

No. 889,258.

F. O'NEILL, JR.
HEMP BRAKE.

PATENTED JUNE 2, 1908.

APPLICATION FILED DEC. 12, 1905. RENEWED OCT. 14, 1907.

7 SHEETS—SHEET 1.

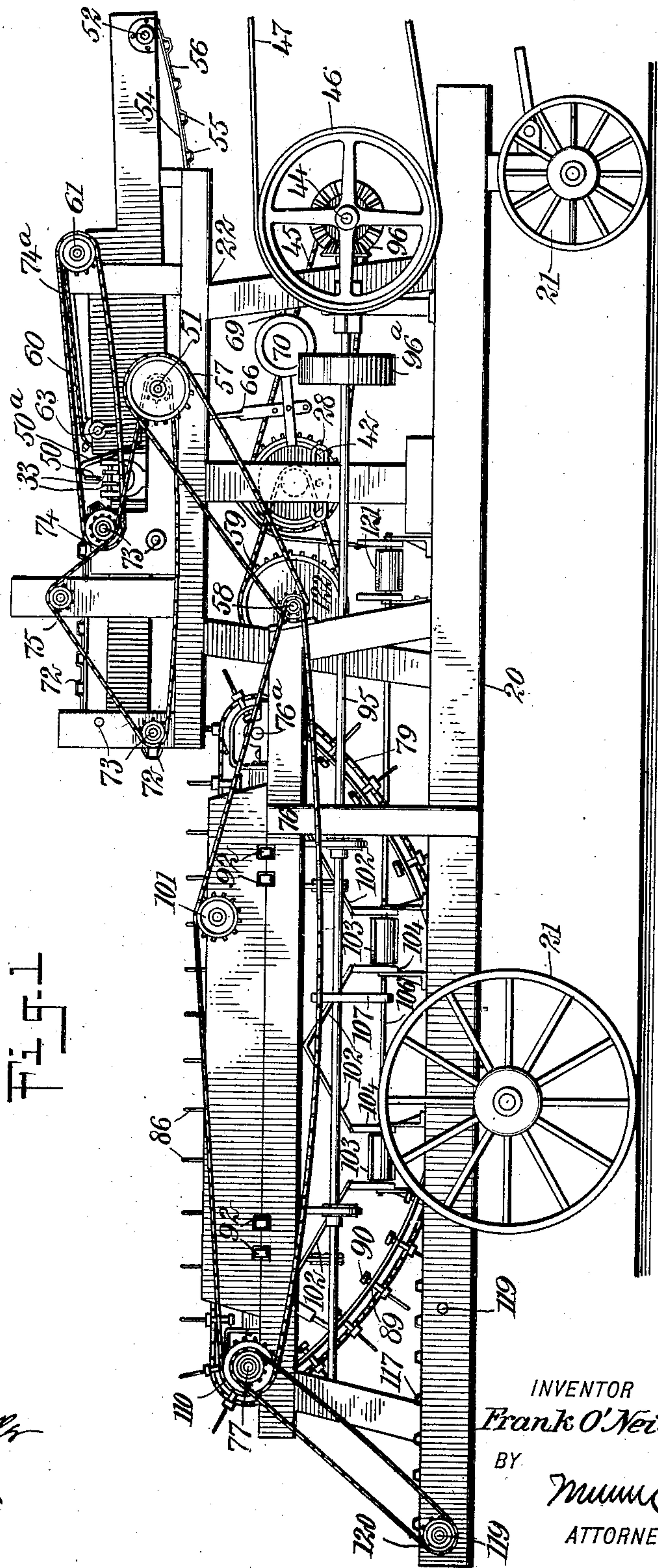


Fig. 1

WITNESSES:

John J. Kitch
S. H. C. Cobb.

INVENTOR
Frank O'Neill, Jr.

BY

Munn & Co.
ATTORNEYS

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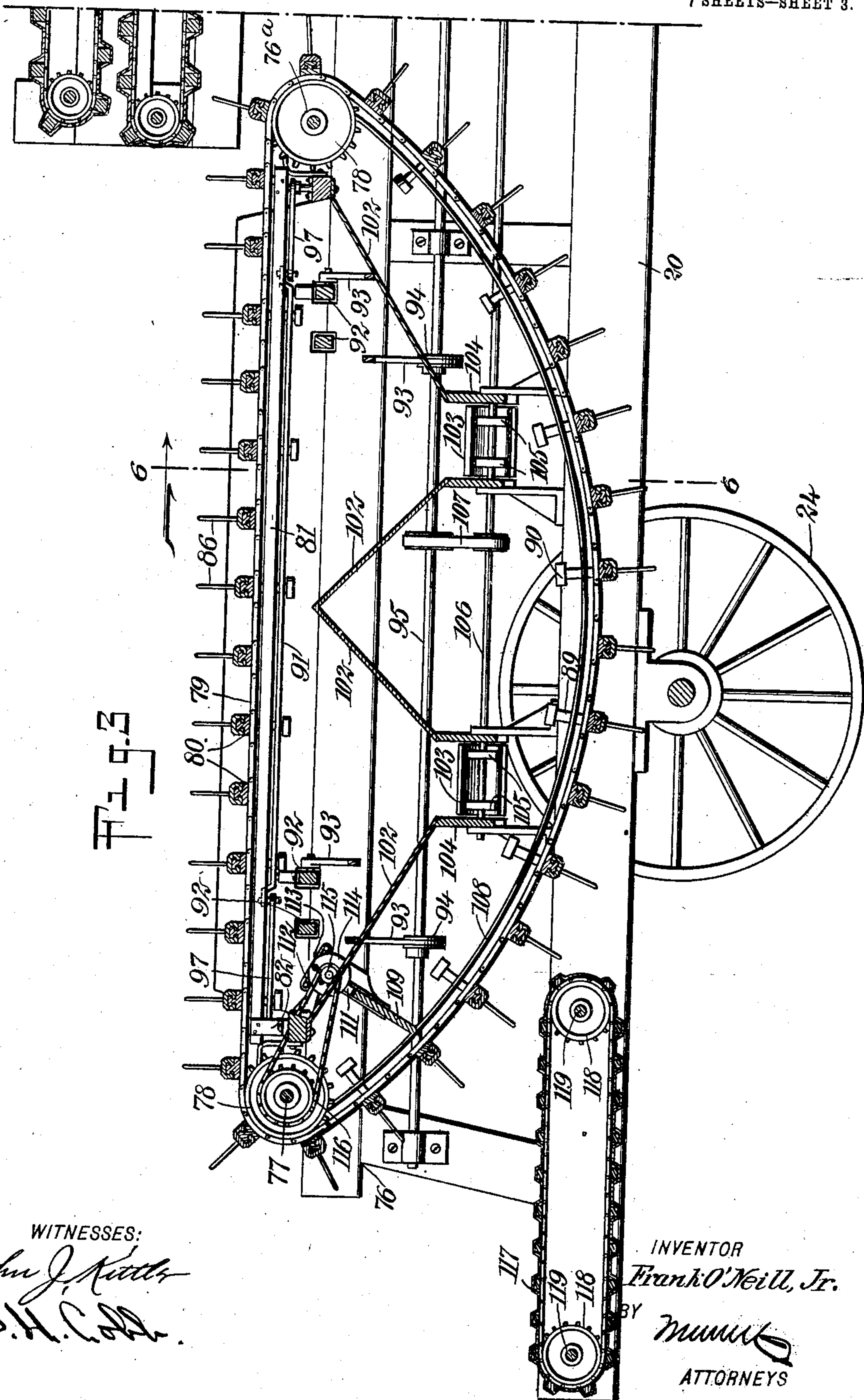


Fig. 3

WITNESSES:

John J. Kittell
S. H. Cobb

INVENTOR

Frank O'Neill, Jr.

