

(No Model.)

4 Sheets—Sheet 1.

C. N. FAY.
TYPE WRITING MACHINE.

No. 578,693.

Patented Mar. 9, 1897.

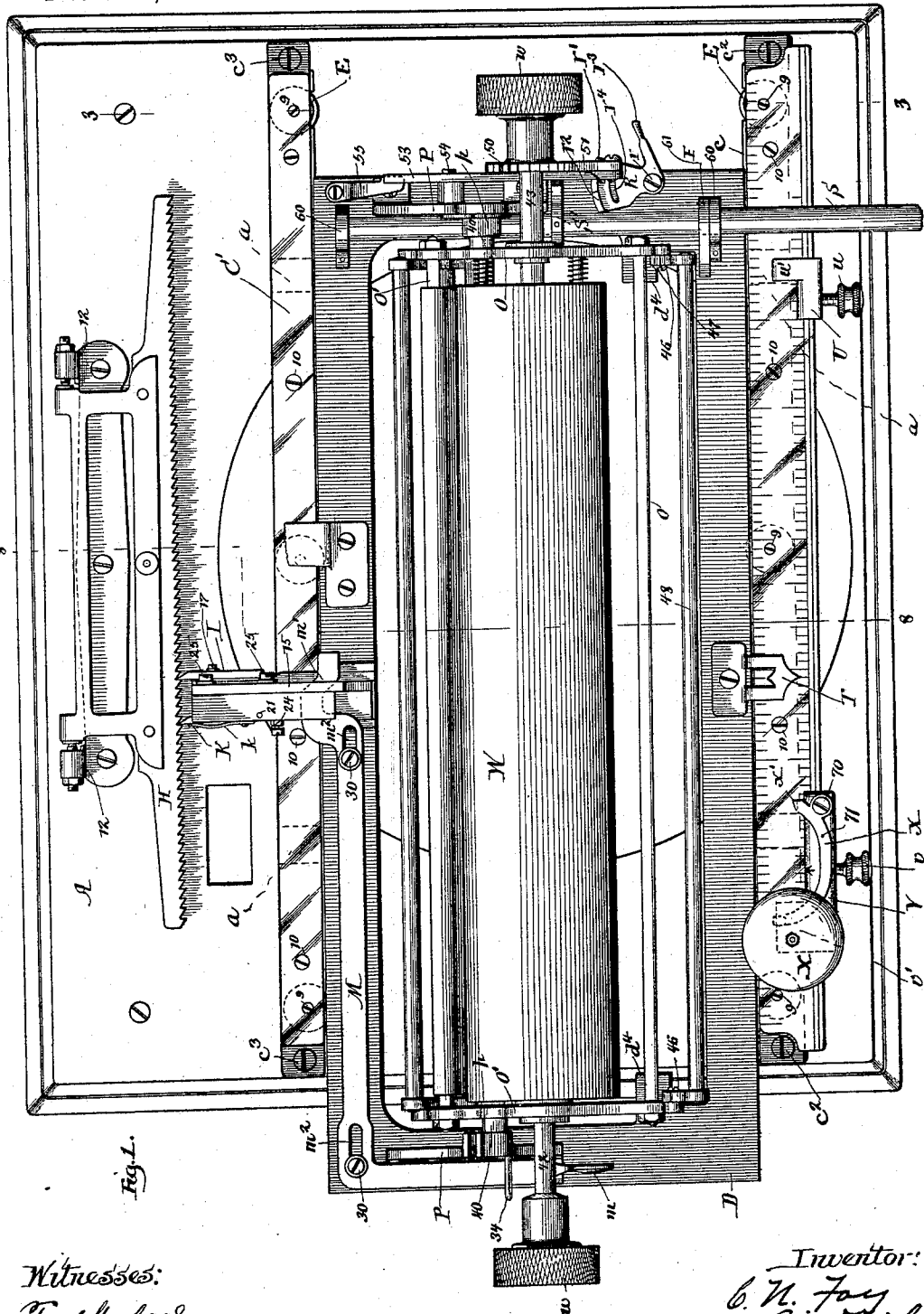


Fig. 1.

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Fred Gulack
Alberta Adamick.

Inventor:
C. N. Fay
By *Chas. Fisher*
Attorneys.

(No Model.)

