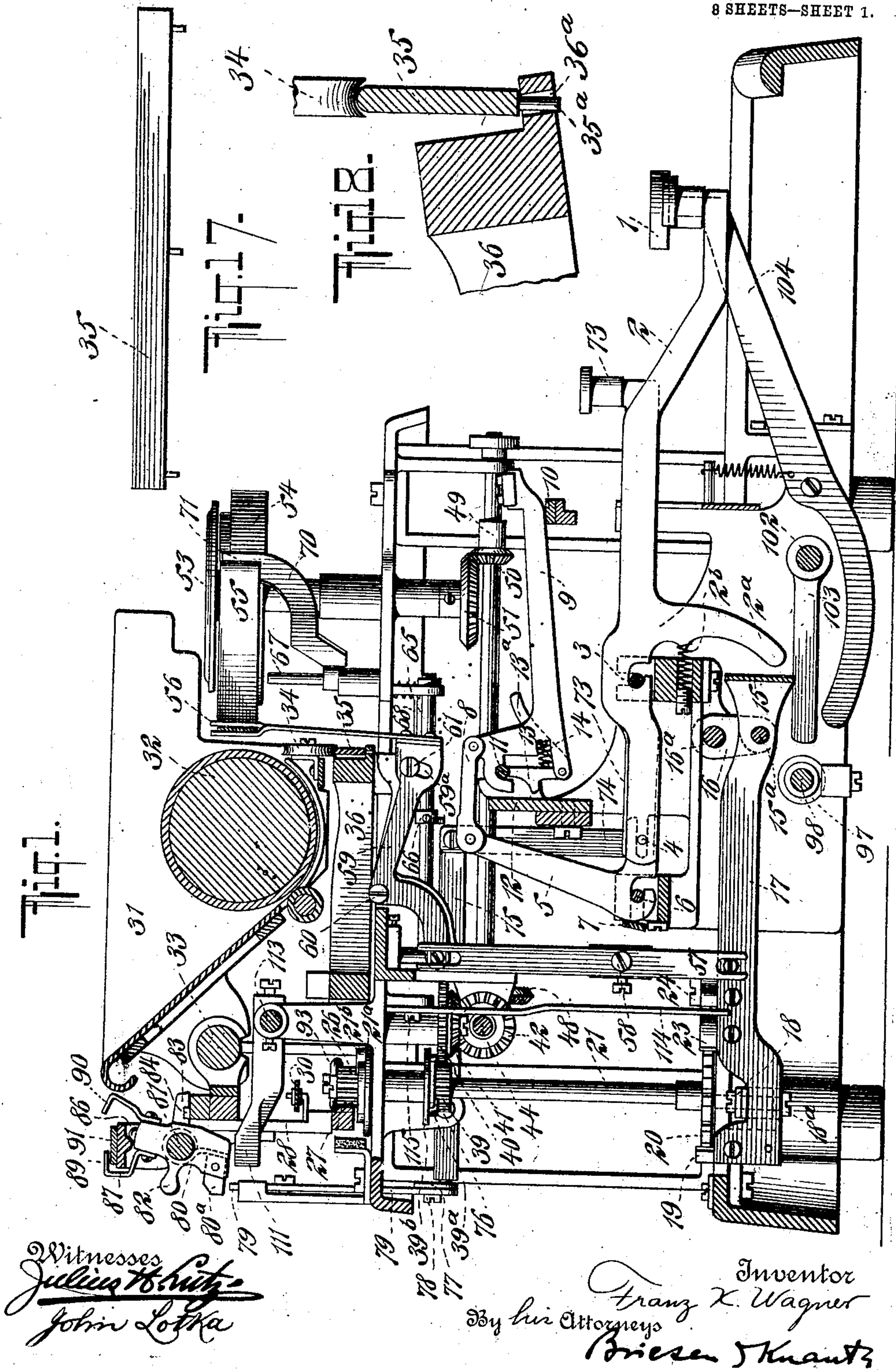


No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 1.



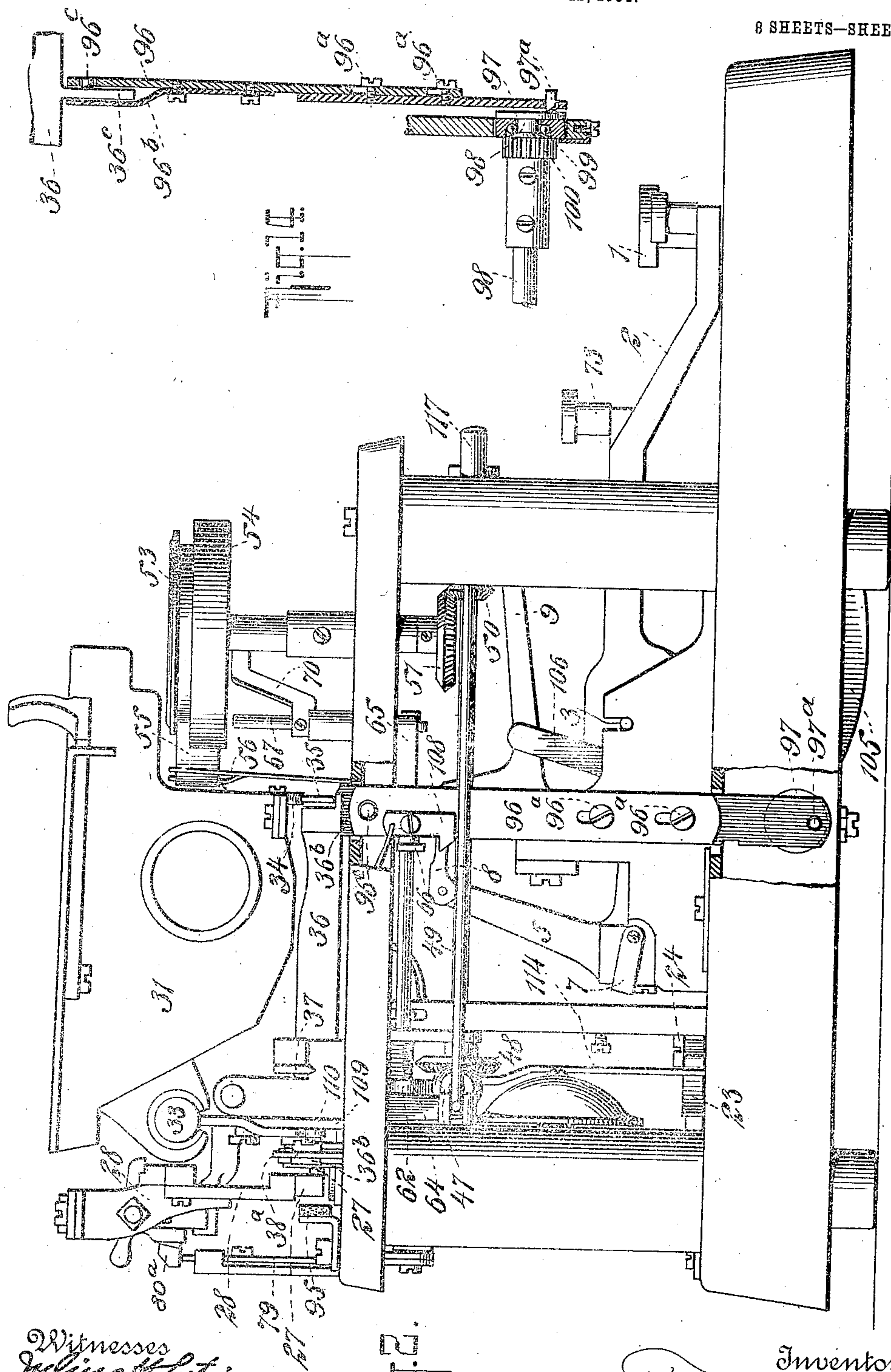
No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.

APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 2.



Witnesses  
Julius H. Lutz  
John Lotta

Inventor  
Franz X. Wagner  
By his Attorneys  
Briesen, Krauth

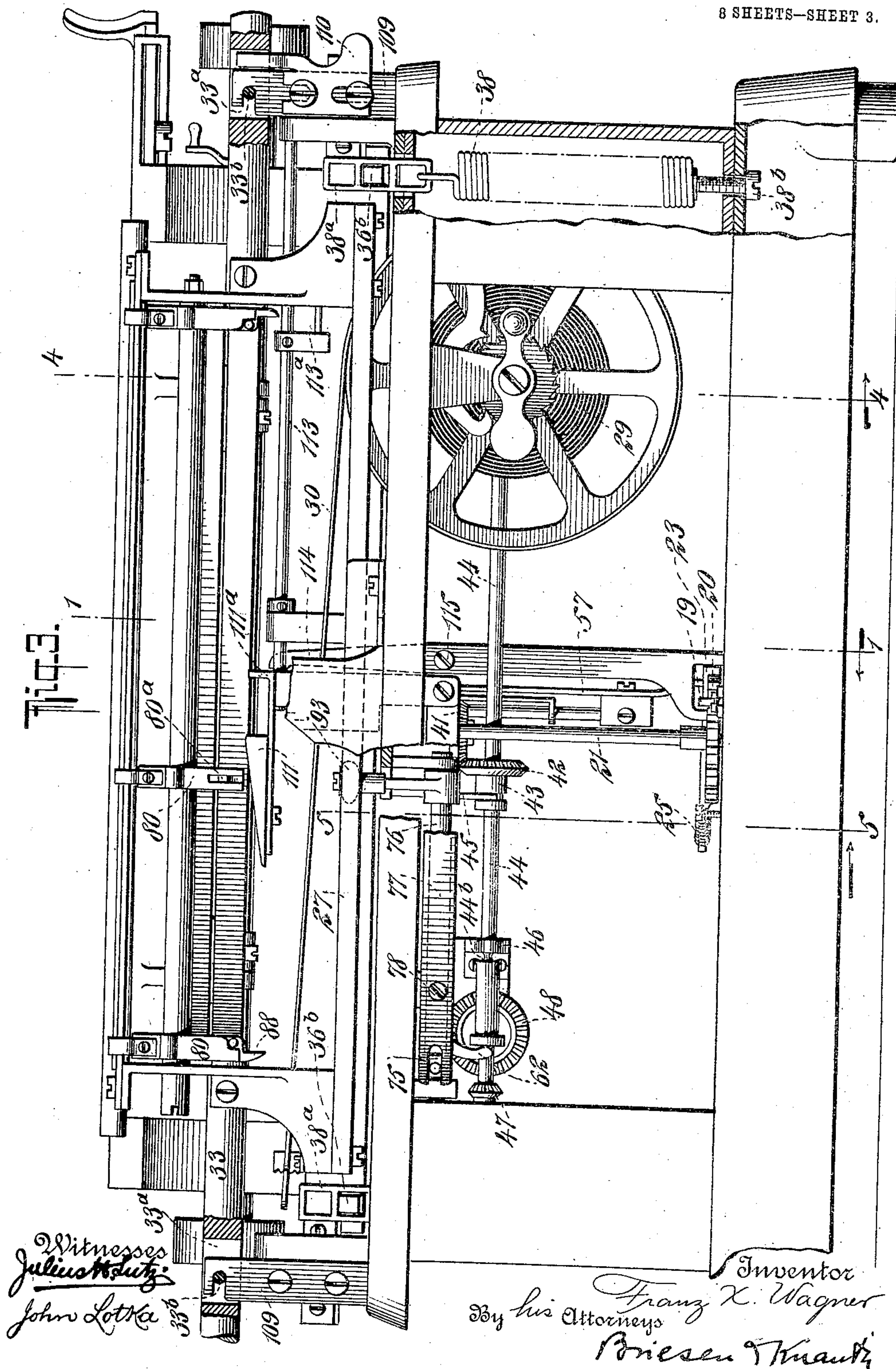


No. 868,042.

PATENTED OCT. 15. 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 3.



Witnesses  
Julius K. Lutz  
John Lotka

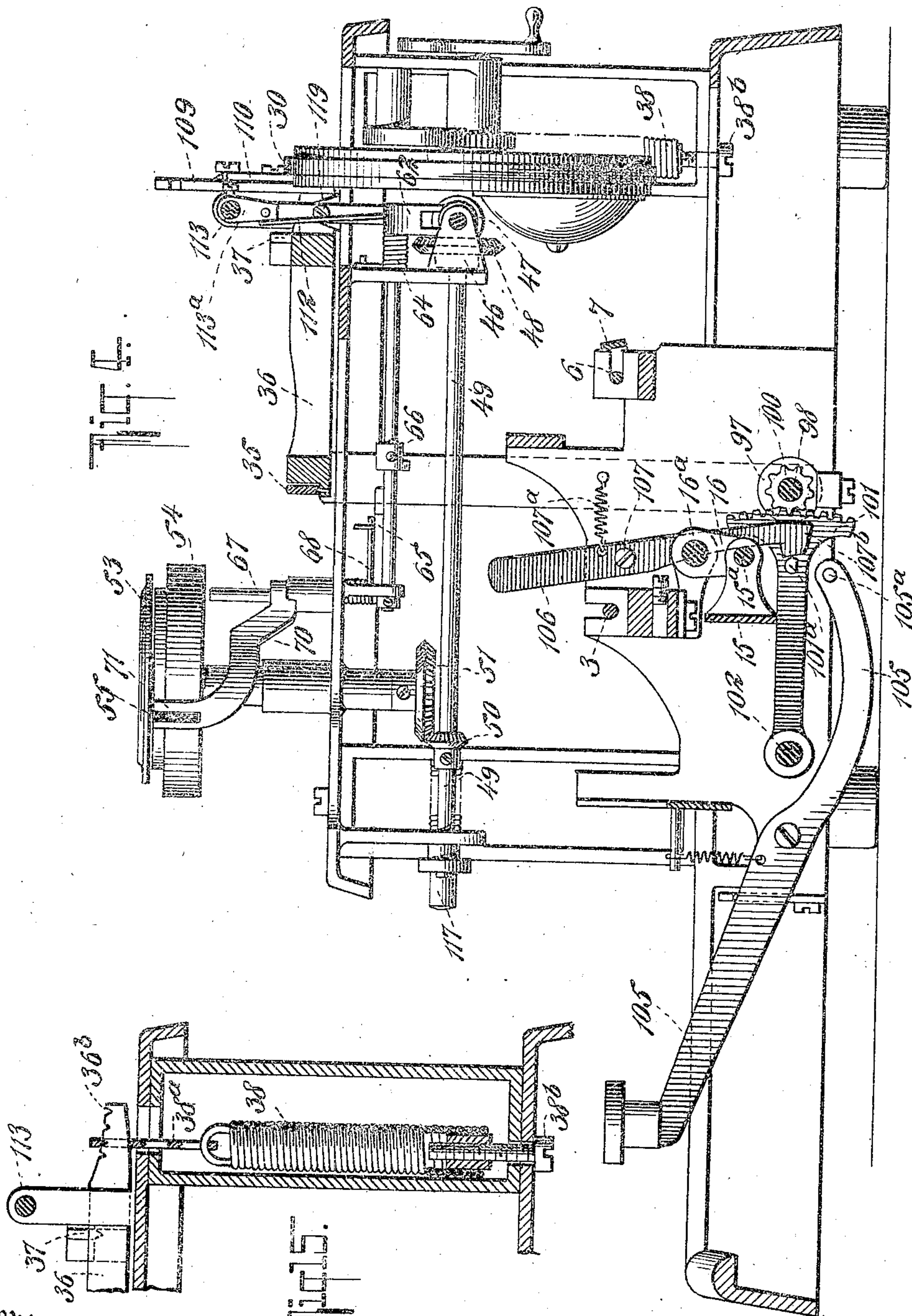
Inventor  
By his Attorneys Franz X. Wagner  
Briesen & Knauth

