

929,933.

3 SHEETS—SHEET 1.



Witnesses  
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Carl Gabrielson, Inventor  
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Patented Aug. 3, 1909.

3 SHEETS—SHEET 2.

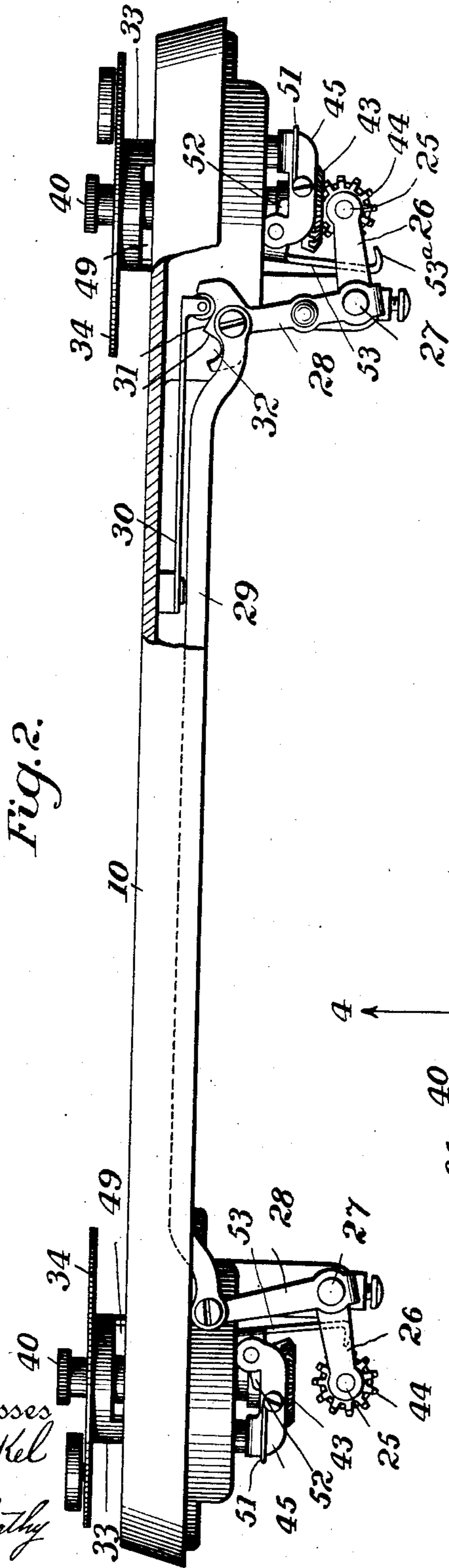


Fig. 2.

