

No. 719,676.

PATENTED FEB. 3, 1903.

W. B. LEE & W. FISHER.

DRAWING OFF MECHANISM FOR COMBING MACHINES.

APPLICATION FILED MAR. 1, 1901.

NO MODEL.

4 SHEETS—SHEET 1.

FIG 1.

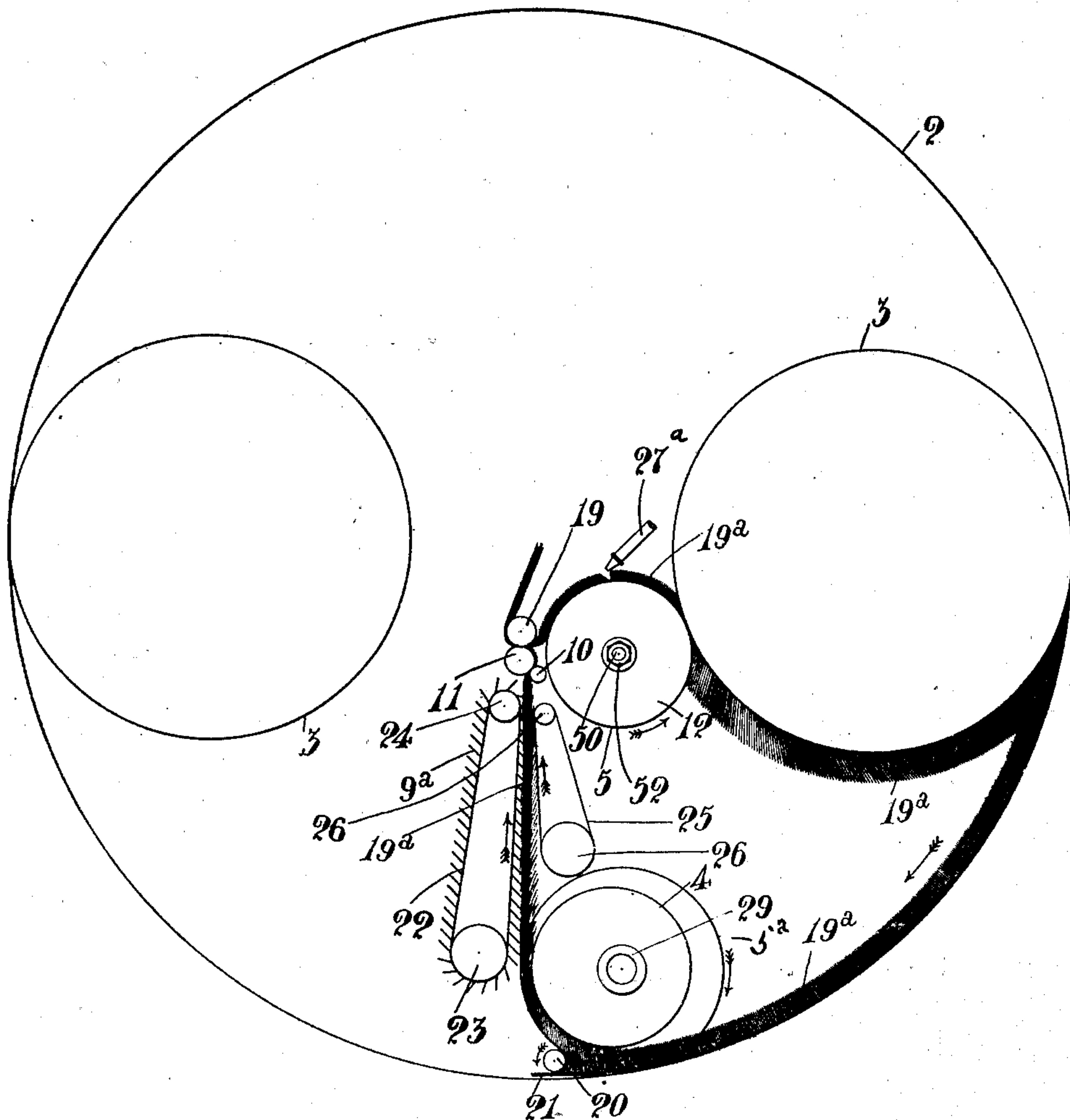


FIG 8.

