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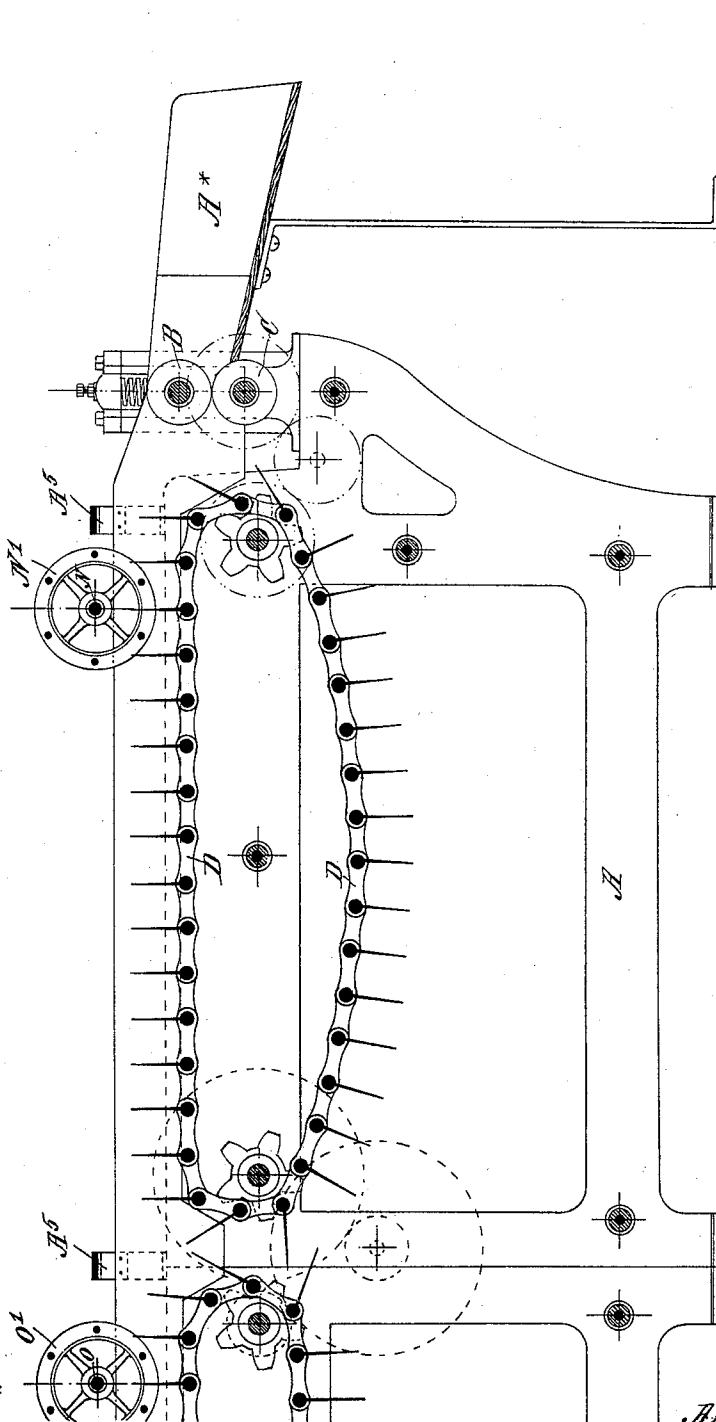
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A. MARSHALL.
HACKLING MACHINE.

No. 585,217.

Patented June 29, 1897.

Fig. 3.



Witnesses:
Henry T. Hirsch.
H. F. Boyle

Inventor:
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By James S. S. S. S.
Attorney.

(No Model.)