No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 4.



Witnesses  
*Julius H. Lutz*  
*John Lotka*

Inventor  
*Franz X. Wagner*  
By his Attorneys  
*Biesen & Knaut*



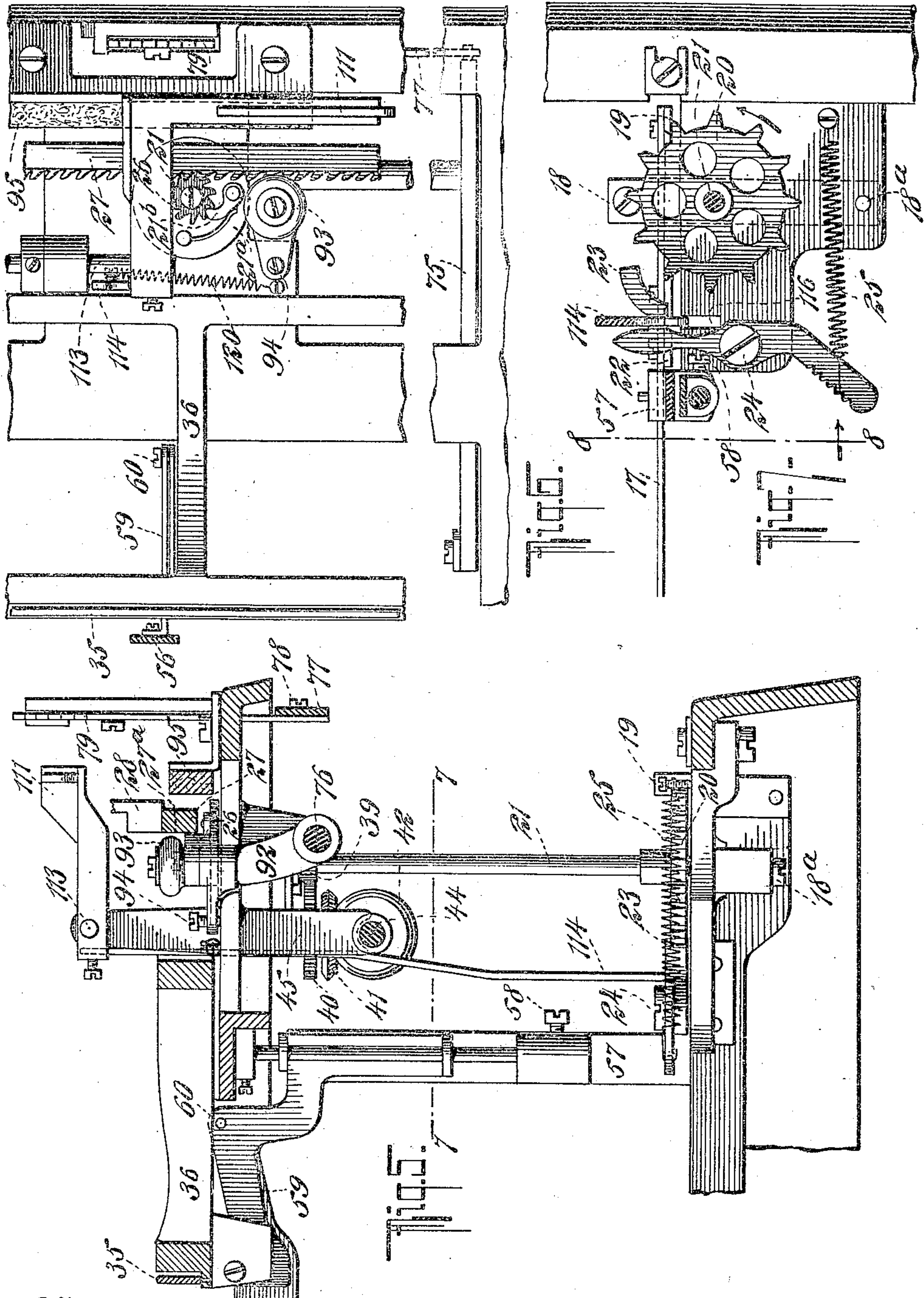
No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.

APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 5.



