

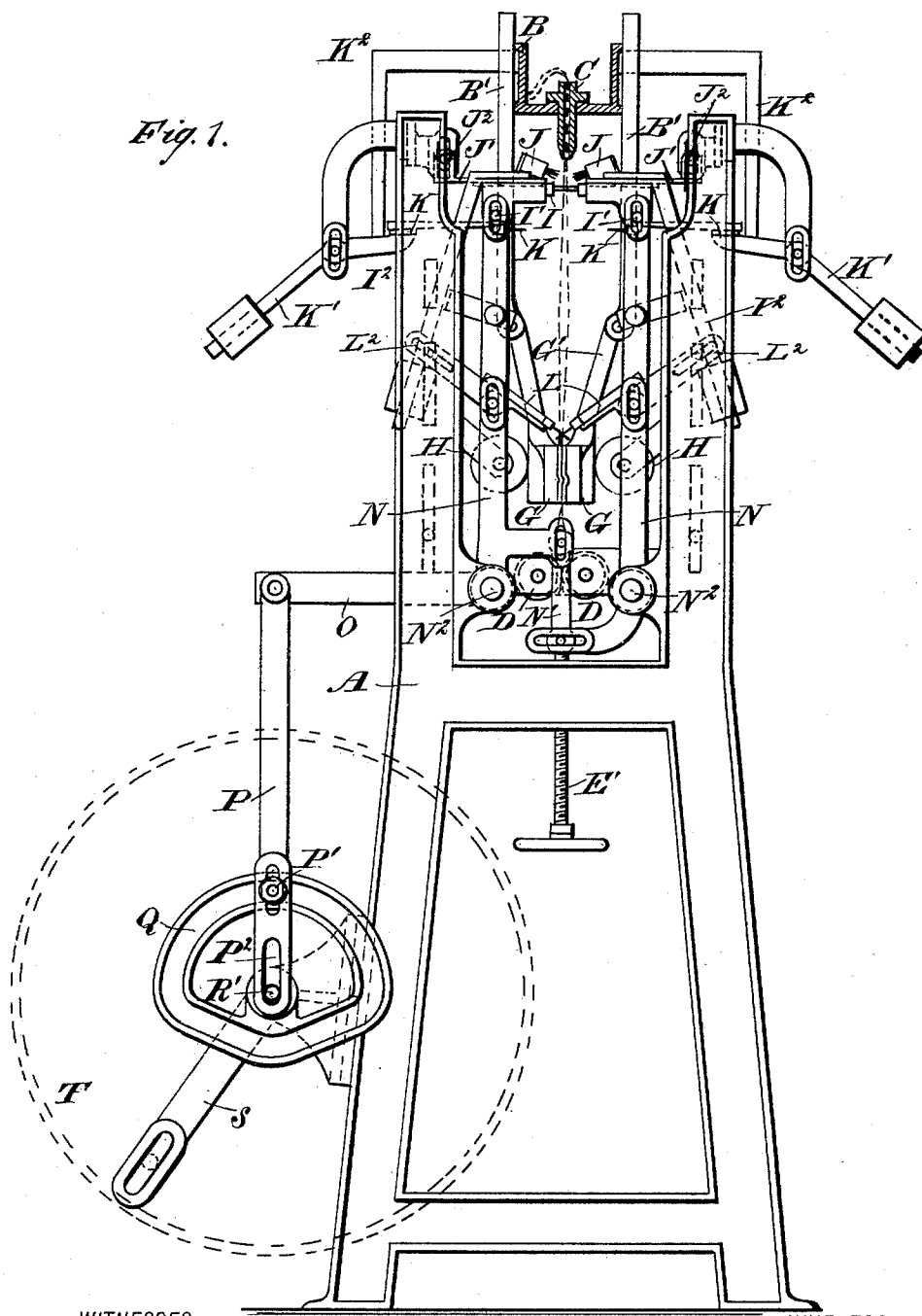
(No Model.)

4 Sheets—Sheet 1.

J. ERSKINE.
MACHINE FOR HACKLING FLAX, &c.

No. 468,194.

Patented Feb. 2, 1892.



