

F. O'NEILL, JR.

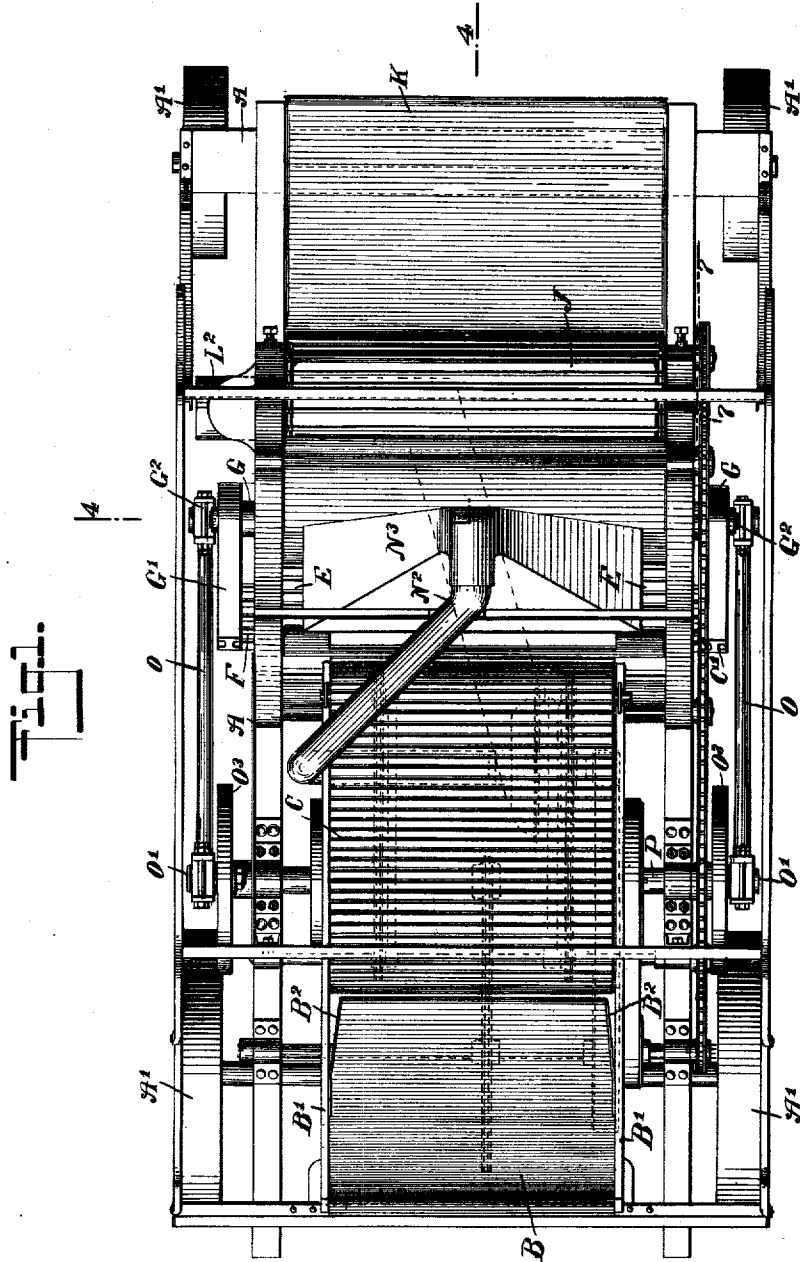
HEMP BRAKE.

APPLICATION FILED NOV. 15, 1909.

1,017,582.

Patented Feb. 13, 1912.

5 SHEETS—SHEET 1.



WITNESSES
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Rev. G. H. H. H.

