

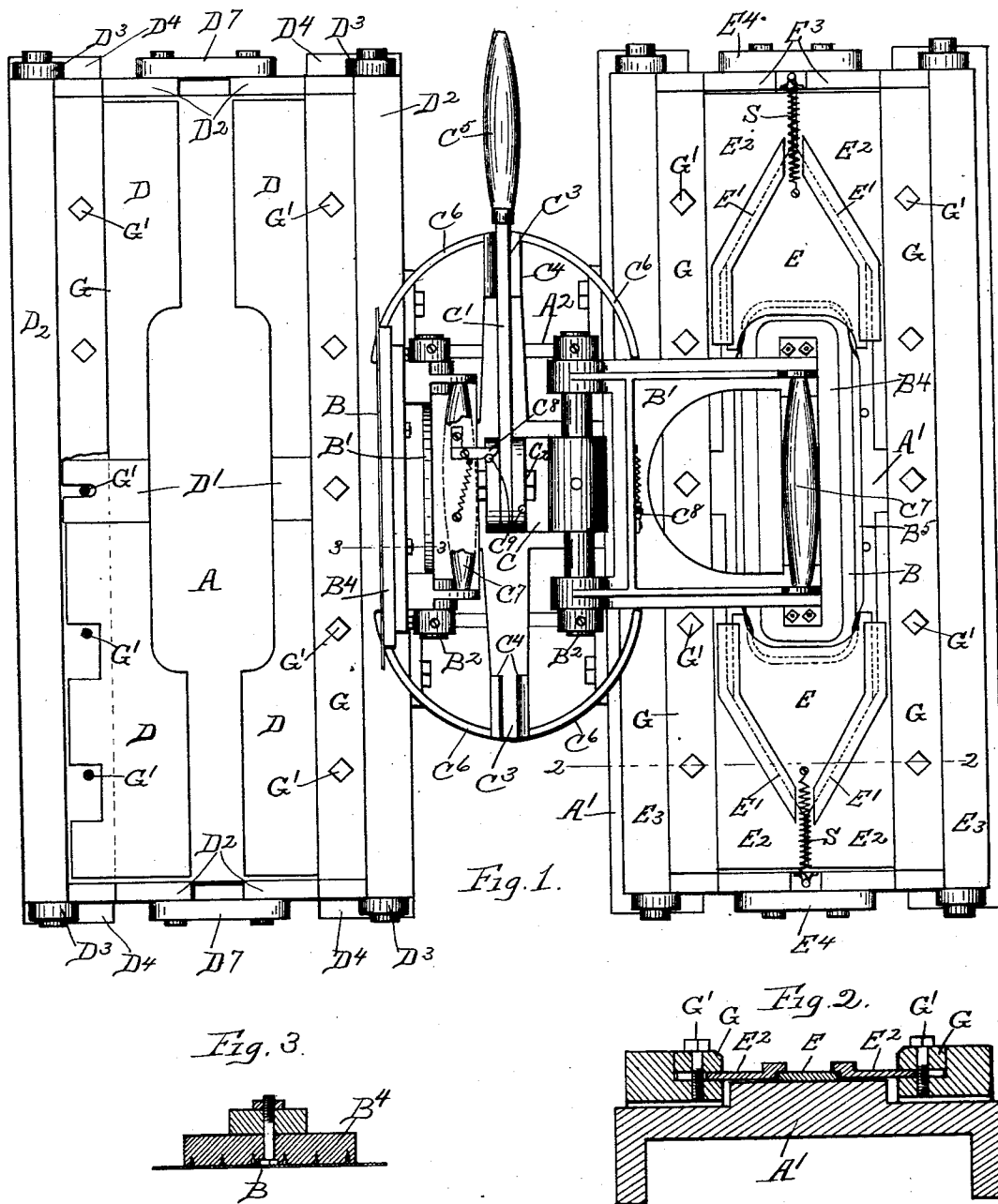
(No Model.)

3 Sheets—Sheet 1.

W. HESS, Jr.
FOLDING MACHINE.

No. 580,280.

