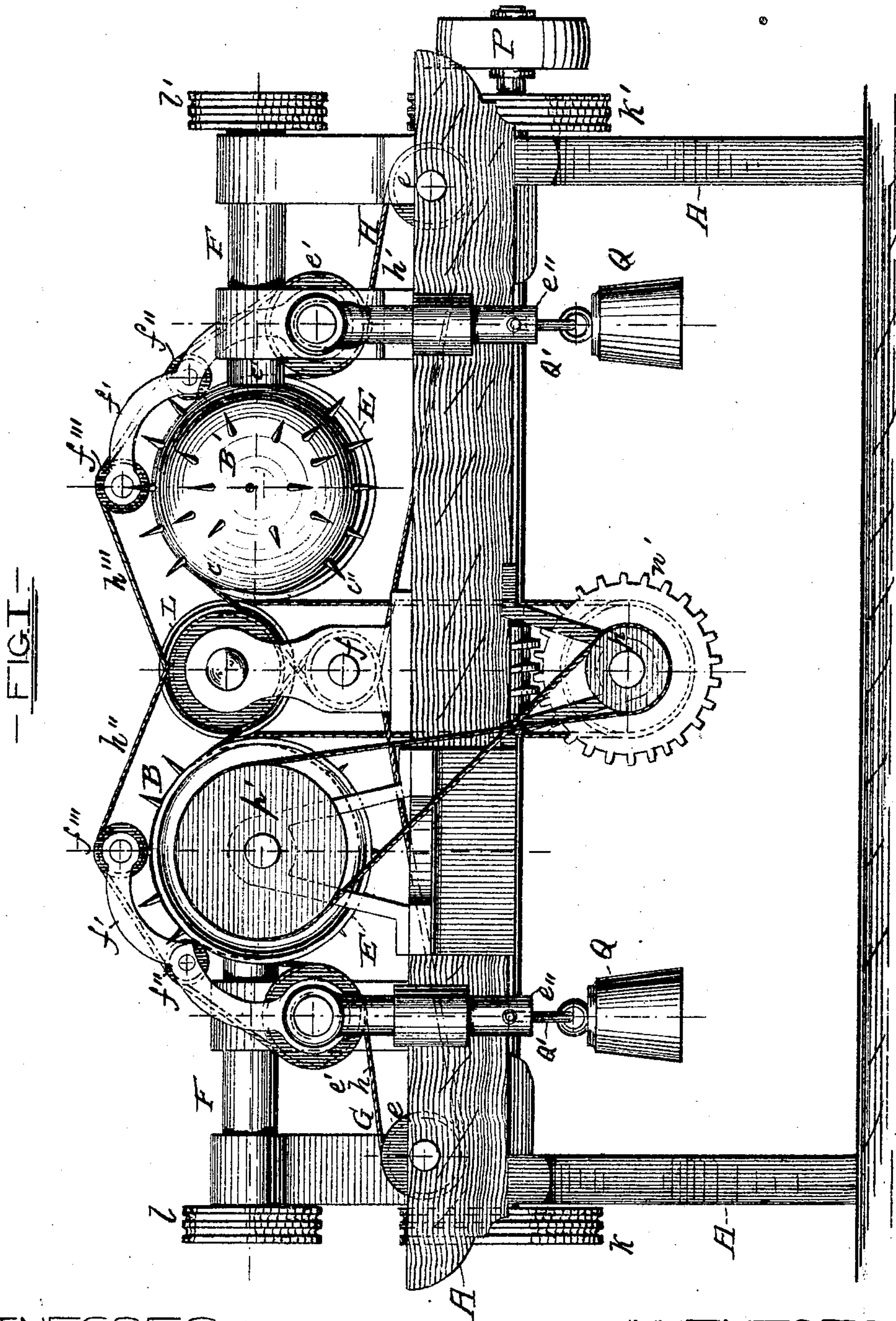


LANNAY & WEBB.

