

(No Model.)

2 Sheets—Sheet 1.

J. BAER.

MACHINE FOR BEATING AND COMBING CUT PILE FABRICS.

No. 412,450.

Patented Oct. 8, 1889.

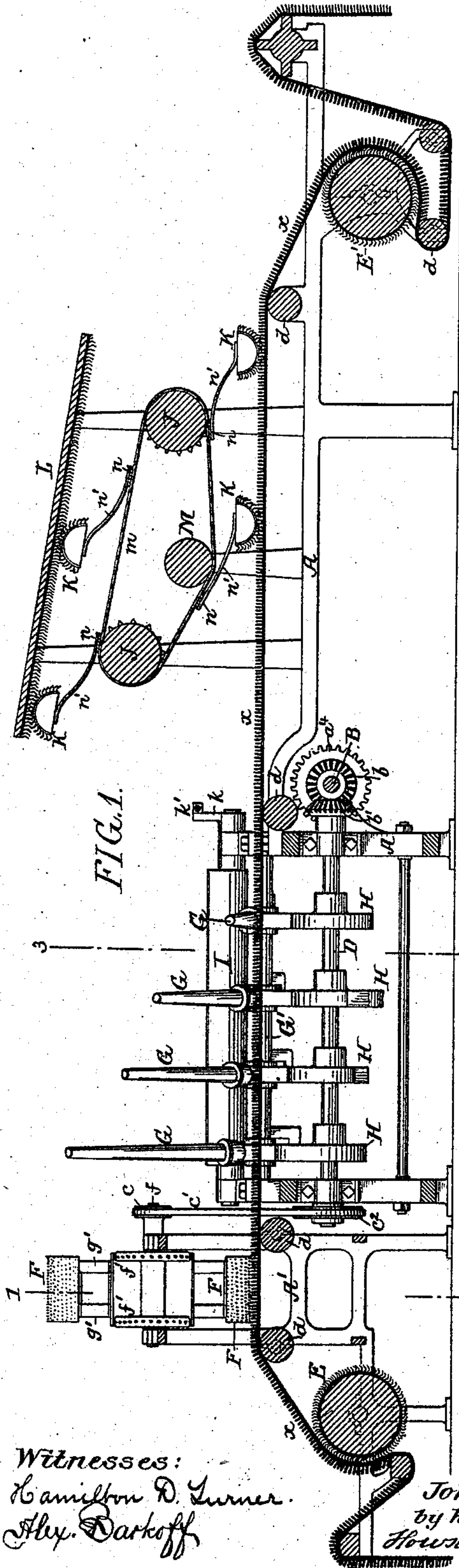
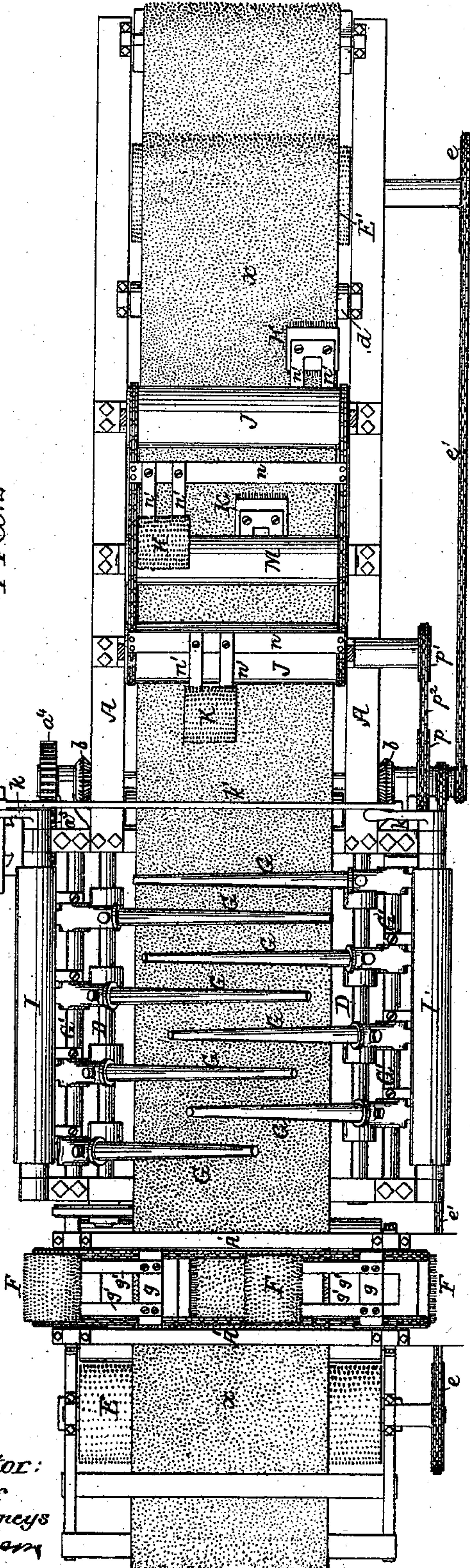