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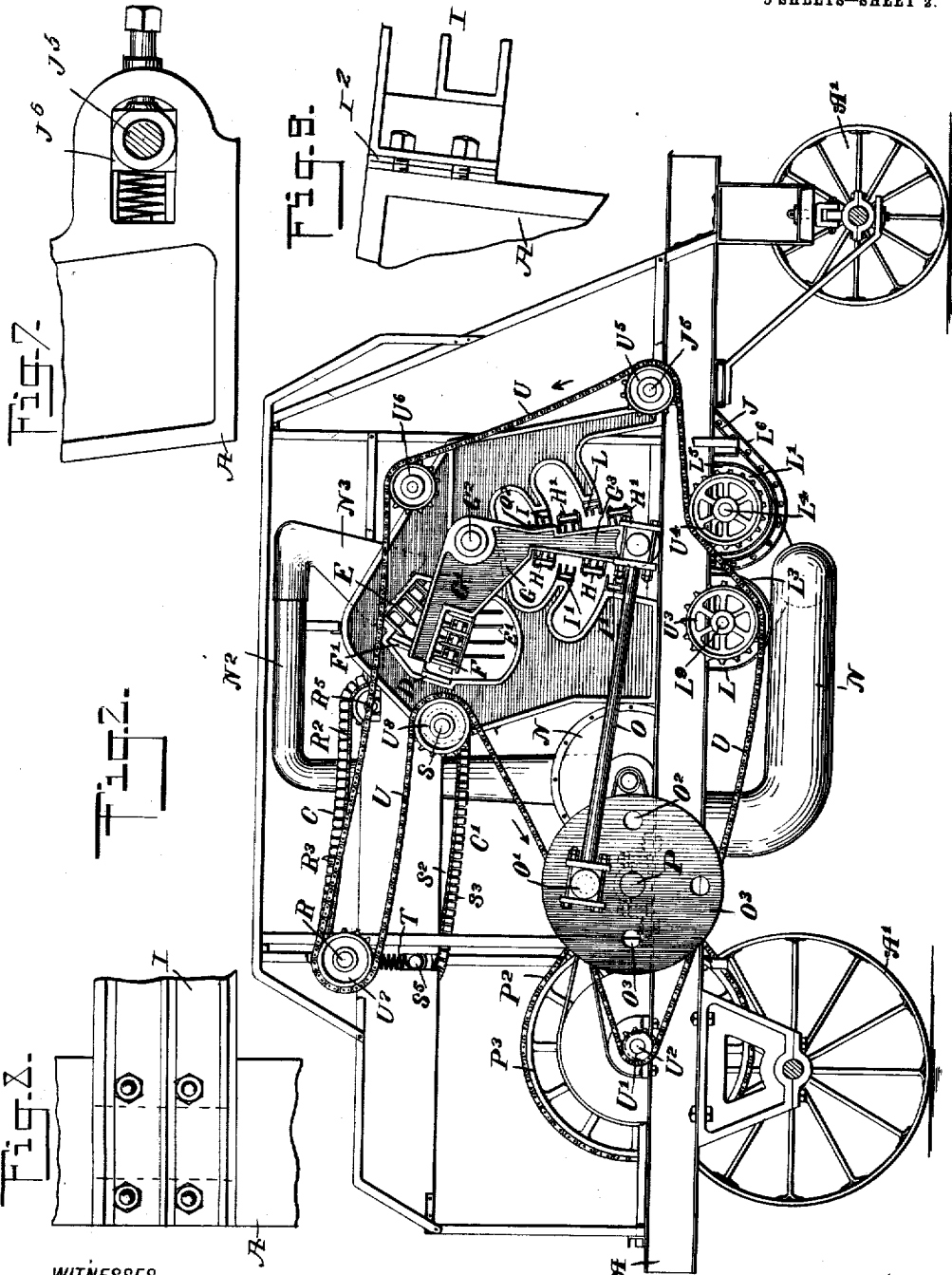
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5 SHEETS—SHEET 2.

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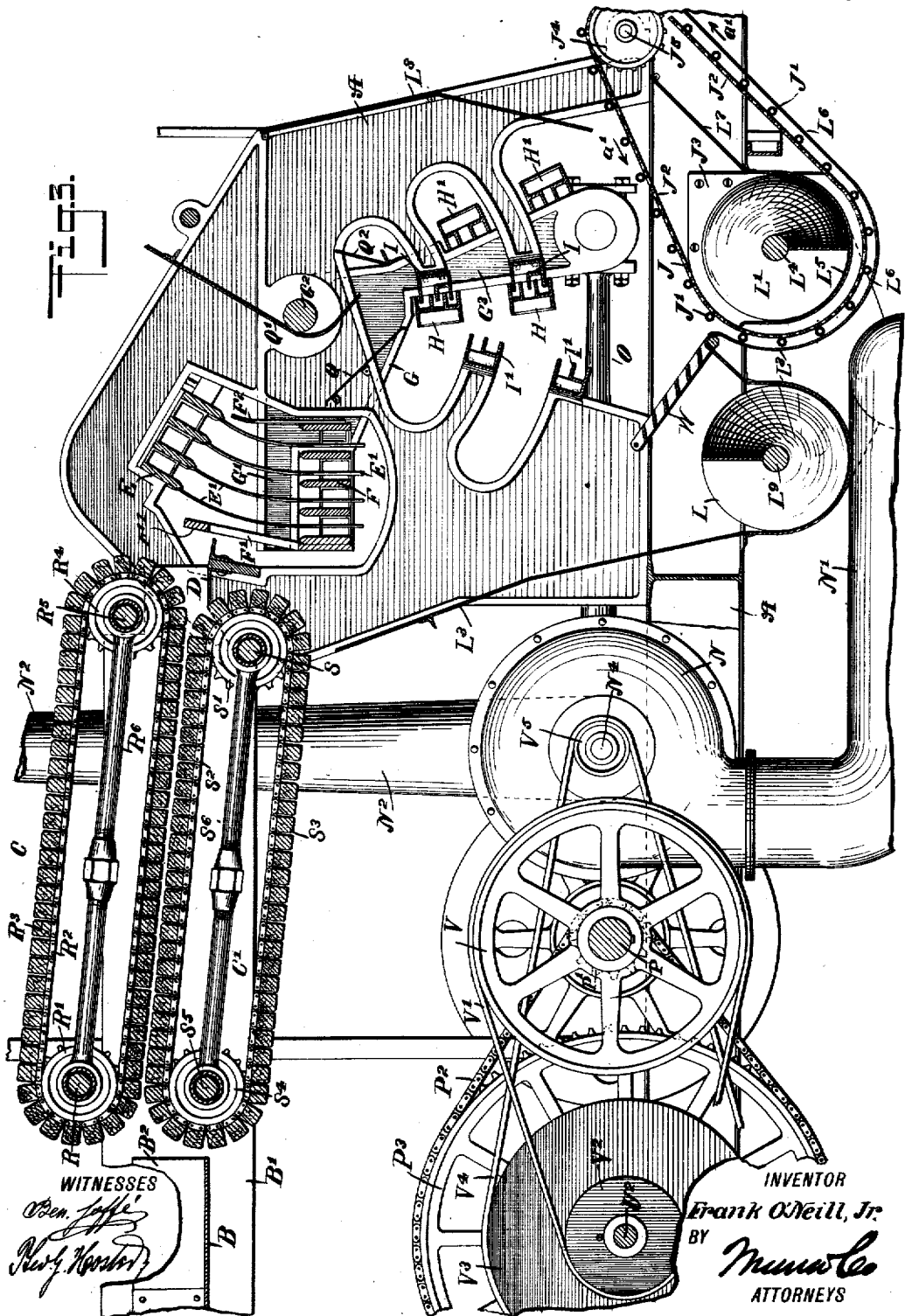
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5 SHEETS—SHEET 3.