Improvement in Hackling Machines.

No. 124,497.

Patented March 12, 1872.



WITNESSES:

Wm. Gardner
John P. Greene

INVENTORS:

Louis F. Lannay and James Webb
by Geo. H. Howard, their atty

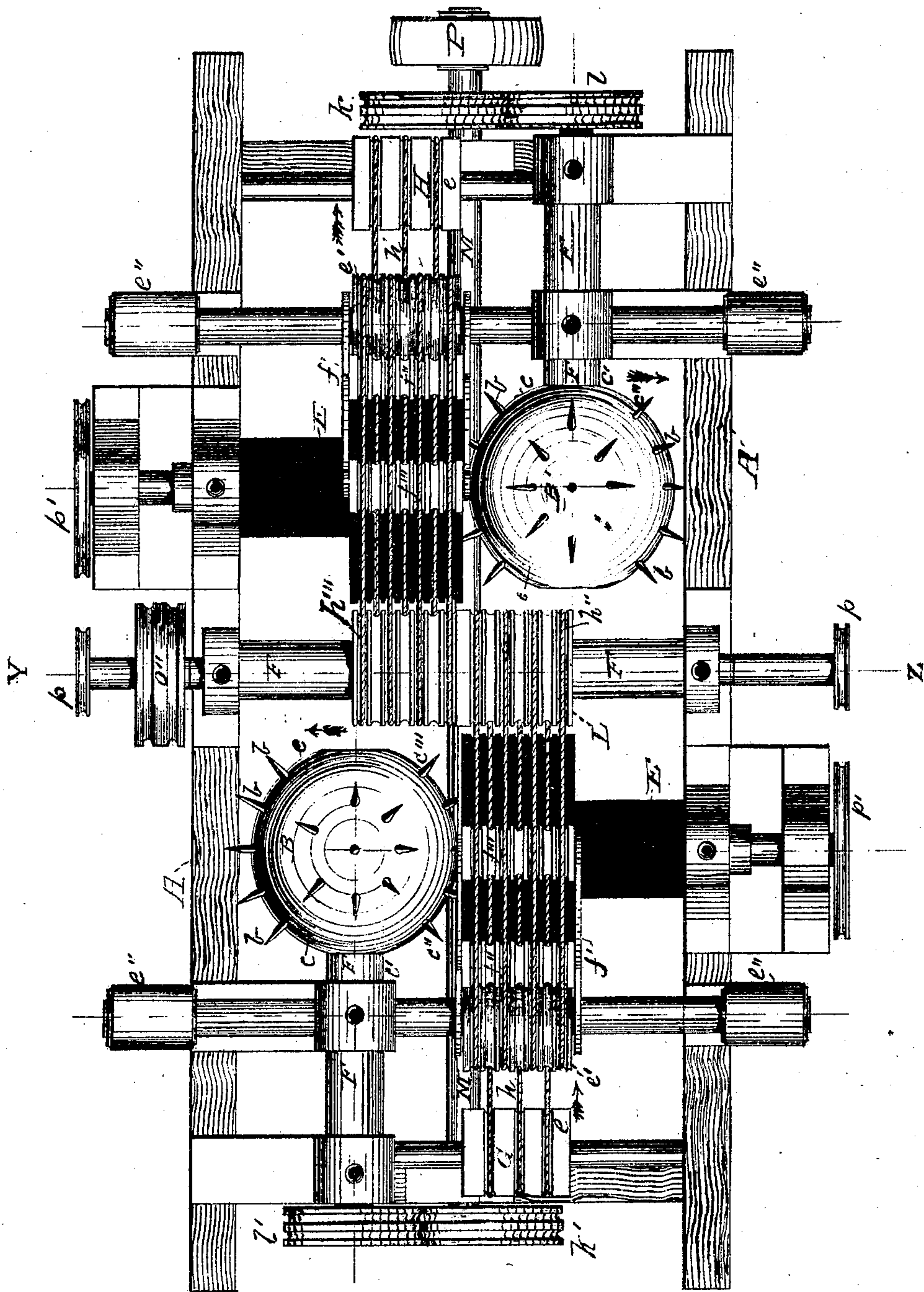
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—FIG. II.—

