

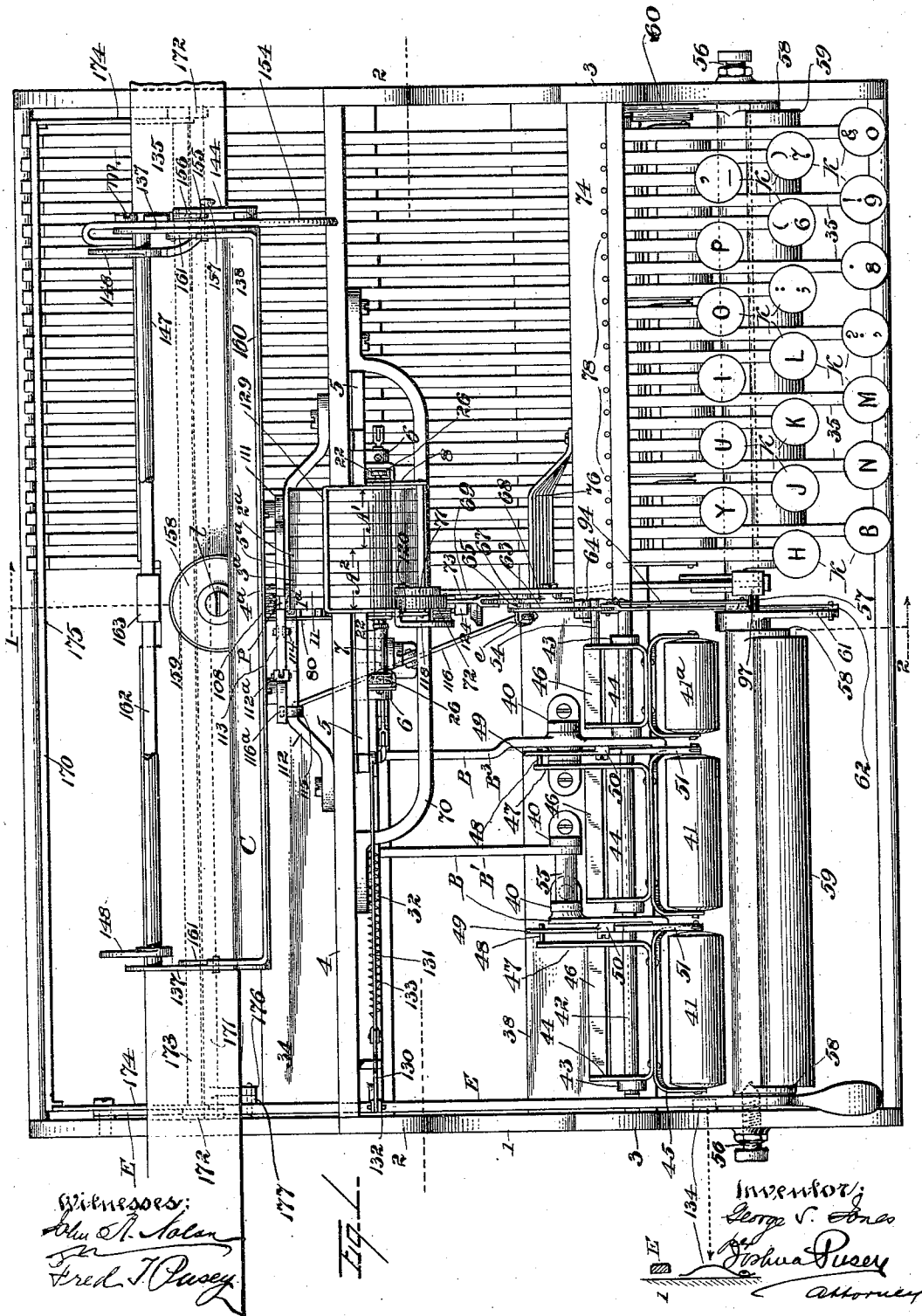
(No Model.)

5 Sheets—Sheet 1.

G. S. JONES.
TYPE WRITING MACHINE.

No. 475,085.

Patented May 17, 1892.



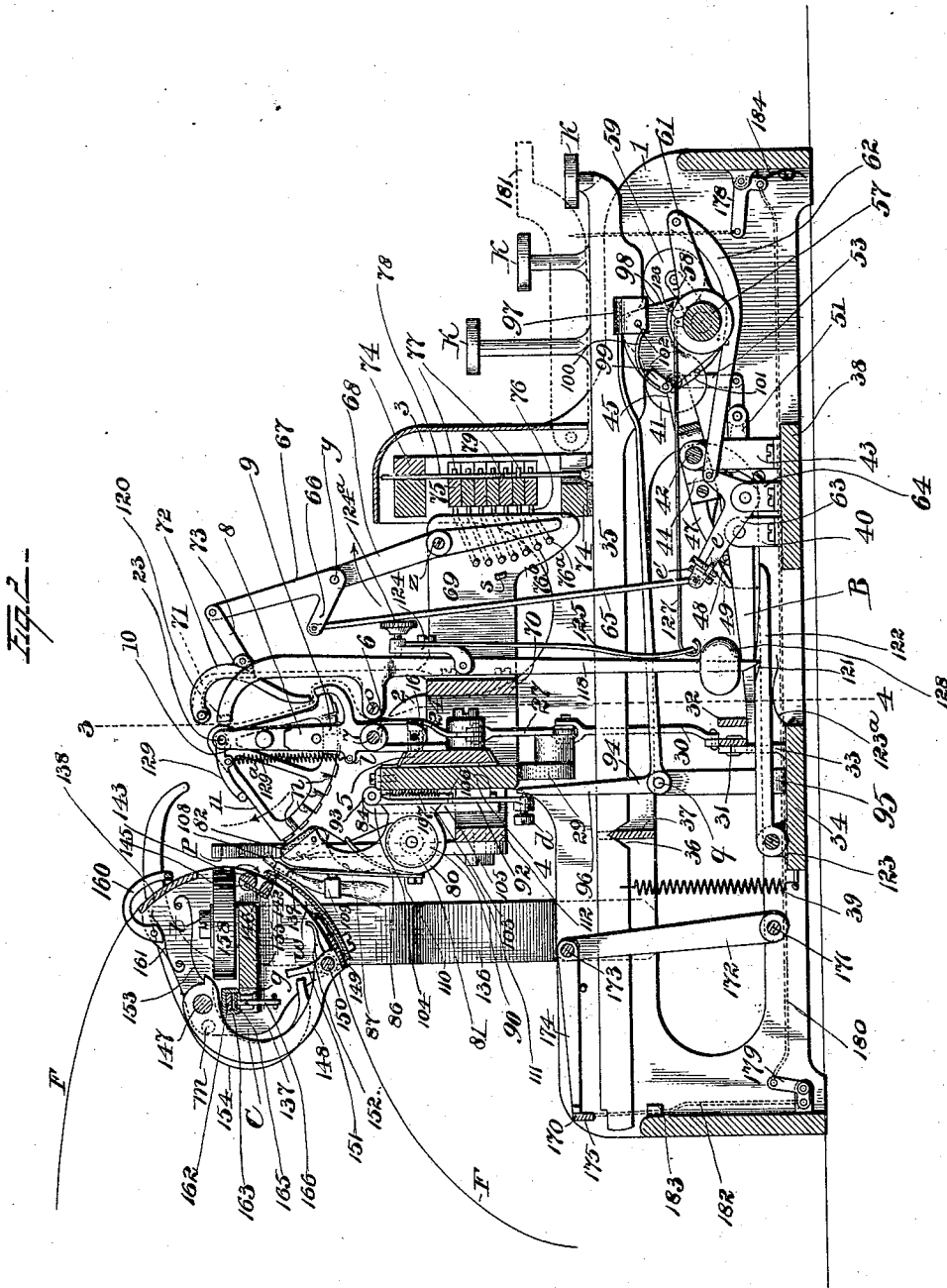
(No Model.)

