1 and F. Cog-wheel D is the object on which the shifting-plate A′, the adjustable arm G, the dogs *i i*, and projection D′ act, and these various operations are to perfect an alternate movement of the cog-wheel back and forth at any desired point, and make the change automatically.

Fig. 8 is the adjustable arm by itself, the same appearing in combination in Figs. 2 and 5, and having a projection, *f′*, on the under side, which may be placed in any one of the holes b^2 of shifting-plate A′, thus making a firm connection therewith, when the nut *c′* on the end of crank-shaft C is screwed down.

When the arm G is placed on the shifting-plate A′, as seen in Fig. 2, one end projects beyond its periphery and operates when it impinges against the pin *o′* in the same manner as projection D′ of the shifting-plate A′, and thus enables the operator, by varying the position of said adjustable arm G, to lessen or augment the range of the alternate movement of the cog-wheel, and consequently the throw of the slides E^1 and F.

On the under side of slide F are pins or cogs *e′*, into which cog-wheel D works, and from its revolution causes the slides E^1 and F to move accordingly. Slide F is of two parts, F′ being an extension which is hinged on slide E^1 at a point shown in Figs. 1, 2, and 14, at *g*. That part of slide F on the face of which are cogs or pins *e′* is connected with slide E^1, by pins *h* passing through the slots d^2, which pins are securely fastened into slide E^1; the object of which slots is to give slide F a motion in advance of slide E in either direction, the effect of which is of special importance to the performance of the invention.

The slides pass through and are guided by extension a^4 of the presser-foot, through an opening of which the cog-wheel D engages and operates them.

At the extremity of slide F, near the presser-foot and plate of the sewing-machine, is an extension, F′, Fig. 14, with a curved projection, I, hinging in slot h^1, and furnished in the edge nearest the presser-foot with slot *p*, through which the needle passes when in the act of sewing the plaits folded, as hereinafter described. Slide F is hinged on slide E^1 by means of pins i^2 and eyes *k*.

The slide E^1 overlies F, (see Figs. 1 and 2,) and terminates also in an extension, E^2, having the edge nearest the presser-foot turned upward at a right angle, or nearly so, provided with a slot, h^2, through which passes the needle when in the act of sewing. In that edge of extension E^2 which is to the right when facing the curved portion of slide E^1, is a slot, shown by dotted lines in Fig. 10, through which the cloth to be operated on passes.

Fig. 15 is used only in box or reverse plaiting, and will be described hereinafter.

Fig. 18 is a tension-spring attached to extension a^4 of presser-foot, and is seen in operative position at H in Fig. 1, and acts on slide E^1, and through it effecting its connections, and by increasing the friction causing their motion to be less easy.

The operation of this invention is as follows: The slides E^1 and F are run forward or from the presser-foot. Slide F, because of the slots d^2, and because the motion is imparted directly to it, moves first, and to the extent of the slot d^2, before slide E^1 partakes of its motion. The slot h^1, Fig. 13, acts on projection I, Fig. 14, and tilts up the extension F′, so that an opening is formed between E^2 and F′, as shown in Fig. 1.

The cloth is then inserted. The cog-wheel D reverses, transmits its motion to slide F, which moves back the length of the slot d^2, thereby acting on projection I and closing the same down on the extension E^2, confining the cloth between the extensions E^2 and F′ securely.

The slides continue their motion toward the presser-foot, the lip *r* of the extension E^2 folding the cloth upward and over, and carrying the fold underneath the presser-foot, where it is sewn down. (The result may be seen under the presser-foot in Fig. 1 and in the left hand of Fig. 21.) The cog-wheel reverses, the slides partake of its motion, and, moving away from the presser-foot, releases the cloth, until their motion is again changed, when they repeat the operation just described. Thus, by each complete movement back and forth, it makes one fold of cloth, which is one-half the width of the space traversed by the slides.

The shape and within limits, the position of the slots h^2 in the rectangular extension E^2, may be varied; but the lip *r*, turned upward at or near a right angle, I regard as of importance to the effectiveness of my invention.

I now begin with the source of motion, and trace the operation of this invention to where motion is imparted to the slides.

The needle-bar conveys its motion through loop a^1 to lever B, thence to crank-shaft C, the end of which may be seen projecting through slot E, giving to said crank-shaft a motion forward and backward through but a small portion of a revolution.

The extent of this motion is variable, however, by adjustable plate *b*, as aforesaid.