WITNESSES:
Dom Twitchell
Co. Sedgwick

INVENTOR:
J. Erskine
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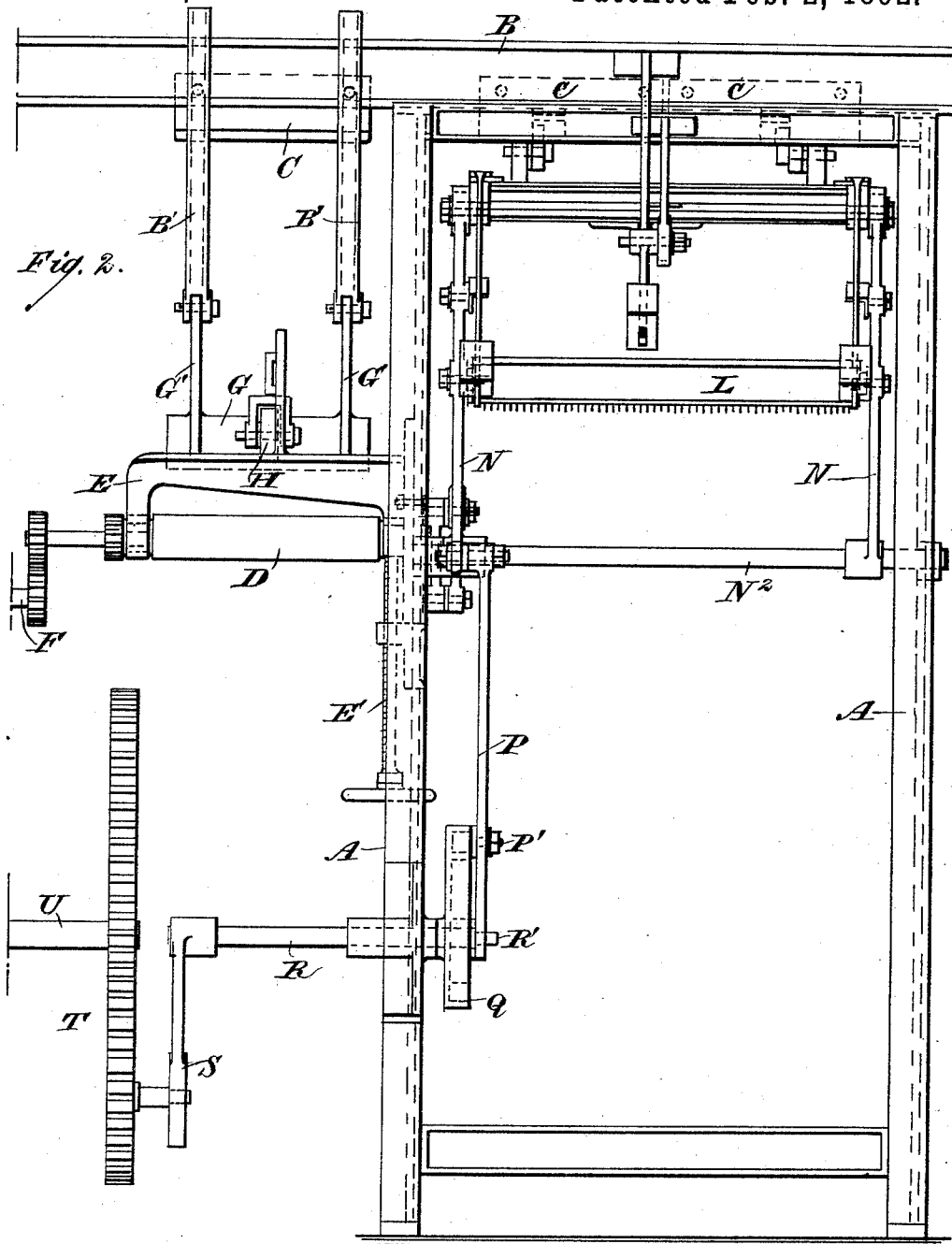
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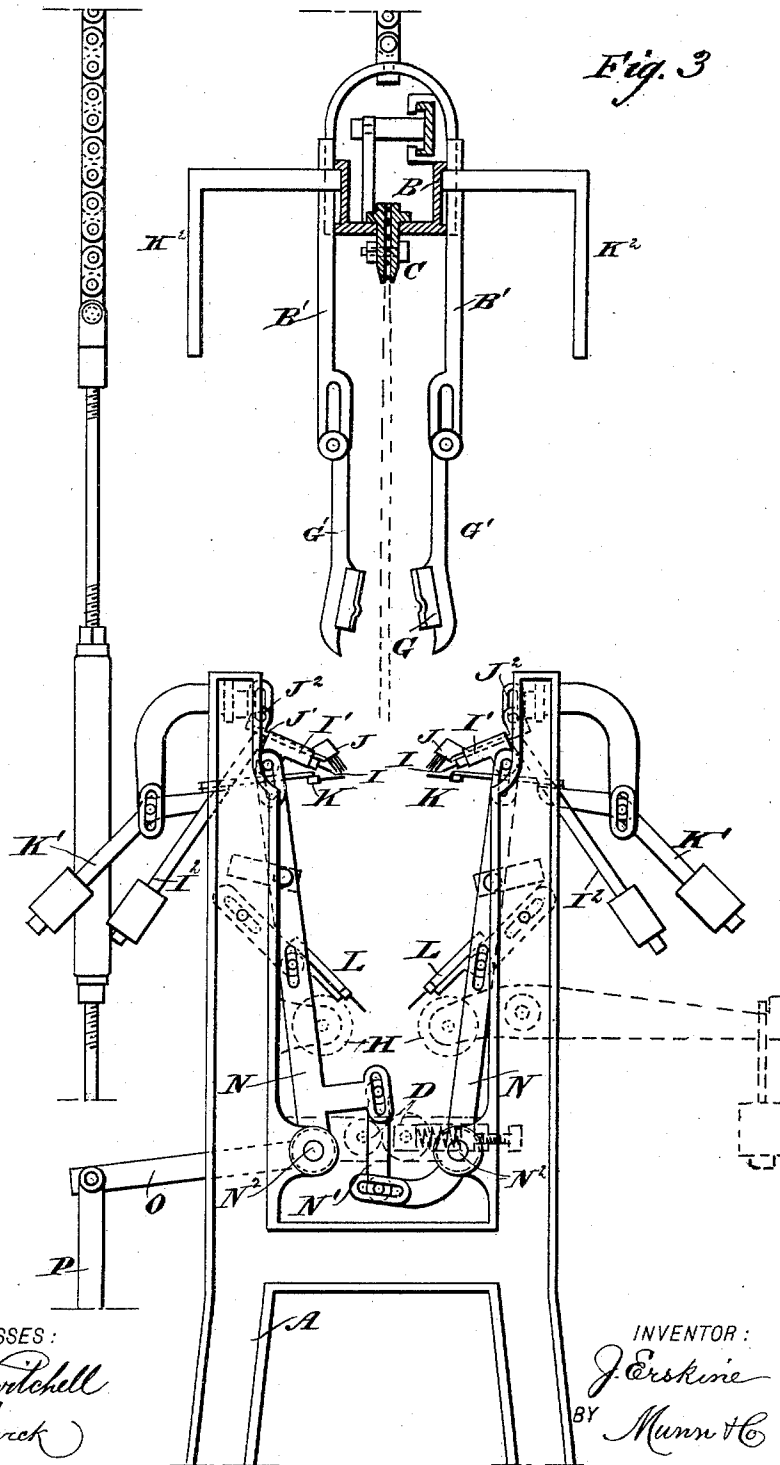
