

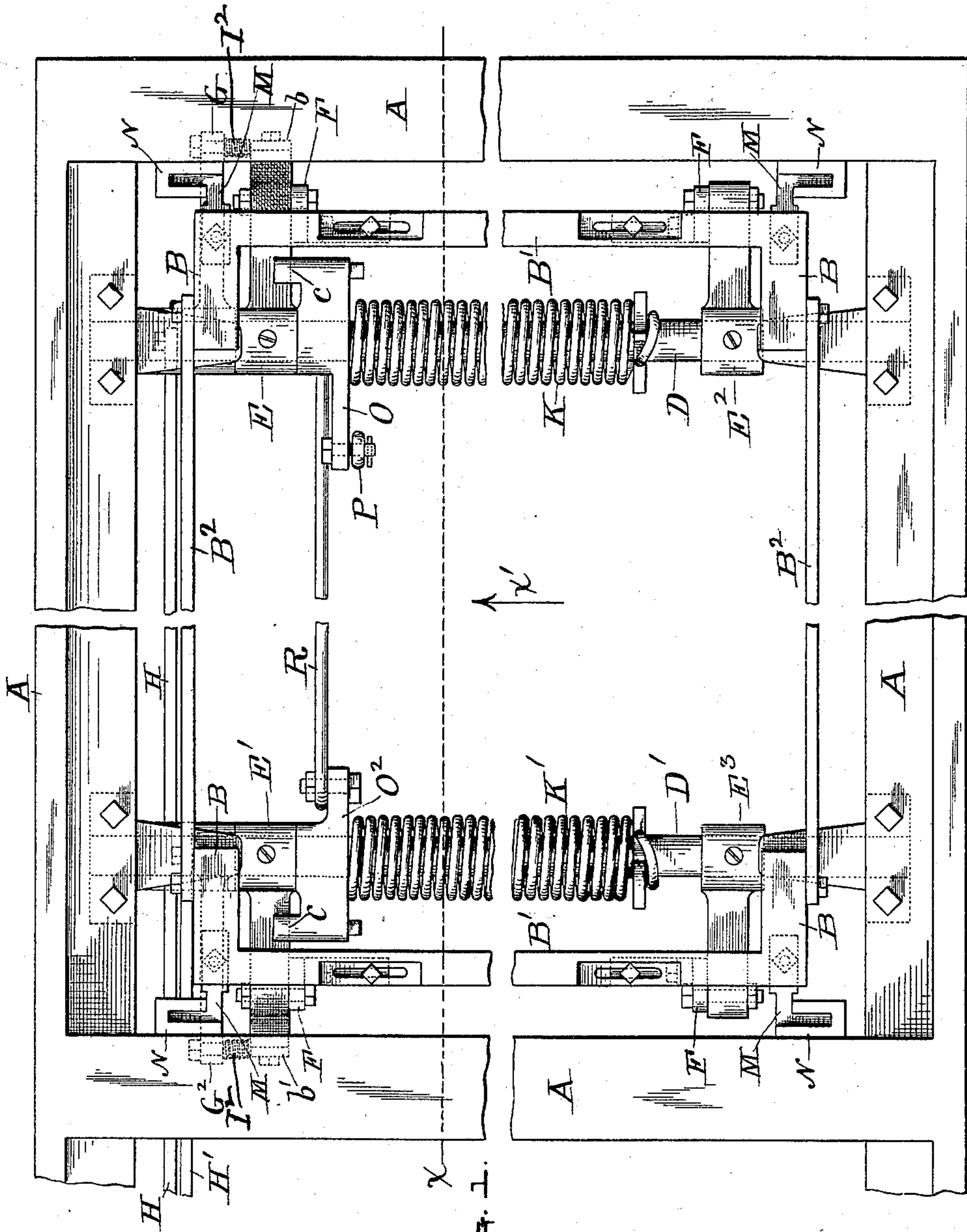
(No Model.)

2 Sheets—Sheet 1.

E. HALL.
CLOTH FOLDING MACHINE.

No. 540,249.

Patented June 4, 1895.



WITNESSES,

Walter B. Nourse.

C. Forrest Kesson.

INVENTOR,

Edward Hall.

