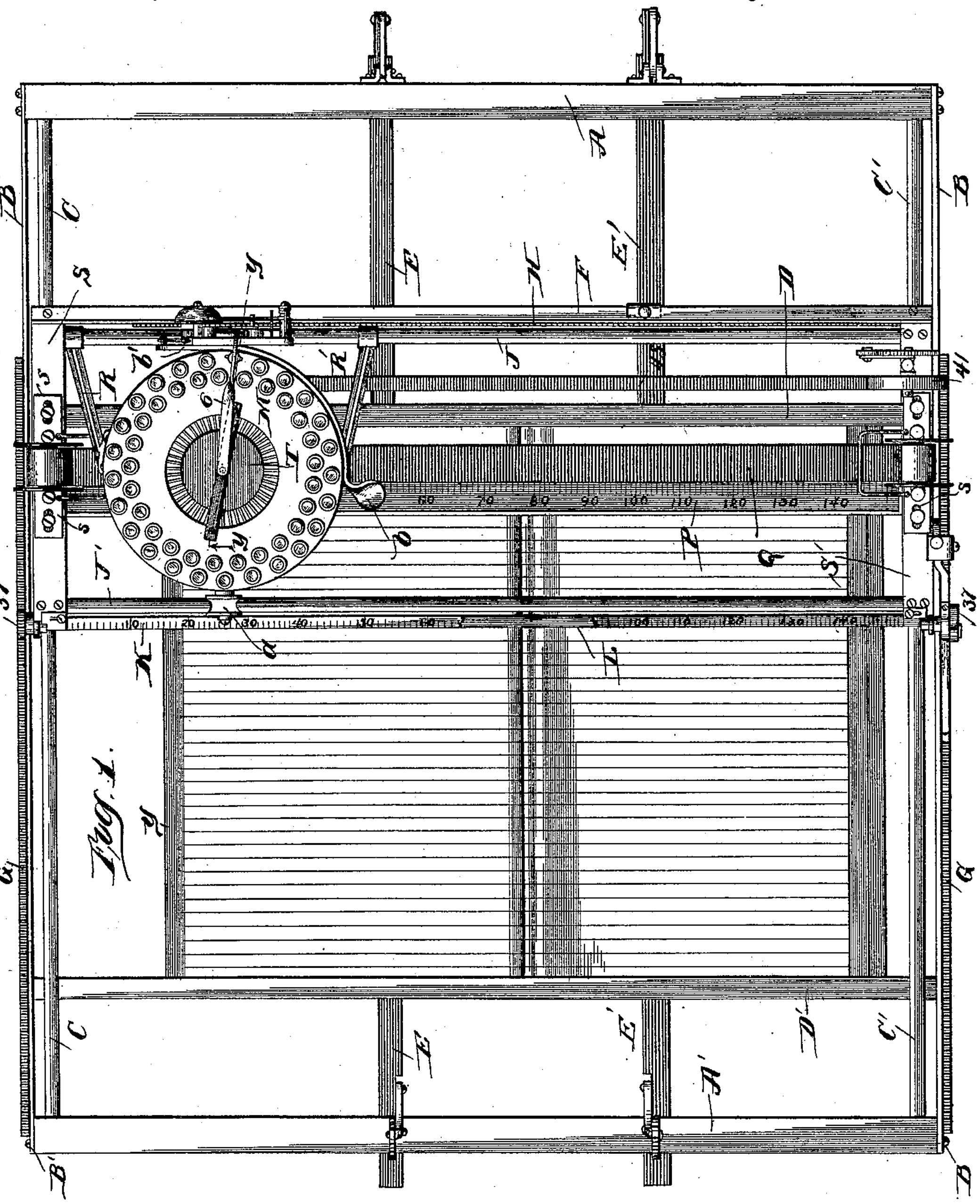
(No Model.)

5 Sheets—Sheet 1.

H. T. BEAUREGARD & F. S. FLOWER.

TYPE WRITING MACHINE.

No. 479,085. Patented July 19, 1892.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 5 Sheets—Sheet 2.

H. T. BEAUREGARD & F. S. FLOWER.

TYPE WRITING MACHINE.

No. 479,085. Patented July 19, 1892.