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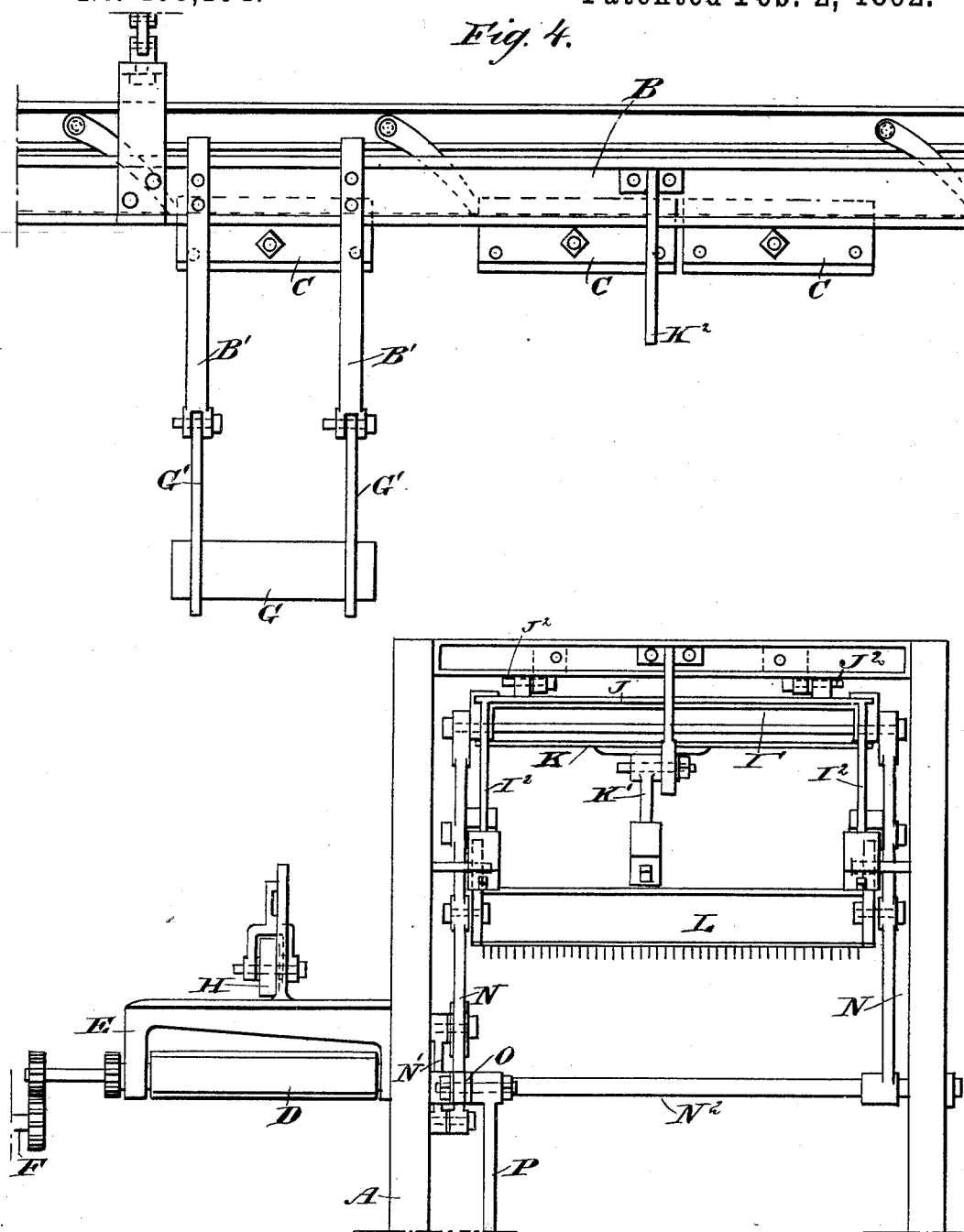
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Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN ERSKINE, OF LIGONIEL, NEAR BELFAST, IRELAND.