5 Sheets—Sheet 2.

G. S. JONES.
TYPE WRITING MACHINE.

No. 475,085.

Patented May 17, 1892.



(No Model.)

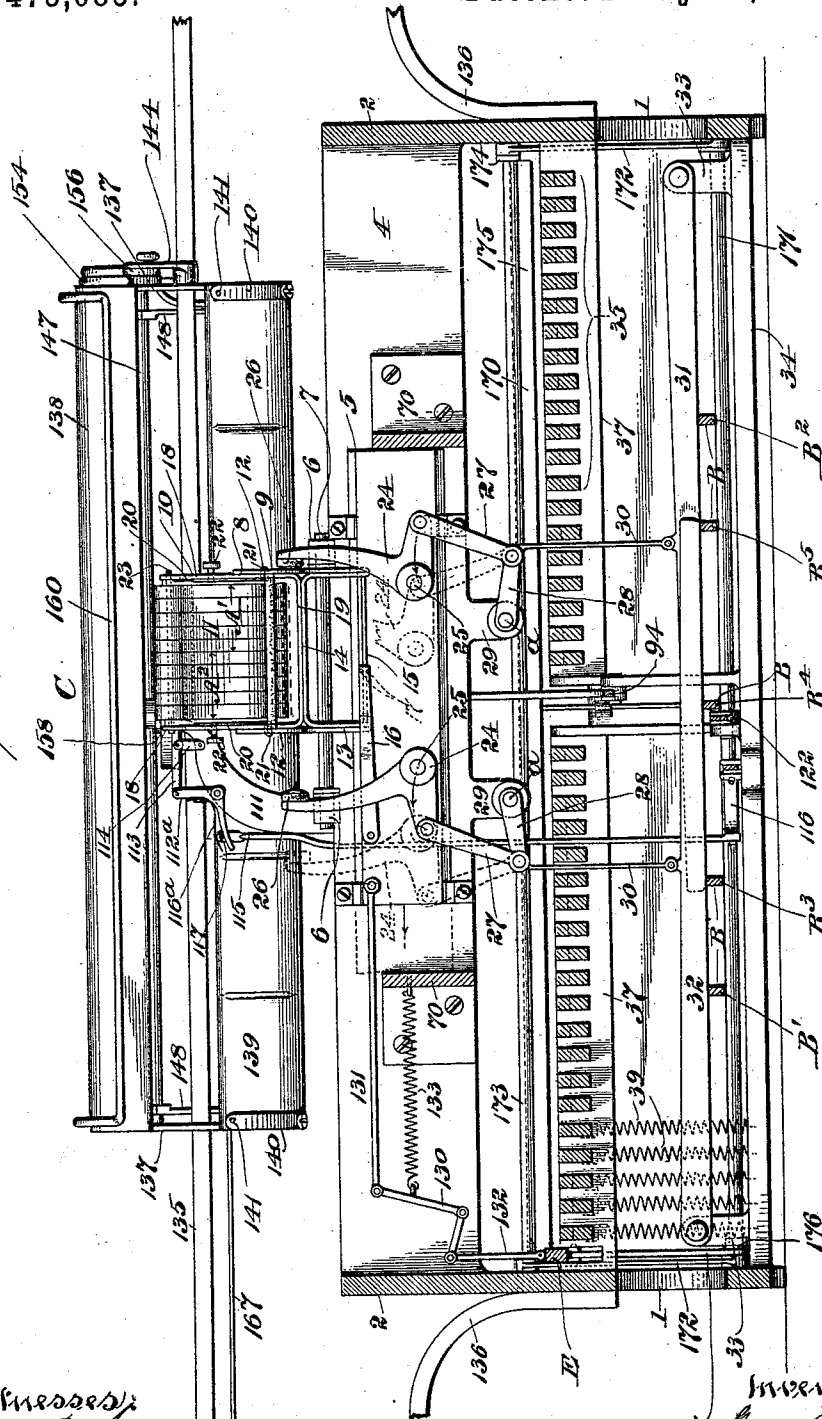
5 Sheets—Sheet 3.

G. S. JONES.
TYPE WRITING MACHINE.

No. 475,085.

Patented May 17, 1892.

Fig. 3.