BY

Mumuk
ATTORNEYS

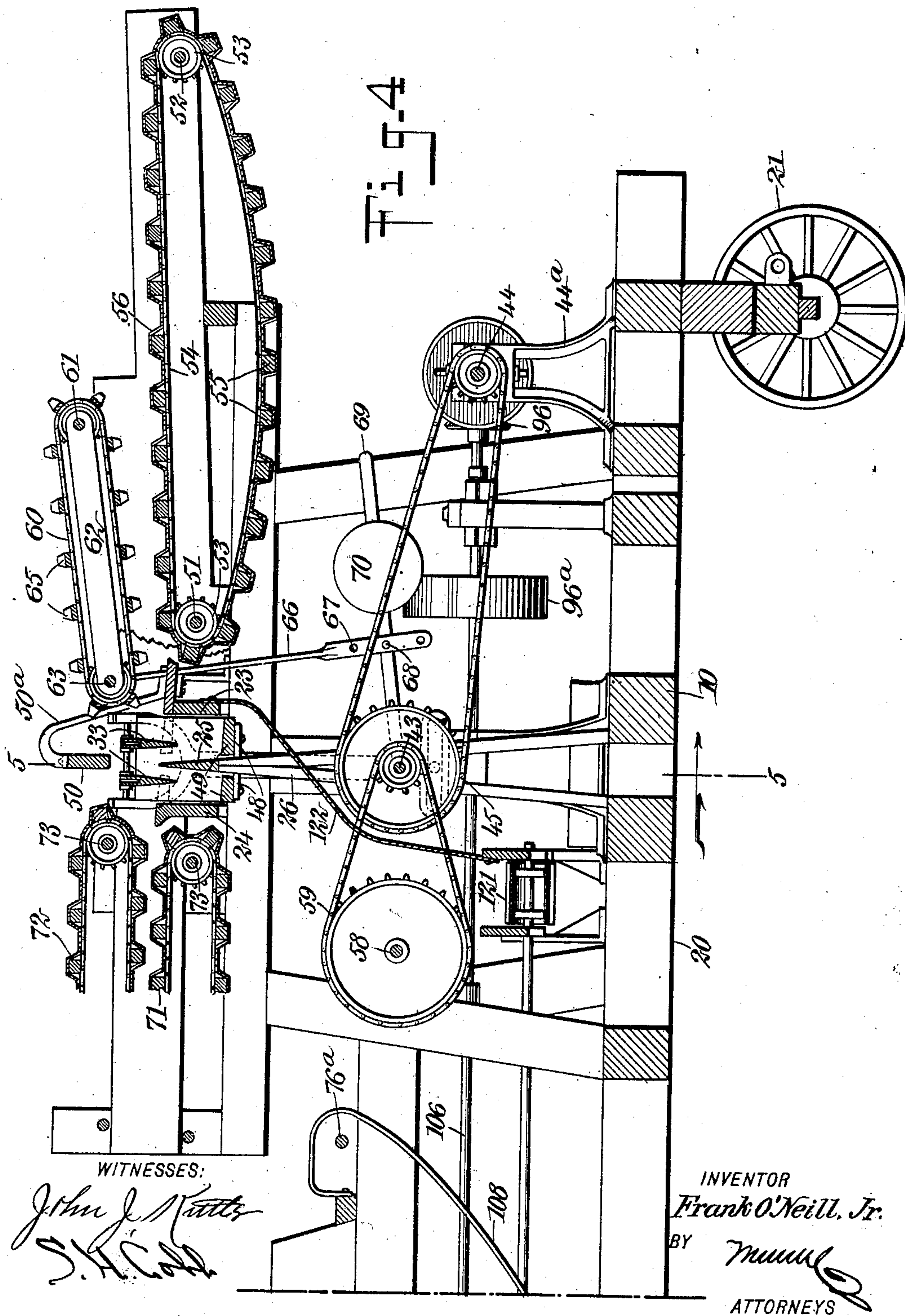
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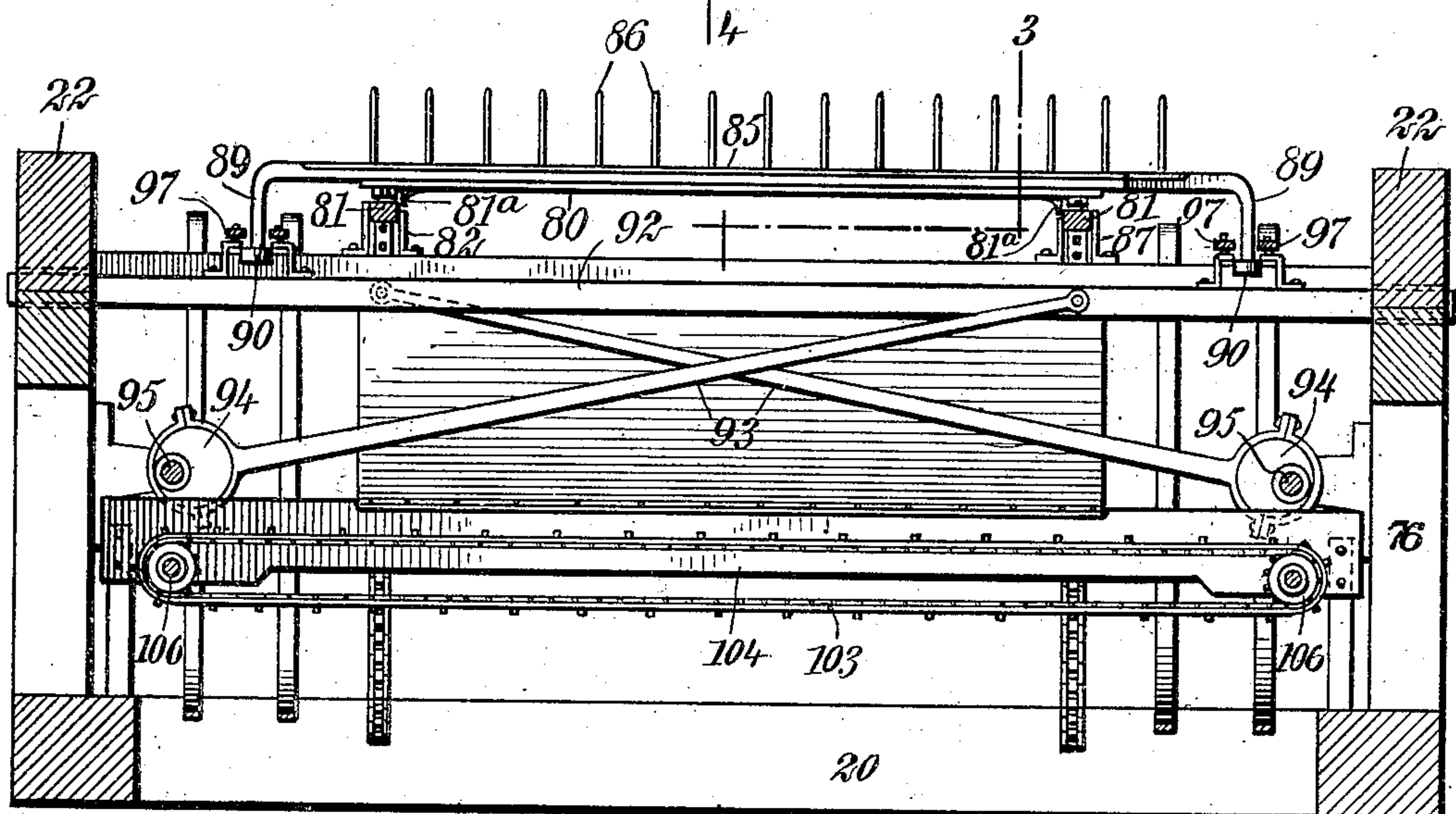
