

A. T. BROWN & C. E. TOMLINSON.

TYPE WRITING MACHINE.

APPLICATION FILED MAR. 11, 1904.

903,442.

Patented Nov. 10, 1908.

3 SHEETS—SHEET 1.

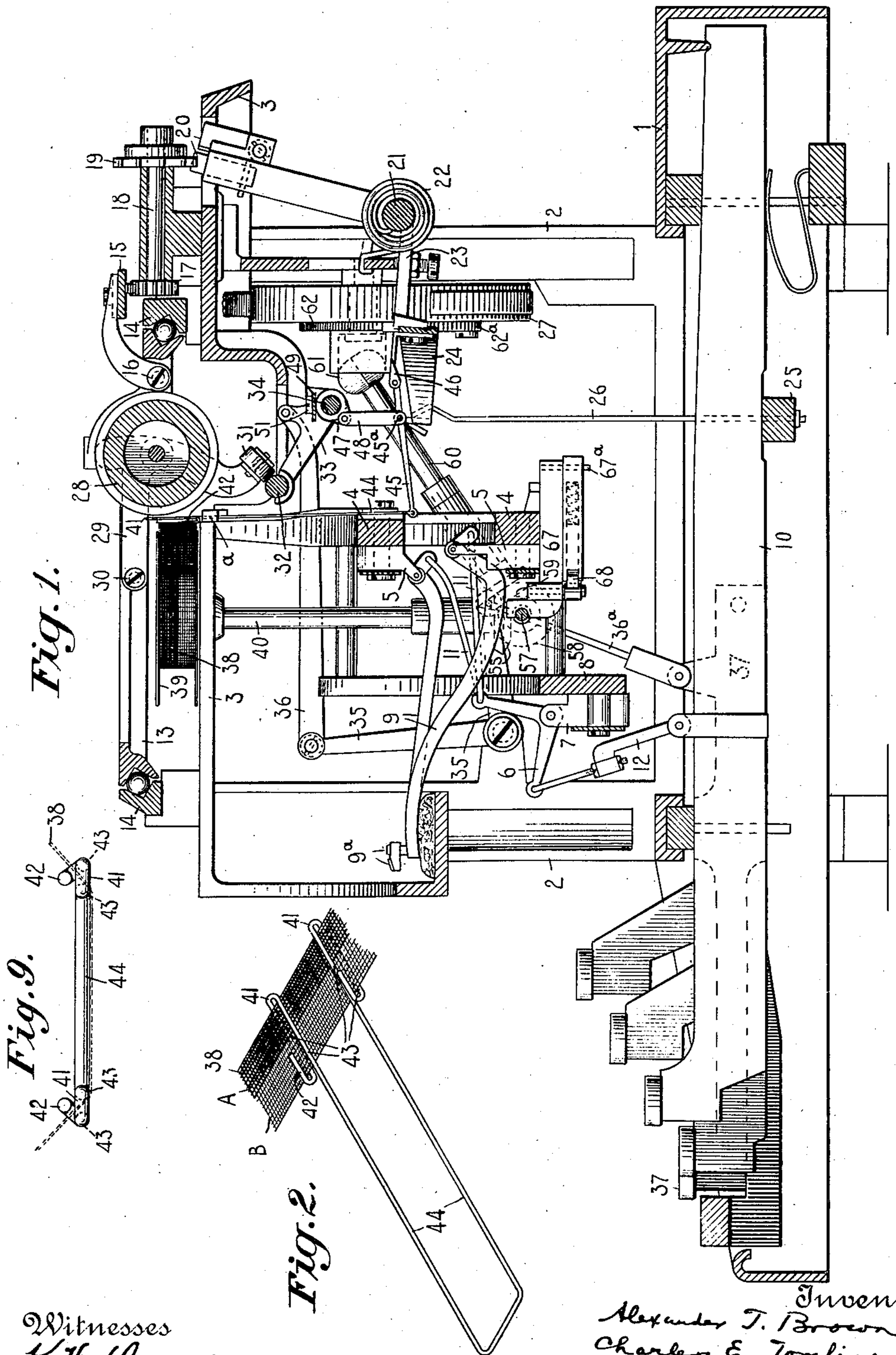


Fig. 9.

Fig. 2.

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3 SHEETS—SHEET 2.

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Fig. 3.