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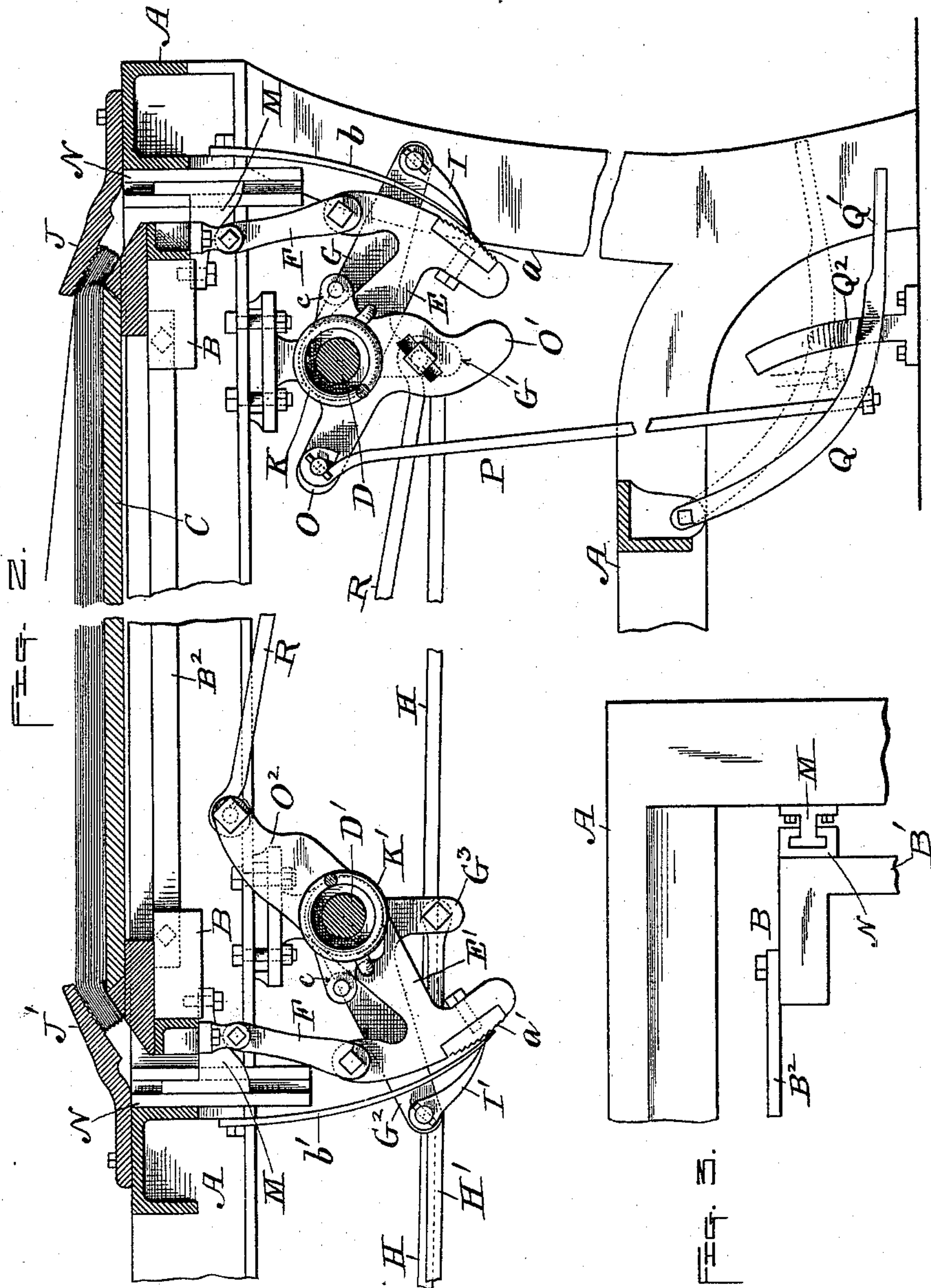
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UNITED STATES PATENT OFFICE.

EDWARD HALL, OF WORCESTER, MASSACHUSETTS.

CLOTH-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,249, dated June 4, 1895.

Application filed May 16, 1894. Serial No. 511,394. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HALL, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain
5 new and useful Improvements in Cloth-Folding Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of
10 this specification, in which—

Figure 1 represents a plan of so much of a cloth-folding machine as is necessary to illustrate my improvements thereon. Fig. 2 is a
15 vertical longitudinal section through the parts shown in said Fig. 1, taken on line x , looking in the direction indicated by arrow x' ; and Fig. 3 represents a modification in the construction, which will be hereinafter described.

My invention relates to machines for automatically folding cloth in equal lengths of
20 folds laid upon a movable table; and consists of certain improvements in the mechanism for supporting, operating and guiding the frame upon which said folding table is placed,
25 as will be hereinafter more fully set forth.