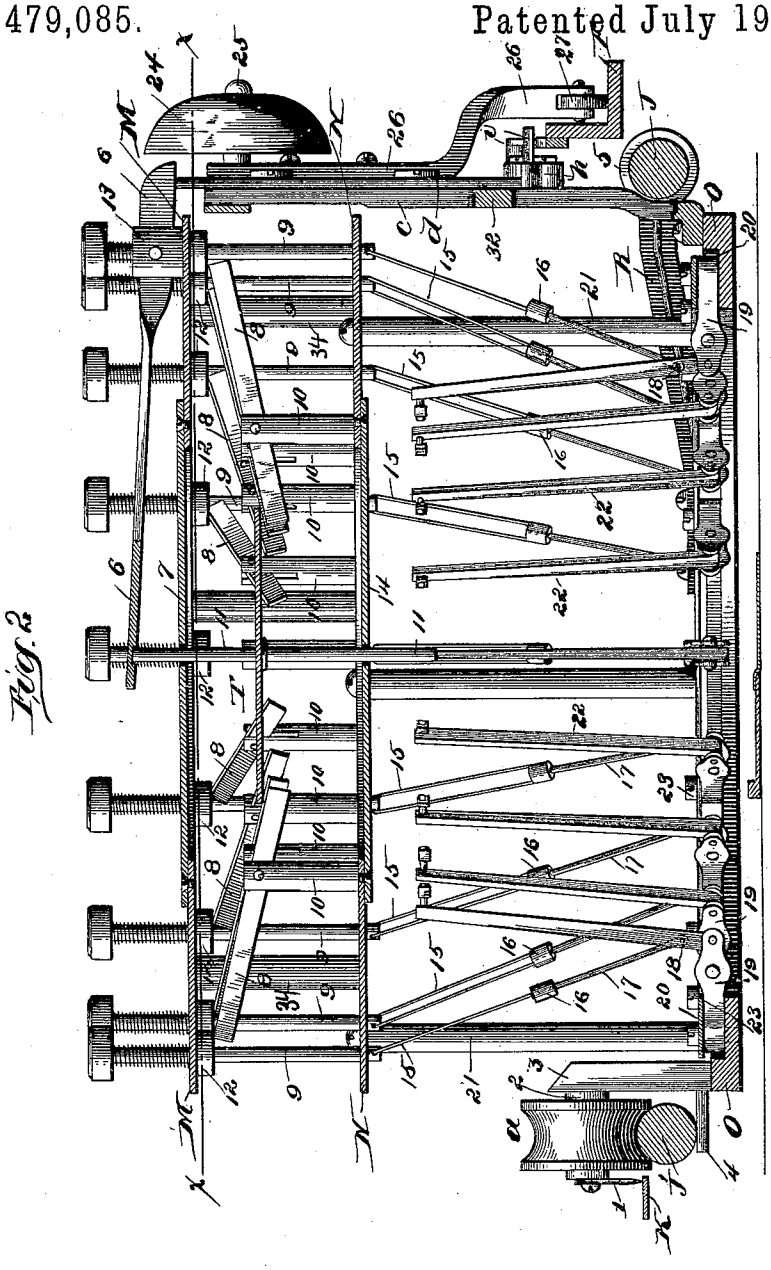

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

H. T. BEAUREGARD & F. S. FLOWER.

TYPE WRITING MACHINE.

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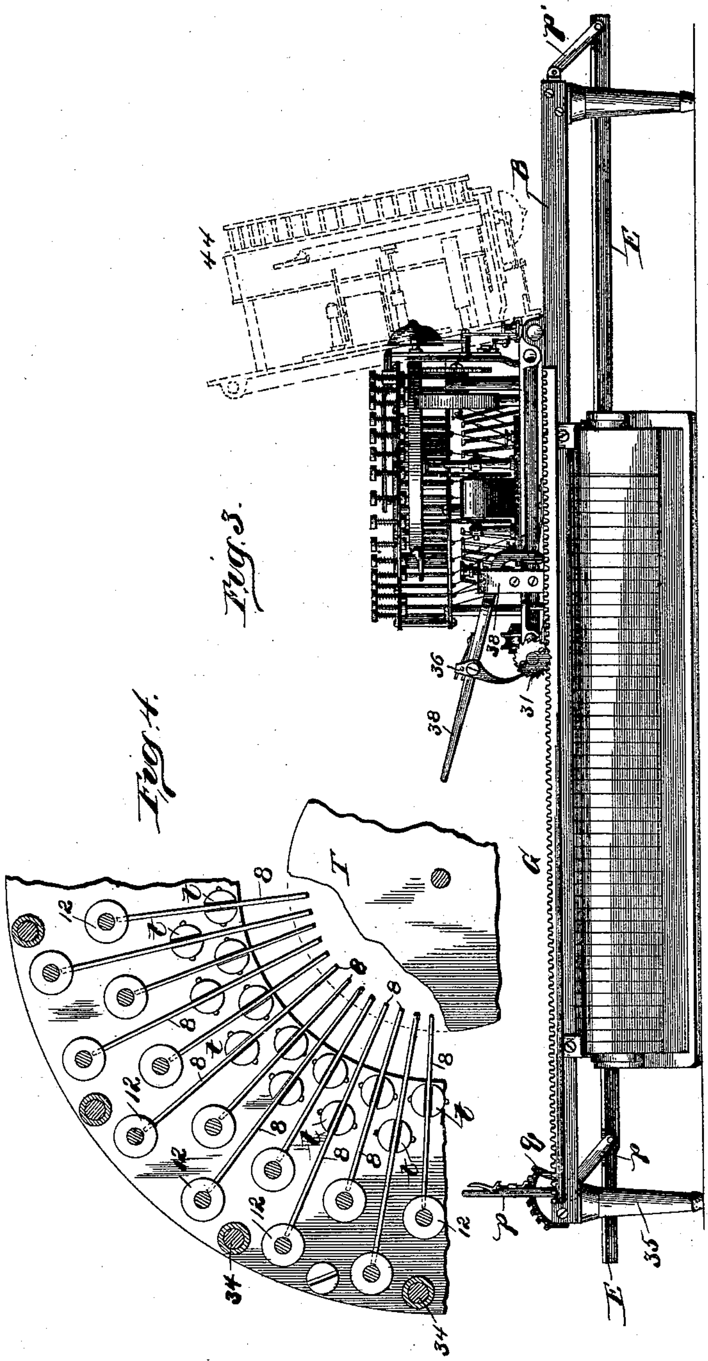