Witnesses  
*Julius H. Hoff*  
*John L. Lohr*

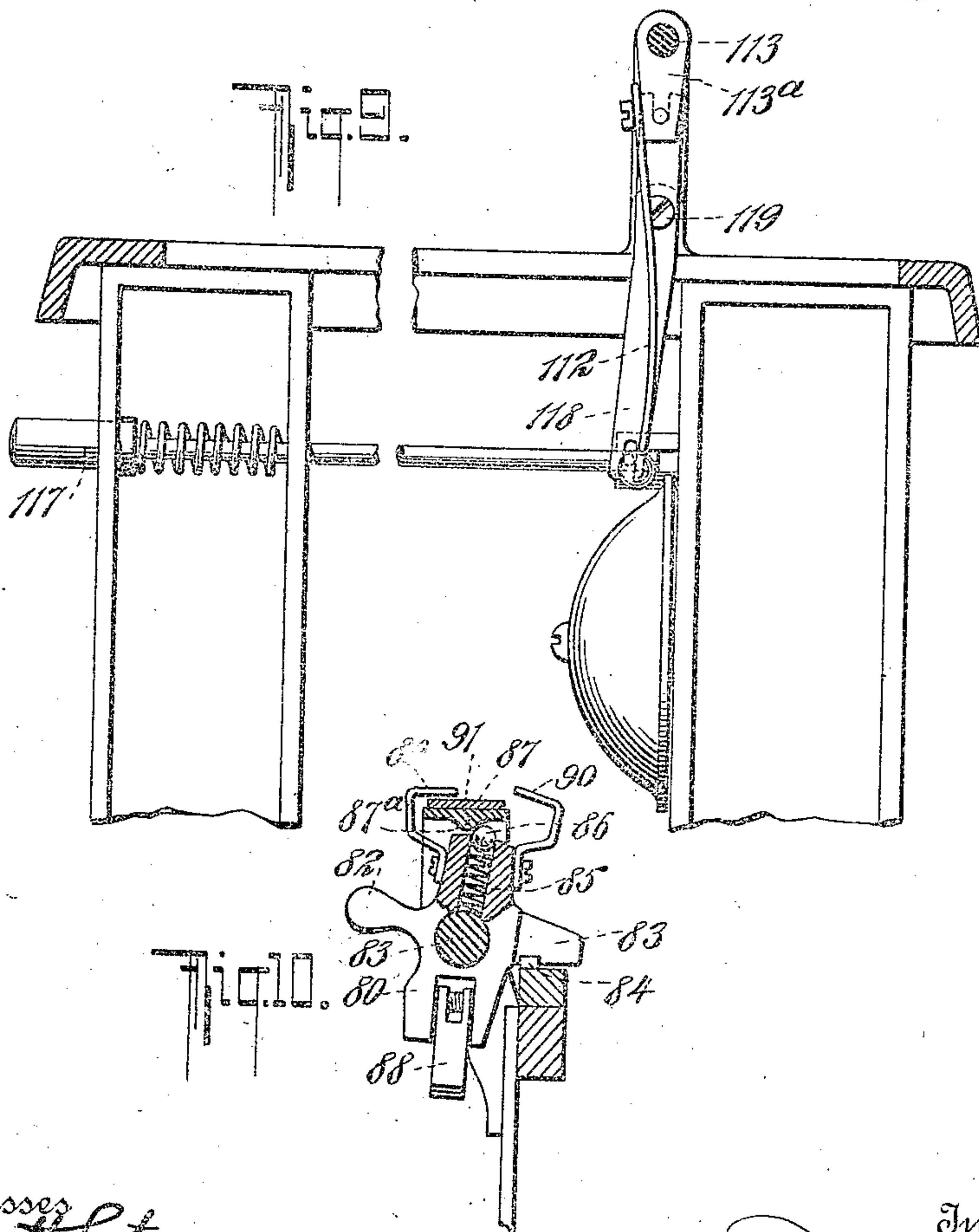
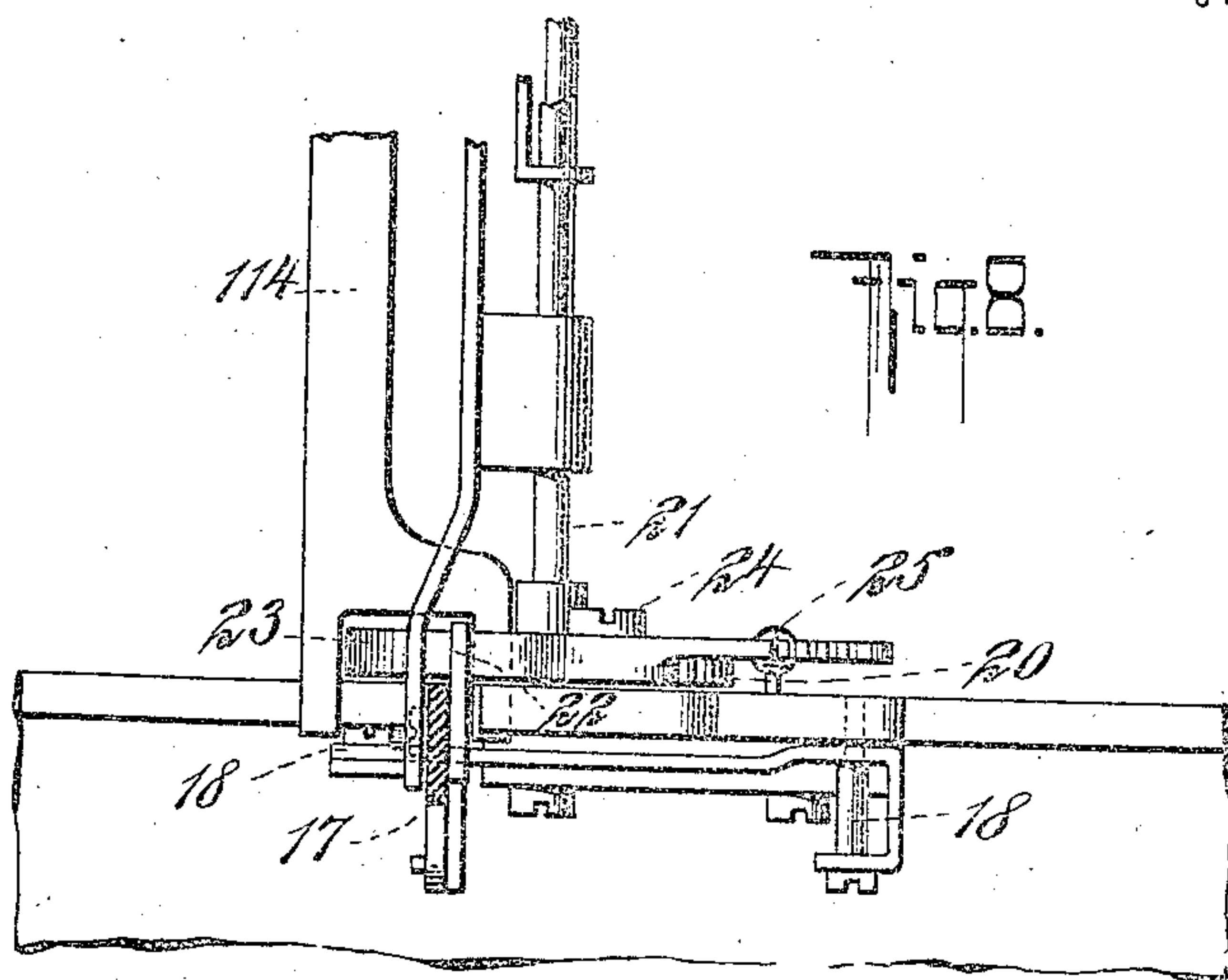
Inventor  
*Franz X. Wagner*  
By his Attorneys  
*Biesen & Knautz*

No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 6.



