

(No Model.)

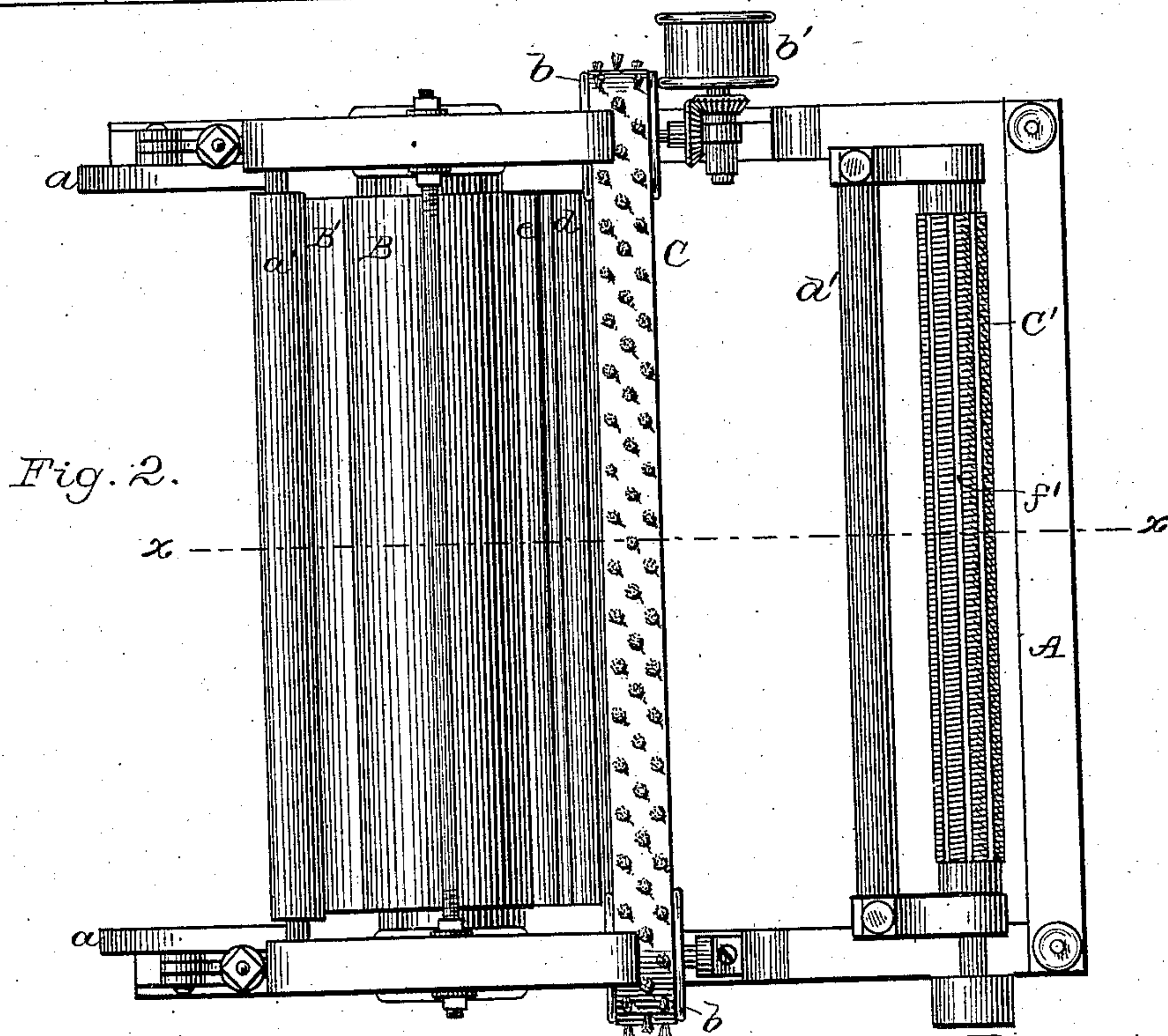
