

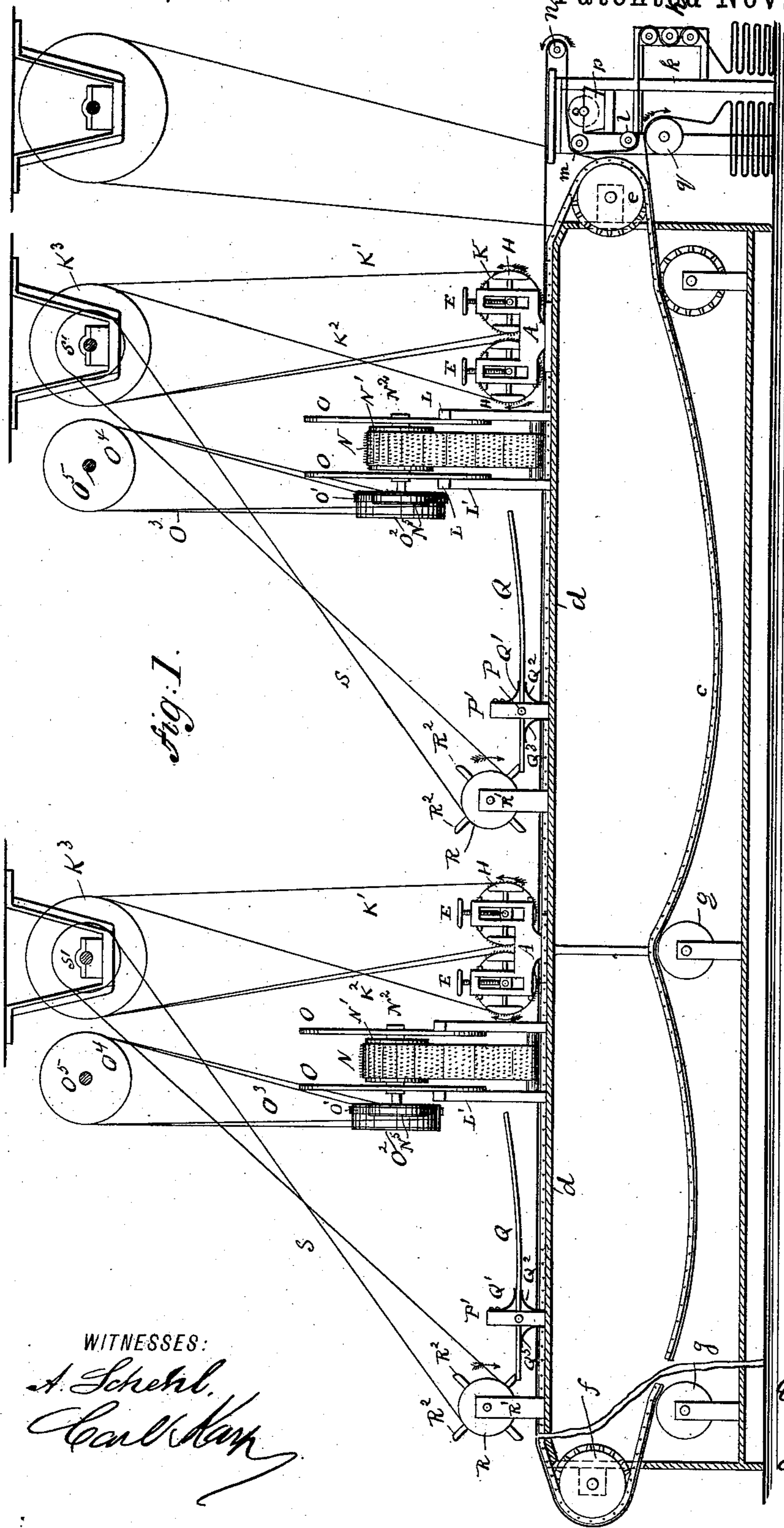
(No Model.)

3 Sheets—Sheet 1.

E. RAU.
MACHINE FOR FINISHING CLOTH.

No. 373,193.

Patented Nov. 15, 1887.



