

No. 679,975.

Patented Aug. 6, 1901.

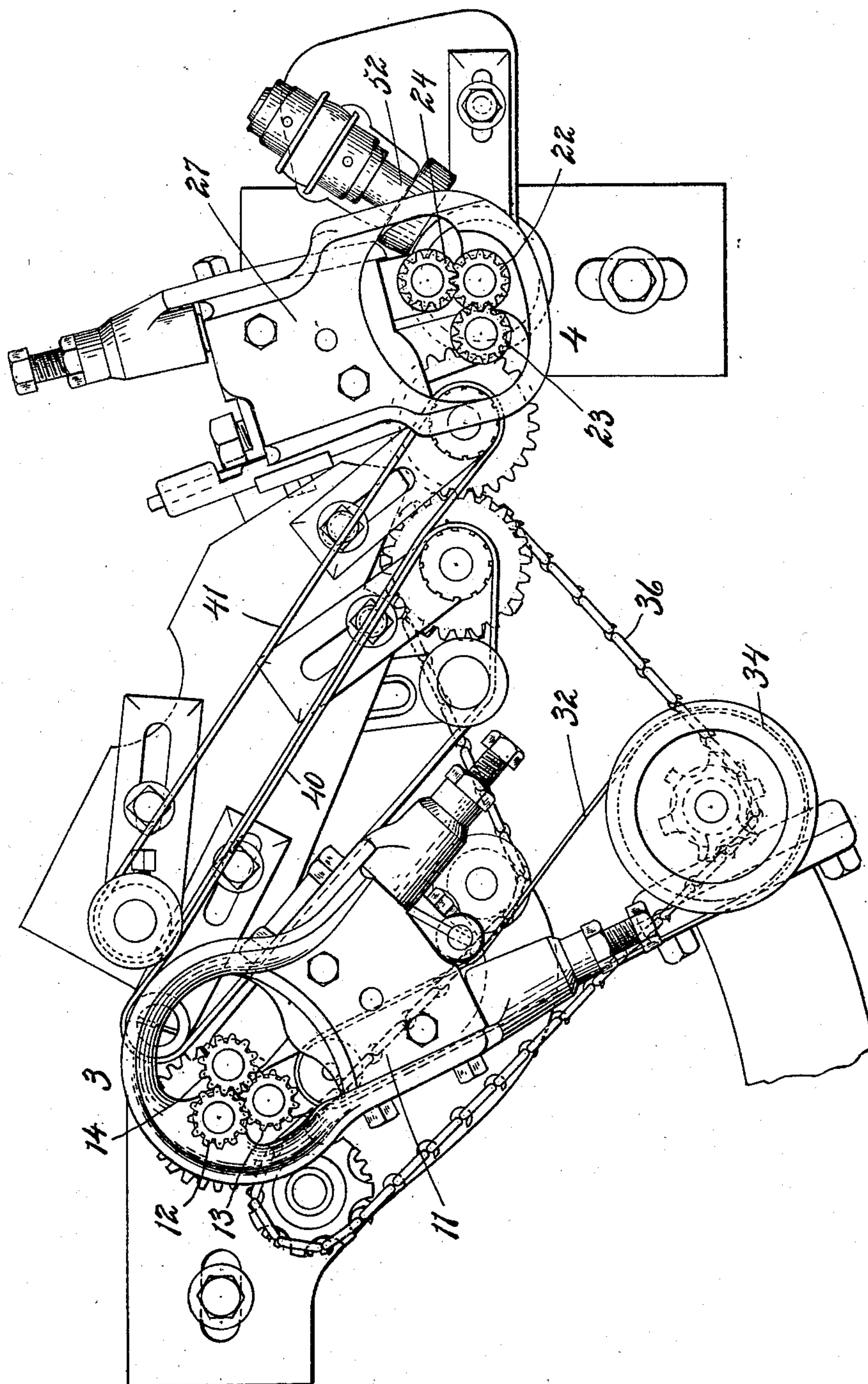
A. LONG & R. FOSTER.
DRAWING-OFF DEVICE FOR CIRCLE COMBS.