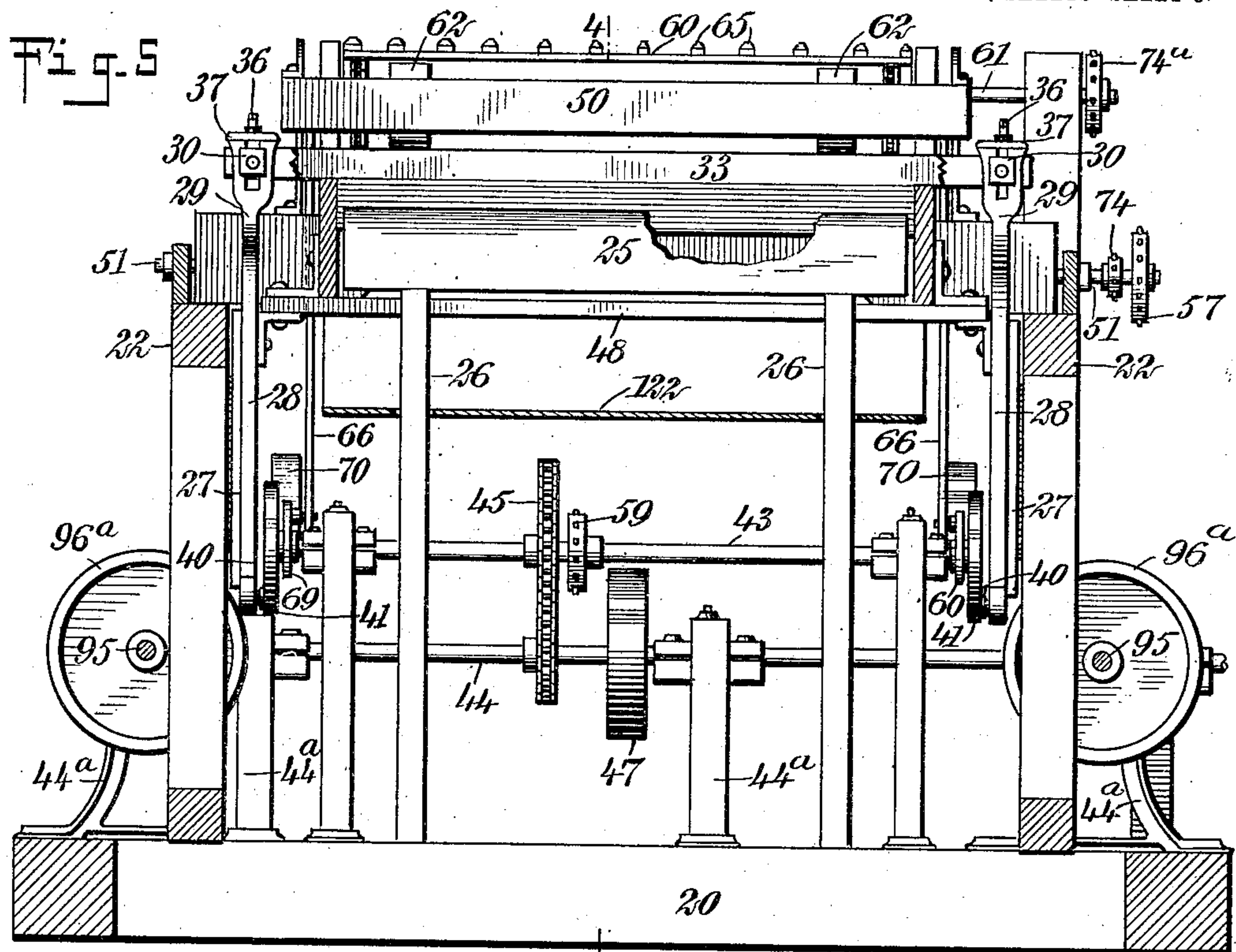
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7 SHEETS—SHEET 5.



