

No. 645,173.

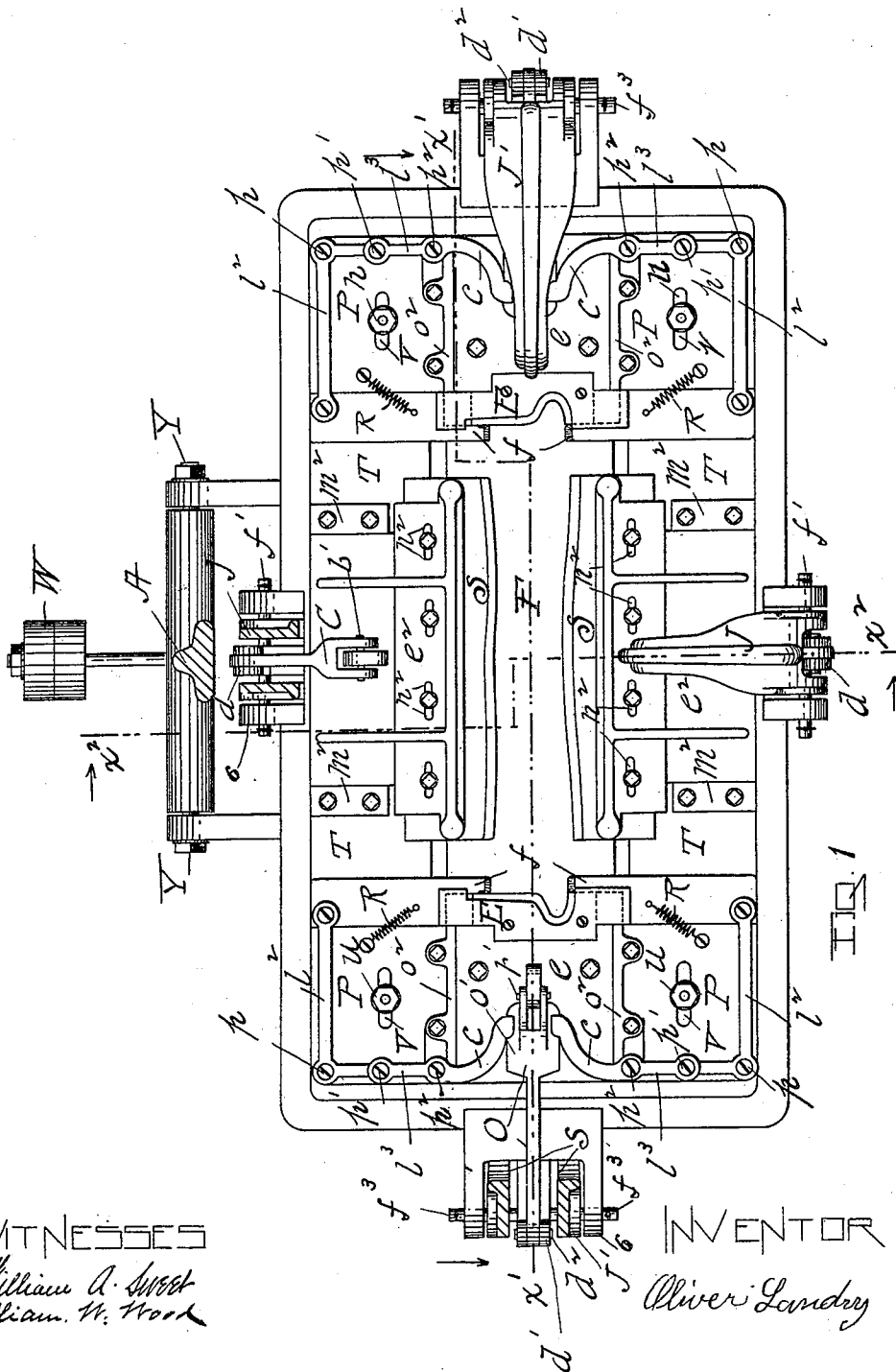
Patented Mar. 13, 1900.

O. LANDRY.
FOLDING MACHINE.

(Application filed June 30, 1899.)

(No Model.)