4 Sheets—Sheet 2.

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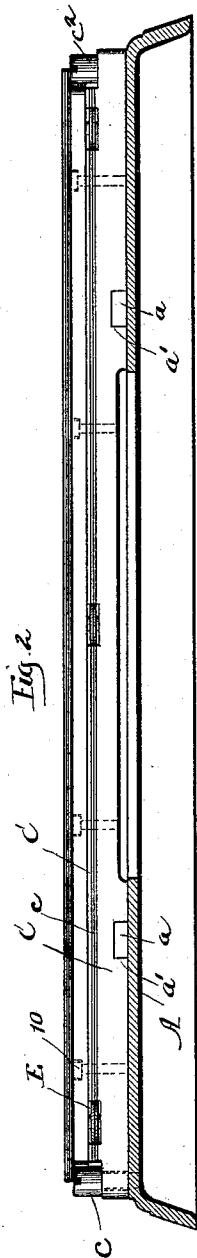


Fig. 2.

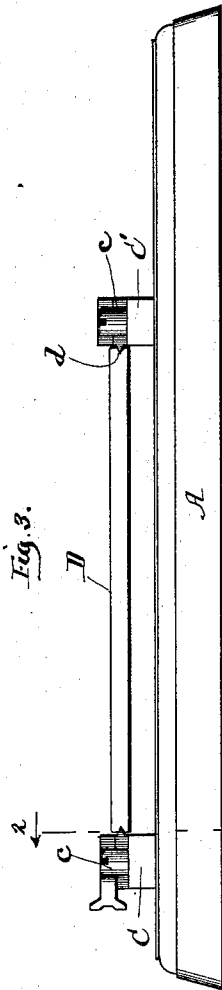


Fig. 3.

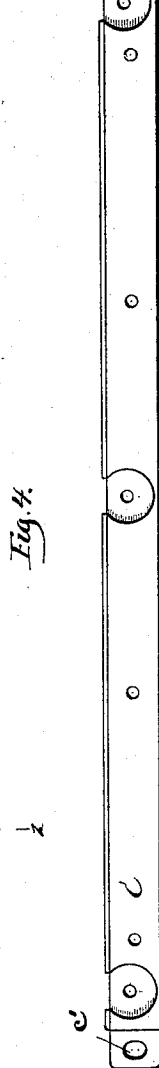


Fig. 4.

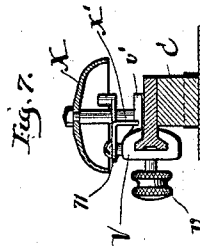


Fig. 7.

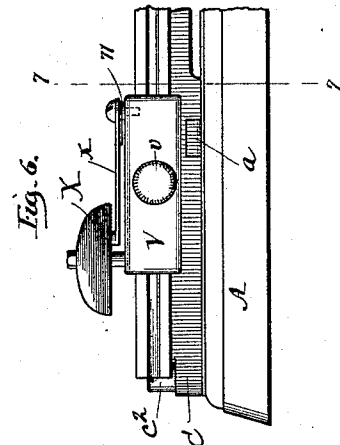


Fig. 6.



Fig. 5.

