

No. 671,162.

Patented Apr. 2, 1901.

H. S. DUKES.

RIBBON MOVEMENT FOR TYPE WRITING MACHINES.

(Application filed Mar. 23, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

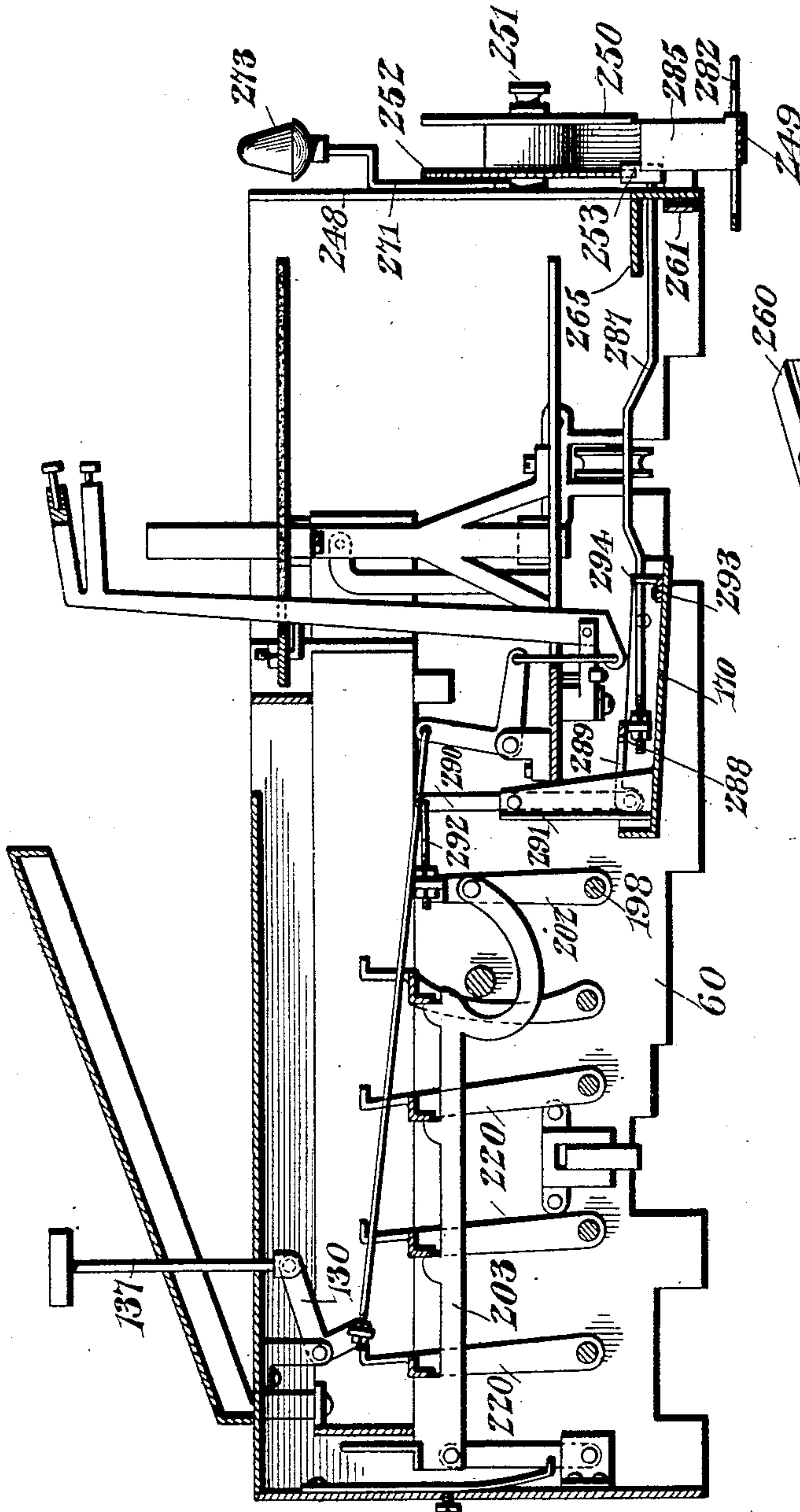


Fig. 1A.

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Witnesses

Jas E. McClure  
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Fig. 2.

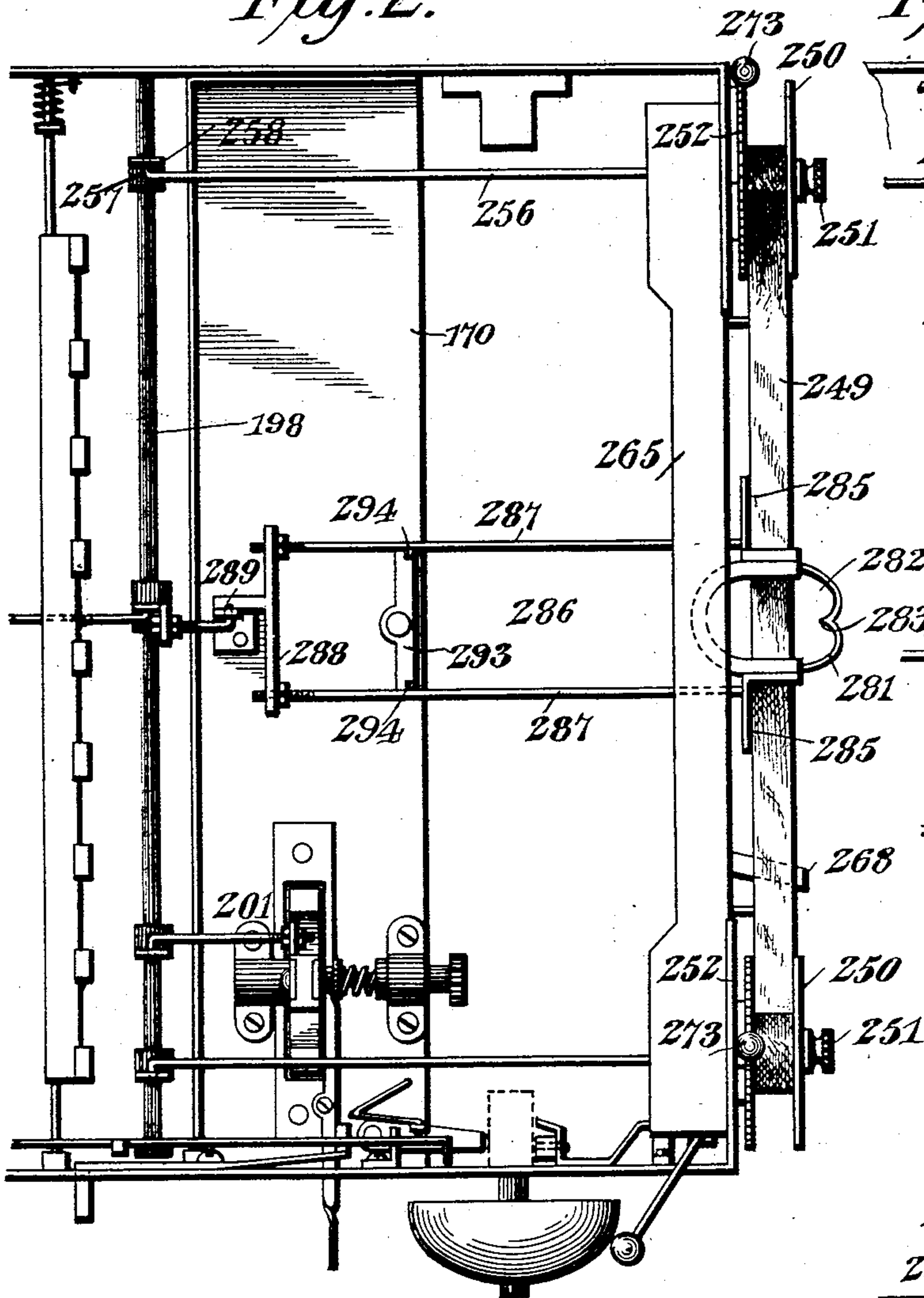


Fig. 3.

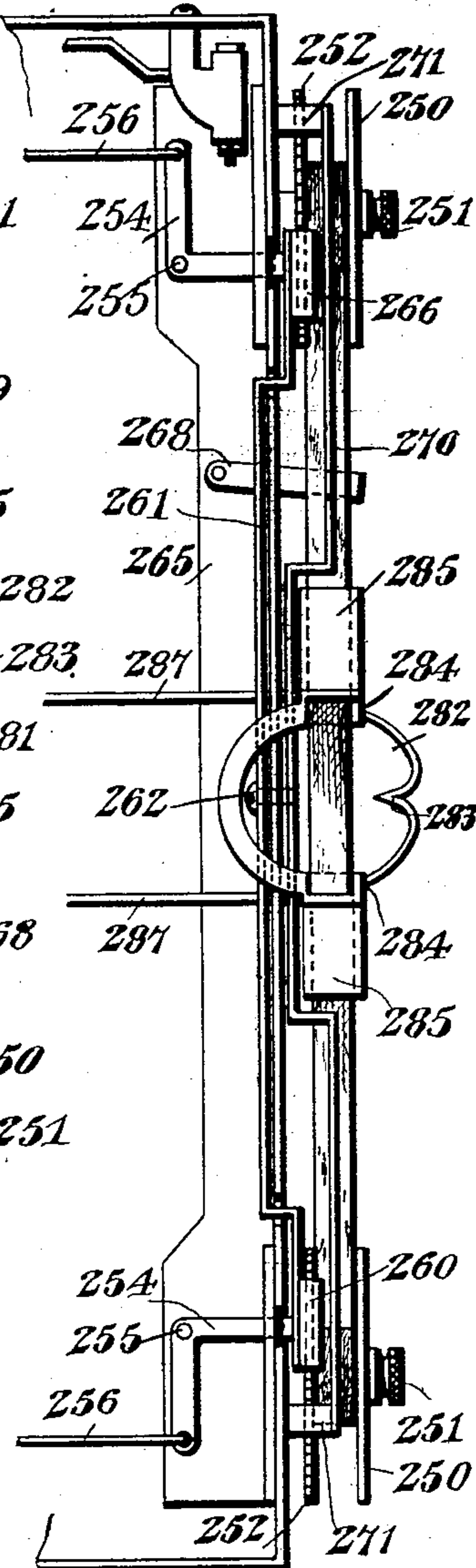


Fig. 9.

