

(No Model.)

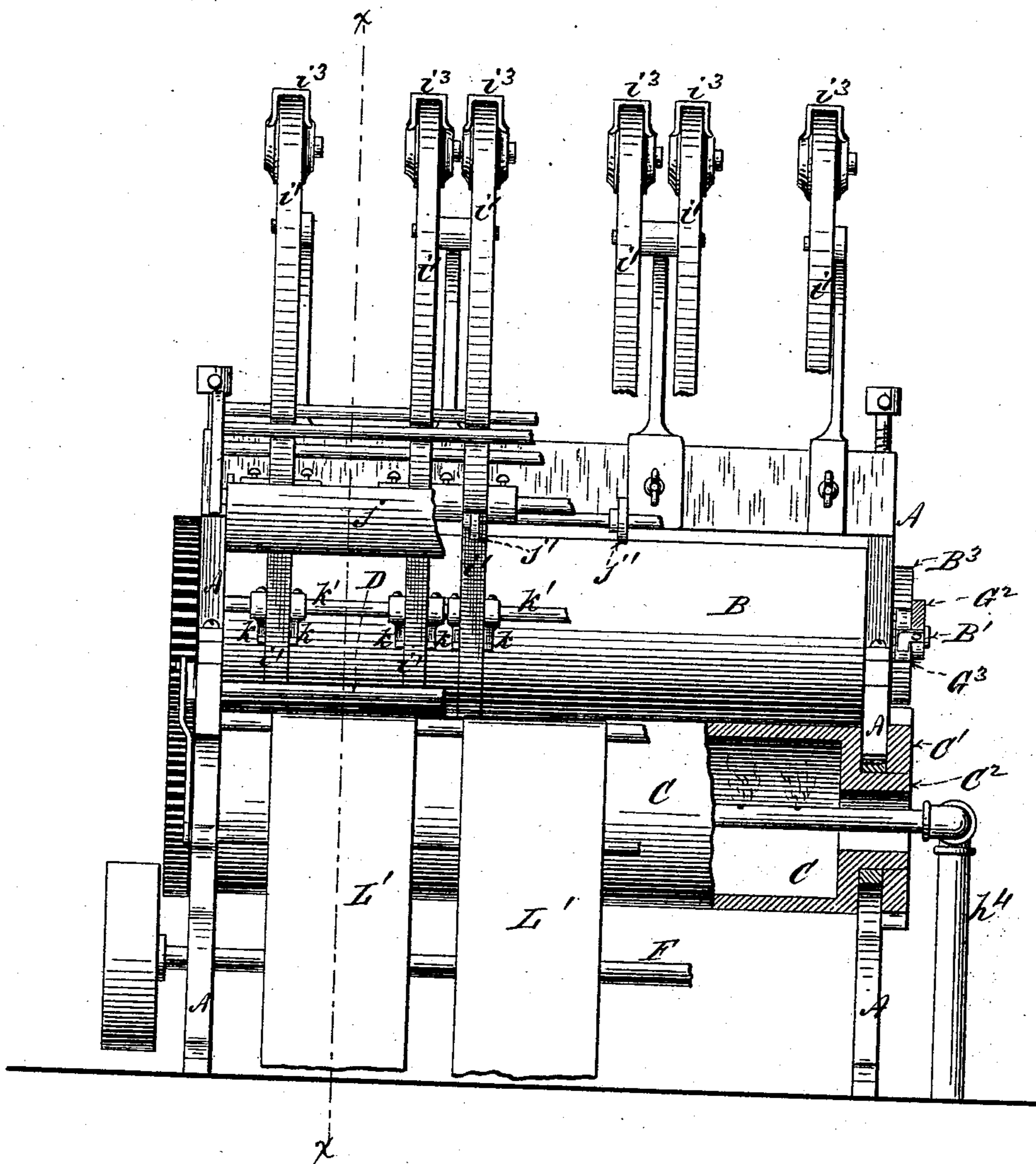
A. BORCHARDT.
CLOTH PLAITING MACHINE.

5 Sheets—Sheet 1.

No. 361,125.

Patented Apr. 12, 1887.

Fig. 1.



Witnesses:

Geo. H. Miath

R. C. Howes

Inventor:

Albert Borchardt,
Per Edw. E. Loomis,
Atty.

(No Model.)