7 Sheets—Sheet 1.



WITNESSES
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INVENTOR
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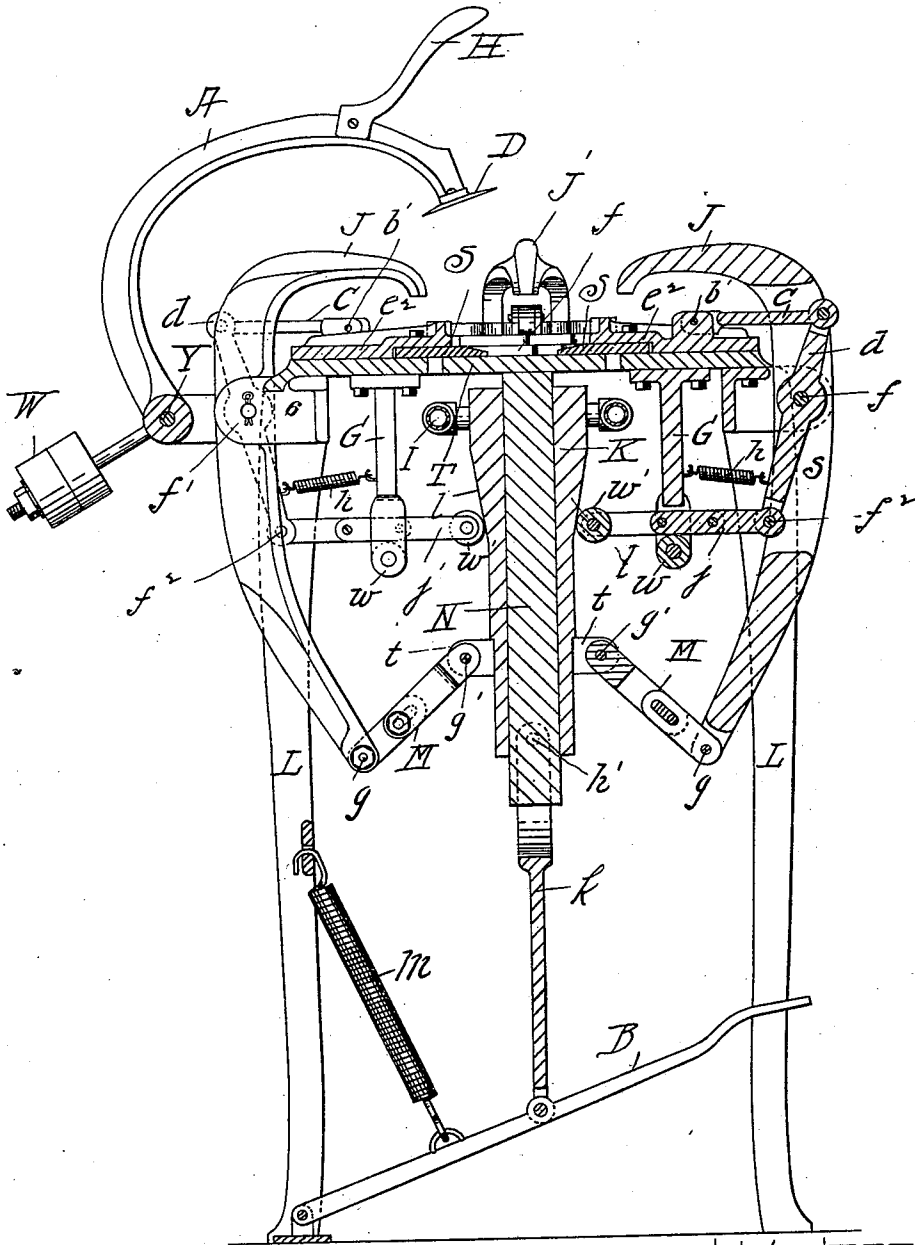
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WITNESSES