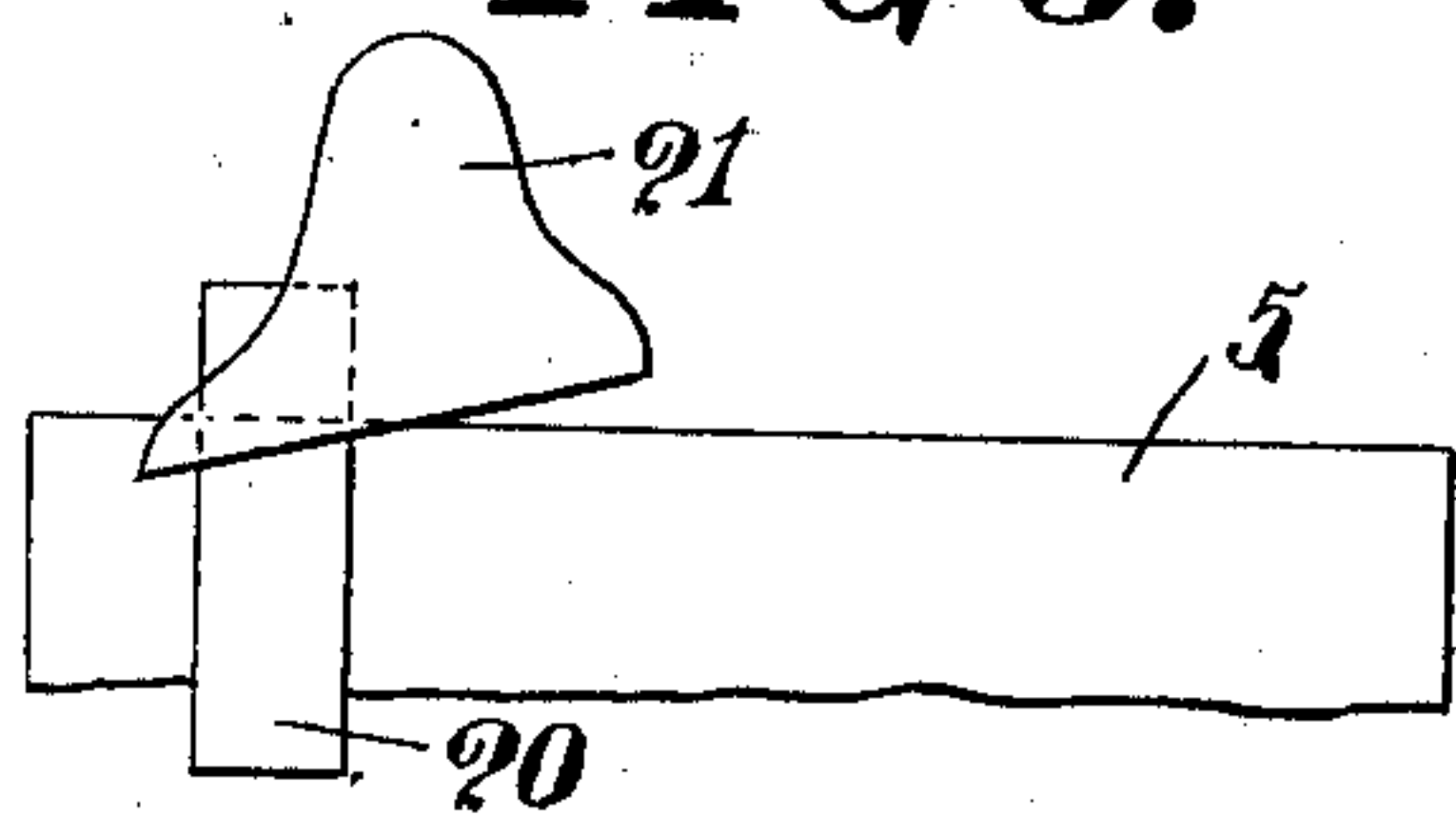
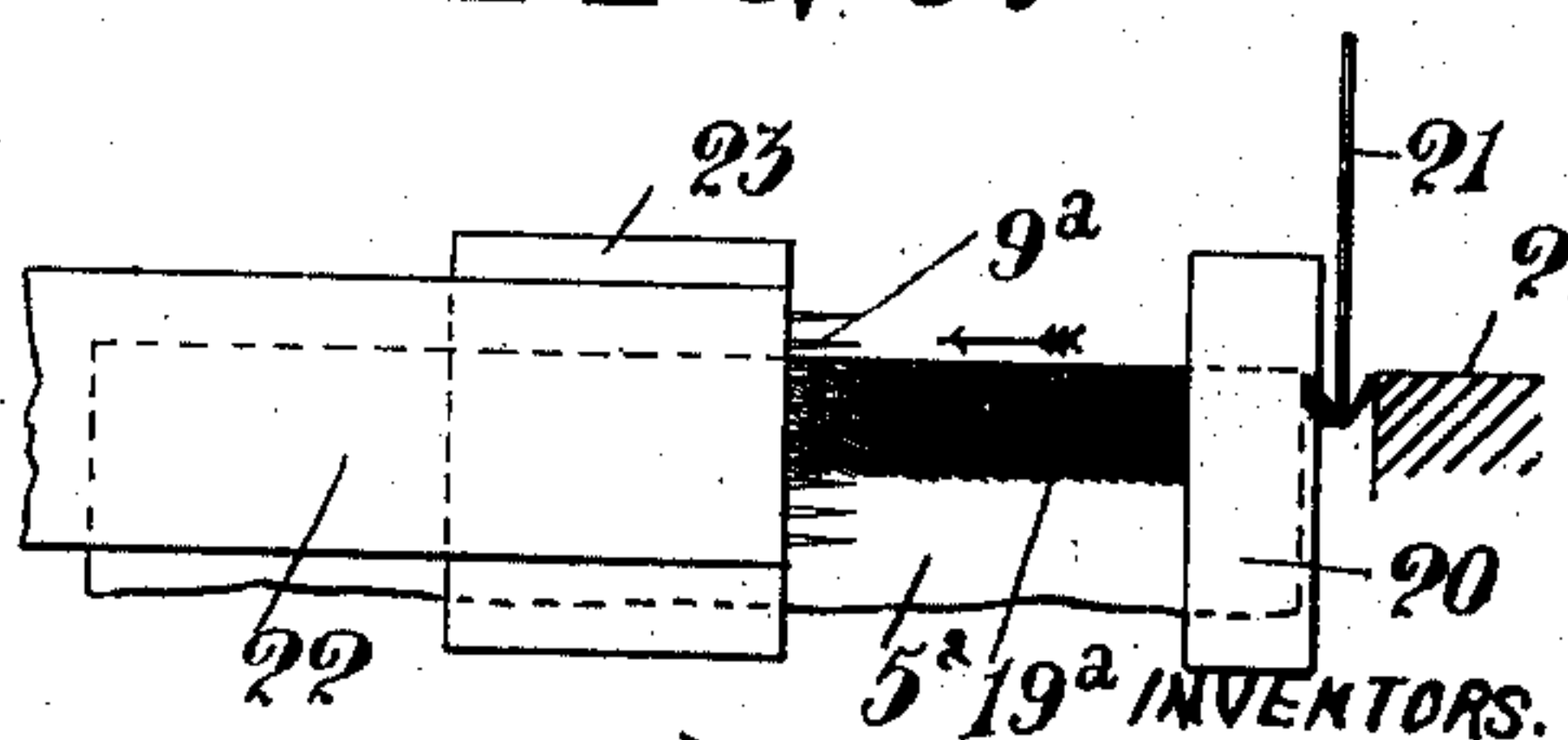