(Application filed Oct. 3, 1900.)

(No Model.)

5 Sheets—Sheet 1.

FIG. 1.



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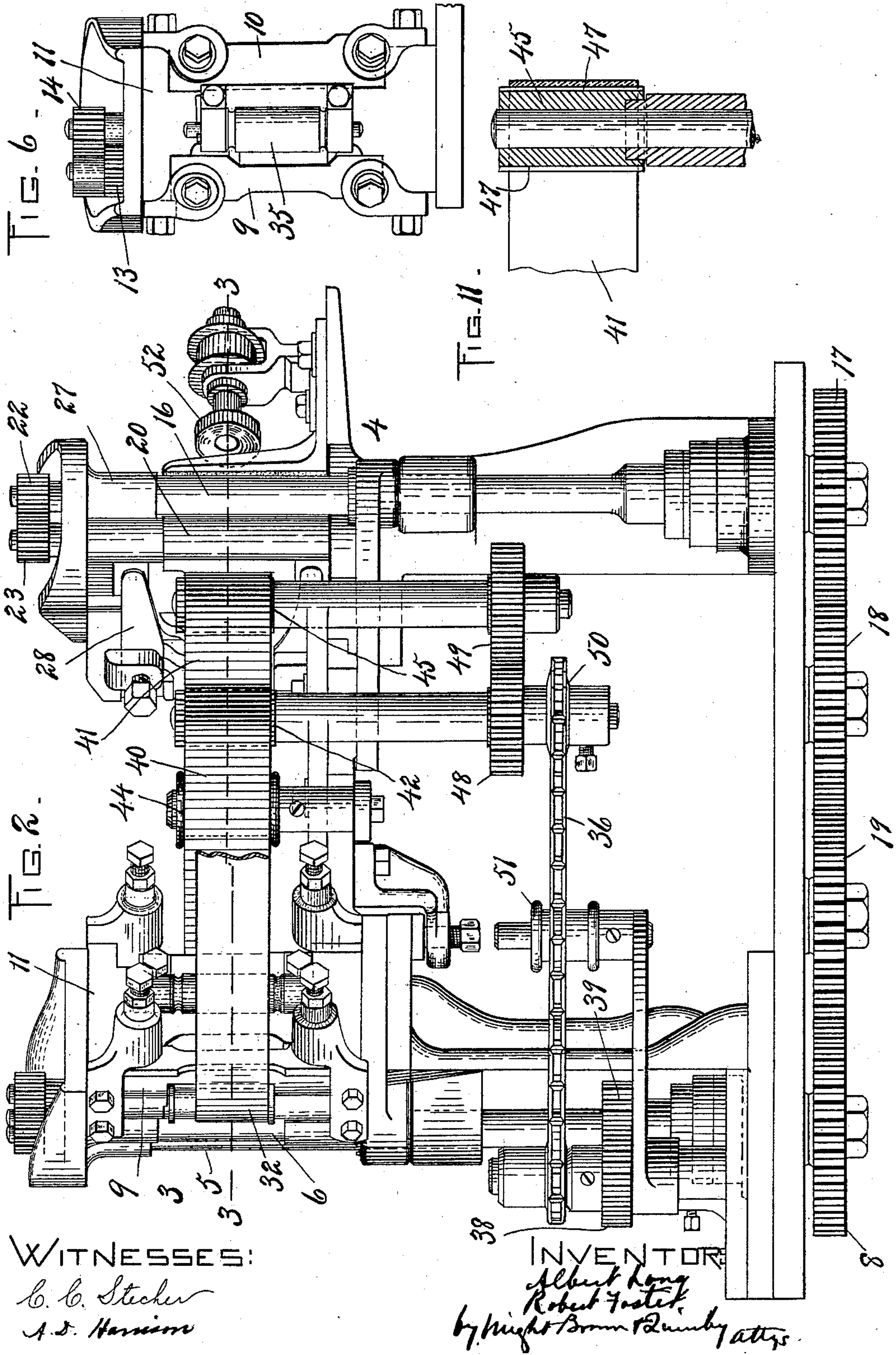