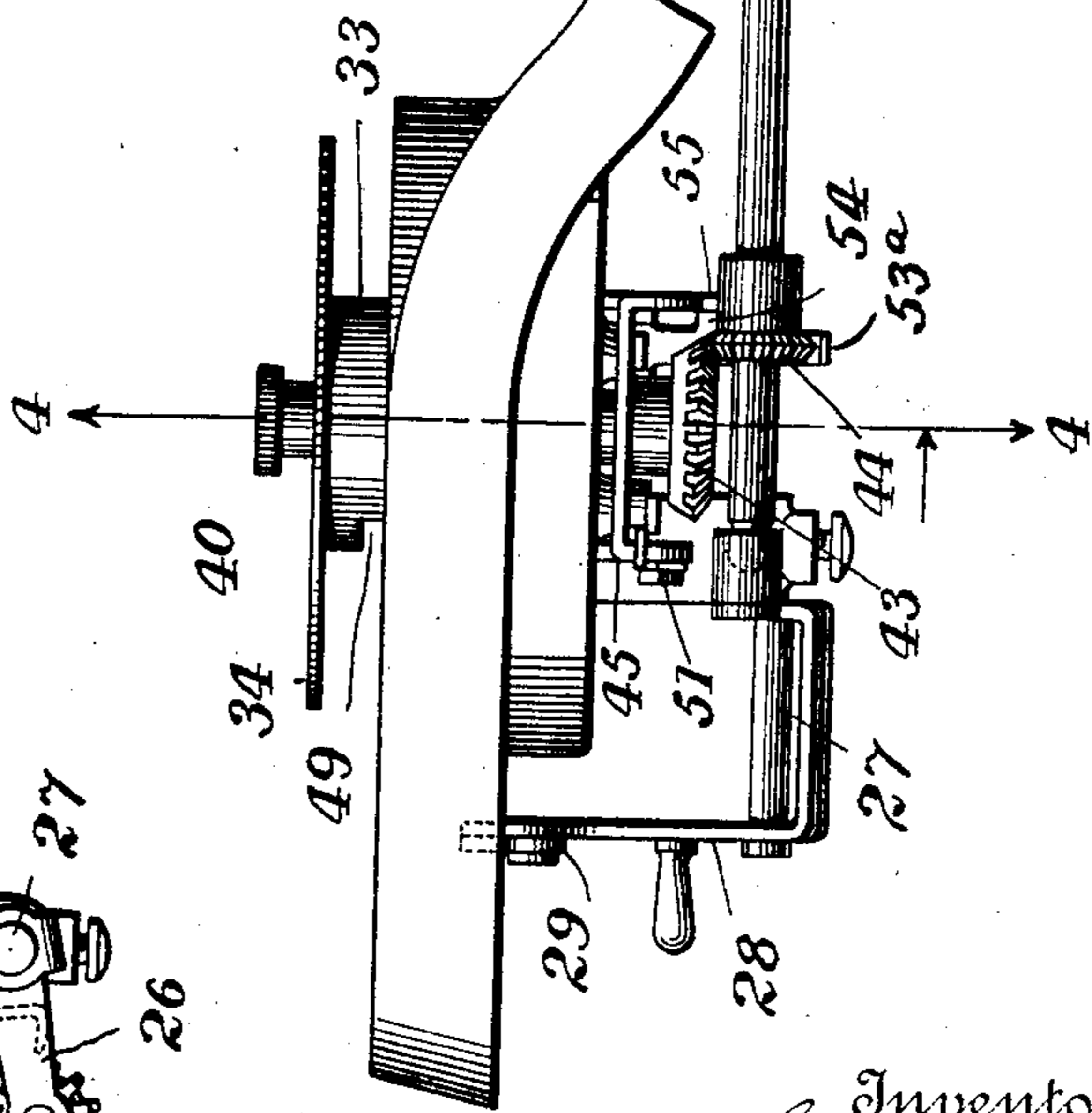


Fig. 3.

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TYPE WRITING MACHINE.  
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3 SHEETS—SHEET 3.

Fig. 4.