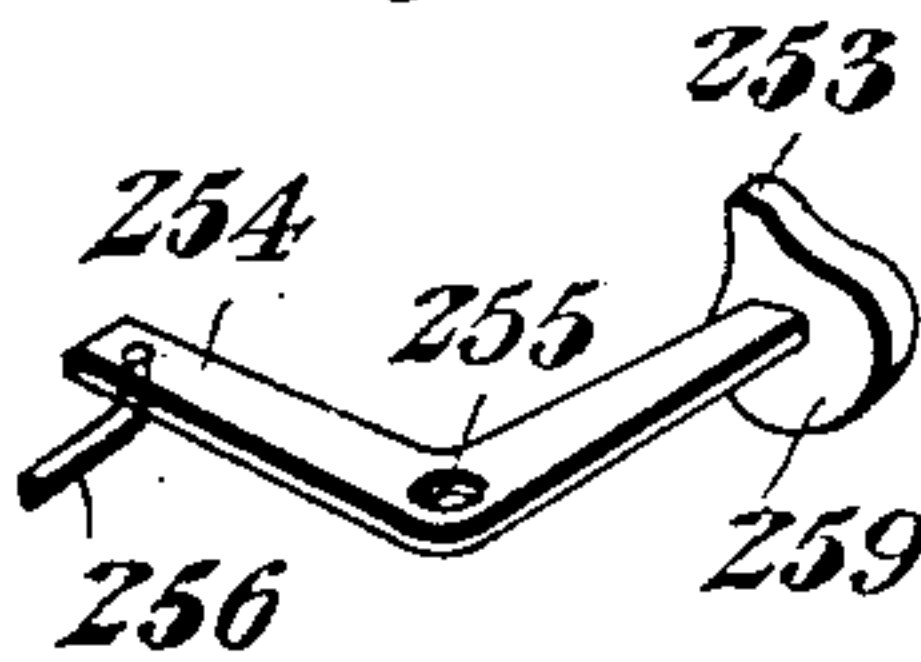


Fig. 10.

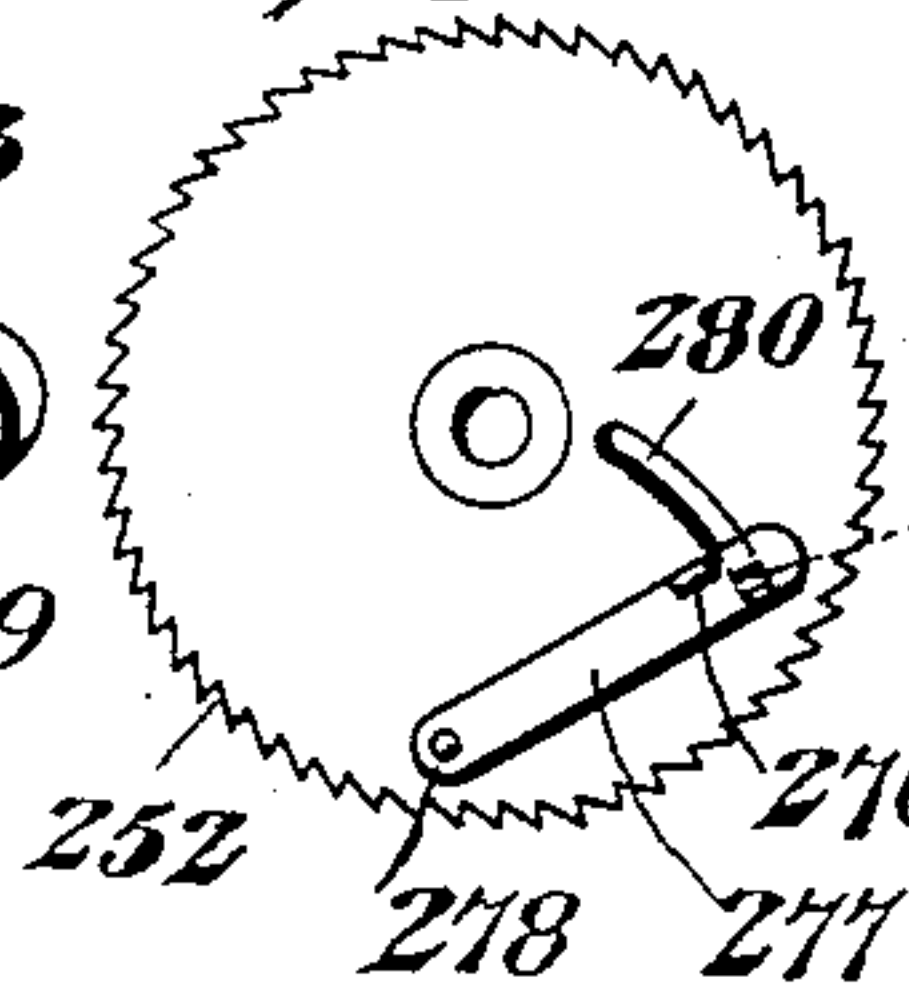


Fig. 11.

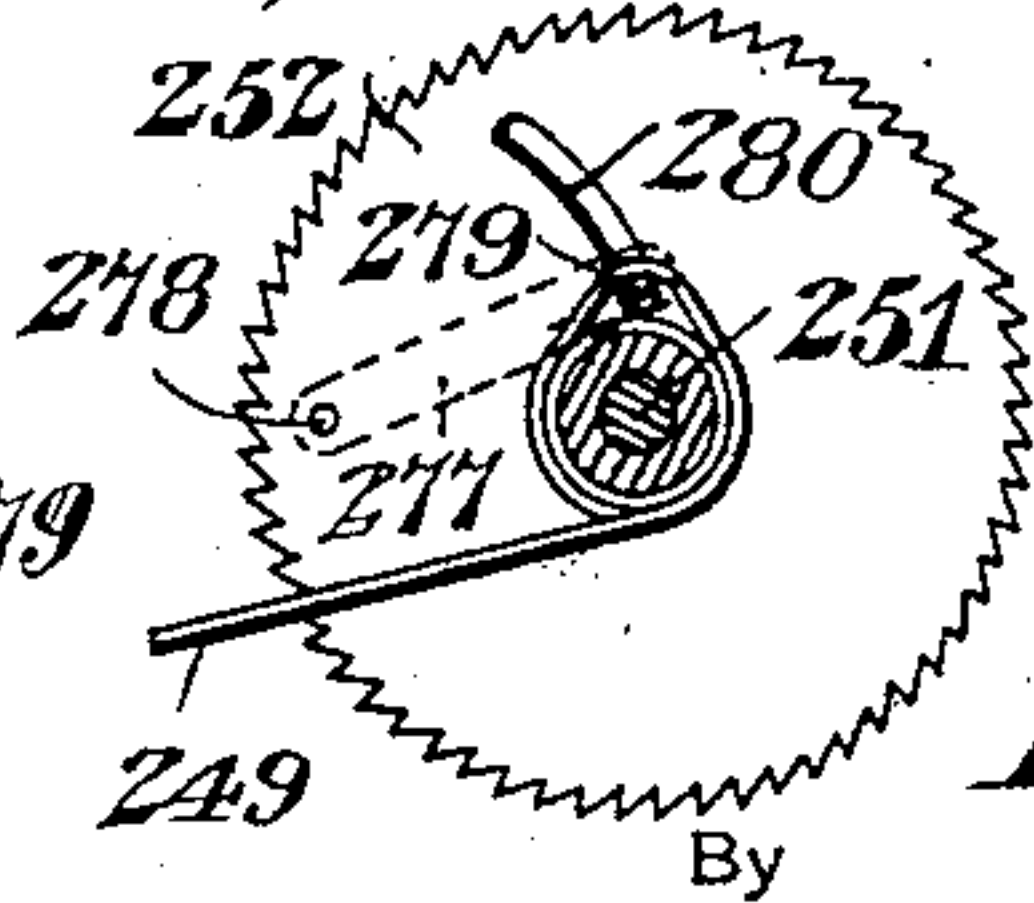
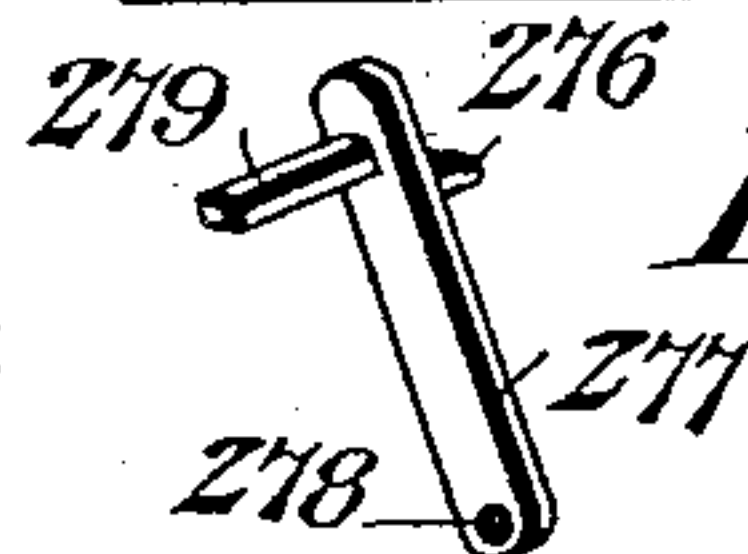


Fig. 12.