Patented Apr. 6, 1897.



Witnesses:
C. H. Curtis
J. A. Griffin

Inventor:
Wendell Hess, Jr.
By Mosher & Curtis
attys

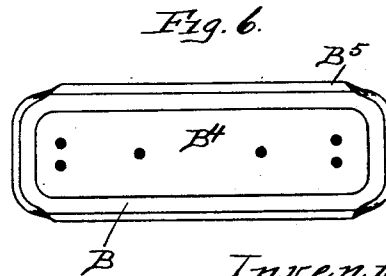
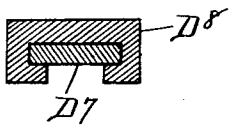
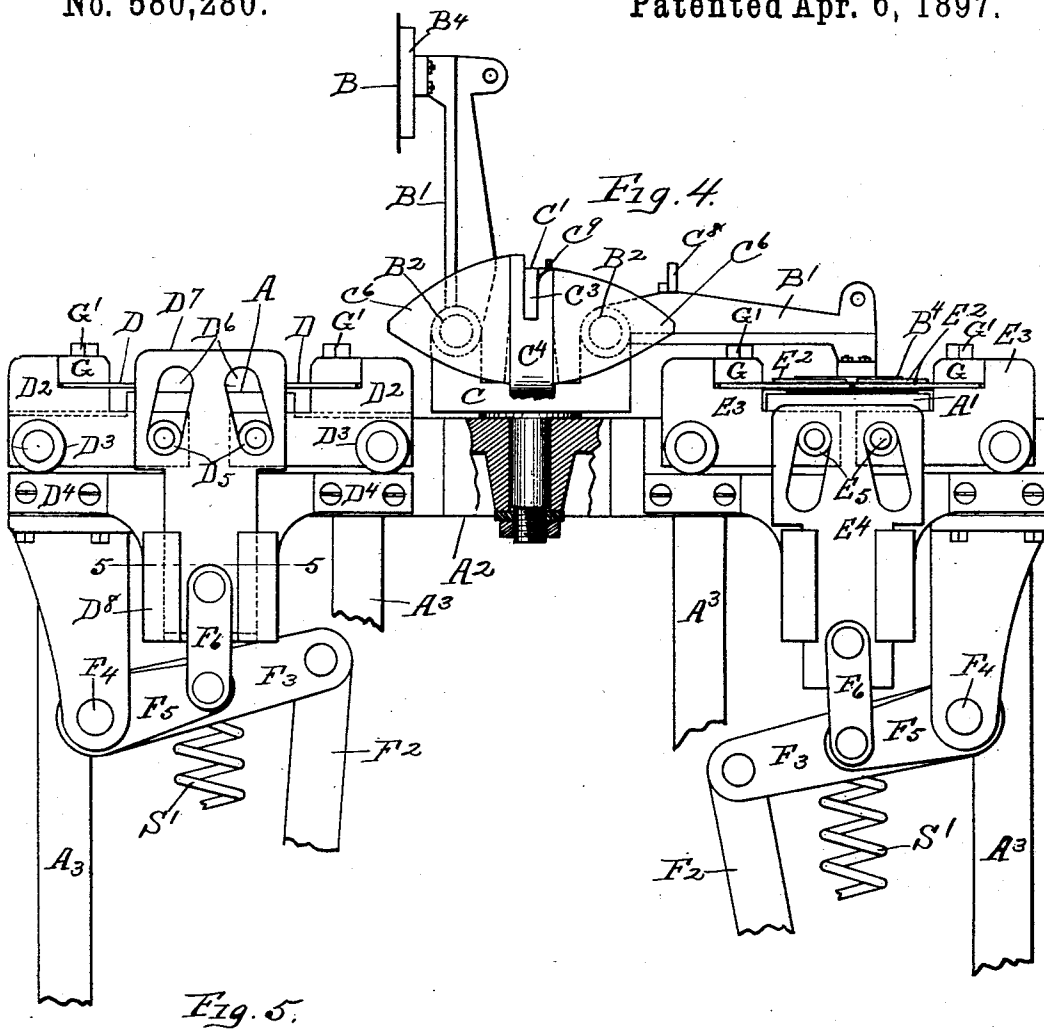
(No Model.)