Witnesses:
John A. Neal
Fred. T. Casey

Inventor:
G. S. Jones
John A. Neal
Fred. T. Casey
Attorney

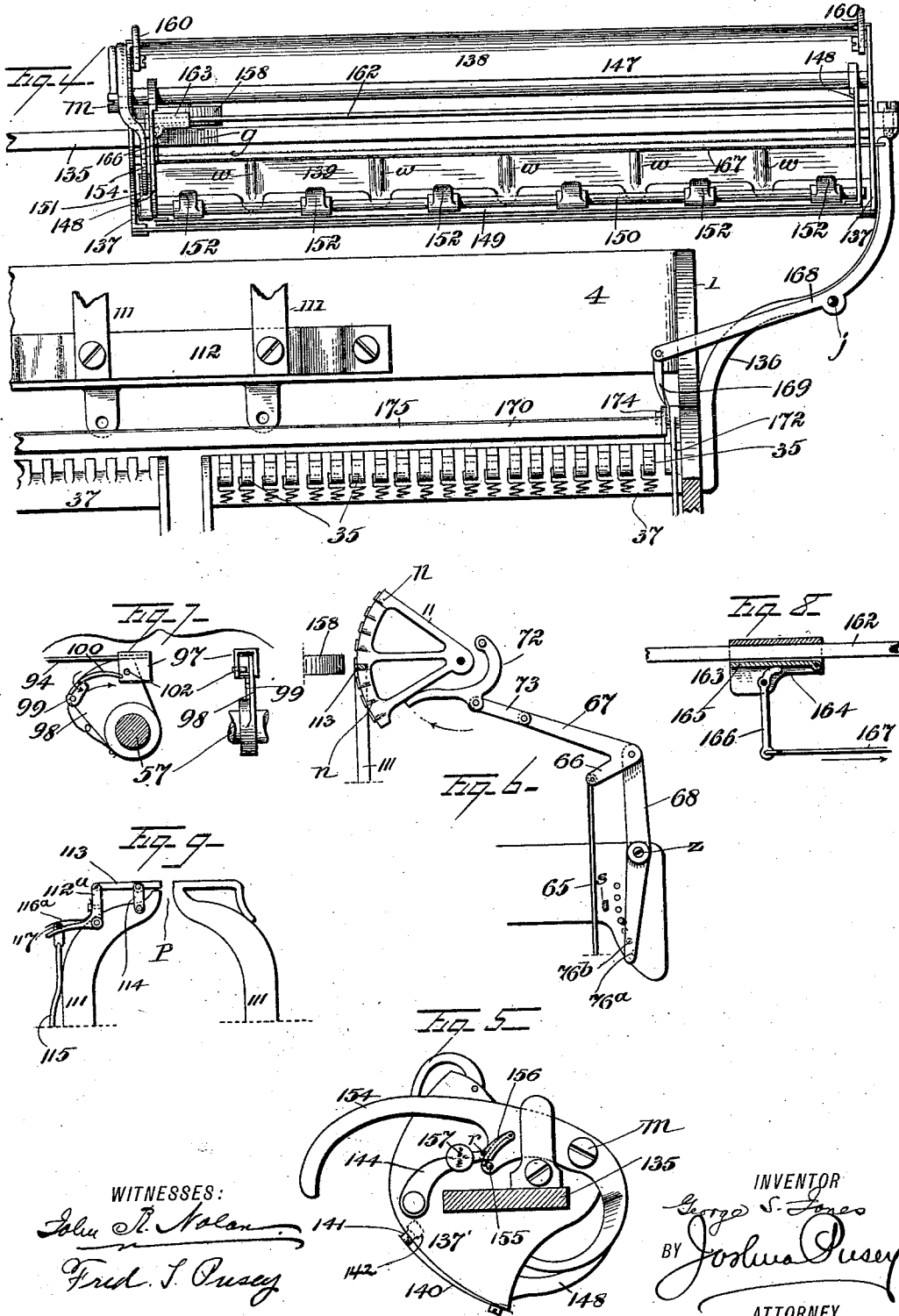
(No Model.)

5 Sheets—Sheet 4.

G. S. JONES.
TYPE WRITING MACHINE.

No. 475,085.

Patented May 17, 1892.



WITNESSES:
John T. Nolan
Fred. J. Pusey

INVENTOR
George S. Jones
BY *Joshua Pusey*
ATTORNEY.

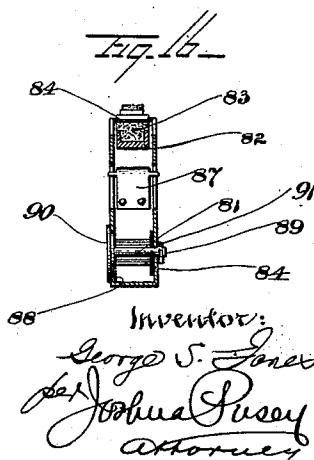
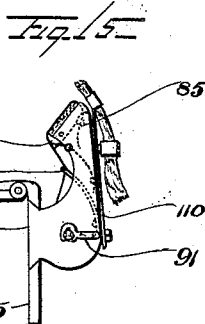
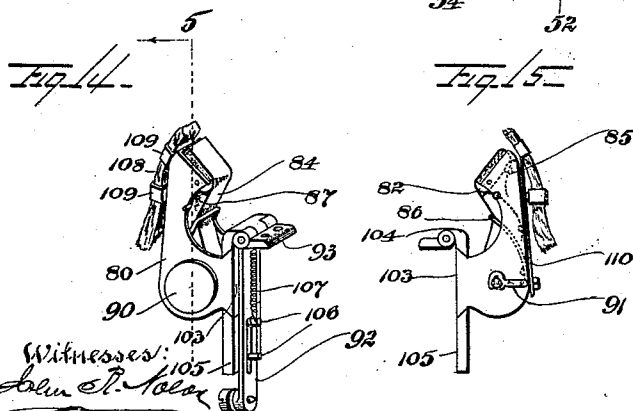
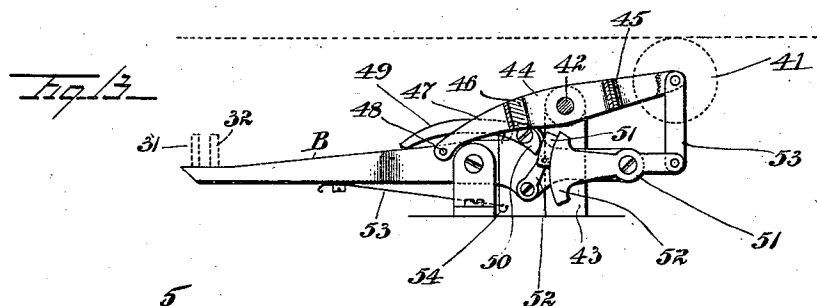
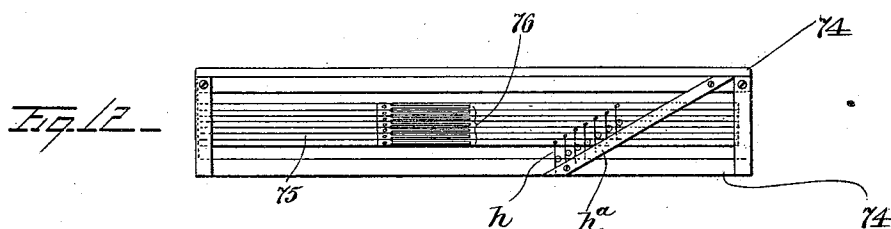
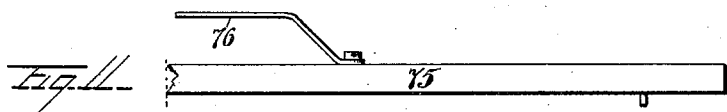
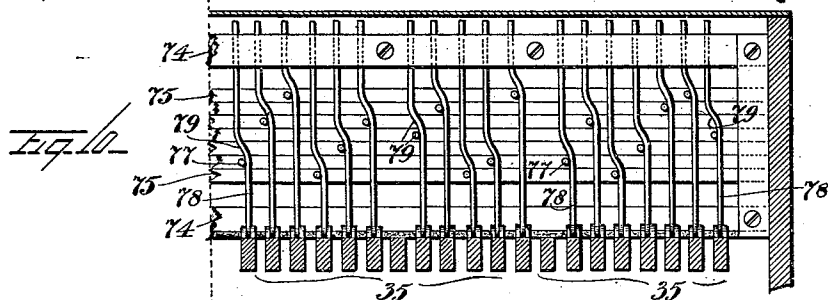
(No Model.)