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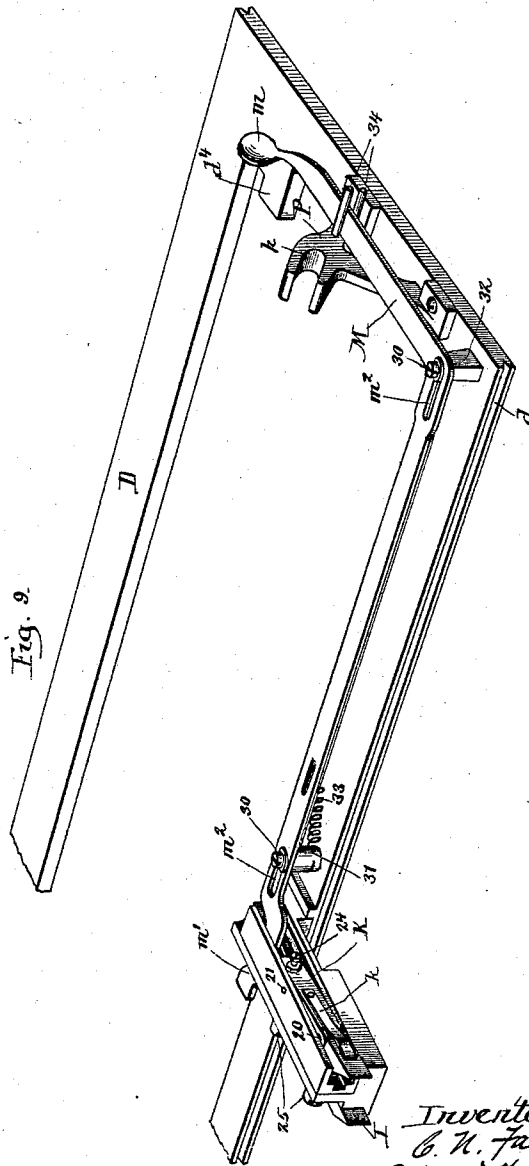
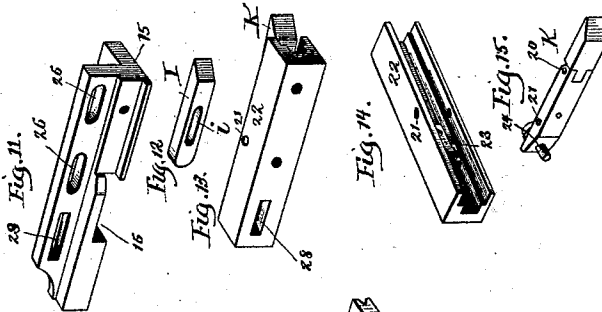
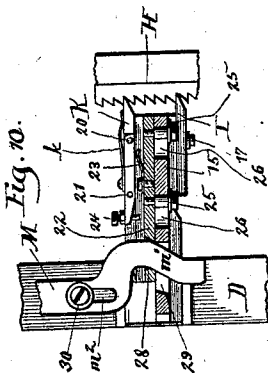
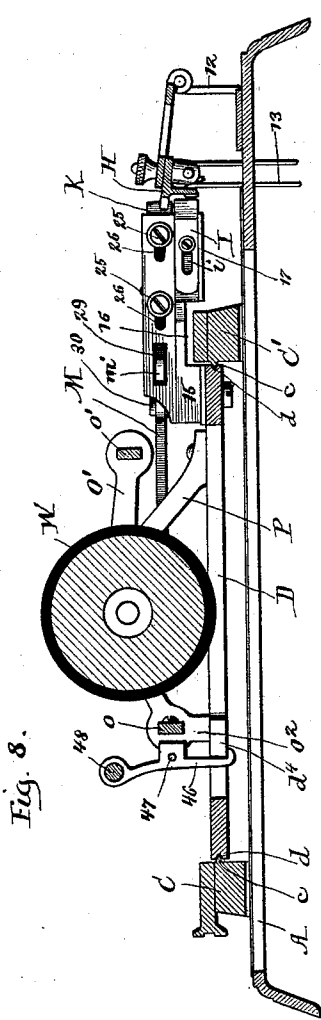
(No Model.)

4 Sheets—Sheet 3.

C. N. FAY.
TYPE WRITING MACHINE.

No. 578,693.

Patented Mar. 9, 1897.