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# RIBBON MOVEMENT FOR TYPE WRITING MACHINES.

(Application filed Mar. 23, 1900.)

(No Model.)

**4 Sheets—Sheet 3.**

Fig. 4.

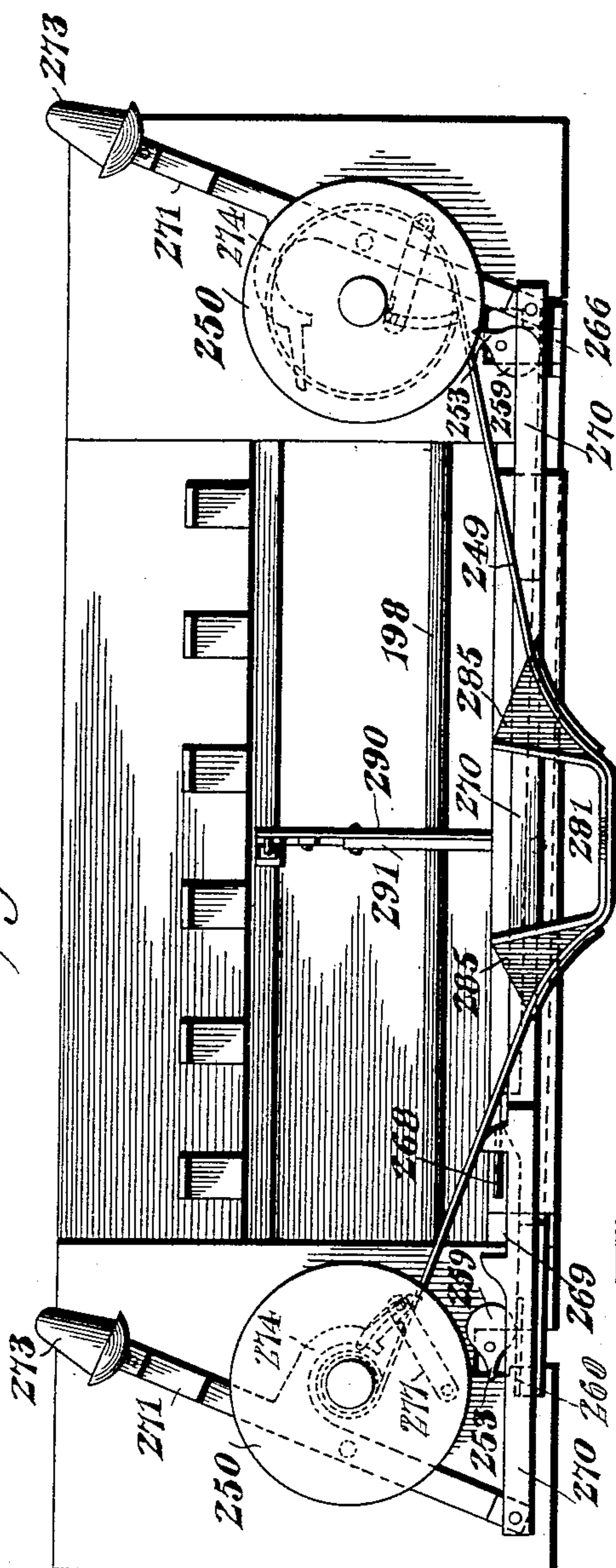
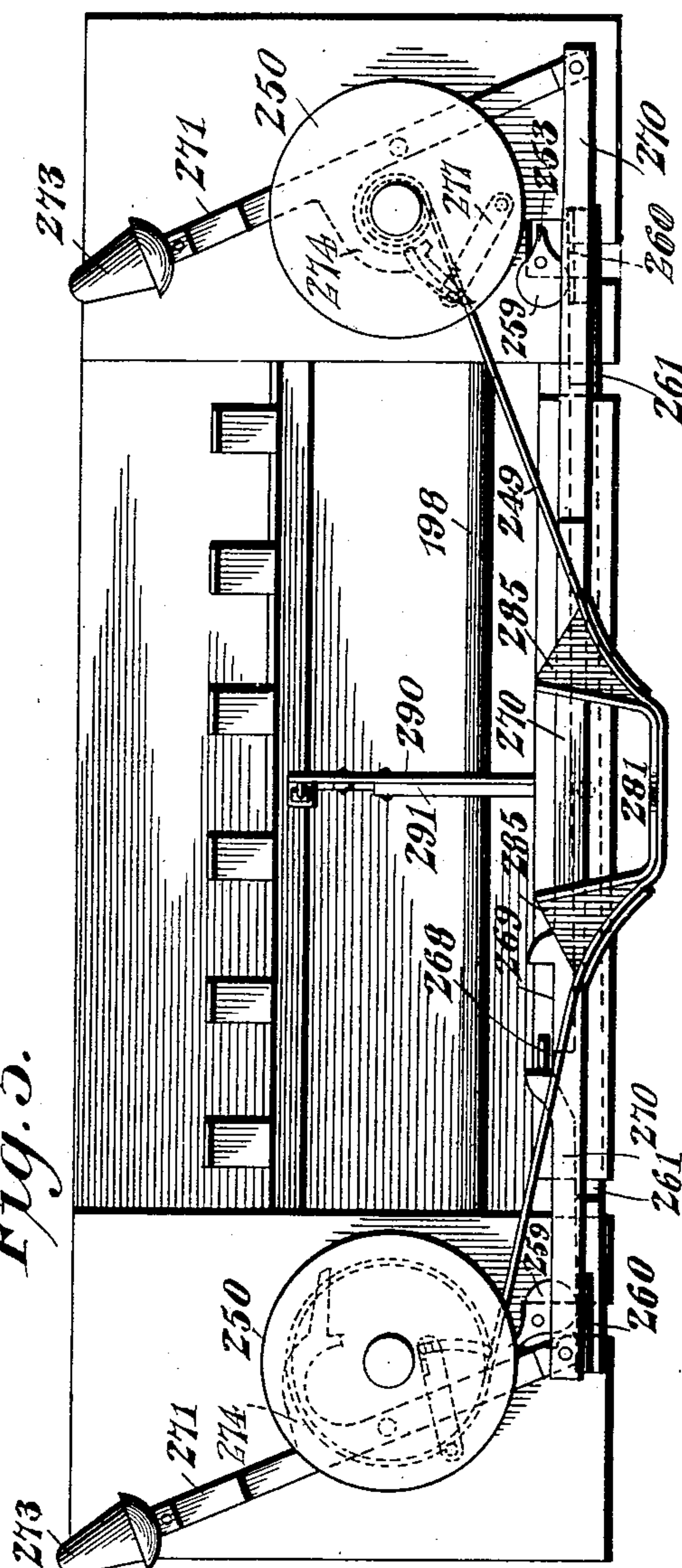


Fig. 5.



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RIBBON MOVEMENT FOR TYPE WRITING MACHINES.

(No Model.)

(Application filed Mar. 23, 1900.)

4 Sheets—Sheet 4.

Fig. 8.