Witnesses  
*Julius K. Lutz*  
*John Lotka*

Inventor  
*Franz K. Wagner*  
By his Attorneys  
*Biesen Thumt*

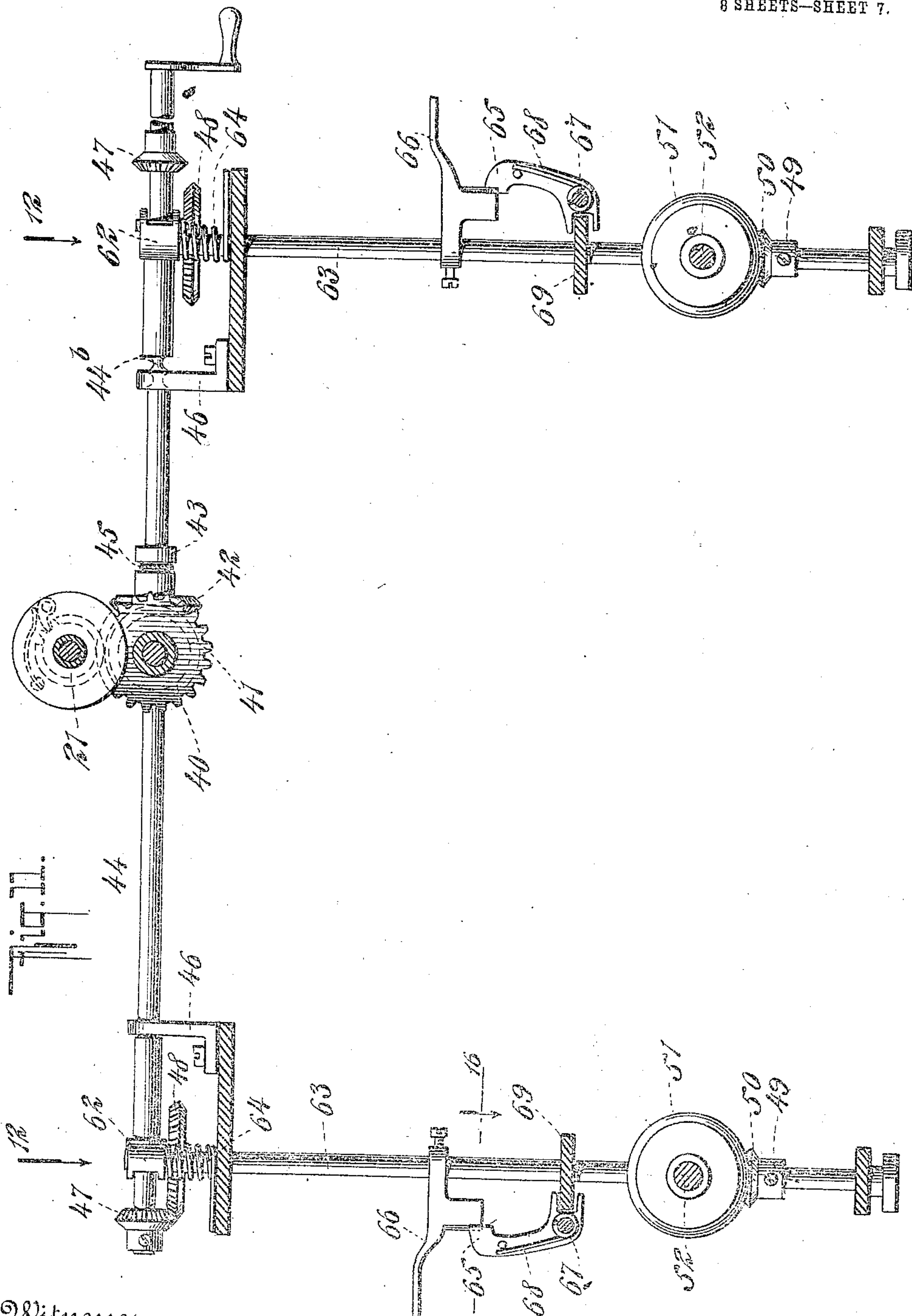


No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 7.



Witnesses  
*Julius H. H. H.*  
*John J. H. H.*

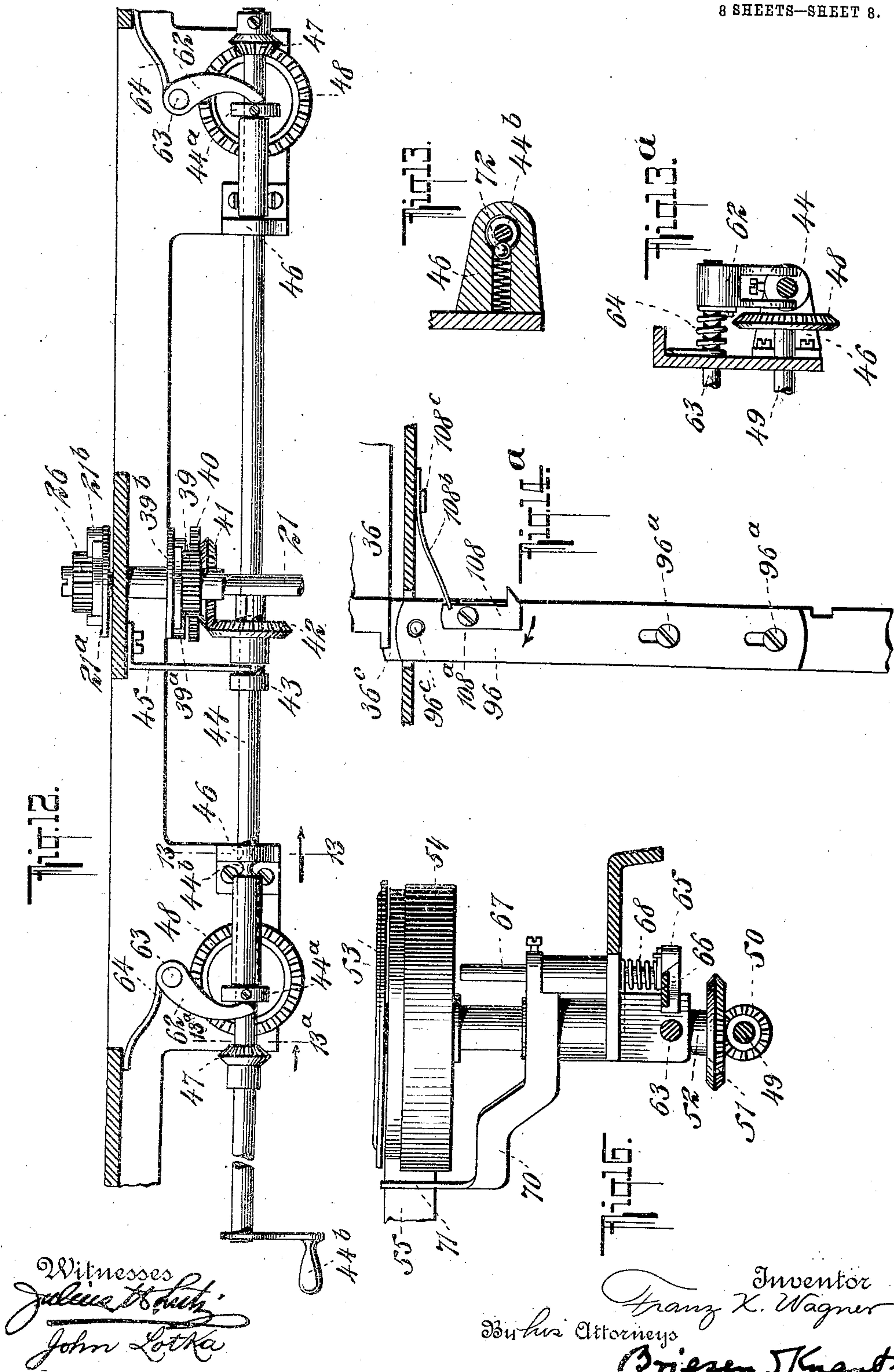
Inventor  
*Franz X. Wagner*  
By his Attorneys  
*W. H. H. H.*

No. 868,042.