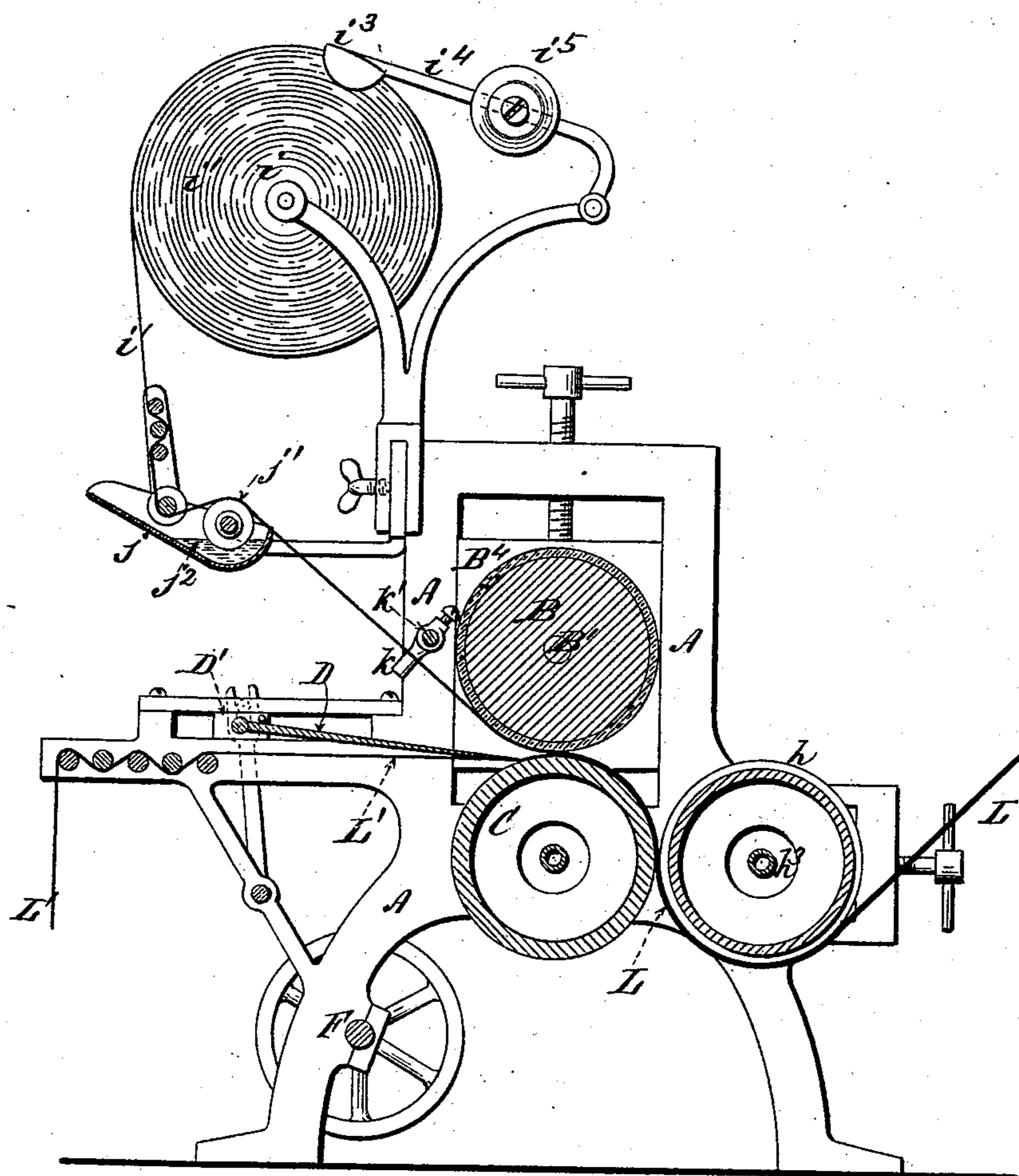
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A. BORCHARDT.
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Fig. 2.



Witnesses:
Geo. W. Miath
R. C. Howes

Inventor:
Albert Borchardt,
Per Edw. E. Quincy,
Atty.

(No Model.)

