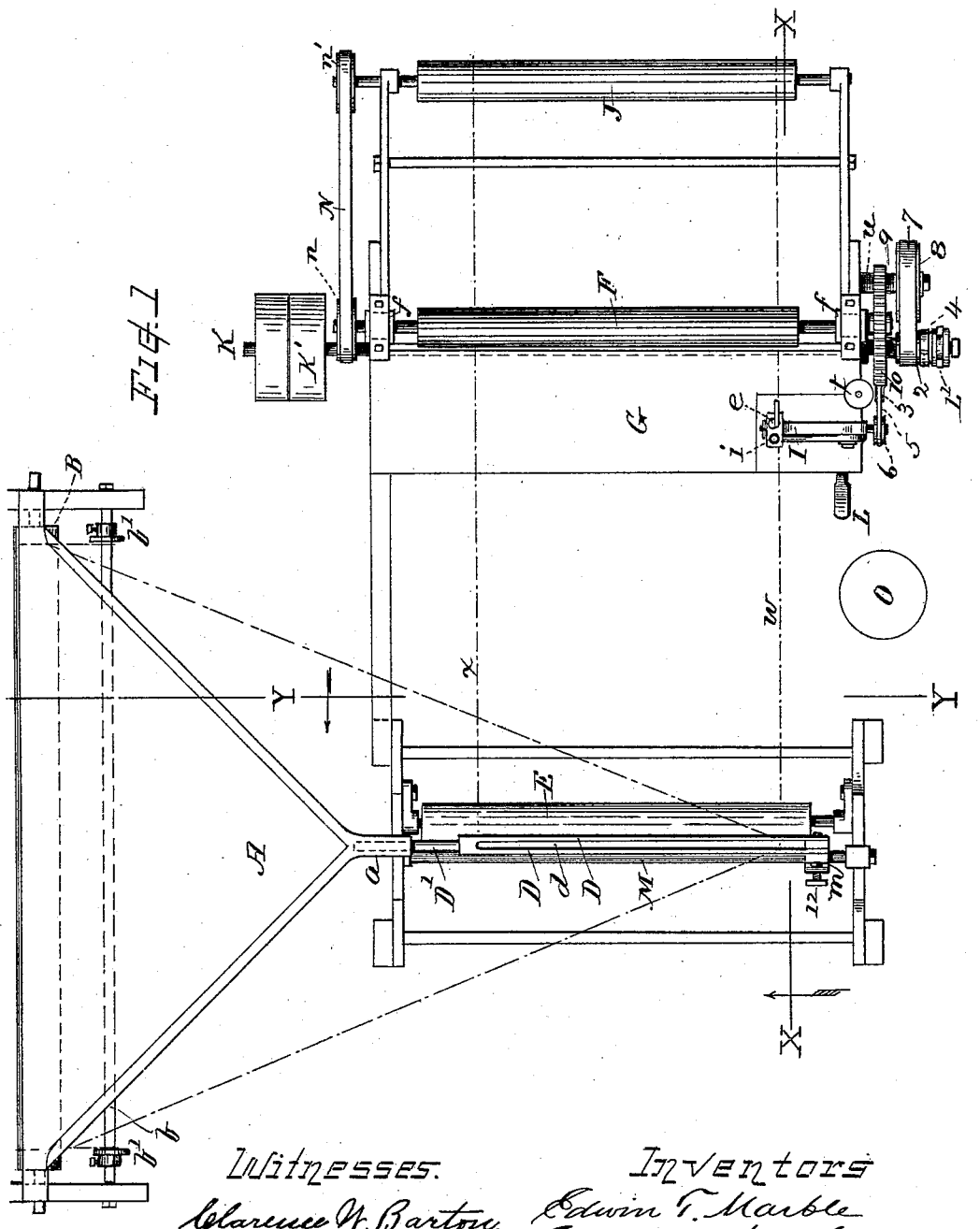
(No Model.) 3 Sheets—Sheet 1.

E. T. & E. H. MARBLE & F. H. GREENE.

MACHINE FOR DOUBLING WEBS OF FABRIC LONGITUDINALLY AND STITCHING THE EDGES.

No. 489,590. Patented Jan. 10, 1893.



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(No Model.) 3 Sheets—Sheet 2.