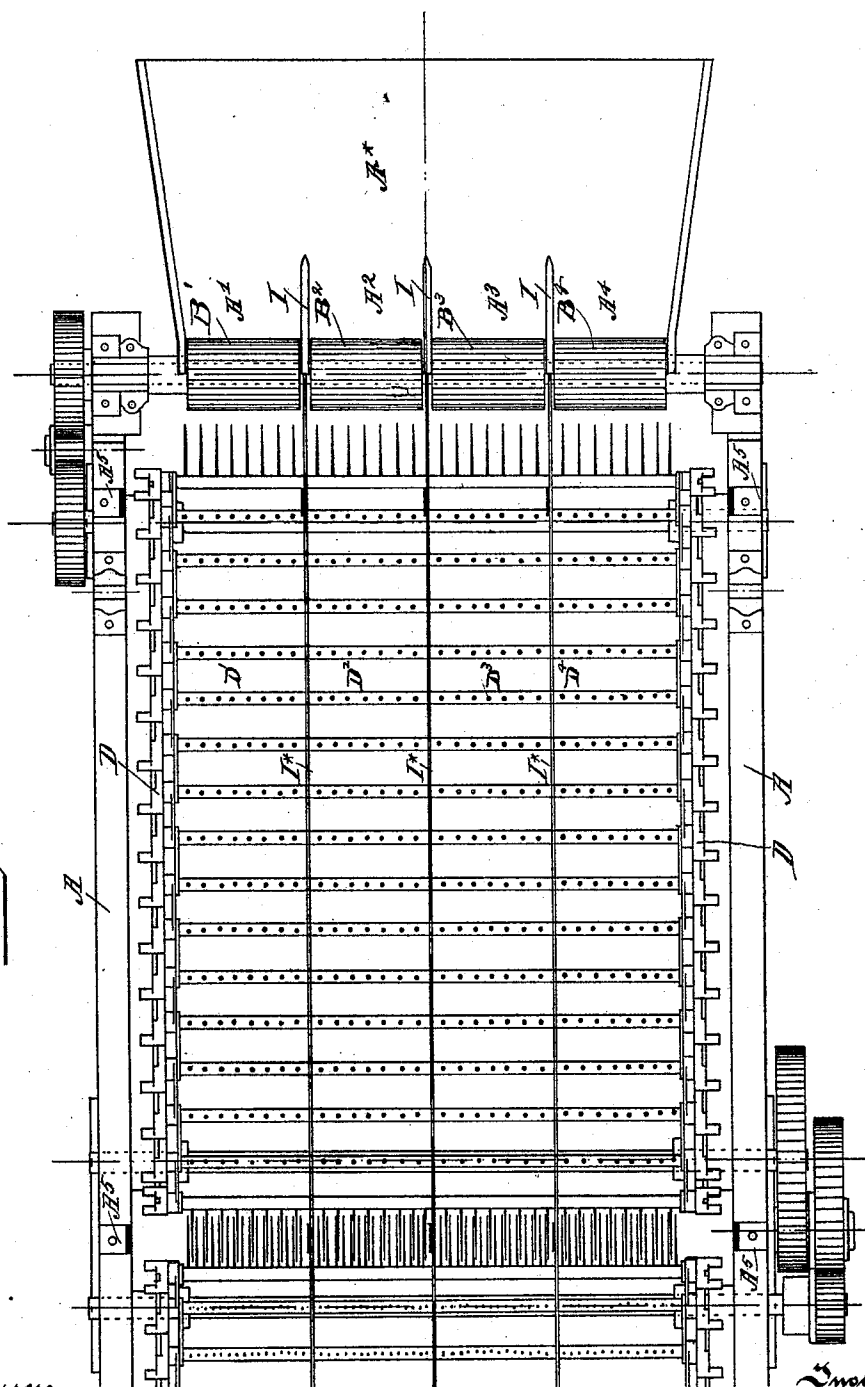
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Patented June 29, 1897.

Fig. 4.



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(No Model.)

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Fig. 5.

