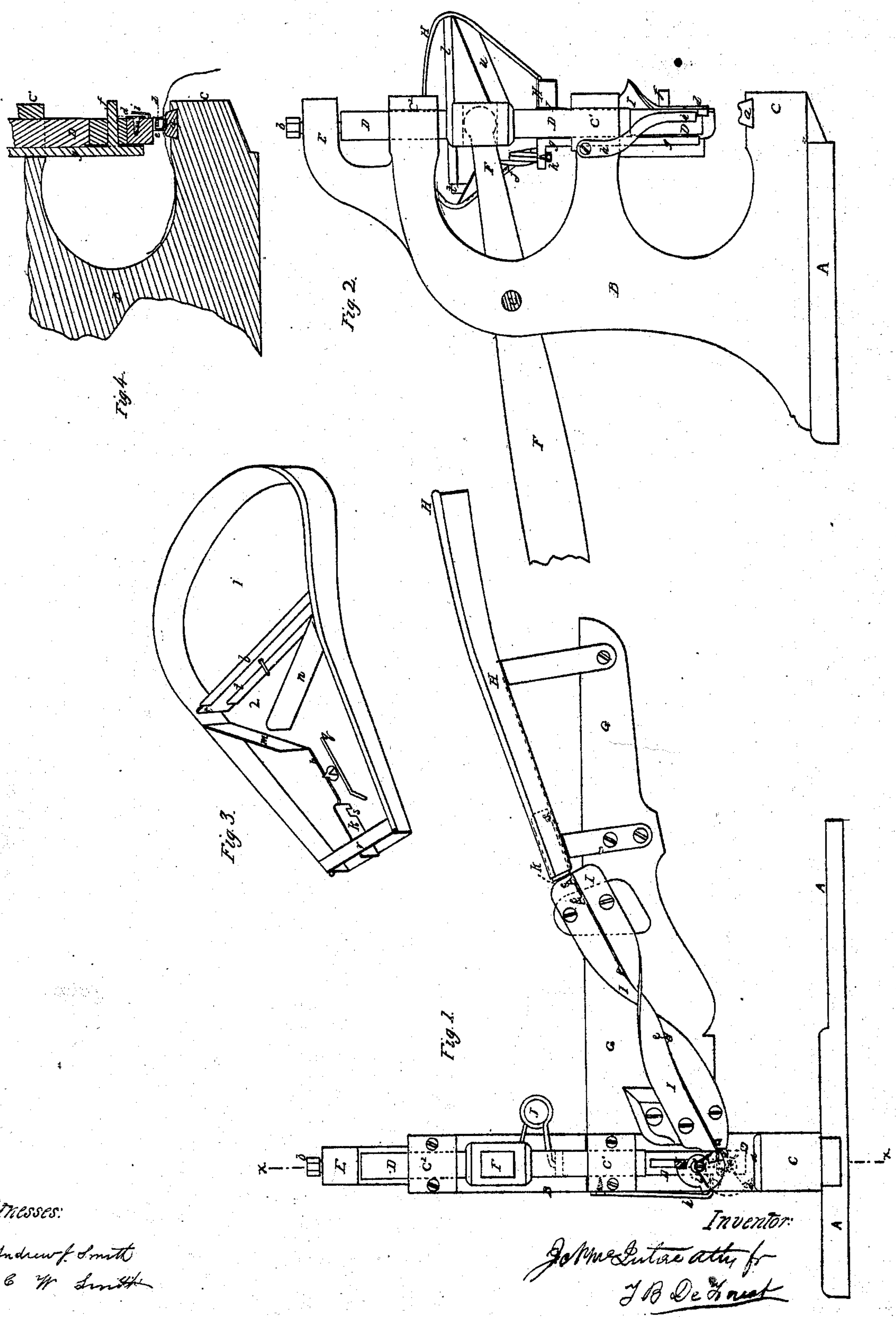


T. B. DeForest. Hoop Skirt Mach.

N^o 36877.

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Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS B. DE FOREST, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR TO THE
SHELTON & OSBORN SKIRT COMPANY AND L. & C. H. DE FOREST, OF
SAME PLACE.

IMPROVEMENT IN APPARATUS FOR ATTACHING CLASPS TO HOOPED SKIRTS.

Specification forming part of Letters Patent No. 36,877, dated November 4, 1862.

To all whom it may concern:

Be it known that I, THOS. B. DE FOREST, of Birmingham, of the county of New Haven, in the State of Connecticut, have invented certain new and useful Improvements in Machinery for Clasp ing Hoop-Skirts; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to an improved machine for performing the operation of "clasp ing hoop-skirts"—that is, putting on the small metallic clasps, which are employed on certain kinds of hoop-skirts for retaining the hoop laterally in the pockets of the tapes.