MACHINE FOR HACKLING FLAX, &c.

SPECIFICATION forming part of Letters Patent No. 468,194, dated February 2, 1892.

Application filed June 18, 1891. Serial No. 396,692. (No model.) Patented in England May 8, 1889, No. 7,695; in France February 15, 1890, No. 190,673, and in Belgium February 17, 1890, No. 67,089.

To all whom it may concern:

Be it known that I, JOHN ERSKINE, a subject of the Queen of Great Britain, residing at Wolfhill Mill, Ligoniel, near Belfast, Ireland, have invented certain new and useful Improvements in Machines for Hackling Flax and other Like Fibers, (for which I have obtained Letters Patent in Great Britain, No. 7,695, dated May 8, 1889; in France, No. 190,673, dated February 15, 1890, and in Belgium, No. 67,089, dated February 17, 1890,) of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in machines for hackling flax and other like fibers, constructed to effect "ending" of the material under treatment and to give a finishing hackling to the fiber.

The invention consists, principally, of a nipping device for ending the flax or fiber.

The invention further consists of a finishing-hackle operating on the fiber in conjunction with the nipping device.

The invention also consists of certain parts and details and combinations of the same, as will be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an end elevation of the improvement with parts in section and with the combs closed and the channel in a lowermost position. Fig. 2 is a front view of the same. Fig. 3 is an end elevation of the improvement with parts in section and the combs open and the channel in an uppermost position, and Fig. 4 is a front view of the same.

Flax and similar fibers are usually hackled in duplex hackling-machines—that is, machines constructed with revolving sheets on which are fastened iron bars and hackles.