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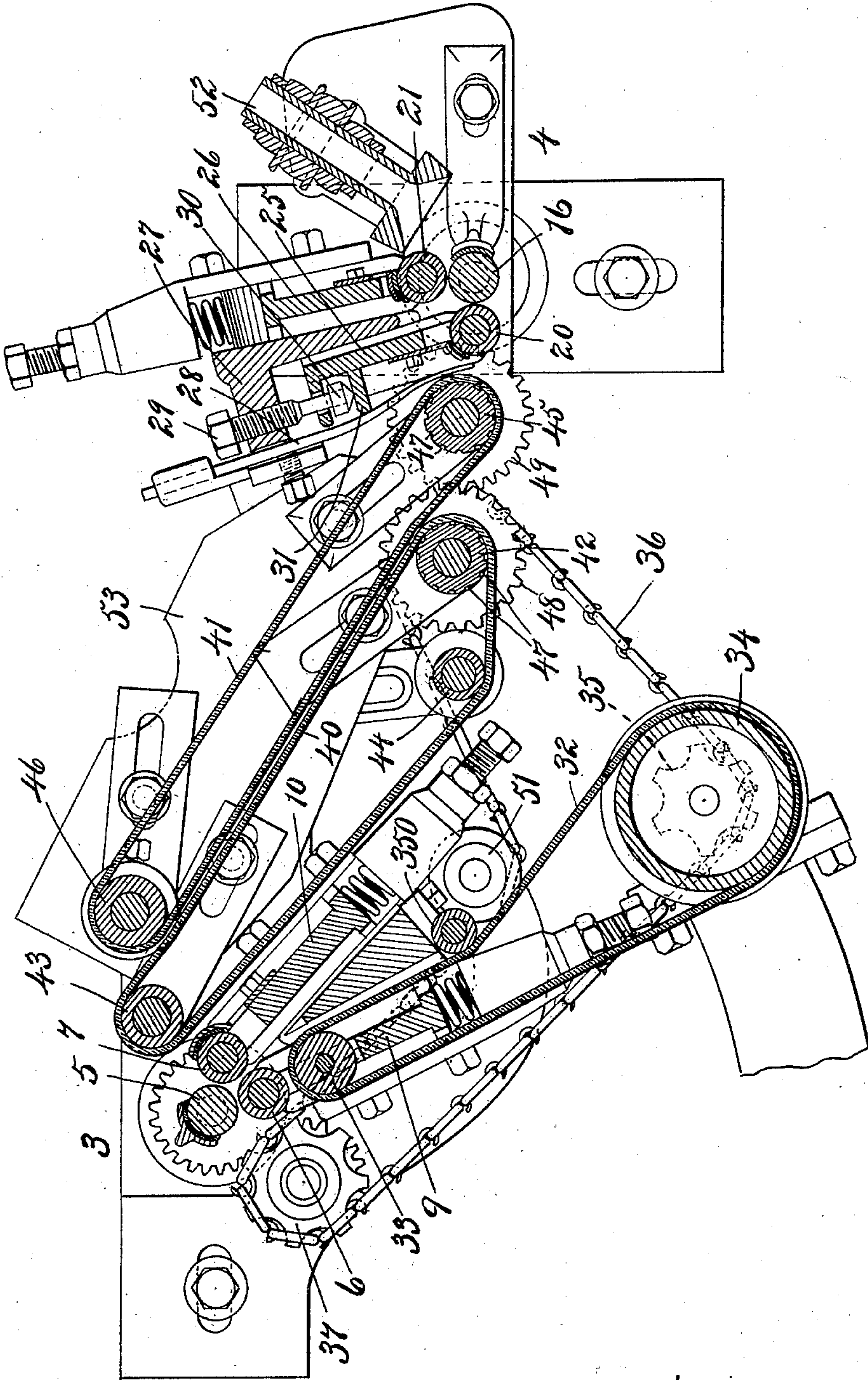
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FIG. 3.