PATENTED OCT. 15, 1907.

F. X. WAGNER.  
TYPE WRITING MACHINE.  
APPLICATION FILED NOV. 12, 1904.

8 SHEETS—SHEET 8.





# UNITED STATES PATENT OFFICE.

FRANZ X. WAGNER, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y.; A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 868,042.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed November 12, 1904. Serial No. 232,413.

*To all whom it may concern:*

Be it known that I, FRANZ X. WAGNER, a citizen of the United States, and a resident of the borough of the Bronx, city, county, and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines, and has for its object the improvement of such machines particularly as regards the escapement mechanism and its relation to carriage feed and ribbon feed mechanism.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings in which

Figure 1 is a sectional elevation of a machine embodying my improvements, taken on line 1—1 of Fig. 3; Fig. 2 is an elevation of such machine from the left side with parts in section; Fig. 3 is a rear elevation partly in section; Fig. 4 is a sectional elevation substantially on line 4—4 of Fig. 3, showing part of the carriage shift and the ribbon movement; Fig. 5 is a detail of the escapement, being a sectional elevation on line 5—5 of Fig. 3; Fig. 6 is a plan of the escapement; Fig. 7 is a section on line 7—7 of Fig. 5; Fig. 8 is a section on line 8—8 of Fig. 7; Fig. 9 is a sectional elevation of the bell trip, and the release of the line lock mechanism; Fig. 10 is a detail sectional elevation of a margin stop; Fig. 11 is a sectional plan of the ribbon reverse mechanism; Fig. 12 is a rear elevation taken as indicated by the arrows 12 in Fig. 11; Fig. 13 is a section on line 13—13 of Fig. 12; Fig. 13<sup>a</sup> is a vertical section on line 13<sup>a</sup>—13<sup>a</sup> of Fig. 12; Fig. 14 is a sectional elevation of the lifting bar of the shifting frame; Fig. 14<sup>a</sup> shows said lifting bar in side view with the adjacent parts; Fig. 15 is a detail elevation showing the spring for balancing the shift frame; Fig. 16 is a section on line 16—16 of Fig. 11; Fig. 17 is a detail front view of the shift rail; and Fig. 18 is an enlarged section showing the connection of the shift rail with the shift frame.

The type bar action shown in the drawings comprises the keys 1, mounted on levers 2, which are fulcrumed at 3, preferably in such a manner as to be easily removable. Each key lever by means of a pin and slot connection 4 operates an elbow lever 5, fulcrumed at 6. The elbow levers are preferably removable from their fulcrum, being normally held by a locking bar 7. Each elbow lever is connected by a link 8, with a type bar 9 normally resting on a cushion 10.

The type bar is provided with an opening and seat for the reception of the pivot 11, carried by the segment 12, and preferably the type bar is held in place

by means of a latch 13, which the spring 14 tends to throw into a position in which it closes the opening for the insertion of the pivot 11.

The handle of the latch is indicated at 13<sup>a</sup>.

Each key lever is provided with a toe 2<sup>a</sup> adapted to engage a universal bar 15, which extends transversely of the machine, and has at each end a lug pivotally connected at 15<sup>a</sup> with a suspended link 16 fulcrumed on the machine at 16<sup>a</sup>.

At the center of the universal bar 15, a bar 17 extends rearwardly, the said bar being secured at its rear end to a cross bar 18 fulcrumed to the frame at 18<sup>a</sup>. (See Fig. 7). The bar 17 carries an escapement pawl 19, which normally arrests a tooth of the escapement wheel 20 mounted on the shaft 21. The bar 17 is further provided with a projection 22 in engagement with the stop pawl 23, fulcrumed on the frame of the machine at 24, and pulled against the projection 22 by an adjustable spring 25. When the universal bar is moved rearward, the pawl 19 releases the escapement wheel 20, which rotates in the direction of the arrow shown in Fig. 7, but at the same time the end of the stop pawl 23 is swung into the path of the escapement wheel, and thus this wheel moves only a short distance sufficient to give the carriage a letter space movement through the connections to be described presently. Upon the return of the universal bar which takes place partly under the influence of the spring 25, but chiefly under the influence of the carriage propelling spring which actuates the escapement wheel 20, the normal position shown in Figs. 1 and 7 is again obtained.

The shaft 21 is provided at its upper end with a loose pinion 26, engaging the rack 27 on the carriage portion 28. This pinion is connected to turn with the shaft in the feed direction, by means of a disk 21<sup>a</sup> rigid on the shaft and a spring-pressed pawl 21<sup>b</sup> carried by said disk. This allows the carriage to be moved by hand freely in a direction contrary to the feed movement without turning the shaft 21. The carriage is fed in the usual manner by means of the spring 29, connected with the tape 31, one end of which is secured to the carriage. The carriage consists of two portions, the front portion 31 which carries the platen 32, and the rear portion 28 which carries the rack 27 and other parts hereinafter described. Both carriage portions are pivotally supported on the rear rod 33 of the machine frame, on which rod the carriage travels transversely of the machine. The front portion of the carriage is also provided with one or more rollers 34 adapted to travel on the rail 35, carried by the shift frame 36.

As shown best in Figs. 17 and 18, the rail 35 is provided with pins 35<sup>a</sup> adapted to be received in openings 36<sup>a</sup> with sufficient play to allow the rail to swing pivotally relatively to the frame 36 and to remain substan-



tially vertical even when the frame 36 is tilted slightly backward by being raised to its upper position. This shift frame 36 is hung on the frame of the machine by means of knife edges 37 (see Figs. 2 and 15) and a spring 38 is employed to press the shift frame 36 upwards so as to counter-balance the weight of the front portion 31 of the carriage.

In order that the action of the spring may be adjusted, I prefer to provide a series of notches, 36<sup>b</sup>, in the shift frame as shown in Fig. 15; by engaging the hook 38<sup>a</sup> connected with the spring 38 with one or the other of these notches, the purchase of the spring is varied. The tension of the spring can be varied by engaging either the upper or the lower opening of the hook 38<sup>a</sup> with the frame 36. The tension of the spring 38 may also be adjusted by means of the screw 38<sup>b</sup> which holds the lower end of the spring. The mechanism for shifting the frame 36 for the writing of capitals or small characters will be described in detail hereafter.