Fig. 3.

Fig. 4.

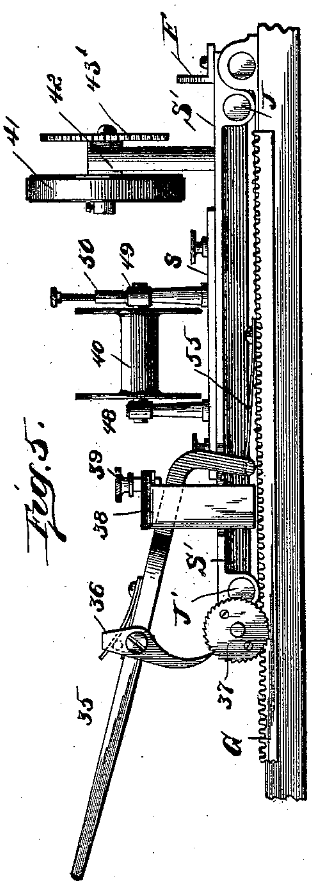

Fig. 5.

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(No Model.) 5 Sheets—Sheet 4.

H. T. BEAUREGARD & F. S. FLOWER.

TYPE WRITING MACHINE.

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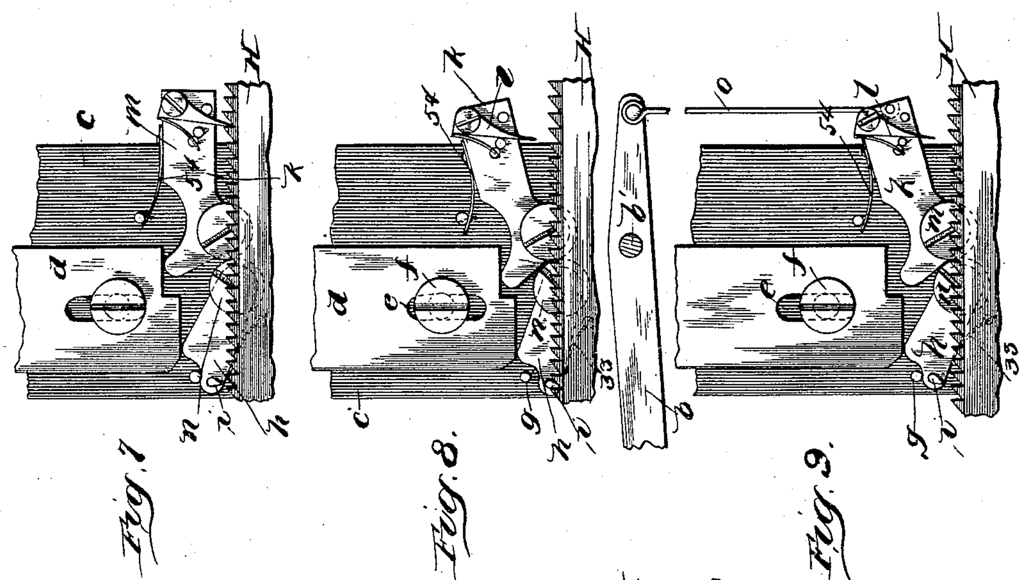