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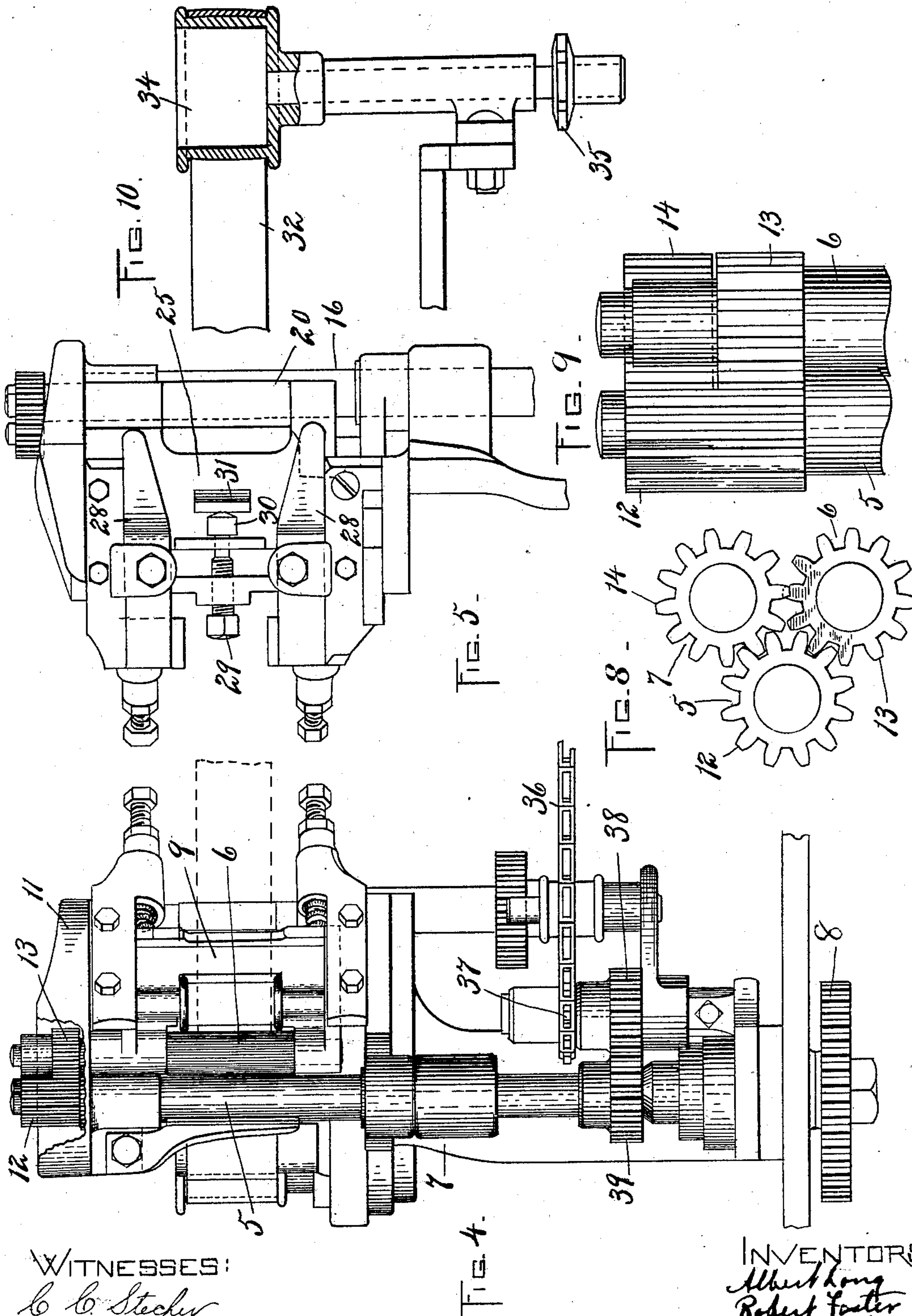
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