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FIG. 2

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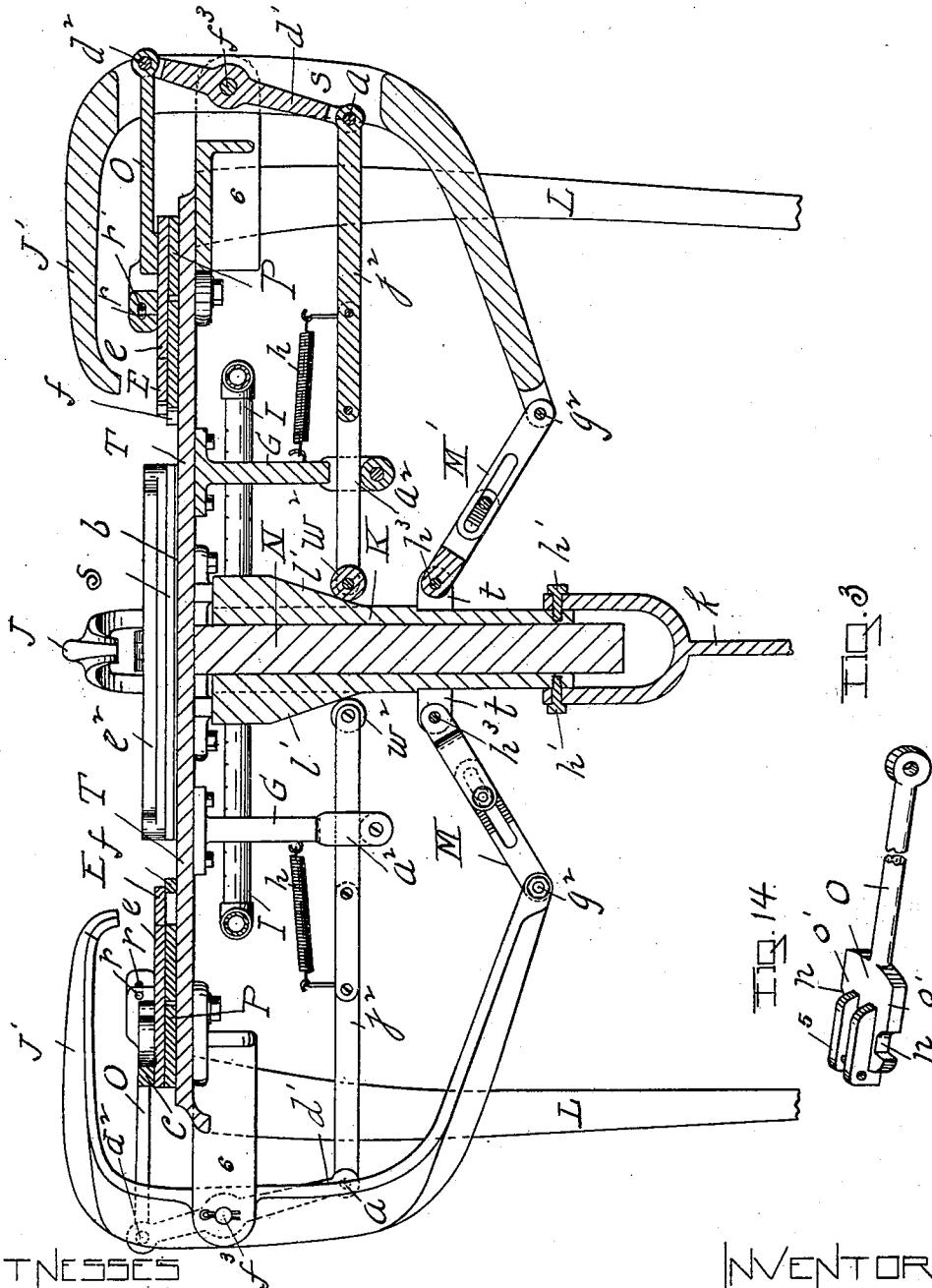
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