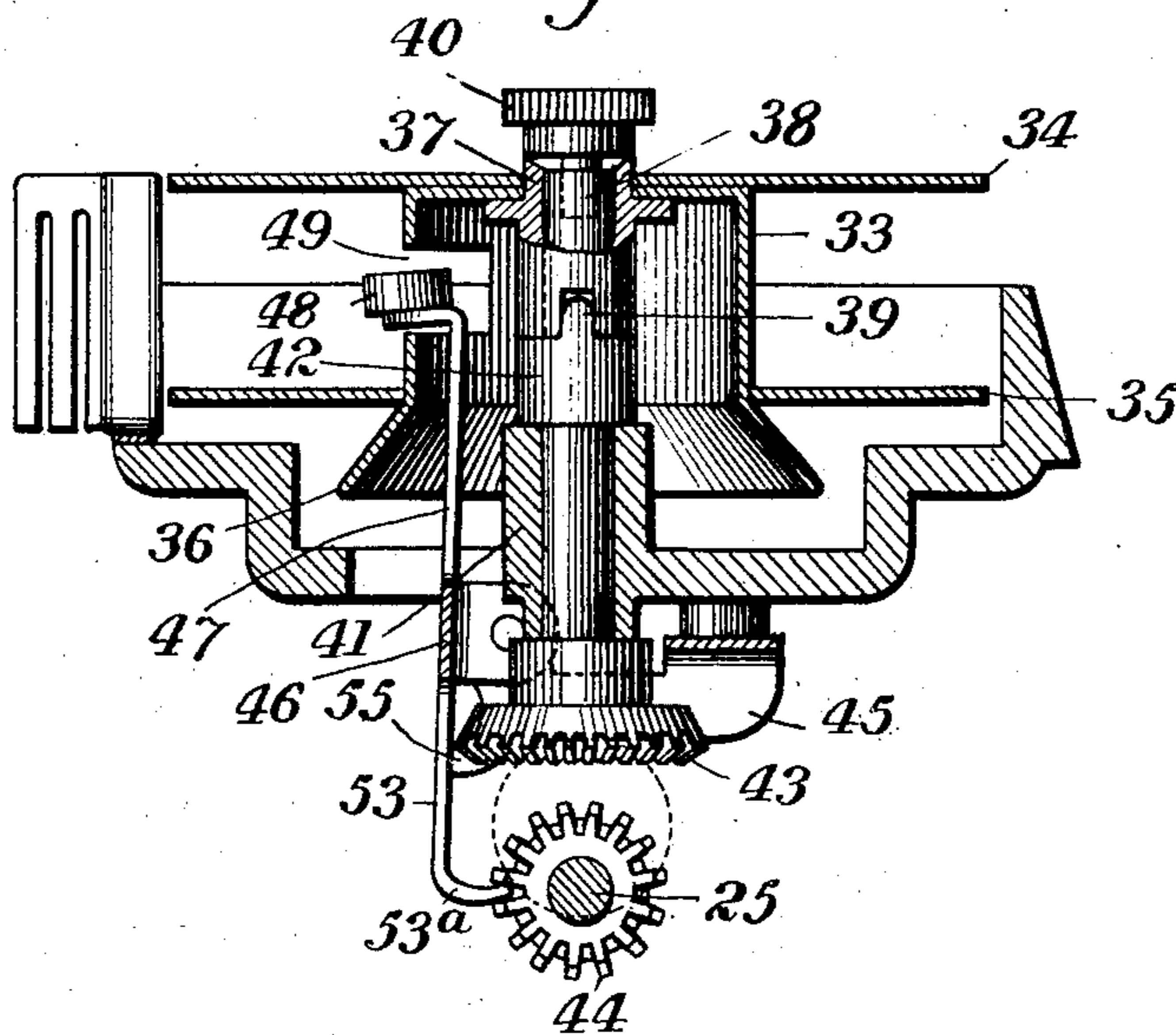


Fig. 5.