5 Sheets—Sheet 5.

G. S. JONES.
TYPE WRITING MACHINE.

No. 475,085.

Patented May 17, 1892.



Witnesses:
Sam. S. Jones
Fred. J. Pusey

Inventor:
George S. Jones
Joshua Pusey
Attorney

UNITED STATES PATENT OFFICE.

GEORGE S. JONES, OF PHILADELPHIA, PENNSYLVANIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 475,085, dated May 17, 1892.

Application filed April 8, 1891. Serial No. 388,147. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. JONES, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

- 10 Figure 1 is a plan view of a type-writer embodying my invention, the keys on the left-hand side of the machine being omitted in order to expose parts otherwise concealed. Fig. 2 is a transverse vertical section, partly
15 in elevation, as on the line 1 2, Fig. 1. Fig. 3 is a longitudinal vertical section as on the line 3 4, Fig. 2. Fig. 4 is a rear view of the paper-carriage and adjacent parts of the machine. Fig. 5 is an end view of said carriage.
20 Fig. 6 is a detail view showing the action of the toggle-lever and connections for upthrowing the central sector. Fig. 7 represents front and end views, respectively, of the rocker-cam devices for operating the inking-pad lever.
25 Fig. 8 is a vertical section of the spacing-clutch and its immediate adjuncts. Fig. 9 is a detail of the bolt devices for locking the upthrown sector. Figs. 10, 11, and 12 are views of the type-governing stop devices.
30 Fig. 13 is a sectional elevation of the lifting-lever devices. Fig. 14 is a perspective view of the inking-pad device and the pivoted arm with which it is connected. Fig. 15 is a side elevation of said device. Fig. 16 is a section
35 as on the line 5, Fig. 14.

This invention relates to type-writing machines, more particularly to that class of machines in which the impression is effected by pressure, as distinguished from a blow or
40 striking action.

The object of the invention is to provide a machine which, while of comparatively cheap and simple construction, shall possess all the requisites of a perfect writing-machine as regards efficiency of operation and durability,
45 and in which machine the impression shall be effected under the eye of the operator.

The main features of the invention reside, first, in a series of character-bearing sectors
50 which are so disposed with respect to a given point—to wit, the center of the machine—that any one of the series may be brought

posite to said point and thereupon moved or swung vertically, so that any predetermined character on the face of the central sector
55 may be thrown up into active position; secondly, in a double series of sectors carrying the “upper” and “lower” case characters, respectively, and mechanism for shifting either series into or out of action, as required; thirdly, 60 in means for locking the central or working sector in its active position when brought thereto, so as to preserve the alignment of the printed characters; fifthly, in pressure devices for the sectors; sixthly, in an inking-
65 pad of novel construction; seventhly, in the general construction of the paper-carriage and in the shifting or spacing mechanism therefor; eighthly, in various matters of construction and operation of the mechanism for
70 effecting the various actions of the devices above stated, and, finally, in certain details of construction, all of which will be hereinafter fully described, and definitely claimed.

Referring to the annexed drawings, the numeral 1 represents the supporting-frame of
75 the type-writing mechanism. The two side walls of this frame are each provided with upward extensions 2 3, the rear extensions 2 of the two walls being connected by means of a
80 stout cross-bar 4. The inner side of this bar is provided with guideways in which is mounted a plate 5, that is capable of longitudinal movement within certain limits.

Secured at proper points to the plate 5 are
85 two vertical brackets 6, in and between which is supported a horizontal rod 7, upon which is mounted the sector-bearing frame 8. This frame in the present instance comprises two
90 separable sections—namely, a lower section 9, which is mounted on the rod, and an upper section 10, which is attachable to or detachable from the lower section, the said upper
95 section carrying the pivoted type-sectors 11. The lower section 9 consists of a strip of metal bent to form the vertical sides or cheeks
12, with their lower extensions 13 and connecting-piece 14, the metal being bent back
100 upon itself to form the extensions. In this way the structure is made very strong and substantial. The extensions are perforated at opposite points just below the cross-bar, so as to receive the rod 7 and be freely movable longitudinally thereon. The lower ends of

the depending portions are connected and braced by means of a cross-rod 15. The section is maintained in an upright position by means of a spring 16, one end of which is fastened to the plate, while its other or free end bears upon the heads of pins 17, that are fixed to said plate in such wise that the connecting-rod 15 lies between the same. The length of these pins is such that although the spring keeps the section upright yet it allows the latter to be moved freely on the rod and also to be tilted slightly, for a purpose hereinafter described. The upper section 10 consists of a single piece of metal that is bent into rectangular shape, so as to form the two side members 18, with their lower connecting portion 19. This section is constructed so that it may be readily inserted between the sides of the lower section, the cross-piece 14 on the latter affording a suitable stop or abutment for the like piece on the upper section.