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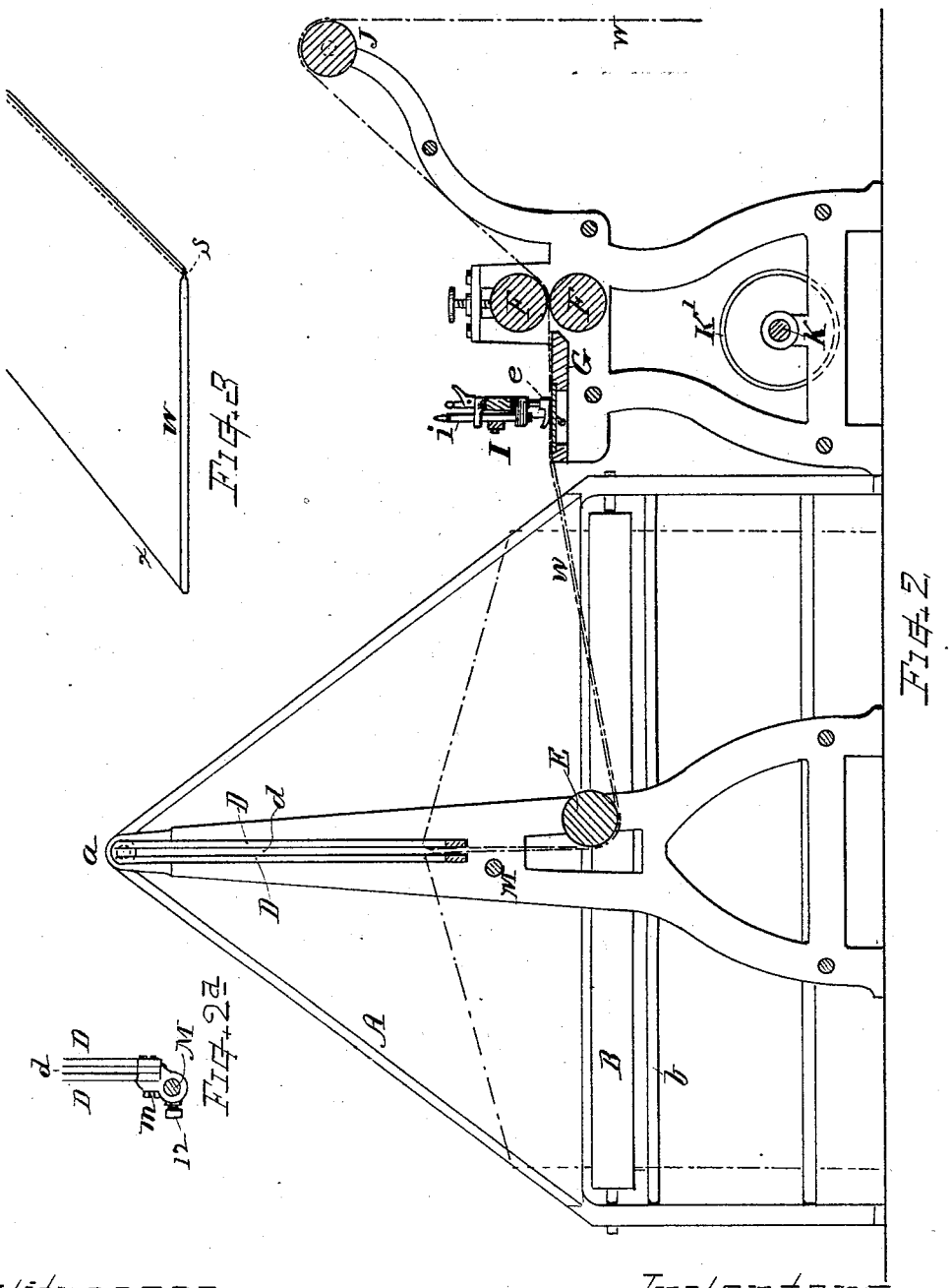

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(No Model.) 3 Sheets—Sheet 3.

