

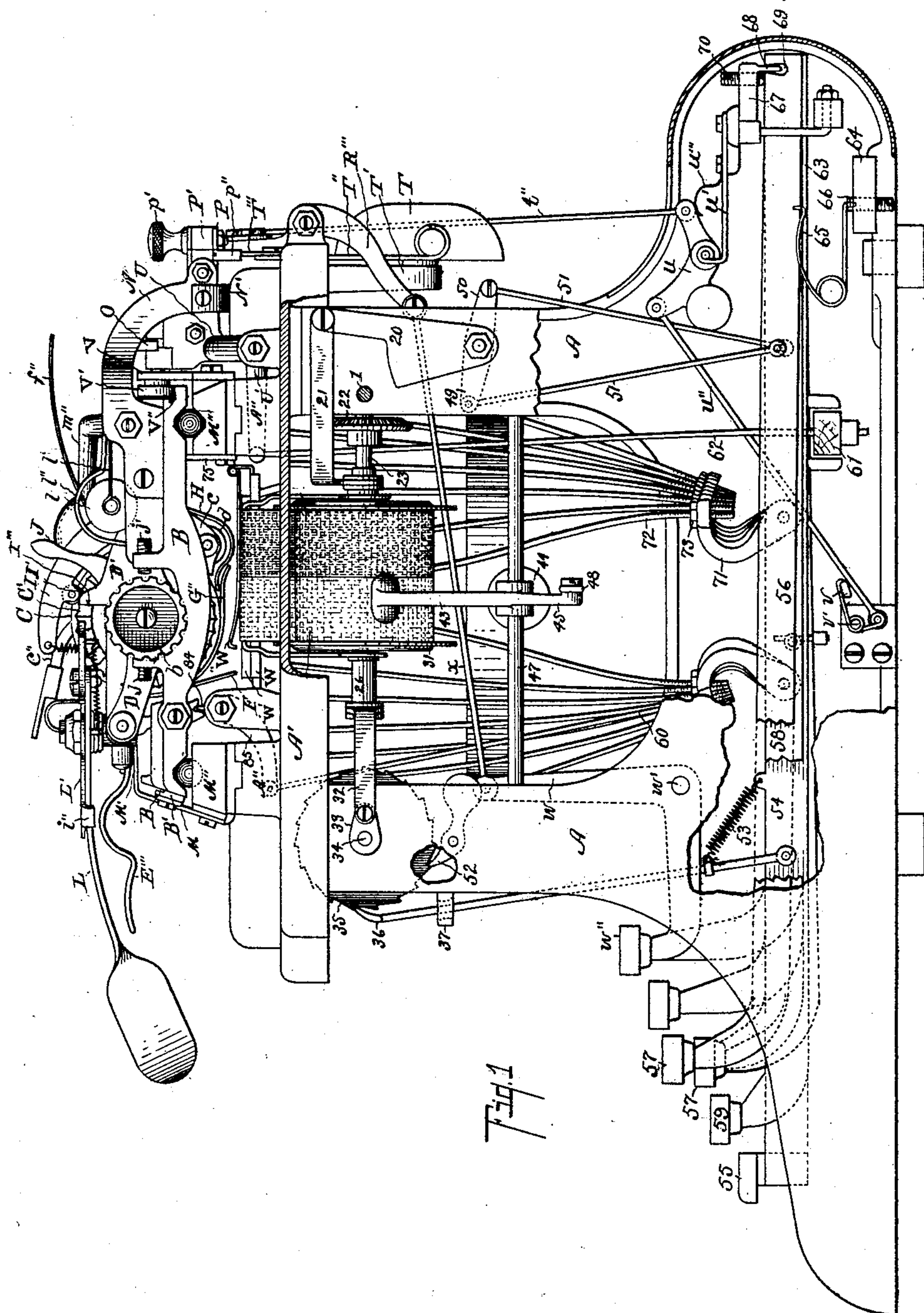
No. 771,620.

PATENTED OCT. 4, 1904.

W. R. FOX & G. J. BARRETT.  
TYPE WRITING MACHINE.  
APPLICATION FILED DEC. 11, 1901.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:

*S. Alice Earl*

*Otto A. Earl*

Inventors

*William R. Fox & G. J. Barrett*

By *Frederick L. Chappell*

Att'y.