Witnesses:
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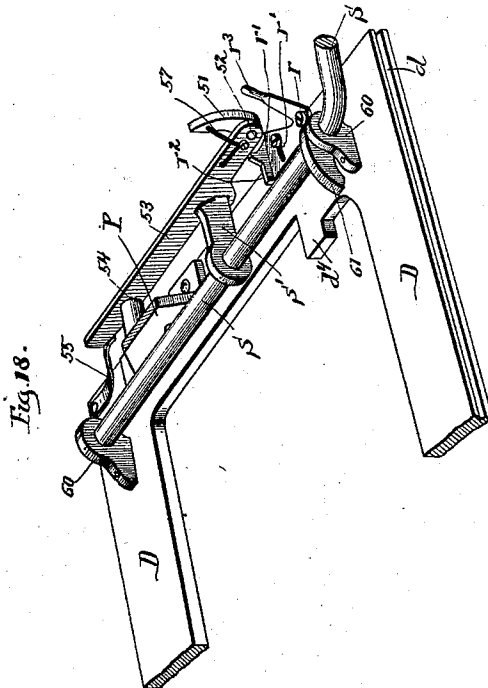
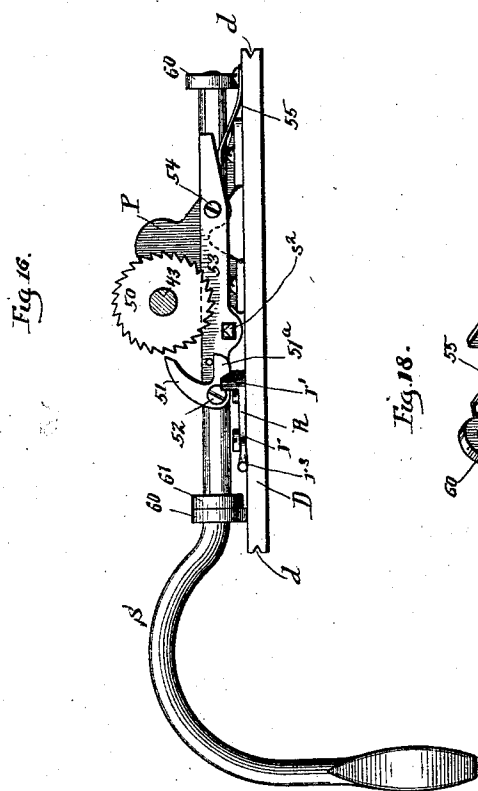
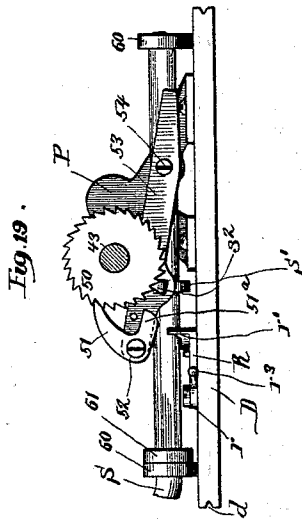
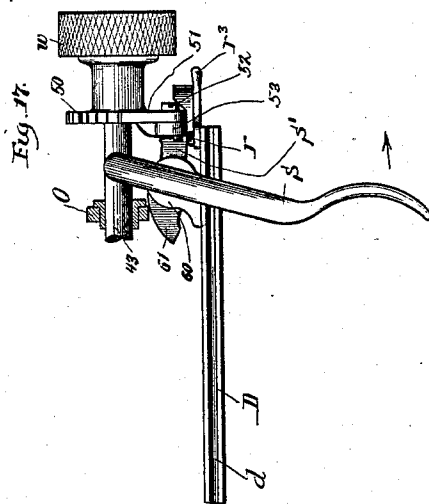
(No Model.)

4 Sheets—Sheet 4.

C. N. FAY.
TYPE WRITING MACHINE.

No. 578,693.

Patented Mar. 9, 1897.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES NORMAN FAY, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,693, dated March 9, 1897.

Application filed April 4, 1895. Renewed January 9, 1897. Serial No. 618,674. (No model.)

To all whom it may concern:

Be it known that I, CHARLES NORMAN FAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My present invention has relation particularly to that class of type-writing machines in which the paper to be printed upon is held against a cylindrical platen that is mounted upon a carriage adapted to be intermittently moved from right to left by the operation of the key-levers.

The main objects of this invention are, first, to improve the construction of the carriage-escapement mechanism and the means for releasing the same; second, to provide for the carriage an improved construction of bell-support and marginal stop. These several objects of invention I have accomplished by the novel features of construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a plan view of a type-writing machine embodying my invention, the keyboard being omitted. Fig. 2 is a view in vertical section on line 2 2 of Fig. 3. Fig. 3 is an end view of the carriage and rails on the top plate of the main frame. Fig. 4 is a detail plan view of the front carriage-rail with its top section removed. Fig. 5 is a detail perspective view of the marginal stop at the right-hand side of the machine. Fig. 6 is a front view showing a portion of the front carriage-rail and top plate of the machine with the bell and bell-support mounted thereon. Fig. 7 is a view in section on line 7 7 of Fig. 6. Fig. 8 is a view in central vertical section on line 8 8 of Fig. 1, parts being omitted. Fig. 9 is a perspective view of part of the paper-carriage and of the escapement and release mechanism mounted thereon. Fig. 10 is a view in horizontal section through the sliding-pawl carrier, the fixed and movable pawls being shown in elevation. Fig. 11 is a perspective view of the arm or bracket for

sustaining the fixed pawl on the carriage. Fig. 12 is a detail perspective view of the fixed pawl. Fig. 13 is a detail perspective view of the sliding pawl and its carrier. Fig. 14 is a detail perspective view of the sliding-pawl carrier. Fig. 15 is a detail perspective view of the sliding pawl. Fig. 16 is a view in end elevation of the paper-carriage and the line-spacing mechanism supported thereby. Fig. 17 is a front view of the right-hand end portion of the paper-carriage and line-space mechanism carried thereby. Fig. 18 is a perspective view of the right-hand end portion of the paper-carriage and line-spacing mechanism. Fig. 19 is a view similar to Fig. 16, but showing the parts in different position. Fig. 20 is a detail perspective view of the line-space-lever drive-arm.