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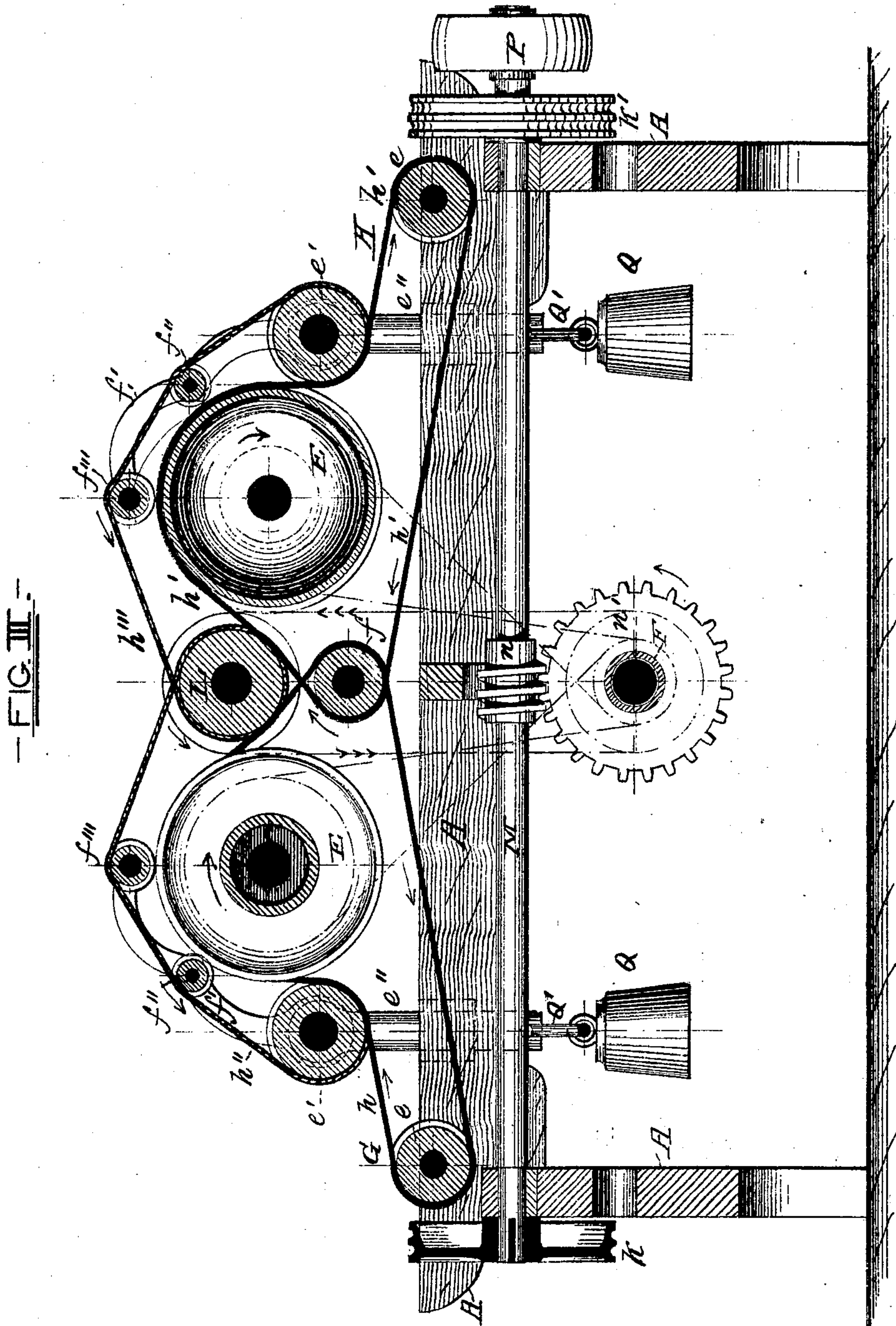
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