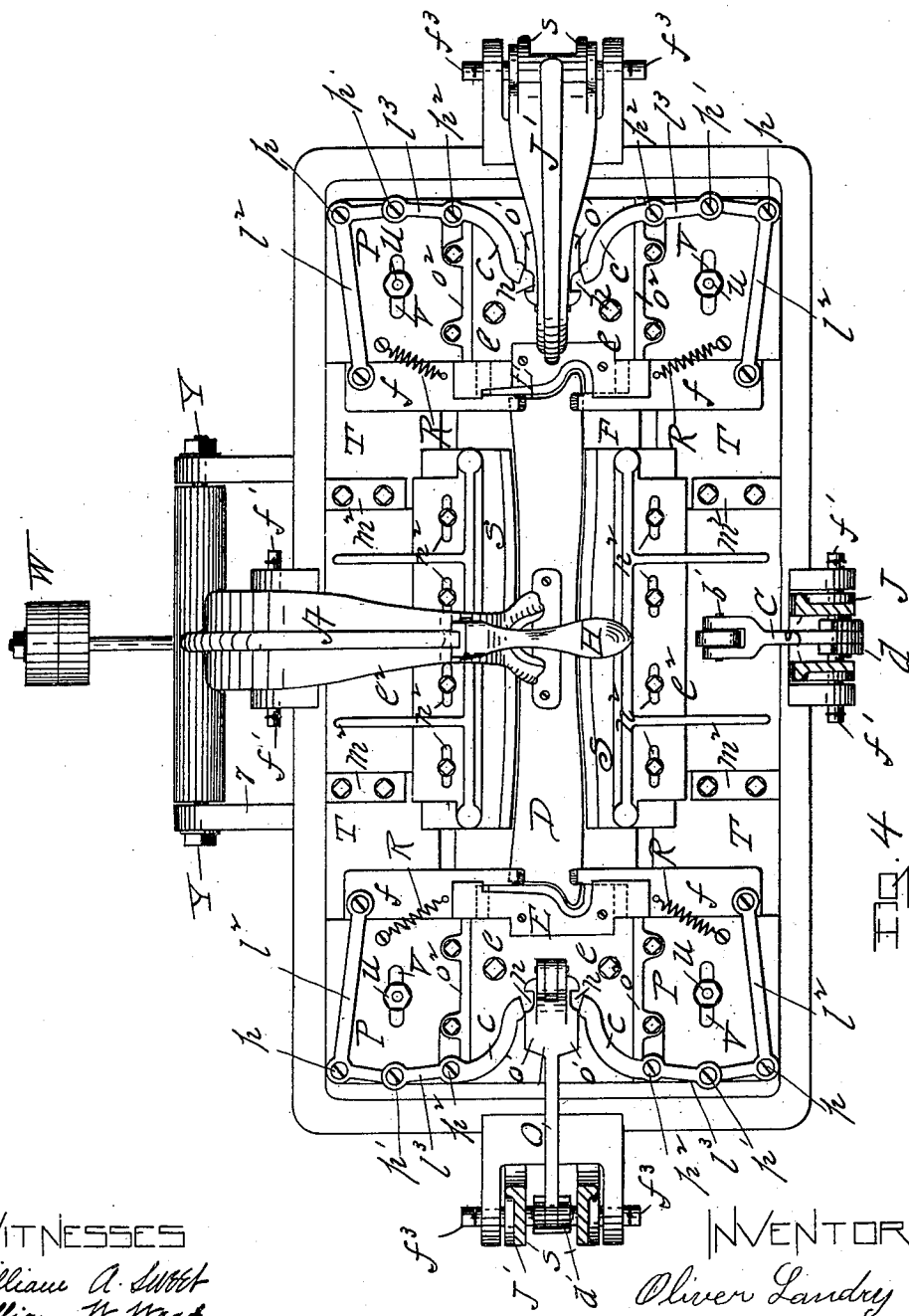
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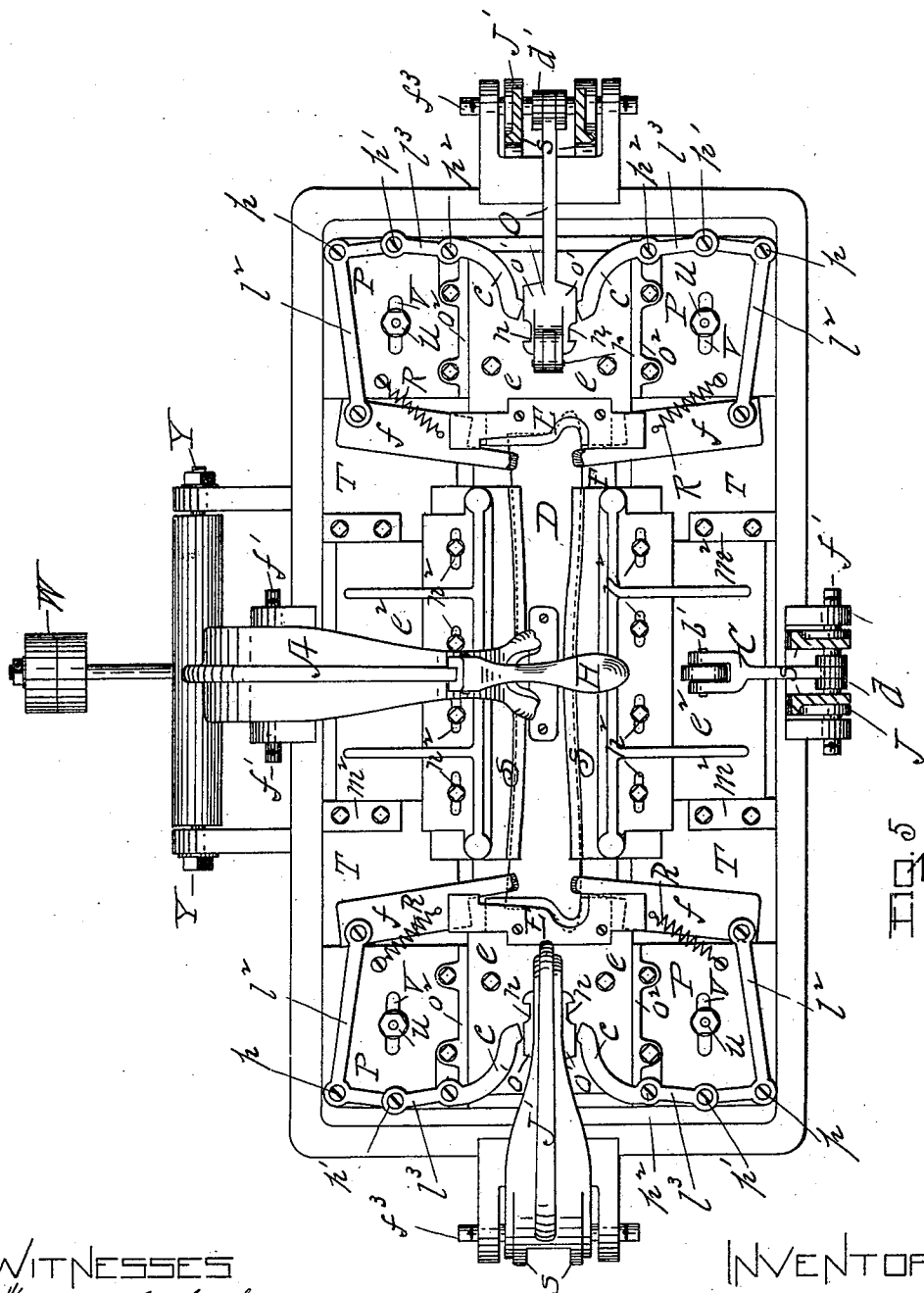
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WITNESSES

