

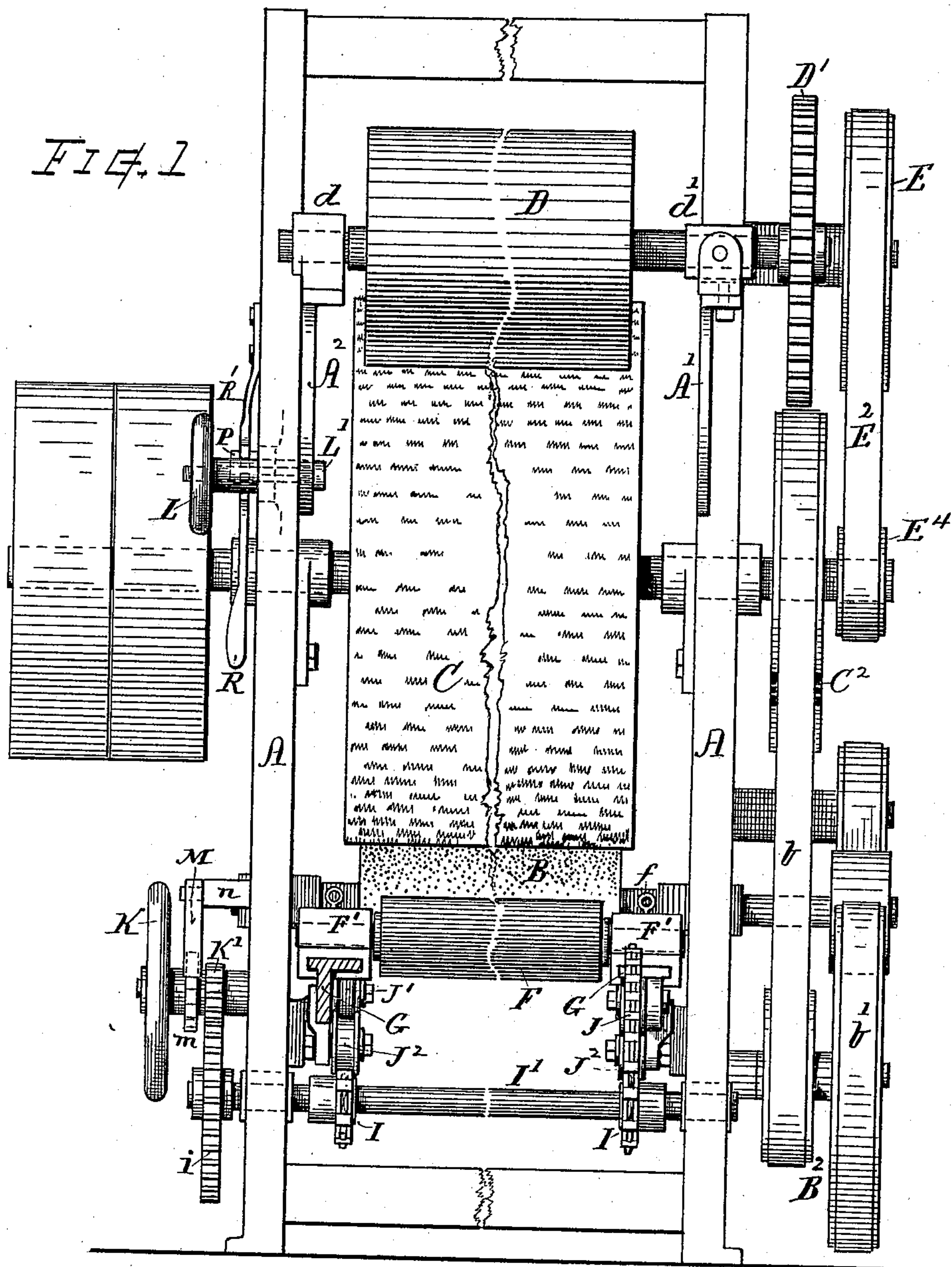
(No Model.)