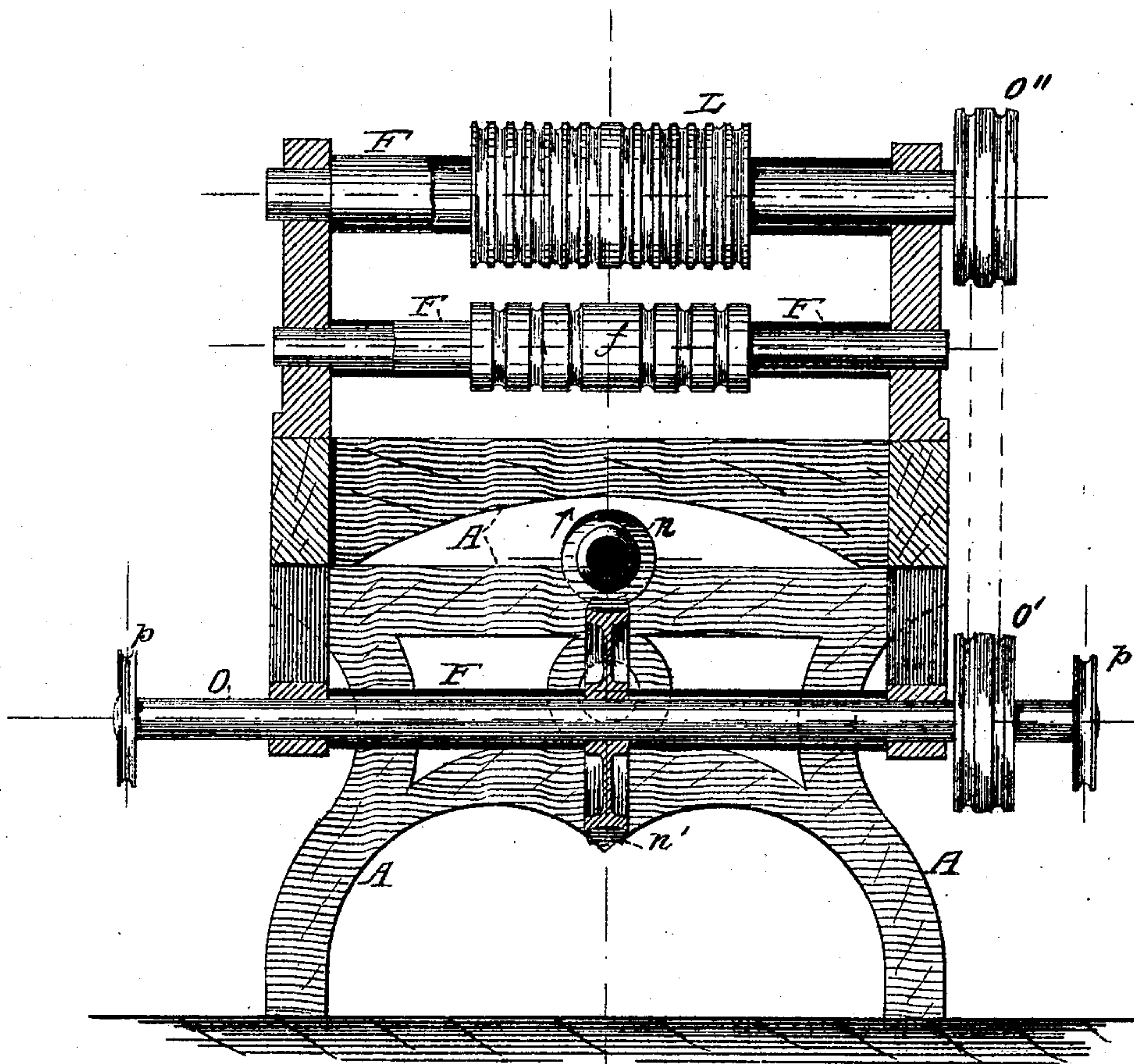
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--FIG. IV.--