WITNESSES:

John J. Kitch
S. H. Cobb

INVENTOR

Frank O'Neill, Jr.

BY *Mumuk*

ATTORNEYS

Fig. 6

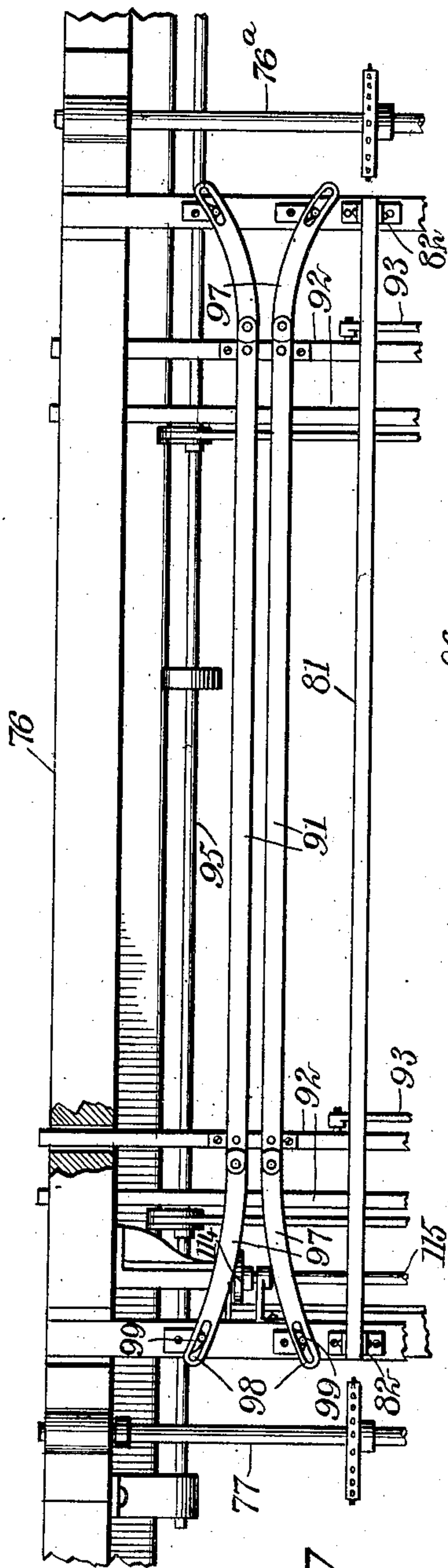
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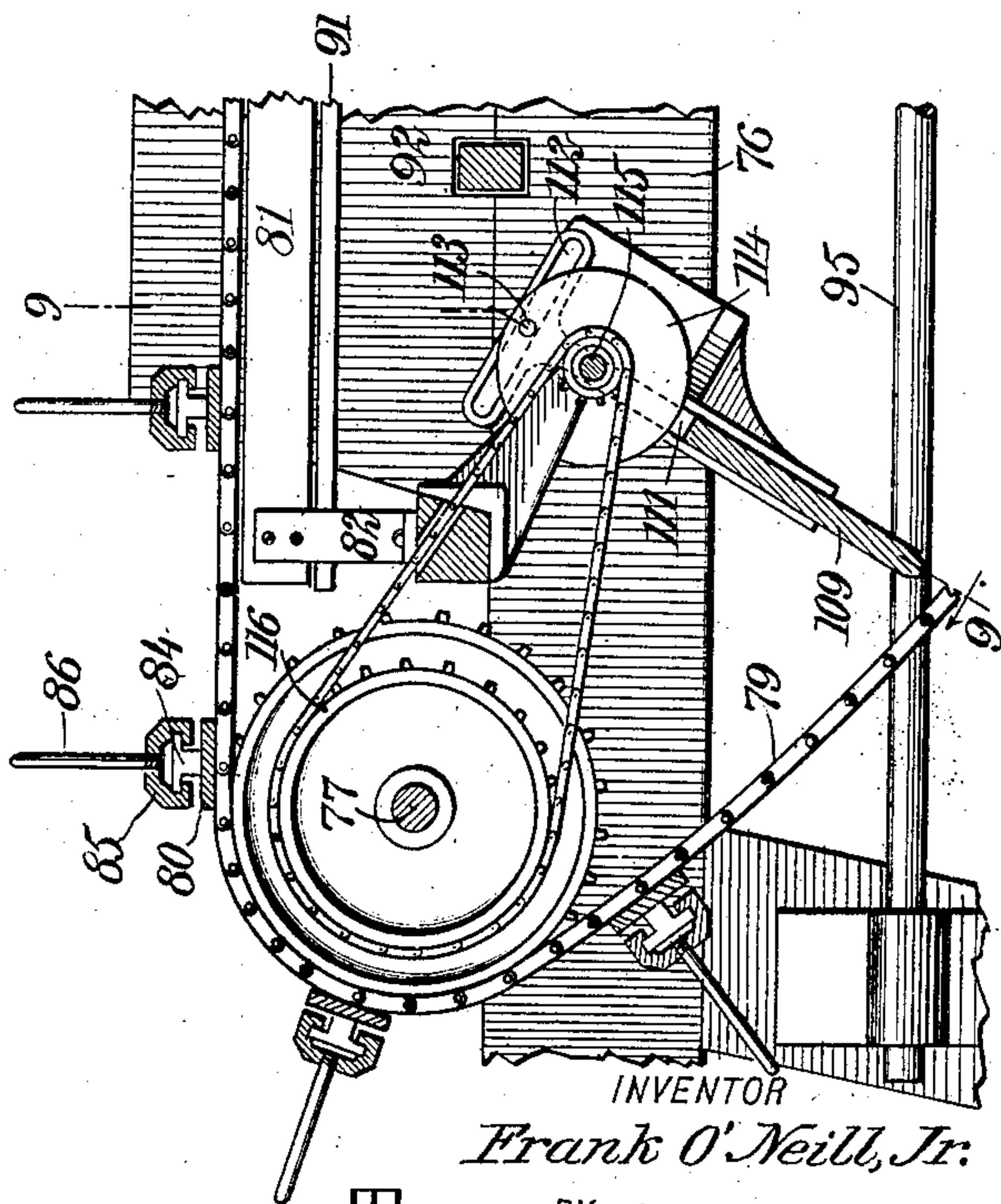
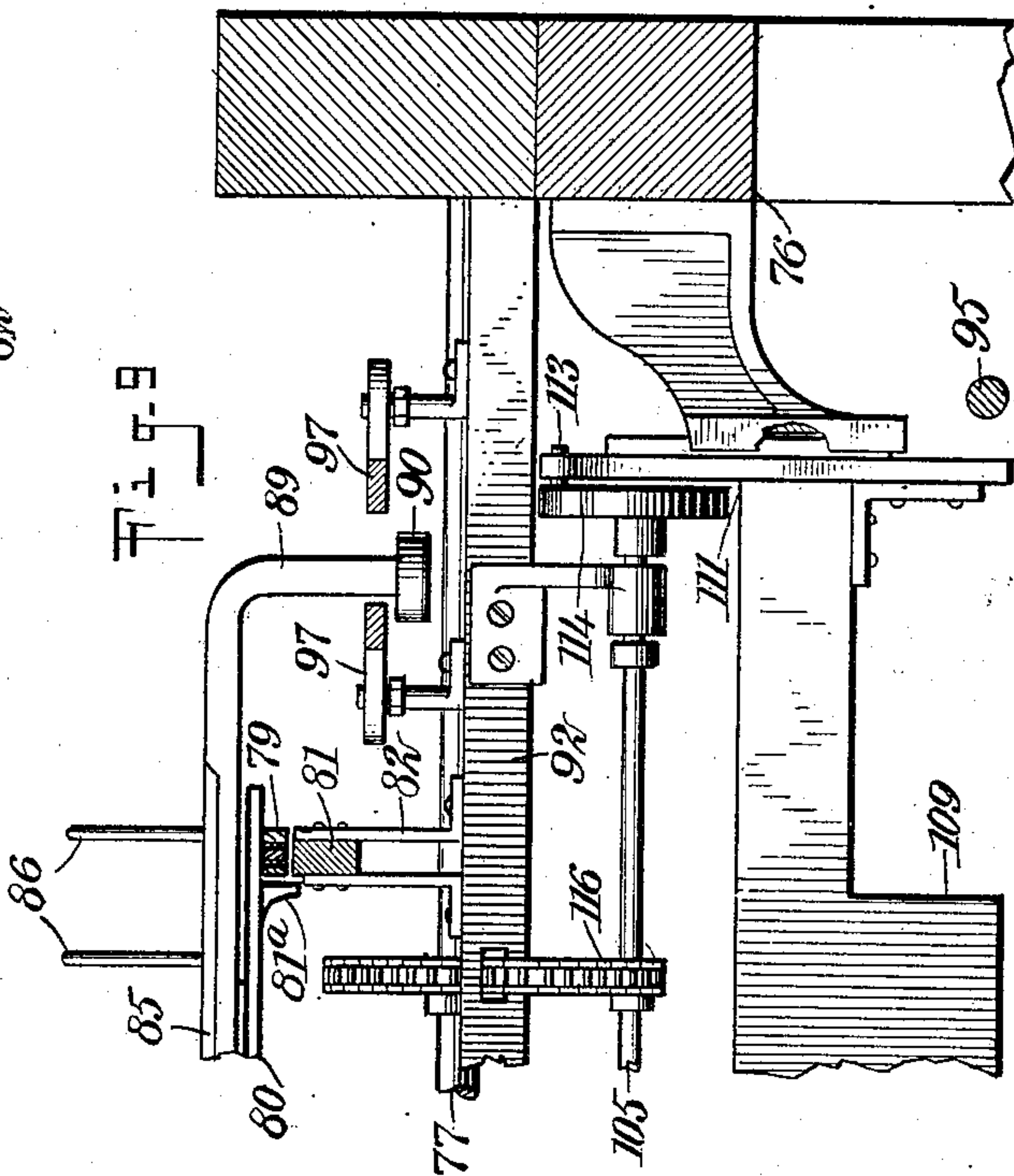
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7 SHEETS—SHEET 6.