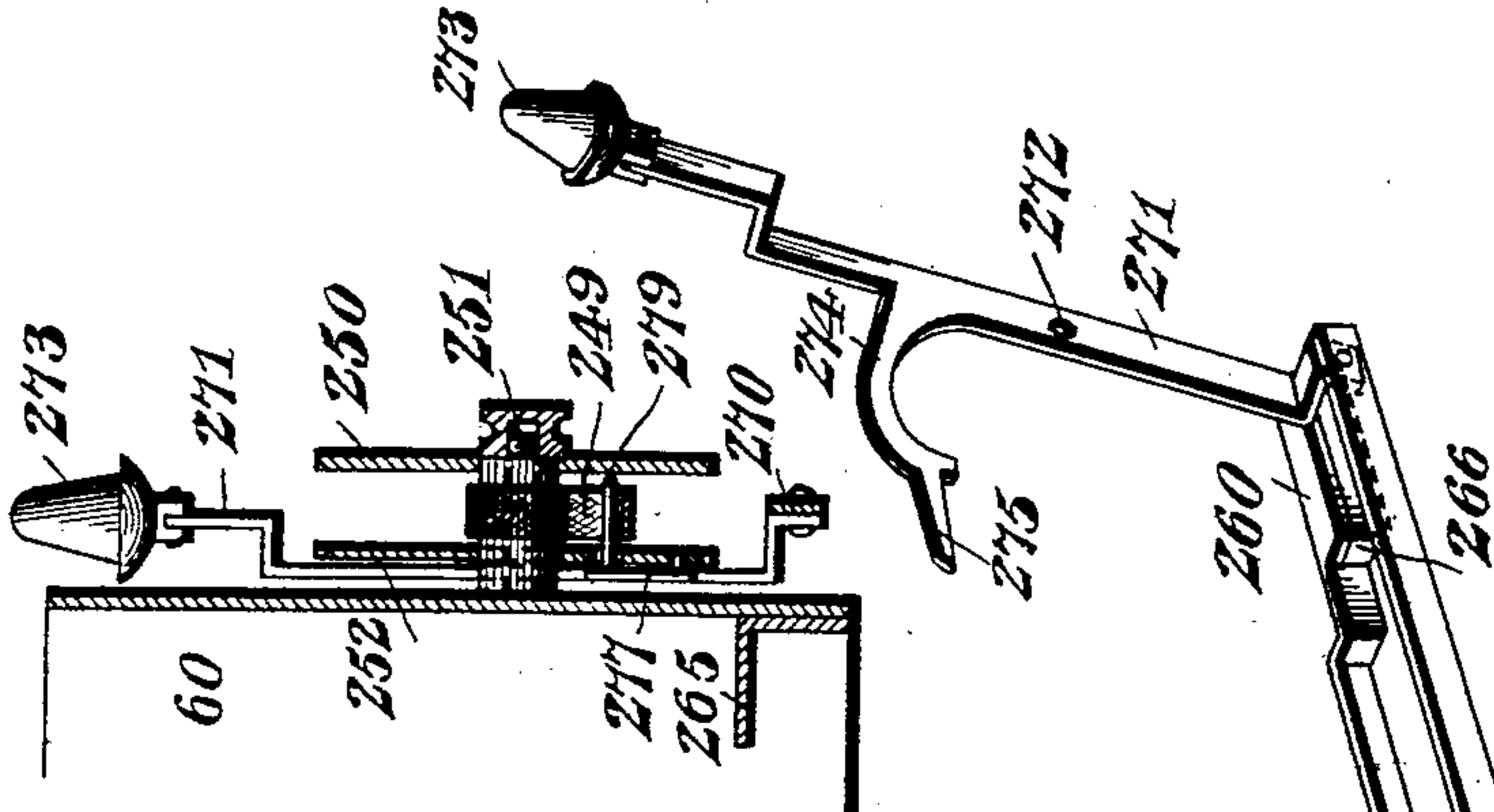


Fig. 7.

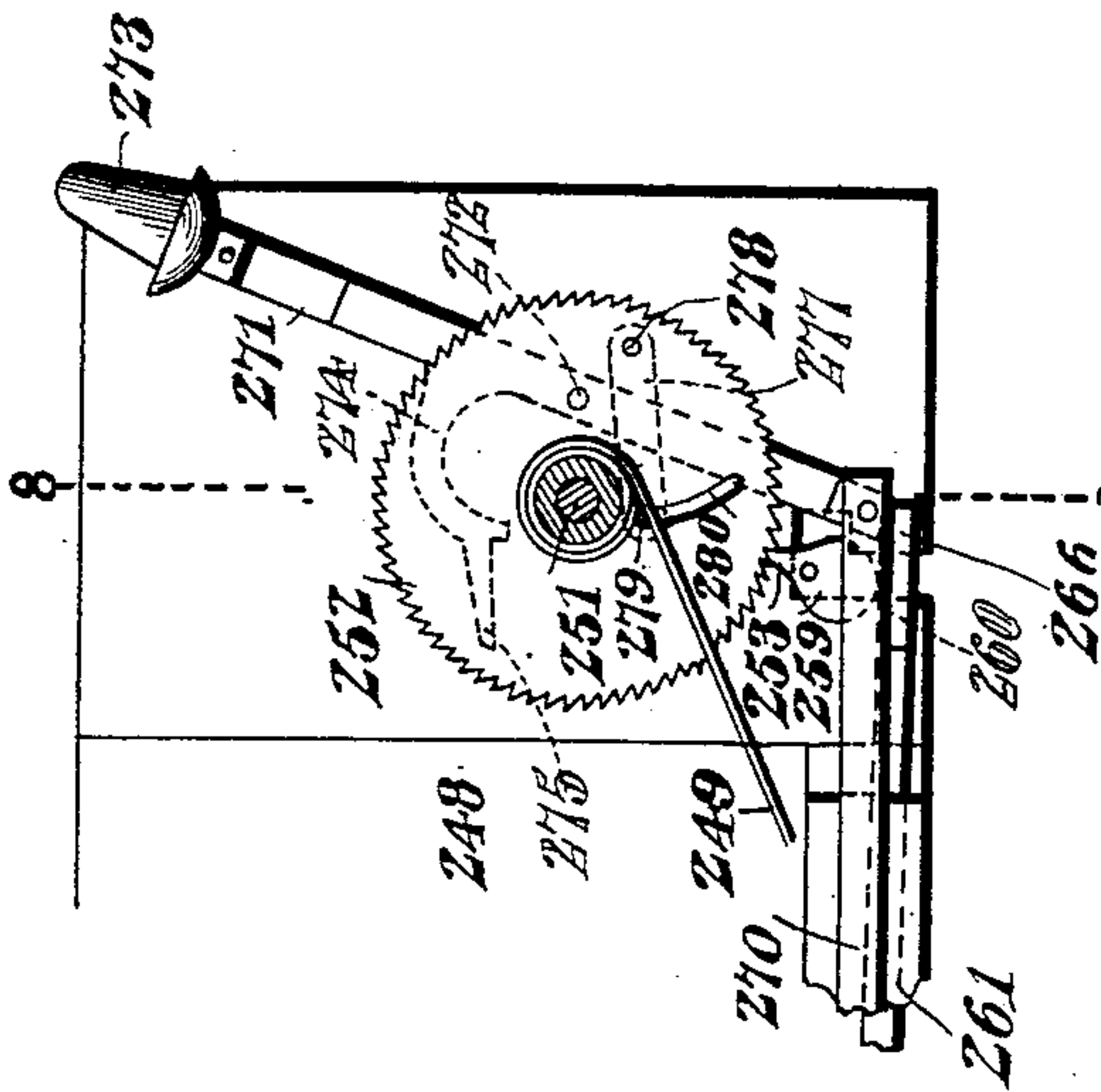


Fig. 6.