3 Sheets—Sheet 2.

W. HESS, Jr.
FOLDING MACHINE.

No. 580,280.

Patented Apr. 6, 1897.



Witnesses:
C. A. Curtis
J. A. Guffin

Inventor:
Wendell Hess, Jr.,
By Mosher & Curtis
Atty.

(No Model.)

3 Sheets—Sheet 3.

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Fig. 8.

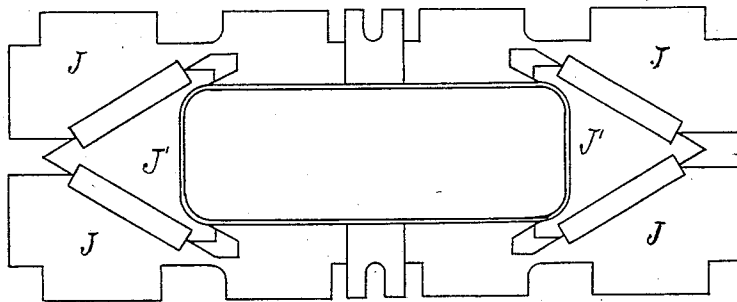


Fig. 9.

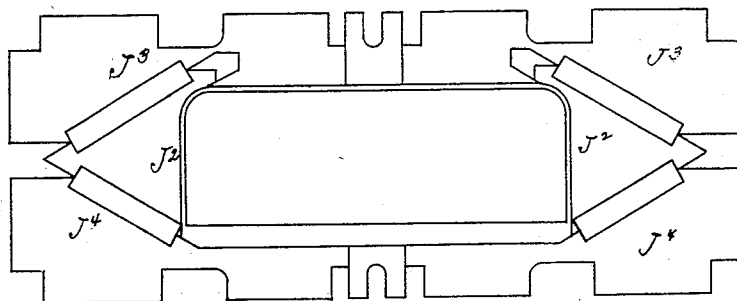
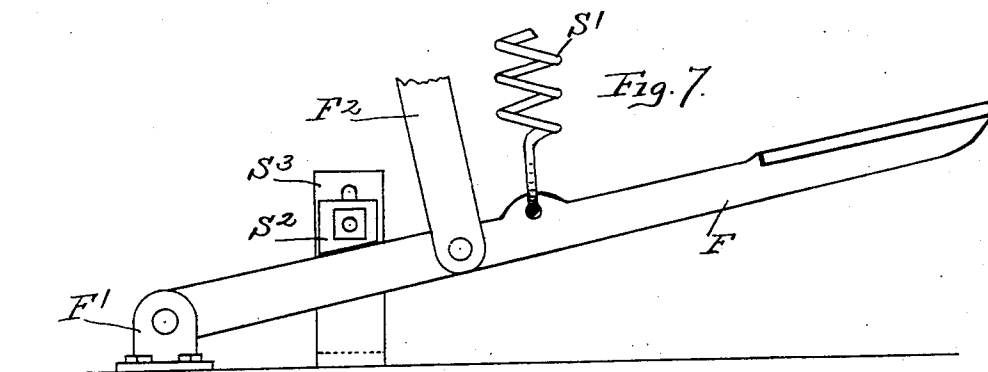


Fig. 7.



witnesses:
C. H. Curtis
J. A. Griffin

Inventor:
Wendell Hess Jr.
By Mosher & Curtis attys

UNITED STATES PATENT OFFICE.

WENDELL HESS, JR., OF TROY, NEW YORK.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,280, dated April 6, 1897.

Application filed October 19, 1896. Serial No. 609,282. (No model.)

To all whom it may concern:

Be it known that I, WENDELL HESS, JR., a citizen of the United States, residing at Troy, 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.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures.