WITNESSES:

John J. Kott's
S. H. C. Del.



INVENTOR

Frank O'Neill, Jr.

BY *Munn*
ATTORNEYS

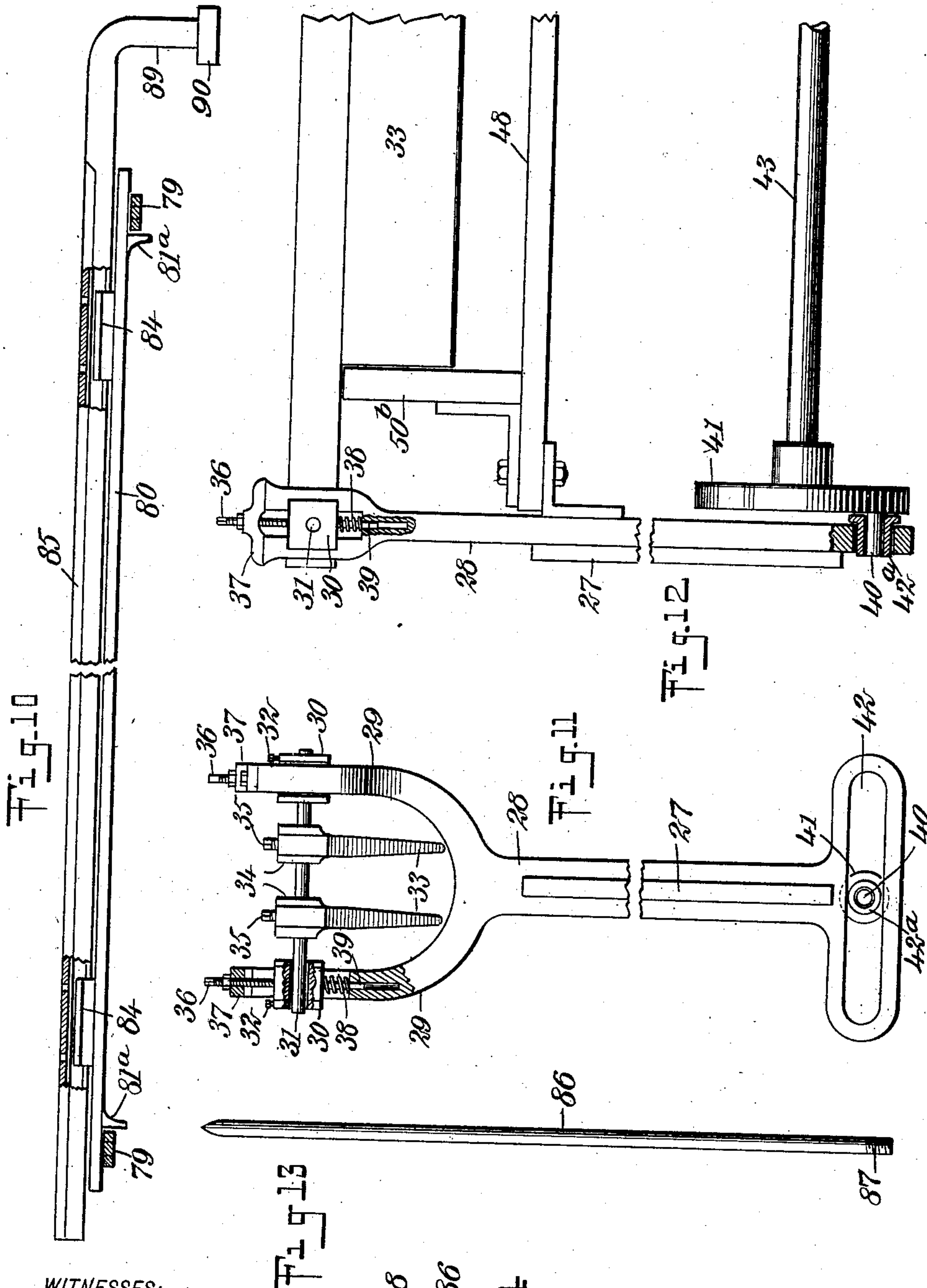
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PATENTED JUNE 2, 1908.

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7 SHEETS—SHEET 7.



WITNESSES:

John J. Kutt
S. H. C. C.

INVENTOR
Frank O'Neill, Jr.

BY *Mumford*
ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANK O'NEILL, JR., OF PARIS, KENTUCKY.

HEMP-BRAKE.

No. 889,258.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed December 12, 1905, Serial No. 291,386. Renewed October 14, 1907. Serial No. 397,353.

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.

My invention relates to machines for separating the fiber from hemp, flax, sea grass and the like, its principal object being to provide an efficient apparatus of this character.

It consists in the various features and combinations hereinafter described and more particularly claimed.

Reference is to be had to 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 side elevation of one embodiment of my invention; Fig. 2 is a top plan view thereof; Fig. 3 is a partial longitudinal section, on the line 3—3 of Fig. 6; Fig. 4 is a similar view, on the line 4—4 of Fig. 5; Fig. 5 is a transverse section, on the line 5—5 of Fig. 4; Fig. 6 is a like view, on the line 6—6 of Fig. 3; Fig. 7 is a broken top plan view of the cleaning portion of the machine, parts being removed; Fig. 8 is a longitudinal sectional detail, on the line 8—8 of Fig. 2; Fig. 9 is a transverse sectional detail, on the line 9—9 of Fig. 8; Fig. 10 shows, in side elevation, one of the agitating bars, parts being broken away and the actuating chains being shown in section; Fig. 11 illustrates, in side elevation, one of the operating members for the movable breaker bars, parts being broken away; Fig. 12 is a partial end elevation of the movable breaker bars and more closely associated elements; Fig. 13 shows, in side elevation, one of the agitating projections of the cleaner; and Fig. 14 is an enlarged end view thereof.

