

No. 765,723.

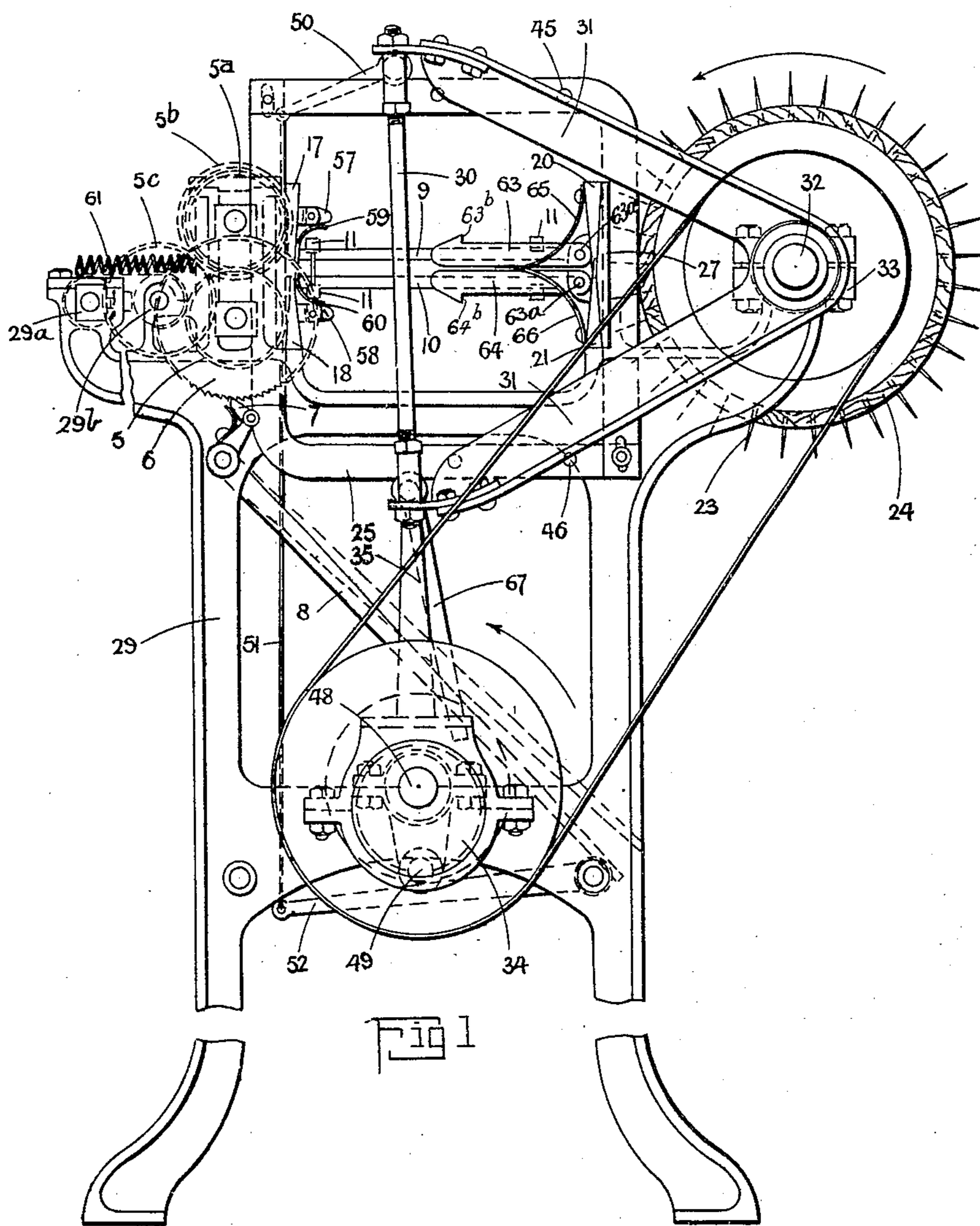
PATENTED JULY 26, 1904.

F. WILKINSON.
FIBER PULLING MACHINE.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses

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S. J. Stidolph.

Inventor

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by his Attorney

Henry H. Hayward.