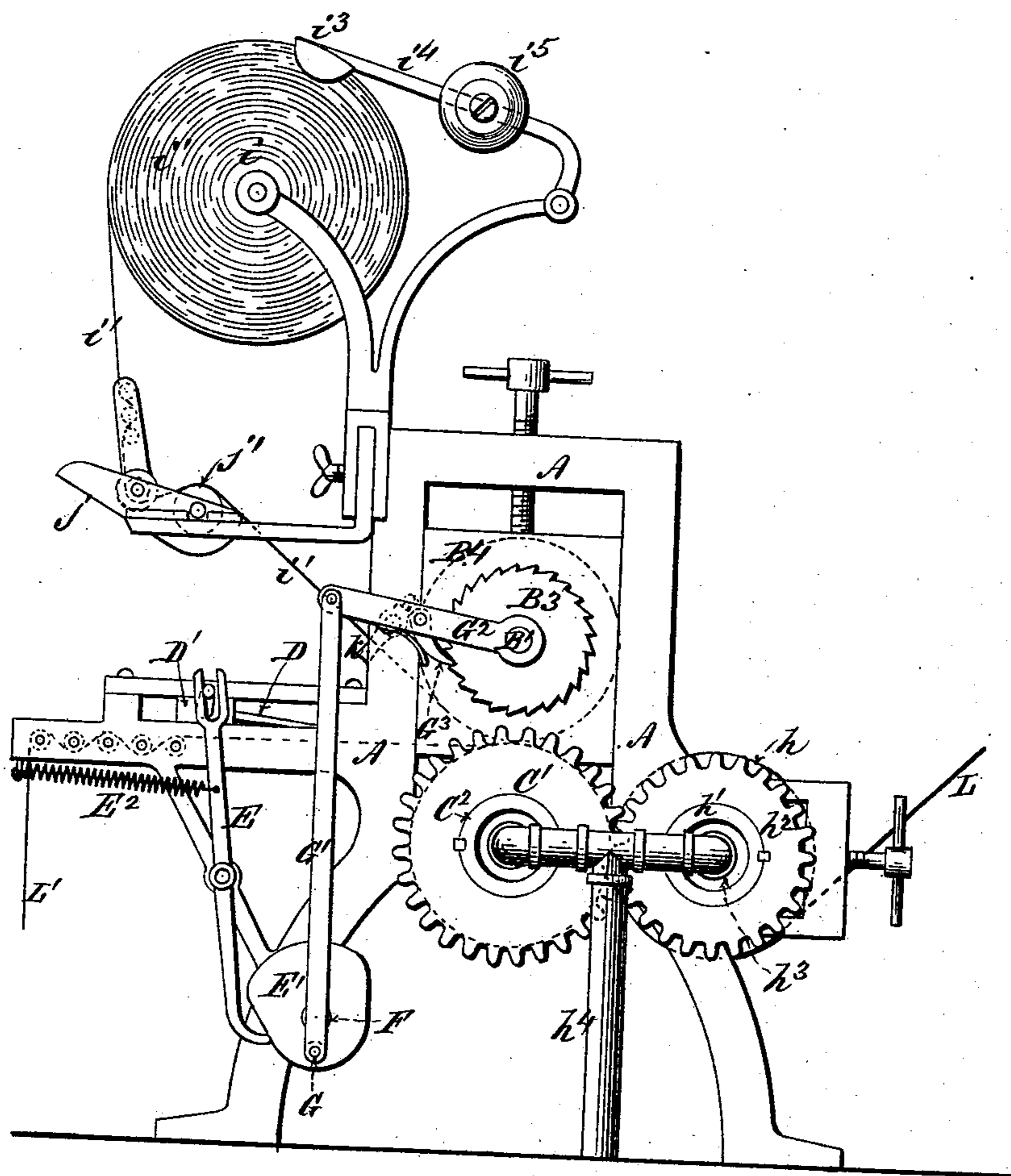
A. BORCHARDT.
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Fig. 3.



Witnesses:

Geo. H. Miatt

R. C. Howes.

Inventor:

Alfred Borchardt,
Per Edw. C. Loomis
Atty.

(No Model.)