As a simple and efficient means whereby the upper section may be attached to or detached from the lower section of the frame, as occasion may require, I secure on the inner face of each of the side members of the upper section a spring-plate 20, the lower or free end of which is provided with a pin 21, which registers normally with a perforation in the adjacent side of the lower frame. Working in the sides of the upper frame-section are headed studs 22, which take against the opposed faces of the spring-plates. Thus by the act of pressing in these studs by the thumb and forefinger the spring-plates are forced inward and their pins freed from the perforations in the lower frame-section, whereupon the upper section may be readily removed from the latter. The type-sectors 11 are pivoted or swung on a rod 23, that is mounted in and between the side members of the upper frame-section. There are in this instance ten of these sectors, and they may be vibrated or swung vertically independently of each other. Each sector has on its curved or outer edge eight characters, thus making in all eighty characters. Only five sectors are in use at one time, the remaining five being brought into active position by means of a shifting device, which will be described in due course. There are, therefore, so to say, two series of sectors, one of which series A' carries the upper-case characters, while the other series A² carries the lower-case characters.

The range of movement of the sector-bearing frame on the rod 7 is such that any sector in the active series may be brought, as desired, to a given point—namely, the center of the machine. The means whereby I effect this end is shown most clearly in Fig. 3, to which reference will now be had. 24 24 represent two bell-crank levers, which are pivoted at suitable points 25 on the plate. The longer arms of these levers extend up above the rod 7, on which the sector-frame is mounted, and the free ends of these arms are pro-

vided with cushions or impact-heads 26, that are in line with the respective sides of said frames. The shorter arms of the levers are connected by means of links 27 with the outer ends of arms 28, that are pivoted at *a* to suitable lugs 29, depending from the cross-bar 4 of the main supporting-frame of the machine. The outer ends of these arms are in turn connected by means of rods or links 30 with longitudinal levers 31 32, respectively, which are fulcrumed at opposite ends—that is to say, the right-hand end of the lever 31 is pivoted in a lug 33, rising from a lower cross-piece 34 of the frame-work, and the left-hand end of the other lever is mounted in a similar lug on the opposite end of this cross-piece. By this construction it will be observed that the act of raising these levers simultaneously will, through the intermediate connections, throw the impact-heads of the crank-levers inward or toward each other; also, that if either lever 31 or 32 be raised independently of the other the crank-lever connected therewith will be actuated. Bearing against the under edges of these longitudinal levers at predetermined intervals are the inner arms of five shorter levers B, which are mounted with respect to and operated through the medium of the keyboard, as hereinafter described. The two outer levers B' B² each bear against the edge of the adjacent longitudinal lever, while the inner levers B³ B⁴ B⁵ each bear against the edges of the two levers 31 32, as illustrated. The several parts are so organized in reference to each other that the act of raising the inner arms of the levers B will operate upon the crank-levers through the longitudinal levers and the intermediate connections, so as to bring into the central or active position any predetermined sector in the series in use—that is to say, if the lever B' be raised the sectors will be thrown to the extreme right, so as to bring the sector marked 1^a into position. If the lever B² be raised, the sectors will be thrown to the left, so as to bring into position the end sector 2^a of the operating group. If the lever B⁴ be raised, it will act upon both levers, and thus bring the sector 3^a into play, and similarly the raising of the levers B³ and B⁵ will bring into central position the sectors 4^a and 5^a, respectively. It will be seen that the heads of the two crank-levers act on the opposite sides of the sector-frame during the several adjustments of the latter. Hence such adjustments are positive, as no rebounding of the once-adjusted sectors can occur. After the adjustment of the particular sector has been effected the next step is to throw up the sector in such wise as to bring the desired type or character to the point (marked P) where the impression movement is made, said type or character during the upward movement of the sector being inked by means of a suitable device adapted to that end. The sector is then positively maintained in the elevated position by means of a suitable locking device, and the sector is

then pressed inward by appropriate means, so as to cause the particular type in view to be brought against the paper and impart thereto the desired impression.

5 The several devices for successively actuating the sectors, as above mentioned, are operated through the medium of suitable keys located at the front of the machine. There are in this instance forty keys K, twenty on each
10 side of the median line of the machine, their bars 35 being fulcrumed side by side toward the rear of the machine. I prefer to fulcrum these bars in the manner shown in the drawings—that is to say, I provide each of the bars
15 at a proper point on its under edge with a V-shaped notch 36, which engages a suitable knife-edge bar or bars 37, extending transversely across the machine. I usually connect the key-bars back of their fulcrums with
20 the lower cross-bar 34 of the main frame by means of spiral springs 39, which act to maintain these bars in place. By this construction any of the bars may be readily removed from or applied to the machine without disturbance of the others.

The levers B, which act upon the longitudinal levers 31 32, are each pivoted in and between suitable brackets or lugs 40, rising from a cross-bar 38 of the main frame-work near the
30 front of the machine. The outer or shorter arms of these levers have each connected therewith in a peculiar manner a roller 41, which is of sufficient width to take against the under edges of eight adjacent key-bars.
35 There being five of these levers B, there are provided five rollers, which are so disposed end to end as to be acted upon by the forty key-bars in the machine. The organization of the parts is such that if one of the keys in
40 any set of eight be depressed the sector upon which is borne that particular letter represented by the key will be moved by the intermediate connections to the center of the machine. When the key-bar has been depressed
45 a predetermined distance, it is necessary that its action on the lever B shall be discontinued and yet the movement of the key-bar not be interrupted. To meet this requirement, I have devised the mechanism, most
50 clearly represented in Figs. 1 and 13 of the drawings. Its construction is as follows: 42 represents a rod or bar that is mounted in suitable brackets or lugs 43, rising from the cross-bar 38, just forward of the fulcrums of
55 the levers B. Pivotally supported upon this rod or bar is a series of metallic frames 44, one being arranged adjacent to each of said levers. To each of these frames is fastened a similar frame 45, in and between the parallel limbs of which is pivoted the roller 41.
60 The latter is held up against the under edges of the key-bars by means of a counterweight 46, fastened between the sides of the pivoted frame 44. That member 47 of this
65 frame 44 adjacent to the lever B is elongated and has secured thereto a lateral pin or stud 48, that extends below the rearward