I have here illustrated a base frame supported, near its opposite extremities, by wheels 21, and near one end of which is mounted an upwardly-extending auxiliary frame 22 supporting breaking and conveying mechanism. The first-named mechanism comprises breaking walls 23 and 24, situated, respectively, at opposite sides of a space toward the feed and delivery ends of the machine as shown in Fig. 4. Between these breaking walls is mounted a fixed breaking bar 25, extending between the upper extremities of standards 26, 26 rising

from the base frame, this breaking bar being preferably wedge-shaped, with its narrow edge uppermost. The breaking bar is shown as unequally spaced between the breaking walls, the distance between it and the wall 23 being greater than that between it and the wall 24. Guided in ways at opposite ends of the fixed breaking bar by means of projections 27 entering grooves in the frame 22 are operating members 28, 28, having, at their upper extremities, pairs of separated arms 29, 29, see Figs. 5, 11 and 12. Each pair of arms is provided with alined slots, in which are situated blocks 30 having openings to receive a rod or supporting member 31, clamped by screws 32 threaded through the blocks and contacting, at their inner ends, with the rods. These rods 31 pass through openings in the opposite ends of movable breaking bars 33, of which two are here shown, situated between the fixed bar and the breaking walls, they being wedge-shaped, similarly to the bar 25, but oppositely placed.

The openings in the breaking bars are shown as bushed or protected by thimbles 34, and set-screws 35 extending through the bars and thimbles into cooperation with the rods permit the bars to be adjusted in position thereon, so that they may contact with material supported upon the fixed breaking members at different points. Such a variation in position is of importance in securing uniform action upon different sizes of material. The bars 33 are also adjustable vertically upon the operating members by screws 36 threaded through cap portions 37 upon the arms of the operating members and contacting with the blocks. These screws, when turned downwardly, force the blocks before them, thus lowering the breaking bars; and when they are moved in the opposite direction, the blocks and bars are raised by springs 38 surrounding guide projections 39 from the under side of the blocks, said projections extending into bores in the members 28. The vertical adjustment of the movable breaker bars secures different depths of stroke between the fixed bars, adapting the machine to operate upon materials in various conditions. For example, the stroke should be greater in treating damp material than when it is dry. Each operating member is reciprocated by a crank pin 40 projecting from a disk 41 into a slot 42 extending laterally of the member in an enlargement at its lower end. A flanged bushing 42^a may,

if desired, be inserted between the crank pin and the slot walls to take the wear. The crank disks are fixed upon opposite ends of a shaft 43 journaled in the frame 22 and connected with a main driving shaft 44, rotatable in standards 44^a rising from the base frame, by sprocket gearing 45. The main driving shaft has fast upon it a pulley 46 by which it may be driven at the desired speed by a belt 47 leading to any suitable source of power.

Material placed across the fixed members 23, 24 and 25 is broken by the passage of the members 33 between their companions. This leaves the stalks bent at an angle between the fixed members, and to release them so that they may be advanced, clearing mechanism is provided. Extending between the operating members 28, between the fixed bar and the side walls, are bars 48, 48. Each of these bars has an upper operating face 49 inclined downwardly from the side toward the direction of advance of material to their opposite edges. They are so placed upon the operating member that when the movable bars are at their extreme downward point, the clearing members will lie at the lower edges of the fixed bar and walls. When the movable bars are in their uppermost position, the clearing bars will lie with their edges at the feed side, just below the upper extremity of the adjacent fixed breaking members (see the position indicated in dotted lines in Fig. 4 of the drawings), and with their opposite or forward edges somewhat above the members at this side. As a result of this relation, the material which is advanced over them will not be caught by their projection above the fixed members, while the raising of the material from between said members by the higher portions of the clearing bars will be insured. Material may also catch between the members 33, and to prevent this, a fixed clearing member 50 is mounted upon arms 50^a rising at each side of the frame. In the raised position of the movable bars they reach points at which their lower extremities are adjacent to the lower edge of this clearing bar, on each side of which they travel. Thus the material is forced from between them. To limit the lateral movement of material between the breaking members, I have shown retaining members or walls 50^b, supported upon the bars 48 at the ends of the movable breaking bars.

Upon the top of the wall 23, it constituting its breaking surface, is an apron 50^c inclined downwardly from the wall. Adjacent to the outer end of this apron is a feeding conveyer mounted upon shafts 51 and 52 journaled in members carried by the frame 22. The shafts have secured upon them pairs of sprocket-wheels 53, 53, cooperating with chains 54 of the feeding conveyer. Between the chains extend bars 55 supporting a cover-

ing 56 of canvas or other suitable material. The plane of the canvas, where it passes over the bars upon the upper run of the conveyer, is somewhat higher than the apron, so that the material will be readily delivered to the fixed breaking members. The shaft 51 is connected, by sprocket gearing 57, to a shaft 58 rotatable upon the frame adjacent to the shaft 43, to which it is shown as connected by sprocket gearing 59.

Above the feeding conveyer is a pressure member in the form of a conveyer 60, supported, at one end, upon a shaft 61 rotatable in the auxiliary frame. About this shaft bars 62, 62 are mounted to swing and have journaled in their ends opposite the shaft 61 a shaft 63, over which the conveyer 60 also runs. The conveyer 60 may be similar to the feeding conveyer in its arrangement of sprocket-wheels and chains, but is preferably without the covering, its bars 64 being provided with series of depressions 65, which are shown as arranged in alinement longitudinally of the conveyer. The upper conveyer normally occupies an angular position similar to that illustrated in Fig. 4, it converging forwardly toward the lower feeding conveyer and furnishing a somewhat wide receiving throat and a relatively narrow delivery throat. It is held in yieldable contact with the material upon the feeding conveyer to exert a fixed pressure thereon by links 66 engaging the shaft 63 near its opposite ends, and having, at their lower portions, openings 67, through which a pin 68 passes into a registering opening in a lever 69. This lever is fulcrumed at some convenient point upon the frame and carries a weight 70 for drawing the forward end of the conveyer 60 into its lowest position. These cooperating conveyers not only so compress the material that it is properly delivered across the fixed breaking members and beneath the raised movable members, but also by the depressions in the bars 64 tend to straighten any stalks which lie at an angle to the direction of advance.

At the opposite side of the breaking mechanism from the feeding conveyers are lower and upper receiving conveyers 71 and 72, which are preferably of somewhat greater width than those at the feed side, to insure the delivery of the material to them. In construction, they may be precisely similar to the main feeding conveyer, and are mounted upon shafts 73 journaled in members carried by the frame 22. Their adjacent sides are advanced in the same direction by sprocket gearing 74 connecting them with the shaft 51, an idler 75 being employed to secure the proper run of the chain. Sprocket gearing 74^a actuates the conveyer 60 from one of the shafts 73. The speed of travel of the receiving conveyers is somewhat greater than that of the feeding conveyers. As a result, the forward ends of the stalks grasped

between them are placed under tension so that the bent portions which are produced by the action of the breaking members are straightened to prepare them for the future treatment.