A designates the top plate of the main frame of the machine, this top plate being provided with the usual openings above the type-basket and for the passage of the inking-ribbon. The top plate A is preferably formed with guide-ribs *a*, adapted to enter the transverse grooves *a'*, formed in the under side of one of the rails C and C', whereby the paper-carriage D is supported. The paper-carriage D has its front and rear edges provided with the grooves or channels *d*, adapted to receive the correspondingly-shaped projecting edges *c* of the rails C and C' and to receive also the peripheries of the wheels E, that are journaled by the screws 9 in the rails C and C'.

In order to permit the carriage-rails C and C' to be adjusted toward or from each other to compensate for wear and to secure their accurate position with respect to the carriage, I mount that one of these rails that is grooved to receive the guide-ribs *a* (preferably the front rail C) in such manner that it can be adjusted back and forth. To effect this adjustment of the rail C, I form in the ends of the rail the slots *c'*, through which pass set-screws *c²*, that enter threaded holes in the top plate of the main frame. By loosening the set-screws *c²* the rail C can be adjusted toward or from the back rail C' in order to secure the easy and accurate movement of the carriage D, and the guide-ribs *a* insure at all times the accurate alinement of the rail C. After the desired adjustment of the rail C is

had the screws c^2 will be again tightened. The rear rail C' may be fixed rigidly to the top plate of the main frame by the screws c^3 , or, if desired, this rail might be made adjustable in the same manner as the front rail C . The front and rear rails C and C' are each formed of superposed plates or sections, although this is not essential, and these sections are conveniently connected together by screws 10.

From the foregoing description it will be seen that not only can the front carriage-rail C be readily adjusted to insure the firm and accurate movement of the carriage D , but when it is desired to remove the carriage and the rails in order to more conveniently reach the type-basket and other subjacent parts this can be readily effected by loosening the screws c^2 and c^3 and removing the carriage-rails from the top plate of the main frame.

The escapement mechanism whereby the step-by-step feed of the carriage is obtained will next be described.

Upon the top frame A of the carriage are mounted brackets 12, that serve to pivotally support a vibrating rack-bar H , this rack-bar being connected by means of a suitable rod or link 13 with the universal bar of the machine in manner well understood in the art. Inasmuch as the rack-bar and the mechanism for operating the same form no part of my present invention, I have not deemed it necessary to illustrate the operating mechanism, although it will be readily understood that the rack-bar is vibrated at each depression of the universal bar incident to the operation of the key-levers or space-key of the machine.

With the rack-bar H engage the rigid and limber pawls I and K , the pawl I being normally out of engagement and the pawl K normally in engagement with the teeth of the rack-bar. The rigid pawl I is mounted upon an arm or bracket 15, that is fixed to and projects rearwardly from the back of the carriage D , this arm 15 being preferably cut away, as at 16, to permit it to ride freely over the back carriage-rail C' . By preference the rigid pawl I is formed with a long slot i , through which passes a set-screw 17, whereby the pawl is adjustably connected to the arm 15.

The limber pawl K is preferably of the construction shown in Fig. 15 of the drawings, that is to say, the pawl comprises a free end adapted to engage with the rack-bar H and pivoted, as at 20, to the body of the pawl, so that the free end of the pawl can turn outwardly against the force of a spring k , that is attached to the body of the pawl, this spring k serving to normally hold the free end of the pawl in line with its body. The body of the pawl K is pivoted, as at 21, upon a sliding-pawl carrier 22, that is grooved (see Fig. 14) to admit the body of the pawl K , and a spring 23 within the pawl-carrier serves to normally throw the free end of the pawl outward, the limit of its outward movement being determined by an adjusting-screw 24, that passes

through a threaded hole formed in the end of the pawl K . The pawl-carrier 22 is held upon the arm or bracket 15 by means of screws 25, that pass through slots 26, formed in the upper flange of the bracket 15, (see Figs. 10 and 11,) and these screws 25 are preferably of the shape shown in Fig. 10, so as to permit the pawl-carrier 22 to slide freely back and forth upon the bracket 15.

The limber pawl K , as will be seen by reference more particularly to Figs. 8 and 9 of the drawings, is mounted upon a higher plane than the rigid pawl I , so that when the rack-bar H is vibrated in downward direction it will be engaged by the rigid pawl I and will pass from engagement with the limber pawl K , thereby permitting the limber pawl to spring forward into position to engage the next succeeding tooth of the rack-bar when this rack-bar is allowed to rise to the plane of the limber pawl.

The operation of the general type of escapement mechanism comprising fixed and limber pawls being well understood by those familiar with this class of machines need not be more particularly described.