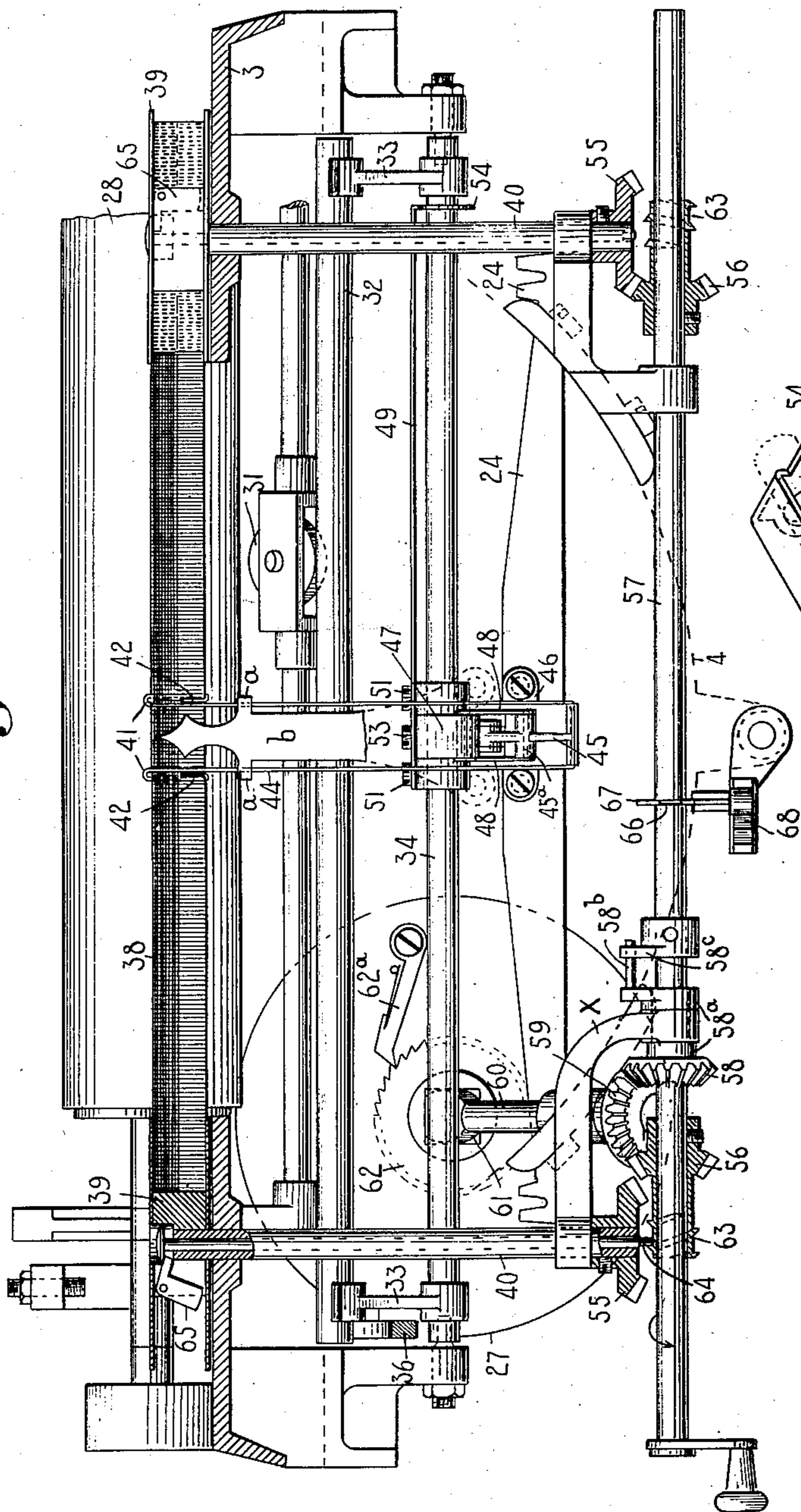
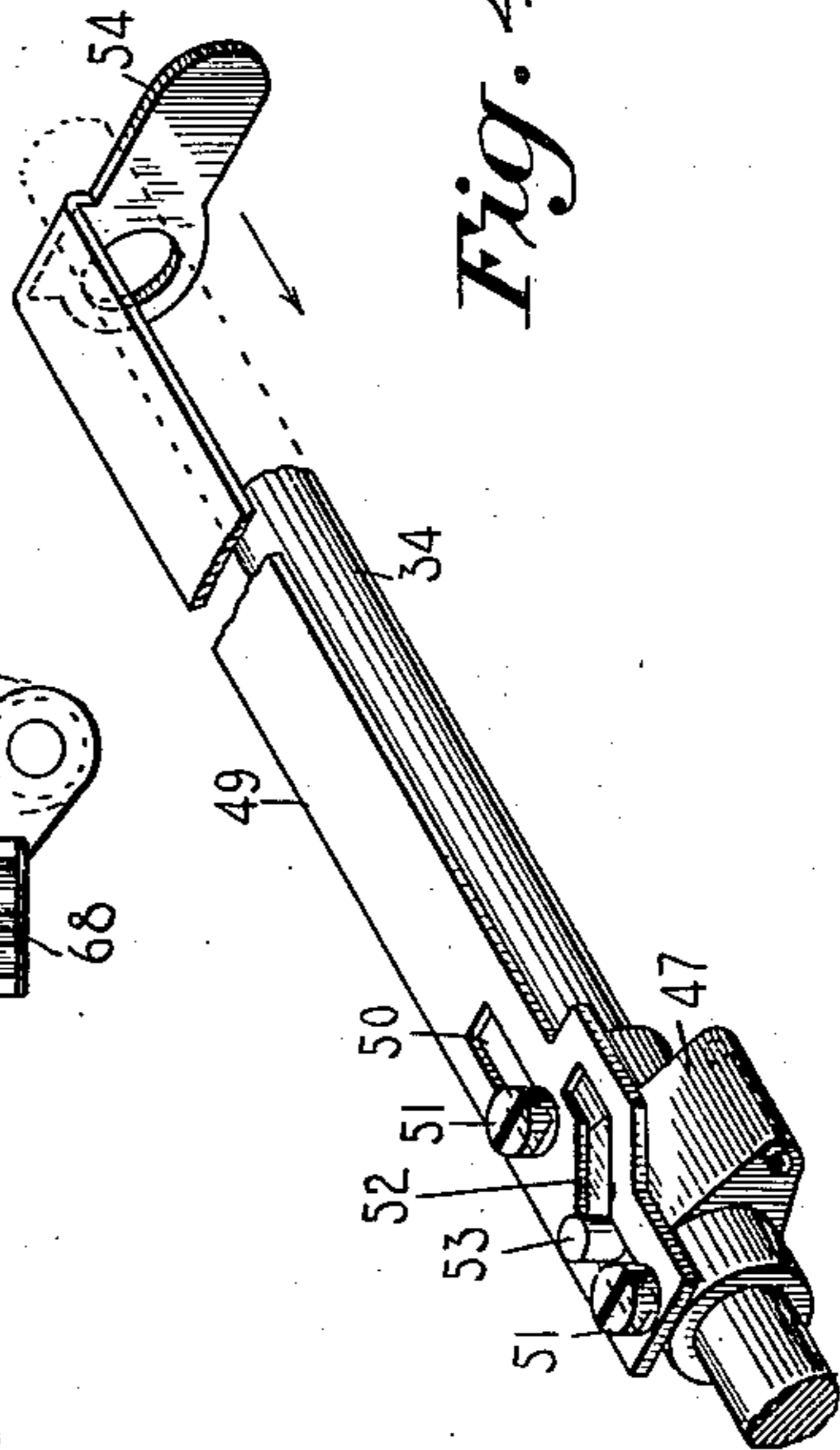


Fig. 4.