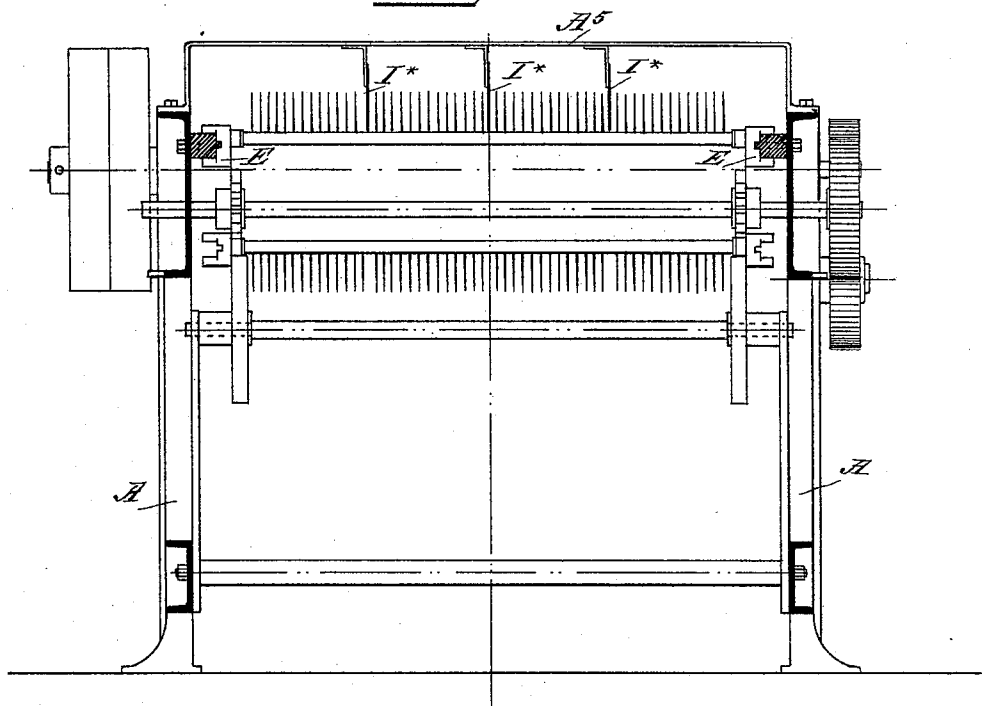
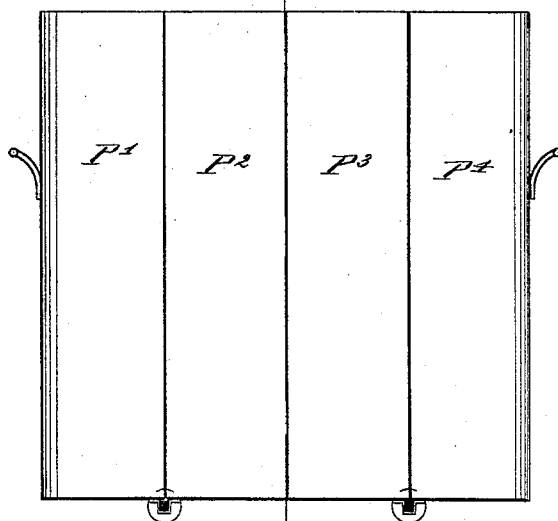


Fig. 8.