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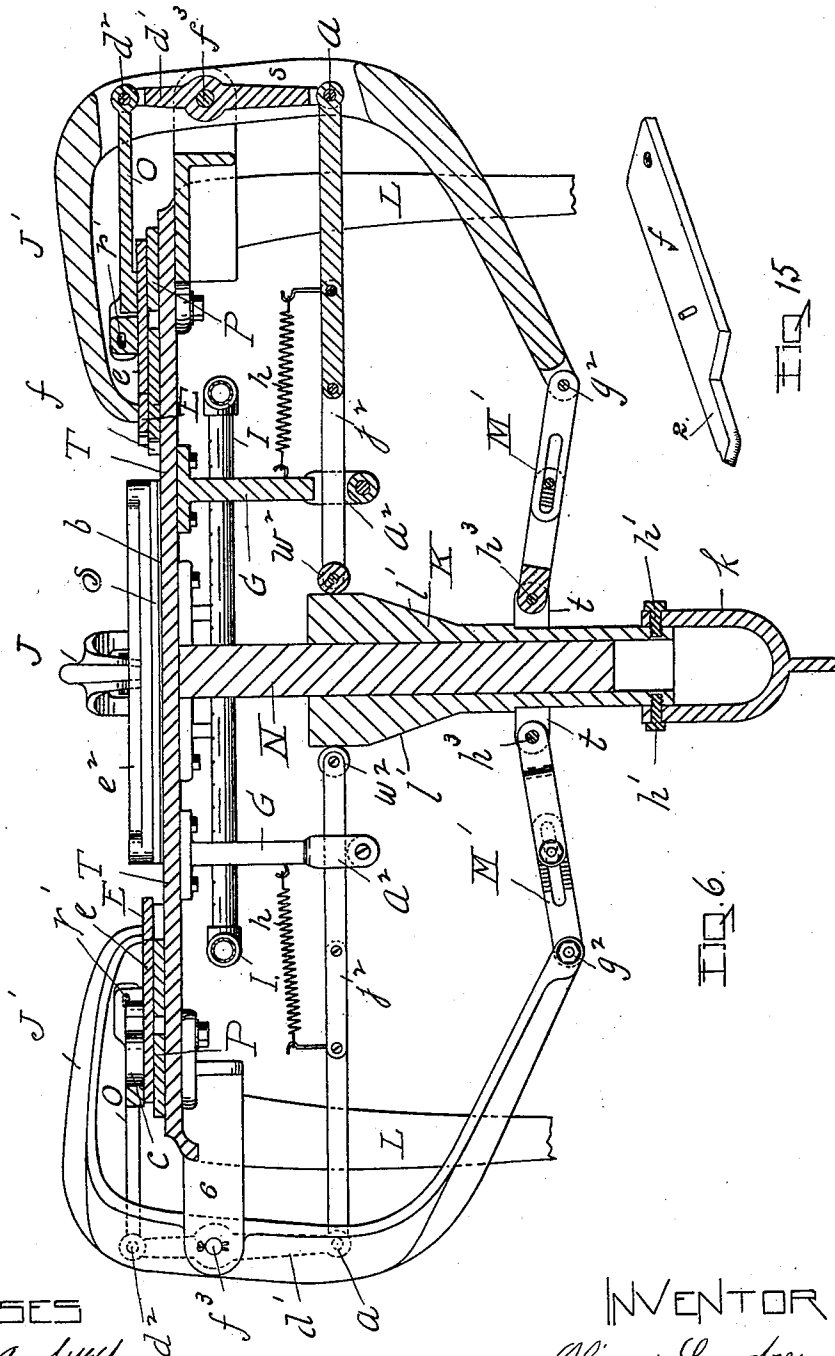
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(No Model.)