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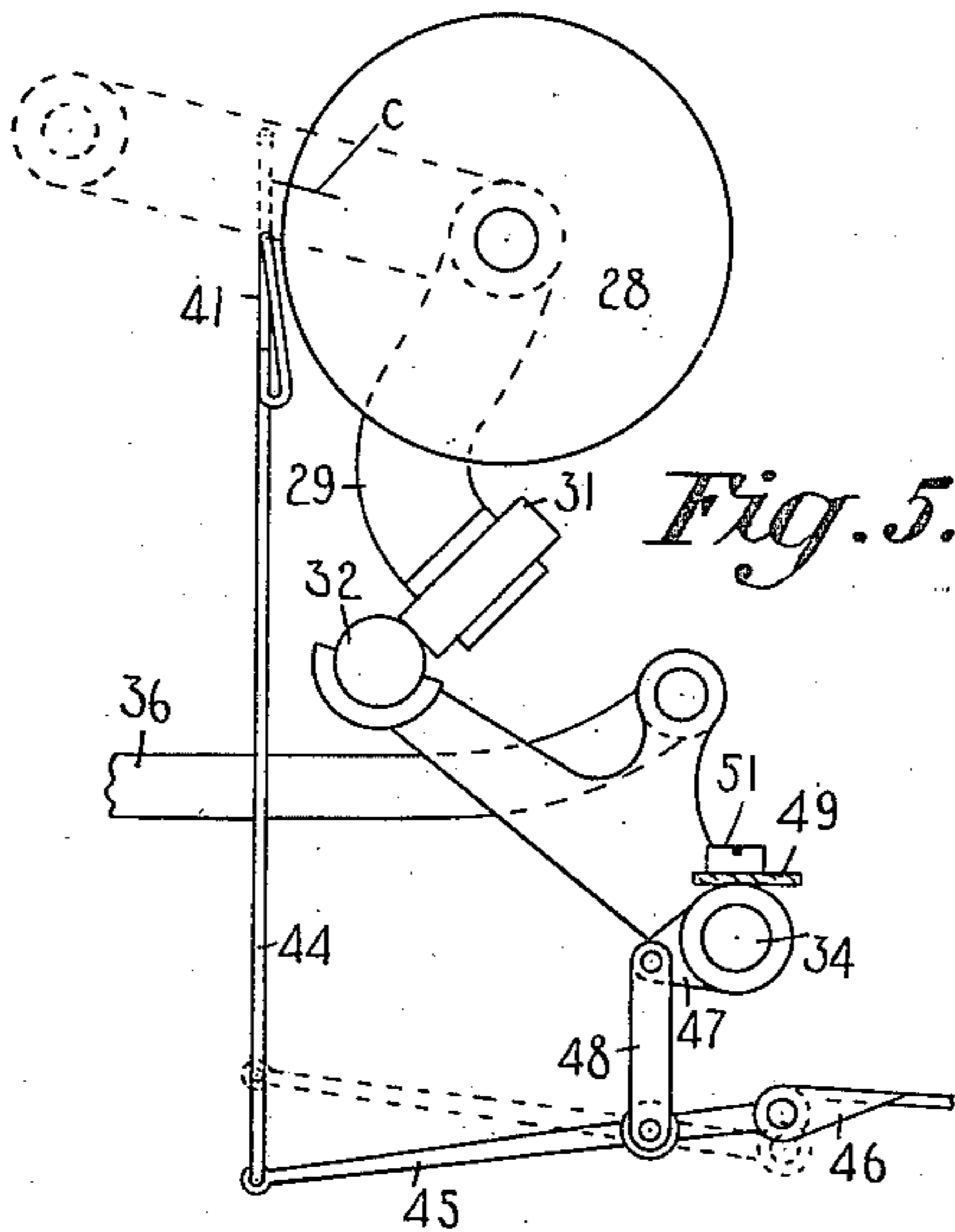


Fig. 5.