4 Sheets—Sheet 1.

E. T. & E. H. MARBLE.
CLOTH NAPPING MACHINE.

No. 486,115.

Patented Nov. 15, 1892.



Witnesses.

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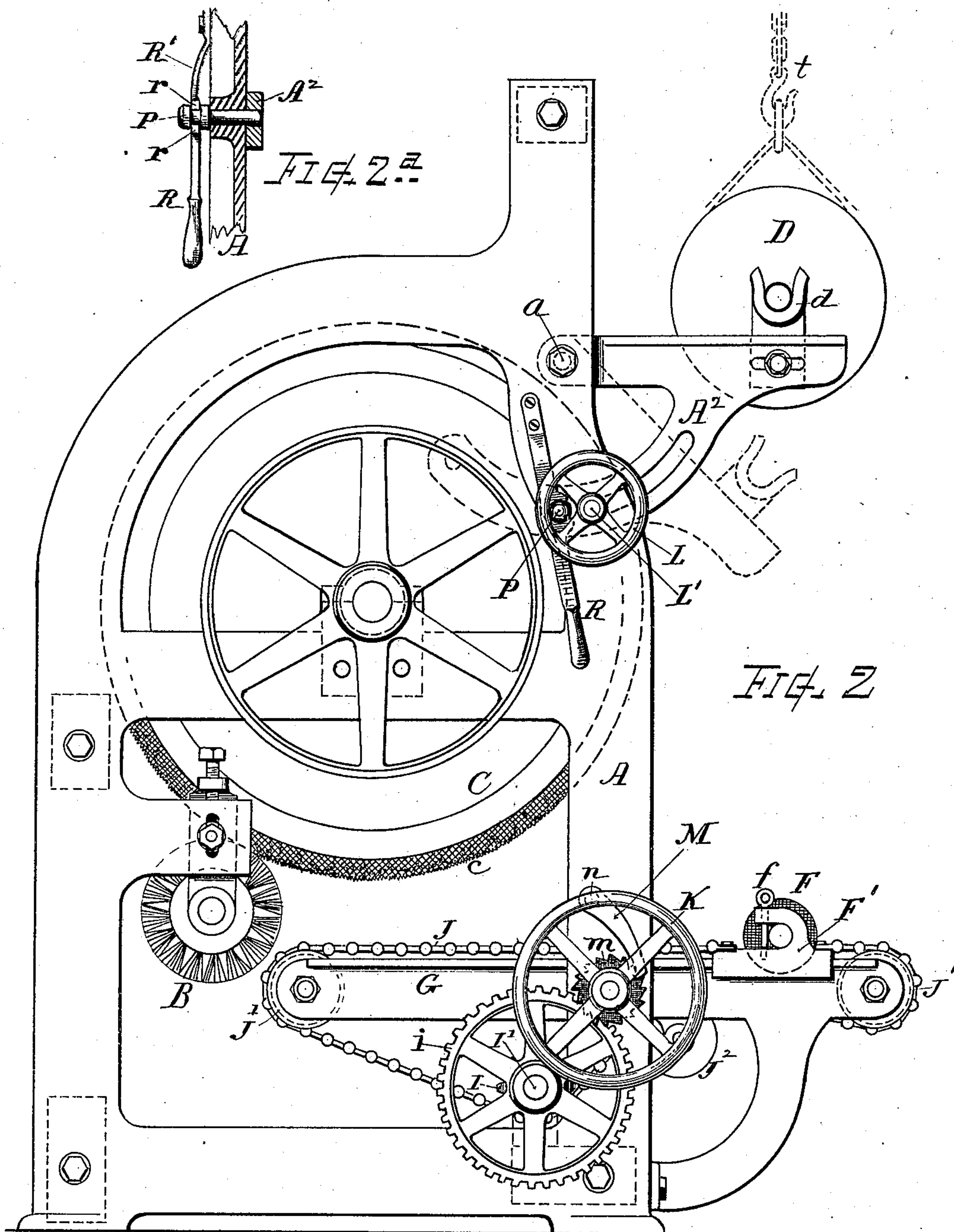
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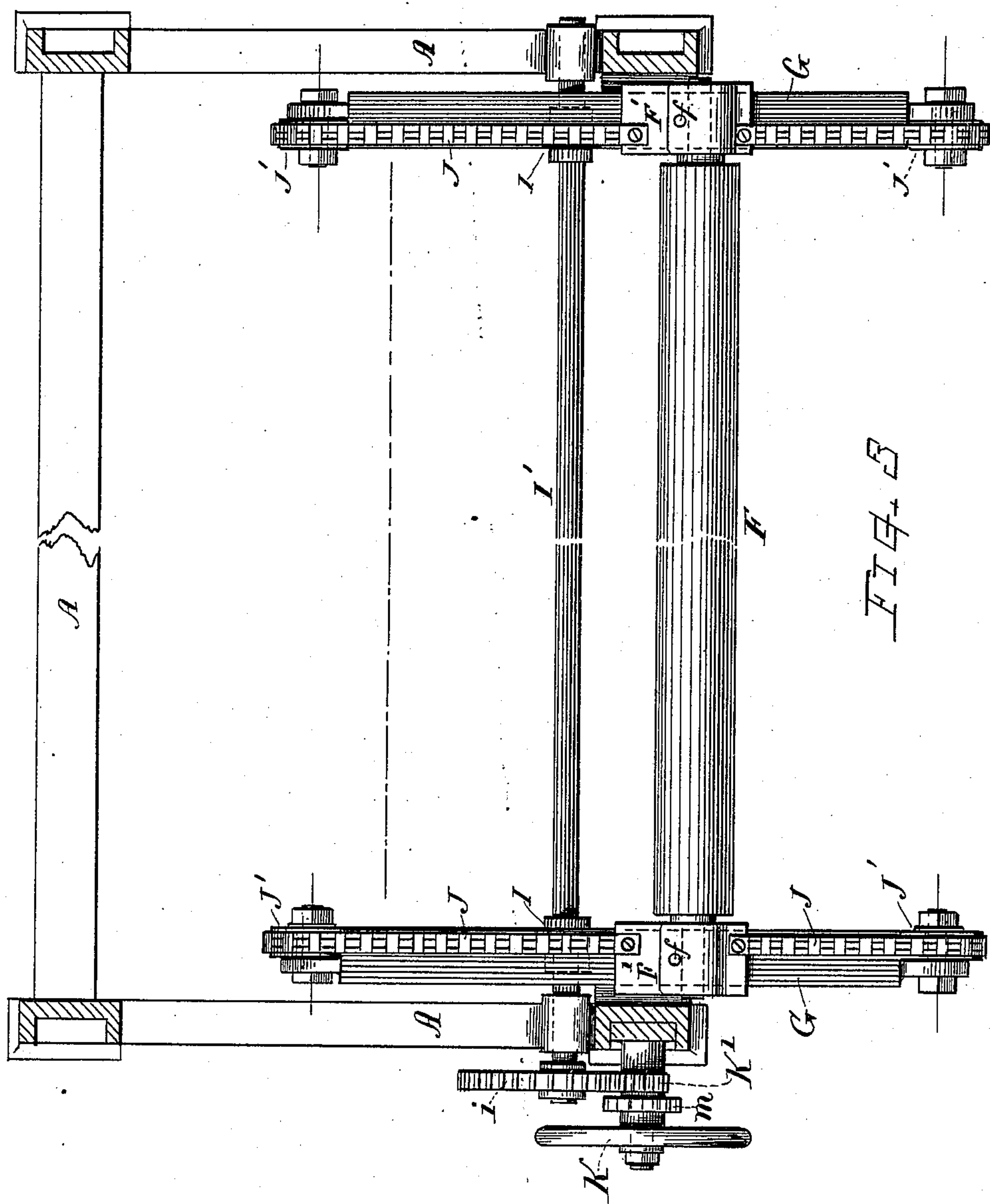