Figure 1 of the drawings is a top plan view of my improved folding-machine. Fig. 2 is a vertical cross-section taken on the broken line 2 2 in Fig. 1. Fig. 3 is a cross-section taken on the broken line 3 3 in Fig. 1. Fig. 4 is a view in end elevation of the upper part of the machine shown in Fig. 1. Fig. 5 is a horizontal cross-section of the cam-plate and its slideway, taken on the broken line 5 5 in Fig. 4. Fig. 6 is a plan view of a former for a cuff with a cuff-blank partly folded upon the same. Fig. 7 is a view in elevation of one of the treadles for operating the machine. Fig. 8 is a plan view of the former and folders, showing a modified form of my invention. Fig. 9 is a similar view of a further modification.

A and A' are similar beds or platforms connected by the bridge A² and supported by the standards A³.

Each bed supports folding mechanism adapted to coöperate with one or more sides of a pattern-plate or former, whereby a collar, cuff, or other blank supported upon the bed may be folded or inturned along one or more of its sides or edges, and the folding mechanisms on the several beds are adapted to coöperate with a common former.

The former or pattern B is supported upon a rotary turret C, pivotally mounted upon the bridge A² intermediately of the beds.

The former is attached to a frame B', hinged upon the turret at B², and is adapted to be carried by the rotary movement of the turret to the several beds successively.

The turret and bridge are provided with mechanism for securing the accurate disposition of the former upon the several beds, comprising the latch C', pivoted upon the turret at C² and adapted to enter and fit the several slots C³ in the upper ends of posts C⁴, erected from the bridge and located on diametrically opposite sides of the turret. The latch is provided with a handle C⁵, by means of which it can be lifted and the turret rotated. The bridge also supports oppositely-projecting guide-wings C⁶, having inclined or beveled upper surfaces leading to and from the several slots C³ and adapted to guide the latch to and from the slots. The wings C⁶ also serve as guides for the former-frame and prevent the former from being brought against the bed in other than its proper position. The former-frame is also provided with a handle C⁷, by means of which it may be moved upon its hinge to raise the former from and lower it upon the several beds.

While the turret is being rotated the former-frame is supported in an elevated or raised position by means of the yielding spring-catch C⁸, supported upon the frame and adapted to engage a pin C⁹ on the turret when the frame is elevated. The nose of the catch is beveled to enable it to automatically ride upon and past the pin.

The folding mechanism supported by the bed A is adapted to coöperate with the opposite sides only and that upon bed A' with the opposite ends only of the former when the former is supported upon the respective beds.

The folding mechanism for the sides consists of a pair of folders comprising plates D D', adapted by their form and arrangement to coöperate with the former to fold or inturn the opposite side edges of a blank.

The folders on each side are secured to a movable support or carriage D², mounted upon rollers D³, adapted to ride upon tracks or ways D⁴, secured to the bed, the support being oscillatory upon the axis of the rollers.

The neighboring ends of the carriages are provided with cam-followers or rollers D⁵, adapted to ride in the respective cam-slots D⁶ in the cam-plate D⁷, which plate is vertically reciprocatory in a slideway D⁸, attached to the bed.

The cam-slots are so formed that a down-

ward movement of the cam-plate forces the folders, through their supports and the followers, inwardly to lap the side edges of the former supported upon the bed.

5 A continued downward movement of the cam-plate, after the followers have reached the upper ends of the respective slots, imparts to the followers and oscillatory ends of the carriages a downward movement, which
10 forces the folders down upon the underlying edges of the former or the intumed edges of a blank to press the same.

An upward movement of the cam-plate relieves such pressure and forces the folders
15 back away from the former.

Vertical movements may be imparted to the cam-plate in any known manner.

The folders upon bed A' are adapted to cooperate with the opposite ends only of the former and comprise a plate E at each end of
20 the bed, having its inner edge of a form and size adapted to the form and size of the end of the former.

Each of the folders E is provided on its
25 outer end with a pair of oppositely-inclined surfaces E', adapted to be engaged, respectively, by the wedges E², which wedges are supported upon carriages E³, constructed and operated in precisely the same manner as the
30 carriages or supports D² for the side-folders on bed A.