WITNESSES:

A. Schehl.
Carl Kopp

INVENTOR

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by
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(No Model.)

3 Sheets--Sheet 2.

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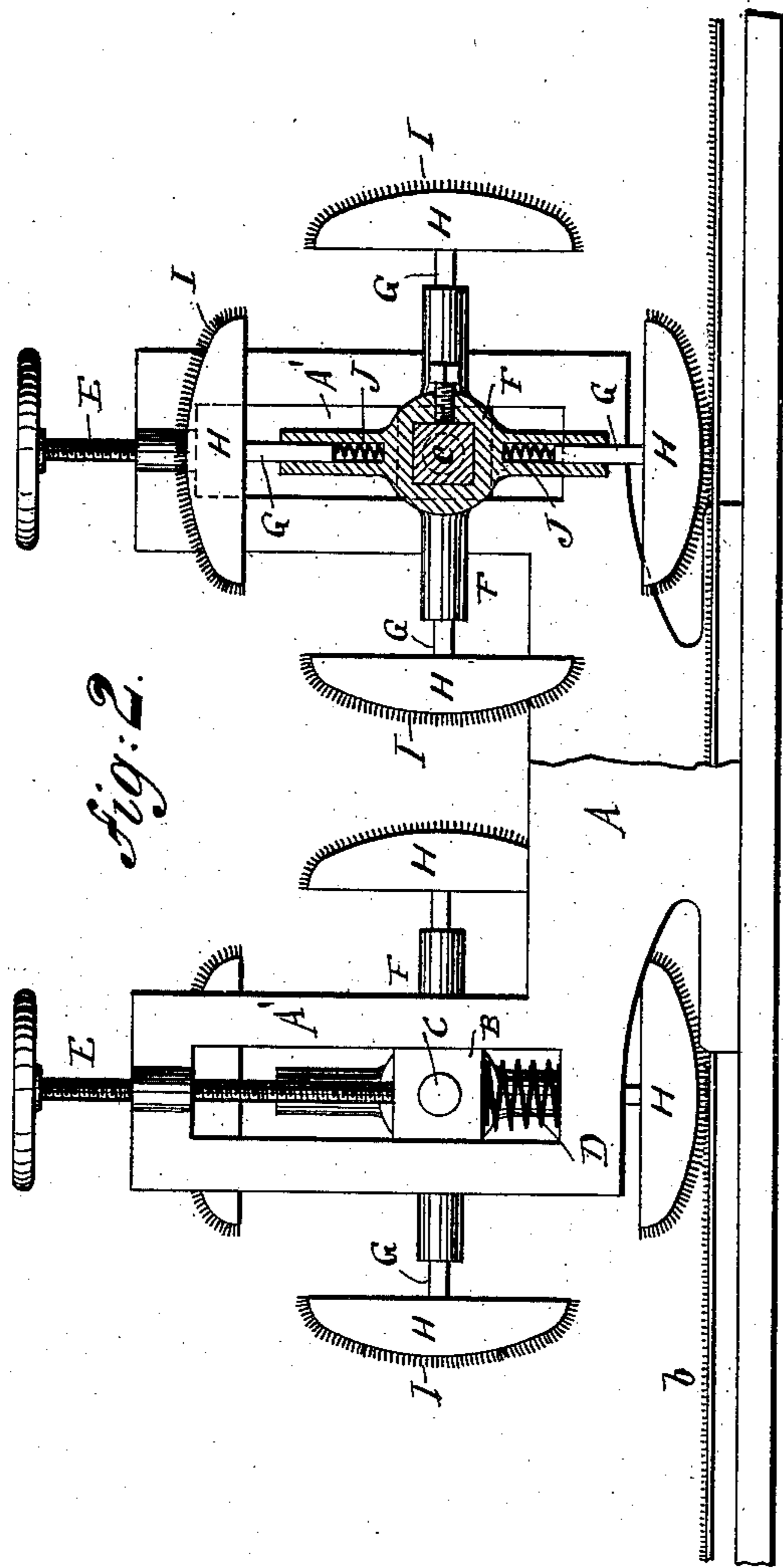


Fig. 2.