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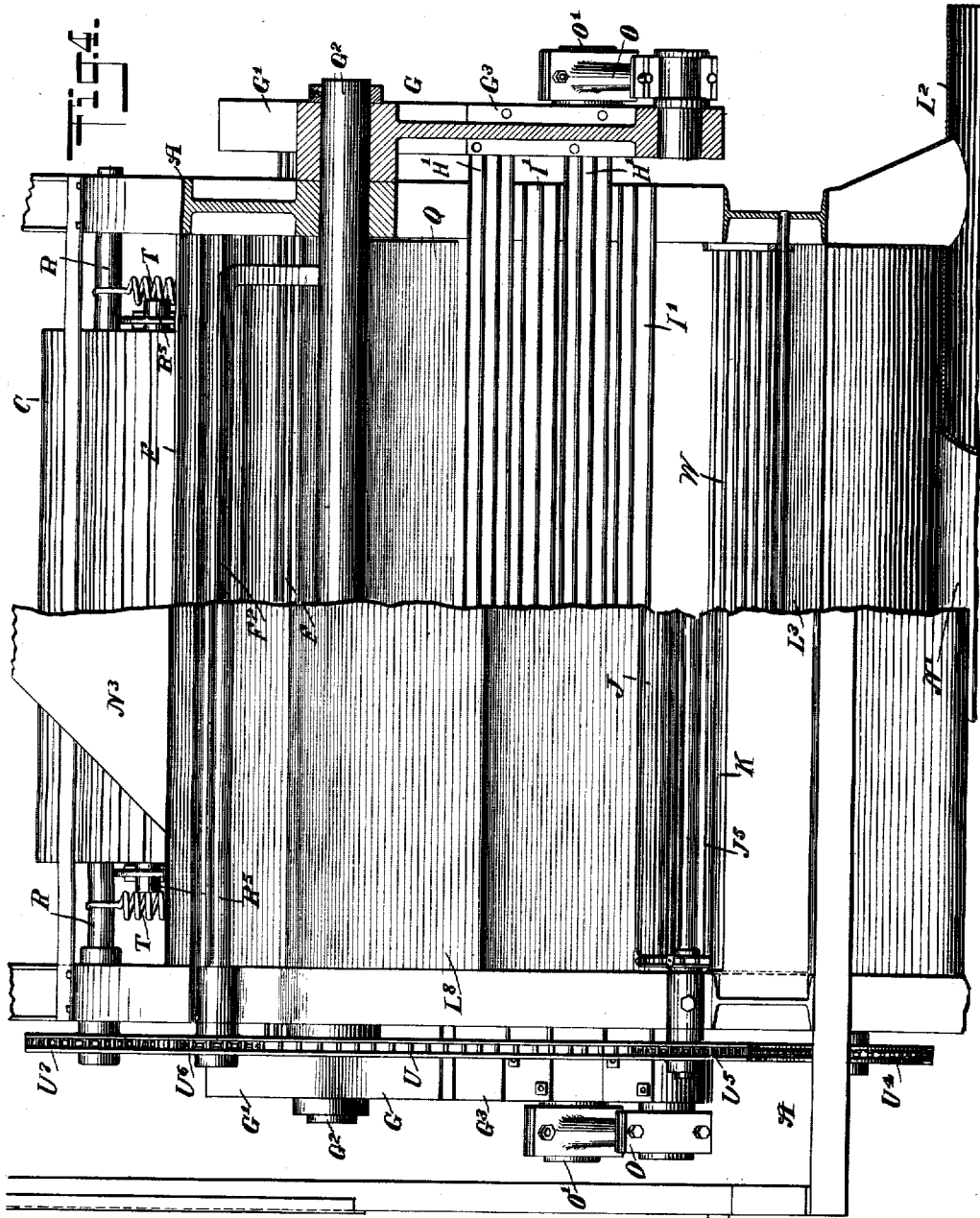
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WITNESSES