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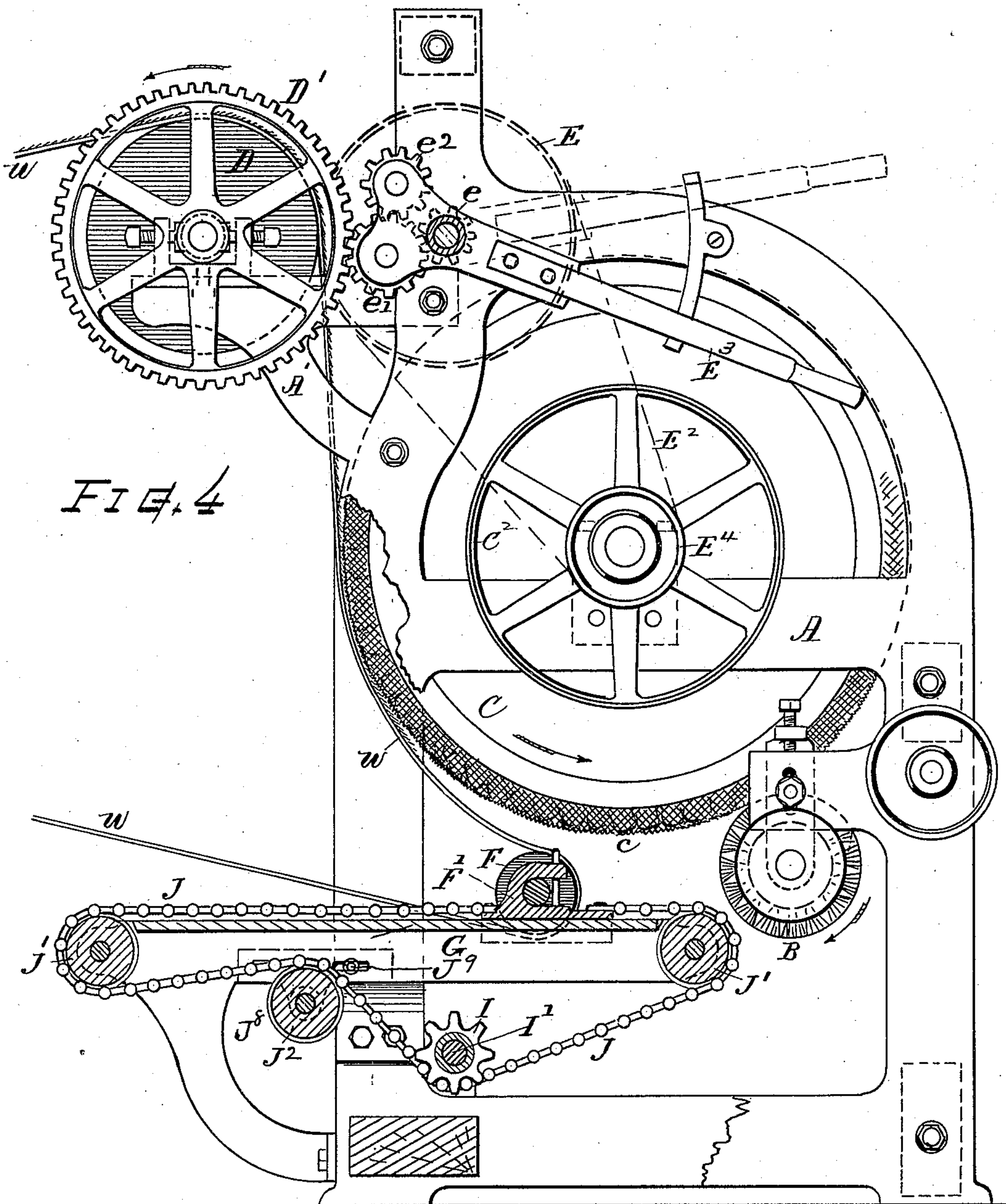
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4 Sheets—Sheet 4.