FIG. 2



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Inventor:
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by his Attorneys
Howson & Howson

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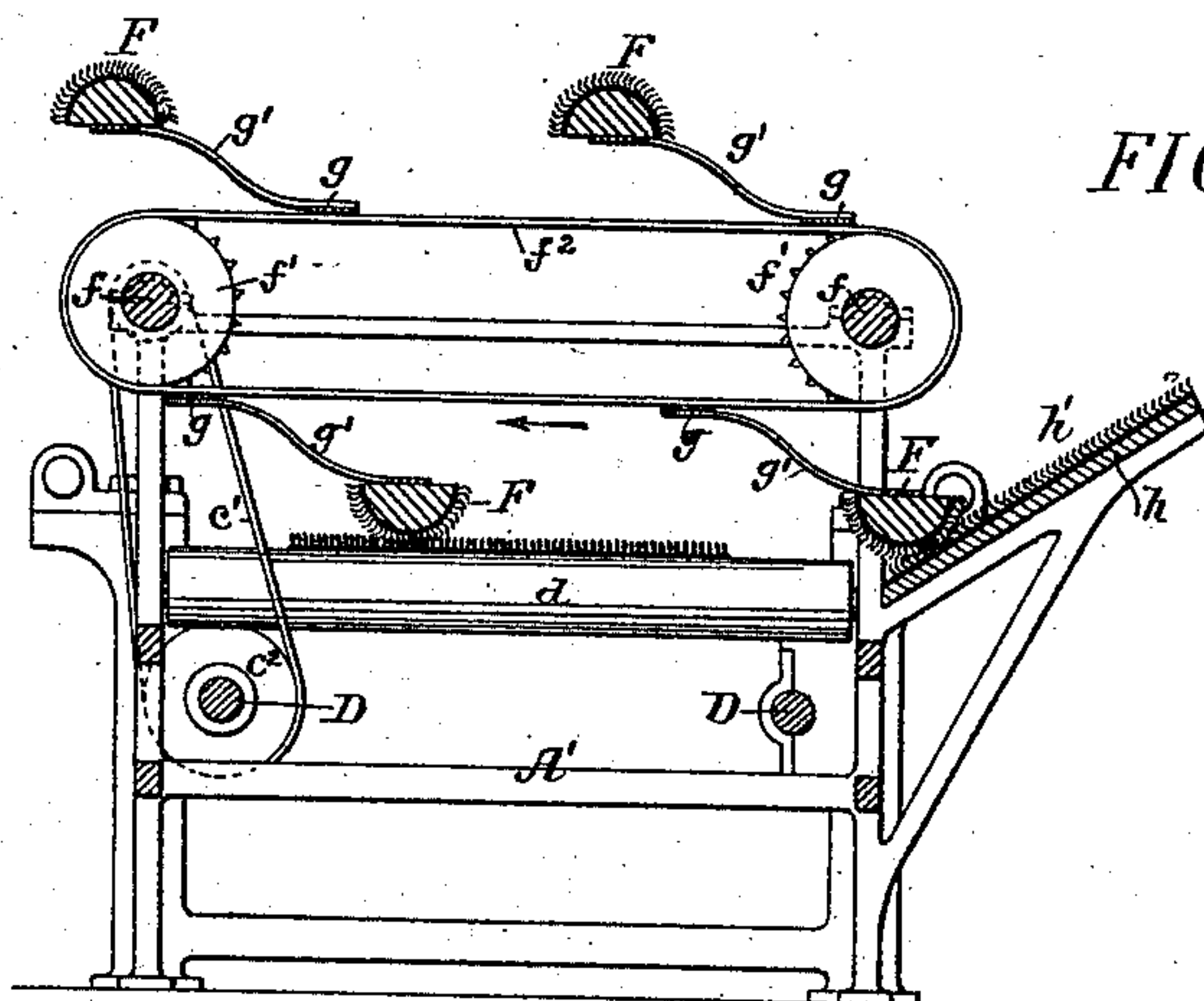


FIG. 3.