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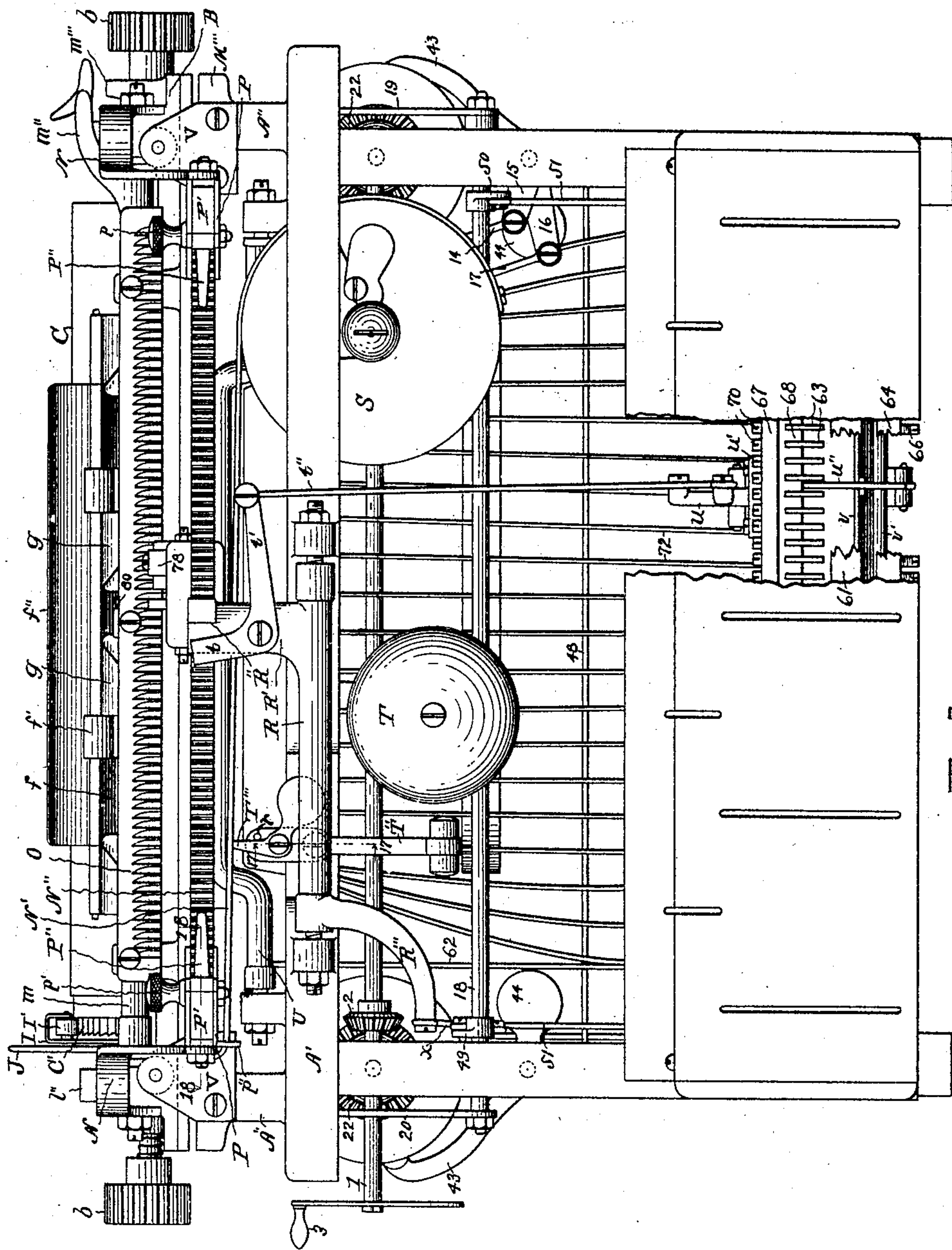
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5 SHEETS—SHEET 2.



Witnesses:

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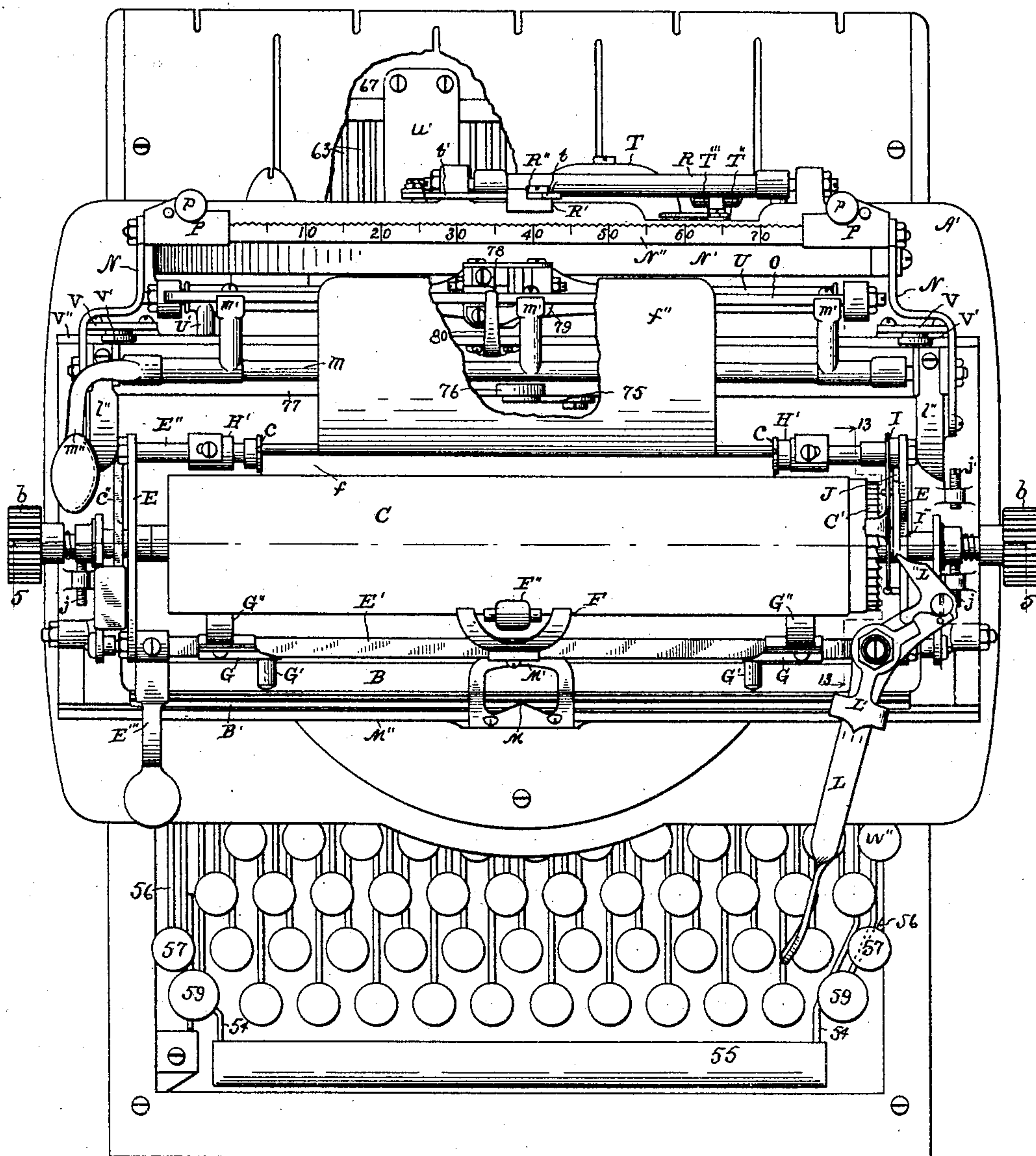