E. T. & E. H. MARBLE.
CLOTH NAPPING MACHINE.

No. 486,115.

Patented Nov. 15, 1892.



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UNITED STATES PATENT OFFICE.

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

CLOTH-NAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,115, dated November 15, 1892.

Application filed June 7, 1892. Serial No. 435,811. (No model.)

To all whom it may concern:

Be it known that we, EDWIN T. MARBLE and EDWIN H. MARBLE, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Cloth-Napping Machines, 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.

Our present invention relates to the way and manner in which the contact-roll is combined with and adjusted in relation to the napping-cylinder, and to the presentation of the fabric to the cylinder-surface between the contact-roll and drum in the peculiar manner hereinafter explained, the object being to bring the fabric into such relation with the cylinder or nap-raising mechanism that a more efficient and desirable napping of the surface is effected; also, to render the apparatus convenient for operation and attendance in the working of heavy fabrics and of greater range of working adjustment.

Another object is to provide a napping-machine adapted for working large, heavy, or endless fabrics and having facilities for the convenient introduction and removal of the fabrics and for the efficient and ready adjustment of the mechanism for presenting the fabric to and relieving it from contact with the napping devices to meet the requirements at different stages of the work or for various classes of fabrics. These objects we attain by mechanism, the nature of which is illustrated in the drawings, wherein—

Figure 1 is a front view of our improved napping-machine. The central parts are much shortened to bring the figure within the size of the sheet. Fig. 2 is a side elevation with the contact-roll at its outward position. Fig. 2^a is a detail view showing the arrangement of the bracket stay-pin and its lever. Fig. 3 is a horizontal section below the cylinder, showing the contact-roll, its guides, and adjusting mechanisms. Fig. 4 is a part side and part sectional view opposite that shown in Fig. 2, showing the contact-roll

moved inward to a position beneath the napping-cylinder.

Referring to parts, A denotes the frame, which can be of the usual construction or of any suitable form for properly supporting the working parts.

C indicates the main cylinder, the periphery of which is covered with teasels attached thereto in any well-known manner or with other nap-raising appliances to give the desired working surface *c*. A working surface of teasels arranged in the manner known as "rolling teaselers" is a preferable form; but as the particular kind of napping-cylinder is not an essential feature of our invention any suitable kind can be employed; also, if desired in any instance, the cylinder can be of the kind known as a "planetary cylinder," in which a circular series of smaller cylinders are employed in place of the single large cylinder C, the parts of the mechanism which constitute our invention being combined therewith for operation in the manner substantially as herein described.

D indicates the feed-roll of draft-drum rotatable in bearings *d d'*, mounted on forwardly-projecting brackets *A' A²*, located at the upper part of the machine. The drum is provided with a gear *D'* on one end of its shaft, which is operated by the pinion *e* and either of the change intermediates *e'* or *e²*, that are mounted on the shifting-lever *E³*. The pinion *e* is fixed to a pulley *E*, that is driven by belt *E²* from a pulley *E⁴* on the cylinder-shaft. The direction of rotation of the drum *D* is changed by raising the lever *E³* to swing the intermediate gear *e²* into mesh with the gear *D'*. This form of gearing is similar to that heretofore employed.

F indicates a roller about which the fabric passes and which we term the "contact-roll," as it serves for sustaining the fabrics in greater or less contact with the working surface of the cylinder. Said contact-roll is mounted and made adjustable in the improved manner which will be here described.

