

G. M. KITZMILLER.

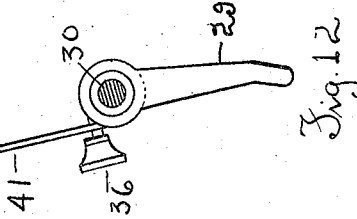
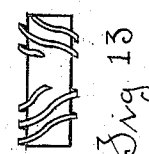
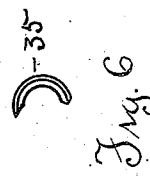
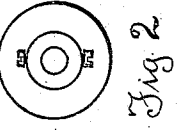
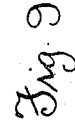
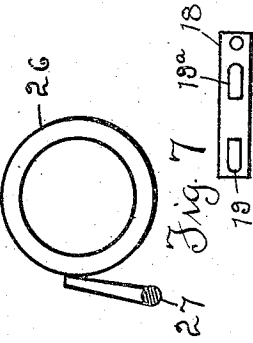
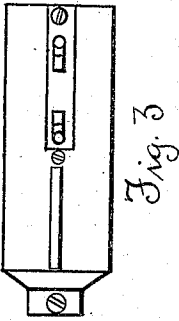
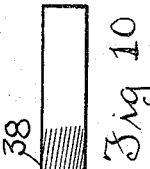
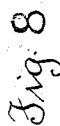
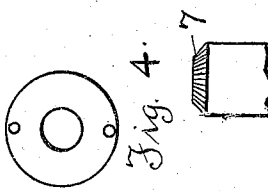
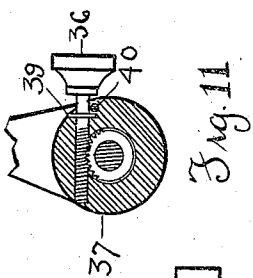
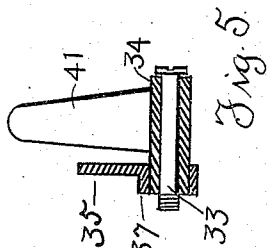
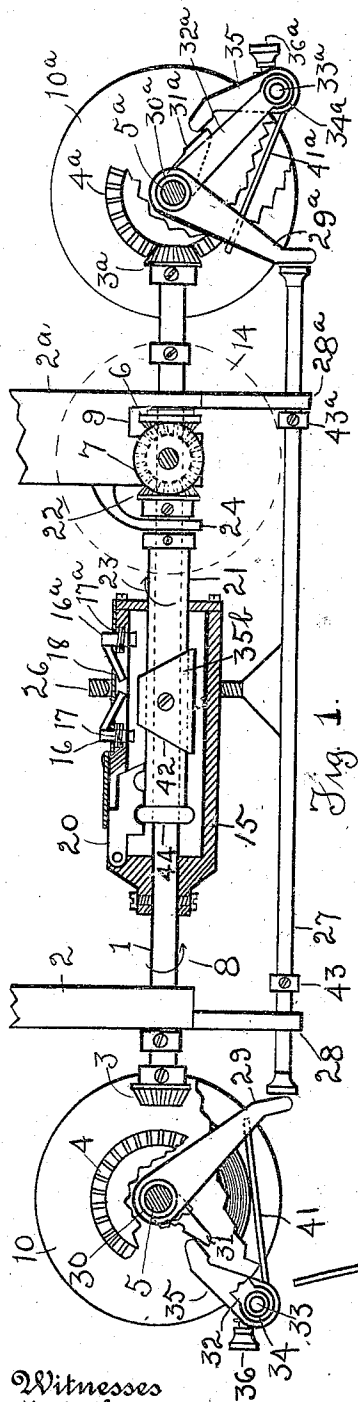
AUTOMATIC RIBBON REVERSING MECHANISM FOR TYPE WRITING MACHINES.

APPLICATION FILED SEPT. 1, 1909.

Patented Dec. 7, 1909.

2 SHEETS-SHEET 1.

942,383.