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WITNESSES

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(No Model.)

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FIG. 11

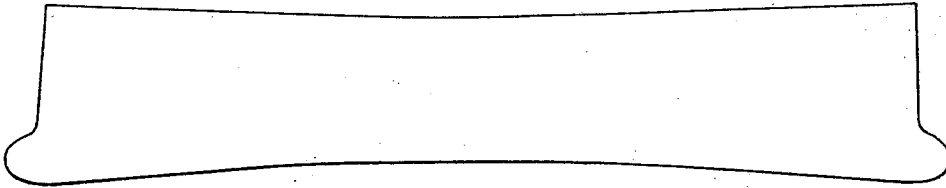


FIG. 12

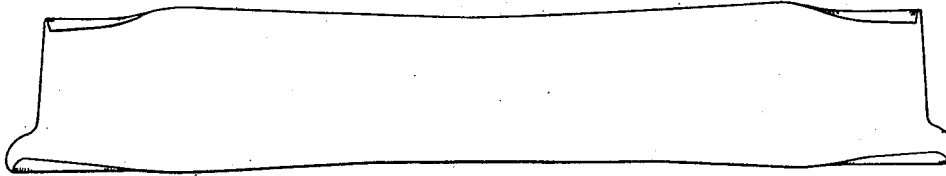
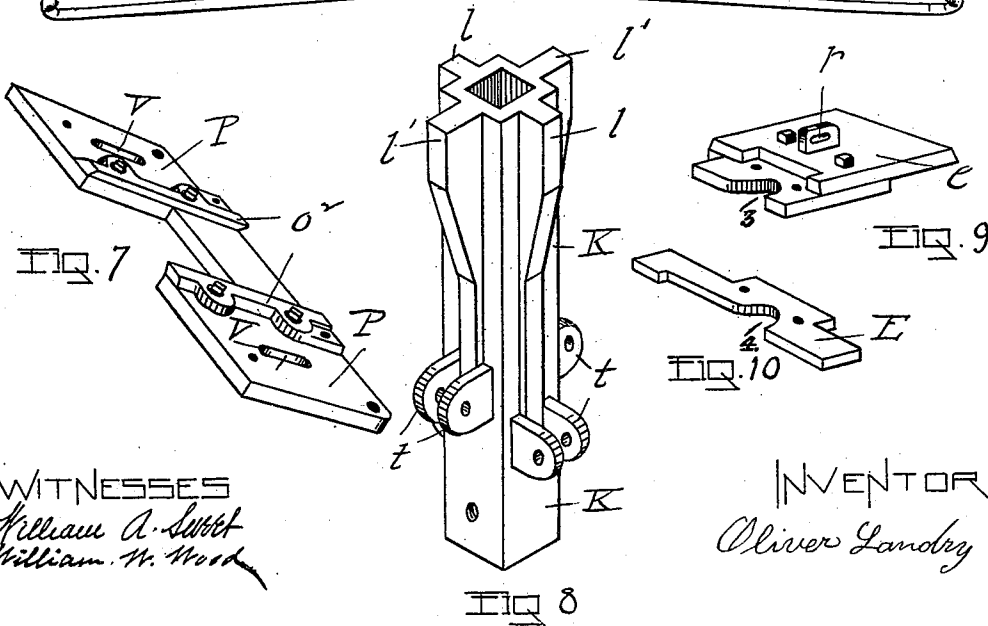
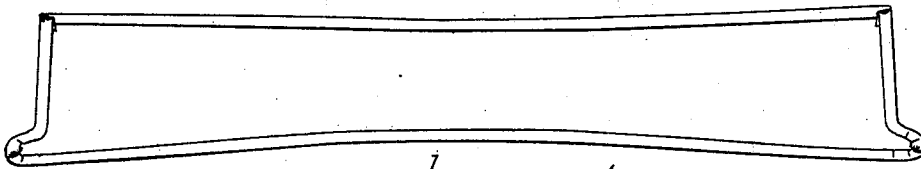


FIG. 13



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UNITED STATES PATENT OFFICE.

OLIVER LANDRY, OF TROY, NEW YORK.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,173, dated March 13, 1900.

Application filed June 30, 1899. Serial No. 722,473. (No model.)

To all whom it may concern:

Be it known that I, OLIVER LANDRY, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification.

My invention relates to improvements in machines for folding, turning, and pressing the edges of fabric blanks for collars, cuffs, shirt-trimmings, and analogous articles preparatory to the uniting of said edges.

The object of the invention is to provide a machine, economical in construction and simple and effective in operation, that will infold the edges of the blanks with precision and uniformity and at the same time produce a locked corner with a neat finished appearance.

The invention also seeks to do rapidly with a single movement what is now done slowly by hand.

These objects are attained by the use of the mechanism illustrated in the accompanying drawings; and the invention consists in certain novel features of the same, which will be hereinafter first fully described, and then particularly pointed out in the claims.

In the drawings to which reference has just been made, Figure 1 is a plan view of the preferred form of a machine embodying my invention, the die-plate and a portion of the pressure-arms being removed. Fig. 2 is a vertical section taken on the line $x^2 x^2$ of Fig. 1 and looking in the direction indicated by the arrows. Fig. 3 is a vertical section taken on the line $x' x'$ of Fig. 1 and looking in the direction indicated by the arrow. Fig. 4 is a plan view with the end-folder fingers thrown toward each other over the edges of the die-plate. Fig. 5 is a similar view showing the end-finger-folders moved longitudinally toward the side-folders. Fig. 6 is a longitudinal section showing the pressure-arms bearing on the folders. Fig. 7 is a detail perspective view of one of the plates upon which the end-folding devices are mounted. Fig. 8 is a detail perspective view of the main operating-slide. Fig. 9 is a detail view of one of the end-folder plates, the cap-piece being removed. Fig. 10 is a detail view of the cap-piece of the end-folder. Fig. 11 is a plan

view of the fabric blank. Fig. 12 is a similar view showing the blank as it appears after being acted upon by the finger-folders. Fig. 13 is a similar view showing the blank after its edge has been completely folded. Fig. 14 is a detail view of the slide which operates the end-folding devices, and Fig. 15 is a detail view of one of the finger-folders.