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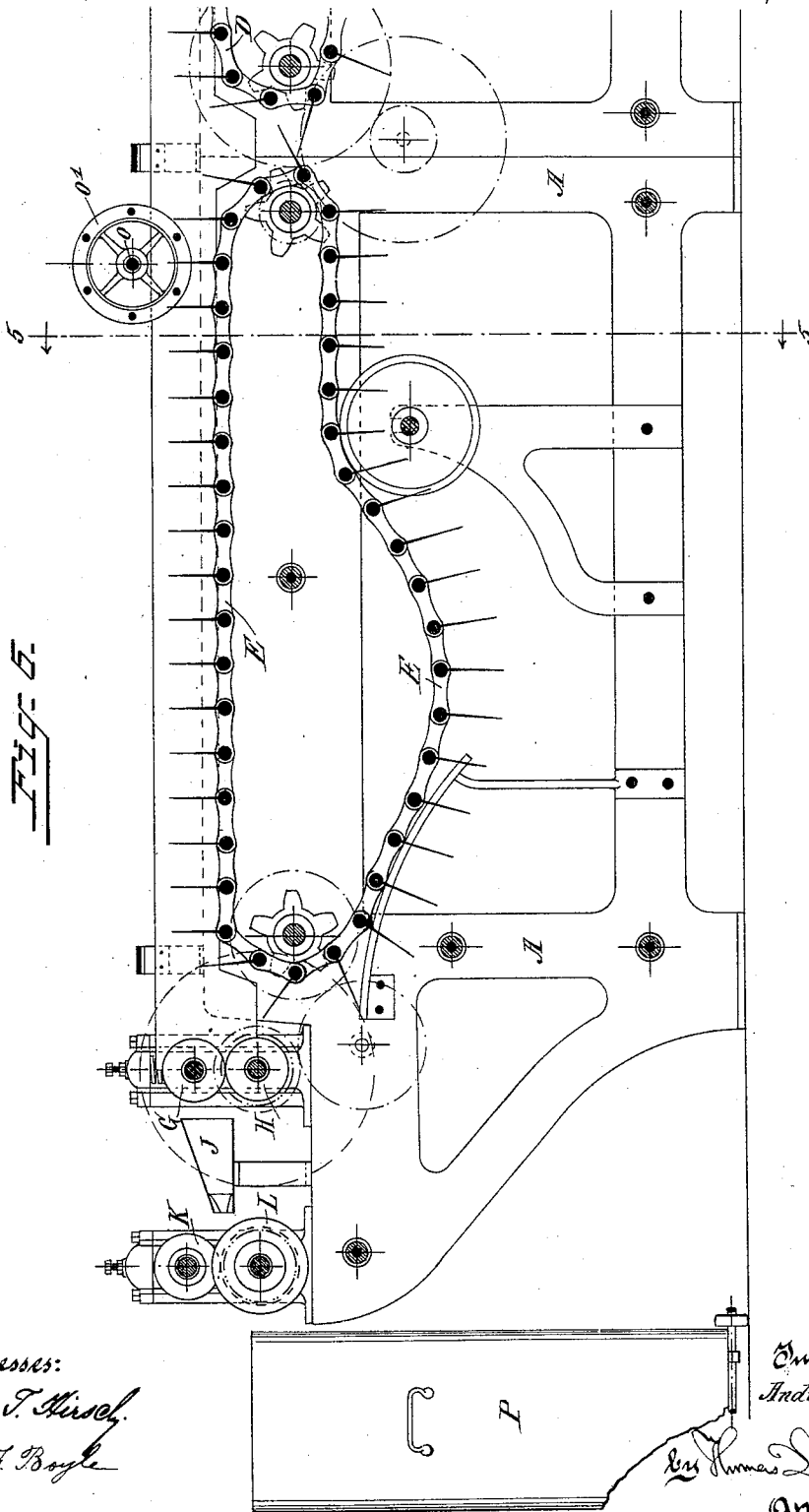
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A. MARSHALL.
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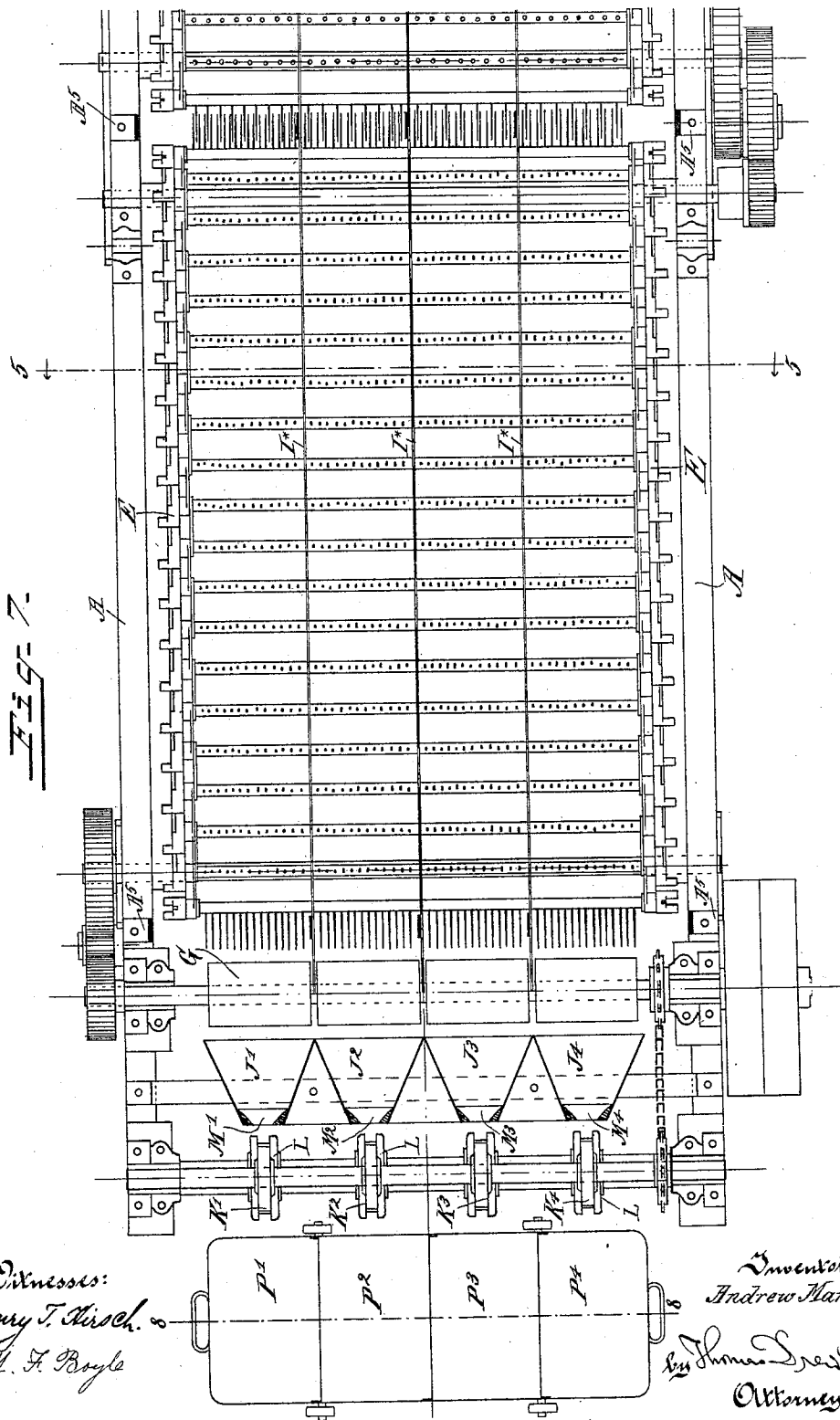
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A. MARSHALL.
HACKLING MACHINE.