Between the end frames and below the cylinder we arrange straight guides or ways *G*, that extend beneath the cylinder and also project some distance outward from the main

frame, as indicated. Such guides are bolted or attached to the side plates of the main frame or otherwise supported in a firm and efficient manner, preferably in horizontal position. Sliding bearing-boxes F' are arranged upon the guides G , in which bearing-boxes the journals of the contact-roll F are supported. The bearing-boxes are best fitted to the guides with under locking-lips at their edges, so that they cannot lift therefrom, and with an open overhanging jaw in which the roll-journal fits, as shown, it being retained therein by a pin f , which can be easily withdrawn, so that the contact-roll can be readily taken out of its bearings. A shaft I' , having sprocket-wheels I fixed thereon, is arranged below the guides to turn in suitable bearings on the frame, and the sliding bearing-boxes F' are respectively provided with chains J , attached to their opposite ends, which chains pass around guide-sheaves J' , mounted on axial studs fixed in the ends of the ways G and engage with said sprockets I in the manner illustrated, so that rotation of the shaft I' and its sprockets I effects a movement of the bearing-boxes F' along the guideways, and thus adjusts the contact-roll F' inward or outward in relation to the cylinder C and drum D . Take-up sheaves J^2 are preferably provided for taking up any slackness in the chains J by moving the pad or stud J^8 , whereby said sheave is supported in or out on its frame, a suitable slot-clamping nut J^9 being provided to accommodate such adjustment. At its end shaft I' is provided with a gear i , that meshes with a pinion K' , mounted on a suitable axial stud and having connected therewith a hand-wheel K , by which rotation of the pinion can be effected, and a ratchet-wheel m , which is engaged by a pawl M , pivoted on the side of the frame at n or in other fixed relation for retaining the parts at position of adjustment.

B indicates the cleaning-brush for removing lint from the teasels or cylinder-surface. Said brush is of rotary cylindrical form and is disposed at the under part of the machine adjacent to the ends of the guides G for operation in the direction indicated. It is rotated from a pulley C^2 on the cylinder-shaft through the intermediate counter-shaft pulleys B^2 by the belts $b b'$, as indicated on Fig. 1. The brush immediately follows the napping contact and clears the lint from the teasels before a second napping contact is effected. Consequently the lint is not bedded onto the teasels, but is taken off while free, and better clearance thus results.

The drum-supporting bracket A^2 , which is arranged to swing downward on its pivot or attaching-stud a , (see dotted line, Fig. 2,) has combined therewith a clamping-screw L' and hand-wheel nut L arranged in connection therewith, as shown, and for retaining said bracket at any position desired. We also provide in combination with said bracket a locking-bolt or stay-pin P for positively sup-

porting the bracket when in its elevated position and sustaining the weight of the drum and the fabric carried thereon. Said stay-pin P is best arranged through an opening in the frame to engage with a corresponding opening in the bracket. (See Fig. 2^a.) A handle-lever R is provided for withdrawing the pin P from the bracket. Said lever has its upper end bolted to the frame A and is provided with a recess or lugs r , that engage a groove in the head of the pin. The upper part of the lever at R' is made to act as a spring for normally holding the pin pressed into engagement with the bracket A^2 . When the bracket is to be dropped, the stay-pin can be retracted by swinging outward the handle-lever. In practice the drum D is some fifteen feet (more or less) in length and about sixteen inches (more or less) in diameter. Hence the utility of positive affixment for the adjustable bracket will be apparent. The drum D is disposed parallel with the cylinder and with its rear side in such relation to the front side of the cylinder that the common plane tangential to the surfaces of both drum and cylinder is approximately upright or nearly perpendicular to the plane of the guides on which the bearings of the contact-roll are adjustably supported, or to the plane of adjustment in which the contact-roll moves as said roll and the fabric thereon is adjusted to or from the face of the cylinder.

By arranging the parts as specified and adjusting the contact-roll in a plane extending beneath the cylinder, the fabric is presented to the napping appliances at the under curve of the cylinder, or, as it may be termed, by "lifting" the fabric in its natural sag or curve to the under curve of the cylinder-face, (see Fig. 4,) thus making contact thereof in such a way that the sag or weight of the fabric, together with the repellent action due to the rotation of the cylinder, tends to force the fabric outward from the cylinder, making the contact lighter and avoiding any drag of the fabric on the teasels; also, rendering the contact more entirely dependent upon and controllable by the adjustment of the contact-roll, the result being the production of a finer and more fluffy nap and the obviation of liability of the napping appliances catching into and tearing the fabric.