WITNESSES--

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UNITED STATES PATENT OFFICE.

LOUIS F. LANNAY AND JAMES WEBB, OF BALTIMORE COUNTY, MARYLAND.

IMPROVEMENT IN HACKLING-MACHINES.

Specification forming part of Letters Patent No. 124,497, dated March 12, 1872.

To all whom it may concern:

Be it known that we, LOUIS F. LANNAY and JAMES WEBB, of the county of Baltimore and State of Maryland, have invented certain Improvements in Machinery for Hackling or Combing Tampico, Hemp, and other fibrous materials, of which the following is a specification; and we do hereby declare that the same is a full, clear, and exact description of our said invention, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Our invention relates to a machine for the purposes above designated, consisting of two spherical combs, with their attachments and uses, which are intended, by the relative positions which they occupy with reference to each other, to comb the entire length of the fibers brought into contact with them. This result we accomplish by combining with the operating mechanism of the combs a compound system of endless feeding and conveying cords, which are conducted over a series of corrugated rollers or pulleys. These feeding and conveying cords are so arranged that they are brought into contact with and grasp the material to be combed, and move in the same direction to the end of the series. Only one-half of the length of the fibrous material is combed by the first spherical comb, as the other half is, during that operation, held by the feeding-cords. When the material has been conveyed over and past the first spherical comb, the hold of the first series of the feeding-cords is relinquished, and the second series, moving in the same direction, now grasp the half of the material just combed, and bring the other half into contact with the second spherical comb. The whole length of the fiber is thus combed. The two spherical combs, running from the points at which the material is held during the operation of combing, revolve in opposite directions. The shafts to which the spherical combs are attached, and which revolve with them, as also all other shafts coming into contact with the material to be combed, are surrounded by stationary sleeves extending between their bearings. The object is to prevent the material from becoming entangled with and wrapping around the revolving shafts. In order that a sufficient tension may be maintained upon the series of feeding and conveying cords, certain

of the corrugated rollers or pulleys, over which they pass, are mounted upon shafts revolving in vertical movable bearings, and are held by weights to the required position, giving the desired tension to the feeding and conveying cords.

In the further description of our invention which follows, due reference must be had to the accompanying drawing, in which Figure 1 is a side elevation of our invention. Fig. 2 is a plan or top view of the same. Fig. 3 is a vertical longitudinal section upon line *x y* of Fig. 2. Fig. 4 is a vertical transverse section upon line *y z* of Fig. 2.

Similar letters of reference indicate similar parts of the invention.

A is the frame of the machine. B and B' are the spherical combs, of which *b* are the teeth. The bodies of the combs may be of wood or other material, and the teeth of steel or other suitable substance, firmly inserted within and projecting from their surfaces. We do not limit ourselves to either the number of these teeth or the manner of distributing them over the surface of the sphere; but, from experiment, we find it advisable to allow about one-fourth of the same upon each side of the center line, those parts marked *c* to remain plain and without teeth. Otherwise the angle, at which the tooth would stand in a position upon the surface of the sphere nearer to its axis *c'* than the point *c''*, would not be favorable for effectiveness.