FIG. 4.

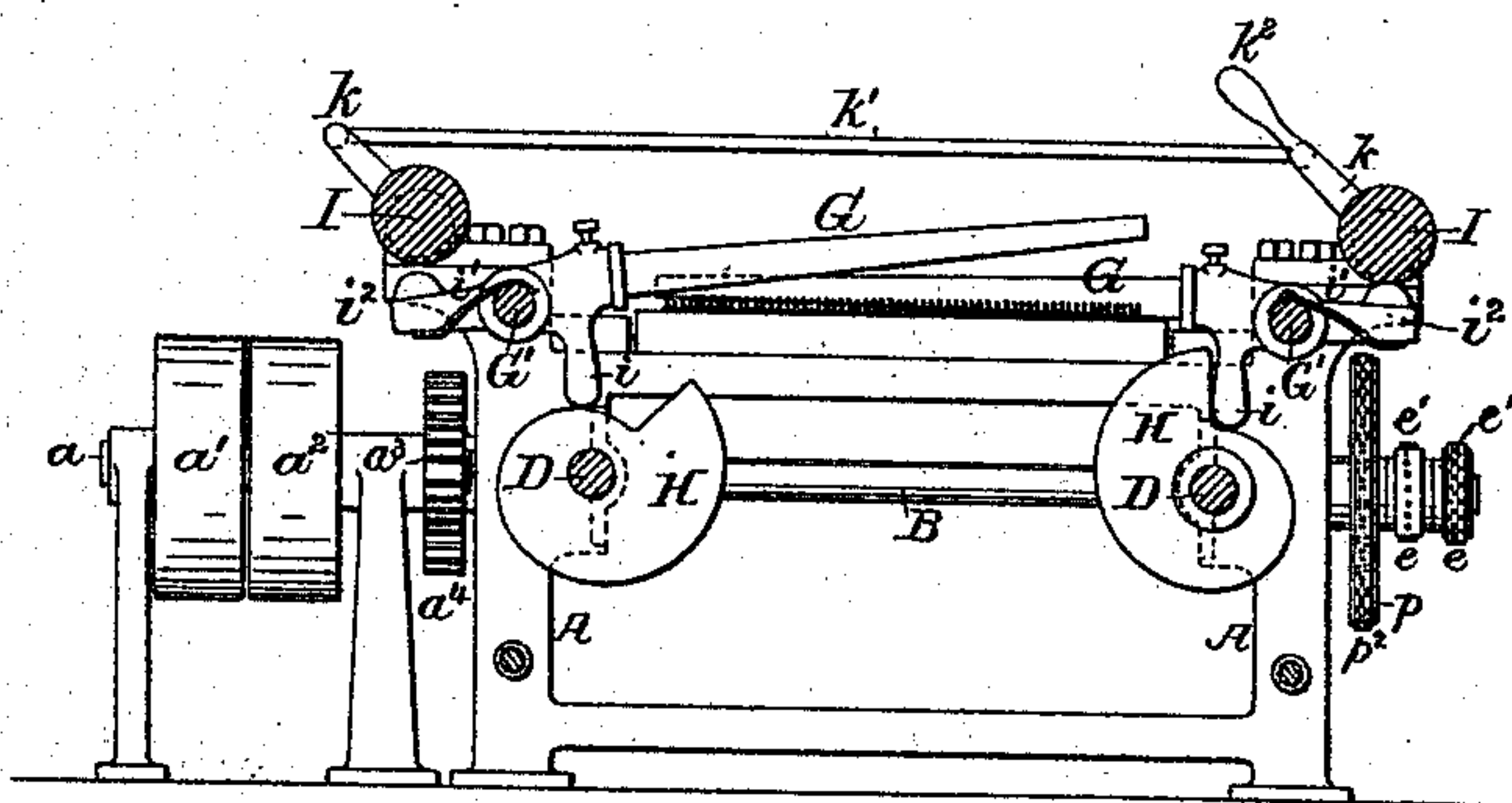
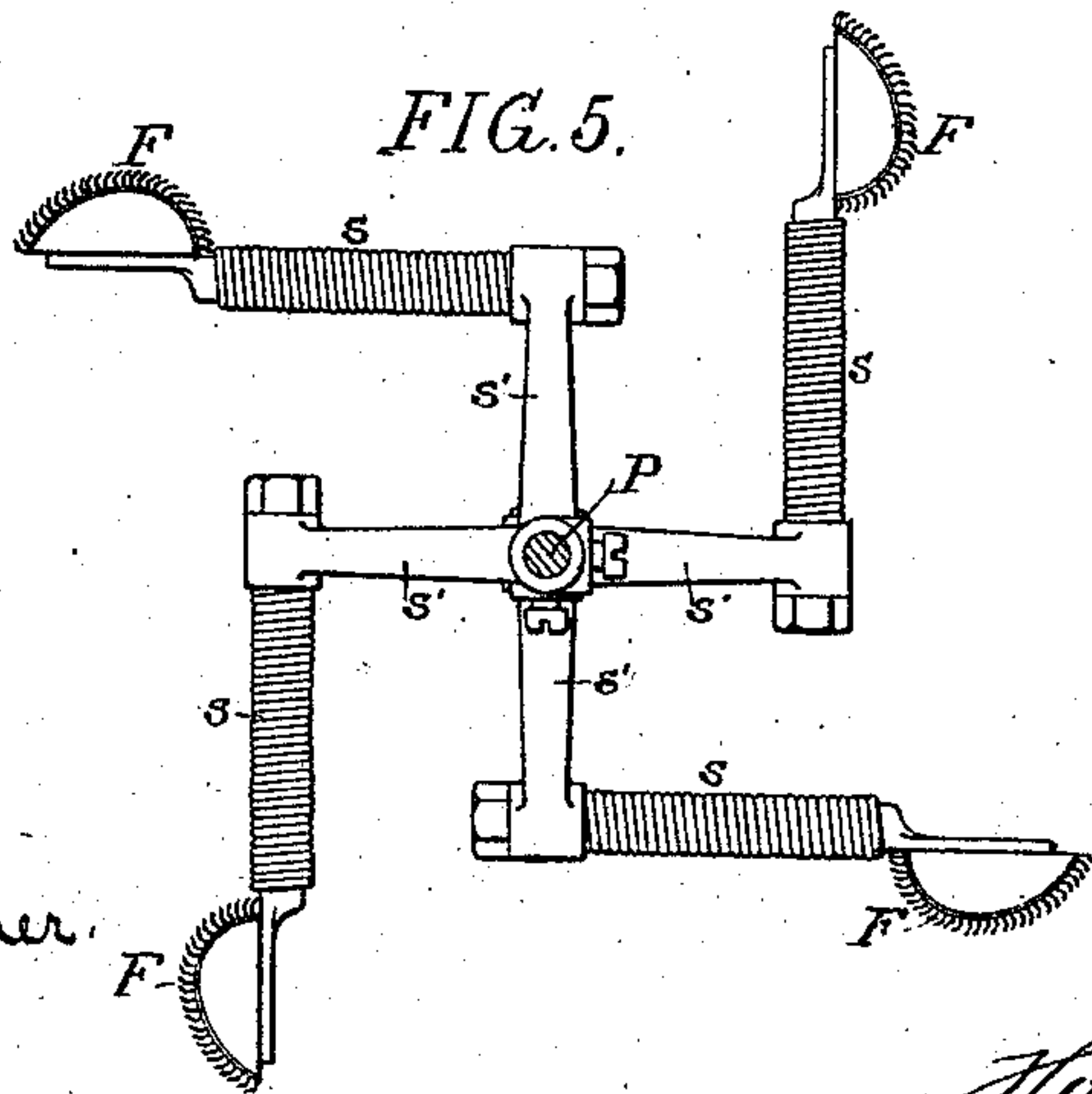


FIG. 5.



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UNITED STATES PATENT OFFICE.

JOHN BAER, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR BEATING AND COMBING CUT PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 412,450, dated October 8, 1889.

Application filed November 5, 1888. Serial No. 289,984. (No model.)

To all whom it may concern:

Be it known that I, JOHN BAER, a subject of the Emperor of Germany, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Beating and Combing Cut Pile Fabrics, of which the following is a specification.