FIG 9.



WITNESSES:

Ella L. Gies
Oliver Munn

William Broadway Lee
William Fisher

BY

Richard R.

ATTORNEYS

No. 719,676.

PATENTED FEB. 3, 1903.

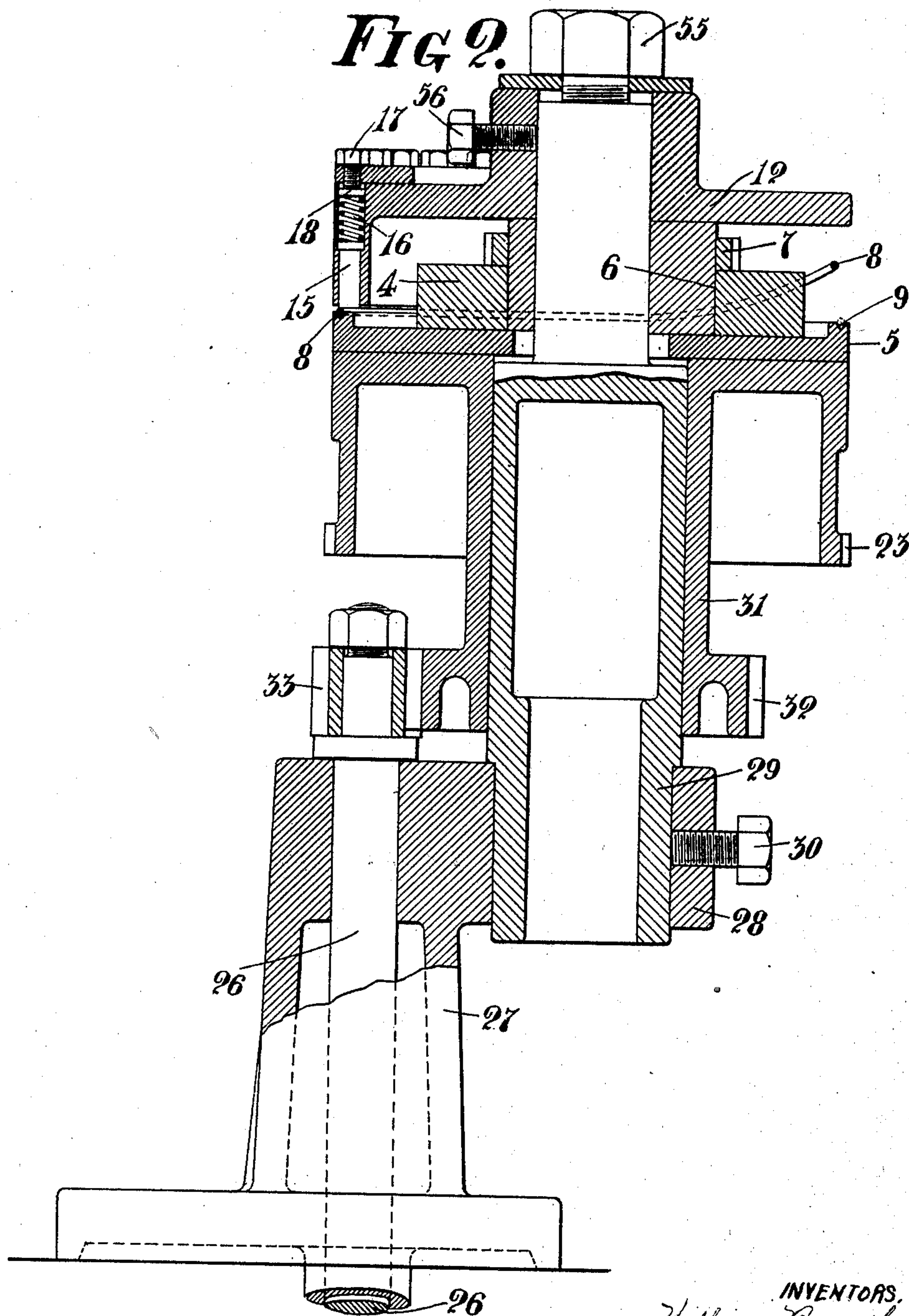
W. B. LEE & W. FISHER.