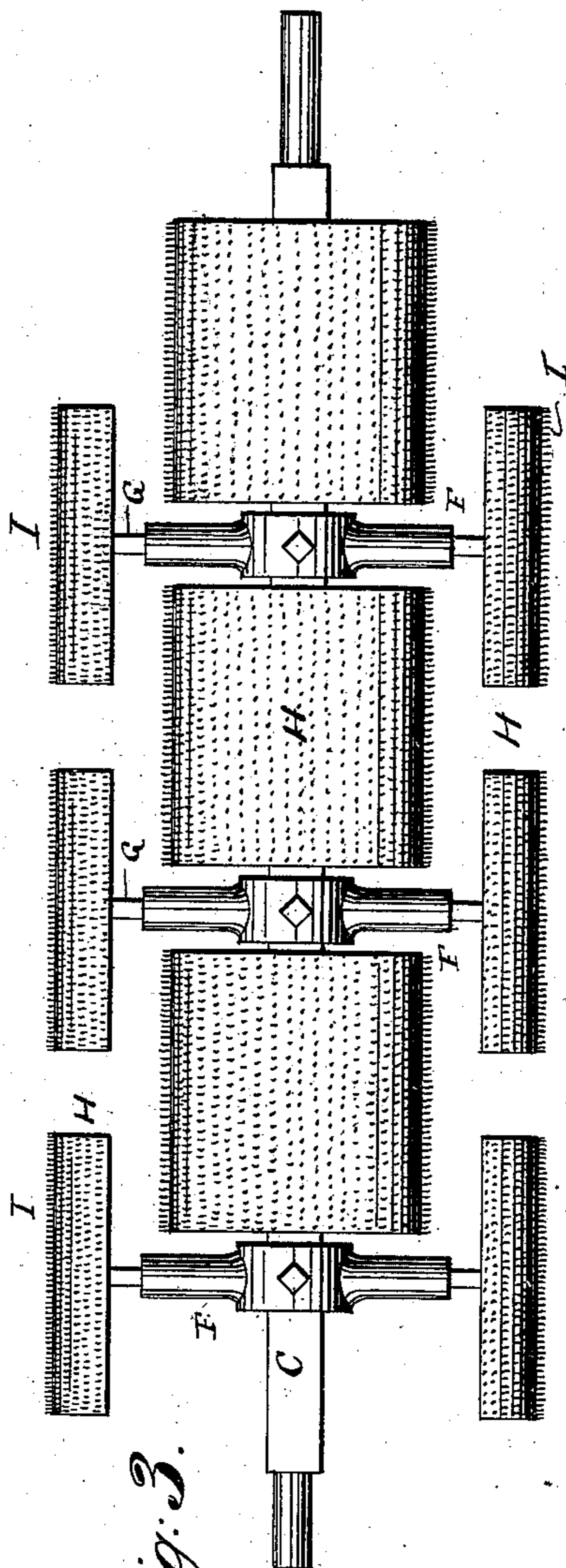


Fig. 3.