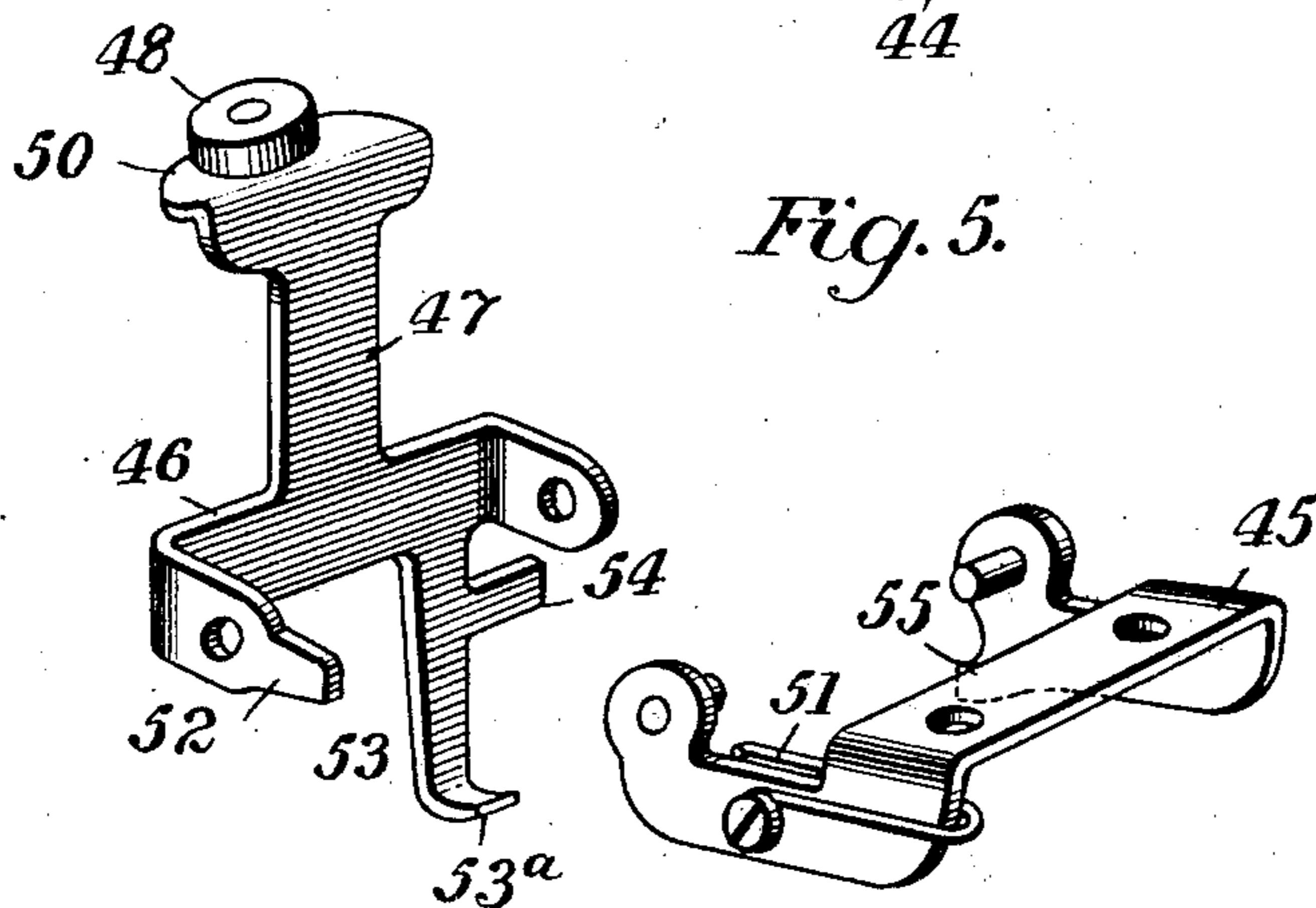
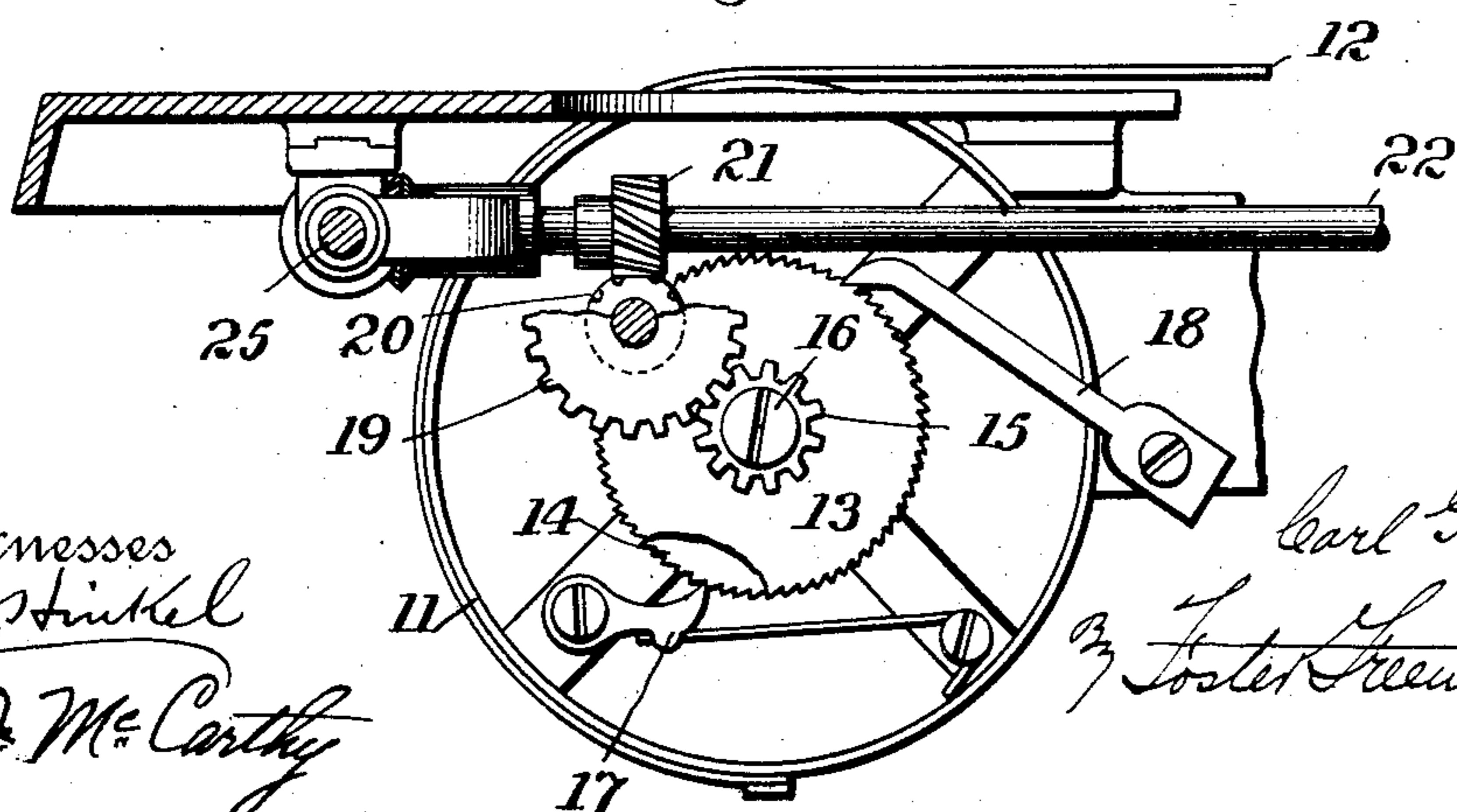