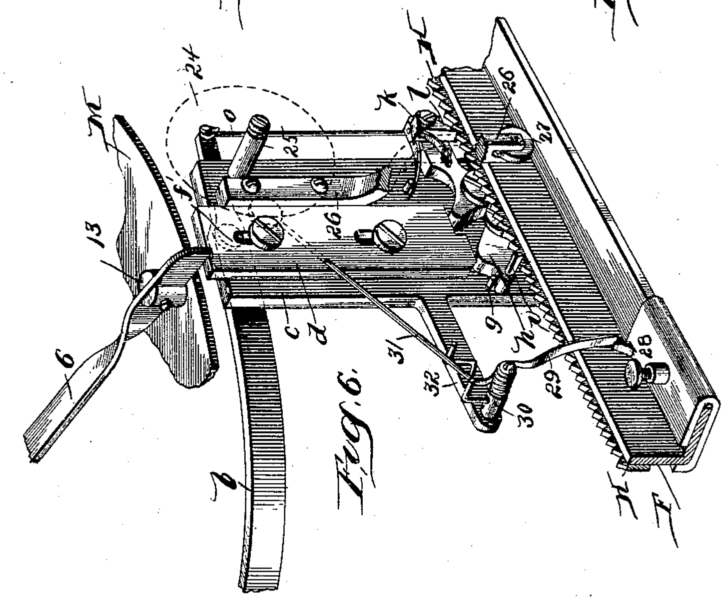

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(No Model.) 5 Sheets—Sheet 5.

H. T. BEAUREGARD & F. S. FLOWER.

TYPE WRITING MACHINE.

No. 479,085. Patented July 19, 1892.

Fig. 11.

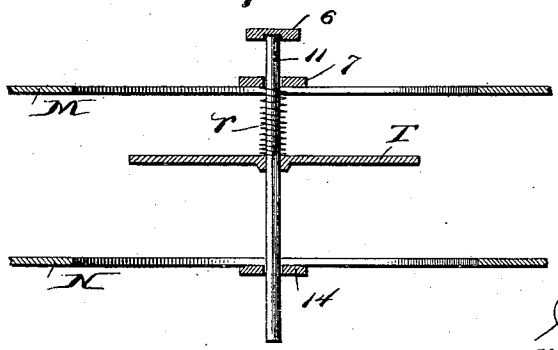
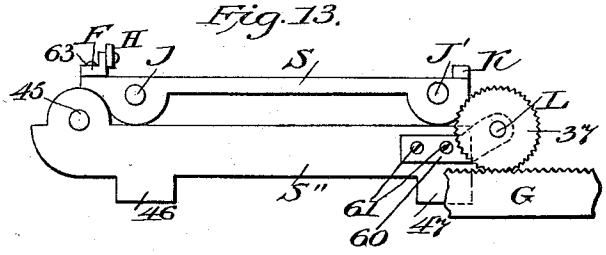


Fig. 13.



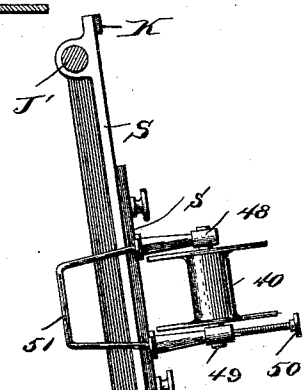


Fig. 10.

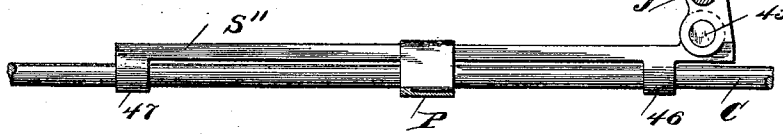
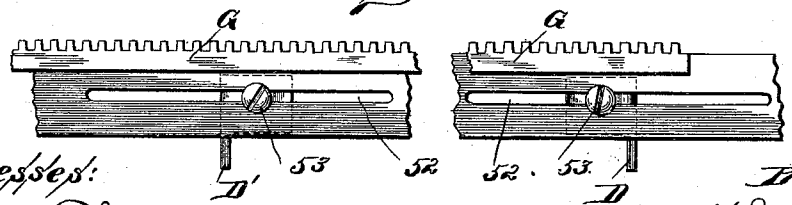


Fig. 12.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY T. BEAUREGARD AND FRANCIS S. FLOWER, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,085, dated July 19, 1892.

Application filed April 13, 1891. Serial No. 388,660. (No model.)