extension 49 of a pawl 50, which is pivoted to the shorter arm of the lever B. To the latter is also pivoted a smaller lever 51, the
70 inner arm of which is expanded to form the segmental member 52, the other or outer arm thereof being connected with the adjacent end of the roller by means of a link 53. Interposed between the said segmental member
75 and the curved or acting edge of the pawl 50 is a shoe 51, which is jointed to an arm 52, pivoted, also, to the shorter arm of the lever B. The pawl bears against the shoe and clamps it upon the opposed segmental member, the
80 said pawl being held in its acting position by means of a spring 53, connected therewith (by the link 54) and with the longer arm of the lever B. It will be observed that when the parts occupy the positions shown and described
85 the segmental lever is fixed to and forms practically a part of the lifting-lever B, so that if the roller connected with said segmental lever be depressed the latter and therewith the shorter arm of the said lifting-lever
90 will be likewise depressed, the inner arm of the latter thus being raised to effect the movement of the longitudinal lever or levers, against which it abuts. It will be observed, further,
95 that as the roller is being depressed the elongated member of the frame will be raised and its projecting pin 48 will take against and raise the opposed extension of the pawl, thus
100 freeing the latter from the brake and perforce releasing the segmental lever 52, whereupon the continued depressing of the roller will not act upon the lifting-lever. To prevent the recoil of the latter and also of the sectors and their intermediate connections
105 when proper adjustment of the sectors has been secured, I make the curvature of the acting face of the segmental lever slightly eccentric—that is to say, the curve is described from a point slightly below the pivotal center of the lever. In this way it will be seen
110 that when the roller is quickly depressed the lower portion of the acting edge of the released segmental lever will take or bite against the brake, and thus prevent a recoil of the lifting-lever. When pressure is removed from
115 the key, the counterbalancing devices automatically return the parts to their original or normal positions. The middle roller 41^a is formed in two parts, so as to leave a central space for the reception or passage of certain
120 devices hereinafter described. The frame for the support of these "sectional rollers," as they may be called, is therefore formed in two parts, which are connected by means of a rigid bar 54, so as to make a practically integral
125 structure. Thus pressure upon one of the roller-sections will actuate the two frame-sections and the parts connected therewith. So far as the devices for operating the lifting-levers in each of the frames are concerned
130 they are identical in construction and operation with each other. The end lifting-levers are each provided with an angular portion, (marked 55,) in order that they shall engage

the longitudinal levers at proper points, respectively, this angular portion in the present instance being in the nature of an elongated pivot or stud mounted between the lugs 40.

(See Fig. 1.)

Having described the mechanism whereby a predetermined sector carrying certain characters is brought to the central position, I shall proceed to describe the means which I prefer to use for the purpose of bringing into active position any desired character on the face of the sector, reference being had more particularly to Figs. 1, 2, and 6.

Mounted in suitable bearings—such as 56—in the sides of the frame 1 so as to extend parallel with and in front of the rod 42 is a horizontal rocking shaft 57, from which forwardly extend lugs or arms 58, in and between which are mounted a pair of rollers 59. These rollers are disposed one on each side of the median line of the machine, so as to take against the under edges of the adjacent key-bars. The rollers are maintained normally in contact with the latter by means of a suitable counterpoise 60, Fig. 1, extending rearwardly from one end of the rocking shaft. In this case I have shown the counterpoise in the nature of a weight; but, of course, a spring may be substituted therefor, if desired, or, indeed, a spring and weight may be employed with equally good effect.

Fixed to the shaft 57 at or near the center of the machine is an outwardly-extending arm 61, to which is fastened one end of a curved link 62, which extends rearwardly below said shaft, the other end of the link being fastened to the shorter arm of a bell-crank lever 63, which is suitably pivoted to lugs 64, rising from the cross-bar 38. The free end of the longer arm of this lever is connected by means of a rod 65 with one arm 66 of a similar lever 67, the latter lever being pivoted at *y* to the upper end of a vertical or nearly vertical lever 68, that is in turn pivoted, at *z*, to a fixed plate 69. This plate extends forwardly from a supporting-bracket 70, which is firmly secured at its ends to the rear cross-bar 4 of the main supporting-frame. The middle part of the bracket is bent or set outwardly so as not to interfere with the actions of those devices that are mounted on the face of the cross-bar. Fixed to this bracket at or about the middle of the machine is a vertical post 71, the upper end of which is curved toward the pivotal line of the sectors. To this curved end of the post at a point slightly above and in front of the said pivotal line, so as to swing in the central line of the machine, is pivoted a depending curved arm 72, the lower end of which lies against or adjacent to that particular sector (in the present instance 1^a) which may occupy the central or active position. This arm is pivotally connected with the upper end of the bell-crank lever 67 by means of a link 73, which forms, in effect, one member of a toggle-lever, the longer arm of the crank-lever constituting the other member. By the con-

struction just described it will be obvious that if one of the keys be depressed the opposed roller 59 will be likewise depressed and the rock-shaft thereby turned forward—*i. e.*, in the direction indicated by the adjacent arrow, Fig. 2—thus similarly turning the arm 61, with which the crank-lever 63 is connected. By reason of the upwardly-inclined position of this arm it will be obvious that the shorter arm of the crank-lever will not be moved backward until the arm on the rocking shaft occupies an opposite position—that is, downwardly inclined—which position it will have assumed at or about the time the longitudinal adjustment of the series of sectors has been effected, as above explained. Having reached this downwardly-inclined position, the arm 61, through the medium of the link 62, will force the shorter arm of the crank-lever backward and in this way depress the longer arm thereof, which latter will thereupon draw downward the arm of the toggle-lever, thus straightening out the toggle and throwing up the free end of the pivoted arm 72, with which it is connected. Obviously this end of the arm in its upward movement will bear against the opposed edge of the central sector and throw it upward a corresponding distance. It will be apparent that the position of the pivotal connection *y* of the toggle with the vertical lever 68 will regulate the range of vertical movement of the upthrown arm and of the sector and consequently determine the particular character on the sector that is brought to the point where the impression is made. It will also be apparent that when the toggle is being drawn downward the upper arm of the vertical lever and perforce the said pivotal connection will be moved forward—*i. e.*, in the direction of the adjacent arrow, Fig. 2—while the lower arm of this lever will be moved in a reverse direction. Hence if the movement of one of the arms of the lever be checked at a predetermined point with reference to a certain character on the active sector the pivoted arm will be thrown up to such an extent as to bring the particular character in view in line with the impression-point. Now, as there are eight characters on the face of the sector, it follows that it is necessary to check the movement of the vertical lever at eight different points in its path of movement, each point being disposed with special relation to a character on the sector and the checking device at such point being adapted to be thrown into play when that particular character is desired. To this end I have devised and prefer to employ the construction and arrangement of devices which I shall now describe, directing attention more especially to Figs. 1, 2, and 6 of the drawings.