Ben. Jaffe

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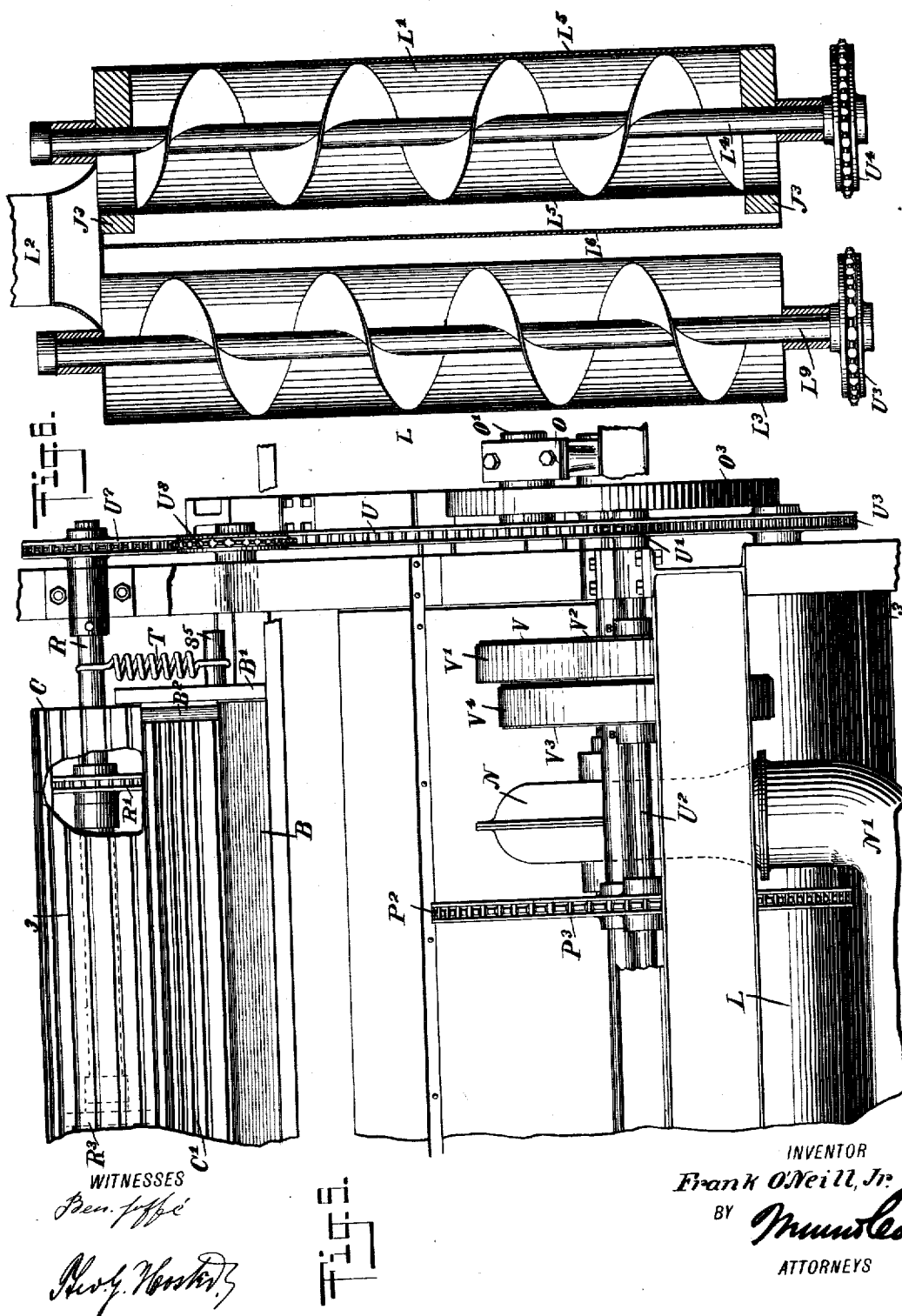
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HEMP BRAKE.
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Patented Feb. 13, 1912.
5 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

FRANK O'NEILL, JR., OF PARIS, KENTUCKY, ASSIGNOR OF ONE-SIXTH TO FRANK O'NEILL, SR., AND THREE-SIXTHS TO GEORGE ALEXANDER, BOTH OF PARIS, KENTUCKY.

HEMP-BRAKE.

1,017,582.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed November 15, 1909. Serial No. 528,138.

To all whom it may concern:

Be it known that I, FRANK O'NEILL, JR., a citizen of the United States, and a resident of Paris, in the county of Bourbon and State of Kentucky, have invented a new and Improved Hemp-Brake, of which the following is a full, clear, and exact description.

The invention relates to machines for separating fiber from the woody portion of hemp, flax, sea grass and the like.

The object of the invention is to provide a new and improved hemp brake, arranged to subject the material successively to the action of breaking mechanisms, to break the woody portion into small pieces, to separate the same from the fibers, to discharge the fibers from the machine in marketable condition, and to gather the broken pieces and the dust and discharge the same from the machine separate from the fibers.