In the operation for introducing an endless web of fabric—for instance, the heavy felts designed for use on paper machinery—the drum D is temporarily supported near its center by a strap and hoist-chain t (indicated by dotted line, Fig. 2) or other convenient means, the bracket A^2 dropped, and the fabric w passed over the end of the drum. The bracket is then raised to place, clamped by the hand-wheel nut L and screw L' , and positively locked by the stay-pin P . The temporary support t is then removed and the fabric spread its full width on the drum. The contact-roll F being at its outward position, as in Fig. 2, is removed from its bearing-boxes

F', passed endwise through the loop of fabric and then replaced in its bearings. The usual roll or bar (not shown) may be employed for keeping the endless fabric extended in front of the machine in a well-known manner. The operator then, by means of the hand-wheel K, effects rotation of the shaft and sprocket-wheels I, causing the advancement of the contact-roll F to a position more or less beneath the cylinder C, so that the fabric is presented in a greater or less curve to the action of the napping-cylinder. The machine being set in motion, the cylinder rotates in the direction indicated and the fabric is fed past the working surface thereof by rotation of the drum D in either direction desired. By the hand-wheel K the operator can control the contact to give such napping action as may be desired at any stage of the operation or for any particular kind of fabric.

What we claim as our invention herein, to be secured by Letters Patent, is—

1. The combination, substantially as described, of the napping-cylinder, the stationary guide-rails disposed below said cylinder, projecting at the front of the machine and extending beneath the cylinder or its axis, the draft roll or drum arranged above and forward of said napping-cylinder, with the common tangential plane of said drum and cylinder being at or nearly perpendicular to the plane of said guide-rails, the contact-roll detachably mounted in its bearings, the said bearings movable on said guide-rails, a shaft extending from one to the other of said guides, parallel with the roll-axis, operating connections from said shaft for simultaneously moving said bearings along the guide-rails, and means for retaining adjustment thereof at any desired position, for the purposes set forth.

2. The combination, with the draft-drum, of the napping-cylinder C, contact-roll F, its sliding bearings F', the bearing-guides G, disposed in a plane extending beneath the cyl-

inder, the chains J, connected with said bearings, and the operating-shaft I', having the sprocket-wheel I fixed thereon that engages the chains, substantially as and for the purpose set forth.

3. The combination of the contact-roll F, its journal-bearing boxes F', the guiding-ways G, the chains J, connected to said boxes, guide-sheaves J' therefor, the shaft I', provided with sprocket-wheels I, that engage said chains, the gear i, fixed on said shaft, the hand-wheel K, and its pinion K', meshing with said gear, the ratchet m, and pawl M, for the purposes set forth.

4. The combination, with the draft-drum, its pivoted supporting-bracket, the bracket-clamping screw, and hand-nut, of a stay-pin arranged in the frame and adapted for entering a recess in said bracket and locking the same when at its normal elevated position, for the purpose set forth.

5. The bracket stay-pin and the springing handle-lever engaging the grooved head thereof, in combination with the frame having a hole for said pin, the draft-drum, and the drum-supporting bracket pivoted to the frame and fitted with a recess that swings into line with said pin-hole and engages with said stay-pin when the bracket is in normal position, for the purpose set forth.

6. In combination with the contact-roll and its traverse-guides, the sliding bearing-boxes F', fitted to their guides by underlocking lips and having the overhanging jaw for receiving the contact-roll journal, and the detachable pins for retaining and releasing said journals and contact-roll, substantially as set forth.

Witness our hands this 4th day of June, A. D. 1892.

EDWIN T. MARBLE.
EDWIN H. MARBLE.

Witnesses:

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ELLA P. BLENUS.