The object of my invention is to construct a machine for combing and beating plush or other cut pile fabrics to raise the nap or pile thereon; and this object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section, partly in elevation, of a machine constructed in accordance with my invention. Fig. 2 is a plan of the same with part of the machine removed to more clearly illustrate the parts beneath. Fig. 3 is an elevation and a transverse section of the machine on the line 1 2, Fig. 1. Fig. 4 is an elevation and a transverse section on the line 3 4, Fig. 1; and Fig. 5 is a view illustrating a modification of part of the invention.

It may be stated at the outset that the machine has been devised mainly for treating cut pile fabrics—such as plushes—after they are dyed and before drying, the object being to raise the nap or pile by combing and beating the fabric while it is in a wet or damp condition, these operations being now generally performed by hand.

A represents the frame-work of the machine, to suitable bearings in which is adapted a driving-shaft a , having fast and loose pulleys a^1 a^2 for the reception of a driving-belt, this shaft being geared by spur-wheels a^3 a^4 to a transverse shaft B, which is geared by bevel-wheels b b' to counter-shafts D—one at each side of the machine.

At one end of the machine is a delivery-roll E, covered with card-clothing or having its surface otherwise toothed or roughened, and at the other end of the frame is a draft-roll E', having a similar surface, so that the strip x of plush or other cut pile fabric will be drawn forward through the machine, suitable rolls d serving to support and guide the fabric in its passage. The shafts of the rolls E E' have pulleys e , which are driven by belts e' from pulleys on the transverse shaft B, the proportions of these pulleys being such that

the roll E' will have a slightly greater surface speed than the roll E, so as to maintain the fabric constantly under tension during its passage through the machine. The fabric in its passage is subjected first to a transverse or crosswise combing, then to the action of vibrating beaters, and finally to a longitudinal or lengthwise combing. For performing the first of these operations—that is, the combing of the pile of the fabric crosswise of the strip—a transverse frame A' is located adjacent to the delivery-roll E, and this frame has bearings for opposite shafts f , carrying sprocket-wheels f' , these sprocket-wheels or drums being connected by chain belts f^2 , on which are cross-bars g , and projecting from the latter are elastic stems or shanks g' , carrying at their outer ends the combs F, the latter being preferably convex on the surface and covered with card-clothing or like toothed material. The shaft f at one end of the frame A' has a pulley c , driven by a belt c' from a pulley c^2 on one of the counter-shafts D of the machine, so that the combs F are drawn in succession across the face of the fabric, the pile of which is thus subjected to a combing action in a direction transversely to the length of the strip of fabric, the yielding or elastic shanks g' of the combs causing the latter to act upon the fabric in substantially the same manner as the hand-combs now used for that purpose. At one side of the frame A' is an inclined table or bench h , having a toothed surface h' , over which the combs F are drawn before they act upon the fabric, thus removing from said combs any strands or fibers that may be caught in the same, and thus maintaining the combs in proper acting condition. The beating of the fabric after it has been subjected to the transverse or crosswise combing action just described is effected by bars G, which are hung upon shafts G' at opposite sides of the machine and have projecting toes i , acted upon by cams H, secured to the opposite counter-shafts D, the cams serving to lift the bars, and springs i' serving to depress the same and bring them into contact with the fabric after the toes i are released from the action of the cams, which are preferably so arranged upon the shafts that the bars act successively from one end of the set

to the other. Each bar has a rearwardly-projecting heel i^2 , and above the outer ends of these heels is mounted an adjustable stop, by which the rise of the heel, and consequently the descent of the beating-bar, may be restricted and the force of the blow delivered by the beater thereby regulated, it being understood that each of the beater-bars has a certain amount of elasticity, so that it will strike the fabric even although the movement of the bar permitted by the stop would not be sufficient to bring the bar into contact with the fabric if said bar were rigid. The stops in the present instance are cams I, each consisting of a bar mounted eccentrically in suitable bearings on the frame A, the shaft of each bar being provided at one end with an arm k , the arms of the opposite shafts being connected by a rod k' , and one arm being provided with a handle k^2 , so that by manipulating this handle the opposite bars I may be simultaneously adjusted so as to regulate the movement of the beater-bars, or so as to lift them free from the fabric altogether when it is desired to intermit the action of the beater-bars upon the fabric. If it is not considered necessary to operate or regulate the beater-bars independently, they may be secured to the shafts G' , in which case but one of the bars of each shaft need have a toe to be acted on by a lifting-cam and a heel for contact with the stop.