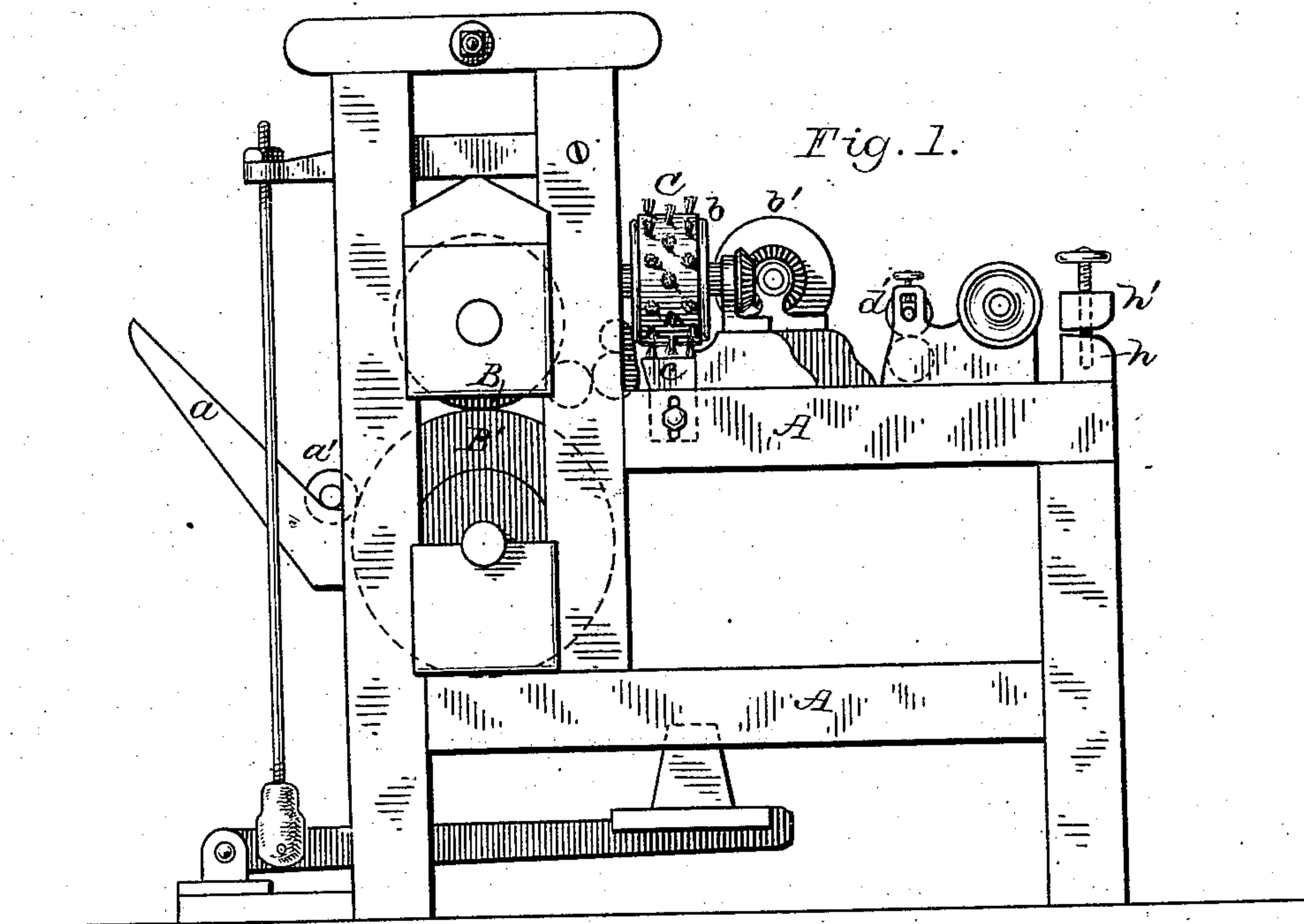
2 Sheets—Sheet 1.