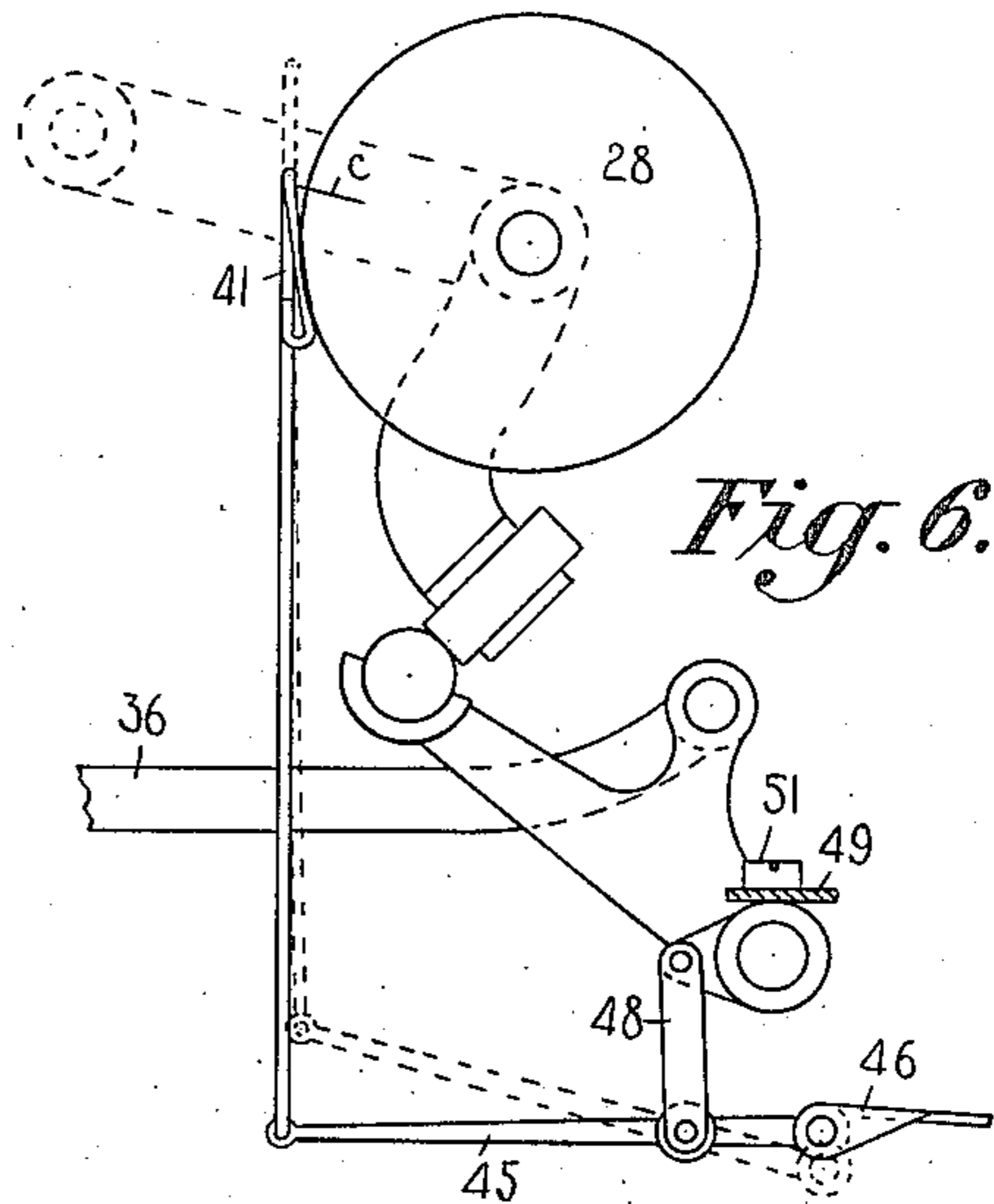


Fig. 6.