The wedges engage both the inclined surfaces and the top surface of the end-folders, as shown in Fig. 2, so that as the operating
35 cam-plate E⁴ is moved downwardly it imparts to the wedges, through the followers E⁵ and the wedge-carriages, first an inward movement against the inclined surfaces of the end-folders, which causes said folders to contract
40 or move toward each other to lap the ends of the former, and then, as the movement of the cam-plate is continued after the followers reach the ends of their respective slots, the wedges are carried by the oscillating move-
45 ment of the carriages against the top surfaces of the folder-plates, thereby forcing the folders downwardly upon the lapped ends of the former or the end folds of the blank to press the same.

50 As the cam-plate is moved upwardly the pressure is relieved and the wedges withdrawn, permitting the end-folders to be restored to their idle position by means of the springs S or in any known manner.

55 The cam-plates may be operated in any known manner. In Fig. 7 I have shown treadle mechanism designed for this purpose, the treadle F being fulcrumed at one end upon a bracket F' and connected by a link F² with
60 an arm F³ on the shaft F⁴, supported in bearings upon the bed. A shorter arm F⁵ upon the same shaft is connected by link F⁶ with a cam-plate. The treadle is adapted to be depressed by the foot of the operator and elevated by means of a spring S', connected at
65 opposite ends to the bed and treadle. A stop

S², adjustably secured upon the standard S³, limits the upward movement of the treadle.

Similar treadle mechanism may be employed for each cam-plate. 70

I do not wish to be limited to the relative arrangement of beds shown nor to the means shown for moving the former from one bed to another.

The beds may be disposed in any desired
75 positions relatively to each other, and any known means may be employed to move the former from one bed to another and accurately place the former upon the several beds successively without departing from the spirit
80 of my invention.

The construction and arrangement shown and described is preferred for the reason that it permits the employment of a second former precisely like that above described, and which
85 is hinged to the opposite side of the turret, so that when the turret is locked in position for either former to be properly placed upon one of the beds the other former will be in position to be properly placed upon the other bed. 90
Such a construction is shown in the drawings and permits the employment of two operators upon the same machine, the duty of each operator being to place a blank B⁵ upon the adjacent bed, lower the neighboring former upon
95 such blank, operate the treadle to fold and press, one the ends and the other the sides of, the blanks, and then raise the former. When a blank has thus been partly folded upon each former on two opposite sides or ends only, it
100 is left thereon and the turret is rotated to reverse the positions of the formers and each operator completes the folding of the blank begun by the other, and then they simultaneously remove the two blanks, which have
105 now been folded on all sides, by raising one or more of the folded edges with the fingers until the blanks can be slipped from the formers.

I employ for the former a plate of sheet
110 metal which is uniformly and relatively thin, from edge to edge and attach the same to a supporting-block B⁴, of wood or similar material, which is relatively thick and rigid and extends nearly to the edge of the sheet metal. 115

When the former-plates are relatively thick and beveled to produce thinner edges, as heretofore practiced, the fold cannot be fixed in the blank by pressure without first withdrawing the plate from the fold, because the thicker
120 portion of the former-plate prevents the presser-plate from pressing upon the fold at the thin edge of the former-plate.

By having the former-plate of uniform thickness, while relatively thin, I am able to
125 impart the full pressure exerted by the folders to the edge fold of the blank, whereby I am able to so fix the fold-line therein that it will not be destroyed by raising the folded edge with the fingers in removing the folded
130 blank from the former.

The former is detachably secured to its

supporting-frame by bolts and nuts, as shown, permitting the substitution of different-sized formers when desired.

The folder-plates and wedge-plates are secured to their supporting-carriages by clamp-bars G and bolts G', and the several plates are slotted to receive the clamping-bolts and permit the plates to be adjusted to adapt them for use with formers of different sizes.

One of the clamp-bars is shown broken away at the left-hand side of Fig. 1 to show the construction of the folder-plates.

The folders can be adapted for formers of different sizes by inserting between the adjacent ends of the corner-plates D on each side a short section or plate D' of a length to close the space between such ends after the corner-plates have been adjusted.