To enable others skilled in the art to which my invention appertains, to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

30 In the drawings, A represents the outer, stationary frame of the folding machine, and B the inner, movable frame thereof upon which is placed the usual wooden table C on which the cloth is folded in the ordinary way. Said
35 frame B may in practice be automatically lowered at first one end and then the other alternately, to allow the folds of cloth to be passed under the usual holding jaws, and may also
40 be both lowered and raised bodily, with both ends upon a level, by means of foot and spring power, as will be hereinafter described. The mechanism for thus operating the frame upon
45 which the folding table is supported, and for guiding said frame in its vertical movements, is constructed and arranged as follows:

Two transverse rock-shafts D D' are arranged—one at each end of frame A, and supported at the ends in suitable bearings on said
50 frame. Upon said shafts are secured the crank-levers E, E', E², E³, which project outward laterally therefrom, the levers E, E², in

one direction, and the levers E', E³ in the opposite direction, as is shown in Fig. 1 of the drawings. The outer ends of said levers are
55 connected by means of links F with the four corners of the movable frame B, previously alluded to, as is best shown in Fig. 2. Just outside of the hubs of crank-levers E, E' are fitted on shafts D, D', the loose, double crank-
60 levers G, G', and G², G³. To the outer ends of the levers G', G³ are attached the rods H, H', whose opposite ends are, in practice, connected with the usual cams or eccentrics, (not
65 shown) that automatically operate the mechanism for moving the folding table vertically, and upon the outer ends of the levers G, G² are
70 mounted spring-pawls, I I' adapted to engage with ratchet-teeth a, a' formed upon or secured to the outer faces or edges of the crank-levers E, E'. Said pawls are prevented from engaging
75 with said teeth until the arms E, E' have nearly reached the limits of their downward movements, by means of stationary guard-plates b, b' , secured at their upper ends to frame A, and whose lower ends come just in front
80 of the teeth and are held against said guard-plates b, b' and teeth a, a' by the usual springs I² I². Shown in Fig. 1. The levers, G, G² are, in practice, made to operate the pawls up and down about the length of the toothed surfaces,
85 but as only very short, vertical movements of the levers E, E' are ordinarily required in the operation of folding, said guard-plates are provided to limit the action of the pawls on
90 said levers, as aforesaid. The connecting rods H, H' are, in practice, operated by their cams or eccentrics alternately, in opposite directions, as usual; that is, while one is moved longitudinally in one direction, the other is
95 moved in the opposite direction. Therefore, the folding-table is likewise alternately lowered, at first one end and then the other, to permit the cloth being slipped under the holding-jaws J, J', at first one end and then the
100 other, in the usual folding operation,—the reverse ends being held, while the free ends are thus folded under, by the upward pressure imparted by the usual torsion-springs K, K', (on shafts D, D') which press the folding-table C up against said holding-jaws, with the
previously folded edges of the cloth between them. Said springs K, K' are fastened at

one end to the shafts and at the other ends to crank-levers connected with the foot power mechanism, hereinafter described.

The movable frame B is held in position laterally, and guided in its vertical movements by means of arms or flanges M, one on each corner of said frame, which fit and slide in suitable guide-ways N on frame A,—the same being fitted sufficiently loose to admit of the aforesaid slight rocking movements of said frame in the folding operation. As various similar ways may, in practice, be adopted for thus holding and guiding said movable frame B, I do not limit myself to the construction above described. In Fig. 3 I have shown the same principle carried out by reversing the positions of the arms or flanges and guide-ways; that is, by attaching said arms or flanges to frame A, and the guide-ways to the movable frame. In the drawings, I have shown said movable frame B, made in four connected parts, the end frames B', B', and the side-bars B², B², attached at the ends to said end frames, the end frames B' B' being held in position and guided as aforesaid. Said side-bars B² B² are not an essential feature in practice, and I therefore reserve the right to use the same or not, as desired.

The special advantage which I claim, of making the movable frame, and its operating mechanism so that the whole length of the folding-table may be tipped in first one, and then the opposite direction, in the operation of folding, is, that the cloth is not liable to be pulled out at the ends from under the jaws as the pile of cloth increases in thickness, or to be folded in uneven lengths, as is now often the case, by the use of the old style of machines, whose folding-table supporting-frames are pivoted at the center, and said folding-table tipped toward the ends from said central pivot.