Fig. 3

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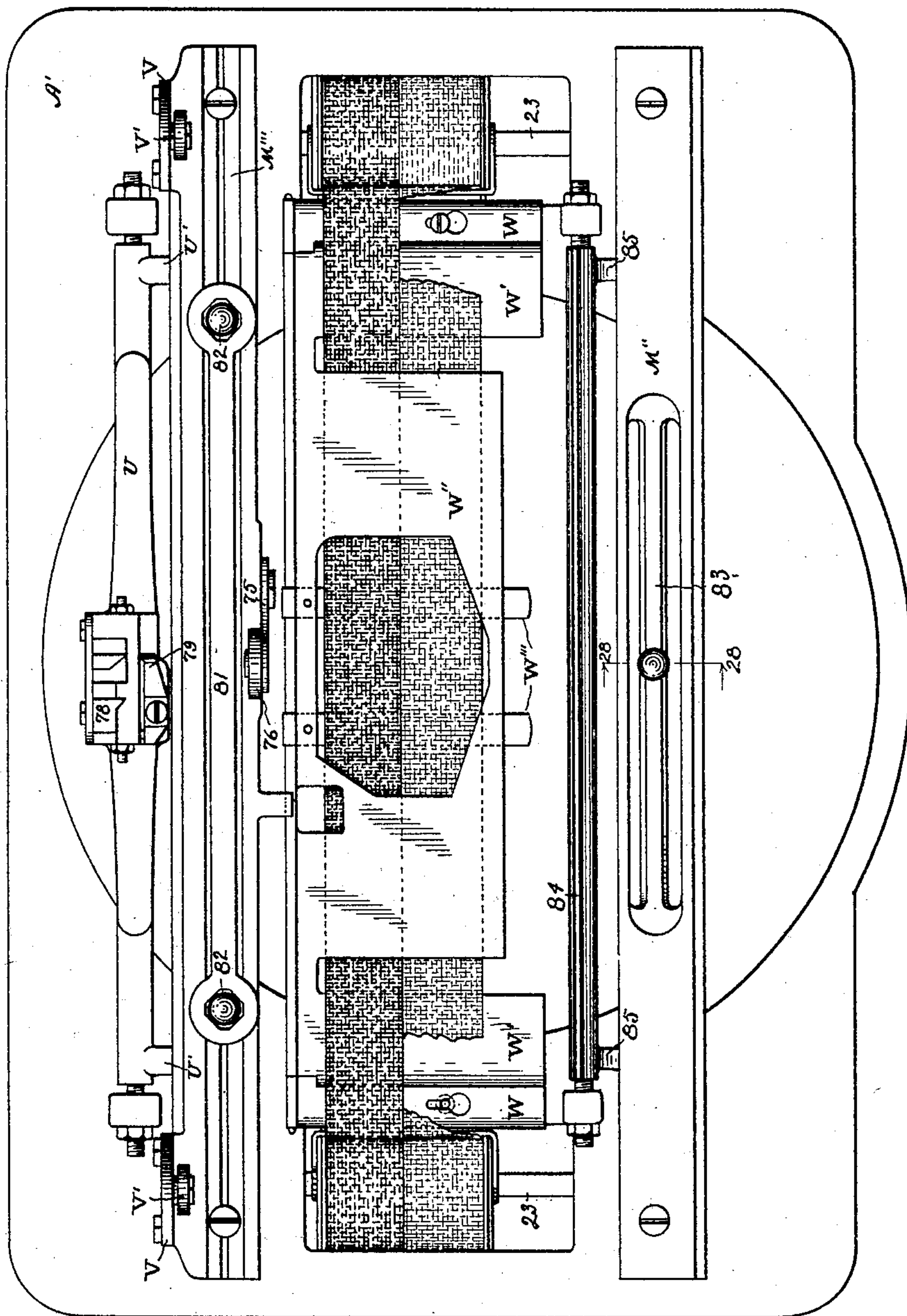
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5 SHEETS--SHEET 4.