Machines have been invented and used previous to my invention for automatically performing this operation, but they are all subject to practical objections and possess imperfections which it is the object of my invention to remove.

My invention consists, first, in feeding the clasps from the hopper or shaking table on their backs under a guide-plate, by which they are guided to a suitable conductor, through which they pass to the punching or clasp ing mechanism.

My invention consists, secondly, in the peculiar construction of guide-plate, as hereinafter fully described.

My invention consists, thirdly, in conducting the clasps down to the clasp ing or punching mechanism through a slit or slot, in combination with suitable guides, whereby the position of the clasp is reversed during its passage through said conductor, as hereinafter more fully explained.

My invention consists, fourthly, in feeding the clasps under a movable punch and onto a holder or sustaining-bar, as hereinafter described, so that one clasp at a time will be received and held between the punch and holding-finger, as hereinafter set forth.

My invention consists, fifthly, in the mode of operation of the devices for inserting and securing the clasp through the tape, substantially as hereinafter more fully described.

To enable those skilled in the art to make and use my invention, I will proceed to de-

scribe the same as I have successfully practiced it, referring by letters to the accompanying drawings, making part of this application, and in which—

Figure 1 is a front elevation of a machine embracing my several improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view of the hopper or shaking table and guide-plate detached. Fig. 4 is a partial vertical section at the line *x x*, Fig. 1.

In the several figures the same letter of reference indicates the same part of the apparatus.

A is the bed-plate or base of the machine, from which extends upward the frame B. This frame, it will be seen from Fig. 2, is formed with three arms or extended portions, C C' C'', in the lower one of which is set a die, *a*. In the other two are formed suitable boxes or bearings for the reciprocating punch or punching-bar D, and from the upper arm, C'', extends a bracket or small stand, E, for the accommodation of a set-screw, *b*, which constitutes an adjustable stop to the reciprocating bar D. This bar is operated by a lever, F, hung on a pivot at *c*, and having its rear end (in a working-machine) connected to any suitable treadle mechanism.

G is an arm secured to the frame B and extending out in about a horizontal position, and is for the support of the hopper or feeding-table H and the conductor or feeder I, both of which are secured to said arm or bracket G, as clearly seen in Fig. 1.

d is a sustaining finger or holder to retain the clasp during a part of the descent of the bar D, in a manner and for a purpose to be presently described. This finger is locked in the proper position to receive the clasps *e* by means of a latch, *f*, on bar *g*, and is turned on its pivot in one direction by the spring *i*, and in the other direction by a bent finger, as pawl *h*, which is secured at its upper end to the arm C', and the lower extremity of which operates on a cam-faced projection, *o*, on back side of holder *d*.

Between the upper end of the sliding bar *g* and bottom side of the lever F is arranged a spring, *j*, which operates to keep the sliding bar *g* constantly pressed downward, and in

top of said bar is a stop screw, *k*, for regulating the downward throw of the said bar, for purposes which will be explained.

The feed table or hopper *H* is divided into compartments by the partitions *l m n*. In the partition *l* is a slide, *t*, or gate for varying the capacity of the passage between the portions 1 and 2. (See Fig. 3.)

p q are guiding-ribs on the surface of the table *H* to guide the clasps to the plate *K*, which is supported by a cross-piece, *r*, and which has cut in its lower edge an opening or square notch, *s*.

The operation of my improved machine will be understood from the following explanations: The compartment 1 of the hopper or table *H* is supplied with clasps, which by the shaking or jarring of the machine are kept flowing down through the passage-way into the compartment 2, (the flow being regulated by the gate *t*,) from whence they pass down between the guiding flanges or ribs *p q*, as illustrated in Fig. 3, to the guide-plate *K*. This guide-plate is so constructed and arranged that it will not receive any clasp that does not approach it in the right position to pass into the feeder *I*. The clasps will naturally tumble onto their backs and ride down the shaking table *H* on their backs. All those which come down on their backs with their points or legs in the position to straddle the plate *K* will pass under said plate to the conductor *I*; but those which ride down on their backs with their legs in the wrong position will shake off to one side of plate *K* and pass out of the lower end of hopper *H* and fall down into any suitable receptacle, or into a tube or conveyer to carry them back to the compartment 1.