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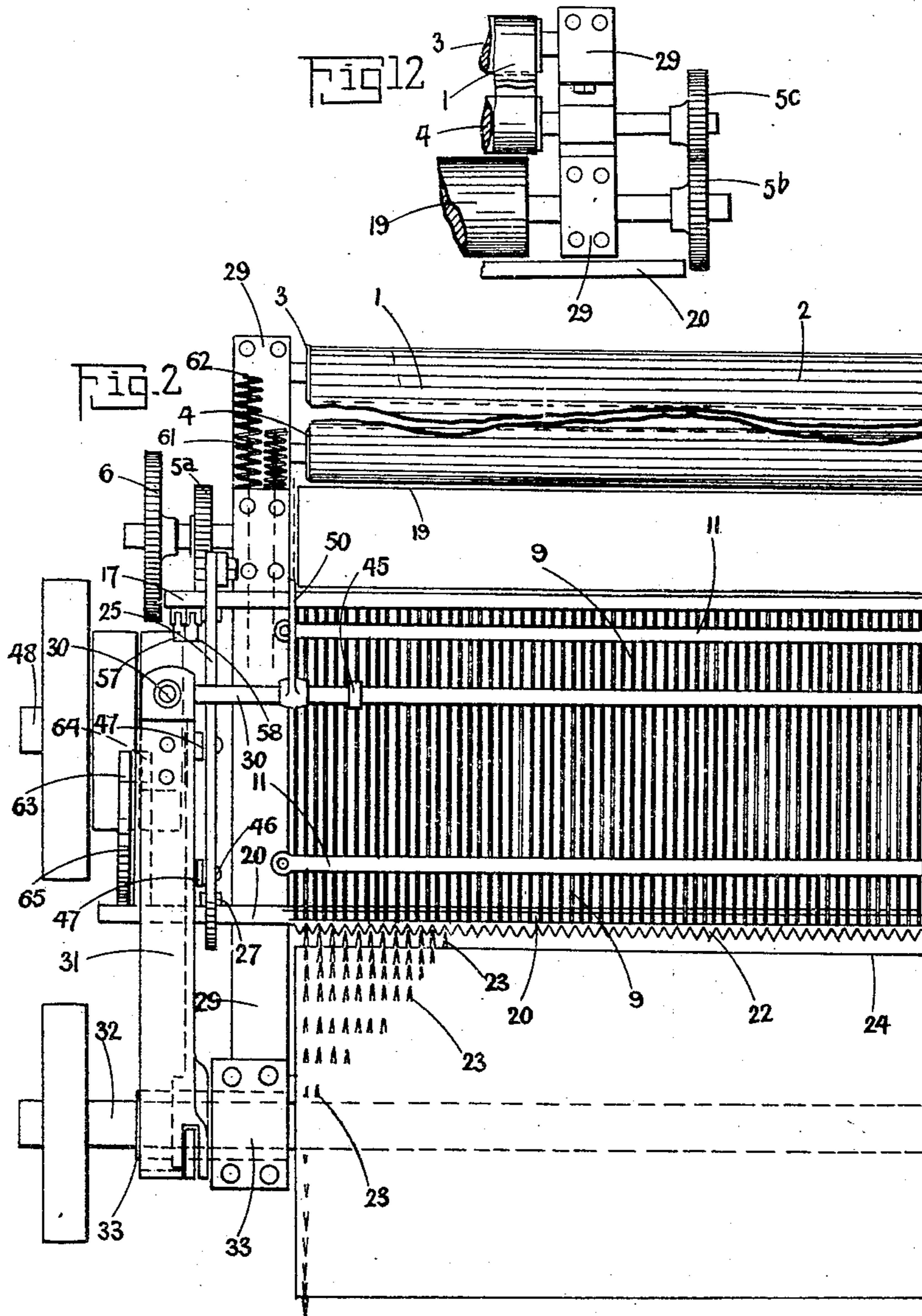
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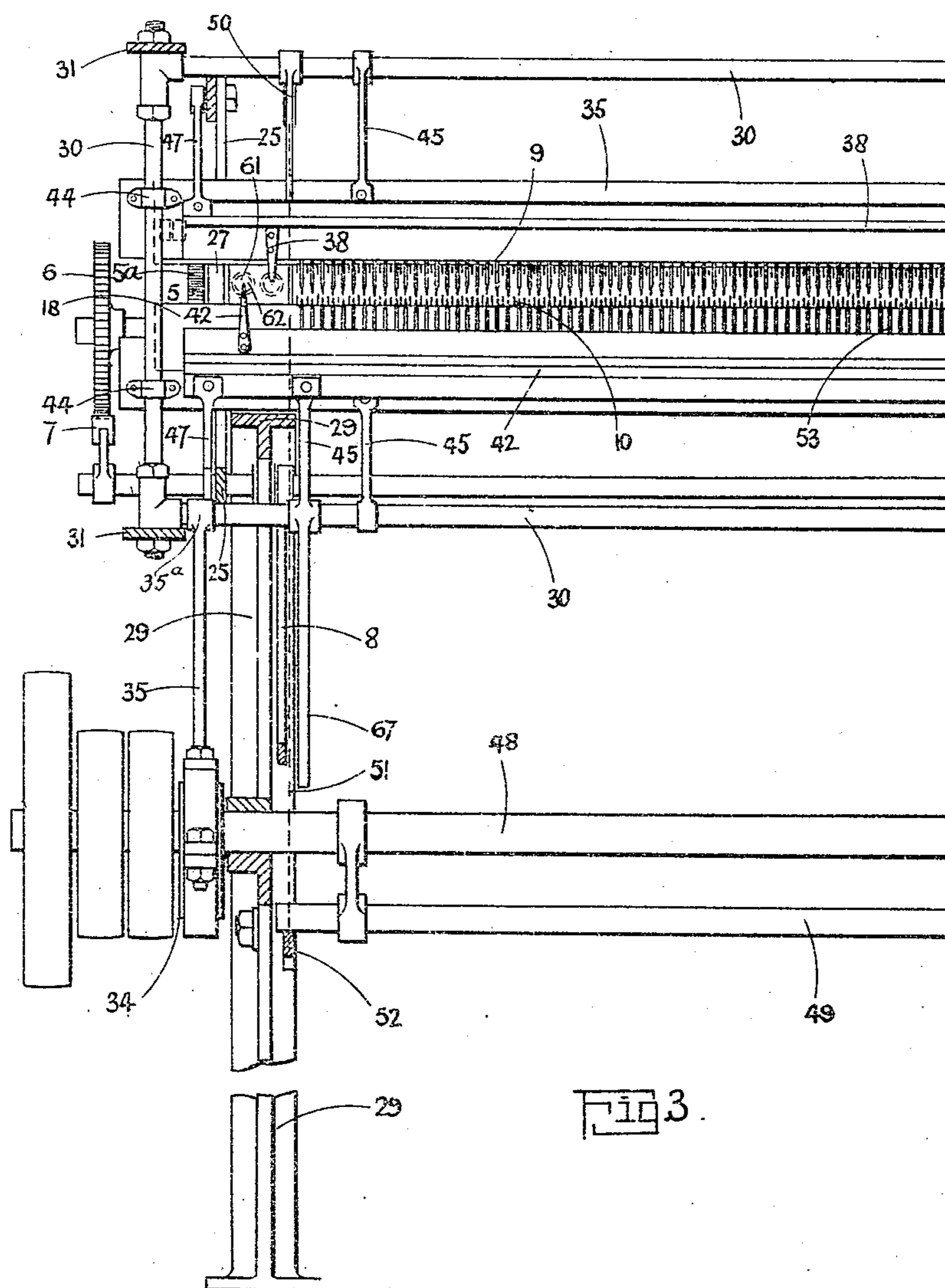