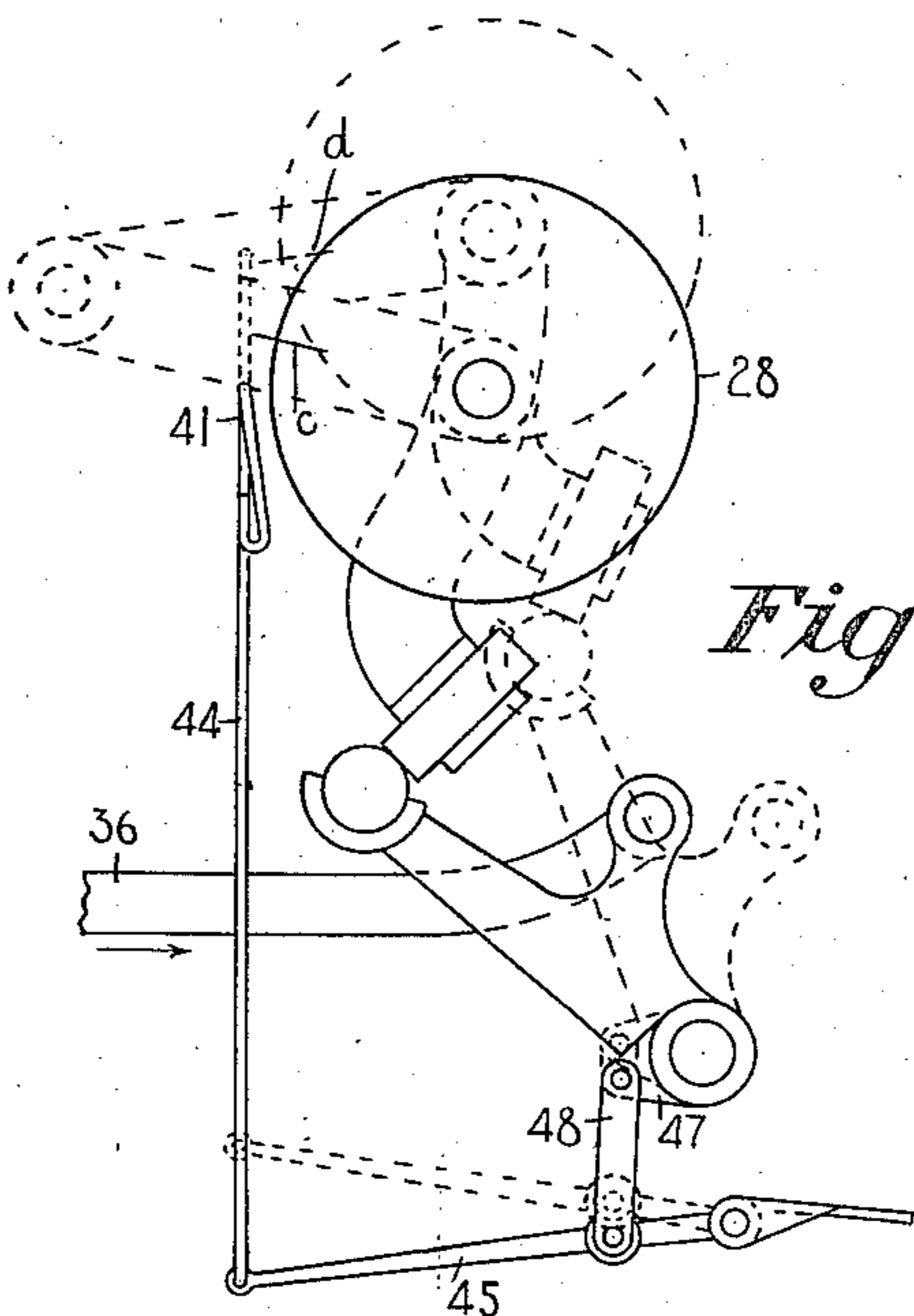


Fig. 7.

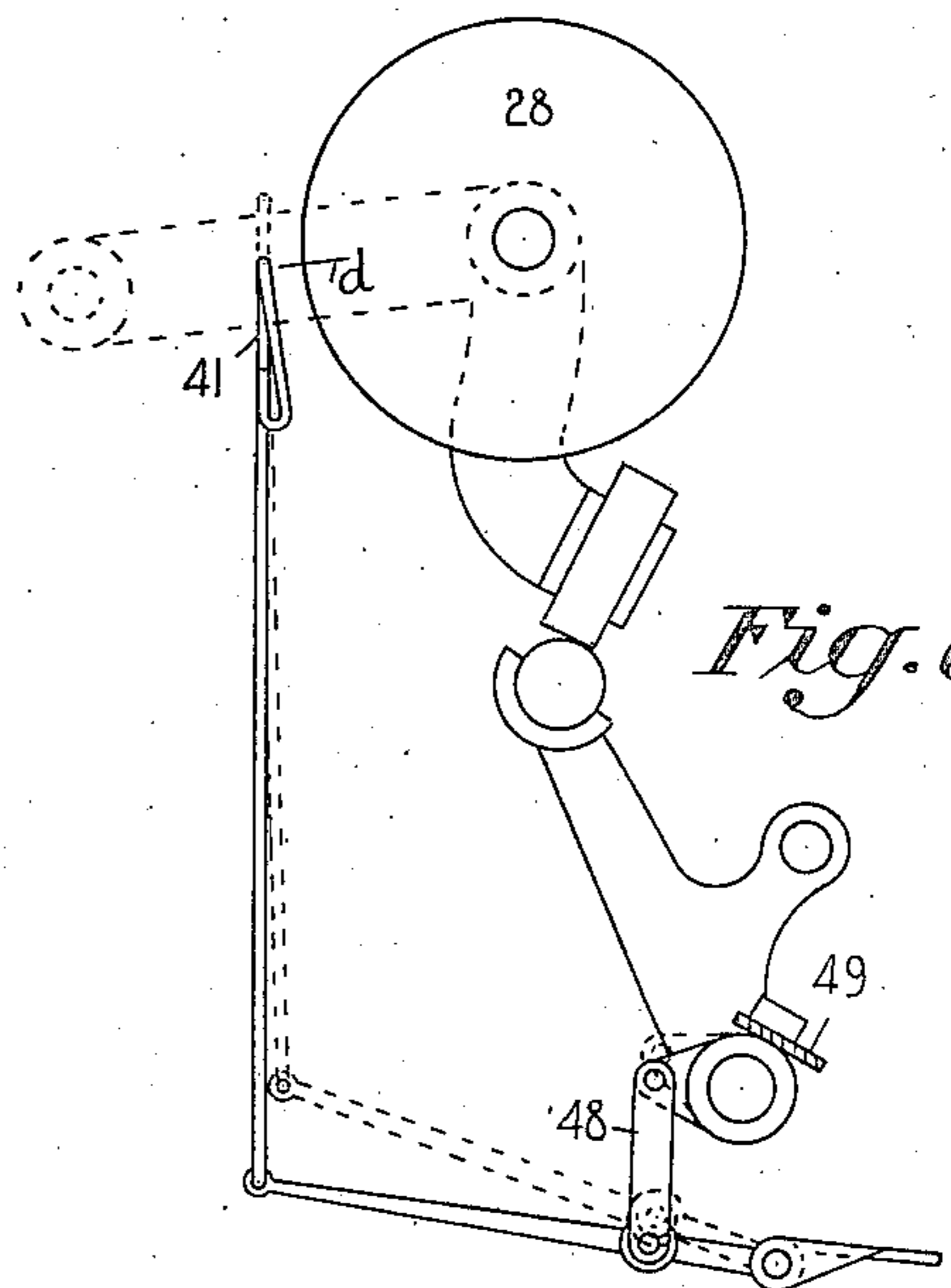


Fig. 8.

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN AND CHARLES E. TOMLINSON, OF SYRACUSE, NEW YORK; SAID
TOMLINSON ASSIGNOR TO SAID BROWN.

TYPE-WRITING MACHINE.

No. 903,442.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed March 11, 1904. Serial No. 197,695.

To all whom it may concern:

Be it known that we, ALEXANDER T. BROWN and CHARLES E. TOMLINSON, citizens of the United States, and residents of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

10 The present invention relates to the ribbon-mechanism of typewriting machines, one object of the invention being to reciprocate the ribbon to cover and uncover the printing point during the operation of the type-mechanism.