N. E. BORDEN.

MACHINE FOR FINISHING TUCKED FABRICS.

No. 287,615.

Patented Oct. 30, 1883.



Attest:
Philip F. Larned.
Howell Battle.

Inventor:
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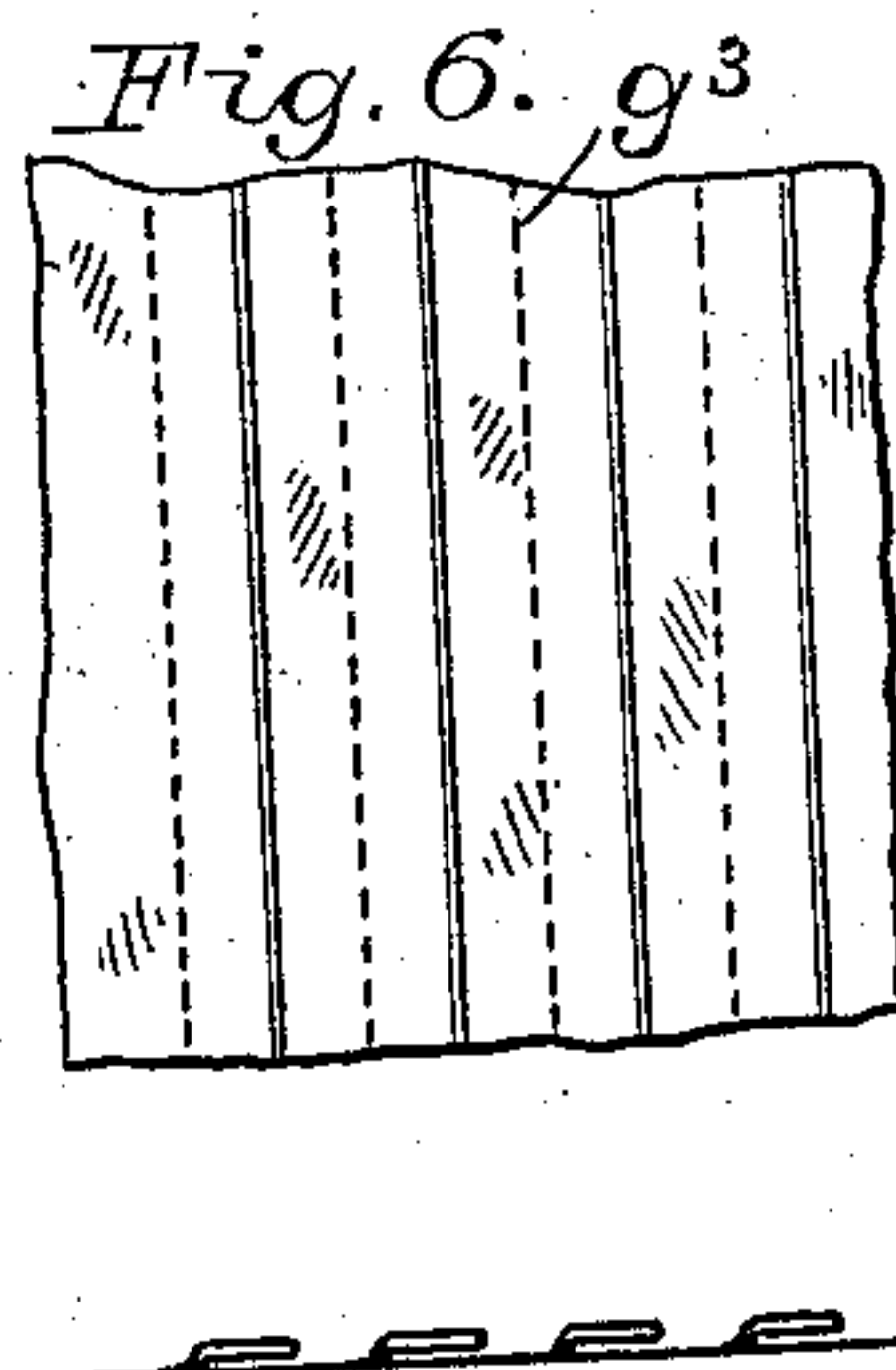
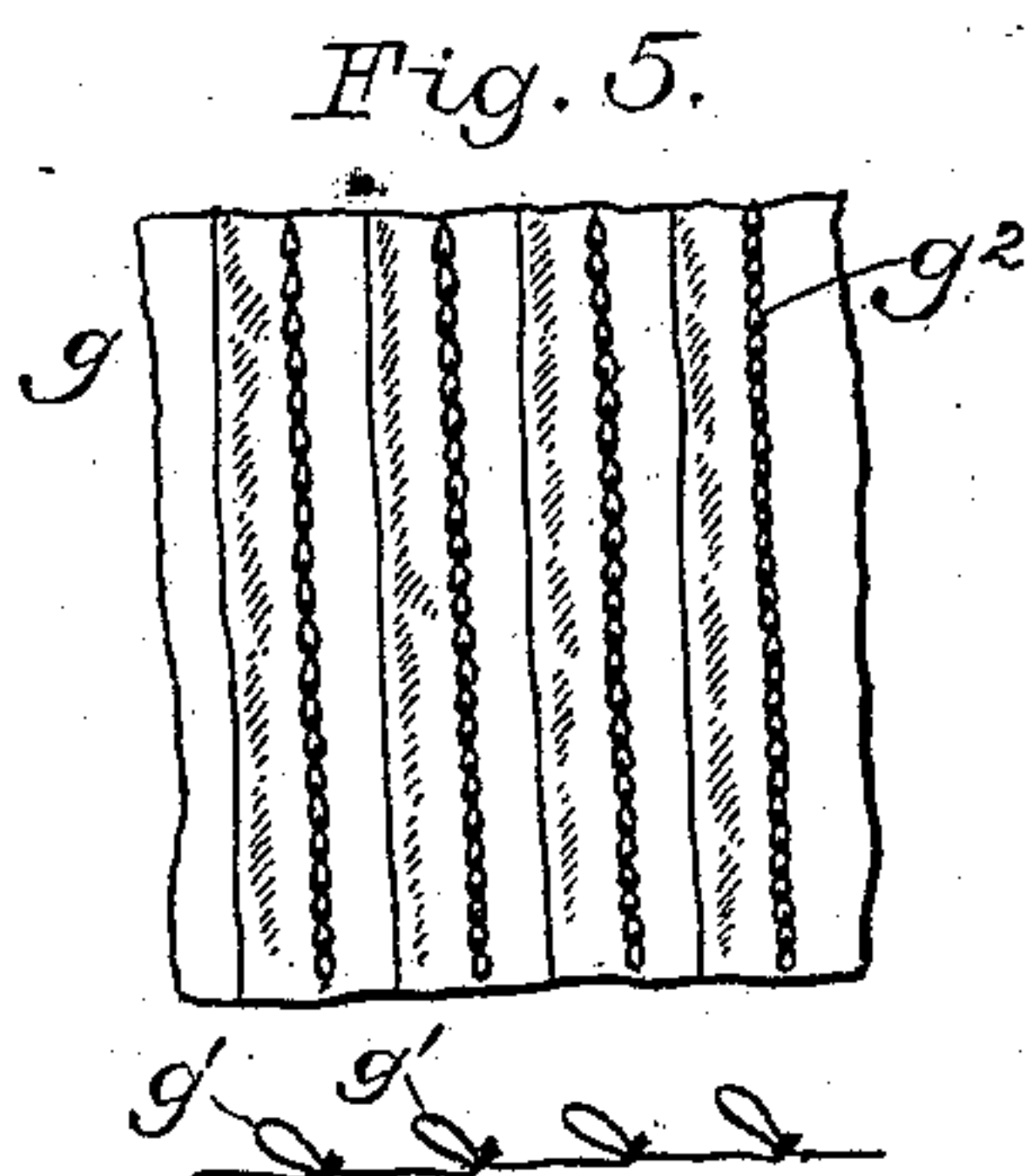
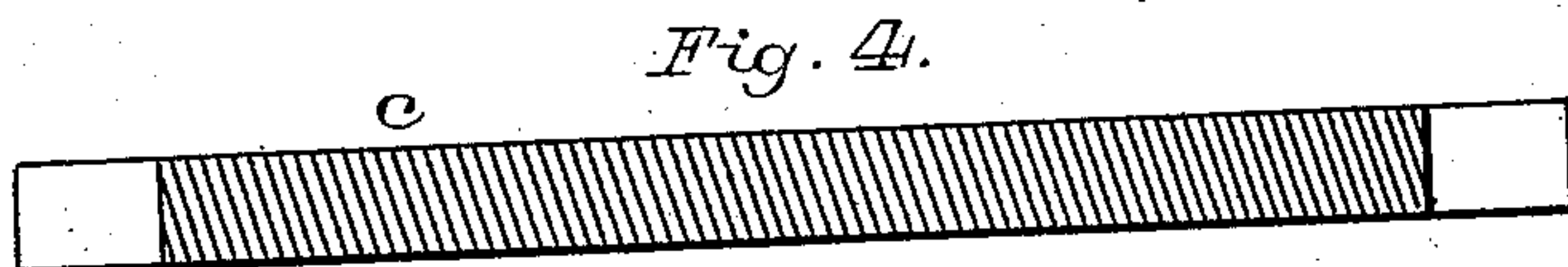