Fig 3.

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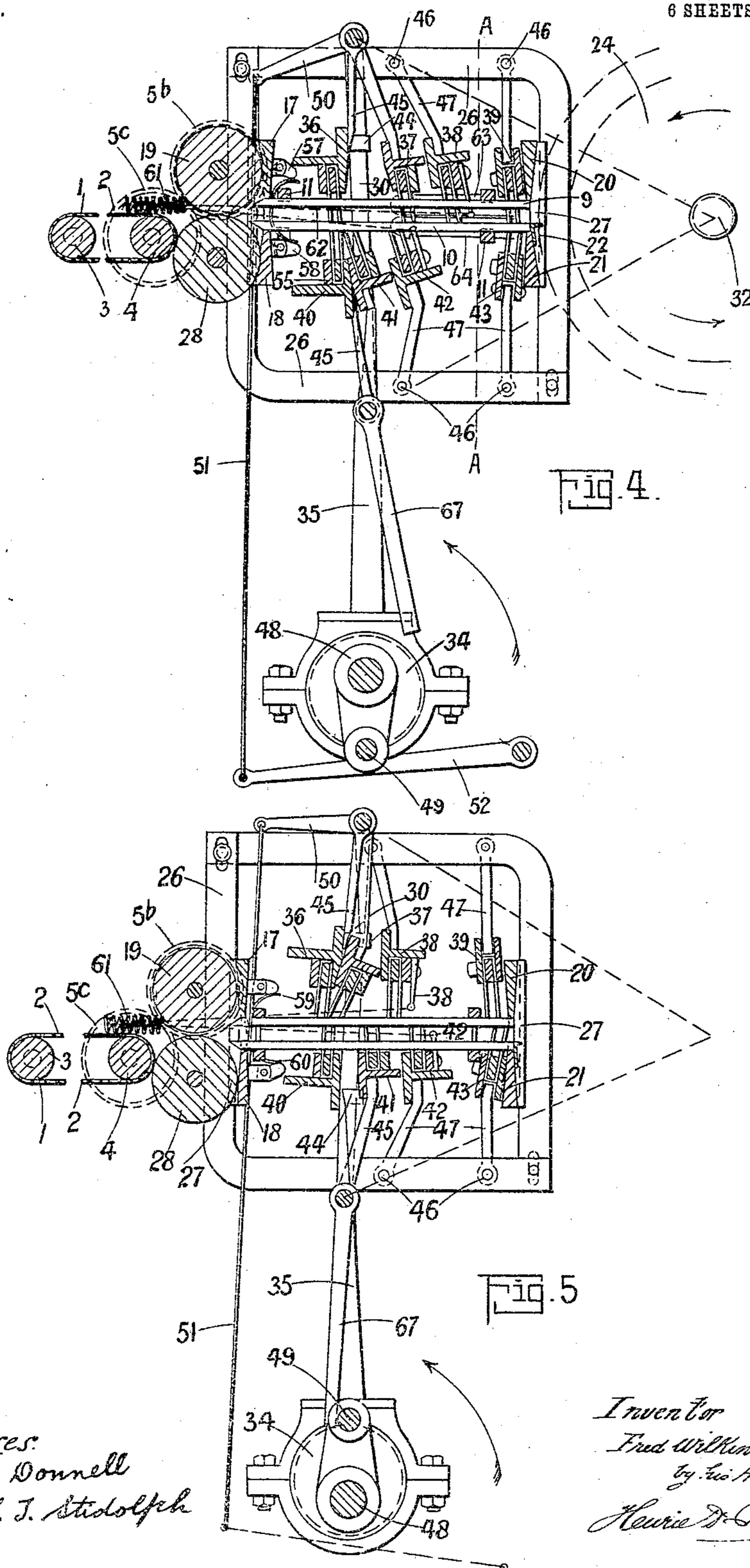
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6 SHEETS—SHEET 4.