Another object is to shift the platen and ribbon in unison so as to use the same part of the ribbon in all positions of the platen.

20 Another object is to shift a reciprocatory ribbon guide so as to use different transverse parts of the ribbon at the same printing point.

Another object is to shift the platen and a reciprocatory ribbon guide independently so as to use different transverse parts or fields of the ribbon at each printing point; another object is to simplify the construction and operation of the ribbon-mechanism; other objects will appear hereinafter.

30 To the ends thereof, the invention consists of features of construction, arrangements and combinations of devices hereinafter described and more particularly pointed out in the appended claims.

35 One form of the invention is embodied in the machine illustrated in the accompanying drawings forming part hereof, in which

40 Figure 1 is a longitudinal vertical sectional view of a front strike typewriting machine to which I have shown my invention applied. Fig. 2 is a perspective view of a ribbon guide showing the manner in which the ribbon is received therein. Fig. 3 is a front elevation partly in section of the ribbon mechanism. 45 Fig. 4 is a perspective view of a part of the ribbon mechanism. Figs. 5 and 6 are detail side views showing, in full lines, the normal positions of parts when different longitudinal strips of the ribbon are to be used at the same printing point. Fig. 7 is a detail side view showing the positions of the parts, in full and dotted lines, for lower and upper

case work with the upper section of the ribbon. Fig. 8 is a like view showing the positions of the parts for upper case work with the lower half of the ribbon; and Fig. 9 is an enlarged detail top view of the ribbon vibrator.

In the drawing, the reference 1 marks the base of a suitable frame from which rise standards 2 to the tops of which a top-plate or frame 3 is made fast. To the underside of the frame 3, two type-segments 4 are made fast, and type bar hangers 5 are attached by screws and washers to the fronts of said segments 4. Bell-cranks 6 are fulcrumed on hangers 7 which are secured to a segment 8, and are connected respectively with the type bars 9 and key-levers 10 by suitable links 11, 12. The type bars 9 are each provided with a plurality of type (two type each in the instance shown).

The carriage 13 runs on suitable guide-rails 14, and has a rack bar 15 pivoted thereto at 16. The rack 15 meshes with a pinion 17 which is fast on a shaft 18. The shaft 18 is provided with a ratchet or escape-wheel 19 which is connected with the shaft by a back-ing-ratchet (not shown) as usual.

20 marks fixed and movable escapement dogs or pawls which are connected with a rock shaft 21 in the usual manner. 22 is a return spring for said shaft 21 and 23 is an arm extending from said shaft and to which the cross-bar 24 is fixed. The cross bar or arm 24 is connected with the universal bar 25 by rods 26 as usual.

27 is the spring-drum for drawing the carriage 13 to the left.

28 marks a platen which is rotatably mounted in arms 29 of a frame, which arms are pivoted to the carriage 13 at 30 in front of the platen, and which frame has a roller 31 journaled in a cross-bar thereof. The platen carrier swings about the pivots 30 to move the platen 28 from one to another printing point, and the faces of the type 9^a on each bar are set at an angle to each other so as to strike normal to the platen. The platen may be shifted by any suitable mechanism, as by that shown, which includes a track bar or shift rod 32 fast in arms 33 of a rock shaft 34, a bell crank 35, a link 36 connecting the bell crank with an arm 33 and a

link 36^a connecting the bell crank with a shift-lever 37.

The ink-ribbon 38 is carried by horizontally disposed spools 39 secured to vertically disposed shafts 40, and is threaded through guides 41 of a ribbon vibrator, the said guides being adjacent to the printing point. The guides 41 are formed by bending wires back substantially parallel to each other twice with their end portions 42 preferably bent in and opposite the spaces between the sides 43 of the first bend. By preference, the guides 41 are formed at the ends of a U-shaped wire 44, which passes through guides *a* on the pointer piece *b*. It will be observed that in Figs. 5 to 8 the sides of the guides 41 are not quite parallel but are substantially so.

In order automatically to cover and uncover the printing-point, the wire 44 is pivotally connected at its cross bar with a lever 45 which is operated by an arm 46 fast to the bar 24, and the fulcrum of the lever 45 is supported by an arm 47 mounted on and rocking with the shaft 34.

In order to bring different lengthwise strips of the ribbon into use at the printing point, the fulcrum of the lever 45 may be shifted or varied in position. In the instance shown, the lever 45 is fulcrumed at 45^a in a link 48 which is pivotally connected with the crank arm 47. In either case, the guide 41 is lifted proportionally whenever the platen is moved up or down, so that the same longitudinal strip, field or transverse part of the ribbon is used at each printing point, and the ribbon is automatically moved to cover and uncover the printing point during the operation of the type mechanism. In so far as the foregoing operations are concerned, the arm 47 may be fast on the shaft 34.

The ribbon 38 consists of a plurality of strips or fields A, B, whether separate or united, having different characteristics, thus one strip A may be of one color, say black, whereas the other strip B may be of a different color such as red, or one strip may be "record" ribbon and the other "copying" ribbon.

In order to be able to use any transverse portion or longitudinal strip of the ribbon 38, the arm 47 is mounted to have a limited motion circumferentially of the shaft 34, any one of a great number of suitable means being used to hold the arm 47 in its several positions relative to the shaft 34. As simple and convenient means as any is illustrated in the drawing, where 49 marks a bar arranged by straight slots 50 and screws 51, to slide along and to rock with the shaft 34, and provided with a cam-slot 52 which engages with a pin or screw 53 on the arm 47. A handle 54 is provided for convenience in sliding the bar 49. The bar 49 rotates the arm 47 whenever the cam-slot 52 is moved one way or the

other along the shaft 34 and so varies the position of the fulcrum of lever 45, by raising or lowering it, whereby different transverse portions or longitudinal strips of the ribbon may be used at each printing point by merely sliding bar 49 in or out.