The invention consists of novel features and parts and combinations of the same, which will be more fully described herein-after and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improved machine; Fig. 2 is a side elevation of the same and showing the breaking mechanism in half stroke position; Fig. 3 is an enlarged sectional side elevation of the same on the line 3—3 of Fig. 5; Fig. 4 is an enlarged elevation of the front or fiber-delivery end of the machine, parts being in section on the line 4—4 of Fig. 1; Fig. 5 is an enlarged elevation of the rear or feed end of the machine, parts being broken out; Fig. 6 is an enlarged sectional plan view of the transverse conveyer for carrying the broken pieces of the woody portion and the dust to one side of the machine; Fig. 7 is an enlarged sectional side elevation of the drum shaft for the fiber conveyer and the adjustable bearing for the said shaft, the section being on the line 7—7 of Fig. 1; Fig. 8 is an enlarged face view of one of the fixed members of the re-breaking and cleaning mechanism; and Fig. 9 is a side elevation of the same.

The hemp brake is mounted on a suitably constructed main frame A, preferably

provided with wheels A', to permit of conveniently moving the machine about from one place to another, and on the rear end of the main frame A is arranged a feed table B, over which the hemp stalks or other material are fed by an operator, so that the material passes between opposed conveyers C, C', which discharge the material over a fixed table D (see Fig. 3), between the fixed member E and the reciprocating member F of an initial breaking mechanism for initially breaking and softening the hemp stalks. The member F of this initial breaking mechanism is mounted on the horizontally-extending arms G' of a rocking lever G, having its pivot G² journaled in the main frame A, and said lever G being provided with downwardly-extending arms G³, on opposite sides of which are secured the sets of re-breaking and cleaning members H, H', operating in conjunction with sets of fixed re-breaking and cleaning members I, I', attached to the main frame A. The sets of reciprocating and fixed members H, H' and I, I' form a re-breaking and cleaning mechanism, to completely separate the fiber and the woody portion of the stalks. The fibers after leaving the lower end of the re-breaking and cleaning mechanism pass onto a longitudinally-extending fiber conveyer J, which carries the fiber to a discharge table K on the front or delivery end of the machine.

The pieces of the woody portion of the stalk separated from the fibers as well as the dust and other extraneous matter dropping down from the members F, H, H', I and I' are gathered and moved transversely by a pair of transversely-extending conveyers L, L', having their discharge ends leading to a discharge pipe L², connected with the outlet pipe N' of a fan or blower N, mounted on the main frame A. The fan or blower N is provided with an inlet or suction pipe N², terminating in a hood N³, extending over the top of the fixed initial breaking member E, so that any loose, extraneous matter at this member E is sucked up by the suction action of the fan or blower N and drawn through the hood N³ and pipe N² into the fan or blower N, from which the extraneous matter is forced through the pipe N into the discharge pipe L². It is to be understood that

by the arrangement described, the extraneous matter from the conveyers L, L' as well as that sucked up by the fan or blower N is forced by the blast of the fan or blower to one side of the machine, entirely separate from the fibers passed onto the delivery table K.

The lower ends of the arms G³ of the lever G are each connected by a connecting rod O with a wrist pin O', engaging one of a series of apertures O² in a crank disk O³, secured on the main shaft P, so that when the latter is rotated a movement is given to the lever G by the action of the crank disks O³, wrist pins O' and connecting rods O. The apertures O² are located at different distances from the center of the crank disk O³, so that the throw of the lever G can be varied to suit the nature of the material under treatment.

It is to be understood that when the machine is running and a rocking motion is given to the lever G, then the member F moves up and down, to co-act with the fixed member E, with a view to initially break and soften the material. When the arms G³ of the lever G rock from the left to the right, the members H act in conjunction with the fixed members I, and when the arms G³ rock from the right to the left, then the members H' co-act with the fixed members I', to completely re-break the woody portions into small particles and to separate the same from the fibers.

The member E of the initial breaking mechanism is formed of spaced transversely-extending bars, slightly inclined and beveled at their lower edges, as shown in Fig. 3, the bars being secured to the main frame A. The reciprocating member F is likewise formed of spaced transversely-extending bars, beveled at their upper edges and adapted to pass between the corresponding bars of the member E. The bars of the member F are secured to the arms G³ of the rocking lever G, and when the machine is running and the material passes between the bars of the members E and F, then the stalks are broken and shaken, and some of the broken pieces of the woody portion of the stalks become detached from the fibers, and are removed, as previously explained.

In order to prevent the material from clogging or choking while in the initial breaking mechanism, use is made of upwardly-extending guides F' and F², secured to the rear and front sides respectively of the member F. On the bars of the member E are secured downwardly-extending radial guide and cleaning members E', passing between corresponding bars of the member F, as shown in Fig. 3. When the machine is running and the member F moves downward, then the guides F' and

F² pull the material downward out from between the bars of the fixed member E, and the guide and cleaning members E' lift the material out from between the bars of the member F, so that the material is not liable to clog or choke in the members E and F, and the latter are in clean condition for properly breaking the material on the up-stroke of the member F.