DRAWING OFF MECHANISM FOR COMBING MACHINES.

APPLICATION FILED MAR. 1, 1901.

NO MODEL.

4 SHEETS—SHEET 2.



WITNESSES:
Ella L. Giles
Edmund

INVENTORS.
William Bradley Lee
William Fisher
BY *Richard R.*
ATTORNEYS

No. 719,676.

PATENTED FEB. 3, 1903.

W. B. LEE & W. FISHER.

DRAWING OFF MECHANISM FOR COMBING MACHINES.

APPLICATION FILED MAR. 1, 1901.

NO MODEL.

4 SHEETS—SHEET 3.

FIG 3.

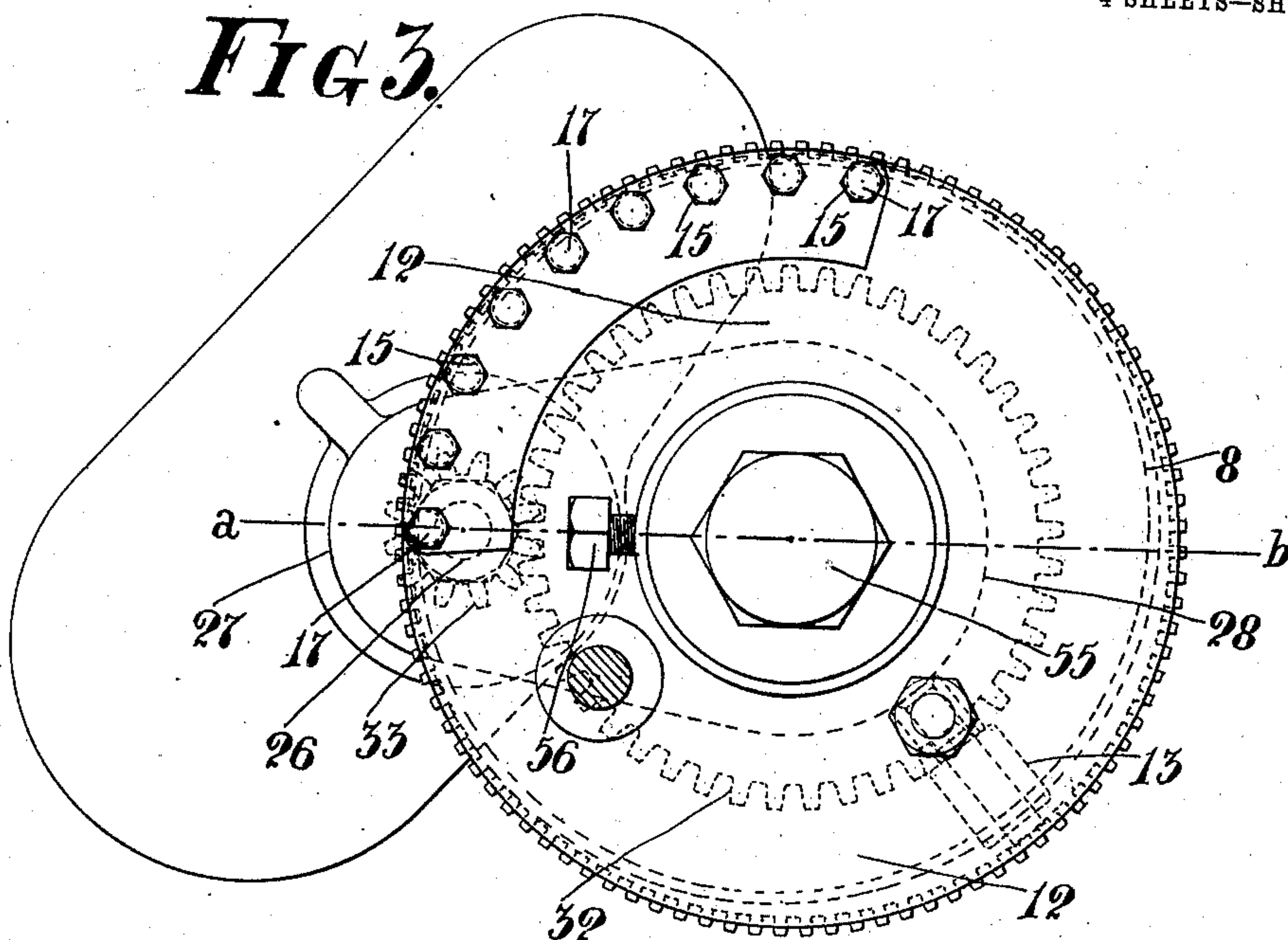
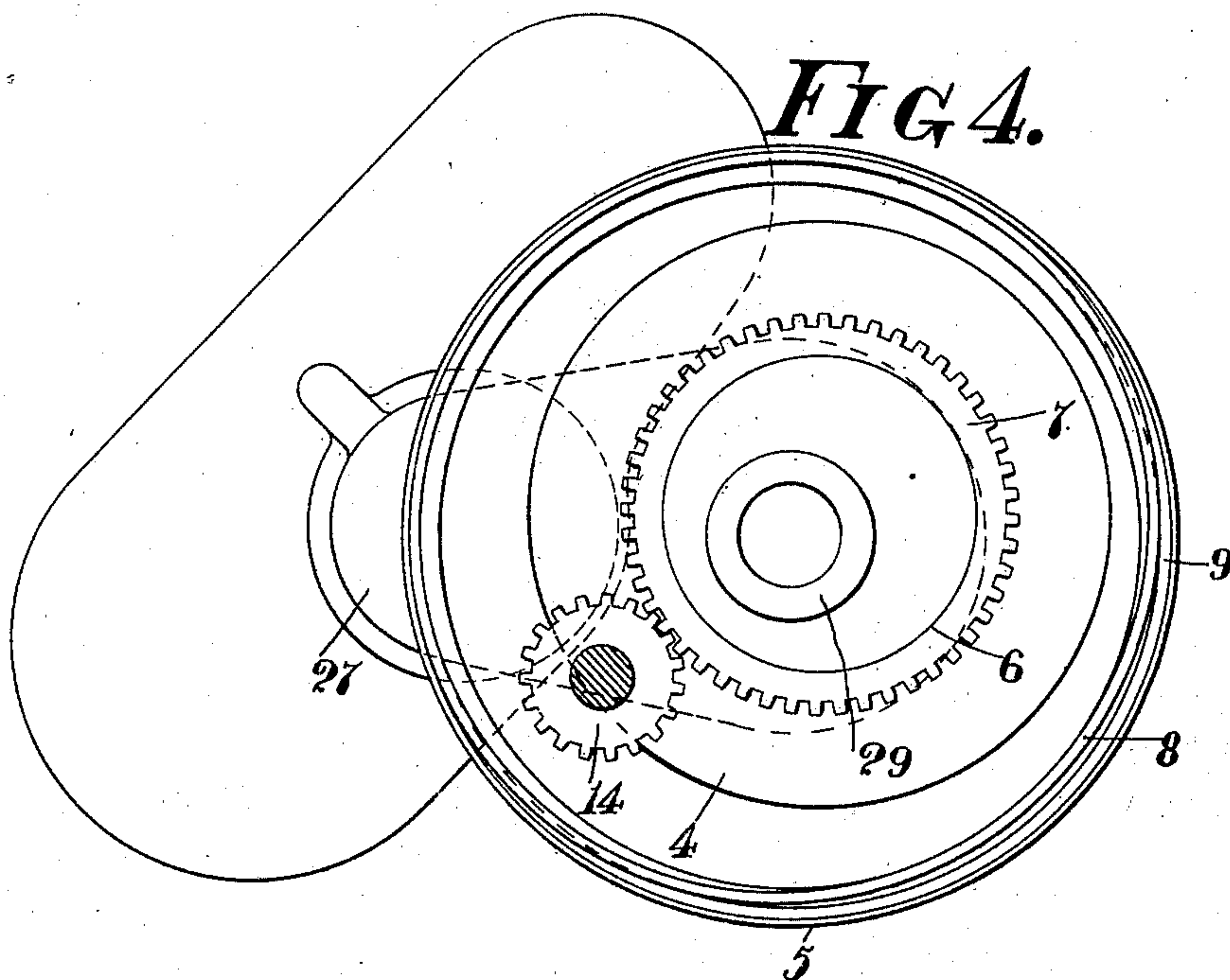