The motion of crank-shaft C is imparted to plate B′, and through it to one of the dogs *i i*, which, acting on pins *o o o*, drives the cog-wheel D in one direction, and continues so to do, carrying the shifting-plate with it, until the projection D′ strikes pin *o′*, when the motion of the shifting-plate is arrested, but plate B′

goes on, causing each of the pins d^1 to shift to the other end of its slot, thus releasing the dog which was in action and bringing into play the dog that was inoperative. The cog-wheel D is then driven in the opposite direction and the motion of the slides E^1 and F is reversed. Should, however, the throw of the slide and, consequently, width of the plait be too great, the operator should loosen the nut c' on the end of crank-shaft C, raise the longer arm of the adjustable arm G, and place the pin f' in any one of the holes b^2, beginning at the left of projection D′, when in position, as shown in Fig. 2, and replace the nut on the end of crank-shaft C.

The nearer the arm G is to the projection D′ the shorter will be the throw of the slides E^1 and F, and one-half of the throw of the slide is the width of the plait.

The part G′ is a rectangular-shaped plate, the front end of which is provided with a slot, p', for the passage of the needle, and is turned down at or near a right angle, and the reverse of lip r of slide E^2, and is an attachment to be used in making box and reverse plaiting, and when not required for that purpose is turned back against slide F′, and takes no part in the operation of the machine.

The edge of plate G′, opposite to that last mentioned, is provided with three slots, r^1. A wire, n, crosses the inner end of these slots, to which spring l is attached. L is a projection attached to extension F′, and which passes through the middle slot r^1, and serves as a guide to direct the motion of the plate G′ when it is turned back against the extension F′, as aforesaid, or turned down, as in Fig. 11. Parts g and pin i^2 are attached to F′, and serve merely for connections for spring l. When the plate G′ is in use, and as long as it continues in use, it compels the cloth to fold the reverse of when the extensions E^2 and F′ alone are in operation.

The method of hinging the plate G′ herein employed may be varied; but to its position in reference to the extensions E^2 and F′, and to the lip r^2, turned the reverse of lip r, I attach special importance.

The plate G′ is used as follows: When it is turned back and not in use, the cloth will fold as shown in Fig. 10. At any time after the slides move away from the needle-bar, the plate G′ may be turned down, when, being supported on extension F′, it will open and close with it. As long as it is turned down it will cause the cloth to roll under, as shown in Fig. 11, and will form plaiting the reverse, as shown in Fig. 10, where the extensions E^2 and F′ are alone employed.

This is again exhibited in Fig. 21, where, on the left, appears the plaiting, as made when the plate G′ is also used.

A box-plait, being the combination of a fold as formed by the slides E^1 and F, when the extensions E^2 and F′ only are in operation, and a fold as formed by these devices with the addition of the plate G′, it is evident that box-plaiting may be made by this attachment by making, first, a fold without the use of the plate G′, and then a fold with G′ in operation, thus forming by a continuation of such operation a series of reverse folds similar to the one shown in Fig. 21, marked Q, such operation merely requiring the bringing into operation of the plate G′ at each alternate fold.

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

1. The presser-foot A, with extensions a^2, a^3, and a^4, substantially as shown and described.

2. The combination, substantially as described, of the lever B, provided with the slot E, and the rock-shaft C, having a crank, e, for the purposes set forth.

3. The combination, substantially as described, of the cog-wheel D, provided with the pin o', shifting-plate A′, provided with projection D′, shaft C, and adjustable arm G, for the purposes set forth.

4. The cog-wheel D, in combination with plate B′, the dogs i i, with their spring d and the shifting-plate A′, substantially as shown and described.

5. The combination, substantially as described, of the slides E^1 and F, the latter being provided with an extension, F′, hinged to the former, as and for the purposes set forth.

6. The combination, substantially as described, of the slides E^1 and F, with their extensions E^2 and F′, and of the plate G′, as and for the purposes set forth.

7. The combination, substantially as described, of the cog-wheel D and slides F and E^1, said slides being connected by slots and pins, as set forth, whereby the motion of the slide F is communicated to the slide E^1, as described.

8. The combination, substantially as described, of the rectangular-shaped extension E^2, provided with the lip r and the plate G′, provided with a reversely-bent lip, r^2, for the purposes set forth.

9. The plate G′, in combination with the slides E^1 and F, substantially as shown and described.

10. The presser-foot A, and its extensions a^2, a^3, and a^4, in combination with the tension-spring H and the slides E^1 and F, substantially as shown and described.

In testimony that I claim the foregoing improvement in sewing-machine gathering and plaiting attachment, as above described, I have hereunto set my hand.

LANSING ONDERDONK.

Witnesses:

JOSEPH HOPKINS,

ISAAC J. MACCABE.