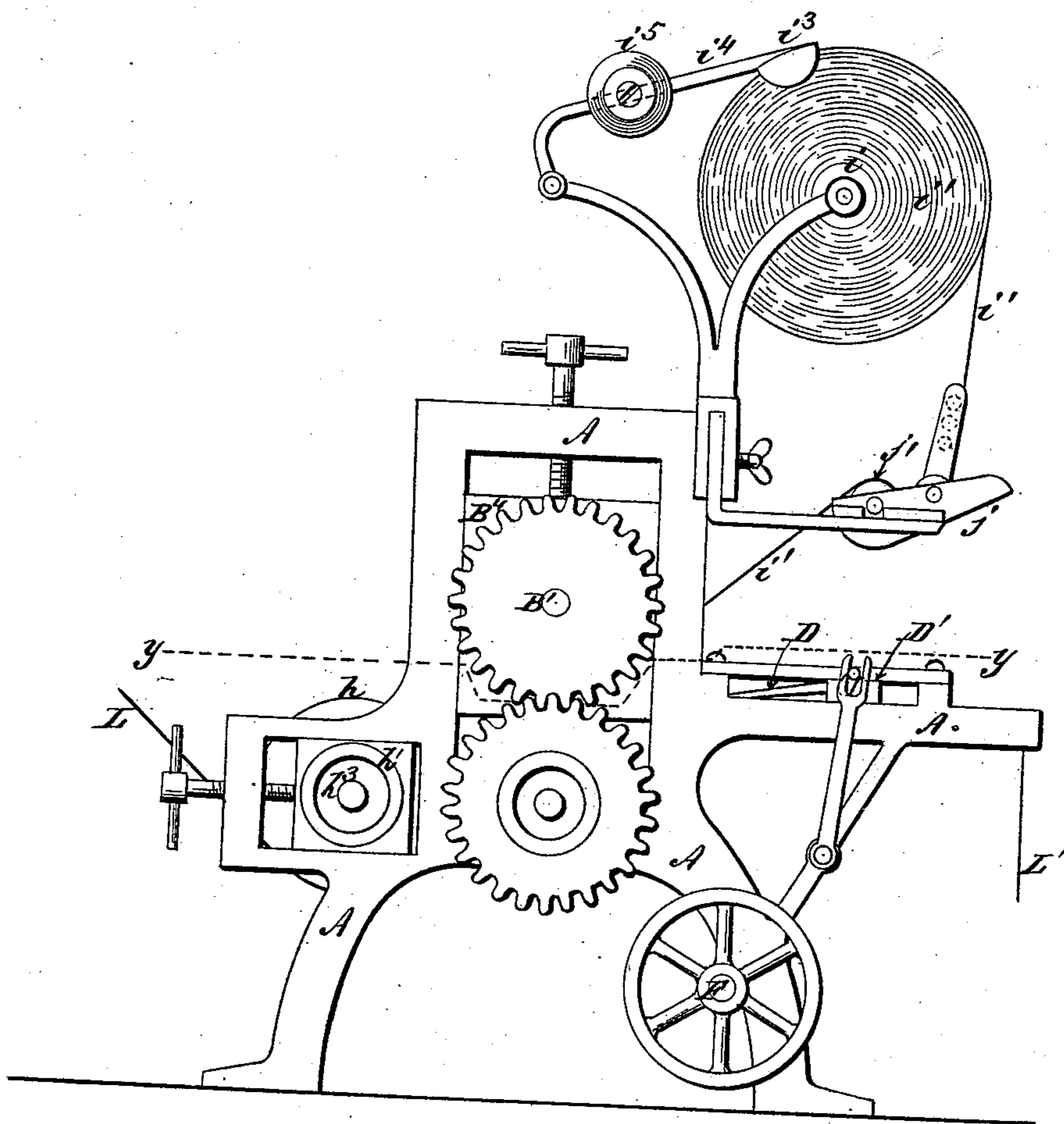
A. BORCHARDT.
CLOTH PLAITING MACHINE.

5 Sheets—Sheet 4.

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Fig. 4.



Witnesses:

Geo. H. Miatt

R. C. Homes.

Inventor:

Albert Borchardt,

Per Edw. C. Loomis.

Atty.

(No Model.)