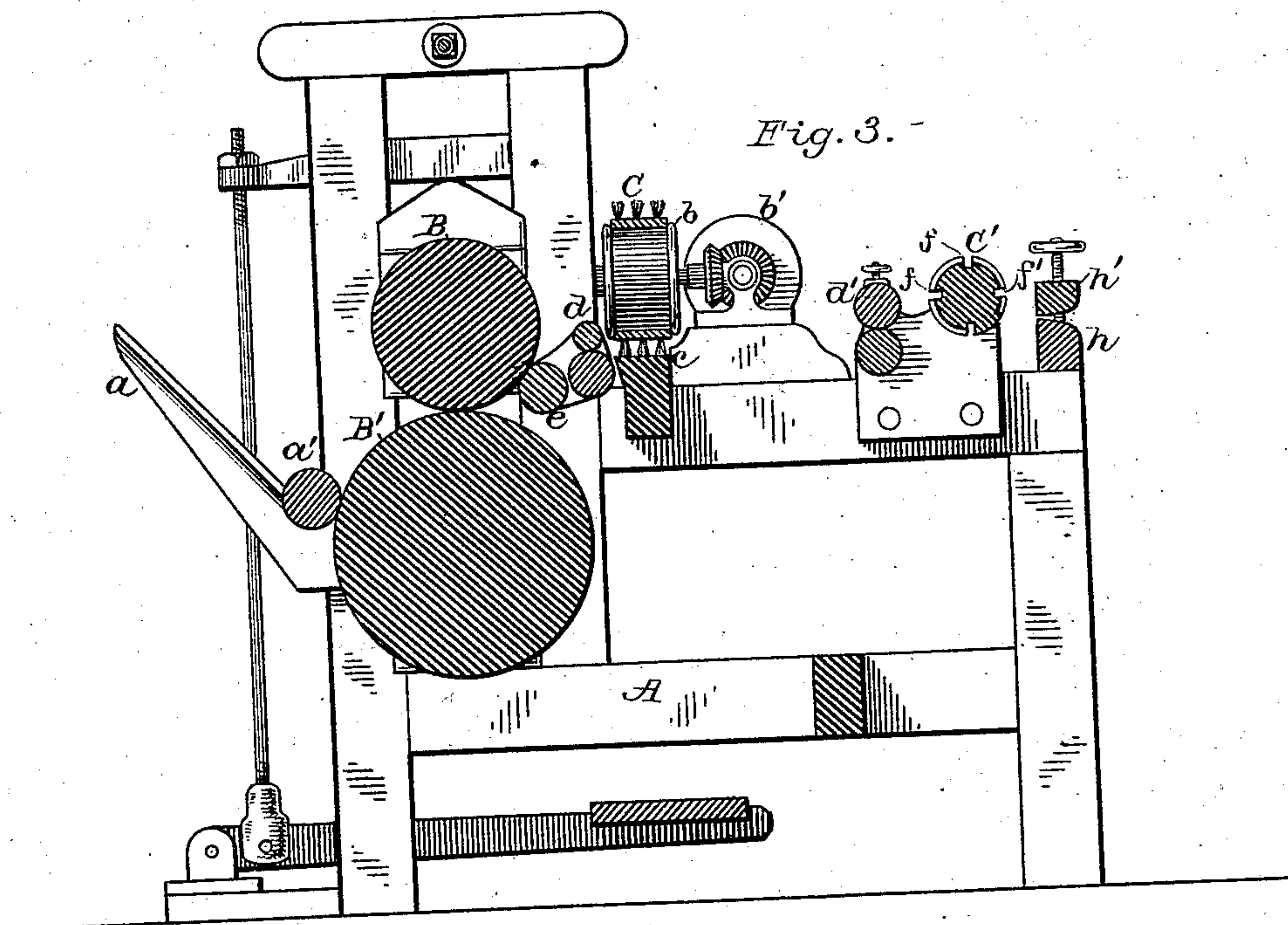
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Attest:
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UNITED STATES PATENT OFFICE.