Fig. 6.



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# UNITED STATES PATENT OFFICE.

CARL GABRIELSON, OF SYRACUSE, NEW YORK, ASSIGTOR TO L. C. SMITH & BROS. TYPE-WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

No. 929,933.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed February 13, 1907. Serial No. 357,202.

*To all whom it may concern:*

Be it known that I, CARL GABRIELSON, a citizen of the United States, and resident of Syracuse, Onondaga county, State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the ribbon mechanism of typewriting machines and more particularly to means for automatically reversing the longitudinal movement of the ribbon as it reaches the end of such movement in either direction.

The object of the invention is to produce a ribbon winding and reversing mechanism which is simple in construction and reliable in operation.

The invention will be described in connection with the accompanying drawing, in which,

Figure 1 is a plan view illustrating the arrangement of the shafts and connections for turning the ribbon spools and a portion of the reversing mechanism; Fig. 2 is a view of the upper part of the frame of a typewriting machine illustrating in front elevation the ribbon spools and reversing mechanism; Fig. 3 is a side view of the same; Fig. 4 is a section approximately on the line 4-4 of Fig. 3; Fig. 5 is a perspective view of the reversing rocker and the bracket upon which it is pivotally mounted; Fig. 6 is a front view partly broken away of the spring drum, driving shaft and intermediate connections.