The material after leaving the initial breaking mechanism passes between the transversely-extending guide plates Q, Q', secured to the main frame A, the said plates forming a guideway for directing the material downwardly between the fixed and reciprocating members H, H', I, I' of the re-breaking and cleaning mechanism. A guide Q² is secured to the arms G³ of the lever G, at the upper forward side, to act as a guiding and cleaning member for the material. The material feeds itself downward between the members H, H', I, I', by its own weight, and the material is acted on by the said members from both sides, so as to re-break the woody portion of the stalks into minute particles and to loosen and detach the same from the fibers.

Each of the members H, H', I, I' consists of a plurality of transversely-extending spaced bars, of which the bars of the members H, H' are adapted to pass between the corresponding bars of the members I, I', as will be readily understood by reference to Fig. 3. The bars of the members I and I' can be set so that the bars of the members H, H' will project a greater or less distance between them by the use of liners I², interposed between the frame A and the backs of the bars, as shown in Figs. 8 and 9.

The lower ends of the fibers projecting below the re-breaking and cleaning mechanism are shaken forward and backward alternately against the slats J' of the fiber conveyer J and the guide rack W secured to the main frame A, and inclined upwardly and rearwardly from the top of that portion of the casing L³ for the conveyers L, L', which extends between the said conveyers L, L', as plainly shown in Fig. 3. The rack W is provided with a series of transversely-extending spaced slats and extends over the conveyer L, so that the minute extraneous matter loosened from the fibers and shaken out of the same by the contact of the fibers with the rack W, readily passes between the slats thereof and falls into the conveyer L, to be carried off as before explained. The slats J' of the fiber conveyer J are secured to sprocket chains J², passing around circular bearings J³ (see Figs. 3 and 6), secured to the sides of the frame A, the chains also passing around sprocket wheels J⁴ attached to the transverse shaft J⁵, journaled in yielding bearings J⁶ (see Fig. 7), held on the frame A, adjacent to the delivery table

K. The shaft L^4 of the conveyer L' extends transversely and centrally through the bearings J^3 and a portion L^5 of the casing for the conveyer L' extends concentric with the peripheral faces of the bearings J^3 , and an outer portion L^6 of the main casing L^3 extends concentric with the bearings J^3 outside of the chains J^2 and the slats J' , and the said casing portion L^6 is extended parallel with the lower run of the conveyer J , as is indicated in Fig. 3. By the arrangement described the extraneous matter dropping down between the slats J' falls into the casing portion L^5 , and is carried away transversely by the conveyer L' , as previously explained. The casing portion L^5 has an upwardly and forwardly inclined extension L^7 , reaching close to the sprocket wheels J^4 , serving to gather the extraneous matter. It is understood that when the machine is running the fiber conveyer J travels in the direction of the arrow a' , so that the fibers are carried along by the slats J' , between the latter and the casing portion L^6 , to be finally discharged onto the table K.

A guide L^8 is arranged in front of the rebreaking and cleaning mechanism, to prevent loose matter from passing out of the machine at this point, the lower edge of the guide L^8 extending close to the upper run of the fiber conveyer J , as shown in Fig. 3.

The feed table B and the opposed conveyers C and C' are flanked by side plates B' , attached to the main frame A, and on the said side plates B' at the front end of the feed table B are arranged inclined guide arms B^2 , for directing the material toward the middle of the opposed conveyers C, C' and away from the shafts thereof, to prevent the material from becoming entangled.

The conveyers C, C' are of the slat and sprocket chain type, as plainly indicated in Fig. 3, and the conveyer C is provided with a driving shaft R, journaled on the main frame A and carrying the sprocket wheels R' , over which pass the sprocket chains R^2 supporting the slats R^3 , the said sprocket chains R^2 also passing around sprocket wheels R^4 , secured on a shaft R^5 , journaled in suitable bearings mounted on a frame R^6 , fulcrumed on the driving shaft R. Thus the conveyer C is fulcrumed at its front end and is free to swing up and down toward and from the lower conveyer C' . The lower conveyer C' is provided at its rear end with a driving shaft S, journaled in suitable bearings arranged on the main frame A, and on the shaft S are secured sprocket wheels S' , over which pass sprocket chains S^2 carrying slats S^3 . The sprocket chains S^2 also pass around sprocket wheels S^4 , secured on a shaft S^5 , journaled in the rear end of a frame S^6 , fulcrumed on the driving

shaft S, and the shaft S^5 is supported on springs T, depending from the shaft R (see Fig. 5). Now by the arrangement described the lower conveyer C' is yieldingly mounted, that is, its rear end is free to move toward or from the rear end of the upper conveyer C, so that the material can readily pass between the conveyers C and C' , to be carried along by the slats and finally fed over the table D, to and between the members E and F of the initial breaking mechanism. By constructing the conveyers C, C' in the manner described, they properly feed the material forward without danger of clogging, especially as the conveyers are free to yield to accommodate the amount of material fed between them.