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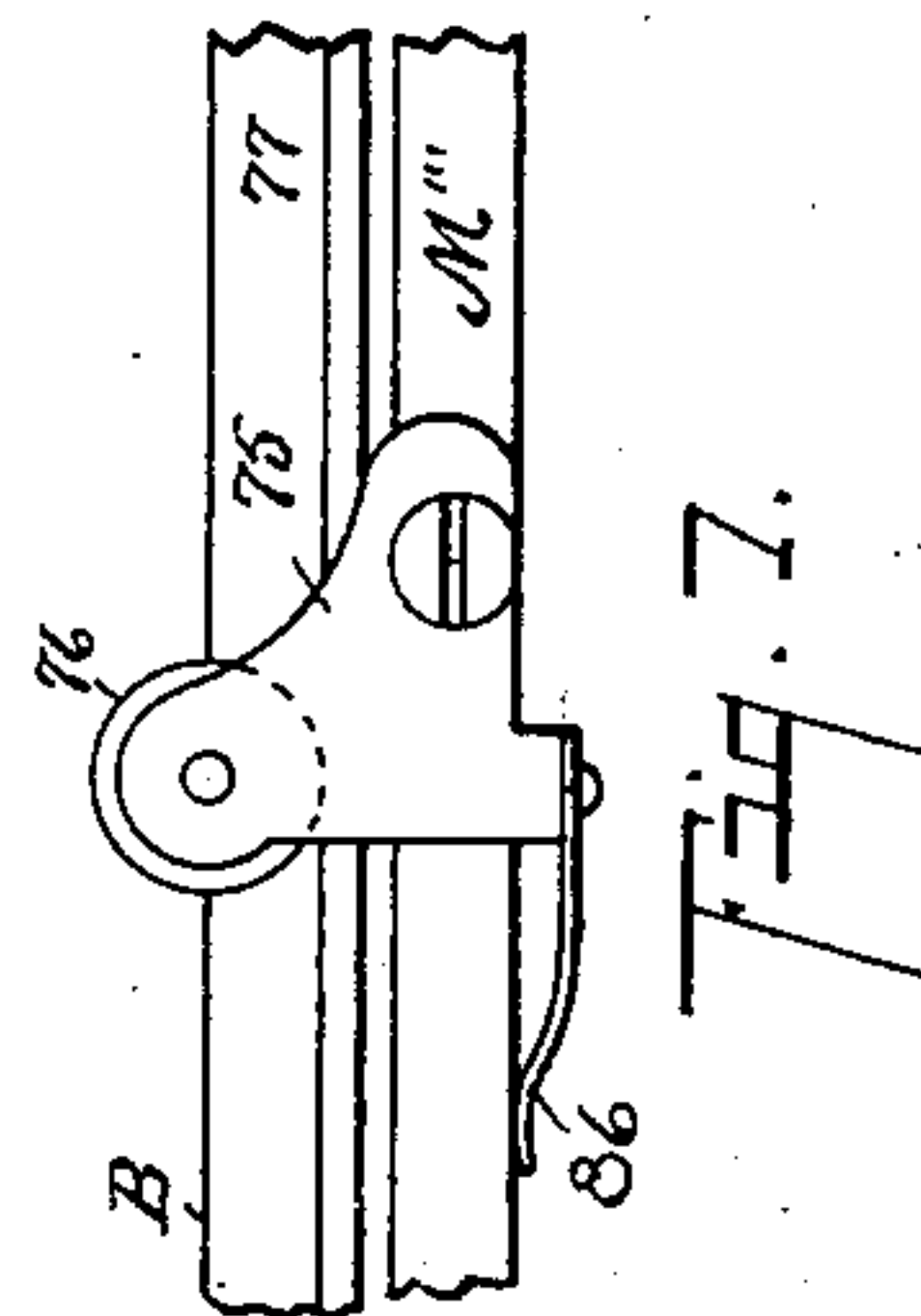