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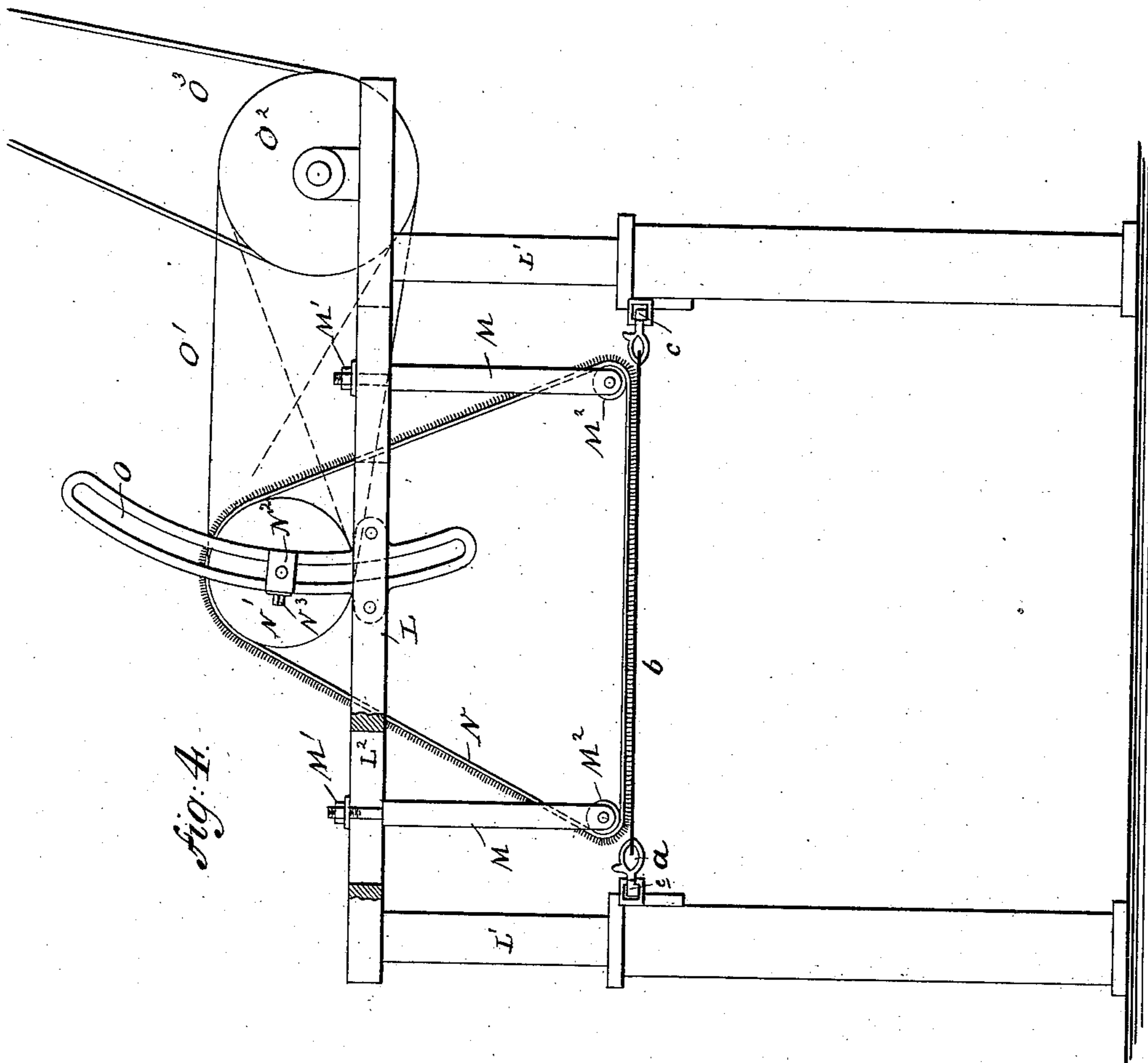
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UNITED STATES PATENT OFFICE.

EUGENE RAU, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOHN GODDARD WATMOUGH, OF SAME PLACE.

MACHINE FOR FINISHING CLOTH.

SPECIFICATION forming part of Letters Patent No. 373,193, dated November 15, 1887.

Application filed December 4, 1886. Serial No. 220,641. (No model.)

To all whom it may concern:

Be it known that I, EUGENE RAU, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Finishing Cloth, of which the following is a specification.

Tentering-machines have been used heretofore for stretching fabrics after they have been dyed.

The object of my invention is to provide certain new and useful attachments to the tentering-machines used heretofore for the purpose of carding and beating plush and raising the nap. Heretofore the nap had to be raised by hand and separate operations, which I do away with.

The invention consists in the combination, with a tentering-machine of the usual construction, of carding rollers and belts for separating the pile threads of the plush, and attachments for beating the plush for the purpose of causing the pile threads to stand erect, all as will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a tentering-machine provided with my improvements. Fig. 2 is an enlarged detail side view of the carding-rollers, parts being broken out and others in section. Fig. 3 is a longitudinal view in elevation of one of the carding-rollers. Fig. 4 is a cross-sectional view of a machine provided with my improvement, showing the transverse carding-belt.