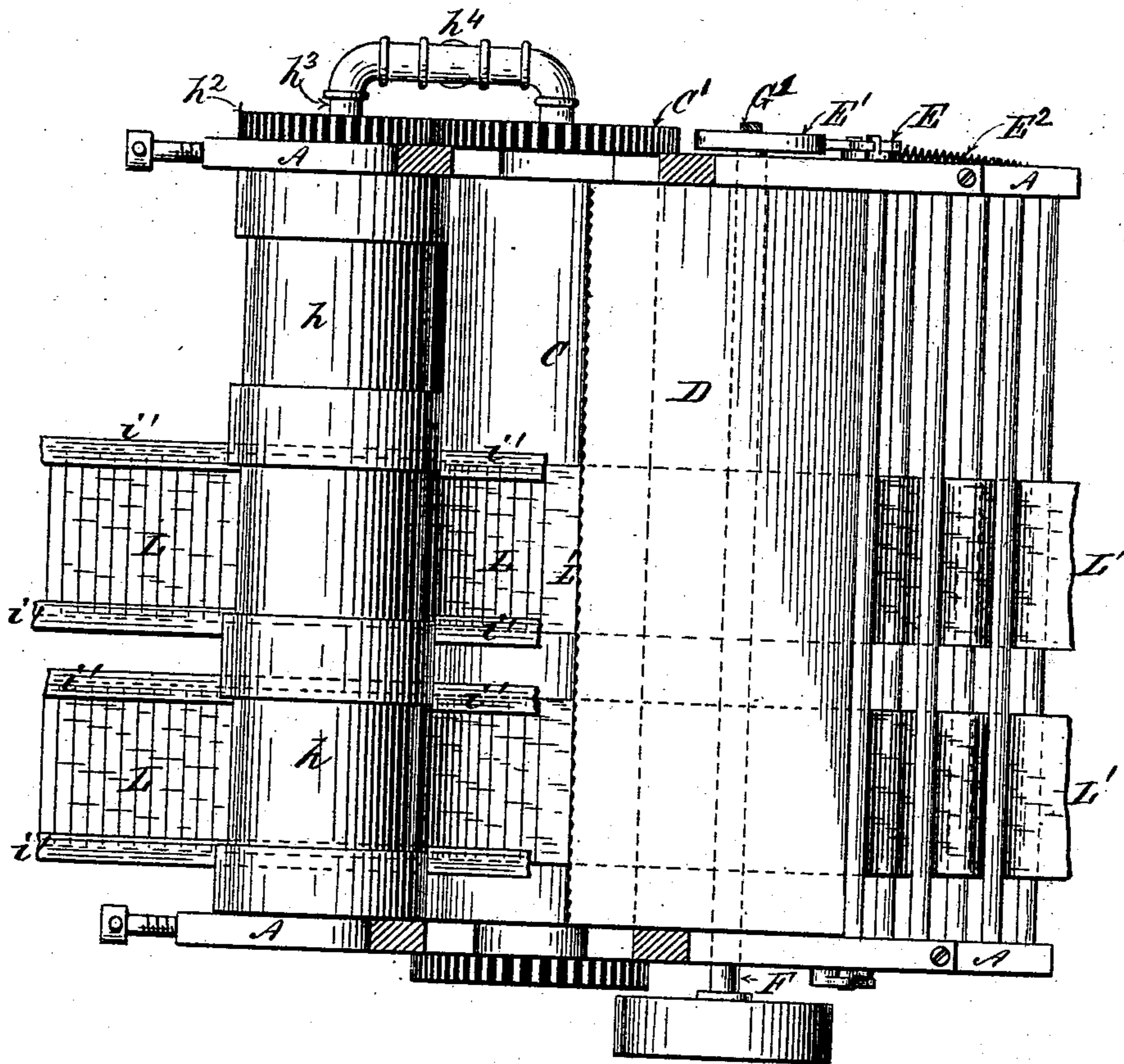
A. BORCHARDT.
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5 Sheets—Sheet 5.

No. 361,125.

Patented Apr. 12, 1887.

Fig. 5.



Witnesses:

Geo. W. Miath

R. C. Howes

Inventor:

Albert Borchardt

Per Edw. C. Quincy

Atty.

UNITED STATES PATENT OFFICE.

ALBERT BORCHARDT, OF HOBOKEN, NEW JERSEY.

CLOTH-PLAITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 361,125, dated April 12, 1887.

Application filed December 1, 1886. Serial No. 220,338. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BORCHARDT, of Hoboken, New Jersey, have invented certain Improvements in Cloth-Plaiting Machines, of which the following is a specification.