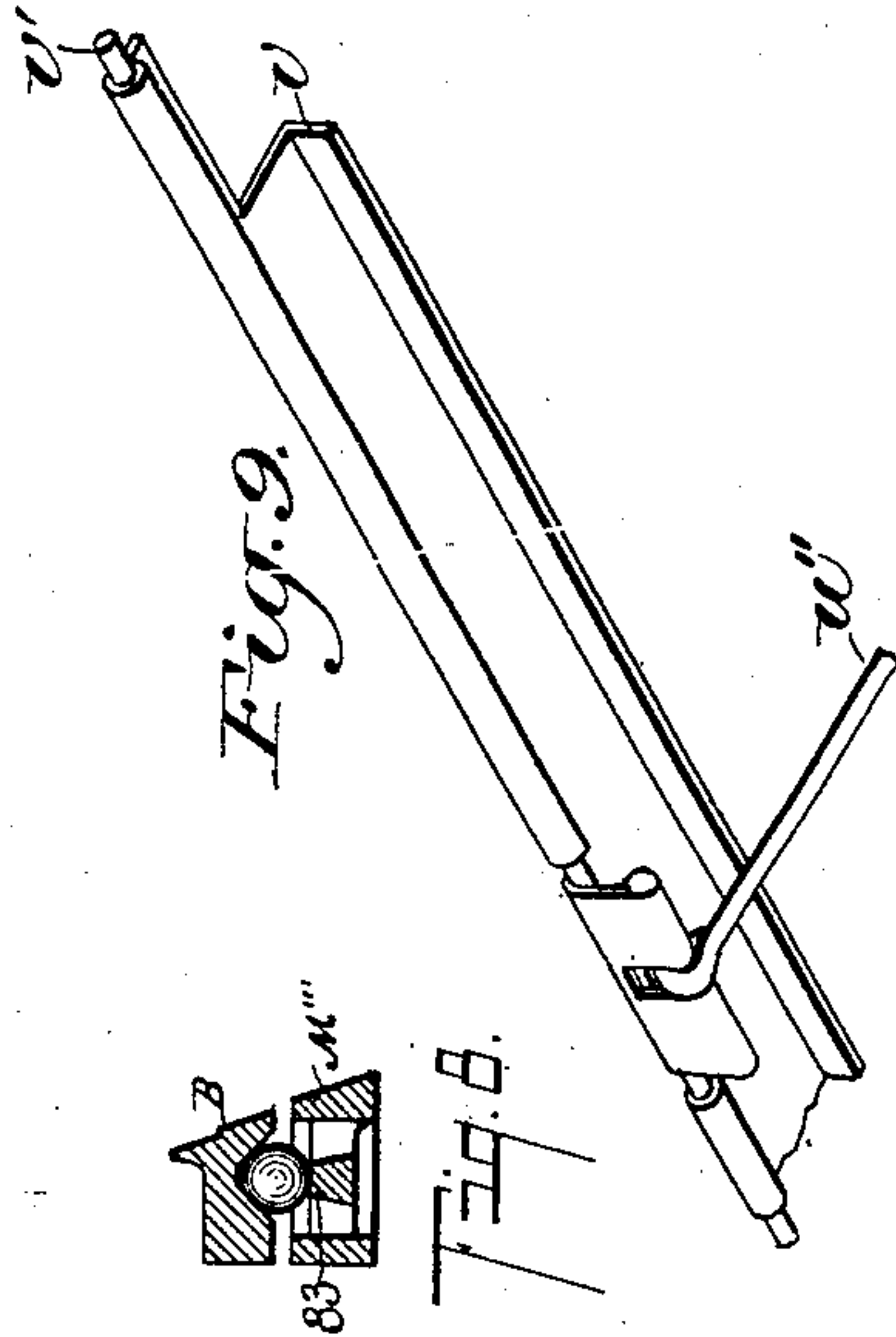
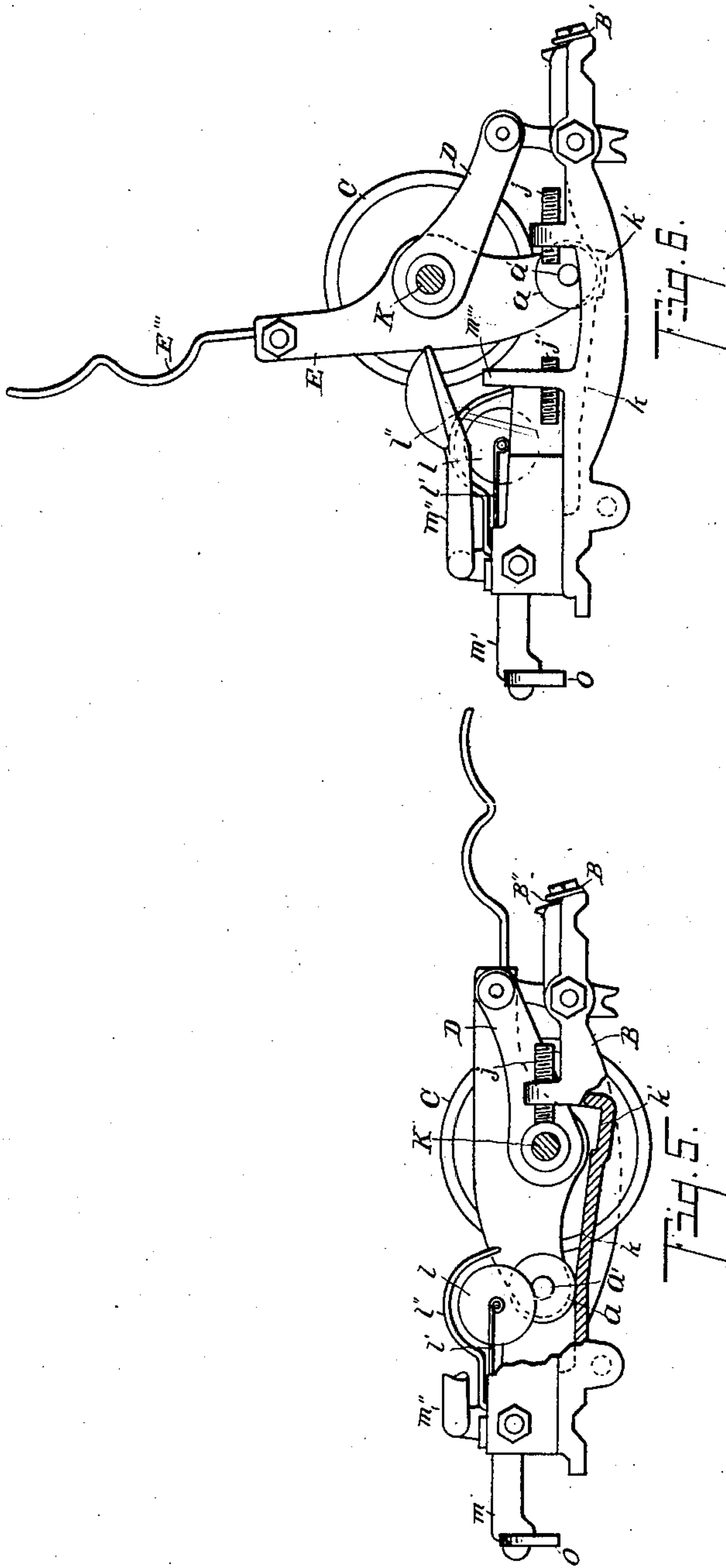
W. R. FOX & G. J. BARRETT.