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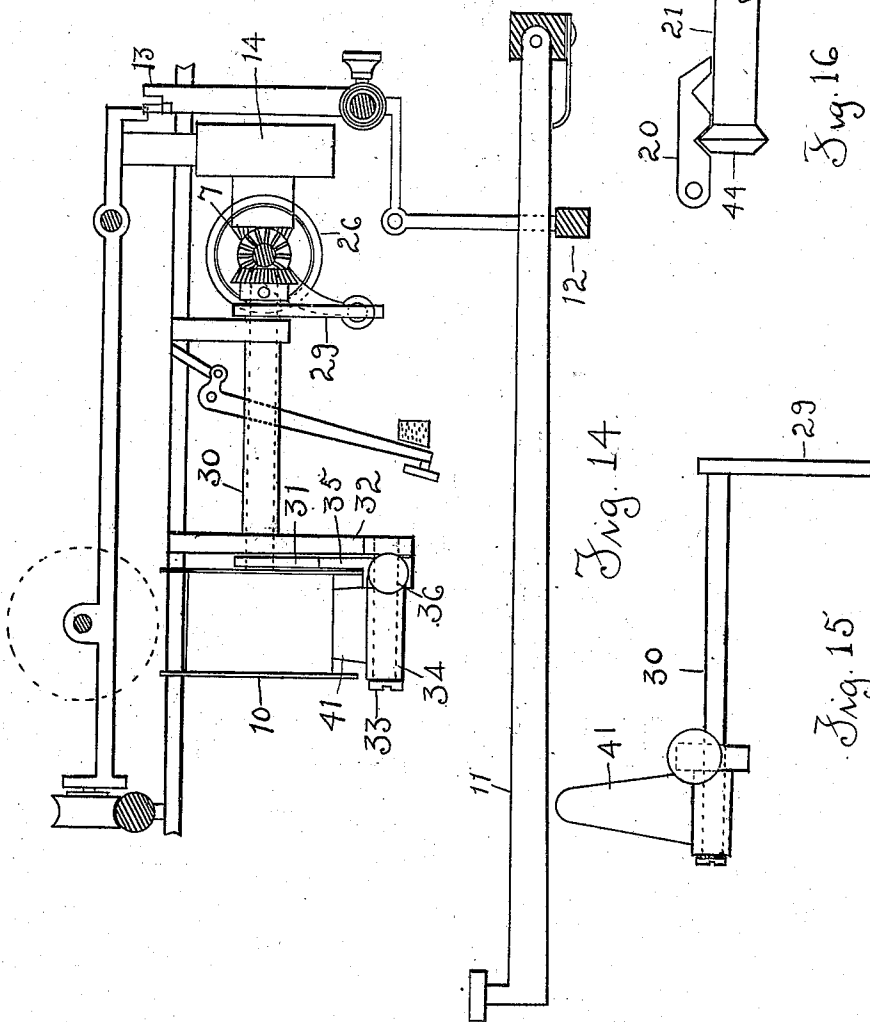
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2 SHEETS—SHEET 2.



Witnesses
A. E. Blom
[Signature]

Inventor
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UNITED STATES PATENT OFFICE.

GEORGE M. KITZMILLER, OF NORFOLK, VIRGINIA.

AUTOMATIC RIBBON-REVERSING MECHANISM FOR TYPE-WRITING MACHINES.

942,383.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 1, 1909. Serial No. 515,712.

To all whom it may concern:

Be it known that I, GEORGE M. KITZMILLER, a citizen of the United States, and a resident of Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Automatic Ribbon-Reversing Mechanism for Type-Writing Machines, of which the following is a specification.

My invention relates to automatic ribbon-reversing mechanism for typewriting machines.

In the present instance I have applied my invention to a typewriter of the well known Remington class, though it is obvious that my invention may be applied to other types of writing machine by slight changes in details of construction, and rearrangement of parts without departing from the spirit of my invention.

The object of my invention is to produce a positive automatic reverse of the direction of the ribbon when it has been unwound from one spool and wound on the other spool, without tension on the ribbon. Also, to provide means for shifting the ribbon travel by hand when desired.