It often happens that a clasp will not ride down on its back, but will come down onto the end of plate *K* in the position shown in red lines in Fig. 3. Now, if the plate *K* were solid the clasp on its end in this position would be apt to stay there (unless the table were very severely shaken) and stop the supply to the feeder *I*; but by having a hole or opening, *s*, cut in said plate *K*, as shown, this difficulty is effectually avoided, for either one leg or the other of the clasp will shake through the opening *s*, and the center of gravity of the clasp then being on one side of plate *K* the clasp will pass off down one side of said plate to the waste or surplus exit. The clasps which pass down around and under the plate *K* are by it and the surface of the bottom of the table *H* guided in between the plates of the feeder *I*, as illustrated. The plates of feeder *I* have their adjacent edges set apart a distance about equal to the thickness of the back or body of the clasps, and the said feeder-plates are bent in a helical curve, so that as the clasps pass through or between them from one end to the other they have their position reversed, as shown, so that although the clasps enter the feeder *I* with their legs sticking up they are delivered to the

clasping mechanism with their points or legs pointing downward. The feeder *I* is inclined at a proper angle to insure the passage of the clasps through it by their own gravity. It will be understood that the supply is such as to generally insure the feeder *I* full from one end to the other of clasps. The clasps pass onto the finger *d*, when the punch or bar *D* is elevated, one at a time. When the said bar descends, it cuts off the clasp (which is on finger *d*) from the column of clasps in the feeder *I*, and carries it down to the work, as illustrated by the dotted lines in Fig. 1. The clasp is carried down between the bottom of punch *D* and the finger *d* until the points of the clasp are entered into the work. When the points of the clasp have entered the tape and passed down either side of the hoop, as shown in Fig. 4, the back of the clasp comes hard up against the bottom of the punch *D*. The finger *d* is then quickly withdrawn, and the punch *D*, continuing to descend, forces the clasp on downward, and the points of the latter, coming in contact with the concave surface of the die *a*, are turned and clinched into the usual shape. Before the bar *D* finishes its return (upward) movement the finger *d* resumes its first-described position, ready to receive and then clasp, which slides on as soon as the punch *D* finishes its upward stroke.

The just described operation of the holding-finger *d* is effected in the following manner, viz: The finger *d* is held in position against the pressure of the spring *i* by the catch *f* of bar *g*. As the bar *D* descends the bar *g* is forced to descend with it by the pressure of the spring *j*, (the latch *f* meantime holding the finger *d*,) until the stop-screw *k* comes in contact with the arm *c'*, when said bar *g* is checked, and the bar *D* and finger *d* continuing to descend, the latter is released from the hold of latch *f*, and is by the force of the spring *i* thrown around on its pivot and from under the clasp. One end of spring *i* is fastened to bar *D*, the other end to finger *d*, as shown in Fig. 1. As the bar *D* ascends, the inclined or cam face *o* on back side of finger *d* comes in contact with the lower end of stationary pawl *h*, and the finger *d* is turned (against the pressure of spring *i*) into its proper position for the reception of a clasp, and as bar *D* continues its ascent said finger *d* is again locked by latch *f*.

One of the greatest advantages consequent to the construction of my improved machine is that the operator or operative, having a less number of motions to go through with, can more readily attain and retain a perfect adjustment of the work to be clasped on the lower or holding die. It will be understood that since the work has only to be properly placed and held on the stationary die *a*, and the clasp is brought to and inserted in the work by a holding device, the whole operation is rendered positive and at the same time simple.

It will be observed that the clasp is received

from the conductor or feeder between the bottom of the "set" or punch D and the top surface of finger *d*, and is there retained until the points of the clasp have been forced fairly into or through the work or material, (the finger *d* receding from the clasp after the latter has become gripped between bottom of set D and top of die *a*,) when the clinching or securing operation is effected, as already described and illustrated.

The feeder or conductor I may be varied in length, curvature, and inclination, and so arranged as to receive the clasps from a different plane without departing from my invention.

The object of the stop-screw *k* is to arrest the motion of bar *g* at the proper time, and by setting the screw *k* at different points the finger *d* may be unlatched and thrown out from the clasp at different times, according to the kind of work being clasped.

One machine may be made to work with different-size clasps by detaching the finger-bar *d* and substituting a different one when the size of the clasp is materially changed.

Having described the construction of my machine and its mode of operation, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment of a hopper or shaking table, in combination with a guide-plate, K, or its equivalent, for guiding the clasps on their backs to the feeder or conductor, substantially as hereinbefore described.

2. The employment of a feeder, I, or conductor so constructed as to receive the clasps on their backs and reverse their position as they pass down or through it, substantially as and for the purpose set forth.

3. The moving punch D, in combination with the finger *d*, or its equivalent, and the feeder, the whole so arranged that the punch cuts off one clasp at a time and forms a stop to the feed, substantially as hereinbefore explained.

4. The combination of the moving punch or set D and its clasp-retaining device *d* with the work-supporting die *a*, substantially as described, whereby the clasps are carried to the work and inserted and secured therein, as hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 27th day of August, 1862.

THOMAS B. DE FOREST.

In presence of—

J. N. MCINTIRE,
L. DE FOREST.