No. 585,217.

Patented June 29, 1897.

Fig. 7.



UNITED STATES PATENT OFFICE.

ANDREW MARSHALL, OF BROOKLYN, NEW YORK.

HACKLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 585,217, dated June 29, 1897.

Application filed July 17, 1895. Serial No. 556,303. (No model.)

To all whom it may concern:

Be it known that I, ANDREW MARSHALL, cordage manufacturer, of Brooklyn, Kings county, in the State of New York, have invented a certain new and useful Improvement in Hackle-Machines, of which the following is a specification.

I have discovered that it is practicable to carry a series of layers of fiber side by side through the machine on hackle-bars of sufficient length to extend across under the whole, dividing the hackle-teeth or gill-bars into a corresponding number of series, keeping the several quantities of fiber separate and distinct throughout the whole of a passage through the machine, and delivering each quantity in a separate sliver independently through separate condensing apparatus. I have devised means for attaining this and for storing the several quantities in partitioned cans independently, allowing the fiber to be drawn out from each again independently in the same manner as the single sliver is drawn out from the ordinary single can or coil.

The improved machine may be used to treat any long fiber—as hemp, manila, &c.—from any locality and having any ordinary qualities. I have contemplated more especially the treatment of sisal as it comes from Central American districts in bales.

The material may be fed into my machine in the same manner as into ordinary machines, except that instead of feeding the machine with a single continuous breadth of fiber it is fed in as a number of separate breadths, according as the hackles are divided. I prefer four such independent breadths.