In the accompanying drawing, the invention is illustrated as embodied in a front strike typewriting machine in which ribbon spools are mounted on vertical axes in the upper part of the machine, being supported by the top plate of the frame 10. The power necessary to effect the winding of the ribbon and the reversal of the ribbon movement is preferably derived from the spring drum 11, which operates the carriage, 12 indicating the band which connects the drum with the carriage, (not shown). Two ratchet wheels 13 and 14 and a pinion 15 are rigidly connected together and mounted to rotate on the stud 16 which supports the spring drum. A pawl 17 carried by the spring drum engages the ratchet wheel 14 and turns the same while the carriage is moving from right to left during the operation of

writing and a holding pawl 18 cooperating with the ratchet wheel 13 prevents the pinion 15 moving while the carriage is being returned to the right. The pinion 15 communicates movement through gear 19, worm 20 and worm gear 21 to a shaft 22 arranged at the rear of the machine and from this shaft movement is communicated to shafts 23, 24, at the ends of the machine through beveled gears, or other suitable connections.

The shafts 23, 24, are arranged at right angles to the shaft 22 and they are connected by flexible couplings to shaft sections 25, extending forward beneath the ribbon spools. The forward end of each of the shafts 25 has a flexible or universal bearing in an arm 26 of a rocker which is mounted on a stud or shaft 27. Each rocker has an upright arm 28 and these arms are connected by a link 29 extending along the front of the machine. The arms 26 extend in opposite directions and are approximately at right angles with the arms 28 so that when the arms 28 are moved to the right one of the arms 26 moves downward and the other upward while the reverse takes place when the arms 28 are moved to the left. A switching device of well known construction is provided to throw the arms 28 to the right or left when they are moved by other means beyond what may be termed their dead center and to hold them in either extreme position. Such a switching device is illustrated in Fig. 2 and consists of a roller mounted on the free end of a spring 30 and adapted to bear on opposite inclines 31 on one of the arms 28. On opposite sides of these inclines are recesses 32 in one or other of which the roller normally rests. The means for rocking the arms 28 to the right or left will be presently described.

Each of the ribbon spools comprises a hollow cylindrical core 33, an upper flange 34, a lower flange 35 and preferably a flaring or conical skirt 36 below the lower flange, which may be an extension of the core 33. As shown the spool is connected with a sleeve 37 adapted to fit on the upper part of the spool shaft 38, the said shaft being provided with a tooth 39 engaging a notch in the sleeve 37 to drive the spool. The spool is held on its shaft by means of a thumb-nut 40 which is screwed on to the upper end of the shaft 38. The shaft 38 is mounted in a bearing 41 and supported by an enlargement

42, resting on said bearing. The lower end of the spool shaft carries a gear 43 by which the shaft is driven, which gear is adapted to mesh with a pinion 44 on the movable shaft section 25 when the said shaft section is in its raised position.

The gears 43 are alternately driven by the pinions 44 and means are provided for alternately throwing the pinions 44 into and out of mesh with the gears 43, the said means being controlled by the movement of the ribbon. Adjacent to each spool shaft is a bracket 45 upon which is pivoted a rocker 46. The rocker has an upwardly extending arm 47, the upper end of which lies within the core of the spool and carries a lateral projection or roller 48 adapted to bear on the interior of the core when the ribbon surrounds the spool and to swing outward through an opening 49 in the core when the inner coil of ribbon has been unwound sufficiently to uncover said opening. As shown the roller 48 is pivotally mounted on a curved flange 50, which flange engages the ends of the slot 49 and assists in drawing the roller into the core of the spool when the spool is rotated. A light spring 51 which is carried by the bracket 45 bears on an arm 52 of the rocker 46 tending to press the roller against the core of the spool and giving it a tendency to move out through the slot 49 when the latter is uncovered.

The rocker 46 has a downwardly extending arm 53, the lower end of which is adapted to engage with the teeth of the adjacent pinion 44 when the pinion is in its lower position, and the roller 48 extends through the slot 49, as illustrated in Fig. 4. As shown the arm 53 has a projection 54 which engages with a stop 55 on the bracket 45 to limit the movement of the rocker and regulate the engagement of the arm 53 with the pinion 44. The arm 53 has a horizontal extension 53<sup>a</sup> adapted to enter between the teeth of the pinion 44.