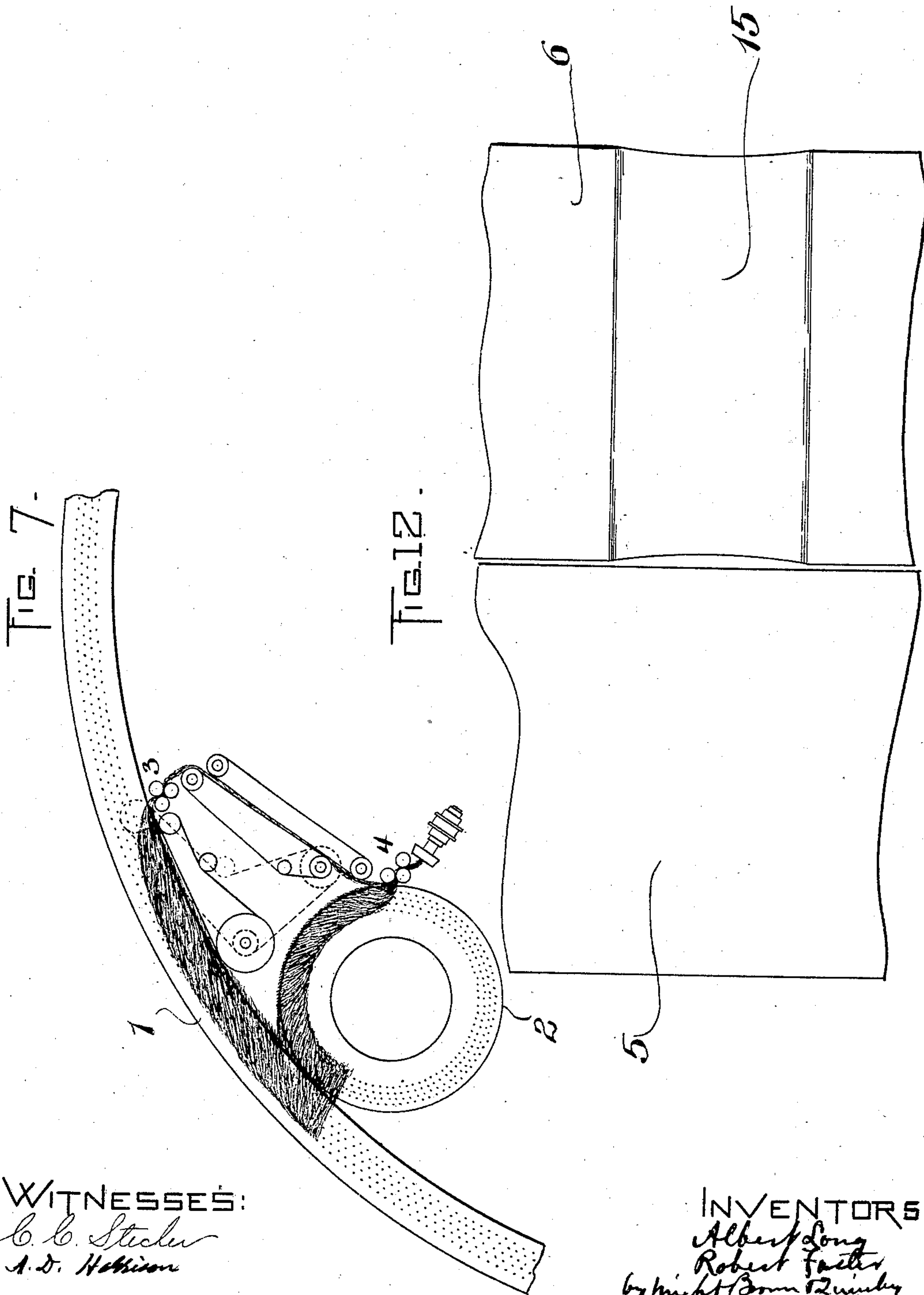
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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