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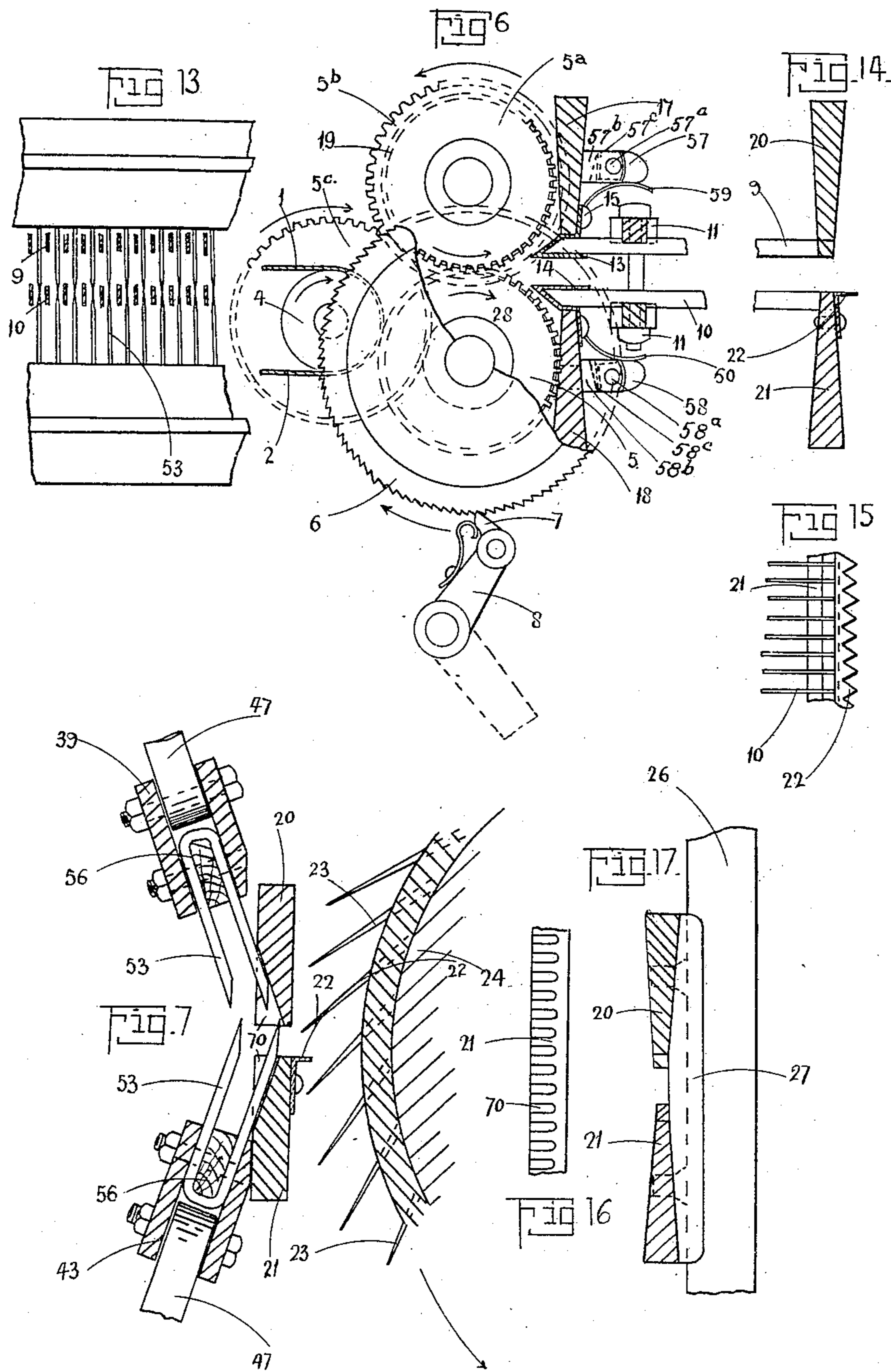
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NO MODEL.