To all whom it may concern:

Be it known that we, HENRY T. BEAUREGARD and FRANCIS S. FLOWER, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

Our invention relates to that class of machines known as "type-writers;" and its object is to provide a type-writer which will write upon the pages of books, as well as upon any other paper that may be employed, and we attain these objects by means of the mechanism shown in the accompanying drawings, in which—

Figure 1 is a plan view of our invention. Fig. 2 is a vertical section of the carriage upon the line *y y* of Fig. 1. Fig. 3 is a side elevation of our invention, showing in dotted lines the carriage elevated upon its hinges. Fig. 4 is a horizontal sectional view of a portion of the carriage, taken upon the lines *x x* of Fig. 2. Fig. 5 is a detail view of the device attached to one of the bars of the frame of our invention by means of which the space between the lines is determined. Fig. 6 is a detail view of a portion of the frame of the carriage and the levers operated by it which control the spacing of the letters and words. Figs. 7, 8, and 9 are detail views of portions of the spacing device in different positions, as shown in Fig. 6. Fig. 10 is a detail view of the frame, one section of which rests upon the main frame and the other supports the framework of the carriage of the type-writer. Fig. 11 is a detail view of the disk T and bearings in which it is held and supported. Fig. 12 is a detail view of the slot and device for rendering adjustable the cross-bars D D′. Fig. 13 is a detail view of the hinged ends of the second frame, showing the bracket 60, supporting the shaft L, that carries the pinion 37, also the location thereon of the bar F and the rack-bar H.

Our type-writing device rests upon a rectangular frame A A′ B B′, supported upon posts 35. Suspended from bars A A′ is a longitudinal bar E, held pivotally by means of the bars *p p′*. The longitudinal bars E E′ are suspended from the frame by means of bars or straps *p p′*, to which they are respectively attached pivotally, also pivotally connected to the frame by brackets and pivots. The bar or strap *p*, located at one end of the frame, is angular in shape, its upper limb constituting a handle provided with an adjustable pawl. The strap *q*, which is riveted to A′ at this end of the frame and to which the strap or bar *p* is pivotally attached, is provided with an arc of ratchet-teeth, in which the pawl of the handle engages. By retracting the handle of bar *p* its lower limb carries the bar E forward and upward, and thus elevates and adjusts the book, page, or leaf or other material to receive the stroke of the types. Both bars E E′ are constructed, connected, and operated precisely alike. One of these bars rests under one part or back of the book and the other under the other part of the back, and by the operation of the bars or either one of them the book or page or other material can be elevated and adjusted, so as to receive the strokes of the types. It is evident that these bars E E′ can be applied to the elevation and adjustment of any form of plate or table on which the paper to be printed may be placed and used. This frame is also provided with two cross-bars D D′, which are adjustably attached to the bars B B′ and are angular in shape. They may be placed at such distance apart as to correspond to the length of the page of the book written upon, and, being angular in shape, lap over the edges of the book and hold it in place. These cross-bars may be adjustable, as shown in Fig. 12, where a slot 52 is cut in the bar B′, and a screw 53, passing through the slot, engages with the end or with the turned-up edge of the cross-bar D.

Attached to the longitudinal bars B B′ of the main frame are the rack-bars G G′. The longitudinal bars C C′ are also made part of the main frame, and upon them the carriage-frame is supported and allowed to slide backward and forward in a longitudinal direction.

The longitudinal bars C C′ are made parts of the main frame by their ends being inserted in openings near the respective ends of the main bars A A′. There may be many modifications in the construction of the main frame. Other means of holding or attaching the bars C C′ may be employed. In these and many other particulars changes and modi-

fications may be made without in any manner departing from the spirit of our invention, and we do not limit ourselves to the particular construction shown.

Upon the main frame is located another frame, which holds and supports the carriage. This second frame is formed at its two ends by the hinged arms S S″ and S′ S‴, the latter S‴ being located immediately beneath S′, Fig. 1, and of exactly the same form and construction as S″, Fig. 10. The lower arms S″ S‴ carry, respectively, at their extreme ends a bracket 60, Fig. 13, which is held rigidly thereto by screws or rivets and which supports in bearings a rod L, which is provided at each end with the pinions 37 37′, that respectively engage the rack-bars G G′. The upper arms S S′ also support a scale P, which is attached to them and held by means of screws or rivets at such end of the scale. The upper sections S S′ of these hinged arms are connected together by two bars J J′, the ends of the sections and the cross-bars being rigidly united by any well-known means, whereby is formed a rectangular frame, upon the slide-bars of which J J′ the carriage moves laterally back and forth. Rigidly connected to the upper sections S S′ is an angular cross-bar F, provided with a rack-bar H. The lower hinged arms S″ S‴ are provided with lugs 46 47, having openings in them, through which pass the longitudinal rods C C′, and by means of which this second frame is enabled to be moved back and forth longitudinally upon the main frame.