By having the end-folders free to slide upon the bed I can produce any desired movement of such folders by a proper adjustment of the wedge-plates upon their supports. To secure such adjustment, the former is lowered upon the bed and the folders placed in the relative positions thereto which it is desired to have them assume at the end of their folding movement. The wedge-plates are then placed in contact with the inclined surfaces of the folders and in this position clamped to their supports or carriages, the latter being held at the limit of their inward movement. Such an adjustment is performed each time the former is changed for the purpose of adapting the machine to fold different sizes of blanks. The blanks for a particular style of collar or cuff vary greatly in length, but not in width or end formation. The same end-folders are therefore used for all sizes of a given style of blank, and in changing from one size to another the former is first changed, and then the end-folders are placed in proper position relatively to the new former and the wedge-plates adjusted upon their supports in the manner just described.

My improved folder-operating mechanism is adapted for use upon a single bed, if desired.

In Fig. 8 I have shown folders adapted to fold a blank upon all four sides simultaneously and adapted to be operated by the mechanism above described in connection with either the side-folders or the end-folders. This is accomplished by making the wedges which operate the end-folders a part of the side-folders, as shown. J J are the combined side-folders and wedge-plates, and J' J' are the end-folders.

In Fig. 9 a similar construction is shown adapted to fold a blank on three sides. In this construction the folder-plates on the fourth side need not be moved, but may be secured in a fixed position and the mechanism for operating the same dispensed with or disconnected temporarily. J³ J² represent the end-folders. J³ is the movable combined

side-folder and wedge-plate, and J⁴ is the fixed side-folder and wedge-plate. In this construction the plate J⁴ has no function as a folder when it is secured in a fixed position, although it retains its function of a wedge-plate. When the movable plate J³ is operated, the end-folder is forced thereby against and along the inclined surface on the fixed plate J⁴ in a diagonal line toward the former.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a folding-machine and in combination, two beds, a rotary turret located between the beds, two formers oppositely disposed upon the turret, folding and pressing mechanisms on the several beds adapted to cooperate respectively with different sides of each former, cam mechanisms for operating the folding and pressing mechanisms on the several beds, a pair of treadles, and connections between the treadles and cam mechanisms, whereby the machine is adapted for conjoint use by two operators, substantially as described.

2. In a folding-machine, the combination with a plurality of beds, and folding mechanism on the several beds adapted to cooperate respectively with different sides of a former, of a former movable from one to the other of such beds and cooperative with the folding mechanism thereon successively, and means for moving the former, substantially as described.

3. In a folding-machine, the combination with a plurality of beds, and folding mechanism on the several beds adapted to cooperate respectively with different sides of a former, of a rotary turret located intermediately of the beds, and a former supported upon the turret and adapted to be carried to the beds successively, substantially as described.

4. In a folding-machine, the combination with a plurality of beds, and folding mechanism on the several beds adapted to cooperate respectively with different sides of a former, of a rotary turret located intermediately of the beds, and a plurality of formers supported upon the turret and each adapted to be carried to the several beds successively, substantially as described.

5. In a folding-machine, the combination with a former, of a movable sliding folder having oppositely-inclined surfaces, a plurality of wedge-plates separately adjustable upon suitable supports and engageable with said inclined surfaces respectively, and means for moving the supports to force the wedge-plates against the folder, substantially as described.

6. In a folding-machine, the combination with a bed and a former, of a folder, a pivoted support for the folder movable upon the bed toward and from the former, a vertically-reciprocatory cam-plate having a cam-slot of limited length, a follower on the folder-sup-

port engageable with the walls of the cam-slot, and means for reciprocating the cam-plate, substantially as described.

7. In a folding-machine, the combination
5 with a former and bed, of a folder having an inclined surface, a wedge engageable with said inclined surface and with the top surface of the folder, a support for the wedge movable both horizontally and vertically, and

means for moving the wedge-support first toward the folder and then toward the bed, substantially as described.

In testimony whereof I have hereunto set my hand this 8th day of September, 1896.

WENDELL HESS, JR.

Witnesses:

GEO. A. MOSHER,

FRANK C. CURTIS.