To illustrate fully the operation of the feeding and conveying cords and gear, as acting in conjunction with the combs, it will be necessary to trace the material in its passage from the point of feeding G to the point H, where it eventually leaves the machine in a combed and finished condition. We will now suppose the machine to be in motion, the power being transmitted thereto by means of the pulley P upon the shaft M. Upon this shaft are two doubly-grooved pulleys, K and K', one being placed at each end of the shaft. The pulleys K and K' give motion to the pulleys *l* and *l'* in opposite directions. The latter pulleys are keyed to the driving-shafts of the spherical combs B and B', which are inclosed within the stationary sleeves F. The spherical combs B and B' are rapidly revolving in directions respectively indicated by the arrows, and the

feeding and conveying cords h and h' moving in a direction also similarly indicated. The manner of imparting motion to the entire system of feeding and conveying cords is as follows: The driving-power of the machine is transmitted through the shaft M , which revolves in the direction indicated. Midway of its length is secured a worm-pinion, n , gearing into the worm-wheel n' , which, moving with its shaft o , also inclosed in sleeves F , in the direction indicated, causes, by means of the doubly-grooved pulleys o' and o'' with their driving-cords, the rotating of the upper center roller L in the direction indicated by the arrow. At the extremities of the shaft o are grooved pulleys p , driving by cords other and larger ones p' upon the shafts of the large corrugated drums E . By referring to Fig. 3 it will be seen that the cords h and h' , passing over the drums E , pass also over the pulleys e under L , and return over f in the center. The pulleys e' are upon shafts having adjustable bearings e'' . Upon the same shafts are standards f' , having attached to them small corrugated guide-rollers f'' and f''' , over which the cords h'' and h''' move, and which, by passing over the drums E , return over the center roller L . By the operation of the weights Q , which hang upon rods Q' extending from one bearing, e'' , to the other, a certain tension is maintained upon the cords h'' and h''' . The material is placed upon the cords h at the point G , one-half of the length of its fibers extending over the sleeves of the shaft of the spherical comb B . The material is carried under the pulley e' between the cords h and h'' , moving in the direction indicated. By these it is carried over the first drum E , and that half of its length exposed to their contact combed by the teeth of the spherical comb B . Continuing on its course, it leaves comb B , and that half already combed is caught between the cords h' and h''' , and the uncombed half brought into contact with the teeth of the spherical comb B' . This half having been operated upon, the whole is now combed, and it is carried between the cords h' and h''' over the second drum E , under e' , to the point of its departure from the machine H . The drums E are hollow, their surfaces, which are presented to the spherical combs, being concave, and the teeth of the combs run within these concave surfaces of the drums, which greatly facilitates the combing process.

The particular merit in this machine, it is apparent from the foregoing description, is in that it does, by the one process, comb the entire length of the fibers of the material. The machine is never stopped during the combing

process, and by the separate systems of endless feeding and conveying cords an uninterrupted feeding to and conveying from the machine is maintained. By the spherical shape of the combs, the material brought into contact with them is instantly straightened out. Neither can any entanglement of the material ensue either with the teeth of the combs or with their shafts, because of the means adopted for its prevention hereinbefore described.

We may add that, having been for many years actively engaged in the hackling and combing of Tampico, hemp, and other like fibrous materials, and having tried various machines and devices for the accomplishment of the results sought to be gained by our invention, we find, from full, complete, and satisfactory experiment, that it produces every result we have desired to see effected.

Having thus described our invention, what we claim as new, and wish to secure by Letters Patent, is—

1. The spherical combs B and B' , with their teeth b upon their shafts, as constituent parts of a machine, operating substantially in the manner, in the positions, and for the purposes hereinbefore set forth and shown.
2. The sleeve F , in combination with the shafts of the spherical combs B and B' , for the purposes specified.
3. The lower center roller f co-operating, substantially in the manner set forth, with the pulleys e , drums E , the upper center roller L , the cords h h' and h'' h''' , and thereby producing the reciprocal feeding and conveying movement herein described.
4. The standard f' with the rollers f'' and f''' , substantially as herein described, for the purposes specified.
5. The standard f' , in combination with their shafts, the adjustable bearings e'' , weights Q , and rods Q' , the whole operating substantially as described, to produce a direct downward pull upon the cords h and h' , for the purposes specified.
6. The drums E , hollowed or with concave surfaces, admitting the teeth of the spherical combs B and B' to operate within them, substantially as described, for the purposes specified.

LOUIS F. LANNAY.
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