These machines have channels which ascend and descend above the hackles. The holders carrying the material to be treated are placed in these channels and pushed forward each time the channel ascends until the fiber has passed through the machine. Fiber hackled in an ordinary hackling-machine requires

hand-dressing afterward, especially flax, if it is for fine yarns. This hand-dressing consists in breaking a portion off of each end of the "strick" or "piece" and combing or hackling out the loose fiber and small naps.

By the term "ending" is understood the breaking of a piece of fiber from each end, so that it may be squared and loose and rough fiber removed, as otherwise lumpy yarn would be produced by the tangled ends.

The ending-machine, presently to be described, is arranged in conjunction with an ordinary hackling-machine, is placed at one end of it, and is designed to do the work that has heretofore been done by hand, as described—that is, first to break the ends by means of nipping-rollers and then afterward comb the fibers.

The improved machine is provided with a suitably-constructed frame A, above which is arranged the usual channel B, forming part of the ordinary or preliminary hackling-machine and extended over the frame A, which is arranged at one end of the ordinary hackling-machine. The channel B is mounted to slide vertically and carries suitable holders C, adapted to move with the said channel and also arranged to slide therein in the usual manner when the channel ascends. The means for accomplishing this movement are of the usual kind, as indicated in Figs. 3 and 4, so that further description is not deemed necessary.

In line with the holders C and below the same, at one side of the frame A and next to the ordinary hackling-machine, (not shown,) is arranged a set of breaking-rollers D, journaled in a bracket E, mounted to slide on the frame A and adapted to be adjusted vertically by a screw-rod E'. The set of rollers are geared together and are connected by gear-wheels with a shaft F, receiving a rotary motion from some source, so that the said rollers D revolve together. The shaft F preferably forms part of the ordinary hackling-machine, so that the ending device operates in conjunction with the channel B. The rollers are preferably somewhat longer than the holders C, as is plainly shown in Figs. 2 and 4.

On the channel B are secured downwardly-extending arms B', carrying on their lower

ends sets of pivoted arms G', supporting a set of gripping or clamping plates G, arranged above the rollers D and adapted to open and close. The closing is accomplished by rollers H, journaled on the brackets E and adapted to engage the outer face of the gripping-plates G when the latter descend with the downward movement of the channel B and its arms B'. When the channel moves upward or ascends, then the plates G move out of contact with the rollers H and by their own weight swing into an open position. The gripping or clamping plates are adapted to grip the fibers below the holders C. One or both of the gripping-plates are lined on their inner faces with india-rubber or other elastic substance, so as not to injure the fiber. When the channel B descends, carrying with it the holders C, supporting the fiber, then the gripping or clamping plates G close by coming in contact with the rollers H, so that only the ends of the fiber extend below the gripping-plates, and are acted on by the rollers H, which nip the ends hanging downward from the plates G, thus accomplishing the ending of the fiber, as above described. When the channel B and holders C ascend, as previously described, the gripping-plates G open by their own weight and permit the long fiber to move upward with the holder C. It is understood that the gripping-plates G prevent long fiber from being drawn down and nipped by the rollers D, as plates G close a short distance above the lower ends of the fiber, as above described. When the channel and holders have descended after the fiber has been broken, the respective holder carrying the strick that has been nipped is pushed forward in the channel to be let down with the latter at the next downward movement of the channel between a set of combs I, arranged in the main frame A and adapted to be brought in contact with the fiber on both sides of the same at the time the holder is in a lowermost position. The combs I serve to comb or hackle the whole length of the strick at the time the channel and the respective holder again ascend and pull the fiber through the closed combs. The combs I open or swing outward when the channel is in an uppermost position. When the channel and holder next descend, the combs I close or nip again on the strick near to the holder, and the above-described operation is repeated until the short fibers and small naps are completely removed. It is understood that the combs I are sufficiently long to permit one strick to be acted on several times before it and its holder are pushed past the outer end of the frame A. As shown in Figs. 2 and 4, the combs I are about twice the length of a holder, so that the strick is acted on twice in the combs. The holder is usually pushed forward a distance equal to its own length at each ascent of the channel. The combs I are mounted on arms I', pivotally connected with levers N, fulcrumed on shafts N², mounted on

the main frame A. The arms I' are provided with weights I², extending outward and serving to return the combs into a normal horizontal position for entering the fiber on the inward movement of the levers N. The latter are connected with each other at opposite ends of their fulcrums by links N', so that the levers move in unison—that is, simultaneously toward and from each other. From one end of one of the shafts N² extends an arm O, pivotally connected with a rod P, provided with a friction-roller P', engaging a cam-groove in a cam Q, secured on the shaft R, as is plainly shown in the drawings.