ALBERT LONG, OF LAWRENCE, AND ROBERT FOSTER, OF METHUEN,
MASSACHUSETTS.

DRAWING-OFF DEVICE FOR CIRCLE-COMBS.

SPECIFICATION forming part of Letters Patent No. 679,975, dated August 6, 1901.

Application filed October 3, 1900. Serial No. 31,842. (No model.)

To all whom it may concern:

Be it known that we, ALBERT LONG, of Lawrence, and ROBERT FOSTER, of Methuen, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Drawing-Off Devices for Circle-Combs, of which the following is a specification.

This invention relates to circular wool-combs of the Noble comb type; and it has for its object to provide improvements in the drawing-off device described in our Letters Patent, No. 606,564, of June 28, 1898. The said patent describes a drawing-off device in which the drawing-heads for both the large and small circles each comprises a series of smooth-faced drawing-rolls, which serve to draw the fibers from the circles and combine them to form a sliver. In this way the fluted rolls and leather aprons ordinarily employed are dispensed with.

The objects of the present invention are to provide for a closer grouping of the drawing-rolls, to furnish means for directing the combed fringe on the large circle toward the drawing-head of that circle, to provide an improved roll-adjustment, to provide improved means for conveying the sliver from one drawing-head to the other, and to render the sliver more compact.

The invention consists in the novel features of construction and arrangement which we will now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a plan view of a drawing-off device constructed in accordance with our invention. Fig. 2 represents a front elevation partly broken away. Fig. 3 represents a horizontal section on the line 3×3× of Fig. 2. Figs. 4 and 5 represent elevations of the two drawing-heads looking from the left in Fig. 1. Fig. 6 represents an elevation of the large circle drawing-head. Fig. 7 represents a diagrammatic view of the comb, showing the drawing-off device. Fig. 8 represents a plan, and Fig. 9 an elevation, of the gearing for the large-circle drawing-rolls. Figs. 10 and 11 represent detail sectional views showing belt-pulleys. Fig. 12 represents a detail side elevation, enlarged, showing the acting faces of two rolls of the large circle drawing-head.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 and 2, Fig. 7, represent the large and small toothed circles, and 3 4 represent the drawing-heads adjacent thereto. The drawing-head 3 of the large circle comprises, as shown in the present instance, three smooth-faced drawing-rolls of general cylindrical form. Roll 5 is the driver, mounted in fixed bearings on the standard or base frame 7 of the drawing-head and having at the lower end of its shaft a driving-gear 8, by means of which it is rotated. Rolls 6 and 7 are mounted in carriers 9 10, yieldingly actuated by adjustable spring-pressure in the direction of the driving-roll 5 and supported in guides on a frame 11, which is pivoted to swing about the axis of roll 5 as a center. This pivotal adjustment permits the rolls 6 7 to be moved toward or away from the large toothed circle. The upper end of the shaft of driving-roll 5 is provided with an elongated gear member 12, which is, in effect, two gears the teeth of one of which are continuations of those of the other. The lower part of gear member 12 meshes with a gear 13 on the shaft of roll 6 and the upper part meshes with a similar gear 14 on the shaft of roll 7. Gear 14 is located above gear 13, its teeth overlapping those of gear 13, as represented in Fig. 8. Roll 5 is continuously driven and drives rolls 6 and 7 positively without slip, giving amply sufficient drawing power to draw a heavy sliver from the teeth of the large circle. There are two nips in the drawing-rolls—one between rolls 5 6 and the other between rolls 5 7. The above-described arrangement of gearing allows us to get the two nips very close together and to draw shorter wool than is possible when the nips are more widely separated.

To maintain the sliver in compact form and prevent it from spreading and fluffing at the edges, an improvement is provided, which is illustrated in Fig. 12 and which consists in annularly grooving the working face of the roll 6, as shown at 15, and of the roll 7 in a similar manner. The groove is exaggerated in the drawings for the sake of making it apparent. Its depth in practice is about four one-thousandths of an inch and its width

about three-eighths of an inch, the diameter of the rolls being one inch and the length of their working faces about three and three-eighths inches. The groove is curved on a circle of about five and three-eighths inches radius. The sliver occupies and is maintained within the grooves 15 on the two rolls 6 7 during the drawing operation. This improvement may, if desired, be applied to the rolls of the small-circle drawing-head, though not with as great advantage as in the case of the large-circle drawing-head.