The shaft 21 of the escapement mechanism is also directly connected with the ribbon feed device in the following manner: A pinion 39 is loosely mounted on the said shaft 21 and is normally driven in the same direction as the shaft during the feed movement, by a spring pressed pawl 39<sup>a</sup> secured to a disk 39<sup>b</sup> rigid with the shaft 21. These parts correspond to those designated by 21<sup>a</sup> and 21<sup>b</sup>, except that the pawls 21<sup>b</sup> and 39<sup>a</sup> face in opposite directions and thus act oppositely. The pinion 39 meshes with a toothed wheel 40, rigidly connected with a bevel wheel 41 engaging another bevel wheel 42 upon a sleeve 43 surrounding a shaft 44 extending transversely of the machine. An arm 45 (Figs. 3, 11 and 12) projected from the frame of the machine holds the bevel wheel 42 against longitudinal movement, and in permanent engagement with the bevel wheel 41. The shaft 44 is capable of sliding lengthwise in the sleeve 43 and in bearings 46, but is held to rotate with the wheel 42, as by a feather and groove connection.

Near its ends, the shaft 44 carries rigidly two bevel pinions 47, adapted to engage bevel wheels 48 on shafts 49 (Figs. 4 and 11). It will be understood from Figs. 11 and 12 that only one of the sets of wheels 47, 48 is in mesh at a time. Each shaft 49 is in driving connection by means of bevel gearing 50, 51, with the shaft 52 of one of the ribbon spools 53, contained in the holders 54. These spools and holders may be of the usual construction the ribbon 55 on its way from one spool to the other passing through a ribbon guide 56 disposed adjacent to the printing point. This ribbon guide receives a rearward and upward movement, at each operation of a key lever, by means of a lever 57 (Fig. 1), having a pin and slot connection with the bar 17 and fulcrumed at 58. The upper end of this lever has a pin and slot connection with an elbow lever 59 fulcrumed at 60 and carrying the ribbon guide 56; the swinging of this lever is limited by a screw 61, extending through a slot 59<sup>a</sup>.

In order that the direction of the ribbon feed may be reversed when the ribbon 55 is almost entirely unwound from one of the spools 53, the following mechanism is provided (Figs. 1, 2, 4 and 11): The shaft 44 is provided adjacent to the bevel pinions 47 with collars 44<sup>a</sup> which are adapted to be engaged by forked push fingers 62 mounted on shafts 63 and under the influence of springs 64 which tend to throw said

fingers toward each other. The fingers 62 are normally held stationary; ready to be thrown inward by the respective springs 64, by means of latches 65 projected into the paths of arms 66 secured to the shafts 63. These latches are secured to vertical shafts 67 and are pressed toward the paths of the arms 66 by springs 68. The movement of the latches may be limited by making them with forked portions, embracing members 69 of the machine frame. Each shaft 67 carries at its upper end an arm 70 having a guide 71 for the ribbon 55. Near each end of the ribbon is secured the usual metal loop or projection of such a size that it cannot pass through the guide 71. When this loop engages the said guide, the guide will be swung aside so as to bring the corresponding latch 65 away from the arm 66. This will release the shaft 63 and cause the spring 64 and push finger 62 to shift the shaft 44 so that its opposite end will come into driving connection with the respective bevel wheel 48, thus reversing the direction of the ribbon movement. The push fingers 62 are brought back to their original (set) position in any suitable manner, for instance, by the carriage shift mechanism, as fully described hereinafter.

In order to prevent any accidental movement of the reversing shaft 44 I may locate a spring pressed ball 72 in one of the bearings 46 (Figs. 12 and 13) to engage one or the other of two grooves 44<sup>b</sup> in the shaft, according to the position of said shaft.

The tabulating mechanism comprises a key lever 73 (Fig. 1) connected by a link 74 with a rearwardly extending lever 75, fulcrumed at 76, the rear end of which operatively engages a transverse lever 77, fulcrumed at 78 (Fig. 3). This lever is connected with a vertically movable stepped stop 79 arranged to be projected more or less into the path of the carriage by suitable mechanism, or an ordinary stop (without steps) may be used when denominational tabulation is not desired. The stop 79 is adapted for engagement with the stop member 80<sup>a</sup> of a column stop 80 (or several of them) mounted on the rear rod 81 which is on the rear portion 28 of the carriage. The stop member 80<sup>a</sup> may be pivoted to the casing 80 and held by a spring 80<sup>b</sup> either in the operative lower position shown in Fig. 1, or in an upper position in which it is out of action. The column stop has a handle 82 for adjusting it lengthwise of the rod, and a toe 83 for holding it after adjustment, said toe engaging a rack 84 on the rear portion of the carriage. A spring 85 (Fig. 10) throws a ball 86 toward a top plate 87 having a ledge or rib 87<sup>a</sup> so that the casing of the column stop is thrown either toward the rack 84 or away from it. The margin stops may be of almost the same construction as the column stop, except that the margin stop proper 88 has a limited swinging movement lengthwise of the rack 84 in the usual manner. The stops adjustable on the rod 81 (whether column stops or margin stops) are preferably provided with two pointers 89, 90, adapted to indicate on the scale 91, one of such pointers being in operative position whether the stop is engaged with the rack 84 or released therefrom.

The release of the carriage from the escapement for tabulating purposes is effected by means of an arm 92 mounted on the fulcrum 76 of the lever 75 and turning



with said lever. The said arm carries a roller 93 (preferably on ball bearings) adapted to engage a smooth surface 27<sup>a</sup> of the escapement rack or feed rack 27 (Figs. 3, 5 and 6). An adjustable stop screw 94, permits of regulating the normal position of the roller 93. Thus at the depression of the tabulating key, the roller 93 will engage the rack 27 and release the carriage by swinging its entire rear portion 28 away from the pinion 26. At the same time the stop 80 will be brought into the path of the stop 79. Furthermore the rack 27 will be brought against a stationary brake strip 95.

The mechanism for shifting the platen portion of the carriage into position for the printing of either small characters or capitals is as follows: The shift frame 36 (see Figs. 2, 14 and 14<sup>a</sup>) is connected pivotally at both ends by lugs 36<sup>c</sup> with lifting bars 96, preferably made in two sections, adjustable by means of screws 96<sup>a</sup>, so that the said lifting bars may be lengthened or shortened. The upper portions of said bars have spring members 96<sup>b</sup> carrying the connecting pins 96<sup>c</sup>. The lower end of each lifting bar has an opening through which projects a pin 97<sup>a</sup>, mounted eccentrically upon a disk 97 secured to a shaft 98. This shaft is journaled in the frame by means of ball bearings 99, and also carries a pinion 100 (see Figs. 4 and 14). This pinion is located only at one side of the machine and engages a toothed sector 101 on a rock shaft 102. This rock shaft at the other end of the machine carries an arm 103 (see Fig. 1). Shift keys 104 and 105 respectively are adapted to engage the arm 103 and the arm of the sector 101. Thus by depressing either one of the shift keys the carriage will be moved to its upper position, but if the shift key 104 has been depressed, the carriage will not return to its lower position upon the release of said shift key, but will be held in its upper position owing to the engagement of a latch 106 pivoted at 107 with a projection 101<sup>a</sup> on the sector 101. The latch 107 is under the influence of a spring 107<sup>a</sup> and has a beveled surface 107<sup>b</sup> at the bottom, which surface is adapted to be engaged by a pin 105<sup>a</sup> on the shift key 105. Thus if the carriage is locked in its upper position and it is desired to release it, the shift key 105 is depressed and the pin 105<sup>a</sup> will swing the latch 106 clear of the projection 101<sup>a</sup> and allow the carriage to drop. It will of course be understood that if the shift key 105 is depressed while the carriage is in its lower position the carriage will be raised but will drop back as soon as the shift key is released, owing to the fact that the pin 105<sup>a</sup> keeps the latch 106 away from the pin 101<sup>a</sup>, until the latter is about in the position shown in Fig. 4. The latch 106 can be rendered inactive, if desired, by swinging its upper end forward into frictional engagement with a surface of the frame, so that the latch will be held out of the path of the shift key 105 until the operator restores the latch to its normal position.