The tentering-machine is of the usual construction and is provided with the grippers *a*, which hold the edges of the fabric *b*, said grippers being secured to an endless chain, *c*, which passes over the top plate, *d*, of the tentering-machine, over the toothed rollers or wheels *e* and *f* at the ends of the machine, and over the carrying wheels or rollers *g*. The box or chamber of the tentering-machine, is heated by steam-pipes or any other device in the usual manner. The plush is passed over a series of rollers, *h*, on a frame, *k*, on one end of the machine. The plush is then passed over the rollers *l* and *m* and over the roller *n*, and between the rollers *m* and *n* is in contact with the roller *o*, journaled in a trough, *p*, said

trough containing water, in which the roller *o* dips. The pile surface of the fabric (plush) is thus moistened by coming in contact with the surface of the roller *o*. The fabric is then gripped by the grippers of the chain *c*, carried over the top plate of the tentering-machine back below said plate, leaves the grippers under the roller *e*, passes over the roller *g*, and is deposited below the same.

On the top plate, *d*, of the machine the frame *A* is held at each side, said frames each being provided with two longitudinally-slotted upwardly-projecting shanks, *A'*, in the slots of which the journal boxes or bearings *B* of the transverse shafts *C* can slide vertically. Said bearings are pressed upward by springs *D*, interposed between the bearings and the bottoms of the slots, and they can be adjusted higher or lower in the slots *B* by means of screws *E*, passed through threaded apertures in the upper part of the shanks.

On each shaft *C* a series of arms, *F*, are held, which project alternately in opposite directions—that is, the alternating arms are at right angles to each other and the arms all project from two opposite sides of the shafts. Each end of each arm is made tubular, and in said tubular ends pins *G* are inserted, to the outer ends of which blocks *H* are secured, having their outer surfaces curved, as shown, and covered with carding cloth, *I*. Springs *J* are interposed between the inner ends of the pins *G* and the inner ends of bores or apertures in the arms *F*, and are secured at each end to said inner ends of the pins and bores, thereby preventing the complete withdrawal of the pins from the apertures, as said springs are too short, even in their expanded position, to admit of such withdrawal, said springs acting expansively to press the pins *G* outward, and thus press the carding-cloth *I* on the blocks *H* upon the pile surface of the fabric, passing over the top-plate of the tentering-machine.

By means of the screws *E* the shafts *C* can be adjusted to a greater or less distance from the surface of the plush, and thus the pressure of the carding-surface of the blocks upon the plush can be adjusted. A pulley, *K*, is mounted on one end of each shaft *C*, and over said pulleys the belts *K'* and *K''* pass, which also pass over a pulley, *K'''*, on a suitable

driven shaft. The belt K^2 is crossed, so that the shaft which it rotates has a reverse direction to that of the shaft rotated by the belt K' , and thus the blocks carrying the carding-cloths are rotated in opposite direction toward each other.

Adjacent to the frames A two cross-bars, L, are held on standards L' on the top of the frame of the machine, said cross-bars L having longitudinal slots L^2 , through which the upper ends of downwardly-projecting bars or arms M pass, which are held in position by nuts M' on screws projecting through the bars L.

On the lower ends of the two arms at the same side of the machine a roller, M^2 , is mounted, over which an endless belt, N, passes, said endless belt also passing over a roller, N' , journaled in bearings N^2 , held by means of screws N^3 in segmentally-curved slotted guides O, fastened on the cross-bars L. The roller N' has a pulley, N^5 , at one end, over which the belt O' passes, as shown in Fig. 4, and also passing over a pulley, O^2 , driven by a belt, O^3 , from a pulley, O^4 , on a suitable driven shaft, O^5 , Fig. 1.

A short distance from the cross-bars L a transverse shaft, P, is journaled in short standards P' in the sides of the machine, and on said shaft one or more beaters, Q, are mounted to swing, on which beaters the springs Q' Q^2 Q^3 act. A short distance from the standards P' a roller, R, is mounted in standards R' on the top of the frame, which roller has a series of tappets, R^2 , which act on the short ends of the beaters Q. The roller R is operated by a belt, S, from a pulley, S' , on the same shaft as the pulley K^3 .