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APPLICATION FILED DEC. 11, 1901.

NO MODEL.

5 SHEETS—SHEET 5.



Witnesses:

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W. R. Fox & G. J. Barrett

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Att'y.



# UNITED STATES PATENT OFFICE.

WILLIAM R. FOX AND GLENN J. BARRETT, OF GRAND RAPIDS, MICHIGAN, ASSIGNORS TO THE FOX MACHINE COMPANY, OF GRAND RAPIDS, MICHIGAN.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 771,620, dated October 4, 1904.

Application filed December 11, 1901. Serial No. 85,433. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM R. FOX and GLENN J. BARRETT, citizens of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improvements in carriage mechanism for type-writing machines.

The objects of this invention are, first, to provide an improved construction of carriage mechanism generally; second, specifically to provide improved ways for the carriage whereby its alinement and proper elevation are secured; third, to provide an improved platen-support with means for shifting the same; fourth, to provide, in connection with the carriage mechanism, an improved locking mechanism for key-levers, whereby the key-levers will be locked when the end of the line or predetermined position on the line is reached; fifth, to provide an improved means of releasing the line-lock mechanism.

Further objects will definitely appear in the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of this invention is fully illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail side elevation view of a complete type-writer embodying the features of this invention, portions of the frame or casing being broken away to show the details of construction. Fig. 2 is a rear elevation view of the structure appearing in Fig. 1, portions of the casing being broken away to show the details of construction. Fig. 3 is a detail plan view of the structure, portions of the frame and other parts being broken away to show the details of construction. Fig. 4 is a plan view of the upper portion of the type-

writer after the carriage has been removed, portions being broken away, so that the details of construction will more fully appear, the hinged ribbon-guide and the bearings being clearly illustrated. Fig. 5 is an enlarged detail end elevation view, partially in section, of the platen, its cradle, and carrying-frame. Fig. 6 is a similar end elevation view showing the position which the parts assume when the cradle is in position for the inspection of the work. Fig. 7 is a rear elevation view of the retaining-brackets and means for holding the carriage to its bearings. Fig. 8 is a detail cross-sectional view of the carriage and its supporting-ball, taken on line 28 28 of Fig. 4. Fig. 9 is a detail perspective view of the line-locking bar and the connection thereto.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar characters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawings, A is the main frame of the machine, within which are supported the key-levers and their various connections hereinafter to be described.

A' is the top plate of the machine, and A'' represents standards thereon, as clearly appears in Figs. 1 and 2, which support the carriage structure and the connected parts. The carriage is operated under spring tension, a ribbon or band N' connecting it to the spring-controlled drum S. The carriage is mounted upon balls and has at its front and rear V-shaped grooves which afford bearings for these balls. At the rear of the machine is a rail M'', Fig. 1, having a V-shaped groove corresponding to the groove in the rear of the carriage, and between this rail and the carriage are placed two balls of convenient size. These balls are held in position by the rack A front rail M' is provided, which is secured in position by suitable screws at each end. At the central portion two longitudinal spaces are cut out down through the same, leaving a narrow way 83 flat on its top. (See Fig. 4.) This permits any accumulation of dust or dirt to



be crushed or crowded off the side of the way by the ball, and consequently the way is always clean and the carriage runs perfectly and evenly on its way without any binding, and thus the platen is always in proper position as to elevation to secure the most perfect alinement. This carriage is held firmly upon its ball-bearings by means of a central retaining-wheel 76. (Shown in Fig. 7.) This wheel is adapted to travel under spring tension upon the way of the carriage 77. It is mounted upon the support 75, which is pivoted upon the rail M'''. Directly under the pivotal point is an ear formed at right angles to the face of the support 75 and extending rearwardly under the rail M'''. This serves as an emergency stop for holding the carriage in position, but is not designed to fit closely under said rail. Secured to this ear is the spring 86, which causes the wheel 76 to bear with slight pressure upon the way 77, thus holding the carriage at all times firmly upon its bearings. The retaining-wheel 76 is provided in addition to the retaining-wheels V', supported on the brackets V on the frame of the machine and adapted to travel in the ways V'' on the carriage-frame.

We support the platen on the carriage of our machine so that there is a decided tendency for it to remain in position either against the front or rear stops for limiting the shifting movement.