6 SHEETS—SHEET 5.



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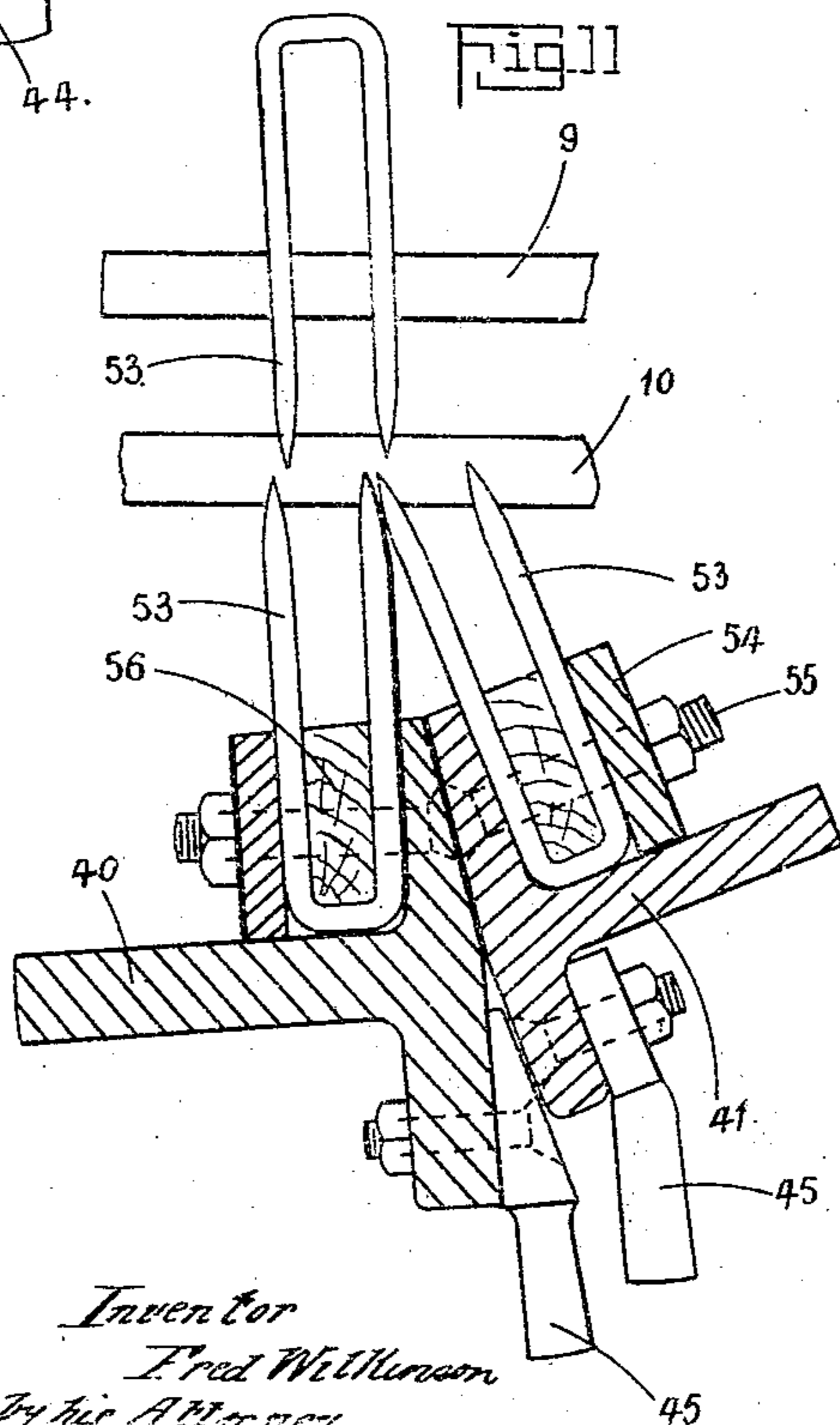
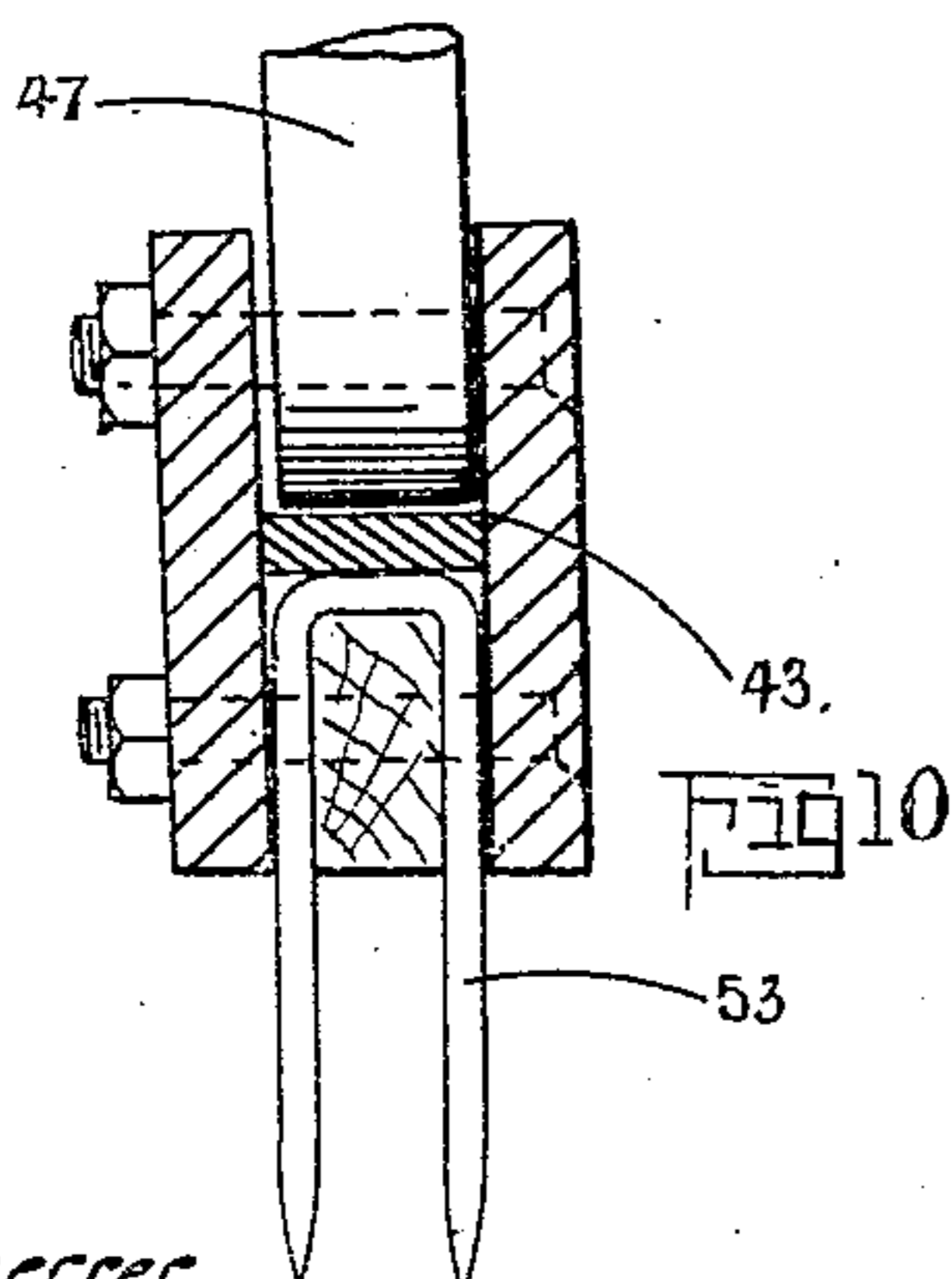