In carrying out my invention I employ a framework consisting of legs L, to the upper ends of which is secured a table T, the central portion F of the table forming a bed on which the folding operation is performed. On the upper side of the table, at the ends of the same, I secure the base-plates P, on which the end-folding devices are mounted. These base-plates are adjustably secured to the table by the bolts u , inserted through slots V in the plates, whereby the plates may be readily and accurately adjusted according to the size of the fabric blank to be folded. The inner edges of these plates P are cut away at their central portions, as clearly shown in Fig. 7, to accommodate the sliding end-folders, and on the upper side of the plates, registering with the edges of the cut-away portions, are secured the ways or guides O^2 . At the outer corners of the plates, as at p , I pivot the angle-levers l^2 , which have their longer arms extended just beyond the inner edges of the plates and pivoted to the outer corners of the finger-folders f , the shorter arms of the levers being pivoted to the outer ends of levers l^2 , which are pivoted on the plates at p^2 , adjacent to the ways O^2 . The finger-folders lie normally close against the inner edges of the plates P, and they are held in this normal position by the springs R, which are secured to the folders and the plates, as clearly shown and as will be readily understood. The inner end of the folder is cut away at one side, so as to fit around the corner of the end-folder plate, and this construction presents a finger 2, adapted to be projected over the edge of the blank and make the initial fold. The inner portion of the lever l^2 is formed into an inwardly-curved arm c , the end of which is adapted to engage a notched slide or plunger, as will be presently more particularly described.

Resting on the base-plate and adapted to

slide thereon between the ways or guides O^2 is the end-folder plate e , provided on its upper side, at about its center, with the slotted lug or ear r and having a stepped portion at its inner edge adapted to engage and move in the cut-away portion of the plate. A cap E is secured on the inner edge of the end-folder plate and projects slightly beyond the edge of the said plate and over the ends of the fingers, thereby holding the free ends of the finger-folders down on the table and to their work. The inner edge of the cap is formed with a recess 4, registering with a recess 3 in the edge of the plate e , both said recesses corresponding in shape to the outline of the end of the fabric blank. A pivot-pin r' is inserted through the lug r and the ears 5, formed on a plunger or slide O , to pivot the plate e to said plunger and at the same time permit a slight play on the pivot. The ears 5 are formed on a horizontal enlargement O' of the plunger, in the side edges of which are notches n , which are engaged by the ends of the curved arms c . The inner corners of the arms c and of the notches n are square, while the outer corners of the same are curved, as shown, so that when the plunger is moving outward the lever cannot be disengaged therefrom, but will act as a lock to limit its movement, while on the inward movement of the plunger the circular movement of the lever will disengage it from the plunger. The plunger, it will be seen at once, is thus permitted to move inward slightly after it has ceased to act on the lever.

Bifurcated arms or brackets 6 are formed on or secured to the under side of the table and project beyond the sides and ends of the same, as clearly shown in Figs. 2, 3, and 6. Fulcrumed in the end arms or brackets 6 at f^3 are levers d' , having their upper ends pivoted, as at d^2 , to the outer ends of the plungers O , and their lower ends pivoted, as at a , to the outer ends of pitmen j^2 , which pass through bifurcations A^2 in the supporting-arms G , depending from the table, and have their inner ends provided with rollers w^2 , bearing against the main operating sliding cam K . Coiled springs h , secured to the pitmen, and the arms G serve to hold the pitmen in constant contact with the said sliding cam K .

On the table, at the centers of the side edges of the same, are the slidable plates e^2 , fitted between the guides m^2 , secured transversely on the table. The inner portions of the slidable plates are slightly raised, so as to extend over the side-folders or folding-plates S , which are adjustably secured thereto through the slots n^2 . On the upper side of each plate e^2 is a lug b' , to which the inner end of a link C is pivoted, the outer end of said link being pivoted to the upper end of a lever d , fulcrumed, as at f' , in a side bracket 6 and having its lower end pivoted, as at f^2 , to a pitman j . The pitman is similar in all respects to the pitman j^2 , having a roller w' at its inner end

and being held in contact with the operating sliding cam K by a coiled spring h , which in this instance is attached to the lever d instead of to the pitman, as shown in Fig. 2.

The side and end pressure-arms $J J'$ are curved levers having the same fulcrums in the brackets 6 as the levers $d d'$, the pressure arms or levers being slotted, as shown at s , to pass around the levers $d d'$ and permit the free action of the same. The lower longer arms of the pressure-levers are pivoted, as at g and g^2 , to the extensible links $M M'$, having their inner ends pivoted, as at g' and h^2 , to ears t on the main sliding cam K .

Depending centrally from the table is a post or guide N , upon which the sliding operating-cam K is mounted. This cam is connected by a link k to a treadle B , which is held normally in a raised position by a coiled spring m , attached to the treadle and to the frame of the machine. The sliding cam K consists of a sleeve, preferably rectangular to prevent rotation, provided with lugs or ears t to receive the links $M M'$ and having inclined ribs or cam-surfaces $l l'$ above said lugs, the ribs l' being longer than the ribs l , so that the end levers will be set in motion before the side levers are actuated.

The edges of the several folders are suitably beveled, so as to readily engage the edge of the blank and ride over the edge of the die-plate.

The die-plate D corresponds in outline to the article to be formed and is made integral with or secured rigidly to the end of a curved arm A , having a handle H and fulcrumed on a pivot-pin Y , mounted in arms 7, projecting rearwardly from the table. A counterweight W is provided beyond the pivot-pin in order to hold the arm and the die-plate in any position in which they may be left by the operator.

I designates a heating-pipe to heat the table and the several folders, thus materially aiding the turning and pressing of the fabric.