FIG 4.



WITNESSES:
Elias L. Giles
Albion

INVENTORS.
William Bradley Lee
William Fisher
BY
Richardson
ATTORNEYS

No. 719,676.

PATENTED FEB. 3, 1903.

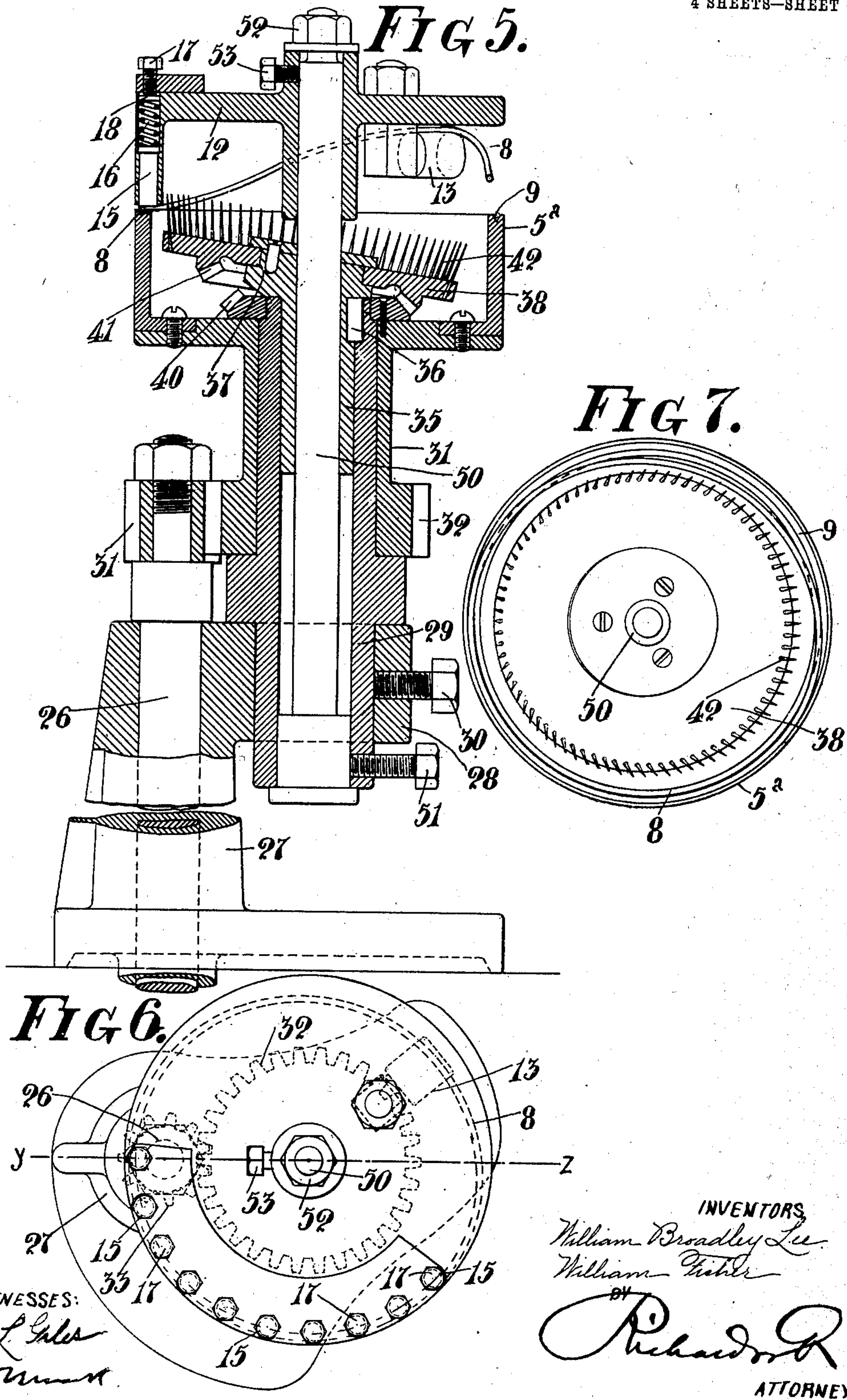
W. B. LEE & W. FISHER.

DRAWING OFF MECHANISM FOR COMBING MACHINES.

APPLICATION FILED MAR. 1, 1901.

NO MODEL.

4 SHEETS—SHEET 4.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON D. C.

UNITED STATES PATENT OFFICE.

WILLIAM BROADLEY LEE AND WILLIAM FISHER, OF BRADFORD, ENGLAND.

DRAWING-OFF MECHANISM FOR COMBING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 719,676, dated February 3, 1903.

Application filed March 1, 1901. Serial No. 49,383. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BROADLEY LEE, residing at Providence Iron Works, Bradford, and WILLIAM FISHER, residing at 19 Farfield Terrace, Bradford, England, subjects of the King of England, have invented certain new and useful Improvements in Drawing-Off Mechanism of Combing-Machines, of which the following is a specification.

This invention relates to improvements in drawing-off mechanism for machines for combing wool and other fibrous material; and its object is to provide a cheap and efficient substitute for the ordinary drawing-off rollers and leathers. For this purpose we employ an endless traveling wire or band or a sufficiently flexible equivalent in combination with a grooved disk or the like for drawing off the fibers. The disk, wheel, or the like is mounted as close as may be to the comb and revolves, preferably, at a greater peripheral speed to that of the comb, the increase being greater the longer the fibers to be dealt with. The upper face of the disk lies within or approximately within the plane in which the fibers are drawn off, and there is an annular groove formed around it near the edge. An annular or endless wire, ribbon, or band works in that portion of the groove whereby the fibers are drawn off, and the remainder of the wire or band travels in a path at an angle thereto, so as to allow the fringe of fibers to pass between the groove and the traveling wire and also allow the drawn-off fibers to be released therefrom. The wire or band is pressed down in the groove upon the fibers lying across it by a suitable presser or pressers bearing upon the wire, so as to freely lay hold of the fibers and draw them off as the disk and wire rotate. The fibers are drawn off where the periphery of the disk and the periphery of the comb meet and diverge from each other in a similar manner to the large and small circles of a Noble comb, and the drawn-off fibers are dealt with in any convenient way. A disk or disks or other suitable guide or guides is or are provided to guide the wire in its inclined path. Two or more wires and grooves may be used.

To fully describe our invention, reference is made to the accompanying sheets of draw-

ings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in each of the views.

Figure 1 represents a plan view of such parts of a Noble comb as are necessary to illustrate the application. Fig. 2 is a vertical section on the broken line *a b* in Fig. 3, with a portion of the pedestal in full, of the drawing-off appliance for the large circle. Fig. 3 is a plan view of the same, and Fig. 4 is a plan view of the same without the presser-plate. Fig. 5 is a vertical section of the drawing-off appliances for the small circles on the broken line *y z*. Fig. 6 is a plan view of the same, and Fig. 7 is a plan view without the presser-plate. Figs. 8 and 9 are detail views showing the roller 20 and inclined pressing-plate 21.