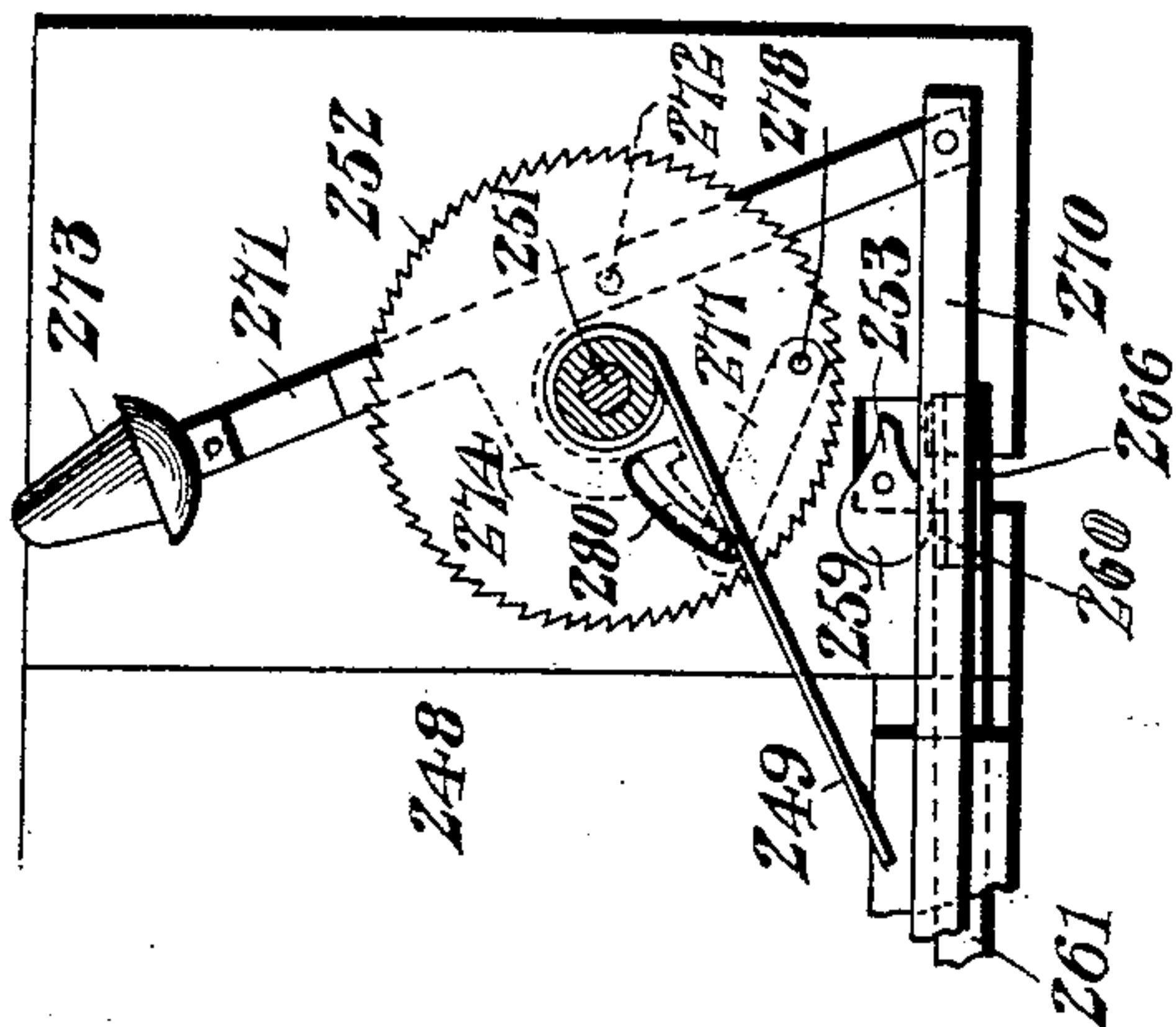
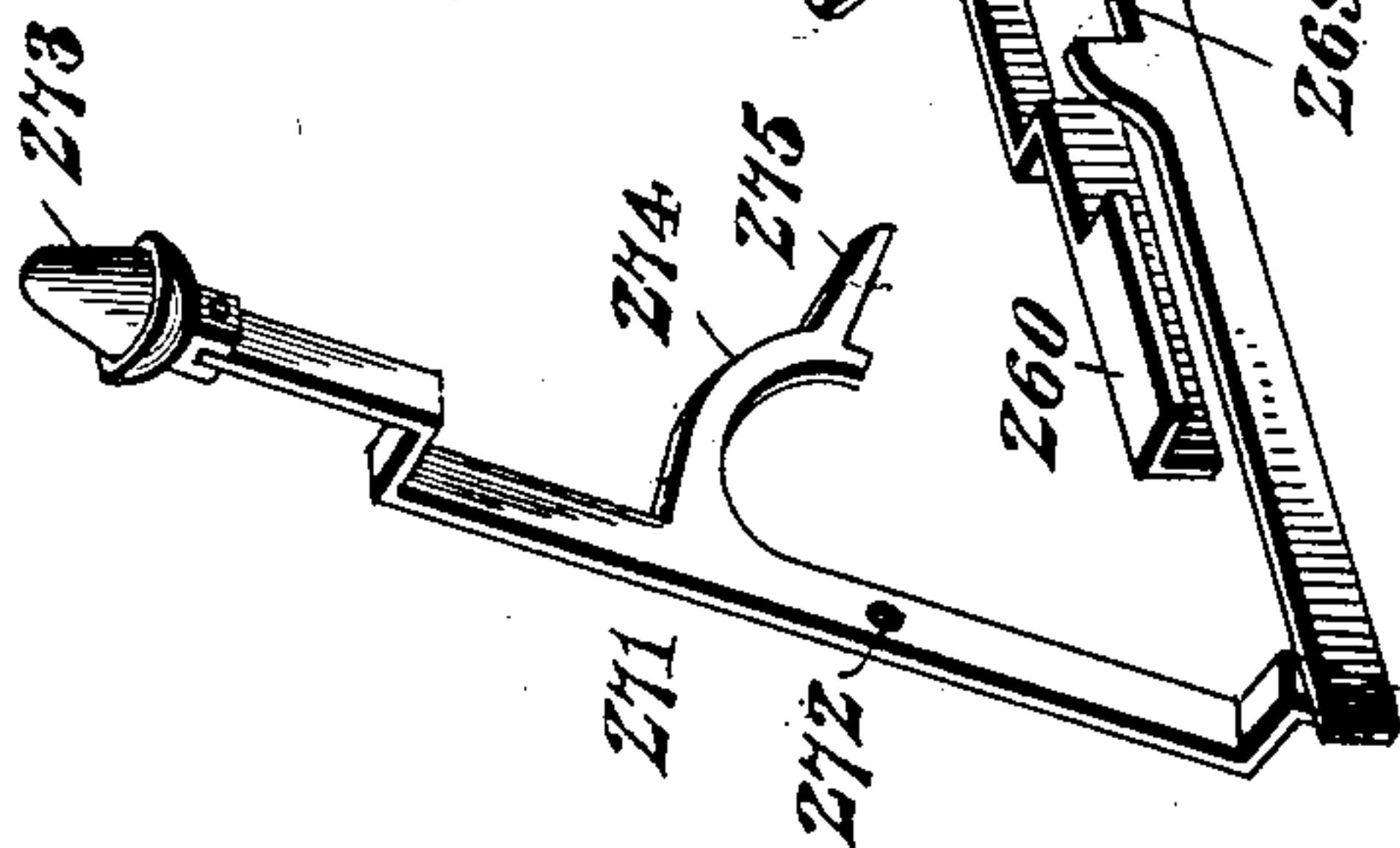


Fig. 13.



Witnesses

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# UNITED STATES PATENT OFFICE.

HARRY S. DUKES, OF LITTLE ROCK, ARKANSAS.

## RIBBON-MOVEMENT FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 671,162, dated April 2, 1901.

Application filed March 23, 1900. Serial No. 9,937. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY S. DUKES, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented a new and useful Ribbon-Movement for Type-Writing Machines, of which the following is a specification.

This invention relates to type-writing machines, and has special reference to an improved ribbon-movement involving automatic reversing mechanism providing positive and reliable means whereby the feed of the ribbon from one spool to the other will be automatically reversed during the operation of the machine.

A further object of the invention is to provide a ribbon-movement including in its organization a novel construction of ribbon-guide associated with operating mechanism providing means whereby the guide will normally hold the inking-ribbon in front of the line of writing, so that all of the writing is absolutely visible and the line being written is only covered by the ribbon when the character is being struck.

Other objects will readily appear to those familiar with the art as the nature of the invention is better understood; and the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The instrumentalities constituting the ribbon-movement are susceptible to a wide range of modification and rearrangement without affecting the results sought for; but the preferred embodiment of the improvements is shown in the accompanying drawings, in which—

Figure 1 is a diagrammatic or skeleton sectional view of a type-writing machine of a type specially designed for printing upon the pages of books or upon other surfaces held in a flat or spread-out condition, showing sufficient of the key and type actions to illustrate the means for actuating the motion-transmitting element which is utilized in that type of machine to operate the elements of the ribbon-movement. Fig. 2 is a top plan view of a portion of the type-carriage of the machine shown in Fig. 1, with the type-action removed to expose the oper-

ative connections between the ribbon-movement and the motion-transmitting element of the type-writing machine. Fig. 3 is a bottom plan view of the type-carriage with the improved ribbon-movement associated therewith. Fig. 4 is a rear elevation of the type-carriage, showing the mounting of the ribbon-spools, the actuating-pawls, which constitute a part of the ribbon-feed movement, and the reversing mechanism for the ribbon-feed. Fig. 5 is a similar view showing a different position of the same parts. Figs. 6 and 7 are detailed views illustrating the different positions of portions of the ribbon-feed-reversing mechanism to show the automatic action thereof. Fig. 8 is a detail sectional view on the line 8 8 of Fig. 7. Fig. 9 is a detail in perspective of one of the actuating-pawls forming a part of the ribbon-feed movement. Figs. 10 and 11 are detail views showing more plainly the mounting of the pivotal trip-latches on the ratchet-disk of the ribbon-spools. Fig. 12 is a detail in perspective of one of the trip-latches for the ribbon-spools. Fig. 13 is a detail in perspective of the reversing device or mechanism for the ribbon-feed. Fig. 14 is a detail in perspective of the reciprocary reversing-bar constituting a part of the ribbon-feed-reversing mechanism or device.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

The ribbon-movement forming the subject-matter of the present application is necessarily capable of use in connection with any form of type-writing machine with which it may be conveniently associated; but the said movement possesses special utility in connection with that class of type-writing machines designed for bookwork and the like. So for illustrative purposes the ribbon-movement is shown in the drawings as applied for use in connection with a book type-writing machine of the type disclosed in my pending application, filed January 12, 1900, Serial No. 1,237.

It is of course unimportant as far as the fundamental features of the invention are concerned how the motion is transmitted to the ribbon-movement, and the manner of transmitting motion to the ribbon-movement will necessarily depend upon the type of machine



with which the same is used; but in the type of book type-writing machine illustrated in my other application and diagrammatically illustrated in the drawings of the present application the operation of the ribbon-movement is effected through the medium of a single motion-transmitting element, preferably in the form of a rock-shaft 198. This motion-transmitting element or rock-shaft 198 extends transversely across the carriage-casing 60 and is operatively associated with the letter-spacing mechanism 201 of the machine and also with the line-lock device, which, however, form no part of the present application. The said motion-transmitting element or rock-shaft 198 is also operatively associated with the key-action of the machine and is suitably connected to the key connection-bar 203, adapted to be engaged by the yoke-levers 220, with which cooperate the keyboard bell-cranks 130, sustaining the key-stems 137. The said keyboard bell-cranks also have operative connections with the type-carrying bars; but these elements form no part of the present invention, and as the same are fully explained in my other application further reference thereto is unnecessary. The said parts have been indicated in the drawings to illustrate an operative means for actuating the motion-transmitting element or rock-shaft 198, which is illustrated as one means for transferring motion to the different elements of the ribbon-movement in the manner to be presently explained.