I employ thin partitions arranged to maintain the complete isolation of each quantity from the adjacent quantity as they travel along through the machine.

My partitioned box or can is mounted on wheels and divided into a number of compartments corresponding to the number of slivers delivered from each machine. I will describe the invention as producing four separate slivers and the receiving-can as divided into four compartments.

The accompanying drawings form a part of this specification and represent what I

consider the best means of carrying out the invention.

Figure 1 is an outline longitudinal section of the entire machine. Fig. 2 is a plan view with certain portions removed. Figs. 3 to 7, inclusive, are on a larger scale. Fig. 3 is a central longitudinal section of a portion of the machine, showing the first chain of hackles, and Fig. 4 a corresponding plan view. Fig. 5 is a cross-section on the line 5 5, seen from the right in Figs. 1, 6, and 7, with the feed mechanism removed. Fig. 6 is a central longitudinal section of a portion of the machine, showing the second chain of hackles; and Fig. 7, a corresponding plan view with certain top parts removed. Fig. 8 is a section on the line 8 8 in Fig. 7.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is a frame, of cast-iron or other suitable material, which may correspond in its general characteristics with the framing adapted to support the ordinary hackle, but wider. The inner face on each side is equipped with longitudinal guide grooves and ridges which receive the projections from the several hackles or gill-bars and compel them to hold such positions that the teeth shall be presented upward while they are making their horizontal travel in the upper part of their several courses and shall be approximately upright during the periods of rising and sinking, all in the ordinary long-approved manner.

A^x is a feed-table arranged to receive the fibers. It is divided by partitions into four divisions A' A² A³ A⁴, each of which, it will be understood, is supplied independently by hand or otherwise with the material to be treated.

The feed-rollers are in four short lengths B' B² B³ B⁴, with a corresponding lower roller under each, turned with the proper slow motion by means of the shafts B and C, on which they are set.

D are the first series of hackle-bars or gill-bars, sometimes denominated the "first chain." They are linked together and are traversed around in the proper path with the same velocity as the surfaces of the feed-rollers. These are longer than the ordinary gill-bars, and the teeth or gill-pins are divided

into series D' D² D³ D⁴, with a little space between each series and the next, these spaces separating the several quantities of fiber which are being carried through the machine.

5 E are the several hackle-bars of the second chain. These are linked together and traversed around with the much higher speed proper for the second chain. The teeth of these bars are also divided into four separate
10 sets or series E' E² E³ E⁴, separated by spaces.

I provide delivering-rolls, serving also as drawing-rolls, running with a surface speed somewhat greater than the second chain. They are divided into four lengths G' G², &c.,
15 each with a corresponding roll H' H² below and each length receiving one breadth of the material M.

I^x I^x are upright longitudinal partitions held up by cross-frames A⁵, so as to insure
20 the complete division of the several quantities of fiber. Each partition I^x matches to a corresponding partition I on the feed-table A^x and constitutes a continuation thereof extending nearly or quite the whole length of
25 the machine.

J' J² J³ J⁴ are conoidal guides which receive the several quantities of fiber and reduce the breadth of each.

30 K' K², &c., are condensing-rolls which have the same surface speed as the delivery and drawing rolls G' H', &c. These condensing-rolls K are each narrow, as shown, and match between flanges in the condensing-rolls L, of which there are a corresponding number
35 mounted on a single shaft below. (See Figs. 1 and 6.) These condensing-rolls receive the several quantities of fiber as they issue from the trumpet-mouths or condensing-guides J' J², &c., and the several quantities are delivered
40 in the form of properly-compressed and distinct slivers and are stored each in its corresponding separate compartment of the divided can P' P², &c. I propose that the material shall be fed in at such rate that the layers
45 of fiber on the hackle or gill bars shall be thinner than usual, in consequence of which the machine will run with less strain on the teeth and it may be run safely at a higher velocity than ordinary.