Fixed between the forward extensions 3 of the two side walls of the main supporting-frame at a proper distance apart vertically are two parallel bars 74 74, the ends of which are connected by means of lateral vertical

strips, so as to form end spaces, in which are supported the respective ends of a series of slats or plates 75, mounted one upon or above the other. Upon the rear of each of these slats is fixed a rod 76, which extends to or preferably through a hole in the plate at a point in the rear of the lower arm of the vertical lever. There are seven of these slats, and therefore seven rods. The positions of the perforations in the plates for the passage of these rods are those where it is required to check the rearward movement of the said lever-arm—that is to say, if said arm be stopped at 76^a the lowest character on the sector will be brought into action, if at 76^b the next upper character, and so on successively until the seventh point is reached. Normally the free ends of the rods do not project into the path of the lever-arm; but it will be obvious that if the end of one of these rods be so projected it will check the movement of the arm at this point. In order, therefore, that any predetermined rod may be projected when a certain key agreeing therewith and with a particular character on the sector is depressed, I have provided each of the slats at a proper point on its forward edge with a pin or stud 77, and have provided each of the keys (with the exception of those keys corresponding with the first or highest characters on the sectors) with a vertical rod 78, that is suitably guided in the rail 74. Each rod is provided at a point adjacent to the proper stud or pin with an inset or cam portion 79, which acts when the key is depressed to push endwise the particular slat from which the stud extends, the direction of movement being such that the stop-rod on the rear of the slat is projected through and beyond its hole in the plate 69. Thus if any key coincident with one of the lower seven characters on the central sector be depressed it will be obvious that the sector will be raised just such a distance as to bring that particular character into active position. The bars are maintained in their normal position by means of suitable springs *h*, secured thereto and to a cross-strip *h'*, which is secured to the rear edges of the rails 74, Fig. 12. It is not necessary to provide a movable stop for the first or highest character on the sector, in view of the fact that the position of the stop therefor is in the rear of the others, and thus it does not interfere with the lever-arm while the latter is being brought to any of the other positions. Therefore I provide a fixed stop *s*, against which the said arm abuts when the first character is in service.

The particular construction and arrangement of the lever devices, their pivotal connections, and the stop devices are such that the toggle is always in a straight or fully open position when the desired character on the sector has been brought to the impression-line. (See Fig. 6.) In its upward passage the sector is inked by contact with an inking-pad of peculiar construction, which pad,

through suitable devices now to be described, is raised at the instant that the type to be inked passes over it and is then retracted to its former or idle position. This feature of my invention is clearly represented in Figs. 2, 14, 15, and 16 of the drawings, and is of the following description: 80 is a shallow box or frame, which is open at its top and forward side. It has mounted in its lower portion a roller 81 and has pivoted at its upper end an inclined block or plate 82, upon the outer face of which is secured a piece of absorbent material 83, constituting an inking-pad. Upon the roller is a strip of suitable ribbon 84, the free end of which is passed up over the face of the pad and then secured (in this instance) to a hook or pin 85 on the under side of the block. The ribbon is held taut on the face of the pad by means of a forwardly-extending spring-yoke 86, that is fastened to the rear wall of the box, the ribbon passing through this yoke, so as to be acted upon by the horizontal member of the latter. The pivoted block is maintained in position by means of a spring-plate 87, one end of which is fastened to the box, its free end extending below the lower outer edge of the block, so as to support the same, as seen. It will be apparent that the tension of the ribbon on the pad-block keeps the block normally pressed against the edge of the supporting-plate 87, yet permits the block to yield or give slightly when the sector passes over it, thus assuring a proper amount of pressure against the sector. When it is desired to reverse the block to ink the pad or to take up the unused portion of the ribbon for the purpose of bringing a fresh or unused portion upon the pad, it is merely requisite to draw outward the free end of the spring-plate. This will release the block and permit the desired end or ends to be accomplished, whereupon the block may be returned to its former position and maintained therein, as before.

I prefer to mount the roller in the box in this way: One side of the box is provided with a circular opening 88, while its opposite side is perforated in line axially with this opening. The roller is inserted in the box by way of the opening in such wise that a stud 89 on one end of the roller enters the perforation and a flanged head 90 on the other or outer end of the roller rests in the opening. Thus the roller may be readily applied to or removed from the box. Displacement and turning of this roller are prevented by means of a spring-catch 91, pivoted on the closed side of the box, so that it may be swung into engagement with a notch in the outward extension of the stud 89, as shown. The lower forward projecting portion of the box is secured, preferably detachably, in the manner hereinafter explained to a vertical arm 92, which is hinged at its upper end to a bracket-piece 93, fixed to the top of the cross-bar 4. Hence the act of vibrating the pivoted arm will correspondingly move the box and its pad, thereby

causing the latter to move against or away from the type-sector. Obviously the pad will apply ink to that type on the sector with which it may come in contact. The ribbon, being of fine texture, evenly distributes upon the type the ink from the saturated absorbent, thus preventing an unnecessarily large application of ink to the type and consequent clogging of the latter. Moreover, it protects the pad from undue wear.