NORMAN E. BORDEN, OF FALL RIVER, MASSACHUSETTS.

MACHINE FOR FINISHING TUCKED FABRICS.

SPECIFICATION forming part of Letters Patent No. 287,615, dated October 30, 1883.

Application filed June 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, NORMAN E. BORDEN, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Machines for Finishing Tucked and other Similar Fabrics; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

It is well known to be desirable to longitudinally tuck cotton fabrics in the piece and while in their unbleached condition, and thereafter to bleach and finish the same. In finishing such goods the tucks must be flatly laid in one direction prior to calendering; and it is also well known to be desirable that the tucks should also be so laid as to conceal that side of the stitch-line at which the excess of thread occurs, especially in chain-stitching, and this usually necessitates a complete reversal in position—i. e., the folds or tucks are normally lying, for instance, toward one edge of the fabric, and must be reversed in position, so as to lie toward the opposite edge. Heretofore such fabrics have been generally operated upon by hand for thus properly laying the tucks, although a machine with a revolving brush has been heretofore used by me with but slight advance in economic results as compared with hand-labor.

The object of my present invention is to reduce the cost of finishing this line of goods to a minimum, and to enable it to be performed even more satisfactorily than it has heretofore been accomplished by the more expensive hand operations.

My improved machine, in its best form, embodies calendering-rolls, although it will be within certain portions of my invention if the calendering operation be performed in a separate machine, inasmuch as the tucks can be properly laid in my machine, if, in lieu of the calender-rolls, smaller and merely feeding or feeding and compressing rolls be employed, so that the fabric may be properly fed through the machine and delivered to a detachable take-up or cloth-roll, and be in proper condition for transfer on said cloth-roll to a calender.

My machine also embodies a traversing brush, serving as a lateral "wiper" for the tucks, a cloth-bed co-operating therewith, leading and compressing rolls, and an auxiliary wiper which preliminarily prepares the fabric for its delivery to the traversing brush. Means for feeding and for rolling the fabric are of course essential if the machine contains no calender-rolls, and they are desirable in part if the latter be employed.

After fully describing the machine shown in the drawings and its mode of operation, the features deemed novel will be specified in the several claims hereunto annexed.

Referring to the drawings, Figure 1 is an end view of one of my machines in its best form. Fig. 2 is a top view of the same. Fig. 3 is a central longitudinal vertical section of the same on line *x*, Fig. 2. Fig. 4 is a top view of the cloth-bed detached from beneath the traversing brush. Figs. 5 and 6, respectively, represent tucked fabrics prior to and after passing through my machine in top view and section in each case.

The frame A may be indefinitely varied in its construction, according to the particular line of service intended, provision being made, substantially as indicated, for the requisite bearings for the various movable portions of the machine. As here shown, the frame A is constructed to provide for vertically-movable boxes for the calender-rolls B B', these latter being mounted as usual in ordinary calendering-machines, and provided with the usual means for causing the upper roll, B, to bear forcibly upon the coincident surface of the lower roll, B', and the usual inclined brackets, *a*, and cloth-roll *a'* are employed for rolling up the fabric as it leaves the calender-rolls.