I desire to call particular attention to the fact that the eccentric pins 97<sup>a</sup> reach their dead center positions when the carriage is in its upper or its lower printing position, thus locking the shift frame 36 against accidental movement in either printing position.

The carriage shift mechanism is also employed for the purpose of setting the ribbon reverse mechanism as has been referred to hereinbefore. For this purpose the lifting bars 96 (see Figs. 2 and 14<sup>a</sup>) are provided with

hooks 108, pivoted at 108<sup>a</sup> adapted to engage the ends of the arms 66. Each hook 108 is connected with a spring 108<sup>b</sup> the upper end of which slides in a guide 108<sup>c</sup> on the frame of the machine. Thus when the lifting bar 96 is in its lower position, the spring holds the hook in the projecting position shown in Fig. 14<sup>a</sup>, but as the lifting bar rises, the hook will be swung on its pivot in the direction of the arrow to finally clear the arm 66 after the latch 65 has been set. Thus when the carriage is shifted to its upper position the hooks 108 will engage and raise the arms 66 unless these arms should happen to be already in their upper or set position. The latches 65 or the portions of the arms 66 engaging them are of course beveled as shown in Fig. 16, or otherwise so constructed that the latch will be swung aside when the arm 66 is raised from its lower to its upper position.

In order to allow the carriage to be readily removed, I provide the following construction, shown in Fig. 3. The frame rod 33 on which the carriage moves has at its ends two recesses 33<sup>a</sup>, facing in the same direction in which recesses are located pins 33<sup>b</sup>, adapted to be engaged by stationary slotted supports 109 carried by the frame of the machine. The slots or recesses 33<sup>a</sup> are somewhat wider than the supports 109 so that the rod can be slid lengthwise to disengage the pins 33<sup>b</sup> from the slots of the supports 109. In order to lock the rod 33 in position, I provide a latch 110 movable vertically to fill the space between one of the supports 109 and the wall of the recesses 33<sup>a</sup> as shown at the right in Fig. 3. By this construction the carriage can be readily removed from the machine, and another carriage of different width substituted therefor.

The following mechanism is employed for locking the carriage at the end of a line: The bell trip 111 which is operated by the right hand margin stop (left hand in Fig. 3) in the usual way is mounted on the rock shaft 113 which also carries the bell hammer 112. After clearing the bell trip 111, the margin stop will engage a lug 111<sup>a</sup> and thus cause the shaft 113 to slide lengthwise. In this movement the lug 111<sup>a</sup> swings a lever 114, pivoted at 115, and provided with an opening at its lower end so as to straddle the stop pawl 23. Normally the lever 114 is inactive; when however the margin stop swings the lever on its pivot, said lever takes such a position as to be in the path of the stop pawl 23 so that the escapement bar 17 cannot be moved rearward. The key levers are thus locked. The lever 114 is guided in a slotted portion 116 of the frame. In order to restore the lever 114 to its original position, I provide a spring pressed key 117 which operates a lever 118, fulcrumed at 119, and having pin and slot connection with an arm 113<sup>a</sup> on the shaft 113. The lug 111<sup>a</sup> will thus be swung out of the path of the margin stop, and as soon as the lug is clear, a spring 120 (Fig. 6) will throw the lever 114 and the shaft 113 back to their original position.

An important advantage is secured by the use of the pawl 23 pivoted on the machine frame, instead of mounting such pawl directly on the bar 17 as has been done for the pawl 19. By the arrangement shown the carriage-propelling spring is caused to actuate the bar 17 on its return movement through a much greater path or throw than could be secured if the pawl 23 were mounted directly on the bar 17. A very quick return



of the universal bar and of the keys is the result; in fact, I may dispense entirely with the individual key-returning springs, one of which is indicated at 2<sup>b</sup> in Fig. 1.

In order that either one of the ribbon spools 53 may be rotated by hand, I provide a handle 44<sup>b</sup> on the shaft machine frame in either position of the shaft 44.

44, as shown in Fig. 12, said handle being clear of the Various modifications may be made without departing from the nature of my invention.

10 I claim as my invention

1. In a key-operated machine, the combination of the key-levers, the universal bar and means for moving it backwards on depressing a key-lever, the sliding escapement bar carried by said universal bar, the escapement pawl carried by the escapement bar to slide therewith, the stop pawl pivoted to a stationary support and engaged by the escapement bar, the escapement wheel cooperating with said pawls, and a connection from said escapement wheel to the carriage.

20 2. In a key-operated machine, the combination of the key-levers, a universal bar and means for moving it backwards on depressing a key-lever, a sliding escapement bar carried by said universal bar, an escapement pawl carried by said escapement bar and adapted to slide therewith, a stop pawl pivoted to a stationary support and engaged by the escapement bar, an escapement wheel cooperating with the pawls, and a line lock cooperating with the stop pawl.

30 3. The key lever having toe 2<sup>a</sup>, combined with universal bar 15 loosely hung in pivoted links 16, said bar carrying the rearwardly projecting rod 17, carrying pawl 19, in combination with spring pawl 23, a cooperating projection 22 on rod 17 and escapement wheel 20, and a connection between said escapement wheel and the carriage.

4. In a key-operated machine, an escapement for the carriage comprising an escapement wheel, an escapement or release pawl 19 and a stop pawl 23, a universal frame having projection 22 controlling the movement of said pawls, and a line lock for locking the pawl 23 and thereby preventing the universal bar from moving rearward.

5. In a key-operated machine, an escapement wheel, pawls adapted to cooperate with said escapement wheel, an escapement bar having a projection engaging one of said pawls on one side, and line lock mechanism engaging the said pawl on the side opposite to that engaged by the projection.

6. In a key-operated machine, a universal frame adapted to be operated by the keys, an escapement wheel connected with the carriage propelling spring, and a pawl pivoted on the machine frame and controlling said wheel, said pawl being engaged by a projection 22 on the universal frame, whereby the pressure of the propelling spring, acting on the pawl, will insure a quick return of the universal frame and finger keys, and whereby the pressure of the spring will be exerted through a comparatively long throw of the pawl and universal frame.

7. In a key-operated machine, an escapement shaft, 21, an escapement wheel 20 carried thereby a feed pinion 26 and a ribbon operating wheel 39 both loosely mounted on said shaft, oppositely facing pawls 21<sup>b</sup> and 39<sup>a</sup> for connecting said pinion and wheel respectively with said shaft, means for operating said escapement wheel, a carriage having a rack engaging said pinion, and ribbon feed mechanism operated by said ribbon operating wheel.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANZ X. WAGNER.

Witnesses:

JOHN LOTKA,

JOHN A. KEHLENBECK.