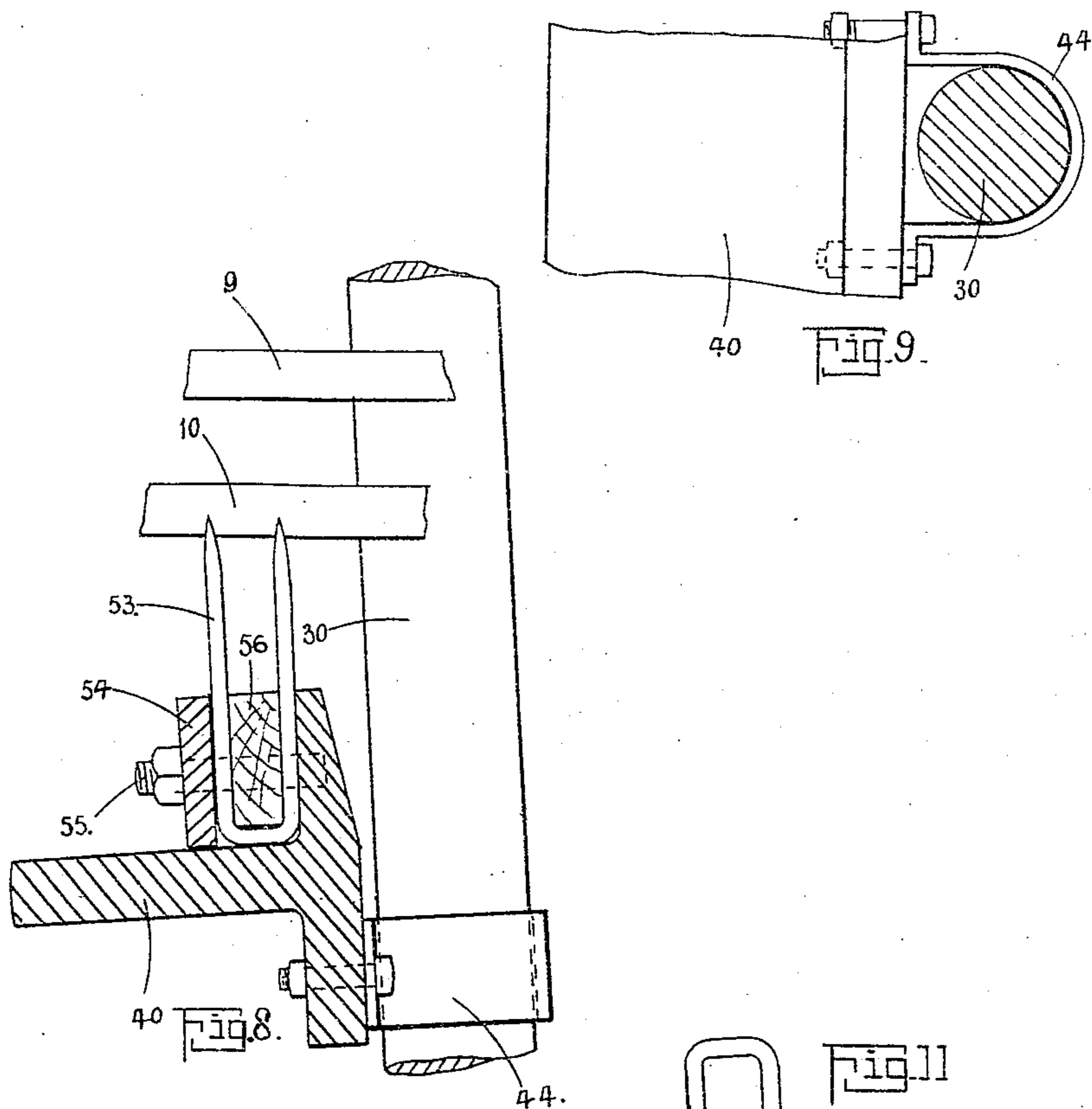
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APPLICATION FILED JUNE 1, 1903.