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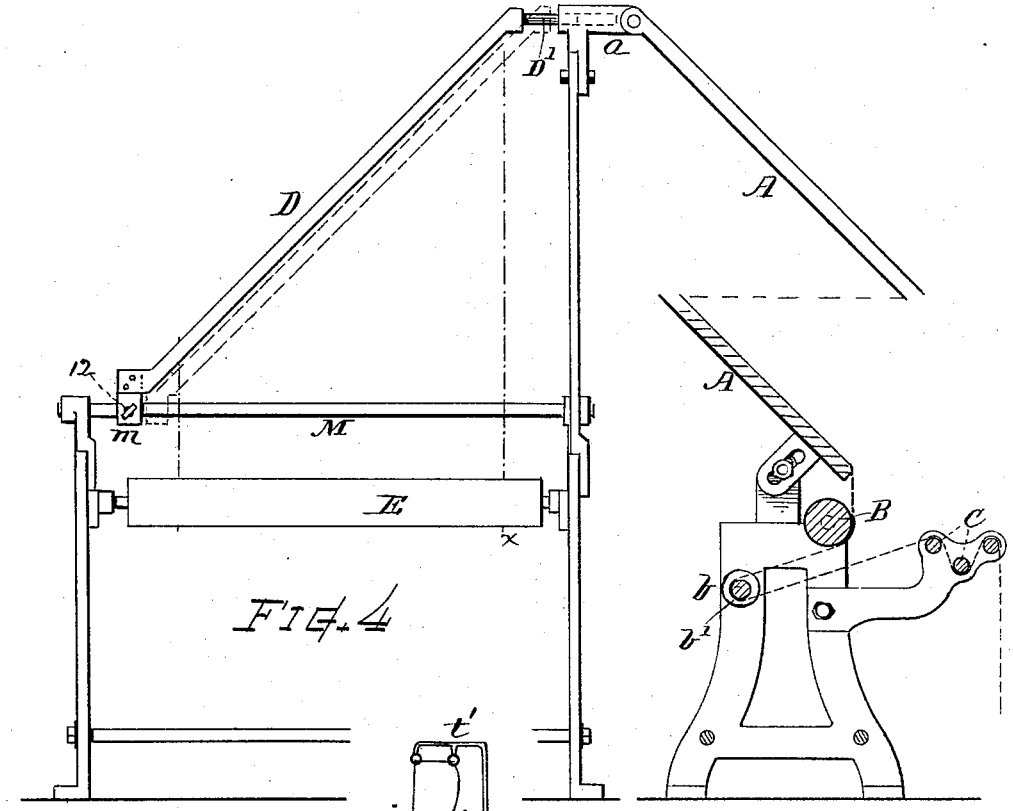

FIG. 4

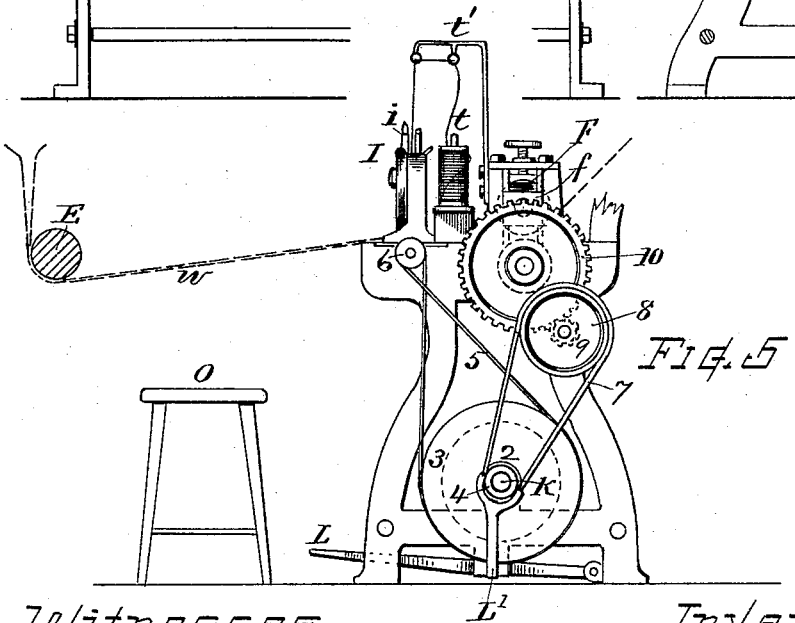

FIG. 5

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UNITED STATES PATENT OFFICE.

EDWIN T. MARBLE, EDWIN H. MARBLE, AND FRED. H. GREENE, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR DOUBLING WEBS OF FABRIC LONGITUDINALLY AND STITCHING THE EDGES.

SPECIFICATION forming part of Letters Patent No. 489,590, dated January 10, 1893.

Application filed August 20, 1892. Serial No. 443,635. (No model.)