The type carried by the type-bars strike through the rear open side 248 of the carriage-casing and upon an inking-ribbon 249, arranged to work transversely of the carriage, at the rear side thereof, and the said ribbon is adapted to be alternately wound upon the oppositely-located ribbon-spools 250, which are detachably journaled upon the spindles 251, projecting from the rear side of the carriage-casing, and each of said spools is provided at its inner side with a ratchet-disk 252, the teeth of which are adapted to be engaged by the point of an actuating-pawl 253, pivotally mounted at the terminal of one end of a vibratory bell-crank lever 254, pivotally mounted at its angle, as at 255, within the rear portion of the carriage-casing and having the inner arm thereof connected with one end of an operating-rod 256, the other end of which operating-rod has a pivotal connection 257 with a rock-arm 258 on the main motion-transmitting rock-shaft 198, whereby this shaft not only transmits motion to the letter-spacing mechanism, but also to the ribbon-feeding mechanism through the medium of the said operating-rods 256 for the oppositely-located vibratory bell-cranks 254. The actuating-pawls 253, which cooperate with the ratchet-disks 252 of the oppositely-located ribbon-spools 250, are provided with enlarged weighted portions 259 at one side of their pivots, which weighted portions are preferably rounded and adapted to be engaged by

the lifting-heads 260, formed at opposite ends of an oscillatory pawl-adjusting lever 261, which is pivotally connected intermediate its ends, as at 262, to the rear cross-bar connecting the opposite end portions of the carriage-casing at the rear open end thereof. The said oscillatory pawl-adjusting lever 261 is common to both of the oppositely-located actuating-pawls 253 for the separate ribbon-spools 250, and the said lever is weighted at one end, as at 266, to provide for normally depressing that end of the lever and correspondingly elevating the opposite end. In other words, the weighted end 266 of the oscillatory pawl-adjusting lever 261 normally drops to a depressed position below the plane of the adjacent actuating-pawl 253, whereby the weighted portion 259 of this pawl will gravitate below the pivot thereof and permit the point of the pawl to engage with the ratchet-disk of the adjacent ribbon-spool to provide means for rotating this spool with a step-by-step movement as the vibratory bell-crank carrying the pawl is operated from the motion-transmitting rock-shaft 198 through the medium of the rod connection 256. With the weighted end 266 of the oscillatory pawl-adjusting lever 261 depressed in its normal position to permit of the adjacent actuating-pawl 253 engaging with the ratchet-disk of the ribbon-spool with which it is associated, the opposite end of the said lever 261 is correspondingly elevated, thereby causing the lifting-head 260 at that end of the lever to bear against the weighted portion 259 of the adjacent pawl 253, and thus cause the said pawl to be rocked upon its pivot to carry the point thereof out of operative relation to the ratchet-disk of the adjacent ribbon-spool, such position of parts being plainly shown in Fig. 4 of the drawings and providing means for causing the ribbon to be wound upon the spool whose ratchet-disk is engaged by the actuating-pawl.

To provide for the automatic reversing of the relative positions of the opposite actuating-pawls, the oscillatory pawl-adjusting lever 260 is provided at one side of its pivotal point 262 with a beveled cam projection 267, which is adapted to be engaged and disengaged by the pivotal setting-arm 268, pivotally supported at one end on the rear cross-bar 265 of the carriage-casing and adapted to extend rearwardly over the oscillatory pawl-adjusting lever 261, with the free swinging end thereof normally engaging in the open yoke 269 of the reciprocatory reversing-bar 270, supported for movement exterior to and at the rear side of the carriage-casing. As will hereinafter appear, when the said setting-arm 268 is thrown laterally into engagement with the upstanding cam projection 267 of the pawl-adjusting lever 261 the weighted end 266 of the said lever is elevated to move the lifting-head 260 at such end into lifting engagement with the weighted portion of the adjacent pawl, and when the said setting-arm is



moved away from and out of engagement with the said cam projection 267 the lever 261 is permitted to assume its normal position under the influence of its weighted portion 266.

5 The opposite extremities of the reciprocatory reversing-bar 270 are pivotally connected to the lower ends of the swinging weighted reverse-levers 271, pivotally mounted intermediate their ends, as at 272, upon the rear side  
10 of the carriage-casing. The oppositely-located swinging reverse-levers 272, by reason of their connection with the common reciprocatory reversing-bar 270, maintain a parallel disposition and move in unison or synchro-  
15 nism; but the said levers maintain a reverse relation, so that when one lies in an operative position with relation to the spool upon which the ribbon is being wound the other is dis-  
20 posed in an opposite position—that is, in a position for being actuated by the trip device carried by the spool from which the ribbon is unwinding until such spool becomes empty. Each of the swinging reverse-levers 271 is in-  
25 terposed between one of the ribbon-spools and the adjacent rear side of the carriage-casing, and each of the same is provided at its upper end with a weight 273 and at an intermediate point with a lateral inwardly-extending trip-arm 274, which is preferably of an arched  
30 form, so that the same will move to a position close to and extending partly around the spindle of the spool with which it is associated. The said inwardly-extending trip-arm 274 of the reverse-lever has extended therefrom an  
35 inclined shouldered finger 275, which is adapted to be engaged by the tappet-lug 276, projected from one edge of the pivotal latch 277. Each of the ribbon-spools has one of the  
40 latches 277 associated therewith, and the said latch for each spool is pivoted at one end, as at 278, to the inner side of the spool contiguous to the periphery of the ratchet-disk, and in addition to the tappet-lug 276 each latch is further provided with an inwardly-extending ribbon-engaging pin 279, projecting  
45 through an arcuate slot 280, formed in the adjacent side of the spool and adapted to swing toward and away from the hub of the spool during the action of the latch, as will  
50 presently appear.

Assuming the parts of the ribbon-feed and shifting mechanisms to be in the position shown in Fig. 4 of the drawings, the weighted end 266 of the oscillatory pawl-adjusting lever 261 will be depressed to permit the adja-  
55 cent actuating-pawl 253 to engage with the ratchet-disks of the adjacent spool, whereby as the motion-transmitting rock-shaft 198 is operated under the influence of the key-action said spool will be rotated with a step-by-  
60 step movement in a direction to provide for winding up the ribbon thereon. The opposite actuating-pawl 253 is held in an inactive position by reason of the elevated unweighted  
65 end of said lever 261 bearing upward against the weighted portion of said pawl, so as to throw the point thereof out of operative en-

gagement with the ratchet-disk of the adjacent spool. In the said position of parts the ribbon continues to wind upon the spool having the  
70 actuating-pawl in operative relation thereto until the opposite spool is about empty. At this point the ribbon uncovers the ribbon-engaging pin 279 of the pivotal latch 277, associated with the said depleted spool, thereby  
75 permitting the free end of the latch to swing by gravity in a direction away from the hub of the spool and toward the periphery thereof. When the pivotal latch of the depleted spool thus swings outward, it carries the tappet-  
80 lug 276 thereof to an interfering position with reference to the inclined shouldered finger 275 of the adjacent reverse-lever 271, so that a continued rotation of the spool which is about depleted of the ribbon carries the tap-  
85 pet-lug 276 into direct engagement with the said shouldered finger 275, thus causing the weighted end of the adjacent reverse-lever to swing in an outward direction and simultane-  
90 ously causing the weighted upper end of the opposite reverse-lever to swing in an inward direction until both levers have reached a position just past the perpendicular, when the combined weight thereof will complete  
95 the movement, causing one lever to swing to its outward limit of movement and the opposite lever to its inward limit of movement, such positions of the levers being shown in Fig. 5 of the drawings. This movement of  
100 the weighted swinging reverse-levers simultaneously reciprocates the reversing-bar 270 in a direction to carry one of the shoulders of the open yoke 269 against the pivotal setting-arm 268, this engagement only occurring when the  
105 weighted reverse-levers reach a perpendicular plane; but when the swinging movement of these levers is completed by gravity in the manner described the continued movement of the reversing-bar 270 in the same direction quickly carries the pivotal setting-arm 268  
110 onto the beveled upstanding cam projection 267 of the oscillatory pawl-adjusting lever, which engagement of the setting-arm with the cam projection of the pawl-adjusting lever oscillates said lever upon its pivot, causing the  
115 weighted end 266 thereof to be elevated and the opposite end to be depressed. This reverse movement of the pawl-adjusting lever 261 carries the lifting-head 260 at the weight-  
120 ed end of the lever against the weighted portion of the adjacent actuating-pawl, so as to turn said pawl to the inactive position, while the opposite pawl is permitted to swing under the influence of its weighted portion to an  
125 operative position for engagement with the ratchet-disk of the nearly empty or depleted spool, which spool therefore at once becomes the active spool and is rotated by the action of the pawl with a step-by-step movement  
130 to provide for winding back the ribbon thereon. This action automatically repeats itself when the ribbon has been almost completely unwound from each spool, and as the ribbon commences to wind upon the pre-



viously-inactive spool the pivotal latch of said spool is caught by the convolutions of the ribbon and held close to the hub of the spool until the spool is again nearly depleted.

5 The intermediate portion of the inking-ribbon 249, between the oppositely-located ribbon-spools 250, engages with the shiftable ribbon-guide 281, which is arranged at the rear side of the carriage and is adapted to  
10 normally hold the inking-ribbon in front of the line of writing, whereby all of the writing is absolutely visible, and the line being written is only covered by the ribbon when the character is being struck, provision being made for retracting the shiftable ribbon-guide, with the portion of the ribbon therein,  
15 to a normal position in front of the line of writing whenever the type return from the printing-point. In the present invention the said shiftable ribbon-guide is preferably in the form of an open-ring frame 282, which is of a sufficient width to permit the type-bar to work inside of the plane thereof without striking the same. The said open-ring guide-frame 282 is provided at the outside thereof  
25 with an inwardly-projecting indicator finger or point 283, which indicates the printing-point of the character, and at diametrically opposite sides thereof with the aligned line-finding guides 284, which are normally in precise alinement with the line of writing, so that the carriage can be quickly adjusted to the line for the purpose of inserting a letter or word or to facilitate writing on ruled paper.  
35 In addition to the transversely-aligned line-finding guides 284 the open-ring frame 282 is provided at diametrically opposite sides thereof with the upwardly-projecting inclined flaring guiding-sleeves 285, which are  
40 open at one edge or side for the insertion of the ribbon and which freely receive the latter to provide for guiding the same transversely beneath and across the open-ring guide-frame 282.