NO MODEL.

6 SHEETS—SHEET 6.



Witnesses.
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UNITED STATES PATENT OFFICE.

FRED WILKINSON, OF PETONE, NEW ZEALAND.

FIBER-PULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 765,723, dated July 26, 1904.

Application filed June 1, 1903. Serial No. 159,673. (No model.)

To all whom it may concern:

Be it known that I, FRED WILKINSON, a subject of His Majesty the King of Great Britain, residing at Britannia street, Petone, in the Provincial District of Wellington, in the Colony of New Zealand, have invented new and useful Improvements in Fiber-Pulling Machines, of which the following is a full, clear, and exact description.

In my apparatus the material to be pulled is passed between superposed gratings and sets of comb-teeth pass from above and below the gratings through the strands of the material. The teeth have intermittent movement imparted to them, whereby the material is held by one set of teeth while a transverse strand is pulled away by the other set. Means are employed for feeding the material to and carrying it forward between the gratings.

Reference is to be had to the accompanying drawings, forming a part of this specification.

Figure 1 is an end elevation; Fig. 2, a plan; Fig. 3, a half cross-sectional elevation on line A A, Fig. 4; Fig. 4, a longitudinal section of part of the machine; Fig. 5, a similar section with the mechanism reversed; Fig. 6, a longitudinal section of feed mechanism on a larger scale; Fig. 7, a section of comb-bars and toothed roller; Figs. 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, details of construction to be hereinafter explained.

Referring to the drawings, 1 is an endless traveling band, having slats 2 and passing around rollers 3 and 4, which are carried in bearings 29^a and 29^b of the frame 29 of the machine. Intermittent motion is communicated to the roller 4 by the lever 8 and pawl 7 through the ratchet-wheel 6, toothed wheels 5 and 5^a, and toothed wheels 5^b and 5^c. The feed-rollers 19 and 28 revolve with the wheels 5 and 5^a.

9 and 10 are gratings, preferably constructed of strips of flat steel, secured in frames 11 and kept at regular intervals apart by slots in the said frames. The front ends of these bars are formed into a mouthpiece by lips 13 and 14, of sheet metal, secured by flanges 15 and 16 to the transverse frames 17 and 18. The rear end of the gratings pass into slots in the rear transverse frames 20 and 21, and beyond

the end of the lower grating 10 a serrated plate 22 is fixed to the frame 21. The teeth 23 of the roller 24 pass into the serrations of the plate 22. The transverse frames 18 and 21 are bolted to the main frame 29 of the machine.

25 and 26 are vertical frames fitted into guides 27, secured to the transverse frames 18 and 21. The transverse frames 17 and 20 are carried by the guides 27. 30 is a transverse lifting-frame surrounding the vertical frames 25 and 26 and bolted to rocking arms 31, which are pivoted upon a shaft 32, mounted in bearings 33 upon the frame 29. Motion is communicated to the lifting-frame 30 and thence to the vertical frames 25 and 26 by an eccentric cam 34 and eccentric-rod 35, the eccentric cam being mounted upon the main driving-shaft 48, the eccentric-rod 35 having an eye 35^a, which is passed upon the lower transverse member of the frame 30. The vertical frames 25 and 26 fit between the upper and lower transverse members of the frame 30.

36, 37, 38, and 39 are comb-carrying bars forming an upper set, and 40, 41, 42, and 43 are other similar but inverted comb-carrying bars forming a lower set. Bars 36 and 40 are pivoted to the frame 30 by hangers 45 and connected to the vertical members of the lifting-frame 30 by straps 44, bars 37 and 41 are pivoted by their hangers 45 upon the horizontal members of the said frame, and bars 38, 39, 42, and 43 are pivoted to the vertical frames 25 and 26 by pins 46 and hangers 47. The hangers 45 of bar 41 are extended downward to form levers 67, which are operated at each revolution of the shaft 48 by the wiper-bar 49, which extends across the machine. Similarly the hangers 45 of bar 37 are formed into bell-cranks with arms 50, which are operated by cords 51 and levers 52, also receiving motion from the said wiper-bar.

The comb-carrying bars are made, preferably, of T-bars and are chamfered, as shown on a large scale in Fig. 11, to allow the points of the teeth of one comb-bar to meet the teeth of the next bar, and the combs comprise teeth 53, made, preferably, of steel wire bent into the shape of staples, which are secured in an angle of the T-bar by a flat bar 54 and bolts 55.

Distance or filling pieces 56, of wood, are used between the teeth, which are evenly spaced laterally and arranged so that they pass between openings in the gratings when the comb-carrying bars are operated.

Referring more particularly to Fig. 6, 57 and 58 are detents pivoted upon pins 57^a and 58^a in jaws 57^b and 58^b and operated by springs 59 and 60. Shoulders 57^c and 58^c upon the detents contact with the bottom of the jaws 57^b and 58^b, and the said detents are thus held by the springs 59 and 60 in the positions shown in Fig. 6. During the operation of the machine the bars 36 and 40 contact with these detents, which yield to the impact of the said bars to the position shown by detent 57 in Fig. 4 at the commencement of the stroke, and thus prevent shock to the parts. The spiral springs 61 have cords or rods 62 attached to the bars 38 and 42 and tend to draw the said bars toward the front of the machine. 63 and 64 are catches pivoted to the frame by pins 63^a and operated by springs 65 and 66, and during the rearward movement of the bars 37 and 38 or of the bars 41 and 42 the sloping ends of the catches 63 and 64 pass upon the bar 37 or 41 until the shoulders 63^b and 64^b of the said catches engage the bar 37 or 41. In Fig. 4 the upper bars are shown in the position they occupy when inserted in the material upon treatment, and the bar 37 is therein shown engaged by the catch 63. When the frame 30 is raised, the bar 37 is raised with it and is thus released from the catch 63.