In order to permit the pawl K to be readily withdrawn from the rack-bar H when it is desired to manually shift the paper-carriage D , I provide a release-key M , that is mounted upon the carriage and is furnished with means whereby the pawl-carrier 22 may be shifted. The preferred construction of release-key is that illustrated more particularly in Figs. 1, 9, and 10 of the drawings, that is to say, the key M is an angular bar, one end of which is provided with a finger-key m and the opposite end of which is provided with a cam extension m' , that passes through a slot 28, formed in the pawl-carrier 22, and through a slot or cut-away space 29 of the bracket 15. The shape of the cam extension m' of the release-key M is such that when this key is drawn outward or toward the left the rear face of the extension m' will act as a wedge to force backward the pawl-carrier 22, thereby withdrawing the pawl K from engagement with the rack-bar and permitting the carriage D to be manually shifted to any desired point.

In order to retain the release-key M upon the carriage, I prefer to form this key with slots m^2 , through which pass the screws 30, that enter threaded seats formed in the blocks 31 and 32, whereon the release-key M rests. A suitable spring 33, connected to the release-key M and to the block 31, serves to draw this key normally inward with sufficient force to normally retain the pawl K in engagement with the rack-bar H . The outer end of the release-key M is preferably sustained also between guide-pins 34, projecting from one of the platen journal brackets or supports, or in other convenient manner. It will thus be seen that when it is desired to manually shift the carriage back or forth this can be readily effected by moving toward the left the release-key M , thereby withdrawing the pawl

K from engagement with the rack-bar. Inasmuch as the finger-piece *m* of the release-key is in juxtaposition to the left-hand thumb-wheel *w* of the cylindrical platen *W*, the operator can readily grasp both the finger-piece *m* of the release-key *M* and the thumb-wheel *w* in order to effect the shift of the carriage.

The cylindrical platen *W* is mounted within an auxiliary platen-frame that is shown as consisting of end bars *O* and *O'*, connected together at front and rear by the rods *o* and *o'*, the end bars *O* and *O'* being provided with outwardly-projecting journal studs or trunnions 40, that enter the journal-bearings *p*, formed at the top of the brackets *P*, that rise from the ends of the carriage *D*. The journal studs or trunnions 40 being thus pivotally sustained permit the auxiliary platen-frame to be turned upward in order to expose the printing to the view of the operator. The platen *W* has journals 42 and 43 projecting from its ends and passing in manner free to revolve through suitable hubs formed in the end bars *O* and *O'* of the auxiliary platen-frame, and these journals 42 and 43 are provided with the thumb-wheels *w*, whereby the platen can be manually revolved. The front ends of the bars *O* and *O'* of the auxiliary platen-frame are provided with feet *o*², that will rest upon the carriage *D* when the platen is turned down to normal position, and to these bars *O* and *O'* are pivotally connected suitable latches 46, that engage the inwardly-projecting lugs *d*⁴ of the carriage (see Fig. 1) and serve to normally retain the platen in such position.

Any suitable means may be employed for locking the platen in normal position, but I have shown the latches 46, that are pivoted, as at 47, to the end bars *O* and *O'*, the ends of these latches 46 being connected by a rod 48, extending across the front of the platen, where it can be conveniently manipulated by the operator.

Upon the platen-journal 43 is mounted a line-space ratchet-wheel 50, and the revolution of this ratchet-wheel is effected by means of a pawl 51, that is pivotally mounted, as at 52, upon the lever 53, that is pivoted, as at 54, to a stud projecting from one of the brackets *P*, that sustain the platen. A spring 55 engages the rear end of the lever 53 and forces the front end of this lever downward against a regulating-block *R*, that is pivoted, as at *r*, to the carriage *D* and is provided with a series of steps *r'* and *r*², whereon the front end of the lever 53 will rest. The pawl 51 is pivoted in such position that its lower arm 51^a will be forced normally below the lower edge of the lever 53 by a spring 57, that is connected to the lever and to the pawl, (see Fig. 18,) but when the lever 53 is in this normal position, as seen in Fig. 18, the contact of the pawl-arm 51^a with the regulator step-block *R* will throw forward the upper end of the pawl 51 and thus hold it normally out of engagement from the ratchet-wheel 50, thereby permitting

the ratchet-wheel and the platen *W* to be freely turned in either direction by the thumb-wheels *w*. The regulator step-block *R* is preferably provided with a handle *r*³, whereby it can be conveniently shifted, and preferably also this step-block is formed with a segmental groove *r*⁴, through which passes a guide-screw that insures the accurate movement of the step-block. (See Fig. 18.) The pawl-carrying lever 53 is operated by a line-space lever *S*, that is journaled in suitable brackets 60, that rise from the carriage *D*, and this lever *S* has fixed thereto a stop-arm 61, that limits its backward movement by contact with the top of the paper-carriage *D*.