As will be observed by the drawings, the movable frame B, has no support except that afforded by the links F, connecting the same with the operating mechanism, and the corner devices for guiding and holding the same in position as previously described, and the removable table C upon which the cloth is folded is made rigid, and thus affords a flat, unbroken surface upon which to fold the cloth. Consequently, the same length of fold may constantly be maintained as the pile of cloth increases in thickness, for the reason that the top surface of the cloth is always kept in a straight and practically level line between the holding-jaws,—the table being gradually lowered as each fold is laid, by the mechanism previously described, and the alternate tipping movements being just sufficient to permit the cloth to be slipped under the jaws, as in other similar machines.

The foot power mechanism for elevating and lowering the folding-table independent of the automatic mechanism previously described, is similar to that of other machines, and consists of the double crank-lever O, O',

fitted loose on shaft D, just inside of crank-lever E; rod P connected at its upper end with lever O, and at its lower end with the foot-treadle Q; the rod R, connected at one end with lever O', and at its opposite end with crank-lever O², fitted loose on shaft D' next to crank-lever E',—said rod R connecting the foot power mechanism on shaft D, to that on shaft D'. The torsion-springs K, K', being fastened at one end to shafts D, D', and at their other ends to crank-levers O, O', when the foot-treadle Q is depressed or forced down, as is shown by full lines in Fig. 2, by pressing on its outer end Q' said springs are wound up tight enough to exert a sufficient power to force the folding-table up, and hold the cloth between the jaws as previously stated; and when said treadle is released from under its holding-shoulder Q², or other locking device, the springs are allowed to unwind, and the upward pressure upon the folding-table being thereby removed, the latter, with its supporting mechanism, drops down by force of gravity and the assistance of springs K, K', so that the cloth folded upon the table may be removed. Having been removed and the end of a new piece of cloth laid upon the table, with one end under one of the holding-jaws, the treadle may then be forced down again under its holding shoulder and the upward pressure thereby applied, preparatory to starting up the automatic folding mechanism of the machine, as ordinarily.

The levers O, O' and O² are provided with lateral projections c, c, which lie over the levers E, E', and thus communicate the down pressure of the springs K, K', to the folding-table and its connections when the foot-treadle is released as previously described, the down pressure being quite strong when the springs are first released, and commence to unwind, and decreasing as they continue to unwind.

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

1. In a cloth-folding machine, frame A, holding-jaws J J', and folding-table C, in combination with movable frame B; links F, pivoted to each corner thereof; crank-levers E E', E², E³, mounted tight on rock-shafts D D', and pivoted to the lower ends of said links F,—the levers E E' also being provided, on their outer faces, with ratchet-teeth a a'; rock-shafts D D', mounted in suitable stationary bearings; double crank-levers G G' and G² G³, mounted loose on shafts D D',—the levers G' G³ being connected with the eccentric-rods H H', and the levers G G², provided with spring-pawls I I', adapted to engage with the aforesaid ratchet-teeth a a' on levers E E'; eccentric rods H H'; spring-pawls I I' and guard-plates b b',—the latter adapted to cover part of said toothed surfaces a a'; flanges and guide-ways M N on frames A B; double crank-lever O O', and crank-lever O² mounted loose on shafts D D', and provided with lateral projections c adapted to bear on the tops of

levers E E'; torsion-springs K K', on shafts D D', adapted to press upward on the folding table through the intermediate connections; rod P connected with lever O, and with means
5 for operating the same, substantially as shown and specified.

2. In a cloth-folding machine, the stationary frame A, and movable frame B, in combination with means for holding and guiding said
10 frame B, in its vertical movements, and means for depressing first one end and then the other of frame B, the said means consisting of the links F, crank-levers E, E', E², E³, the levers E, E', being provided with ratchet-teeth on
15 their outer faces, shafts D, D', torsion-springs K, K' on shafts D, D' double crank-levers G, G', G², G³, pawls I, I', guard plates b, b', and eccentric rods H, H', all constructed and ar-

ranged to operate, substantially as shown and specified.

3. In a cloth folding machine, the combination of stationary frame A; jaws J, J', secured thereto,—one at each end of the machine, and alternately rising and falling end-frames B, B', with means for holding and guiding said
25 frames B B' in their vertical movements, said means consisting of flanges and guide-bearings M, N, at each corner of the machine,—one on the stationary frame and the other on the end of the movable frame at each of said
30 corners, substantially as set forth.

EDWARD HALL.

Witnesses:

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