In order to rotate the shafts L^3 and L^4 of the conveyers L, L' , the shaft J^5 of the fiber conveyer J and the shafts R and S of the conveyers C and C' , use is made of a sprocket chain U, passing over a sprocket wheel U' , secured on a transversely-extending shaft U^2 , journaled on the main frame A. The shaft U^2 is driven from the main driving shaft P by the use of a sprocket wheel P' , secured on the shaft P and over which passes a sprocket chain P^2 , also passing over a sprocket wheel P^3 , attached to the shaft U^2 . The sprocket chain U passes from the sprocket wheel U' around the lower portion of a sprocket wheel U^3 , secured on the shaft L^3 , and then the sprocket chain passes over the upper portion of a sprocket wheel U^4 , secured on the shaft L^4 , and then the sprocket chain U passes around a sprocket wheel U^5 , secured on the shaft J^5 of the conveyer J, then the sprocket chain U passes over an idler U^6 , journaled on the main frame A, then the chain passes around sprocket wheels U^7 and U^8 , secured on the shafts R and S, respectively, and from the sprocket wheel U^8 the sprocket chain U passes back to the sprocket wheel U' . Now when the machine is running and the shaft U^2 is driven from the main shaft P, then a traveling motion is given to the sprocket chain U, which latter actuates the conveyers L, L' , J, C and C' , in unison for the purpose above described.

The blower N is driven from the driving shaft P, and for this purpose the driving shaft P is provided with a pulley V, over which passes a belt V' , also passing over a pulley V^2 , mounted loosely on the shaft U^2 and attached to a larger pulley V^3 , connected by a belt V^4 with a pulley V^5 , secured to the shaft N^4 of the fan or blower N.

The operation is as follows: When the machine is running, and the operator feeds the hemp stalks or like material over the table B to and between the opposed longitudinally-extending conveyers C and C' , then the latter carry the material forward

and feed the same over the table D between the members E and F of the initial breaking mechanism, which breaks the material, as before explained, and then the material passes between the members H, H' and I, I' of the re-breaking and cleaning mechanism, so that the fibers are completely freed of extraneous matter, and are carried by the slat belt conveyer J to the delivery table K at the front end of the machine. The loose material is carried off by the transverse conveyers L and L' and the suction device connected with the fixed member E of the initial breaking mechanism, as previously explained, it being understood, however, that the extraneous matter is discharged from the machine completely separate from the fibers, which leave the machine in marketable condition.

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

1. A hemp brake provided with an initial softening and breaking mechanism, a re-breaking and cleaning mechanism arranged to receive the material from the first mechanism, the said initial softening and breaking mechanism having fixed members, and reciprocating members moving to and from the said fixed members, and the said re-breaking and cleaning mechanism having two spaced sets of fixed members and two sets of reciprocating members co-acting alternately with the said sets of fixed members, and an angular reciprocating lever carrying the reciprocating members of the said two mechanisms.

2. A hemp brake provided with an initial softening and breaking mechanism disposed approximately horizontally, and re-breaking and cleaning mechanism disposed approximately vertically and receiving the material from the said initial softening and breaking mechanism, the initial breaking mechanism having upper fixed members and lower up and down reciprocating members, and a suction device arranged adjacent to the said upper fixed members for receiving extraneous matter from the said fixed members.

3. A hemp brake provided with an initial softening and breaking mechanism disposed approximately horizontally and re-breaking and cleaning mechanism disposed approximately vertically and receiving the material from the said initial softening and breaking mechanism, the initial breaking mechanism having upper fixed members and lower up and down reciprocating members, a suction device arranged adjacent to the said upper fixed members for receiving the extraneous matter from the said fixed members, and a conveyer for carrying off the extraneous matter dropping from the said reciprocating members.

4. A hemp brake having an angular recip-

rocating lever provided with arms on opposite sides of the fulcrum, one of the arms extending approximately in a horizontal direction and the other arm extending approximately in a vertical direction, breaking members mounted on the said horizontal arm to reciprocate with the latter, stationary breaking members above the said reciprocating breaking members, sets of breaking members on the said vertical arm of the lever to reciprocate with the latter, and spaced sets of stationary breaking members on opposite sides of the said vertical arm of the said lever and with which co-act the said sets of breaking members on the lever.

5. A hemp brake comprising opposed conveyers, between which passes the material to be operated on, fixed and reciprocating initial breaking members receiving the material from the said conveyers, fixed and reciprocating re-breaking and cleaning members receiving the material from the said initial breaking members, a fiber conveyer receiving the fibers from the said re-breaking and cleaning members, and means including a suction device and a conveyer for gathering the extraneous matter from the said breaking means and discharging the said matter separate from the said fibers.

6. A hemp brake comprising opposed conveyers between which passes the material to be operated on, fixed and reciprocating initial breaking members receiving the material from the said conveyers, fixed and reciprocating re-breaking and cleaning members receiving the material from the said initial breaking members, a fiber conveyer receiving the fibers from the said re-breaking and cleaning members, a suction device arranged adjacent to the said fixed initial breaking members for receiving the extraneous matter therefrom, and a pair of conveyers below the said breaking members for gathering the dropping extraneous matter.