The operation of the machine is as follows: The material to be operated upon is placed upon the endless traveling band 1, by which it is fed intermittently between the feed-rollers 19 and 28, the lever 8 of the feed mechanism being operated by the wiper-bar 49. Thence it passes into the space between the gratings 9 and 10, where it is operated upon by the teeth 53 of the combs. In the positions of the parts shown in Fig. 4 the lower set of bars 40, 41, 42, and 43 are lowered below the grating 10 and the upper set of bars 36, 37, 38, and 39 are lowered into the spaces of the grating 9. As the eccentric rotates in the direction shown by the arrow the wiper-bar 49 carries the levers 67 to the position shown in Fig. 5, and the bars 41 and 42 are carried rearwardly, while the bar 40 remains stationary, or nearly so, as shown. The material is thus held by the bar 40, while the bars 41 and 42 drag away such part of the material as shall have passed the bar 40. The catches 64 detain the bars 41 and 42 until the teeth 53 are lowered by the eccentric below the grating 10. When released, these bars revert to the positions shown by Fig. 4 under the action of the spiral springs 61, the bar 42 pushing the bar 41 and during such return stroke do not touch the material. The bar 40 is forced a minute distance by the bars 41 and 42 toward the front of the machine, the straps 44, which

are attached to the said bars and pass around the vertical members of the frame 30, (see Fig. 9.) being made large enough to provide for this movement, and when the teeth of the said bar 40 rise again they engage in a fresh strip of material. The movement of the bar 40 toward the rear of the machine is effected by the dragging of the material by the bars 41 and 42 while the teeth of the bar 40 are inserted in the material. The eccentric then lowers the lifting-frame and the upper set of bars are brought into operation by means of the lever 50 and cord 51, the succeeding operations of these bars being similar to those just described in reference to the lower set. The final separation of the fibers is effected by the bars 39 and 43, the toothed roller 24, and the serrated plate 22, the said bars regulating the passage of the material and preventing the roller dragging away irregular quantities.

The fibers of some materials can be sufficiently separated without using the toothed roller 24 and the serrated plate 22, and other fibers can be separated without using the bars 36, 37, 38, 40, 41, and 42 or the grating 9 and 10 and using merely the transverse bars 20 and 21, the comb-bars 39 and 43, the serrated plate 22, and the roller 24, as shown in Fig. 7. In this latter case the comb-bars merely regulate the passage of the material, while the roller and serrated plate effectuate the separation of the fibers, and in this case the gratings 9 and 10 are dispensed with and replaced by grooves 70, formed in the bars 20 and 21 and into which the teeth 53 enter, as shown in Figs. 7 and 17.

In this specification double sets of combs have been described, one above and one below the gratings; but it will be understood that one set only, either above or below the gratings, will operate alone; but it is preferable to have a double set, as described, for the sake of treating more material in a given time.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In apparatus for the purpose described, comb-bars provided with teeth for regulating the passage of the material, other comb-bars provided with teeth for separating the fibers of the material and gratings into the spaces of which the ends of the teeth enter, substantially as set forth.

2. In apparatus for the purpose described comb-bars provided with teeth for regulating the passage of material, other comb-bars provided with teeth for separating the fibers of the material, gratings into the spaces of which the ends of the teeth enter, a serrated plate at the rear of the gratings and a toothed roller, the teeth of which pass through the serrations of the said plate, substantially as set forth.

3. In apparatus for the purpose described, comb-bars provided with teeth for regulating the passage of material, other comb-bars pro-

vided with teeth for separating the fibers of the material, frames to which the comb-bars are pivoted, an eccentric cam mounted on the driving-shaft of the machine for operating the said frames, and a wiper-bar and lever for operating the fiber-separating comb-bars, substantially as set forth.

4. In apparatus for the purpose described, comb-bars provided with teeth for regulating the passage of material, other comb-bars provided with teeth for separating the fibers of the material, frames to which the comb-bars are pivoted and spring-operated catches for detaining the fiber-separating bars until their teeth are lowered below the gratings, substantially as set forth.

5. In apparatus for the purpose described, comb-bars at the front of the machine straps for connecting the said bars to the vertical members of the lifting-frame, spiral springs for operating the comb-bars, and spring-operated detents for preventing shock to the parts when the comb-bars return toward the front of the machine, substantially as set forth.

6. Apparatus for the purpose described, comprising in combination, an endless traveling band and feed-rollers by which material is fed intermittently to the machine, means

for operating the said band and rollers, gratings between which the material passes, lips upon the gratings, combs for holding the material, other combs for separating the fibers of the material, means for operating the combs, a toothed roller at the rear of the machine and a serrated plate with which the toothed roller operates, substantially as set forth.

7. In apparatus for the purpose described, a comb comprising a T-shaped bar, teeth bent into the shape of a staple, a clamping-bar bolted to the said bar, and distance-piece passing through the teeth, substantially as set forth.

8. In apparatus for the purpose described vertical frames, comb-bars pivoted thereon, spring-operated catches for detaining the said bars, teeth carried by the comb-bars, and gratings receiving said teeth, with means for operating the comb-bars, substantially as set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRED WILKINSON.

Witnesses:

E. S. BALDWIN,
S. STIDOLPH.