The angular cross-bar F, provided with the rack-bar H, is rigidly attached to the arms S S′ near their hinges by screws or rivets 63, Figs. 13 and 1. Upon the extreme ends of the upper sections of these hinged arms is located adjustably a second scale K, made to conform to the scale P. Upon the upper surface of the hinged arms S S′ are located the adjustable plates *s s*, in which are fixed posts 48 49, having bearings supporting the reels 40 for the ribbon, one of said posts 49 being provided with a thumb-screw, which presses upon the end of the journal of the reel 40 and constitutes a tension device. Plates *s s* are made adjustable by means of the longitudinal slots 62 therein, through which screws are introduced and screwed into the arms A S′.

The frame of the carriage consists of three annular disks M, N, and O, the two lower disks being held rigidly together by posts 21 and the upper disks being held rigidly together by posts 34. The lower annular disk O is provided with the arms R R′, Fig. 1, having openings or bearings 5, Fig. 2, in which passes the sliding rod or bar J, upon which they ride or slide. At the opposite side of the carriage the frame is provided with a post 3, attached to the disk O, which carries the wheel *a*, traveling upon the rod or bar J′. Below the rod J′ extends a pin 4, projecting from the post 3, the purpose of which is to prevent the wheel *a* from departing or springing away from its contact with the rod J′. Permanently attached to the lower annular disk is the plate *c*, provided with the arm 32, to which plate is rigidly attached a bracket 26, provided with a wheel 27, that travels upon an angular cross-bar F, the purpose of which is to steady the movement of the carriage when being operated and prevent the springing of the parts from disengagement with the pawls and levers from the rack-bar H, as hereinafter explained. By means of this construction the principal portion of the frame upon which the carriage rests and travels and the carriage itself may be thrown back and inspected when desired, as shown in Fig. 3. The disks M and N are provided with openings or bearings through which pass the type-keys 9, these type-keys being provided with collars 12, as shown, and with spiral springs located between the button of the type-key and the disk M, by means of which, when the type-key has been pressed down, they restore it to its normal position. The collars 12 are rigidly affixed to the type-keys. Upon the disk N, near its interior edge, are rigidly located posts 10, corresponding to each of the type-keys, and in these posts are pivotally held bars 8, one end resting under the collar 12 and the other end under the disk T, hereinafter to be described, the relation being such that when the type-key is pressed down the bar or lever 8 causes the disk T to be elevated.

At the extreme ends of the type-keys are attached the double connecting-rods 15, which are connected at their lower extremities with the nuts 16, into which are screwed the connecting-rods 17, which connect pivotally with the type-levers 22, as shown. By means of the nuts 16, provided with female screw-threads, and the rods 17, provided at their upper ends with male screw-threads, the length of the connections between the type-keys and the type-lever may be adjusted and the stroke of the type adjusted.

The type-levers 22 are held pivoted at their lower ends in brackets 19, which are rigidly attached to the disk O of the frame by screws 23, Fig. 2.

The plate T is rigidly attached to the post 11, which is held loosely in bearings in the cross-bars 7 and 14, the cross-bar 7 being rigidly attached to the disk M and the cross-bar 14 being rigidly attached to the disk N.

The disk T is held in normal position by resting upon the ends of the levers 8; but when the disk is raised by a movement of the levers 8 a spring, as shown in Fig. 11, may be employed between the upper side of the disk T and the cross-bar 7 to bring it back to its normal position. A lever 6, pivotally held in a post 13, which is rigidly attached to the disk M, extends to and rests upon the upper end of the post 11 of the disk and is operated thereby. The short end of the lever rests upon the plate *d*, which is provided with slots, and is held adjustably by means of screws to the plate *c*. Below the plate *d* are located two

locking-levers *h* and *k* in such relation that in its normal position the plate *d* rests upon the upper projection of those two levers, as shown in Figs. 6, 7, 8, and 9. These levers *h* and *k* are pivotally attached to the plate *c* by the screws *m* and *n*. *h* is provided with a dog *i*, which extends out so as to engage with the rack-bar H, and it is provided with the spring 33, Fig. 8, which forces it into normal position. *k* is provided with a dog *l*, which is pivotally attached to the lever and held in normal position by a spring to engage with the rack-bar H, and it also is provided with a spring 54, which forces it back to its normal position, as shown in Fig. 7. The arm 32 of the plate *c* is furnished with a projection 30, which carries a hammer 31, and also an arm 29, which engages with a projection upon a slide 28, located upon the angular cross-bar F, whereby the progress of the carriage across its frame is announced by a stroke upon the bell 24, Fig. 2, and the movement of the carriage is arrested when the wheel 27 comes in contact with this projection.

Fig. 7 shows the plate *d* and locking devices *h* and *k*, with the dog *l*, engaging the rack-bar H, in normal position.