Beyond the beaters the frame A of the machine has bearings for the shafts of drums J, which have sprocket-teeth engaging with chain belts m , the latter having cross-bars n , carrying the spring-shanks n' of combs K, similar to the combs F, and serving to comb the pile of the fabric in the direction of the length of the strip, the shaft of one of the drums J being driven from the transverse shaft B through the medium of pulleys p p' and belt p^2 , so that the combs K travel over the surface of the fabric in a direction contrary to the direction of movement of the fabric itself. Above the drums J is an inclined table or plate L, toothed on the under surface and occupying such relation to the belts m and the combs K, carried thereby, that said combs will be drawn along the toothed surface of the plate, and will be cleaned thereby in the same manner as the combs F are cleaned by the toothed surface of the plate h . It will be observed on reference to Fig. 2 that the width of each comb K is but a fraction of the entire width of the fabric, so that the successively-acting combs act upon different and preferably upon adjacent lateral portions of the strip of fabric, this being found to be the most effective method of operation, and one which, moreover, reduces the power necessary to drive the machine as compared with what would be required if combs of the full width of the strip of fabric were employed. In order to insure a comparatively long travel of each comb over the face of the fabric passing beneath the same, and yet pre-

vent that strain or pressure upon the comb which would be caused if the spring-shanks n' were carried around the rear drum J while the comb was still in contact with the fabric, I place between the drums J J a bearing or directing roller M, which serves to cause the belts m to take a substantially horizontal course for a considerable distance after leaving the forward drum J, and yet permits the upward deflection of the rear portions of the belts, so that the ends of the shanks gradually rise on a gentle incline and each comb K is free from contact with the face of the fabric before the shanks carrying said comb reach the rear drum J.

Although it is preferable in carrying out my invention to use traversing belts as a means of carrying the combs, this is not absolutely essential to my invention. For instance, in Fig. 5 I have shown a modified form of the device in which the flexible shanks or stems s of the combs are secured to arms s' , projecting from a shaft P, the flexible shanks in this case being represented as formed by coiled springs. The arms in this case are so arranged upon the shaft as to cause the successive action of the combs of the series in the same manner as when the combs are mounted upon belts, as originally described.

The machine constructed in the manner set forth is adapted for acting upon other classes of cut pile fabrics besides plushes and velvets, although, as before stated, it has been designed especially for treating the latter class of goods and intended to supplant the hand treatment now considered necessary.

It should be understood that my invention is entirely distinct from that class of machines in which a strip of fabric is traversed in contact with the toothed surface of a rotating drum, it being essential to the proper carrying out of my invention that the toothed combs should be drawn along the surface of the fabric for a considerable distance while in position to exercise a combing effect upon the pile of the fabric.

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

1. The combination of mechanism for supporting and traversing the strip of fabric with two sets of combs, mechanism for traversing one set of combs crosswise of the fabric and the other set lengthwise of the same, a set of beaters, and means for operating the same, said set of beaters being located between the two sets of combs, whereby the final action upon the fabric is that of one of the sets of combs, substantially as specified.

2. The combination of means for supporting and traversing the strip of fabric with a belt or equivalent carrier, means for operating the same, and a toothed comb supported on said carrier by means of a spring stem or shank, substantially as specified.

3. The combination of means for supporting and traversing the fabric, a belt or equivalent

lent carrier, means for operating the same, and combs supported on said carrier by means of spring stems or shanks, said combs having toothed convex faces for acting on the fabric, substantially as specified.

5 4. The combination of means for supporting and traversing the fabric, a belt or equivalent comb-carrier, means for operating the same, combs having spring stems or shanks
10 connected to said carrier, and a toothed plate or table with which the combs are brought into contact in their passage, substantially as specified.

15 5. The combination of means for supporting and traversing the strip of fabric, belts

having spring stems or shanks carrying combs for acting upon the fabric, opposite drums for carrying said belts, means for operating the belts, and a directing-roll located between the drums and in a lower plane than the rear drum, whereby the belts will rise at an angle from the fabric on approaching said rear drum, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN BAER.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.