The devices for wiping or laying the tucks down flatly are termed by me "wipers," and I employ two of these for obtaining the best results—i. e., smoothly-laid tucks—with the least possible cost for attendance and maximum rate of speed in operation.

It is to be understood that the prior machine, hereinbefore referred to, as heretofore used by me embodied a revolving cylindrical brush operating parallel with the fabric and with the lines of tucks, in connection with a concave revolving cloth bed-roll of sufficient lateral

area of bed to receive the fabric endwise and enable the brush to sweep or wipe laterally in the arc of a circle over the tucks from one edge of the fabric to the other. This concave presentation of the fabric to the brush necessitated close attention, many attendants for handling and controlling the fabric, and very slow operation of the machine, and the character of the work performed there-
 10 with was liable to be irregular.

A characteristic feature of my machine is a horizontal wiper, which enables the fabric to be delivered thereto flatly and in a properly distended condition, and it is in like manner delivered from said wiper to compressing-rolls or calender-rolls, or to both in succession, and therefore I am enabled to perform the operation rapidly, and with few attendants. In fact, no more are required than for an ordinary
 20 calendering-machine, and the finished fabric is of a regular and uniform character.

My main wiper consists of the horizontal endless brush C, composed of tufts of bristles in an endless belt mounted upon pulleys or drums *b* at opposite sides of the machine, and one of said drums is geared to a driving-pulley, *b'*, through which power is applied to the brush for causing it to continuously operate while the machine is in use. Beneath the
 30 lower side of said brush is a cloth-bed, *c*, and between them the tucked fabric passes longitudinally. The cloth-bed or the brush-drum bearings, or both, may be capable of vertical adjustment, so as to cause the brush to bear with more or less force upon the fabric. As the lower or working face of the brush is continuously moving crosswise of the machine and of the fabric, it has a tendency to laterally move the fabric on its bed, and therefore I
 40 deem it desirable that the bearing-surface of the bed be serrated or roughened, so as to frictionally engage with and hold the fabric against said laterally-moving tendency. I find that said bed serrated angularly and having sharp edges at each serration serves a good purpose. It is, however, obvious that if the fabric in front of and behind the brush be firmly gripped by leading and compressing rollers the brush-wiper will be prevented from unduly moving the fabric laterally; but it is desirable
 50 that the fabric be compressed as little as possible until after the tucks have been at least partially flattened or laid.

Between the brush and the calender-rolls is a pair of compressing-rolls, *d*, between which the fabric passes directly from the brush, the constant movement of the latter assuredly causing the tucks to be presented in their proper flattened condition to the bite of said
 60 compressing-rolls. Between the compressing-rolls *d* and the calender-rolls is a roll, *e*, which is introduced as a tightener for more assuredly causing the fabric to be presented smoothly to the calender-rolls, or to a cloth-roll if the fabric be not calendered in this machine and the calender-rolls be not employed.

It is to be understood that the brush-wiper and the compressing-rolls *d* will enable the machine, if operated at comparatively slow speed, to perform the laying of the tucks in a satisfactory manner; but with the same number of attendants the speed of the machine can be augmented to about six hundred yards per hour, if I employ an auxiliary wiper to preliminarily prepare the fabric for the main
 75 wiper C. Said auxiliary wiper C' may be like the one used as the main wiper; but I prefer that it be in the form of a revolving roll spirally scored, with angular edges *f* at the scores, and to assure a good and reliable control over the tucks I prefer that said roll be also longitudinally scored, as at *f'*, which makes each convolution of the angular edges into several sections, each of which, at its end, has a comparatively sharp or pointed edge, which will
 85 so effectually engage with a tuck as to turn it sidewise, it being understood that said roll is rotated so that the spiral movement of the serrations is in the direction in which the tucks are to be laid, and that said roll revolves more rapidly than the speed at which the fabric is passed through the machine.