In cloth-plaiting machines as heretofore constructed the fabric is passed between intermittently-rotating creasing-rollers, one or both of which are heated. When these rollers are brought to rest, a reciprocating tucking-blade, the edge of which presses gently downward toward the surface of the lower roller and is armed with slightly-projecting teeth, catches the fabric lying upon the surface of the lower roller and presses it forward toward the line of bearing of the rollers upon the fabric, thus forming in the fabric a double bight or return-bend, which, when the creasing-rollers are again rotated, is pressed down and creased.

For the purpose of fastening the plaits in their folded position, cords which have been previously carried through a bath of mucilage or glue are fed between the creasing-rollers near the edges of the fabric, and are pressed down and made to adhere to the folds. This mode of fastening the plaits, however, results in the smearing of the rolls with gum or mucilage pressed out of the cord, and hence in the smearing, to a greater or less extent, of the fabric. This difficulty of course does not ensue when the gummed cord is not employed, in which case, after the fabric has passed through the plaiting-machine, it is refolded and stitched along its longitudinal edges, for the purpose of retaining the plaits in their folded positions.

The object of the present improvement is to avoid the gumming of the creasing-rollers and the smearing of the fabric with gum, while automatically effecting the fastening of the plaits in the machine in which the plaiting operation is performed.

To this end the invention consists, first, in suitable mechanism for feeding between the edges of the plaited fabric and the upper creasing-roller strips of paper coated upon their under sides with an adhesive substance,

which strips are by the rotation of the rollers pressed down along the edges of the plaited fabric.

The second feature of the invention consists in the arrangement, in connection with the lower creasing-roller, of a tension-roller mounted in bearings which are preferably adjustable toward and from the lower creasing-roller. The tension-roller, which may also be a heated roller, is circumferentially grooved, so that it bears only upon the paper strips applied to the edges of the plaited fabric. The tension-roller is driven a little faster than the creasing-rollers, and thus exerts a slight pull, which stretches the plaited fabric to which the paper strips have been applied with more or less tension over so much of the lower creasing-roller as intervenes between the line of bearing of the tension-roller and the line of bearing of the upper creasing-roller.

The prolonged contact of the plaited fabric and the strips adhering thereto with the surfaces of the heated rollers effects two useful results. It dries the paste or other adhesive material with which the under surfaces of the paper strips are coated, and it sets the creases, so that the tendency of the plaits to spring open is greatly diminished. Ordinarily these results will be effected by the contact of the plaited fabric with the heated lower creasing-roller; but, if necessary, the tension-roller may also be heated, so that the plaited fabric and strips may be further heated by passing under the tension-roller.

The accompanying drawings of a cloth-plaiting machine containing the improvements are as follows:

Figure 1 is a front elevation of the machine, showing a portion of the lower creasing-roller in central vertical longitudinal section, for the purpose of illustrating a mode in which the rollers may be conveniently heated. Fig. 2 is a transverse section through the line *xx* on Fig. 1. Fig. 3 is an elevation of the right-hand side of the machine. Fig. 4 is an elevation of the left-hand side of the machine. Fig. 5 is a horizontal section through the offset dotted line *yy* on Fig. 4.

The machine illustrated in the drawings contains the ordinary appurtenances of cloth-plaiting machines as heretofore constructed—to wit, the upper and lower creasing-rollers, 5 B and C, mounted horizontally in suitable bearings in the substantial frame A, and the tucking-blade D, affixed to the horizontally-sliding frame D', to which proper reciprocating motions are imparted by means of the 10 rocking lever E, which is moved in one direction by the cam E', affixed to the driving-shaft F, and in the opposite direction by the retracting spiral spring E².

The driving-shaft F is provided with the 15 crank G, for giving motion, by means of the pitman G', to the radius-bar G², loosely mounted upon the shaft B' of the upper creasing-roller, and provided with the pawl G³, for engaging the teeth of the ratchet-wheel B³, affixed to 20 the shaft B', and thus imparting a prescribed range of rotating movement to the upper creasing-roller, and to the rollers geared thereto, during each revolution of the driving-shaft F. The upper creasing-roller is mounted 25 in the usual vertical adjustable boxes, B⁴.

One of the new features of the machine is the tension-roller *h*, to the hollow shaft *h'* of which is affixed the pinion *h*², which engages with and is driven by the spur-wheel C', affixed 30 to the shaft C² of the lower creasing-roller, C. The spur-wheel C' is made slightly larger than the pinion *h*², in order to drive the roller *h* a little faster than the creasing-roller C.