The platen frame or cradle E is supported at the rear by means of a pair of wheels *a*, mounted on the rod E'' at the rear of the platen-frame (see Fig. 5) and adapted to travel upon suitable ways upon the end rail of the carriage-frame B. The wheels *a* have outwardly-projecting hubs *a'*. Supported by springs *l'*, attached to the rear of the carriage-frame, are two wheels *l*, which bear upon the periphery of the hubs *a'*, as shown in Fig. 5, the pivotal point of the wheel *l* being back of *a'* and midway of the throw of the hub *a'* when the carriage shifts. Thus the platen frame or cradle is held under spring tension either against the stops *j* or *j'*, depending upon its position. By having the wheel *l* bear upon the hub *a'* of the wheel *a* the friction is reduced to a minimum. Over the wheel *l* and the spring *l'* we place the guard *l''* to prevent the spring from becoming distorted or bent or the wheel *l* from being thrown out of position.

Pivoted to the ends of the platen-shaft K' and to upwardly-extending arms on the rock-shaft E' are links D. A rock-shaft 84, with an upwardly-projecting lip adapted to engage a V-shaped lug on the rock-shaft E', is pivoted to the frame of the machine. A wire 60 connects the arms 85 of the rock-shaft 84 to the finger-lever 58, carrying the button 59 on its forward end. Through these connections the platen is shifted. A notch *k'* is formed in the

way *k* at its forward end, into which the wheel *a* on the platen-frame drops when the platen is raised to the position indicated in Fig. 6. A forwardly-projecting lever E''' is provided for convenience in raising the platen.

L is the line-spacer lever, which with its connections has been described in our concurrent application herewith.

The finger-lever 63 we provide with the usual buttons 57 on their forward ends. These levers are provided at their rear ends with any desirable pivotal connections to the type-bars of the machine. The type-bars are adjustable through these connections to secure the proper position of the parts; also the proper throw of the type-bars in relation to the finger-levers.

We provide improved means of locking these levers at the end of the line. This is accomplished by the bell-crank *t t'*, which is pivoted upon the stop-arm R'. (See Fig. 2.) The upper portion of this bell-crank *t* is normally in the line of travel of an adjustable stop P', carried by the carriage at the rear of the machine. When this adjustable stop P' comes in contact with the upper end *t* of the bell-crank, the other end, *t'*, with its connecting-wire *t''*, is forced downward. This connecting-wire *t''* connects with another bell-crank *u*, which is pivoted upon a support *u'* in the lower part of the machine. (See Figs. 1 and 2.) To the other end of this bell-crank *u* is attached another wire, *u''*, which in turn connects with a swinging plate *v*, which is pivoted at *v'* beneath the forward portions of the finger-levers. This swinging plate *v* extends across the machine just under the levers, as shown in Fig. 1. It is made, preferably, of sheet metal formed over the pivot *v'*, and its upper portion or bearing edge is formed over to give it strength in the manner shown in Fig. 1, which gives an end view of the plate. When the connecting-wire *t''* is forced downwardly by reason of the bell-crank *u* and the connecting-wire *u''*, the plate *v* is swung around upon its pivot *v'* until the turned-over portion at its upper edge comes up in close proximity to the levers of the machine, thereby locking them against depressions. The point at which it is desired that this locking shall take place may be determined by the position of the adjustable stop P', which is adapted to slide back and forth upon the rack N'', which is supported by the brackets N to the rear of the machine. The marginal adjusting device coöperates with this line-locking mechanism, and therefore the description of the marginal adjusting device is here repeated to show its relation, the marginal adjusting device being the subject-matter of a concurrent application herewith. The marginal adjusting device is located at the rear of the machine, preferably as shown in Figs. 1, 2, and 3, in which N'' is a graduated margin-rack upon which are mounted two adjustable slides. At the rear of the top plate of the machine is pivoted a



casting R, with an upwardly-extending arm R', provided with a stop R'', which serves to limit the movement of the carriage to engage the adjustable carriage-stops P'. Extending from the casting R downward is another arm, R'''. By reference to Fig. 1 will be seen the bell-crank lever *w*. (Shown mostly in dotted lines pivoted in the right side of the machine at *w'*.) From the upper extremity of this bell-crank lever (see Fig. 9) is a wire *x*, connecting with the arm R''' of the stop R''. The forward end of the bell-crank lever *w* bears a finger-button *w''*, which is a part of the keyboard of the machine. When this finger-button *w''* is depressed, the upwardly-extending arm R' of the stop R is swung backward out of the line of travel of the stops P'. The swinging of the casting R, with its stops, also swings the lever *t* out of engagement with the stops on the carriage, thereby releasing the line-locking mechanism.

The alarm-bell for indicating the approaching end of the printing-line is located at the rear of the machine. Pivoted upon the top plate at one side of the bell is the clapper-arm T'. (See Fig. 2.) The upper portion of this clapper-arm bears the trip-pawl T'', as shown. This trip-pawl is in the line of travel of a downwardly-projecting ear *p''*, carried by the margin-adjusting slide. The relative location of this ear and trip-pawl is such that the clapper-arm is swung out and liberated, so that the weight in the lower end of the arm strikes the bell about eight spaces before the carriage reaches the limit of its travel. When the carriage is drawn back to the beginning of the line the trip-pawl is free to tip backwardly without disturbing the clapper-arm at all as the ear is swung to one side. Said trip-pawl normally rests against the stop-pin *r*.