Upon the lever *S* is fixed a drive-arm *S'*, (see Figs. 18 and 20,) the outer end of which engages with the pawl-carrying lever 53 and preferably projects through an opening formed in this lever. The extreme outer end of the arm *S'* is shown as provided with an inclined upper edge *s*², forming a check-stop that engages the teeth of the ratchet-wheel 50 and thus limits the "overthrow" or revolution of the platen beyond the extent necessary to form the space between the lines of printing. The line-space lever *S* has its front end bent downwardly into position to be conveniently manipulated by the operator in manner well understood.

From the foregoing description it will be seen that when the operator shifts the line-space lever *S* in the direction of the arrow, Fig. 17, the rocking of the lever in its bearing will cause the drive-arm *S'* to force upward the pawl-carrying lever 53, thereby causing the pawl 51 to engage the teeth of the ratchet-wheel 50 and impart to this wheel and to the platen the necessary extent of revolution for forming the space between the lines of printing. As the operator releases the line-space lever *S* the spring 55 will force downward the front end of the lever 53 from the position shown in Fig. 19 to the position seen in Fig. 16, thereby restoring the line-space lever also to its normal position. When the regulator step-block *R* is in the position seen in Fig. 18, that is to say, with the step *r'* beneath the lever 53, the lever 53 will be permitted to move downward such distance only that the pawl 51 will travel through sufficient space as to give a narrow space between the lines of printing, but when the regulator-block *R* is shifted so as to bring the step *r*² beneath the lever 53 this lever 53 and the pawl 51 will be permitted to swing downward a greater distance, so that when the pawl is forced upward from such position by the line-space lever it will impart double the movement to the ratchet-wheel 50 and thus make the wide space between the lines of printing.

By reference more particularly to Fig. 1 of the drawings it will be seen that the front carriage-supporting rail is provided upon its upper surface with a scale over which will travel an arm or pointer *T*, that is fixed to the carriage *D*, the graduations of this scale correspond-

ing to the movements of the carriage-escape-
ment mechanism. The front carriage-rail C
has its upper section projecting beyond the
body of the rail and preferably provided with
5 a T-shaped or flanged head, upon which are
held the right-hand margin-stop U (see Fig.
1) and the bell-support and stop V. The
margin-stop U is formed with a groove adapt-
ed to fit over the flanged edge of the front
10 carriage-rail, and by means of a set-screw *u*
this margin-stop can be set at any position
upon the rail. The stop U is provided with
an arm *u'*, that projects inwardly in position
to engage and to arrest the arm or pointer T,
15 that projects outwardly from the front of the
carriage D. (See Fig. 1.) The stop and bell-
support V are also formed with a groove
adapting it to fit over the flanged front edge
of the rail C, and is provided with a thumb-
20 screw *v*, whereby the stop can be set at any
desired position along the rail. This stop V
is also provided with an inwardly-projecting
lug or arm *v'*, (see dotted lines, Fig. 1,) that
will limit the movement of the paper-carriage
25 toward the left by contact with the pointer
T. Upon the stop V is mounted a bell or
other signal X, the wiper *x* of which is piv-
oted at 70 and held normally in position
shown by a spring 71, so that its end *x'* will
30 be engaged by the arm or pointer T shortly
before the carriage reaches the limit of its
travel toward the left. It will thus be seen
that when the stop V is set at any desired
position adjacent the left-hand end of the
35 rail C the movement of the carriage toward
the left will be determined and the signal-
bell will be operated before the carriage
reaches the end of its travel. The stop V
can be readily withdrawn from the rail C,
40 thereby permitting the paper-carriage to be
removed whenever it is desired to have better
access to the type-basket or when it is desired
to substitute a carriage having a platen of
greater length.

45 Having thus described the invention, what
I claim is—

1. In a type-writing machine, the combina-
tion with a paper-carriage, of an escapement
mechanism for said carriage comprising a
50 horizontally-arranged and vertically-movable
rack-bar, a fixed and a limber pawl sustained
by said carriage for engagement with said
rack-bar, a rearwardly-projecting laterally-
rigid guide-support attached to said paper-
55 carriage and whereby one of said pawls is
sustained in manner free to reciprocate in a
direction at right angles to the path of travel
of said carriage and a release-key mounted
upon the carriage and whereby said recipro-
60 cating pawl may be withdrawn from engage-
ment with said rack-bar.