The above-described carding-rollers, the endless carding-belts, and the beaters are duplicated on the frame of the tenting-machine, as shown in Fig. 1.

The transverse carding-belt shown in Fig. 4 can be adjusted according to the width of the fabric. The arms M being adjusted from each other a distance approximately equal to the width of the fabric, the slack of the carding-belt N is taken up by adjusting the roller N' on the curved guides O. The rollers M^2 on the lower ends of the arms M serve to hold the outer surface of the transverse carding-plate N close to the pile surface of the plush, b.

The operation is as follows: The moistened fabric is first subjected to the action of the first pair of carding-rollers, composed of the carding-blocks H, fastened on the arms of the transverse shafts C, the cards opening and spreading the pile threads which have become united by the dyeing process. Then the pile threads are subjected to the action of the transverse carding-belt N, and then to the action of the beaters Q, which beaters Q serve to raise the pile threads—that is, to cause them to project all in the same direction from the body of the fabric. The fabric is then, for the second time, subjected to the carding and beating action. When one of the tappets R^2 acts on

the short end of a beater Q, said short end is forced downward, and the springs Q' and Q^3 , above and below the beaters and at opposite sides of the pivots, are compressed. When the tappet R^2 slides off the end of a beater, said springs, acting on the beaters, throw the long end of the same downward and forcibly upon the pile of the fabric, and thereby the spring Q^2 is compressed, and in expanding throws the beater upward again, and so on.

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

1. The combination of carders acting on the fabric in the direction of the length of the same, a carder acting on the fabric in a direction transverse to the length of the same, the beaters for raising the pile thread, and means for operating said carders and beaters, substantially as described.

2. The combination of frames at the sides, transverse shafts journaled in boxes supported in said frames, means for adjusting said boxes vertically, arms on said shafts provided with rounded blocks having carding-cloth, and means for operating said shafts and arms, substantially as described.

3. The combination of vertically-slotted frames at the sides, boxes supported in the slots thereof, springs beneath said boxes, screws above said boxes bearing thereon for adjusting them vertically in said slots, transverse shafts journaled in said boxes, arms on said shafts provided with rounded blocks at their outer ends, said blocks having carding-cloth on their faces, and means for operating said shafts, substantially as described.

4. The combination of vertically-slotted frames at the sides, boxes supported in the slots thereof, springs beneath said boxes, screws above said boxes bearing thereon for adjusting them vertically in said boxes, arms on said shafts provided with spring-actuated rounded blocks at their outer ends, said blocks having carding-cloth on their faces, and means for operating said shafts, substantially as described.

5. The combination of vertically-slotted frames at the sides, boxes supported in the slots thereof, springs beneath said boxes, screws above said boxes bearing thereon for adjusting them vertically in said slots, transverse shafts journaled in said boxes, arms on said shafts provided with apertures in their outer ends, rounded blocks provided with carding-cloth on their outer faces, having shanks inserted in said apertures, springs interposed in said apertures between the inner ends of the shanks and of the apertures and connected to each, and means for operating said shafts, substantially as described.

6. The combination of a top plate, transverse bars above the same, arms projecting downward from said bars, means for adjusting said arms laterally in said transverse bars, rollers connected to said arms, a roller on the transverse bar supporting said arms, an endless carding-belt passing around all said roll-

ers, means for adjusting said roller on the bar vertically, and means for rotating it, substantially as described.

7. The combination of a top plate provided
5 with transverse bars, arms projecting downward from the transverse bars, means for adjusting said arms laterally in said transverse bars, rollers on the lower ends of said arms, curved guides on the transverse bars, boxes
10 supported in said curved guides, means for adjusting said boxes, rollers journaled in said

boxes, an endless carding-belt passing around all said rollers, and means for rotating one of said rollers, substantially as described.

In testimony that I claim the foregoing as
my invention I have signed my name in presence of two subscribing witnesses.

EUGENE RAU.

Witnesses:

CHAS. M. LUKENS,
ALEX. C. KNOOR.