It is thought the operation of the device will be readily understood from the foregoing description taken in connection with the accompanying drawings. The fabric blank is placed on the folding-bed and the die-plate brought down, so as to hold the same firmly. The treadle is then depressed by the operator, thereby lowering the operating-cam slide K and causing the cam-ribs thereon to force outward the pitmen $j j^2$, and consequently vibrate the levers $d d'$, so as to operate the side and end folders. In order to successfully infold the edges and form a locked corner with a neat finished appearance, it is necessary to start a fold at the ends of the sides of the blanks before the folding proper is started. To accomplish this result, the ribs l' are longer than the ribs l , and the finger-folders f are employed. The greater length of the ribs causes the levers d and the plunger O to move inward slightly before the levers d and the plates e^2 , with the side-folders, act. The pin-

and-slot connection between the plunger O and the plate *e* permits the said plunger to move inward before acting on the plate. This initial movement of the plunger carries the ends of the lever-arms *c* inward, thereby vibrating the levers *l*^s *l*² and causing the finger-folders *f* to move toward each other to the position shown in Fig. 4. The continued inward movement of the plunger carries it beyond the range of the lever-arms, consequently disengaging the said arms, and sets the end-folder plate *e* in motion. The plate *e* impinges against the edge of the finger-folder, so that as it continues to move inward it will cause the said fingers to swing on their pivotal connections with the levers *l*^s, as shown in Fig. 5. The movement of the finger-folders forms the fold shown in Fig. 12, and the complete fold, as shown in Fig. 13, is formed by the action of the side-folders *S* and the end-folder plates *e* in engaging the edge of the blank and forcing the same against and over the edge of the die-plate. The side and end pressure arms are set in motion simultaneously with the initial movement of the main cam *K*, and they should be so adjusted by means of the extensible links that they will come down onto the folder-plates just as the said plates reach the inner limit of their movement. The pressure then applied by these pressure-arms serves to crease the fold and make it permanent. Upon releasing the treadle the springs *m* and *h* return the several levers to their initial positions. The die-plate is then raised and the blank removed. As the end-folding plate moves outward the springs *R* hold the fingers *f* against the inner edge of the plate and cause the fingers to follow the movement of the plate until they assume the position shown in Fig. 4. The springs then tend to draw the fingers toward the sides of the table; but this movement is resisted by the lever-arms *c* bearing against the sides of the enlargement *O'* of the plunger. As soon, however, as the continued movement of the plunger brings the notches *n* opposite the ends of the said lever-arms the springs *R* instantly throw the fingers outward and the lever-arms into engagement with said notches, bringing the parts into their initial positions. (Shown in Fig. 1.) The described operation of folding may then be repeated.

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

1. The finger-folder *f* having its inner or front end provided with a beveled folding edge, having its outer front corner cut away in a vertical plane to form a notched edge, and provided with a pivot-hole near its rear end, substantially as described and for the purposes herein specified.

2. The operating-cam *K* having lugs *t* and

cam-ribs *l* *l'* above the lugs, the ribs *l'* being longer than the ribs *l*.

3. In a collar-folding machine, the combination with the supporting-frame, and the folders mounted thereon, of pivot or fulcrum pins at the sides of the supporting-frame, pressure-levers adapted to bear upon the folders mounted on said pivot-pins and having longitudinal slots, folder-operating levers mounted on the fulcrum-pins within the longitudinal slots of the pressure-levers, and means for actuating all said levers.

4. In a machine of the character described, the combination of a base-plate, a finger-folder resting against the edge of the base-plate, a slidable end-folder plate mounted on said base-plate and bearing against the edge of the finger-folder and thereby adapted to actuate said finger-folder, and suitable operating mechanism.

5. The combination of a base-plate, a finger-folder resting against the edge of said plate, a slidable folder-plate mounted on the base-plate and bearing against the edge of the finger-folder, a cap-plate secured on the said folder-plate and projecting over the end of the finger-folder, and suitable operating mechanism.

6. The combination of a finger-folder, an end-folder plate, a spring holding the finger-folder in its normal position, a plunger having a pin-and-slot connection with the end-folder plate, a system of levers connected to the finger-folder and adapted to be engaged by the plunger, and means for reciprocating the said plunger.

7. The combination with the table and a base-plate thereon, of a slidable end-folder plate mounted on the base-plate, a finger-folder resting loosely on the table against the edge of the base-plate, a spring holding the finger-folder normally against the edge of the base-plate, a system of levers fulcrumed on the base-plate and having a pivotal engagement with the outer end of the finger-folder, a plunger having a pin-and-slot connection with the end-folder plate and provided with a notch in its side edge adapted to engage the end of the lever system and actuate the same during a portion of its movement, and means for reciprocating the plunger.

8. The combination of the side and end folders, levers connected therewith, a vertically-reciprocating slide having cam-faces arranged in pairs of unequal length, pitmen connected to said levers and bearing against the said cam-faces, pressure-levers, and links pivoted to the pressure-levers and to the slide below the cam-faces.

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Witnesses:

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H. JUDD WARD.