The heating of the tension-roller may be effected, in the usual way, by means of the jets of 35 flame from a gas-pipe, *h*³, inserted through the hollow shaft *h'* and affixed to the gas service-pipe *h*⁴.

Another feature of the present invention 40 consists of the paper-strip reels *i*, upon which the paper strips *i'*, &c., are coiled, and from which the strips *i'* are delivered with such tension as may be due to the bearing upon the surface of the coil, in each case, of a brake, 45 *i*³, affixed to the end of a pivoted arm, *i*⁴, provided with an adjustable weight, *i*⁵. From the reels *i*, respectively, each of the paper strips *i'* is led by means of suitable guide-rollers downward to a paste-reservoir, *j*, and over 50 a paste-roller, *j'*, having its lower portion immersed in the paste or other fluid adhesive material, *j*², contained in the paste-reservoir. After passing over the paste-roller the strips *i'* are respectively led under the upper 55 creasing-roller, and are so guided that they are pressed downward by the upper creasing-roller along the edges of the plaited fabric L as the latter passes through between the creasing-rollers.

60 If the reels, guide-rollers, and pasting-rollers are properly adjusted, the strips of paper will be appropriately delivered between the creasing-rollers; but, as a measure of abundant caution, each of the strips is carried between 65 the adjustable guides *k*, which are secured by set-screws to the horizontal bar *k'*, sup-

ported in the frame of the machine in a position adjacent to the upper creasing-roller.

In this class of machines it is customary to make the creasing-rollers and tucking-blade 70 sufficiently long to adapt the machine for performing plaiting operations upon two or more cloths, L' L', simultaneously fed to the machine. The same practice will be adhered to with the improved machine herein described, 7 and to that end there will be provided as many reels for the paper strips and as many guide and paste rollers as may be required by the number of creasing operations which the machine is adapted to simultaneously per- 80 form.

By the operation of the machine it will be seen that the paper fastening-strips *i'* are applied to the edges of the fabric concurrently with the creasing operation, and that the 85 plaited fabric with the strips applied is therefore held in contact with the surfaces of the heated rollers for a sufficient length of time to dry the paste, and to thus permanently secure the plaits in their folded position, so that 90 the plaited fabric can be handled without causing the unfolding of the plaits.

As the fastening-strips are applied to the edges of the plaited fabric, it is not necessary to remove the strips until after the fabric has 95 been sewed to the object in connection with which it is to be used, after which the paper fastening-strips, if they show, can easily be torn off.

What is claimed as the invention is— 100

1. The combination, in a cloth-plaiting machine, as set forth, of the plait-forming device and the creasing-rollers with a paste roller or rollers and means for guiding strips of paper over the surface or surfaces of said paste roller 105 or rollers and between the creasing-rollers, whereby the paper strips are pasted upon one side only and their pasted surfaces are pressed against and made to adhere to the plaited fabric along the edges thereof, respectively. 110

2. In combination with the creasing-rollers B and C and means, substantially such as described, for pasting the paper strips *i'* upon one side only and feeding the same to the creasing-rollers, the tension-roller *h*, for holding the plaited fabric and the paper strip adhering thereto against the surface of the lower creasing-roller, and thereby prolonging the period during which the plaited fabric and the paper strip adhering thereto is held in 120 contact with the heated surface of the lower creasing-roller.

3. A paper-strip reel, *i*, a paste-roller, *j'*, and suitable guide-rollers for leading the strips from the reel *i* over the said paste-roller, in 125 combination with the creasing-rollers B and C and means for forming plaits in a fabric which is fed between the creasing-rollers, whereby the pasted surface of the paper strip *i'* is laid along the edge of the plaited fabric 130 and pressed against the surface thereof by its passage between the creasing-rollers.

4. In a cloth-plaiting machine substantially such as described, provided with means for automatically applying strips of paper pasted upon one side only to the edges of the
5 plaited fabric, the combination of the creasing-rollers B and C, the tension-roller *h*, and suitable gearing for causing the surface of the tension-roller *h* to move slightly faster than the surface of the creasing-roller C, as and for the purpose set forth.

ALBERT BORCHARDT.

Witnesses:

R. C. HOWES,
M. L. ADAMS.