Fig. 8 shows the position when a type-key has been struck and the plate *d* is forced down so as to engage dog *i* with and disengage the dog *l* from the rack-bar, whereby when the type-key and the plate *d* rise to normal position the carriage is drawn along the extent of one tooth of the rack-bar and the dog *l* re-engages with the next succeeding tooth thereof.

Fig. 9 shows the disengagement by means of the thumb-lever *b* of both dogs *i* and *l*, the depression of the end of the lever *b* lifting the lever *k* and its dog *l* out of engagement with the rack-bar and the dog *i* being normally out of engagement. By this means the carriage may be moved at will along upon the rods J J′.

A belt or strap 43 is connected with the second frame at the side S and at the other end is wound upon a spring-box 41, attached to S′ by the post 42, Fig. 5, within which box is located a coiled spring. This spring is wound up so that its resiliency or tension constantly tends to retract the carriage toward the side S′. Upon the shaft which supports the spring-box 41 is rigidly located the ratchet-wheel 43′, provided with a pawl. The central end of the coiled spring is connected with this shaft and is wound up by it, and its tension upon the strap 43 is increased or regulated. This is effected by turning the ratchet-wheel 43′, Fig. 5, which is held at any desired position by the pawl.

The carriage-lever *b* is pivotally attached to the plate *c* at *b*′, Figs. 1 and 9, by a pivot *f*′, Fig. 6, and it is connected by a rod *o* with the end of the locking-lever *k*, the carriage-lever *b* being curved, as shown, around the right side of the carriage, so that when it is pressed down the end of the locking-lever *k* is lifted, disengaging the dog *l* from the rack-bar H and enabling the carriage to be moved back to the left-hand side of its frame.

Located near the extreme end of the lower section S″, which is located upon the slide-bar C′, is a post 38, provided with a slot in which is pivotally placed the lever 35, provided with a dog 36, that engages with the pinion 37. The post 38 is provided with a thumb-screw 39, which regulates the stroke of the lever 35. This lever is curved at its shorter end and is provided on its interior side with a pin, which connects with the spring 55, which restores the lever to its normal position after it has been operated. The function of this lever and this dog 36 is to move the frame which supports the carriage toward the foot of the main frame, and it also regulates the distance between the lines of printed matter.

Having described the general construction of our invention and its different parts, we now describe its mode of operation.

The book to be written upon having been introduced beneath the main frame and the cross-bars D D′ having been adjusted and the longitudinal bar having been forced up, so as to furnish a smooth and solid surface for the operation of the type, the operator proceeds to operate upon the type-keys of the carriage, and the key of a given lever having been struck and pressed down through its operating and connecting rod, pivotally connected with the type-lever, causes it to be thrown down, the type striking upon the paper at a central point in a line on the page of the book. This movement of the type-key by means of the bars 8 elevates the disk T and its post 11, and thereby operates the lever 6, causing the short end of the latter to be pressed downward upon the plate *d*. This plate *d*, resting upon the upper projections of the two locking-levers *h* and *k*, presses the interior ends of these levers downward, and the dog of the lever *h* engages with the rack-bar H, while the dog of the lever *k* is disengaged; but when the type-key is restored to its normal position the pressure of the lever 6 ceases to operate upon the plate *d* and the springs of the locking-levers cause them to be restored to their normal position, lifting the plate *d* up, and the carriage is allowed to move the distance of one tooth of the rack-bar H. In this manner in the operation of the type-writer the carriage passes along upon its slide-bars to the right until the arm 29 engages with a projection upon the slide 28, moving upon the angular cross-bar F, whereby the progress of the carriage across its frame is announced by a stroke upon the bell and its movement arrested by the wheel 27 coming in contact with the said projection. By means of the carriage-lever *b* the dog of the locking-lever *k* is disengaged and the carriage brought back to its original starting-point. The lever 35 is then operated, causing the carriage to move toward the foot of

the main frame the required distance of space between the lines to be printed.

It is evident that there may be many variations and modifications in the details and arrangement of our invention without departing from the spirit thereof. For instance, the framework of the carriage, which consists of three annular plates or disks held together by posts, need not be in circular or annular form, but may be in any form in which the arrangement of keys and other parts can be adapted. So, also, with reference to the circular disk T, it is not necessary that it shall be circular or any specific form, provided its construction and arrangement is such as to be operated in the manner shown by the keys.

Having, therefore, described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a type-writing machine, the combination of a main frame provided on two of its sides, respectively, with a parallel rack-bar and slide-bar, means suspended pivotally from said frame for elevating adjustably the book or page to receive the type-stroke, and a superposed frame supporting and carrying a type-writing carriage and operating devices and provided with pinions engaging said rack-bars, all substantially as shown.