To all whom it may concern:

Be it known that we, EDWIN T. MARBLE, EDWIN H. MARBLE, and FRED. H. GREENE, all citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Machine for Doubling Webs of Fabric Longitudinally and Stitching the Edges, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

In the manufacture of various fabrics that are to be fulled, or flocked and fulled, or otherwise finished, it is desirable to protect the face of the goods by doubling the web or entire piece longitudinally and fastening the selvages together, so that when subjecting the fabric to the flocking, fulling and scouring operations only the back of the fabric is exposed to the action of the machinery and to receive the flocks. The felting, fulling and shrinking are thus rendered more uniform, since with the doubled web and connected edges all parts are more nearly of the same thickness and are not liable to escape their proportion of the pressure and action of the rolls or fulling mechanism.

Previous to our invention the work of doubling the fabric and attaching the edges has usually been accomplished by stretching the fabric between two posts placed at some distance apart, and having hooks fixed therein to hold the edges of the web, then with a large needle and common twine catching the edges together by hand at intervals of about six to twelve inches with an over-stitch or knotting of the twine. This mode of doubling and attaching requires considerable time and labor of employés; takes up much room in the factory, and is in several other respects unsatisfactory. It leaves openings at the side through which the flocks can reach the face of the goods and which also are liable to catch upon parts of the washers or fulling mills and thus tear the fabric. Also, in felted fabrics the occasional tacking allows the edges to become unevenly felted, or more or less drawn at different parts.

The objects of our present invention are to overcome the above named objections and to provide a practical and efficient mechanism for use in factories or elsewhere, whereby the operations of doubling and continuously stitching together the selvages of webs of fabric to be flocked, fulled, scoured or otherwise treated can be quickly and automatically performed. Also, to provide doubling appliances and draft-rollers adapted for feeding forward a doubled web of fabric, and a sewing or stitching mechanism combined and organized substantially in the manner specified, and co-acting to double and to stitch together the edges of said fabric simultaneously with its advancement through said doubling appliances and draft-rolls.

Another object is to afford facilities for the adjustment of the doubling guides to accommodate different widths of fabric, and cause the selvage edges thereof to run at the same position irrespective of their doubled width as more fully hereinafter explained.

The particular subject-matter claimed is hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of mechanism illustrating the nature of our invention. Fig. 2 is a vertical section of the same at line X—X Fig. 1. Fig. 2^a shows the adjustable support for the inclined doubler-guide. Fig. 3 shows the way the fabric is doubled and its selvages attached together. Fig. 4 is a vertical section of the machine at line Y Y, Fig. 1 [a portion of this figure is displaced to accommodate the size of sheet] and Fig. 5 is an elevation view showing an arrangement of pulleys and gearing for operating the draft-rolls and stitching mechanism.

In the practical embodiment of our invention, the mechanism comprises means for longitudinally folding or doubling the fabric to bring the selvages uniformly together; means for attaching or stitching the same upon each other, and means for advancing the fabric so that the doubling and the attaching together of the selvages may be continuously, simultaneously and quickly performed as the web passes through the machine.

In the mechanism as herein shown, A denotes a triangular table or frame, its base supported adjacent to the carrier-roll B, and its apex elevated and terminating in a guide-holder *a*.

C indicates a series of tension bars, and *b* a tension bar with edge guides *b'* adjustable thereon.

D D indicate two inclined guide-bars having a space *d* between them through which the fabric is led as it comes over the table A and by means of which the doubling is effected in a well known manner.

E indicates a guiding roll beneath which the doubled web is carried.

F F indicate a pair of draft-rolls mounted in suitable housings in connection with a bed or table G, upon one end of which is mounted a sewing machine or stitch forming mechanism I, the needle bar *i* and presser foot *e* of which are located at proper position to receive the selvage edges of the fabric *w* as the doubled web is drawn forward over the table G and into the bite of said draft-rolls. The thread or twine *t* is best supported on a suitable holder fixed to the end of the bed G, and a suitable guide *t'* may be employed for leading it to the sewing mechanism as required. The bearings *f* of the rolls F, or one of them, are properly adjustable in their frame to afford the required pressure and friction for advancing the fabric.

J indicates a delivery-roll operated from the arbor of one of the rolls F by pulleys *n* *n'* and belt N.