In the lower end of the rod P is arranged a slot P², engaging the reduced end R' of the shaft R, so that the reduced end forms a guide for the rod P.

On the shaft R is secured a crank-arm S, connected with a wrist-pin on a gear-wheel T, secured on the main driving-shaft U and imparting motion to the levers N, so that the latter swing inward at the time the channel B is in a lowermost position.

On top of the comb-arms are formed guide-ways, in which are fitted to slide plates J', carrying at their inner ends brushes J and held in place by studs J², projecting from brackets on the main frame. The studs J² engage vertical slots in the brush-plates J' to permit a rising and falling of the brushes at the inward and outward swinging of the combs I. When the levers N swing outward into the position shown in Fig. 3, the combs I swing downward and the brushes inward over the combs to remove the tow from the combs.

Below the combs is arranged a set of catchers K, operating in conjunction with the brushes J to remove the tow from the same. The tow-catchers are mounted on weighted levers K', fulcrumed on the frame A and actuated by rods or arms K², projecting from the channel B, as shown in the drawings. When the channel descends, the arms K² strike the levers K', so that the catchers are swung downward, thereby engaging the tow on the brushes J and throwing the tow or combings downward to the floor. A second set of tow-catchers L may be arranged below the first set K, as is plainly shown in the drawings, this set, however, being pivotally connected with the levers N and operated from the same. The second set of tow-catchers is preferably hung on pivots attached to the main frame and engaging slots in the tow-catcher arms. The latter carry pins engaging vertical slots in the levers N, so that when the latter swing outward the tow-catchers K swing downward to pull on the tow and assist in delivering the same, as above described.

It is understood that the combs I close at the time the channel B is in a lowermost position, so that they enter the fiber at opposite sides close to the lower end of the respective holder C. The said combs I remain in this closed position during the ascent of the channel B, so that they act on the fiber through-

out the length of the strick, as and for the purpose above described. The levers N, carrying the combs I, then swing outward, so that the brushes J remove the tow, and the latter is picked off the brushes and thrown on the floor by the tow-catchers K and L. Thus it will be seen that fiber, after being hackled in the ordinary manner, receives an ending by first breaking the ends by means of the nipping-rollers D and then afterward combing the fiber by drawing the same through the brushes I, as above described.

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

1. A hackling-machine provided with a nipping device for ending the flax or fiber, substantially as shown and described.

2. In a hackling-machine, the combination, with a set of gripping-plates, of a nipping device arranged below the said gripping-plates and consisting of two rollers adapted to engage the flax or fiber projecting from the said gripping-plates, substantially as shown and described.

3. In a hackling-machine, the combination, with a flax or fiber holder having a vertical sliding motion, of a set of gripping or clamping plates opening and closing on the ascending and descending of the said holder and adapted to clamp the fiber held by the said holder, and a nipping device arranged below the said clamping-plates and consisting of two

revolvable rollers between which is adapted to pass the fiber projecting below the said gripping-plates for ending the fiber, substantially as shown and described.

4. In a hackling-machine, the combination, with a nipping device for ending the flax or fiber, of a finishing-hackle operating on the said fiber, substantially as shown and described.

5. In a hackling-machine, the combination, with a flax-holder, of a set of combs operating in conjunction with the said holder to comb the flax or fiber when the holder ascends, a set of brushes operating in conjunction with the said combs, and a set of tow-catchers arranged below the said combs and adapted to remove the tow or combings, substantially as shown and described.

6. In a hackling-machine, the combination, with a flax-holder, of a set of combs operating in conjunction with the said holder to comb the flax or fiber when the holder ascends, a set of brushes operating in conjunction with the said combs, a set of tow-catchers arranged below the said combs and adapted to remove the tow or combings, and means, substantially as described, for imparting motion to the said tow-catchers, combs, and brushes, substantially as shown and described.

JOHN ERSKINE.

Witnesses:

WM. CAMPBELL,
SAMUEL S. PALMER.