2. In a type-writing machine, the combination of a main frame provided with a parallel rack-bar and slide-bar on its two respective sides, means connected with said frame for elevating adjustably the book or page to receive the stroke of the type, a superposed frame in two sections hinged together at one side and capable of opening and folding together, the lower section thereof resting and moving upon the slide-bars of such frame, pinions engaging said rack-bars, and means for operating said pinions, and said upper section being provided with slide-bars, upon which rests and is carried the carriage of said type-writing machine, all substantially as shown.

3. In a type-writing machine, the combination of a main frame provided with rack-bars and slide-bars, one or more swinging bars suspended pivotally from opposite sides of said frame and having means to elevate and lower them adjustably, two angular cross-bars, the ends of which are adjustably connected with the two opposite sides of said frame, a superposed frame in two sections hinged together at one side, and a type-writing carriage movably attached to said second frame, all substantially as shown.

4. In a type-writing machine, the combination of a main frame with a superposed frame having two sections hinged together at one side, provided with slide-bars, and means for propelling said frame along upon said main frame, and a type-writing carriage supported movably upon said superposed frame, and means for propelling said carriage by regular and limited movement along upon said last-mentioned frame, substantially as shown.

5. In a type-writing machine, the combination of a main frame, a second frame superposed movably upon said main frame and having pinions engaging with the rack-bars of said main frame, and means to operate said pinions, a type-writing carriage movable upon said superposed frame and provided with a central plate T, operated by each respective type-key of the said carriage, a pivoted lever 6, the movable plate *d*, and the levers *h* and *k*, pivotally connected to the plate *c* with their respective dogs, whereby the operation of the type-keys causes the respective dogs *i* and *l* to engage and disengage the rack-bar H and said type-writing carriage to move in spaces regulated thereby, all substantially as shown.

6. In a type-writing machine, the combination of a main frame provided with rack-bars and slide bars or ways with a superposed frame provided with means for moving it along upon said main frame, said second frame provided, also, with a rack-bar and slide bars or ways, a type-writing carriage movable upon said superposed frame and provided with a central plate capable of vertical movement, the pivoted levers 8, operated by their corresponding type-keys, the type-arms 22, connected pivotally with the stems 9 of said type-keys by connecting-rods, the pivoted lever 6, the plate *d*, movably attached to the plate *c*, the levers *h* and *k*, with their respective dogs *i* and *l*, and the rack-bar H, whereby the stroke of the type-keys operates the type-arms and produces the spacing or step-by-step movement of the carriage across the superposed frame at the same time, all substantially as shown.

7. In a type-writing machine, the combination of a series of type-keys held in bearings in the frame of the carriage, corresponding type-levers pivotally supported on said frame, pivoted levers 8, corresponding to and each operated by its respective type-key, a plate T, capable of vertical movement and supported in bearings in said frame, the lever 6, pivotally connected with said frame, the plate *d*, movably attached to the plate *c*, connected with said frame, the levers *h* and *k*, with their respective dogs *i* and springs, and the rack-bar H, all substantially as shown.

8. In a type-writing machine, the combination of the carriage-frame provided with keys held in bearings therein with a plate T, having a post supported in bearings in said frame, type-arms pivotally held by brackets attached to said frame and each connected with and operated by its respective type-key, means for operating said plate T by the operation of each type-key, respectively, the pivoted lever 6, the movable plate *d*, attached to the plate *c*, the two locking-levers *h* and *k*, with their respective dogs and springs, and the rack-bar H, all substantially as shown.

9. In a type-writing machine, a plate *c*, permanently attached to the carriage, in combination with a plate movably attached thereto and means whereby the downward stroke of

the type-key causes said movable plate to bear upon and move the locking-levers, said locking-levers being provided with springs restoring them and said movable plate to their normal positions, all as substantially shown.

10. In a type-writing machine, the combination of a frame provided with a rack-bar, a carriage movable on said frame, the two locking-levers *h* and *k*, each provided with its respective dog *i* and *l*, means for alternately engaging and disengaging said dogs, respectively, with and from said rack-bar, and a carriage-lever pivotally attached to said carriage and connected by a rod or link with the locking-lever *k*, whereby the dog of the said locking-lever *k* may be disengaged from said rack-bar and said carriage moved freely upon said frame, all substantially as shown.

11. In a type-writing machine, a frame adapted to support a movable carriage and provided with a rod held in bearings in the opposite ends of said frame, the ends of said rod carrying pinions, a post rigidly attached to said frame and carrying a lever pivotally held therein, and a thumb-screw to regulate the stroke of said lever and engaging with one of said pinions, and a spring restoring said lever to its normal position, all substantially as shown.

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

HENRY T. BEAUREGARD.
FRANCIS S. FLOWER.

Witnesses:
LLEWELLYN C. MERRILL,
J. L. GERRY.