We have described the various parts of our type-writer carriage in the form which we consider best adapted for the various uses; but we desire to remark that the same can be greatly varied in details without departing from our invention. We believe, however, in each instance that we have adopted the form best adapted for the purpose, and therefore desire to claim the same specifically as well as broadly.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a carriage having two V grooves or ways; one rail with a corresponding groove or way; balls interposed between said grooves; and another rail having a horizontal flat bearing-surface, the portion immediately adjacent to such bearing portion being cut away on both sides, and a ball interposed between such bearing portion and the other V-groove of the carriage substantially as described.

2. In a type-writing machine, the combina-

tion of a carriage; a grooved ball-race therein; guides for the carriage; and a horizontal flat narrow way cut away on both sides for the ball on the top of the front guide whereby the action of the ball will tend to clear the said way of dust or other accumulations, as specified.

3. In a type-writing machine, the combination of a carriage mounted upon ball-bearings; a central retaining-wheel therefor mounted upon a support pivotally attached to the rail or frame of the machine, such pivotal point being at one side of a line passed downwardly through the center of said wheel and its bearing-point upon said carriage; a way upon said carriage for said retaining-wheel; a stop or projection extending from said wheel-support at its lower extremity, at right angles thereto; and a spring attached to said support the opposite end of which is adapted to bear upon the said rail or frame of the machine, substantially as described.

4. In a type-writing machine, the combination of a carriage mounted upon the ball-bearings in suitable ways on the frame of said machine; a lever pivotally attached to the frame or rail of the machine; a retaining-wheel on said lever to embrace the carriage and keep it in engagement with the said ball-bearings; a stop for limiting the motion of said lever away from the frame of the machine; a spring to hold the said lever and retaining-roller yieldingly in contact with the carriage, substantially as described and for the purpose specified.

5. In a type-writing machine, the combination of a platen cradle or frame supported at the rear upon rollers or wheels having outwardly-projecting hubs; detent-wheels under spring tension bearing upon the periphery of said hubs; and guards for said detent-wheels and springs, substantially as described.

6. In a type-writing machine, the combination of a platen cradle or frame supported at the rear upon rollers or wheels having hubs; detent-wheels under spring tension bearing upon the periphery of said hubs and guards for said detent wheels and springs, substantially as described.

7. In a type-writing machine, the combination of a platen cradle or frame supported at the rear upon rollers or wheels having hubs; detent-wheels under spring tension, bearing upon the periphery of said hubs, substantially as described.

8. In a line-locking mechanism for a type-writing machine, the combination of an adjustable margin-stop on the carriage; of the bell-crank lever *t*, *t'* pivoted upon the swinging stop R', the upper portion *t* of which lever is normally in the line of travel with the adjustable margin-stop carried by the type-writer carriage; a connection between one end of said bell-crank lever *t'*, and the bell-crank *u* pivoted adjacent to the finger-levers; a spring



for returning said bell-crank *u* to normal position; a swinging plate *v* made of sheet metal pivoted to the type-writer frame and extending underneath the finger-levers at right angles to the same, the upper edge of which swinging plate *v* is normally out of the line of travel of the finger-levers and positioned to swing into the path of said finger-levers; connections between the said swinging plate *v* and the bell-crank *u* to swing it upon its pivot *v'* to an upright position into the line of travel of said finger-levers; and connection between said bell-crank *t t'* and the keyboard whereby said bell-crank *t t'* may be thrown out of line of travel of said adjustable margin-stop, substantially as described.

9. In a type-writing machine, the combination of a swinging line-stop arm pivoted to the rear of the machine; a bell-crank pivoted upon the said swinging line-stop arm, one end of which bell-crank lever is normally in the line of travel of the marginal stop of the carriage; a lever with finger-key in the keyboard of the machine; connections from said lever to the swinging line-stop arm whereby the line-stop arm and the bell-crank can be swung out of engagement with the margin-stop on the carriage; a transverse pivoted plate *v* beneath the key-levers of the machine; connections from said plate to the bell-crank lever carried by the swinging line-stop arm, whereby the movement of the carriage will actuate the bell-crank lever to lock the keys whenever the margin-stop of the carriage strikes the swinging line-stop arm and so that

the keys will be released when the line-stop arm is disengaged, coacting for the purpose specified.

10. In a type-writing machine, a locking-plate *v* adapted to swing upon a pivot, said plate consisting of a piece of sheet metal having an eye formed along one edge of the same, and the other edge turned over, and a bifurcated arm projecting from said plate having its extremity turned over in the form of an eye, substantially as described.

11. In a type-writing machine, a locking-plate *v* adapted to swing upon a pivot, said plate consisting of a piece of sheet metal having an eye formed along one edge of the same, and the other edge turned over, and an arm projecting from said plate having its extremity turned over in the form of an eye, substantially as described.

12. In a type-writing machine, the combination with a movable carriage of a line-locking mechanism to be acted upon by a stop on said carriage; and connections from said locking mechanism to a key on the keyboard of the machine, whereby the same can be manipulated from the keyboard, as specified.

In witness whereof we have hereunto set our hands and seals in the presence of two witnesses.

WILLIAM R. FOX. [L. s.]  
GLENN J. BARRETT. [L. s.]

Witnesses:

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EDW. G. MATTER.