7. A hemp brake comprising opposed conveyers between which passes the material to be operated on, fixed and reciprocating initial breaking members receiving the material from the said conveyers, fixed and reciprocating re-breaking and cleaning members receiving the material from the said initial breaking members, a fiber conveyer receiving the fibers from the said re-breaking and cleaning members, a suction device arranged adjacent to the said fixed initial breaking members for removing the extraneous matter therefrom, and a pair of conveyers below the said breaking members for gathering the dropping extraneous matter, one of the said conveyers for the dropped extraneous matter extending transversely in the said fiber conveyer.

8. A hemp brake comprising opposed conveyers between which passes the material to be operated on, fixed and reciprocating ini-

- tial breaking members receiving the material from the said conveyers, fixed and reciprocating re-breaking and cleaning members receiving the material from the said initial
- 5 breaking members, a fiber conveyer receiving the fibers from the said re-breaking and cleaning members, a suction device arranged adjacent to the said fixed initial breaking members for removing the extraneous matter therefrom, a pair of conveyers below the
- 10 said breaking members for gathering the dropping extraneous matter, and an endless chain drive for the said conveyers.
9. In a hemp brake, a breaking mechanism, consisting of a reciprocating breaking member, a stationary breaking member, guides in front and rear of the reciprocating member, and radially extending cleaning members on the bars of the stationary member and projecting between the bars of the
- 20 reciprocating member.
10. In a hemp brake, the combination with a breaking mechanism, of opposed conveyers between which the material operated upon passes, each of said conveyers being pivoted at one end respectively, and one end of each conveyer being free to move toward and from the pivoted end of its companion.
- 25 11. In a hemp brake, the combination with a breaking mechanism, and opposed endless conveyers between which the material passes to the breaking mechanism, the said conveyers being yieldingly mounted at opposite ends so as to move toward and from each other.
- 30 12. In a hemp brake, the combination with a breaking mechanism, and opposed endless conveyers, between which the material passes to the breaking mechanism, both of said conveyers being pivoted at one end, and placed so that the free end of one will be opposite the pivoted end of the other, and means for yieldingly holding them in contact with the material passing between them.
- 40 13. In a hemp brake, the combination with a breaking mechanism, of opposed endless conveyers between which the material is fed to the breaking mechanism, the conveyers being each pivoted at one end and arranged so that the free end of one is opposite the pivoted end of the other, and springs connecting the shafts of the conveyers at one end with each other.
- 50 14. In a hemp brake, the combination with a horizontally reciprocating re-breaking and cleaning mechanism, a skeleton conveyer below the rebreaking and cleaning mechanism, a pan or trough placed within said skeleton conveyer, and a transverse screw
- 60 conveyer placed within said pan or trough.
15. In a hemp brake, the combination with a re-breaking and cleaning mechanism, of a skeleton conveyer placed below said re-breaking and cleaning mechanism, a pan or
- 65 trough placed within said skeleton con-

veyer, a transverse screw conveyer placed within said pan or trough, and a guide placed in front of said skeleton conveyer, and means for operating said conveyers.

16. A hemp brake provided with a breaking mechanism having fixed and movable members between which passes the material in a downward direction, an endless slat conveyer for the fibers arranged below the said breaking mechanism for the lower ends of the material to strike against to separate the fibers and the extraneous matter, and a screw conveyer between the runs of the said conveyer for carrying off the extraneous matter.

17. A hemp brake provided with a breaking mechanism having fixed and movable members between which passes the material in a downward direction, a rack below the said breaking mechanism for the lower ends of the material to strike against to separate the fibers and extraneous matter, and a screw conveyer below the said rack for carrying off the extraneous matter passing through the rack.

18. A hemp brake provided with a breaking mechanism having a fixed breaking member, a reciprocating breaking member operating in conjunction with the said fixed breaking member, the said breaking members each being formed of spaced bars, guides at the front and rear sides of the said reciprocating member, and guides on the bars of the said fixed member and extending between the bars of the said reciprocating member.

19. A hemp brake provided with a breaking mechanism, consisting of a reciprocating member having spaced bars, and a fixed member having spaced bars, the bars of the fixed members having cleaning members forming extensions thereof and projecting between the bars of the reciprocating member.

20. A hemp brake provided with an initial breaking mechanism, consisting of stationary and reciprocating members, a re-breaking mechanism receiving the material from the first mechanism and consisting of two sets of stationary members arranged so that the members of one set will be opposite the spaces between the members of the other set, and reciprocating members between the fixed members and coacting therewith, and an angular lever carrying the reciprocating members of said mechanisms.

21. In a hemp brake, a breaking mechanism, a casing below the breaking mechanism, said casing having a portion thereof formed of spaced walls, an endless slat conveyer mounted to travel between the walls of the casing, and a screw conveyer mounted in the casing within the inner wall thereof.

22. In a hemp casing, a breaking mechanism, a casing below the breaking mechanism having a portion thereof formed of

spaced walls, screw conveyers in the casing,
an endless slatted conveyer traveling around
one screw conveyer between the walls there-
of, and a rack arranged in an inclined posi-
5 tion with respect to the endless conveyer and
extending partially over the other screw
conveyer.

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

FRANK O'NEILL, JR.

Witnesses:

CORNELIUS W. VAN ARTSDALEN,
W. H. RAMSAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."