The construction of the drawing-head for the small circle is in general similar to that of the head for the large circle. Three rolls are employed—a driving-roll 16, having a driving-gear 17 at the lower end of its shaft connected by gears 18 19 with the gear 8 on the shaft of roll 5, as shown in Fig. 2, and two driven rolls 20 21. Roll 16 has a gear 22 on the upper end of its shaft, meshing with gears 23 24 on the shafts of rolls 20 21. The rolls 20 21 are mounted in carriers 25 26, supported in guides on a pivotal frame 27. The carrier 26 is yieldingly actuated in a manner similar to the carriers 9 10 of the other drawing-head and moves its roll 21 in a radial direction toward or from driving-roll 16. The carrier 25, however, has an improved adjustment. It is so mounted in its guides as to be incapable of twisting or moving its roll 20 out of parallelism with the other rolls, but is adapted by its longitudinal movement to adjust the roll 20 tangentially with respect to the driving-roll 16. Roll 20 and the nip between it and roll 16 are thus moved nearer to or farther from the small toothed circle. Should this tangential movement of the roll 20 take place in a straight line, the roll 20 would not maintain its proper distance from the roll 16. We therefore make the carrier 25 capable of free lateral movement in its guides and provide bow-springs 28 28, which bear against the upper and lower ends of the carrier and press the roll 20 yieldingly toward roll 16. These springs are disposed longitudinally of the carrier 25, so that the carrier slides with respect to the springs in its tangential adjustment without changing the tension of the springs. Adjustment of the carrier 25 is effected by means of a screw 29, mounted in the pivotal frame 27 and having a head 30, which is engaged with the carrier 25, and has a pivotal point bearing against an ear 31 thereon, so as to allow for the lateral movements of the carrier.

32 is a belt or apron mounted between the small toothed circle 2 and the drawing-head 3 for the large toothed circle and having its outer stretch extended along the inner edge of the large toothed circle. Said belt is supported by a small guide-pulley 33, adjacent to the drawing-head, and a large driving-pulley 34 and passes over a small external guide-pulley 35. The pulley 34 has a sprocket-wheel 35 at its lower end engaged by a chain 36, driven from a sprocket-wheel 37, the latter

being connected by gears 38 39 with the shaft of the driving-roll 5 of drawing-head 3. The outer stretch of belt 32 travels in the same direction as the large toothed circle and at a higher speed than said circle, and it acts as a "licker-in" to slant the combed fringe projecting from the inner edge of the large circle forward toward the drawing-head 3. The fibers of wool are thus interposed between the rolls of the drawing-head at the earliest possible moment and the drawing efficiency is greatly increased.

In our prior patent hereinbefore referred to we illustrated means for conveying the sliver from the drawing-head of the large circle to that of the small circle, comprising a pair of horizontal geared rolls, pivoted bells or funnels adjacent to the drawing-heads, and troughs interposed between the funnels and said rolls. An objection to this device is that it leaves the sliver practically unsurrounded and the electricity with which the sliver is usually charged causes the fibers on the outside to separate or fly apart. We have found it desirable, therefore, to employ the arrangement shown in the drawings in lieu of the above for conveying the sliver from one head to the other.

40 41 represent two vertical carrying belts or aprons supported upon pulleys 42 43 44 45 46 and driven in opposite directions, the said belts having two facing stretches which run in contact at an equal speed. The turns of the two belts are arranged near the respective drawing-heads. Pulleys 42 and 45 are drivers and are provided with shallow sharp-edged longitudinal grooves or flutes 47 47 in their faces to increase their tractive power on the belts. The shafts of said pulleys are provided with intermeshing gears 48 49, and the pulley 42 has a sprocket-wheel 50 on its shaft, over which the chain 36 passes. The chain 36 further passes around an external idle pulley 51.

The course of the sliver is as follows: It is nipped from the large circle by the rolls 5 6, passes between the rolls 5 7, and around the turn of belt 40, caused by pulley 46, between the belts 40 41, and around the opposite turn of belt 41. There it meets the sliver which is being nipped from the small circle by the rolls 16 20, and passing between said rolls is united with the sliver to form a single sliver which passes out from between rolls 16 21 and through a funnel 52 into the can or receptacle provided for it. The belts inclose the sliver between the drawing-heads and prevent it from fluffing or breaking by electrical action.