The ribbon 38 is moved endwise by means of bevel gears 55 fast on the shafts 40, gears 56 fast on a shaft 57, said shaft being adapted to move longitudinally as usual through and independently of a bevel gear 58 which is held against movement during the longitudinal shift of the shaft by collars 58^a that are located on opposite sides of a fixed bracket *x* and are secured to a bearing sleeve which is received in a bearing in the bracket and forms part of or is connected to the bevel gear 58. A gear 59 meshes with the gear 58 and is carried by a shaft 60 and a universal joint 61 connects the shaft 60 with the usual ratchet wheel 62 loose on the shaft of and driven in one direction by a pawl 62^a on the spring drum 27.

The longitudinal travel of the ribbon 38 is automatically reversed by means of worms 63 fixed on the shaft 57, headed sliding pins 64 extending through the hollow shafts 40, and bell-levers or controlling devices 65 which are fulcrumed in the cores of spools 39 controlled by the ribbon 38 so that when the ribbon is about all unwound from a spool 39, the corresponding lever 65 is released, whereupon the associated rod or pin 64 drops down into engagement with the corresponding worm 63 and affords a movement of the shaft 57 to engage the gears 55, 56 at the empty spool, thus reversing the direction of the feed of the ribbon. The pin 64 is lifted as soon as the ribbon begins to wind on the empty spool and bears against and actuates the bell-lever 65 which tends to move to the position shown in dotted lines in Fig. 3 by its own weight.

From the foregoing description it will be understood that the weight of each vertically disposed rod or reversing device 64 is sufficient to move its controlling device or bell crank 65 to the position shown in full lines in Fig. 3 when the ribbon uncovers the bell crank and it is free to be moved by the rod, and that each ribbon reversing device, dropping as it does by its own weight into cooperation with its associated worm 63, will effect a reversal in the direction of the feed of the ribbon by power applied from the spring drum 27, so that no strain whatever is exerted upon the ribbon itself in bringing about the reversal in the feed thereof and that such reversal is instantly brought about and there is no period when the ribbon is not being fed in either one direction or the other, or when it will receive successive impacts of the types on the same point on the ribbon. Thus the instant one spool is disengaged from its driv-

ing mechanism the other spool is engaged so that the ribbon is fed at all times in either one direction or the other.

While as stated above the shaft 57 is adapted to be moved longitudinally independently of the bevel gear 58, said gear is at all times adapted to turn the shaft irrespective of the longitudinal position of the shaft by means of a crank pin 58^b that projects from one of the collars 58^a and extends loosely through a bifurcation in an arm 58^c that has its hub or collar secured to the shaft 57 by a pin or otherwise. The shaft 57 is held at the limit of its movement in either direction by a groove 66 therein and the contacting arm 67 which is pivoted at 67^a and is held by a spring-latch 68 as usual.

In Figs. 5 to 7, the line *c* marks the lower case printing point; and in Figs. 7 and 8, the line *d* marks the upper case printing point. As stated above, Figs. 5 and 6 show, in full lines, the different positions of lever 45 for using different parts of the ribbon at one printing point. In Fig. 7 the dotted lines show the effect of operating the platen shift key, while Fig. 8 shows the effect of operating the bar 49 and the shift key.

The claims herein are not limited to the precise form of the invention shown in the drawing and above described as the invention may be embodied in forms other than those shown and described.

Certain of the features shown in the accompanying drawings are not claimed herein and do not constitute our joint invention but are the invention of Alexander T. Brown and are claimed in separate applications filed by him on April 21st, 1902 and March 4th, 1904 bearing Serial Nos. 103,898 and 196,537 respectively. These features relate to the type bar construction and mounting and to the platen shifting mechanism.

What we claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, a ribbon-guide consisting of a U-shaped wire having its ends bent back twice upon themselves to form catches for both edges of the ribbon, combined with a rocking arm or lever connected with said guide at the bend of the U, whereby the ribbon is vibrated to cover and uncover the printing point.

2. In a typewriting machine, the combination with the platen arranged to be lifted to shift the case, of a reciprocatory ribbon guide, a rock shaft and connections for shifting said platen, an arm on said shaft, a link pivoted on said arm, a lever fulcrumed on said link and actuating said guide, and means for actuating said lever during the operation of the type keys.

3. In a typewriting machine, the combination with the platen arranged to be lifted to shift the case, of a reciprocatory

ribbon guide, a rock shaft and connections for shifting said platen, an arm mounted on the said shaft, a link pivoted on said arm, a lever fulcrumed on said link and actuating said guide, whereby the same part of the ribbon width may be used at the printing point in either shifted position of the platen, means for operating said lever during the operation of the type keys, and means for connecting said arm and shaft in different relative positions, whereby different parts of the ribbon-width may be used at the printing point in either shifted position of the platen.

4. In a typewriting machine, the combination of a platen, a rock shaft and connections for moving said platen to different printing positions, a reciprocatory ribbon-guide for covering and uncovering the printing point during the operation of the type mechanism, a lever for actuating said guide, an arm on said rock shaft and movable independently circumferentially thereof and which supports the fulcrum of said lever, and means whereby said arm may be moved to and held in different circumferential positions relative to said rock shaft.

5. In a typewriting machine, the combination of printing instrumentalities, an inking ribbon having a plurality of fields of different characteristics, an automatically actuated ribbon vibrator adapted to move the ribbon so as to cover and uncover the printing point, and means for determining which of the plurality of fields shall be presented to the action of the printing instrumentalities, said determining means comprising a lever 45, a rotary sleeve that is operatively connected to the fulcrum of said lever, and a hand actuated longitudinally movable slide operatively connected to said sleeve and operative to turn said sleeve to different positions to change the position of the fulcrum of said lever and to retain it in the relative position to which it is shifted.