50 N' N² N³ N⁴, Figs. 1 and 2, are top rolls or reels corresponding in breadth to the several quantities of fiber passing through the machine and mounted on a single shaft N in the positions represented. They press down the
55 several quantities of fiber carried on the first chain of gill-pin bars and contribute to make the layers uniformly dense. The partitions I^x are received in the narrow spaces between these several short lengths of top rolls.

60 O' O² O³ O⁴ are a second set of top rolls or reels mounted in the position represented over the second chain and perform a function for the second chain corresponding to that performed by the first set of top rolls or reels for
65 the first chain.

The mounting of the second set of reels over the first part of the quick chain has the ob-

vious effect to press down the material gently on that chain and prevent it from rising above
70 the tops of the gill-pins and has the further effect to increase the tension or pull of the second chain. Ordinarily a fiber moves more than half its length off of the slow chain and onto the quick chain before the friction of
75 the quick chain and of the accompanying quick-running fibers with which the forward end of the fiber thus conditioned is environed will overcome the friction of the gill-pins and of the slow-going fibers with which its rear
80 end remains associated and induce it to move forward at the rate of the quick chain, and thus draw the rear end away from the slow chain and thereby straighten the rear end. In my invention the gentle weight of the reel
85 O increases the tensile pull due to the quick chain, and there being no corresponding reel on the last part of the slow chain the fiber changes its rate of travel earlier than it otherwise would. It assumes that rate due to the
90 quick chain so soon as half or before half its length has been transferred from the slow onto the quick chain. The effect is to make the action more uniform.

The sisal or other material is carried
95 through the machine in the same manner as through an ordinary machine of this class, except that the material is worked in separate quantities running parallel to each other
100 thinner than usual and all treated by one set of driving mechanism. It will be seen that only one set of hackle-bars and one set of driving mechanism are required for the entire breadth of my machine and for the four quantities of material treated simultaneously. This involves a corresponding
105 reduction in the cost and in the power. My invention attains the production of four slivers or other desired number greater than one with economy of weight and cost of machine, economy of power in driving it,
110 economy of labor in attending, and economy of wear and tear of the mechanism.

In the first treatment the sisal may be taken directly from the bale, the repeated thin
115 layers in which it is worked in the parallel traverses through my machine causing the irregularities to be of little effect. In each subsequent treatment any desired number of slivers from the first treatment, four or whatever the number stored in one partitioned
120 box being usually most convenient, may be fed through each compartment of the feed-table. Three drawings will, with sisal of ordinary quality in good condition, be sufficient in place of the six drawings usually
125 given, saving largely in the number of machines and in time required for treatment of any given quantity of stock.

I can vary the width of the machine and of the several spaces for the separate quantities of material fed through and can vary
130 the number of parts into which the material is divided.

I claim as my invention—

1. In a machine for spreading and drawing fiber, the upper and lower feed-rolls, each divided into independent companion pairs of feeders, delivery-rolls correspondingly arranged, in combination with continuous transverse gill-bars carried by an endless traveling support and having the gill-pins in parallel longitudinal groups with intermediate spaces, partitions I^x extending into the latter, together with a general feed-table having contiguous to the pairs of feed-rolls partitions I entering between each pair of upper and lower rolls, and in longitudinal alinement with the partitions I^x, and a box or can having corresponding partitions to form independent compartments, for receiving the several slivers, and separately storing them, substantially as set forth. 25
2. In a machine for spreading and drawing fiber, the upper and lower feed-rolls, each divided into independent companion pairs of feeders, delivery-rolls correspondingly arranged, in combination with continuous transverse gill-bars carried by an endless traveling support and having the gill-pins in parallel longitudinal groups with intermediate spaces, partitions I^x extending into the latter, together with a general feed-table having contiguous to the pairs of feed-rolls partitions I entering between each pair of upper and lower rolls, and in longitudinal alinement with the partitions I^x, and a box or can having corresponding partitions to form independent compartments, for receiving the several slivers, and separately storing them, substantially as set forth. 30
- In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses. 35

ANDREW ^{his} X MARSHALL.
mark

Witnesses:

ANDREW MARSHALL MCCARTHY,
P. J. EISEMANN.