In the accompanying drawings, Figure 1 is a rear elevation of a typewriting machine with my invention applied, all parts not necessary to illustrate the same, having been removed. Fig. 2 is an end elevation of the cylinder. Fig. 3 is a plan view of the cylinder showing the slots and impinger holes. Fig. 4 is a view of the end plate of the cylinder. Fig. 5 is a part sectional view of the ribbon follower arm and bearing. Fig. 6 is an edge view of the curved plate with inclined faces or edges. Fig. 7 is an end view of the actuating rod and ring. Fig. 8 is a plan view of the spring-drum barrel with the spring drum removed. Fig. 9 is a plan view of the impinging pin retaining plate. Fig. 10 is a view of the ribbon follower tubular shaft showing threads longitudinally thereof. Fig. 11 is an enlarged sectional view of the actuating arm showing the screw and tubular shaft. Fig. 12 is a modified form of arm and follower. Fig. 13 is a right and left-hand worm. Fig. 14 is a side elevation of the power-shaft, driving-gears, motor spring gear, cylinder, actuating ring, escapement, type-bar, key-lever, universal bar, ribbon-spool, tubular shafts, follower and gear. Fig. 15 is a side elevation of a modified form of the follower and arm.

Fig. 16 is a view of the retaining latch and disk with oppositely-acting inclined faces. All parts in Fig. 14 not necessary to illustrate my invention have been omitted.

Similar reference characters refer to similar parts.

Figure 1 is an embodiment of one form of my invention, consisting of an endwise movable gear-driven power-shaft 1, movably supported in the bearing posts or hangers 2, and 2^a, and is provided with bevel-gears 3, and 3^a, at or near its ends, which mesh with the bevel-gears 4, and 4^a, (secured to the spool shafts 5, and 5^a) according to the direction of the ribbon travel. A rotary motion is imparted to the power-shaft 1, by the gears 6, and 7, which rotate the shaft in the direction indicated by the arrow 8. The gear 6, is mounted in a longitudinal groove (not shown) on the shaft 1, so as to permit the shaft 1, to be shifted endwise, while the gear 6, is held from such endwise movement by the fork 9, allowing a free rotation by the action of the spring-drum gear 7.

An intermittent feed is transmitted to the ribbon spools 10 and 10^a by the action of the key-lever 11, universal bar 12, escapement 13, motor-spring 14, gears 7, and 6, and gears 3^a, and 4, and 4^a (Fig. 1); according to the direction of the ribbon travel.

Mounted on the shaft 1, is a cylinder 15, provided with a pair of impingers or impinging pins 16, and 16^a, which are held in normal position by the springs 17 and 17^a, and the retaining plate 18. The plate 18, is provided with slots 19, and 19^a, for the reception of the inclined portion of the impingers 16, and 16^a, and to prevent them from leaving their seat. The cylinder 15, is also provided with a spring-pressed latch 20, adapted to maintain the shifted position of the shaft 1, as will be further explained. Mounted on the shaft 1, and extending into the cylinder 15, is a tubular shaft 21, driven also from the gear 7, by its gear 22. The direction of rotation of the shaft 21, however, is opposite to that of the shaft 1, as indicated by the arrow 23. The shaft 21, and its gear 22, are held from endwise movement by the bracket 24. Mounted on the shaft 21, within the cylinder 15, is a plate 35^b, provided with oppositely-acting inclined faces; these faces being located so as to coact with the impingers 16 and 16^a.