4. The necessary reciprocation is imparted to the ribbon-guide 281 for the purpose of shifting the position of the ribbon to and from the line of writing through the medium of the reciprocatory frame 286, essentially consisting  
50 of a pair of rods 287, slidably working through the rear cross-bar 265 of the carriage-casing and connected at any suitable point to the ribbon-guide 281 or any of the attached parts thereof. The front ends of the frame-rods 287 are connected, respectively, to opposite  
55 extremities of the cross-bar 288, which constitutes a part of the reciprocatory frame 286, and the said cross-bar for the front ends of the frame-rods 287 is provided with an arm 289, having a pivotal connection with the lower end of an oscillatory lever 290, pivoted intermediate its ends upon a standard 291, mounted upon the supporting-plate 170 within the type-carriage, and the upper end of said  
60 lever 290 has a link connection 292 with the rock-arm 202 of the motion-transmitting shaft 198, whereby the movement of this shaft may

be directly transmitted to the reciprocatory frame 286 for the purpose of imparting the necessary shifting movement to the guide 70 281 and the inking-ribbon carried thereby. The reciprocatory frame 286 for the ribbon-guide 281 is preferably guided in its reciprocation by means of the guide-plate 293, secured upon the supporting-plate 170, within  
75 the carriage, and provided at its extremities with the short upstanding arms 294, engaging at the inner sides of the rods 287, constituting a part of the reciprocatory frame.

By reason of the connections described it 80 will be obvious that whenever a key of the type-action is depressed and communicates movement to the motion-transmitting rock-shaft 198 this shaft will in turn transmit motion to the reciprocatory frame 286 and provide for thrusting the ribbon-guide 281 rearwardly, thereby carrying the portion of the ribbon within the guide over the printing-point. When the key is released, the tension-spring of the machine returns the motion-transmitting rock-shaft to normal position,  
90 and consequently retracts the ribbon-guide, and thereby draws the ribbon back from the line of writing, so as to completely expose the sentence.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described ribbon-movement will be readily apparent to those skilled in the art without further description, and it  
100 will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable  
110 ribbon-spools, feeding mechanism for the spools including actuating-pawls, a pawl-adjusting device, and a trip device including a pair of synchronously-operating reverse-levers, a reversing-bar actuated by said levers  
115 and operatively related to the pawl-adjusting device, and adapted to engage with said reverse-levers, and trips carried by the spools.

2. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools,  
120 feeding mechanism for the spools including actuating-pawls, a pawl-adjusting device, and a trip device including operating-levers, a reversing member actuated by said levers and operatively related to the pawl-adjusting  
125 device for effecting the necessary movement thereof, and trips carried by the spools and adapted to engage with said levers.

3. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools,  
130 feeding mechanism for the spools including actuating-pawls, a pawl-adjusting device, and a trip device including a pair of synchronously-swinging reverse-levers, a reciproca-



tory reversing-bar connecting and actuated by the said levers and operatively related to the pawl-adjusting device, and trip-latches carried by the spools and adapted to engage with said reverse-levers.

4. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, feeding mechanism for the spools including actuating-pawls, a pawl-adjusting device, and a trip device including a pair of synchronously-swinging reverse-levers weighted so as to swing by gravity in the reversing movement and having an operative connection with the pawl-adjusting device to reverse the position thereof, and gravity trip-latches carried by the spools and adapted to cooperate with said reverse-levers, substantially as set forth.

5. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common actuating means for both pawls, a single oscillatory pawl-adjusting lever supported independently of the pawls and having its opposite terminal portions adapted to contact respectively with the separate pawls, said lever being arranged to press one pawl to an inactive position, while the other pawl is in operation, and means for automatically reversing the position of said pawls, substantially as set forth.

6. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable ribbon-spools, each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single oscillatory pawl-adjusting lever supported independently of both pawls and arranged to hold one of the same in an inactive position, while the other is in operation, and means for automatically tilting said lever to reverse its position, substantially as set forth.

7. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single pawl-adjusting lever having its opposite portions arranged to directly engage respectively with the separate pawls, said lever being adapted to hold one pawl in an inactive position, while the other is in operation, and a trip device actuated by the spools for reversing the position of said lever, substantially as set forth.

8. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single oscillatory pawl-adjusting lever having an intermediate pivotal support and adapted to have the terminal portions respectively at opposite sides of its pivot engage with the separate pawls to provide for

holding one of the same in an inactive position while the other is in operation, and a trip device actuated by the spools for reversing the position of the pawl-adjusting lever, substantially as set forth.

9. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pawl-adjusting device arranged beneath and common to both pawls, said device being adapted to directly engage with the weighted portion of one pawl to tilt the same out of engagement with its ratchet-disk, while the other pawl is left free to be held in an operative position, and means for reversing the position of the pawl-adjusting device.

10. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pawl-adjusting device common to both pawls and adapted to directly engage with and elevate the weighted portion of one pawl, while the other pawl is left free to gravitate to an operative position, and a trip device, actuated by the spools, for automatically reversing the position of the pawl-adjusting device, substantially as set forth.

11. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pivotally-supported pawl-adjusting lever extending across the interval between the two pawls and arranged to directly engage with and elevate the weighted portion of one pawl, while the other pawl is free to gravitate to an operative position, and means for automatically reversing the position of said lever.

12. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes, and each provided with a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and held by gravity in an active position, operating means for both pawls, a single oscillatory pawl-adjusting lever extending across the interval between the oppositely-located pawls and having terminal lifting-heads respectively disposed beneath and adapted to directly engage with the opposite pawls, and means for automatically shifting the lever upon its pivot to reverse the position thereof.

13. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes, and each provided with a ratchet-disk, a pivotally-sup-



ported actuating-pawl associated with each spool and having a weighted portion, operating means for both pawls, a single oscillatory pawl-adjusting lever extending across the interval between the opposite pawls, and having lifting-heads respectively disposed beneath the said pawls, said lever being arranged to normally elevate the weighted portion of one pawl, while leaving the other pawl free to operate, and means for automatically reversing the position of said lever, substantially as set forth.

14. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and having a weighted portion, operating means for said pawls, a single oscillatory pawl-adjusting lever extending across the interval between the opposite pawls and weighted at one side of its pivot said lever having lifting-heads respectively arranged beneath the separate pawls, one of said lifting-heads being engaged with one of the pawls, while the other head is out of engagement with the opposite pawl, and means for automatically reversing the position of said lever, substantially as set forth.

15. In a type-writing machine, the ribbon-movement, comprising a pair of non-shiftable ribbon-spools rotating in fixed planes and each having a ratchet-disk, an actuating-pawl associated with each spool having a weighted portion, common operating means for both pawls, a single oscillatory pawl-adjusting lever, provided with oppositely-located lifting-heads, respectively arranged beneath and adapted to directly engage with the opposite pawls, said lever being normally arranged to hold one pawl in an inactive position, while the other is free to operate, a movable setting-arm adapted to engage with the pawl-adjusting lever to reverse the position thereof, and a trip device, actuated by the spools, for automatically changing the position of the said setting-arm, substantially as set forth.

16. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, vibratory bell-cranks, each carrying a pivotal actuating-pawl, each pawl being associated with a spool and having a weighted portion, an oscillatory pawl-adjusting lever having oppositely-arranged lifting-heads respectively working beneath the opposite pawls, said lever being further provided at one side of its pivot with an upstanding cam projection, a pivotally-supported setting-arm arranged to move against and away from the said cam projection, and a trip device, actuated by the spools, said trip device including a reciprocatory reversing-bar having an operative connection with said setting-arm, substantially as set forth.

17. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools,

each having a ratchet-disk, vibratory bell-cranks each carrying a pivotal actuating-pawl, each pawl being associated with a spool and having a weighted portion, an oscillatory pawl-adjusting lever having oppositely-arranged lifting-heads respectively working beneath the opposite pawls, said lever being further provided at one side of its pivot with an upstanding cam projection, a pivotally-supported setting-arm arranged to move against and away from the said cam projection, and a trip device, actuated by the spools, said trip device including synchronously-operating reverse-levers actuated from the spools, and a reciprocatory reversing-bar connecting said levers and having an operative connection with the said setting-arm, substantially as set forth.

18. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and having a weighted portion, a pivotal pawl-adjusting lever having lifting-heads respectively operating beneath the weighted portions of the separate pawls, a pivotal setting-arm adapted to move in and out of engagement with the pawl-adjusting lever for reversing the position thereof, and a trip device including a pair of synchronously-swinging reverse-levers, a reciprocatory reversing-bar connecting the said levers and adapted to move against the setting-arm in both directions, and trip-latches carried by the spools and engaging with said reverse-levers, substantially as set forth.

19. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, a pivotally-supported actuating-pawl for each spool having a weighted portion, operating means for said pawls, a pivotal pawl-adjusting lever having lifting-heads respectively working beneath the weighted portions of the separate pawls, a setting-arm adapted to move in and out of engagement with the pawl-adjusting lever to reverse the position thereof, a pair of synchronously-swinging reverse-levers connected at one side to the spools, each having weighted upper ends and inwardly-projecting trip-arms provided with inclined fingers, a pivotal trip-latch mounted upon each spool and having a tappet-lug engaging with the inclined finger of the adjacent reverse-lever, and an inwardly-extending ribbon-engaging pin, and a reciprocatory reversing-bar connecting the two reverse-levers and having an open yoke receiving the setting-arm, substantially as set forth.

20. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, a pivotally-supported actuating-pawl for each spool, a pawl-adjusting lever arranged to normally hold one pawl in an inactive position while the other is free to operate, a pair of synchronously-swinging reverse-levers mounted at one side of the spool and weighted so as to



tory reversing-bar connecting and actuated by the said levers and operatively related to the pawl-adjusting device, and trip-latches carried by the spools and adapted to engage with said reverse-levers.

4. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, feeding mechanism for the spools including actuating-pawls, a pawl-adjusting device, and a trip device including a pair of synchronously-swinging reverse-levers weighted so as to swing by gravity in the reversing movement and having an operative connection with the pawl-adjusting device to reverse the position thereof, and gravity trip-latches carried by the spools and adapted to cooperate with said reverse-levers, substantially as set forth.

5. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common actuating means for both pawls, a single oscillatory pawl-adjusting lever supported independently of the pawls and having its opposite terminal portions adapted to contact respectively with the separate pawls, said lever being arranged to press one pawl to an inactive position, while the other pawl is in operation, and means for automatically reversing the position of said pawls, substantially as set forth.

6. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable ribbon-spools, each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single oscillatory pawl-adjusting lever supported independently of both pawls and arranged to hold one of the same in an inactive position, while the other is in operation, and means for automatically tilting said lever to reverse its position, substantially as set forth.

7. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single pawl-adjusting lever having its opposite portions arranged to directly engage respectively with the separate pawls, said lever being adapted to hold one pawl in an inactive position, while the other is in operation, and a trip device actuated by the spools for reversing the position of said lever, substantially as set forth.

8. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, an actuating-pawl cooperating with the ratchet-disk of each spool, common operating means for both pawls, a single oscillatory pawl-adjusting lever having an intermediate pivotal support and adapted to have the terminal portions respectively at opposite sides of its pivot engage with the separate pawls to provide for

holding one of the same in an inactive position while the other is in operation, and a trip device actuated by the spools for reversing the position of the pawl-adjusting lever, substantially as set forth.

9. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pawl-adjusting device arranged beneath and common to both pawls, said device being adapted to directly engage with the weighted portion of one pawl to tilt the same out of engagement with its ratchet-disk, while the other pawl is left free to be held in an operative position, and means for reversing the position of the pawl-adjusting device.

10. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pawl-adjusting device common to both pawls and adapted to directly engage with and elevate the weighted portion of one pawl, while the other pawl is left free to gravitate to an operative position, and a trip device, actuated by the spools, for automatically reversing the position of the pawl-adjusting device, substantially as set forth.

11. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl cooperating with the ratchet-disk of each spool and having a weighted portion, operating means for both pawls, a single pivotally-supported pawl-adjusting lever extending across the interval between the two pawls and arranged to directly engage with and elevate the weighted portion of one pawl, while the other pawl is free to gravitate to an operative position, and means for automatically reversing the position of said lever.

12. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes, and each provided with a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and held by gravity in an active position, operating means for both pawls, a single oscillatory pawl-adjusting lever extending across the interval between the oppositely-located pawls and having terminal lifting-heads respectively disposed beneath and adapted to directly engage with the opposite pawls, and means for automatically shifting the lever upon its pivot to reverse the position thereof.

13. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes, and each provided with a ratchet-disk, a pivotally-sup-



ported actuating-pawl associated with each spool and having a weighted portion, operating means for both pawls, a single oscillatory pawl-adjusting lever extending across the interval between the opposite pawls, and having lifting-heads respectively disposed beneath the said pawls, said lever being arranged to normally elevate the weighted portion of one pawl, while leaving the other pawl free to operate, and means for automatically reversing the position of said lever, substantially as set forth.

14. In a type-writing machine, the ribbon-movement comprising a pair of non-shiftable spools rotating in fixed planes and each having a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and having a weighted portion, operating means for said pawls, a single oscillatory pawl-adjusting lever extending across the interval between the opposite pawls and weighted at one side of its pivot said lever having lifting-heads respectively arranged beneath the separate pawls, one of said lifting-heads being engaged with one of the pawls, while the other head is out of engagement with the opposite pawl, and means for automatically reversing the position of said lever, substantially as set forth.

15. In a type-writing machine, the ribbon-movement, comprising a pair of non-shiftable ribbon-spools rotating in fixed planes and each having a ratchet-disk, an actuating-pawl associated with each spool having a weighted portion, common operating means for both pawls, a single oscillatory pawl-adjusting lever, provided with oppositely-located lifting-heads, respectively arranged beneath and adapted to directly engage with the opposite pawls, said lever being normally arranged to hold one pawl in an inactive position, while the other is free to operate, a movable setting-arm adapted to engage with the pawl-adjusting lever to reverse the position thereof, and a trip device, actuated by the spools, for automatically changing the position of the said setting-arm, substantially as set forth.

16. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools each having a ratchet-disk, vibratory bell-cranks, each carrying a pivotal actuating-pawl, each pawl being associated with a spool and having a weighted portion, an oscillatory pawl-adjusting lever having oppositely-arranged lifting-heads respectively working beneath the opposite pawls, said lever being further provided at one side of its pivot with an upstanding cam projection, a pivotally-supported setting-arm arranged to move against and away from the said cam projection, and a trip device, actuated by the spools, said trip device including a reciprocatory reversing-bar having an operative connection with said setting-arm, substantially as set forth.

17. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools,

each having a ratchet-disk, vibratory bell-cranks each carrying a pivotal actuating-pawl, each pawl being associated with a spool and having a weighted portion, an oscillatory pawl-adjusting lever having oppositely-arranged lifting-heads respectively working beneath the opposite pawls, said lever being further provided at one side of its pivot with an upstanding cam projection, a pivotally-supported setting-arm arranged to move against and away from the said cam projection, and a trip device, actuated by the spools, said trip device including synchronously-operating reverse-levers actuated from the spools, and a reciprocatory reversing-bar connecting said levers and having an operative connection with the said setting-arm, substantially as set forth.

18. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, a pivotally-supported actuating-pawl associated with each spool and having a weighted portion, a pivotal pawl-adjusting lever having lifting-heads respectively operating beneath the weighted portions of the separate pawls, a pivotal setting-arm adapted to move in and out of engagement with the pawl-adjusting lever for reversing the position thereof, and a trip device including a pair of synchronously-swinging reverse-levers, a reciprocatory reversing-bar connecting the said levers and adapted to move against the setting-arm in both directions, and trip-latches carried by the spools and engaging with said reverse-levers, substantially as set forth.

19. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, each having a ratchet-disk, a pivotally-supported actuating-pawl for each spool having a weighted portion, operating means for said pawls, a pivotal pawl-adjusting lever having lifting-heads respectively working beneath the weighted portions of the separate pawls, a setting-arm adapted to move in and out of engagement with the pawl-adjusting lever to reverse the position thereof, a pair of synchronously-swinging reverse-levers connected at one side to the spools, each having weighted upper ends and inwardly-projecting trip-arms provided with inclined fingers, a pivotal trip-latch mounted upon each spool and having a tappet-lug engaging with the inclined finger of the adjacent reverse-lever, and an inwardly-extending ribbon-engaging pin, and a reciprocatory reversing-bar connecting the two reverse-levers and having an open yoke receiving the setting-arm, substantially as set forth.

20. In a type-writing machine, the ribbon-movement comprising a pair of ribbon-spools, a pivotally-supported actuating-pawl for each spool, a pawl-adjusting lever arranged to normally hold one pawl in an inactive position while the other is free to operate, a pair of synchronously-swinging reverse-levers mounted at one side of the spool and weighted so as to



swing by gravity in the reversing movement, said levers having an operative connection with the pawl-adjusting lever, to reverse the position thereof, and gravity trip-latches carried by the spools and adapted to cooperate with said reverse-levers, substantially as set forth.

21. In a type-writing machine, the combination with the carriage open at its rear side, of a shiftable ribbon-guide located exterior of the carriage contiguous to its open rear side and arranged to hold the printing portion of the ribbon in a position to normally expose the writing through said open side of the carriage, key-operated connections, and a single reciprocatory element connected with the shiftable guide and also operatively associated with the key-operated connections, said reciprocatory element being arranged to work centrally within the carriage, substantially as set forth.

22. In a type-writing machine, the carriage,

and the shiftable ribbon-guide for the front portion of the ribbon, said guide having an inwardly-projecting indicator-finger for the printing-point, and oppositely-located transversely-aligned line-finding guides located in a different plane from the said indicator, substantially as set forth.

23. In a type-writing machine, the carriage, and the ribbon-guide consisting of an open-ring frame provided at opposite sides thereof with upwardly-inclined flaring guiding-sleeves open at one side for the insertion of the ribbon, and arranged to guide the latter transversely beneath the open-ring frame, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HARRY S. DUKES.

Witnesses:

J. G. DUNAWAY,  
S. F. ETTINGER.