The operation of the ribbon reversing mechanism is as follows: Normally the ribbon is partially wound upon both spools, one spool being free to rotate and the other being positively rotated by reason of its gear 43 being in mesh with its pinion 44. The rollers 48 are therefore normally held within the cores of the spools and the arms 53 are held out of engagement with the pinions 44, as illustrated in Fig. 2. When the last coil of ribbon is unwinding from the free spool, the roller 48 moves outward through the opening 49 as soon as said opening is uncovered, being urged outward by the spring 51. The engaging point of the arm 53 simultaneously moves in between the teeth of the pinion 44. As both pinions 44 are constantly rotated while the ribbon is feeding, the engaging point of the arm 53 finds its way in between the teeth of the free pinion

instantly. The continued rotation of the free pinion causes it to rise, the point 53 forming a fulcrum about which it rotates. As the pinion rises it carries the free end of the shaft 25 and the arm 26 upward, rocking the arm 28 toward the center of the machine. Before the pinion 44 reaches the gear 43 the spring roller of the switching device passes the angle between the inclines 31 and throws the arm 28 over and effects the completion of the reversing movement, throwing one of the pinions 44 into engagement with the gear of the empty spool and the other pinion out of engagement with the gear of the full spool. The reversal of the ribbon movement is thus effected while the spools are moving through a small arc and before the last coil of ribbon leaves the empty spool. During the final upward movement of the pinion 44 it leaves the point of the arm 53 and is thus free to rotate its spool. The ribbon immediately begins to wind on the spool and the roller 48 is withdrawn from the slot and remains within the core of the spool during the winding and unwinding of the ribbon on the same until the end of the unwinding movement. It will be understood that the ribbon spools are alike and that the reversing devices connected with each are the same, and hence the foregoing description applies to the entire mechanism. Each of the ribbon spools can be instantly removed by first removing its thumb screw 40. The flaring skirts 36 facilitate placing the ribbon spools back on their shafts as they direct the rollers 48 into the spool cores.

Having described my invention what I claim and desire to secure by Letters Patent is,

1. In a typewriting machine, the combination with the spools and spool shafts, of gears on the spool shafts, flexibly mounted driving shafts provided with pinions adapted to mesh with the gears on the spool shafts, and means controlled by the ribbon and adapted to engage with said pinions alternately to throw the pinions into and out of mesh with their respective gears.

2. In a typewriting machine, the combination with the spools and spool shafts, of gears on the spool shafts, flexibly mounted driving shafts provided with pinions adapted to mesh with the gears on the spool shafts, and a rocker adjacent to each spool and controlled by the ribbon, said rocker having an arm adapted to engage with the adjacent pinion to throw the pinion into mesh with its gear.

3. In a ribbon reversing mechanism for typewriting machines, the combination with a ribbon spool and spool shaft, of a flexibly mounted driving shaft for the spool, and a rocker having one arm extending into the spool and controlled by the ribbon and a second arm adapted to engage with a toothed

wheel carried by the flexibly mounted shaft to bring said shaft into driving relation with the spool shaft.

4. In a typewriting machine, the combination with a ribbon spool, a spool shaft and a gear thereon, of a flexibly mounted driving shaft having a pinion adapted to engage with the gear and a single movable device having one arm controlled by the ribbon and another arm adapted to engage with and move said flexible shaft to throw said gear and pinion into mesh.

5. In a typewriting machine, the combination with a ribbon spool and spool shaft and a gear carried by the spool shaft, of a driving shaft having a pinion, and a single movable ribbon controlled device supported independently of the spool and the spool shaft and adapted to throw said gear and pinion into mesh as the ribbon is exhausted from the spool independent of any strain exerted by the ribbon.

6. In a typewriting machine, the combination with a spool having a hollow core provided with a lateral slot or opening, of a gear for driving said spool, a driving pinion movable into and out of mesh with said gear, and a rocker having an arm extending into the spool core and a second arm adapted to engage said pinion and throw it into mesh with said gear.

7. In a typewriting machine, the combination with a spool having a hollow core and a lateral opening therein, of a pair of gears for driving said spool, a rocker having an arm extending into the spool and a lateral projection adapted to pass through said opening when the ribbon is unwound, said rocker having a second arm adapted to engage one of said gears and throw it into mesh with the other when the said projection extends through the opening in the spool core.