Beyond the frame 22 a second auxiliary frame 76 rises from the base frame and carries cleaning mechanism. This includes shafts 76^a and 77 carrying pairs of sprocket wheels 78, over which operate chains or endless members 79, connected by series of transversely-extending bars 80. Beneath each chain, extending longitudinally of the machine, is a supporting member 81 mounted upon brackets 82, 82 placed at points near the extremities of the frame 76. These members 81 not only support the chains, but serve to stiffen the frame. To prevent the displacement of the chains from the supports, the bars 80 may have, extending from them at the inner side of the supports, projections 81^a. The bars 80 have projecting from them separated guide members 84, 84, which, as illustrated, are of T-shape and serve as guides for movable agitating bars 85, from which extend closely arranged agitating pins or projections 86. The outer ends of the pins are preferably pointed or rounded, and at their opposite extremities are threaded at 87 to engage openings in the bars. In the threaded ends slots 88 may be provided, to receive a screw-driver or like tool, this facilitating the removal of the pins in case they become broken. The ends of the bars 85 are alternately turned inwardly at opposite sides of the conveyer, or have projecting portions 89 provided with heads or enlargements 90. The projections travel between pairs of opposite guiding bars 91, 91, fixed to carrier bars 92, mounted to slide through openings in the frame 76. To each of the carrier bars is pivoted a rod 93, connected with the strap of an eccentric 94 fixed to shafts 95, 95, extending longitudinally of the machine and being rotatable upon the frame 76 so that as the shafts are rotated the carrier bars will be reciprocated in opposite directions. These shafts are shown as driven by bevel gearing 96 from the shaft 44 and carry fly-wheels 96^a. The agitating bars have guide portions 97, pivoted at their ends and provided, at their outer extremities, with slots 98 to receive pins 99 rising from the frame. These guide portions are curved or diverge outwardly, to furnish a relatively fixed throat, facilitating the entrance of the bar projections as they are advanced by the chains, whatever may be the position of the main portions of the operating bars.

The travel of the cleaning conveyer is effected by sprocket gearing 100, connecting the shaft 50 and shaft 77 and including an idler 101. The rate of advance of the cleaning conveyer secured by this gearing is comparatively slow, while the eccentrics 94 im-

part to the carrier bars a relatively rapid reciprocation. This in turn reciprocates the portions 85 of the conveyer bars by means of the operating bars, so that the broken material is shaken or agitated between the pins 86. The waste separated from the fiber by this agitation falls upon inclined shields 102 which lead to transverse conveyers 103, extending substantially at right angles to the cleaning conveyer and operating in troughs 104, by which the refuse is carried to one side of the machine. The waste conveyers, as illustrated, operate over wheels 105 fixed to longitudinally-extending shafts 106, one of which may be connected to the shaft 95 by a belt 107. To keep the lower run of the cleaning conveyer out of contact with these waste conveyers and with the shafting, and to direct the agitating bar projections to the operating bars, I have shown guide members 108 conforming to the general curvature of the depending chains, and secured, at their ends, to the frame 76.

As the fiber might tend to stick between the agitating projections of the cleaner, its discharge at the delivery end is insured by a clearing bar 109 movable in guides 110 at the sides of the frame 76 between the conveyer chains. The bar has, at each end, an extension 111, provided with a lateral slot 112 to receive pins 113 of crank disks 114. These crank disks are fast upon a shaft 115, mounted to rotate upon the frame 76 and connected, by sprocket gearing 116 with the shaft 77. The operation is so timed that when one of the agitating bars is in alinement with this clearing bar, the latter is at its inmost or most raised point. As the agitating bar travels from beneath it, the clearing bar descends between the chains and forces the fiber from the pins. This fiber may be received by a conveyer 117 carried by sprocket wheels 118 upon shafts 119 journaled in the base frame. Sprocket gearing 120 connects the outer conveyer shaft with the shaft 77. Some waste may fall from the material while it is under the action of the breaker mechanism, and this may be received and delivered at one side of the frame by a conveyer 121 carried by the shafts 106, similarly to the conveyers 103. A deflector 122 is shown leading from the wall 23 of the breaking mechanism to this conveyer 121.

The general operation of the machine may be stated as follows: The hemp or other material to be treated is laid upon the feeding conveyer with the butt ends of the stalks inward. It is advanced beneath the upper conveyer 60, which flattens and straightens it. These conveyers move the material across the apron upon the fixed breaking members. The movable members descend, breaking the stalks, which are then freed from between the members by the clearers 48 and 50. It is desirable to break the ma-

terial into lengths so short that if this were done at a single blow to fracture adjacent sections, the fiber would be liable to injury. In my improved machine this is prevented
 5 by first breaking the stalks into greater lengths than those to be ultimately attained between the members 23 and 25, and then advancing the material over the narrower space between the members 25 and 24 and
 10 effecting their fracture at intermediate points. This manner of treatment renders the material so pliant that injury is avoided. The influence of the feeding conveyers upon the material continues sufficiently to bring it
 15 into engagement with the receiving conveyers 71 and 72. These grasp the broken material and, by their differential speed, straighten it and discharge it upon the cleaning conveyer, the pins of which pass between and separate
 20 the fibers. The rapid reciprocation of the movable bars and pins shakes the material, so that the waste portion is separated from the fiber and falls into the conveyers 117. The fiber passes on and is cleared by the
 25 member 109 and carried out of the machine by the conveyer 117.

It will be seen that my improved hemp brake is entirely automatic in its action, that there is no danger in its use of tangling or in-
 30 juring the fiber, and that choking is positively prevented.

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

35 1. In a hemp brake, the combination with breaking mechanism, of opposed conveyers between which the material operated upon passes, said conveyers being arranged in pairs upon both sides of the breaking mech-
 40 anism.

2. In a hemp brake, the combination with breaking mechanism, of opposed conveyers between which the material operated upon passes, said conveyers being arranged in
 45 pairs upon both sides of the breaking mechanism, and means for advancing one pair of the conveyers at a different speed from the companion pair.

3. In a hemp brake, the combination with breaking mechanism, of opposed conveyers between which the material operated upon passes, said conveyers being arranged in
 50 pairs upon both sides of the breaking mechanism, and means for advancing both conveyers at the delivery side of the breaking mechanism at a greater speed than those at the feed side.

4. In a hemp brake, the combination with breaking mechanism, of opposed conveyers
 60 between which the material operated upon passes, one of said conveyers being free to move toward and from its companion.

5. In a hemp brake, the combination with breaking mechanism, of opposed conveyers
 65 between which the material operated upon

passes, one of said conveyers being pivoted near one end and free to move toward and from its companion at the opposite end.

6. In a hemp brake, the combination with breaking mechanism, of opposed conveyers
 70 between which the material operated upon passes, one of said conveyers being pivoted near one end and free to move toward and from its companion at the opposite end, a link connected to the free end of the said con-
 75 veyer, and a weight operating upon the link.

7. In a hemp brake, the combination with breaking mechanism, of opposed conveyers between which the material passes to the
 80 breaking mechanism, one of the said conveyers being yieldingly mounted and movable towards and from the other conveyer.

8. In a hemp brake, the combination with breaking mechanism, of opposed conveyers
 85 between which the material passes to the breaking mechanism, one of the said conveyers being pivoted at one end and free to move towards and from the other conveyer, and means for yieldingly holding it in con-
 90 tact with the material on the other conveyer.

9. In a hemp brake, the combination with breaking mechanism, of opposed endless con-
 95 veyers between which the material passes to the breaking mechanism, one of the conveyers being pivotally and yieldingly mounted so as to move towards and from the other conveyer and provided with transverse bars having depressions in their upper faces.