Surrounding the cylinder 15, is a trans-

versely movable ring, or band, 26, which receives its motion from the transversely movable rod 27, movably supported in the brackets 28 and 28^a, the rod 27, coacting with the arms 29 and 29^a, which are mounted on, and movable with the tubular shafts 30 and 30^a, which are mounted in suitable brackets, and form a bearing for the spool shafts 5 and 5^a. The arms 29 and 29^a, are located next the spool shaft gears 4 and 4^a. Mounted on, and also movable with the tubular shafts 30 and 30^a, next the ribbon-spools, are the arms 31 and 31^a. Secured to the frame or tubular shaft support, are stationary arms 32 and 32^a, forming a support for the bearings 33 and 33^a (see Fig. 5), which are screwed into the free end of the stationary arms 32 and 32^a, forming a bearing for the short tubular shafts 34 and 34^a and the arms 35 and 35^a. The tubular shafts 34 and 34^a, are provided with screw threads cut longitudinally thereon, for the purpose hereinafter described. A screw 36, passes through the hub 37, and engages the longitudinal threads 38 (Fig. 10) for the purpose hereinafter explained. The screw 36, is provided with a flange or disk 39 (Fig. 11) behind which is placed a pin 40, to prevent the screw from leaving the hub 37.

Having given a general description of a construction which shows one form of embodiment of my invention, I will proceed to describe the operation thereof. Fig. 1 shows the reverse as just having been effected. We will assume in the usual operation of the machine, the ribbon has been unwound, for instance, from the spool 10, and has been wound on the spool 10^a. As the ribbon continues to wind on the spool 10^a, the follower, or arm 41^a, is forced from toward the center of the spool, forcing the free end of the arm 35^a, against the free end of the arm 31^a, which being secured to the tubular shaft 30^a, forces the free end of the arm 29^a, against the end of the rod 27, which in turn forces the ring or band 26, against the inclined portion of the impinger 16. The pin 16, is forced against the tension of the spring 17, until its end projects a sufficient distance to engage the inclined face 42, of the inclined-faced plate 35^a. The shaft 1, rotating in one direction, and the shaft 21, in the opposite direction, forces the shaft 1, and cylinder 15, with it, endwise, or transversely of the machine, causing the gears 3 and 4 to mesh and the gears 3^a and 4^a to disengage, thereby reversing the direction of the ribbon travel. After the reverse has been effected, the spring 17, causes the impinger 16, to return to normal position. The ring 26, is prevented from a continued contact with the impinger 16, by the collar 43, striking the bracket 28. In the shifting operation, the latch 20, is lifted over the disk 44, which maintains the shifted position of

the shaft 1. It is understood that the disk 44, and latch 20, rotate in opposite directions. The impinger 16, having been returned by the action of the spring 17, the shifting of the power shaft 1, may be effected by hand, if desired. Should it be desired to cause the reverse to become effective nearer or farther from the end of the ribbon, the screw 36 may be turned either one way or the other, as desired, whereby the arm 35, is caused to contact with the arm 31, sooner or later, accordingly as the screw 36 is moved.

While I have preferred to use a plate (see Figs. 1 and 6), I am not confined to such, as I may desire to use a right and left hand worm, similar to that shown in Fig. 13. Likewise I may desire to use the follower and arm shown in Figs. 12 and 15, in which event the shaft 30, would be provided with a bearing below and horizontal to the spool shaft, and the follower 41, would assume a more vertical position on the folds of the ribbon next the outside of the machine. I may also desire to use the form of disk and latch shown in Fig. 16.

It is to be understood that there are various changes in details of construction and rearrangement of parts which I may make without departing from the spirit of my invention, which embodies the broad idea of using means to automatically reverse the direction of the ribbon travel at variable distances from the end of the ribbon.

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

1. In a typewriting machine and in a ribbon-reversing mechanism, the combination with ribbon-spools, of power-driven devices provided with shifting means, means for rotating said devices in opposite directions, and means controlled by the ribbon-spools for operatively connecting said devices.

2. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, power-driven devices provided with shifting means, gears for rotating said devices in opposite directions, and means controlled by the ribbon to connect the said devices.

3. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, shafts, one surrounding the other, means for rotating said shafts in opposite directions, a device having oppositely-acting shifting means thereon, and mounted on and rotating with one of said shafts, and means controlled by the ribbon for operatively connecting said shafts.

4. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, an endwise shiftable rotatable shaft, a non-shiftable shaft mounted on, and revolving in a direction opposite to

that of the shiftable shaft, means for rotating said shaft, and devices cooperating with the ribbon-spools for operatively connecting the shafts for the purpose specified.

5 5. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, an endwise-movable rotatable shaft, endwise shifting means mounted on said shaft, means for rotating said shaft
10 in one direction and the means mounted thereon in the opposite direction; engaging devices revolving with the movable shaft, and means controlled by the ribbon for operatively connecting said shifting means and
15 said engaging devices.

6. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, an endwise movable power-shaft, a non-shiftable shaft mounted on and
20 rotating in a direction opposite to that of the movable shaft, means for rotating said shafts, and devices provided with shifting means on said non-shiftable shaft coacting with devices on the movable shaft, controlled
25 by the ribbon.

7. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, an endwise-movable gear-carrying, gear-driven power-shaft, a gear-
30 driven non-shiftable shaft mounted on and revolving in a direction opposite to that of the shiftable shaft, means for rotating said shafts, and means controlled by the ribbon to connect said shafts for the purpose specified.
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8. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, an endwise-movable gear-carrying, gear-driven power-shaft, a gear-
40 driven non-shiftable shaft mounted on and revolving in a direction opposite to that of the shiftable shaft, means for rotating said shafts, means controlled by the ribbon to connect said shafts to reverse the ribbon, and
45 mechanism for completing and maintaining the reverse.

9. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
50 driven shiftable shaft, a non-shiftable shaft surrounding the shiftable shaft, means for rotating said shafts in opposite directions, and devices revolving on said shafts controlled by the ribbon for reversing the longitudinal travel thereof.
55

10. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
60 driven shiftable shaft, a non-shiftable shaft surrounding and revolving on said shiftable shaft in a direction opposite to its direction of rotation, means for rotating said shafts from the spring-drum, a device provided with oppositely-acting inclined faces mounted
65 on and movable with said non-shiftable

shaft, and devices revolving with and on the shiftable shaft, controlled by the ribbon, for causing the shiftable shaft to move endwise and reverse the longitudinal travel of the ribbon.

11. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
70 driven shiftable shaft, a non-shiftable shaft mounted on said shiftable shaft, means for rotating said shafts from the spring-drum in opposite directions, a device provided with oppositely-acting inclined faces mounted
75 on and movable with said non-shiftable shaft, and devices revolving on, and shiftable with the shiftable shaft, controlled by the ribbon for causing the shiftable shaft to move endwise and reverse the longitudinal travel of the ribbon.
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12. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
85 driven shiftable shaft, a gear-driven non-shiftable shaft mounted on, and revolving in a direction opposite to that of the shiftable shaft, a device provided with oppositely-acting inclined faces mounted on and
90 rotating with said non-shiftable shaft, a cylindrical member secured to and movable with the shiftable shaft surrounding the non-shiftable shaft, impingers mounted in said cylinder, and means controlled by the ribbon for causing said impingers to coact with the inclined faces for reversing the ribbon travel.
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13. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
105 driven shiftable shaft, a gear-driven non-shiftable shaft mounted on and revolving around said shiftable shaft in a reverse direction to its rotation, a device provided with oppositely-acting inclined faces mounted on and rotating with said non-shiftable shaft, a disk on said non-shiftable shaft surrounding the non-shiftable shaft, a cylinder secured to and movable with the shiftable shaft surrounding the non-shiftable shaft, spring-pressed impingers mounted in
110 and revolving with said cylinder, a spring-pressed latch coacting with said disk, and means controlled by the ribbon for causing a cooperation of the parts for the purpose specified.
115

14. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-
120 driven shiftable shaft, a gear-driven non-shiftable shaft mounted on and revolving around said shiftable shaft in a reverse direction to its rotation, a device provided with oppositely-acting inclined faces mounted on and rotating with said non-shiftable shaft, a disk on said non-shiftable shaft, a cylinder secured to and movable with the
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130

shiftable shaft surrounding the non-shiftable shaft, spring-pressed impingers mounted in and revolving with said cylinder, a spring-pressed latch coacting with said disk, and a ring or band surrounding said cylinder, controlled by the ribbon, for causing a cooperation of the parts for the purpose specified.