8. In a typewriting machine, the combination with a spool having a hollow core provided with a lateral opening, and having a flaring skirt below said core, of a rocker having an arm extending upwardly into the spool core and normally adapted to bear on the interior of the core, and a second arm adapted to effect the engagement of the spool with its driving means.

9. In a typewriting machine, the combination with a ribbon spool having a hollow core provided with a lateral opening, of a rocker having an arm extending into the core provided with a roller adapted to bear on the interior of the core, and a second arm adapted to effect the engagement of the spool with its driving means.

10. In a typewriting machine, the combination with a ribbon spool having a hollow core provided with a lateral opening, of a rocker having an arm extending into the core provided with a roller adapted to bear

on the interior of the core, and a second arm adapted to effect the engagement of the spool with its driving means, the said spool being removably mounted on its driving shaft and having a flaring skirt adapted to pass over said roller in placing the spool on its shaft.

11. In a typewriting machine, the combination with a ribbon spool, of a gear and pinion for turning said spool, and a movable device supported independently of the spool and spool shaft and having an arm extending into the spool and a second arm adapted to throw said gear and pinion into mesh, the movement of said device being controlled by the ribbon.

12. In a typewriting machine, the combination of a pair of ribbon spools, a ribbon having its ends connected with the spools, gears for driving said spools, pinions for driving the gears, means connected with the carriage for turning the pinions, and non-rotatable means operated independently of a tension on the ribbon for throwing the pinions alternately into and out of mesh with the gears.

13. In a typewriting machine, a ribbon spool having a hollow core in combination with ribbon reversing mechanism comprising a movable part supported independently of and extending into said core.

14. In a typewriting machine, the combination with a rotatable ribbon spool having a hollow core, of a ribbon reversing mechanism having a movable non rotating part supported independently of and extending into said core.

15. In a typewriting machine, the combination with a ribbon spool arranged to rotate about a vertical axis and provided with a hollow core having a lateral opening, of a ribbon reversing mechanism having a part extending vertically into said core and adapted to cooperate with said opening.

16. In a typewriting machine, the combination with a ribbon spool arranged to rotate about a vertical axis and provided with a hollow core having a lateral opening, of a ribbon reversing mechanism having a movable non-rotating part extending vertically into said core and adapted to cooperate with said opening.

17. In a typewriting machine, the combination with a ribbon spool arranged to rotate about a vertical axis and provided with a hollow core having a lateral opening, of a ribbon reversing mechanism having a movable non-rotating part extending into said core and adapted to cooperate with said opening, said part being adapted to effect a reversal of the ribbon movement.

18. In a typewriting machine, the combination with a ribbon spool arranged to rotate about a vertical axis and provided with a hollow core, of a ribbon reversing

mechanism having a movable non-rotating part extending vertically into said core and adapted to be controlled by the unwinding of the ribbon.

5 19. In a typewriting machine, the combination with a ribbon spool, a gear connected with the spool, and a pinion for driving said gear and adapted to be moved to and from engagement therewith, of means  
10 supported independently of the spool and the spool rotating devices and having one member extending into the interior of the coil of ribbon wound on the spool and a second member adapted as the ribbon is ex-  
15 hausted from the spool, independently of any strain exerted by the ribbon, to cause the pinion to move into engagement with the spool driving gear.

20 20. In a typewriting machine, the combination with a ribbon spool, a gear con-

nected with the spool, and a pinion for driving said gear and adapted to be moved to and from engagement therewith, of a non-rotatable rocker mounted to vibrate about an axis extending transverse to the axis of revolution of the spool, one arm of said rocker extending upwardly into the interior of the spool and within the coil of ribbon supported thereby and another arm adapted as the ribbon is exhausted from the spool, independently of any strain exerted by the ribbon, to cause the pinion to move into engagement with the spool driving gear. 25 30

In testimony whereof I affix my signature in presence of two witnesses.

CARL GABRIELSON.

Witnesses:

CHAS. F. PARSONS,  
G. RAYMOND REED.