At the rear of the spiral roll-wiper C' there is a pair of compressing-rolls, *d'*, which, in function, correspond to the rolls *d*, in that they receive the fabric from said wiper; but they also serve to properly present the fabric to the main wiper. It is to be understood that these wipers may be reversed in position without materially affecting the results; but I prefer
 100 the soft and yielding action of the bristles of the wiper C to precede the operation of the calender-rolls, if they be employed, and, as a rule, if but one wiper be employed, I should use the brush-wiper.

It will be observed that the calender-rolls constitute the feeding mechanism by which the fabric is drawn through the machine, and that if they be not employed as calenders they will be of service as feeders, and such feeding-rolls or equivalent positively-driven mechanism will of course be always employed—as, for instance, a positively-driven cloth-roll can be relied upon for feeding with fair but not so good results.

It is obvious that my improvements without real calendering-rolls may be embodied in a machine mounted upon casters and provided with means for ready anchorage upon a floor, whereby it may be at will placed in front of
 120 any suitable calendering-machine for temporary service, and as readily removed when other lines of goods are to be calendered. It is also obvious that the compressing-rolls *d* may be positively driven, if it be desirable to employ them also as feeding-rolls.

For the better understanding of the operation of my machine, I have in Fig. 5 illustrated a piece of tucked fabric, *g*, in its normal condition, in which the tucks *g'*, as will
 130 be seen, are raised and inclined toward the left hand, leaving the usual chain-stitch line,

5 g^2 , wholly exposed; and in Fig. 6 I illustrate the same in a finished condition, the tucks having been properly turned toward the right hand and flatly laid, with the light stitch-line g^3 exposed and the heavy stitch-line concealed.

10 Referring now to Fig. 3, it will be seen that the fabric g , properly dampened, is passed beneath the auxiliary or preliminary wiper C' , which, by its spiral sectional scores, wipes or
15 turns the tucks in a direction opposite to that in which they are normally inclined, and that the adjacent compressing-rolls d' receive the tucks thus laid and set them for proper presentation to the main or brush wiper C , and
20 that from it the compressing-rolls d receive the fabric and deliver it properly by way of the tightener-roll e to the calender-rolls, and that the cloth-roll receives and rolls up the fabric, the constantly-enlarging roll of fabric
resting upon and being driven by contact with the lower calender-roll.

25 It is obvious that my machine may be successfully employed in the finishing of other lines of goods which have characteristics similar to those of tucked goods—as, for instance, gray goods with longitudinal lines of gray
edgings, stitched at one edge thereof to said goods, can be bleached and afterward finished to advantage, after the manner of tuckings.

30 As in all cloth-finishing machines tension devices of some kind are employed, and to illustrate one form of tension it will be understood that the fabric passes into the machine between the coincident surfaces of the
35 tension-brake h and a stationary top bar, h' , at the front end of the machine.

In some cases I deem it desirable to employ

a second spiral wiping-roll in front of the tension-brake, so that the latter can only bear upon the tucks in at least a partially-flattened
40 condition, and with some classes of goods a lighter tension device may be employed at the front of the machine and a second heavier tension between the two wipers. As a rule, the
45 pairs of rolls d d' should be mounted in adjustable bearings, whereby the desired degree of compression can be maintained and regulated for various kinds of goods.

Having thus described my invention, I claim as new and desire to secure by Letters Patent— 50

1. The combination, substantially as hereinbefore described, of a horizontally-operating wiper and the compressing-rolls parallel therewith, organized for finishing tucked or
55 similar fabrics, as set forth.

2. The combination, substantially as hereinbefore described, of the horizontally-operating wiping-brush, the cloth-bed, and compressing-rolls organized for finishing tucked
60 or similar fabrics, as set forth.

3. The combination, substantially as hereinbefore described, of the horizontal brush-wiper, the auxiliary spiral roll-wiper and compressing-rolls organized for finishing tucked
65 or similar fabrics, as set forth.

4. The combination, substantially as hereinbefore described, of calender-rolls, one or more horizontally-operating wipers and compressing-rolls organized for finishing tucked
or similar fabrics, as set forth.

NORMAN E. BORDEN.

Witnesses:

GEORGE E. BAMFORD,
HENRY H. EARL.