The circle 2 represents the inner periphery of the large comb-circle, and the circles 3 the outer peripheries of the two small circles.

The drawing-off wheel is practically the same for both the large and the small circles, excepting as regards size, and they have a more or less V-shaped groove 9 formed in them. These draw-off wheels 5 and 5^a are driven at a greater peripheral speed than that of the adjacent peripheries of the comb-circles from which they draw off. The arrows, Fig. 1, indicate the direction of rotation. An endless wire 8, of steel or any other suitable material of sufficient flexibility and durability, lies partly in and partly above the grooves 9, and it is essential that the wires travel with the wheels 5 and 5^a, and the V shape of the grooves insures this. The portion of the wires lying in the grooves extends from the point in the wheel when the periphery of the wheel begins to leave the circle and the point or almost the point when the fibers are taken off the wheel, and the wire is pressed down in the grooves between these points by the fixed presser-plate 12. The wire is lifted during the remainder of its path sufficiently to allow the fringe of fibers projecting from the circle to pass underneath and also allow the drawn-off fibers to be withdrawn. This can be conveniently done by a guide-roller 13, mounted on the under side of the presser-plate 12. It will be understood that while the wire and the wheel both travel the sector of the wheel in engagement with

the wire is suspended in its position with regard to the bed of the machine and the circle 2.

To allow of a certain amount of variation in the thickness of the fringe, we do not let the presser-plates press directly upon the wire, but we introduce spring-studs 15 in such plates. These studs are pressed down through holes in the plates by spiral springs 16, placed in recesses above them, and their pressure is regulated by the screws 17, bearing upon the disks 18 above them. It is obvious that any or all of these studs 15 can be replaced by antifriction-rollers, and it is probably an advantage to use rollers at the commencement of the nip—that is to say, when the pressure between the wire and groove requires to be greater. We find it is an advantage to use a small roller 20, which may be driven at the same peripheral speed as the wheel 5 at the position shown in relation to the large circle and the drawing-wheel. These rollers may be driven by the friction of the fibers only; but in either case we find the fringe of fibers is more completely drawn off. The fringe of fibers projecting from the wheel 5 in the large-circle drawing-off device is preferably bent down more or less against the side of the wheel by means of an inclined plate 21, (shown on a larger scale in the detail views, Figs. 8 and 9,) and it travels in this way until it reaches the endless pinned chain or apron 22, mounted upon the rollers 23 and 24. Immediately before the fibers reach the apron 22 the pressure of the wire is released, and the pins 9^a engage the fibers and carry them forward in sliver form. An endless apron 25, mounted on rollers 26 and driven at a greater speed than 22, may be employed to draw the ends of the sliver next to it forward. In this way the endless pinned chain 22 and apron 25 convey the sliver toward the center of the comb and pass it between the rollers 10 and 11, where they join the sliver directly removed from the small-circle drawing-off device by the rollers 11 and 19, and the joint slivers are passed off the comb in any convenient way. An air-jet issuing from the nozzle 27^a is preferably arranged to impinge tangentially in relation to the drawing-off device of the small circle upon the ends of the fibers projecting from such device and direct them toward the rollers 11 and 19. The lines 19^a, Figs. 1 and 9, give a general idea of the way the fibers are disposed in accordance with the above description.

We do not confine ourselves to the above methods of conveying the fibers away from the drawing-off devices, as no doubt other methods can be devised—as, for instance, when short fibers are being dealt with the same arrangement may be used for drawing off the fibers from the large circle as that herein described with reference to the small circles. One or more porcupine-rollers may be used instead of the endless chain 22.

Particularly when the studs 15 press directly upon the wire 8 the latter is preferably

lubricated on the top by a siphon-wick or the like bearing upon it and feeding it with oil at any convenient point between where it passes out and into the nip.

To facilitate bending forward the ends of the fibers within the nip of the large circle, we employ the roller 4 within such nip. This roller is mounted upon the eccentric bearing 6 on the spindle 29 and is driven faster than 5 by its spur-wheel 7 from the pinion 14, driven by a belt (not shown) from one of the rollers 24 or in any other convenient way.

We prefer when applying our improvements to existing combs to employ the combination shown in Figs. 2 and 5. In each case the driving-shaft 26 passes through a hole in the bottom plate of the comb, through which the ordinary driving-shaft of the drawing-off roller passes, and a pedestal 27 is fixed to such bottom plate. These pedestals each have an arm 28, with holes therein, in which the spindles 29 are fixed by the set-screws 30. The hubs 31 of the drawing-off wheels 5 are mounted on these spindles and are driven by their teeth 32 at their lower ends engaging the pinions 33 at the top of the shaft 26. In Fig. 5 the spindle 29 is made hollow and the piece 35 is keyed therein by the key 36. The bearing 37 is made on the top of 35 for the inclined comb 38, which is driven by the bevel-wheel 40, fixed on the wheel 5, engaging the bevel-wheel 41 on the under side of 38. Although the points of the pins 42 move in a path almost concentric with the wheel 5, the bearing 37 is not concentric with it, and thus allows the wheel 41 to be considerably larger than the wheel 40. Consequently the former does not rotate as fast as the wheel 5, and the comb-pins have a retarding effect on the inwardly-projecting fringe of fibers, thus presenting them more in sliver form to the rollers 11 and 19. The presser-plate 12 in Fig. 5 is fixed on the top of the spindle 50, fixed in the hollow spindle 29 by the set-screw 51. The presser-plate is pressed down by the nut 52 and is fixed by the set-screws 53.