K indicates the operating shaft provided with pulleys K' for the drive-belt, and having mounted loose thereon two attached pulleys 2 and 3 that are connected to run with the shaft by a friction clutch 4 controlled by a suitable shipper, which in the present instance consists of an angle lever L' and treadle L. From the pulley 3 a belt 5 runs to the sewing mechanism pulley 6 for operating the needle-bar and stitch formers; and from pulley 2 a belt 7 runs onto a pulley 8 that is mounted on a suitable stud *u* and connected with a pinion 9 that meshes with the gear 10 fixed upon the arbor of the lower draft roll F. It will be understood that these pulleys and gears are of such relative proportions that the speed of the rolls drawing the fabric and the movement of the needle will produce the desired number of stitches per inch as the web advances. The shaft K is run continuously and when pressure is applied to the treadle L, and the clutch 4 thrown into engagement, the stitching mechanism I and draft-rolls F are simultaneously put into action; and conversely, are simultaneously stopped when the treadle is released.

The sewing or stitch-forming devices can be of any suitable kind as employed in ordinary sewing machines, and being a well known class of devices are not here shown in detail. A step-feed is not necessarily employed therewith as the entire web of fabric *w* is advanced by the rolls F, and is delivered, doubled and stitched along the selvage *s* as indicated in Fig. 3.

The inclined doubler-bars D are connected at their upper ends and provided with a support D' that slides on or telescopes with the guide-holder *a*, while the lower ends of said bars are attached to a collar or bearing *m* that slides on the rod or supporter M disposed transversely across the frame. The collar *m* is provided with a set-screw or clamp device 12 for retaining the parts in any position. By adjusting the position of the bars D laterally [see dotted lines Fig. 4] the mechanism is made to double different widths of fabric and to run their selvage edges at the given position in line with the needle-bar *i* of the sewing mechanism I by carrying the line of fold *x* more or less to the right or left. This improvement of combining with the guides D means for their adjustment laterally to cause the selvage line of different width fabrics to run at the same position, is a feature of our invention.

In the operation, the web of fabric in its full width is passed between the bars C around the bar *b* and carrier-roller B by which it is freed from wrinkles; thence face upward over the triangular frame or table A and downward between the inclined guide-bars D, by which it is reversed and its edges brought together, the doubled web then passing beneath the roll E, forward over the table G to the pair of draft-rolls F which draw the fabric forward, its selvages running beneath the presser-guide *e* and in line of the sewing mechanism that stitches the edges together as fast as the web advances. From the rolls F the fabric passes over the roll J and then falls to the floor, or is otherwise taken care of as desired. The attendant occupies a position at O convenient for observing the action of the sewing mechanism, and for correcting the alignment of the selvages; and where the foot can be placed on the treadle L for starting and stopping the machine as required.

We are aware that different mechanisms have heretofore been patented, by means of which fabrics are folded and sewed in the operations of making bags; therefore we do not broadly claim means of such nature, neither do we broadly claim the employment of tension-bars, triangular table, and inclined guide-bars as a separate mechanism for doubling fabrics.

We claim as our invention herein to be secured by Letters Patent,

1. In combination, substantially as described, the upwardly inclined triangular frame or table, the parallel guide-bars with intervening space *d*, extending obliquely downward from the apex of said frame, and laterally adjustable in relation to the direction of draft, the guiding roll E beneath said guide-bars, the support-table G, the pair of draft-rolls across the rear of said support-table, the sewing mechanism arranged on said support-table in front of said draft-rolls, the driving-shaft K, and operating belts and gearing whereby motion is imparted from said shaft simultaneously to said draft-rolls and sewing mechanism, for the purposes set forth.

2. In combination, substantially as de-

scribed, the table G, the pair of draft-rolls F, the stitching mechanism I mounted on said table, the drive-shaft K carrying the loose pulleys 2 and 3, the clutch 4 therefor, the intermediate pulley 8 with pinion 9, its belt 7, the gear 10 fixed on the draft-roll arbor and meshing with said pinion, the stitcher-operating belt 5 on pulley 3, and treadle devices L controlling said clutch, all substantially as and for the purpose set forth.

3. A doubler-guide that is laterally adjustable in relation to the direction of draft, in combination with the triangular frame or table, the draft-rolls and the sewing mechanism, substantially as and for the purpose set forth.

4. In a machine for doubling and attaching selvages of fabrics, the combination, substantially as described, of the guide-holder socket *a*, the inclined guide-bars D having at one end the stud 12 telescoping with said socket, the bearing-slide fixed to the other ends of said guide-bars, the support-rod whereon said bearing-slide is mounted and a screw or clamp-device for securing the same at positions of adjustment on said rod, as and for the purpose set forth.

Witness our hands this 18th day of August, A. D. 1892.

EDWIN T. MARBLE.
EDWIN H. MARBLE.
FRED. H. GREENE.

Witnesses:
CHAS. H. BURLEIGH,
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