15. In a typewriting machine and in a ribbon-reversing mechanism, the combination of ribbon-spools, a gear-carrying, gear-driven shiftable shaft, a gear-driven non-shiftable shaft mounted on and revolving around said shiftable shaft in a reverse direction to its rotation, a device provided with oppositely-acting inclined faces mounted on and rotating with said non-shiftable shaft, a disk on said non-shiftable shaft, a cylinder secured to and movable with the shiftable shaft surrounding the non-shiftable shaft, spring-pressed impingers mounted in and revolving with said cylinder, a spring-pressed latch coacting with said disk, a ring or band surrounding said cylinder, a transversely-movable rod attached to said ring or band, and means controlled by the ribbon folds to actuate said rod, whereby operative connections are made to reverse the travel of the ribbon.

16. In a typewriting machine and in a ribbon-reversing mechanism, the combination with a ribbon and ribbon-spools, means for rotating said spools, means for reversing the rotation of said spools, and means adjustable with a screw for varying the distance from the end of the ribbon at which the reverse shall become effective.

17. In a typewriting machine and in a ribbon-reversing mechanism, the combination with a ribbon and ribbon-spools, of means for rotating said spools, and means for reversing the rotation of said spools, the last named means comprising an arm or follower bearing on the ribbon folds, adjustable by a screw, to vary the distance from the end of the ribbon at which the reverse shall become effective.

18. In a typewriting machine and in a ribbon-reversing mechanism, the combination with a ribbon and ribbon-spools, of means for rotating said spools, and means for reversing the rotation of said spools, the last named means comprising an arm or follower having a bearing portion, and a screw passing over and at right-angles to said bearing adapted to move the follower nearer or farther from the ribbon folds for varying the distance from the end of the ribbon at which the reverse shall become effective.

19. In a typewriting machine and in a ribbon-reversing mechanism, the combination with a ribbon and ribbon-spools, of means for rotating said spools, and means for reversing the rotation of said spools, the last named means comprising a tubular shaft surrounding the spool shaft, arms on said shaft, a follower having a bearing near the periphery of the ribbon-spool, and a device coacting with said follower and one of said arms, adjustable by a screw, for varying the distance from the end of the ribbon at which the reverse shall become effective.

20. In a typewriting machine and in a ribbon-reversing mechanism, the combination with a ribbon and ribbon-spools, of means for rotating said spools, and means for reversing the rotation of said spools, the last named means comprising a tubular shaft surrounding the spool shaft, an arm at either end of said tubular shaft, a stationary arm whose free end is near the periphery of the spool, a follower having a bearing on said stationary arm, and an arm movable around said bearing, controlled by a screw and screw threads for varying the distance from the end of the ribbon at which the reverse shall become effective.

21. In a typewriting machine and in a ribbon-reversing mechanism, the combination of a ribbon and ribbon-spools, a gear-carrying, gear-driven shiftable shaft, a gear-driven non-shiftable shaft mounted on and revolving around said shiftable shaft in a reverse direction to its rotation, a gear connected to the spring-drum for driving said shafts, a plate provided with oppositely-acting inclined faces mounted on and rotating with said non-shiftable shaft, a disk on said non-shiftable shaft, a cylinder secured to and movable with the shiftable shaft surrounding the non-shiftable shaft, spring-pressed impingers mounted in and revolving with said cylinder, a spring-pressed latch coacting with said disk, a ring or band surrounding said cylinder, a transversely movable rod co-acting with said ring or band, a tubular shaft surrounding the spool-shaft provided with arms, and an adjustable follower coacting with said arms for the purpose specified.

Signed at Norfolk, in the county of Norfolk, and State of Virginia, this 31st day of August, A. D. 1909.

GEO. M. KITZMILLER.

Witnesses:

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