10. A hemp brake, comprising vertical and spaced walls, a fixed bar projecting be-
 100 tween the walls, adjustable reciprocating bars mounted above the walls and fixed bar.

11. A hemp brake, comprising spaced vertical walls, a fixed bar projecting between
 105 the walls, and horizontally adjustable reciprocating bars mounted above the walls and fixed bar.

12. A hemp brake, comprising spaced vertical walls, a fixed wedge shape bar project-
 110 ing between the walls, and vertically and horizontally adjustable wedge-shaped reciprocating bars mounted above the said walls and the fixed bar.

13. A hemp brake, comprising vertical breaking walls, a fixed breaking bar between
 115 the walls, movable breaking members arranged above and adapted to extend between the walls and the fixed breaking bar, and clearing members arranged between the walls and fixed breaking bar opposite the
 120 movable members, said clearing members having inclined operating faces and moving in unison with the movable breaking members.

14. A hemp brake comprising breaking
 125 members, and a clearing member situated between the breaking members and being provided with an inclined operating face, said breaking and clearing members being relatively movable so that a portion of the
 130

operating face may project from between the breaking members.

15 15. A hemp brake comprising breaking members, and a clearing member situated between the breaking members and being provided with an inclined operating face, said breaking and clearing members being relatively movable so that a portion of the operating face farthest from the feed side
10 may project from between the breaking members.

16. A hemp brake comprising cooperating breaking members, and means whereby the lateral spacing of the members may be varied.

15 17. A hemp brake comprising fixed breaking members, a reciprocatory operating member, and a breaking member adjustably mounted upon the operating member.

20 18. A hemp brake comprising fixed breaking members, a reciprocatory operating member, a support adjustable upon the operating member, and a breaking member mounted upon the support.

25 19. A hemp brake comprising fixed breaking members, a reciprocatory operating member, a support adjustable upon the operating member, and a breaking member movably mounted upon the support.

30 20. A hemp brake comprising fixed breaking members, a reciprocatory operating member having separated arms, blocks movable in the arms, a rod extending between the blocks, and a breaking member mounted upon the rod.

35 21. A hemp brake comprising fixed breaking members, a reciprocatory operating member having separated arms, blocks movable in the arms, a rod extending between the blocks, a breaking member movably
40 mounted upon the rod, and means for fixing said breaking member in place.

45 22. In a hemp brake, a cleaner comprising endless members, agitating members movable thereon and having projecting portions, and separated operating members between which the projections travel.

50 23. In a hemp brake, a cleaner comprising endless members, agitating members movable thereon and having projecting portions, separated operating members between which the projections travel, and guide members pivoted to the operating members.

55 24. In a hemp brake, a cleaner comprising endless members, agitating members movable thereon and having projecting portions, separated operating members between which the projections travel, and guide members pivoted to the operating members and to a relatively fixed point.

60 25. In a hemp brake, a cleaner comprising endless members, agitating members movable thereon and having projecting portions, separated operating members between which the projections travel, and diverging guide
65 members connected to the operating members.

26. In a hemp brake, a cleaner comprising endless members, agitating members movable thereon and having projecting portions, reciprocatory carriers, and operating members fixed to the carriers and engaging the
70 projections.

27. In a hemp brake, a cleaner comprising a frame, supporting members secured at separated points upon the frame, conveyers movable over the supporting members, movable agitating members mounted upon the conveyers, and stop members carried by the conveyers for contact with the supporting
75 members.

28. A hemp brake comprising breaking
80 mechanism, a conveyer, and a clearing member operating through the conveyer.

29. A hemp brake comprising breaking mechanism, a conveyer having separated bars, a clearing member situated within the
85 conveyer, and means for projecting said clearing member between the bars.

30. A hemp brake comprising breaking mechanism, cleaning mechanism, a conveyer to which the cleaning mechanism delivers,
90 and a clearing member cooperating with the cleaning mechanism above the conveyer.

31. A hemp brake comprising breaking mechanism, endless cleaning mechanism, and a conveyer operating within the clean-
95 ing mechanism.

32. A hemp brake comprising breaking mechanism, endless cleaning mechanism, and a conveyer operating within the cleaning mechanism and arranged to travel at
100 right angles thereto.

33. In a hemp brake, spaced walls, a fixed breaking bar projecting between the said walls, reciprocating members, and breaking
105 bars adjustably mounted between the members of the reciprocating members.

34. In a hemp brake, spaced walls, a fixed breaking bar projecting between the walls, reciprocating members each having a bifurcated upper end, a rod adjustably mounted
110 in the bifurcated ends of said members, and breaking bars adjustably mounted on the said rods.

35. In a hemp brake, spaced walls, a fixed breaking bar between the walls, reciprocating members, breaking bars adjustably
115 mounted in the reciprocating members, and bars extending between the reciprocating members and adapted to work between the said walls and the fixed breaking bar.

36. In a hemp brake, spaced walls, a fixed breaking bar between the walls, reciprocating members, breaking bars carried by the reciprocating members, and bars extending
125 between the reciprocating members and each having an inclined operating face, said bars working between the said walls and the fixed breaking bar.

37. In a hemp brake, spaced walls, a fixed breaking bar extending between the walls,
130

reciprocating members, breaking bars carried by the reciprocating members, bars extending between the reciprocating members and working between the walls and the
 5 fixed breaking bar, and retaining members carried by the bars working between the said walls.

38. In a hemp brake, a cleaner comprising an endless conveyer, agitating members
 10 movable transversely thereon, reciprocating members, and means for operating the agitating members from said reciprocating members.

39. In a hemp brake, a cleaner comprising
 15 an endless conveyer, agitating members movable transversely thereon and having projecting ends, reciprocating members, and guides carried by the reciprocating members and in which the projecting ends of the agi-
 20 tating members project.

40. In a hemp brake, a cleaner, comprising and endless conveyer, agitating members movable transversely on said conveyer and having projecting ends, reciprocating car-
 25 rier bars, and guide bars carried by the carrier bars and between which the projecting ends of the agitating members project, said guide bars having pivoted diverging end sections.

30 41. In a hemp brake, a cleaner comprising and endless conveyer, agitating bars movable transversely on the conveyer and having angular projecting ends, reciprocating car-

rier bars, and guide bars carried by the carrier bars and between which the angular ends
 35 of the agitating bars project, said guide bars having pivoted and curved diverging end sections.

42. In a hemp brake, a cleaner comprising an endless conveyer, agitating bars movable
 40 transversely of the conveyer, and a reciprocating member cooperating with the conveyer to remove the fiber therefrom.

43. In a hemp brake, a cleaner comprising an endless conveyer, agitating bars movable
 45 transversely of the conveyer, and a reciprocating clearing bar arranged between the runs of the conveyer and adapted to project between the agitating bars.

44. In a hemp brake, a cleaner, comprising
 50 an endless conveyer, agitating bars movable transversely of the conveyer, a reciprocating clearer between the runs of the conveyer and adapted to project between the agitating
 55 bars, inclined shields within the conveyer, and transverse conveyers also within the first conveyer and to which the waste is deposited by the said shields.

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

FRANK O'NEILL, JR.

Witnesses:

JAMES McCLURE,

ROY T. CLENDENIN.