The belts 40 41 are much longer lived than the leathers or aprons used with the fluted rolls of ordinary drawing-off mechanism. They are quite different in their action also, since they serve only as conveyers and do not participate in the drawing action. The sliver will not break and follow the belts, as it often does the ordinary leathers, for the wool in our arrangement is not forced into intimate

contact with the belts, as is done by the fluted rolls. The pulleys 42 43 44 45 46 are all mounted in holders which are adjustably attached to a base 53, the latter being supported adjustably by the base frames or standards of the two drawing-heads.

The lick-in belt 32 being independent both of the drawing-rolls and of the carrying-belts 40 41 can have its speed adjusted as desired without altering that of said rolls or carrying-belts. It is further to be noted that the rear end of the operating stretch of belt 32 is farther away from the circle 1 than is the forward end, the effect of which disposition of the belt is to make its action on the fringe a graduated one, the fibers being first slanted slightly as they strike the belt and finally to a maximum degree as they leave the belt and pass into the drawing-heads.

We claim—

1. In a drawing-head for a combing-machine, the combination of three drawing-rolls connected in a series, the middle roll having two gears on its shaft, the end rolls each having a gear on its shaft meshing with one of said middle-roll gears, the gears on the end rolls being located at different heights and overlapping.

2. In a drawing-head for a combing-machine, the combination of three drawing-rolls connected in a series, the middle roll having on its shaft a double-gear member comprising two gears, the teeth of one of which are continuations of those of the other, the end rolls each having a gear on its shaft meshing with said gear member, the gears on the end rolls being located at different heights and overlapping.

3. In a circle-comb the combination with the large and small toothed circles, of the drawing-off devices adjacent thereto, means to conduct the sliver from the drawing-off device of the large circle to that of the small circle, an endless belt independent of said drawing-off devices and of said conducting means, extended along the inner edge of the large circle and adapted to slant the combed fringe on said circle toward the drawing-off device of that circle, and means to drive said belt.

4. In a circle-comb, the combination with the large circle, of means for drawing off the fiber therefrom and for conducting the drawn sliver away from the drawing-point, and an

endless belt independent of said drawing and conducting means and adapted to slant the combed fringe toward the drawing-point, said belt having an operating stretch extended along the inner edge of the circle and located nearer thereto at its forward end than at its rear end.

5. In a drawing-head for a combing-machine, the combination of a series of smooth-faced drawing-rolls, one or more of which is annularly concaved on its working face.

6. In a drawing-head for a combing-machine, the combination of a series of drawing-rolls, smooth-faced and cylindrical in general form, one or more of which is annularly concaved on its working face.

7. In a drawing-head for a combing-machine, the combination of two drawing-rolls, and means to adjust one of said rolls both tangentially and radially with respect to the other.

8. In a drawing-head for a combing-machine, the combination of two drawing-rolls, means to press one of said rolls yieldingly in a radial direction toward the other, and means to also adjust said roll tangentially with respect to the other.

9. In a drawing-head for a combing-machine, the combination of two drawing-rolls, a carrier in which one of said rolls is mounted, said carrier being movable to adjust said roll tangentially and radially with respect to the other roll, means acting on the carrier to yieldingly press the adjustable roll toward the other roll, and an adjusting device acting on the carrier for moving the roll tangentially, said device having a pivotal bearing on the carrier.

10. In a drawing-head for a combing-machine, the combination of two drawing-rolls, a carrier in which one of said rolls is mounted, guides in which said carrier is adjustable both tangentially and radially with respect to the other roll, yielding means acting on said carrier to press its roll toward the other roll, and a tangential adjusting-screw having a pivotal connection with the carrier.

In testimony whereof we have affixed our signatures in presence of two witnesses.

ALBERT LONG.

ROBERT FOSTER.

Witnesses:

CHAS. L. BURNHAM,
DAVID HARPUS.