6. In a typewriting machine, the combination of printing instrumentalities, finger keys therefor, a platen, a rock shaft for shifting the platen to change the case position thereof, a ribbon vibrator, an actuating lever therefor, an adjustable device that is carried by said rock shaft, means for supporting the fulcrum of the actuating lever by said adjustable device so that the lever and rock shaft will move together during the shift of the platen, hand actuated means movable with the rock shaft for adjusting said adjustable device, and means for actuating said lever at each operation of a finger key.

7. In a typewriting machine, the combination of printing instrumentalities, finger keys therefor, a platen, a rock shaft for shifting the platen to change the case position thereof, a ribbon vibrator, an actuating lever

therefor, an adjustable sleeve carried by and adapted to be turned to different positions on and relatively to said rock shaft, means for supporting the fulcrum of said lever on said sleeve, means carried by the rock shaft for adjusting the sleeve to different positions circumferentially on the shaft, and means for actuating said lever at each operation of a finger key.

8. In a typewriting machine, the combination of ribbon spools having substantially vertically disposed axes, reversing devices that drop by their own weight and which are associated with said spools, ribbon reversing mechanism controlled by said reversing devices, and controlling devices carried by the ribbon spools and cooperating with said reversing devices.

9. In a typewriting machine, the combination of ribbon spools having substantially vertically disposed axes, vertically disposed reversing devices that drop by their own weight and which are associated with said spools, ribbon reversing mechanism controlled by said reversing devices, and controlling devices carried by the ribbon spools and cooperating with said reversing devices, said controlling devices being released by the ribbon on the spools.

10. In a typewriting machine, the combination of ribbon spools having substantially vertically disposed axes on which they rotate, reversing devices that are disposed centrally of said spools and which drop by their own weight, ribbon reversing mechanism which is engaged by said reversing devices, and means for controlling said reversing devices.

11. In a typewriting machine, the combination of ribbon spools having substantially vertically disposed axes on which they rotate, reversing devices that are disposed centrally of said spools and which drop by their own weight, ribbon reversing mechanism which is engaged by said reversing devices, and controlling devices associated with said reversing devices and which are released when an end of the ribbon is approached to afford an operation of a reversing device.

12. In a typewriting machine, the combination of a carriage, a spring drum therefor, ribbon reversing mechanism actuated by said spring drum, reversing devices that drop by their own weight into cooperation with said ribbon reversing mechanism to bring about an operation of the reversing mechanism, and controlling devices that are released by the ribbon and control said reversing devices.

13. In a typewriting machine, the combination of ribbon spools, an automatically actuated vertically disposed reversing device associated with each ribbon spool, and ribbon reversing mechanism comprising a worm associated with each reversing device, each

reversing device being adapted to drop vertically and in the direction of its length by its own weight into cooperation with its associated worm.

14. In a typewriting machine, the combination of ribbon spools, an automatically actuated reversing device associated with each ribbon spool, ribbon reversing mechanism comprising a worm associated with each reversing device, each reversing device being adapted to drop by its own weight into cooperation with its associated worm, and controlling devices associated with said actuating devices and which are released by the ribbon when an end thereof is approached.

15. In a typewriting machine, the combination of horizontally disposed ribbon spools that turn on substantially vertical axes, reversing devices that are vertically disposed and extend centrally through said ribbon spools, a pivoted controlling device carried by each ribbon spool and which cooperates with an associated reversing device, a worm for each of said reversing devices and which worms are adapted to rotate said ribbon spools, and a spring drum which turns said worms.

16. In a typewriting machine, the combination of ribbon spools, hollow shafts for turning said ribbon spools, headed sliding pins working in said hollow shafts and extending through the centers of the spools, controlling devices, each pivoted to a ribbon spool and cooperating with the head of a pin and being controlled by the ribbon on the spools, and means with which the pins cooperate to effect a reversal in the direction of the feed of the ribbon.

17. In a typewriting machine, the combination of ribbon spools, vertically disposed hollow shafts for turning said ribbon spools, sliding pins that extend longitudinally through and work in said hollow shafts and extend into the cores of said spools, controlling bell crank levers, each pivoted to a ribbon spool and cooperating directly with a pin, each bell crank being controlled by the ribbon on the spools, and means with which the pins cooperate to effect a reversal in the direction of the feed of the ribbon.

18. In a typewriting machine, the combination of ribbon spools, hollow shafts for turning said ribbon spools, sliding pins working in said hollow shafts and extending through the centers of the spools, controlling devices, each pivoted to a ribbon spool and cooperating with the head of a pin and being controlled by the ribbon on the spool, a gear on each hollow spool shaft, a pinion adapted to cooperate with each gear, a longitudinally movable shaft carrying said pinions and a worm for each pin.

19. In a typewriting machine, the combination of ribbon spools, vertically disposed

hollow shafts for turning said ribbon spools,
sliding pins that extend longitudinally
through and work in said hollow shafts and
extend into the cores of said spools, control-
5 ling bell crank levers, each pivoted to a rib-
bon spool and coöperating directly with a
pin, each bell crank being controlled by the
ribbon on the spools, a gear on each hollow
spool shaft, a pinion adapted to coöperate
10 with each gear, a longitudinally movable

shaft carrying said pinions, and a worm for
each pin.

Signed at Syracuse, in the county of Onon-
daga and State of New York this 9th day of
March A. D. 1904.

ALEXANDER T. BROWN.

CHARLES E. TOMLINSON.

Witnesses:

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ELIZABETH PURDY.