2. In a type-writing machine, the combina-
tion with a paper-carriage and with a tilting
platen-frame and platen sustained thereby, of
65 an escapement mechanism comprising a hori-
zontally-arranged and vertically-movable
rack-bar and a pair of pawls mounted upon

the rear of said carriage and independent of
said tilting platen-frame, and a laterally-rigid
guide for one of said pawls and whereby it is
70 sustained in manner free to reciprocate in a
direction at right angles to the path of travel
of the carriage, a laterally-rigid reciprocating
pawl-carrier mounted upon said guide where-
by said reciprocating pawl is sustained and
75 a release-key mounted upon the carriage and
engaging said laterally-rigid pawl-carrier to
effect its reciprocation in order to withdraw
it from engagement with the rack-bar.

3. In a type-writing machine, the combina-
80 tion with a paper-carriage, of an escapement
mechanism for said carriage comprising a
movable rack-bar, a pair of pawls for engag-
ing said rack-bar, one of said pawls being
fixed upon said carriage and the other of said
85 pawls being mounted upon said carriage in
manner free to reciprocate in a direction
transverse to the path of travel of said car-
riage, suitable mechanism for guiding said
pawl in its reciprocating movement, a cam
90 for withdrawing said pawl from engagement
with the rack-bar and a release-key for op-
erating said cam.

4. In a type-writing machine, the combina-
95 tion with a paper-carriage, of an escapement
mechanism for said carriage comprising a
movable rack-bar, a pair of pawls for engag-
ing said rack-bar, one of said pawls being
sustained upon said carriage in manner free
to reciprocate in a direction transverse to the
100 path of travel of said carriage, a fixed pawl
mounted upon the carriage, an arm for sus-
taining said fixed pawl, a reciprocating car-
rier whereon said reciprocating pawl is mount-
ed and a release-key for retracting said re-
105 ciprocating carrier and a pawl from engage-
ment with the rack-bar.

5. In a type-writing machine, the combina-
tion with a paper-carriage, of an escapement
mechanism for said carriage comprising a
110 horizontally-arranged and vertically-movable
rack-bar and a pair of pawls for engaging
said rack-bar, one of said pawls being sus-
tained upon said carriage in manner free to
reciprocate in a direction transverse to the
115 path of travel of said carriage, a reciprocating
pawl-carrier for supporting said reciprocating
pawl, and a sliding release-key compris-
ing an angular bar having a finger-piece
at one end adjacent the center of the carriage
120 and having its opposite end cam-shaped to
engage said reciprocating pawl-carrier in order
to retract the pawl from engagement with
the rack-bar.

6. In a type-writer the combination with a
125 top plate A of the main frame, and with a
sliding paper-carriage, of front and rear rails
upon the top plate and between which said
sliding paper-carriage is guided, the front
carriage-rail being formed of superposed sec-
130 tions, the upper section of said front carriage-
rail projecting forwardly beyond the lower
section and at a distance above the top plate
of the main frame, a margin-stop adjustably

mounted upon the forwardly-projecting portion of the upper section of said front carriage-rail, and an arm extending forwardly from the carriage above said front carriage-rail and arranged to engage said adjustable margin-stop.

7. In a type-writing machine, the combination with a top plate A of the main frame, of a sliding paper-carriage, front and rear guide-rails for said carriage, said front guide-rail having its upper portion extended forwardly beyond its lower portion and raised at a distance above the top plate and provided with a projecting flange, an adjustable dovetailed margin-stop fitted upon said forwardly-projecting flanged upper portion of the front carriage-rail and a projecting arm extending forwardly from the paper-carriage over said front rail and into position to engage said adjustable margin-stop.

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

tion with the top plate A of the main frame, and with the sliding carriage D mounted thereon and having a forwardly-projecting stop or arm, of front and rear rails C and C' between which said carriage is supported in manner free to slide, said front rail C having a forwardly-projecting flanged portion with unobstructed ends raised above the top plate of the main frame and an adjustable margin-stop mounted upon said forwardly-projecting portion of said front rail and removably connected therewith whereby said margin-stop may be withdrawn endwise from the rail so that the carriage can be slipped from engagement with the rails.

In witness whereof I have set my hand this 30th day of March, A. D. 1895.

CHARLES NORMAN FAY.

Witnesses:

GEO. P. FISHER, Jr.,
ALBERTA ADAMICK.