In Fig. 2 the presser-plate is pressed down by the bolt 55 screwing into the top of the spindle 29, upon the top of which the presser is fixed by the set-screw 56.

We claim—

1. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto and having a groove in its working face, an endless wire rotating in unison with said wheel, a pressing device arranged to press said wire into said groove where it passes into proximity to the comb and means for lifting the wire out of the groove as it passes out of proximity to the comb, substantially as described.

2. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto and having a groove in its working face, an endless wire rotating in unison with said wheel, a yielding pressing device arranged to press said wire

into the groove as it passes into proximity to said comb, and means for raising the wire out of the groove as it passes out of proximity to said comb, substantially as described.

5 3. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto having a vertical annular flange with a groove in the edge thereof, an endless band traveling in unison
10 with said flange, a presser device for pressing said band into the groove as it passes in proximity to the comb and means for lifting said band out of the groove as it passes out of proximity to said comb, substantially as described.

15 4. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto and having a vertically-disposed circular flange with a
20 groove in its edge, an endless band rotating in unison with said flange, a presser-plate located above said wheel having a portion depending in opposition to said flange in proximity to the comb, a plurality of yielding studs
25 carried by said depending portion and adapted to press said endless band into the groove, and means for removing said band from the groove as it passes out of proximity to the comb, substantially as described.

30 5. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto, and having a vertically-disposed circular flange with a
35 groove in its edge, an endless band rotating in unison with said flange, a presser-plate located above said wheel having a portion depending in opposition to said flange in proximity to the comb, a plurality of studs slid-
40 ingly held in said depending portion and adapted to press said band into the groove when in proximity to said comb, springs in rear of said studs, screws for varying the tension of the springs, and a roller carried by the
45 under side of the presser-plate over which the band passes whereby it is lifted out of the groove as it passes out of proximity to the comb and pressing-studs, substantially as described.

50 6. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto having an upwardly-extending flange provided in its edge with a groove, an endless wire traveling in
55 unison with said flange, a pressing device for pressing said wire into the groove as it passes into proximity to the circular comb, means for elevating the wire as it passes out of proximity to the comb, and an auxiliary circular comb located within said flange with means
60 for operating it, substantially as described.

65 7. In a circular-combing machine, the combination with the circular comb, of a wheel rotating in proximity thereto having an upwardly-extending flange provided in its edge with a groove, an endless wire traveling in
unison with said flange, a pressing device for

pressing said wire into the groove as it passes into proximity to the circular comb, means for elevating the wire as it passes out of proximity to the comb, a circular comb journaled
70 within said flange having a circular rack on its under face, and a gear meshing with said rack, with means for operating the gear, substantially as described.

8. In a circular-combing machine, the combination with the circular comb, of a wheel
75 rotating in proximity thereto having an upwardly-extending flange provided in its edge with a groove, an endless wire traveling in unison with said flange, a pressing device for
80 pressing said wire into the groove as it passes into proximity to the circular comb, means for elevating the wire as it passes out of proximity to the comb, a circular comb journaled within said flange in an inclined position, a
85 bevel-rack on the under side of said comb, and a bevel-gear meshing with said rack with means for operating said gear, substantially as described.

9. In a circular-combing machine, the combination with the circular rack, of a pedestal
90 or support, a tubular spindle secured thereto, an inner spindle secured within said tubular spindle, a cup-shaped wheel journaled on said tubular spindle with means for rotating it, a
95 comb located within the cup-shaped wheel and journaled on said inner spindle, a circular rack on the under side of said comb, a gear rigidly connected with said cup-shaped wheel and meshing with said rack, an endless
100 wire traveling in unison with the cup-shaped wheel, said cup-shaped wheel having a groove in its edge and a pressing device for pressing the wire into said groove, substantially as described.

10. In a circular-combing machine, the combination with a circular comb 2, of the
wheel 5 journaled in proximity thereto and having an annular groove, an endless wire traveling in unison therewith, means for
110 pressing said wire into the groove as it passes into proximity to the comb 2, and an auxiliary roller 20 in proximity to the circular comb and wheel, substantially as described.

11. In a circular-combing machine, the combination with a circular comb 2, of the
115 wheel 5 journaled in proximity thereto and having an annular groove, an endless wire traveling in unison therewith, means for pressing said wire into the groove as it passes
120 into proximity to the comb 2, and an auxiliary roller 20 in proximity to the circular comb and wheel, and an inclined plate 21 in proximity to the auxiliary roller for pressing down the fibers, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

WILLIAM BROADLEY LEE.

WILLIAM FISHER.

Witnesses:

DAVID NOWELL,
SAMUEL DRACUP.