In Fig. 2 I have illustrated clearly the devices which I use by preference for the purpose of automatically operating the pivoted arm at the proper time—to wit, when the particular type to be inked is passing the pad. Following is their construction: 94 indicates a bell-crank lever, which is pivoted at *q* to a post 95, rising from the cross-bar 34 of the main frame. The short arm 96 of this lever projects upward, so that its free end lies just in front of the lower end of the vibrating arm 92. The longer arm of the lever projects toward the front of the machine to a point above the rocking shaft 57, before described. The free end of this arm has secured thereto a U-shaped head 97, which saddles the convex edge of a segmental plate 98, that is fixed to the said rocking shaft. On one face of this plate is pivoted the end of a finger 99, which carries on its opposite or inner end a curved cam-piece 100. This finger and therewith the cam are maintained in a normal position by means of a suitable spring 101, secured to the finger and to the plate. In the inner face of one of the limbs of the cap is a pin 102, which lies normally just above and slightly beyond the adjacent end of the cam 100. The latter is of such formation that when the rocking lever is turned forward by the act of depressing a key, as hereinbefore stated, the forward edge of the cam passes under the pin and the upper face of the cam in its movement thereupon raises said pin and perforce the end of the lever-arm with which it is connected. Consequently the shorter arm of the lever is thrown backward, its free end abutting against and correspondingly moving the opposed end of the pivoted arm, thus throwing the pad device into contact with that predetermined type on the sector which may at this instant have been brought opposite the pad. When the cam-face has cleared the pin, the latter will drop down below the rear edge of the cam, and thus cause the lever and the pad devices to resume their normal or inactive positions. When the pressure is removed from the key and the rocking lever is thereupon returning to its original position, the lower face of the cam will pass under the pin and be slightly raised by the latter; but the instant the forward edge of the cam has escaped the pin the cam will be returned to its first or down position by the action of the spring. The parts will then be in condition for a succeeding operation. I usually provide the lower end of the pivoted arm 92 with a set-screw *d*, against the end of which the

crank-lever acts. Thus by properly turning this screw the throw of said arm and consequently of the pad devices thereon may be minutely adjusted as occasion may require.

As above mentioned, the box equipped with the pad devices is secured detachably to the arm, so that the box, &c., may be readily removed from or applied to the latter as required. I therefore provide the former at its point of attachment to the arm with a bevel-edged plate 103, which is mounted between the oppositely-inclined edges of two pieces 104 105, that are attached to the rear face of the arm. The upper piece 104 is fixed to or is integral with the arm, while the lower piece is in the shape of a vertical slide-section. It is provided with a couple of headed studs 106, which project through a longitudinal slot in the arm, one of which studs is connected with the upper part of said arm by means of a spiral spring 107. This spring thus holds the slide-piece up against the opposed edge of the plate, and in this way locks the latter and its connected pad devices to the arm; yet obviously said slide device may be readily depressed against the action of the spring in order to free the plate and permit the removal of the latter and its adjuncts. It will be observed that I have mounted a brush device 108 just above the inking-pad, so as to lie in the path of the type on the upthrown sector. This brush device I consider to be an important feature of my invention. It removes the surplus ink from the inked type, and thus renders the impression very clean and sharp. In the present illustration this brush consists of yarn or similar fibrous material supported by means of a couple of clasps 109, which are formed on or secured to an arm 110, (preferably yielding or elastic,) that is fastened to the back of the box 80. When the acting end of this brush becomes saturated or clogged with ink, it may be drawn upward and cut off, so as to present a fresh surface to the type.

In order to lock the sector temporarily in its upthrown position, so as to insure accurate register of the type with the point of impression, and thus secure perfect alignment of the successively-printed characters, I have devised a locking mechanism of very simple construction, which is automatically brought into play at the proper time when the key is depressed. This construction is very clearly represented in Figs. 1, 3, 6, and 9 of the drawings, to which attention will now be directed. 111 represents two vertical posts, which are fastened rigidly to a bracket-piece 112, that is fixed to the upper cross-bar 4 of the main frame. The upper ends of these posts are curved inward toward each other and then upward, so as to form a central space *P* just wide enough to receive the upthrown sector. This space being in front of and adjacent to the point where the impression is made, its sides guide the sector in its (the sector's) upward movement, and also prevent lateral dis-

placement of the upthrown sector. Pivoted to the upper portion of one of the posts 111—in the presence instance the left-hand post—is a small bell-crank lever 112^a, to the vertical arm of which is pivoted one end of a horizontal bolt 113, which extends normally to the adjacent edge of the central space. This bolt is maintained in its horizontal position by means of a link 114, pivoted thereto and to the post. It will be seen that if the horizontal arm of the lever be raised or lowered the bolt will be projected into or withdrawn from the central space. Now, I have provided the left-hand lateral edges of each sector with a series of notches or recesses *n*, corresponding in number to the characters on the edge of the segment, there being a notch adjacent to each character, as seen. In this way it will be obvious that when the sector has been upthrown, as described, if proper movement be given the lever 112^a, the bolt will be projected into the opposed notch in the sector, and will thus prevent vertical movement of the latter. In order to operate said lever automatically, I connect its horizontal arm by means of a rod 115 with one end of a lever 116, Figs. 1 and 3. This lever extends in a diagonal direction, so as to bring its free end into the path or are traversed by a lateral set-screw *e* on the longer arm of the lever 63, previously described. Thus before this arm reaches the limit of its downward movement the point of the screw *e* will abut against and depress the opposed end of the diagonal lever, thereby elevating the rear end of the latter and throwing up the horizontal arm of the crank-lever 112^a, so as to project the bolt into engagement with the notch in the sector. When the free end of the diagonal lever is relieved from pressure, its rear arm will resume the down or normal position, thus drawing down the connected arm of the crank-lever and retracting the bolt from the notch in the sector. I prefer to make the rod connection with the said arm somewhat yielding or elastic, so that the action of the bolt against the sector shall be yielding or, so to say, "cushioned." I do this by extending the upper end of the connecting-rod freely through a slot or opening in the end of the crank-lever and providing the latter with a flat spring 116^a, which bears upon the projecting head of the rod. I also provide the latter just above the arm of the crank-lever with a cross-pin or stud 117. Thus when the rod is raised, its head, bearing against the spring, will throw upward the horizontal arm of the crank-lever with the result mentioned. When the rod is retracted, its pin will bear against the said arm and draw it to its first or normal position. The shape of the notches in the sectors is such that the notch in the active sector will not interfere with the movement of the latter toward the point where the impression is made on the paper. The means which I employ for imparting this "impression movement," as it may be called, to the upthrown sector appears more clearly in Fig. 2 of the

drawings. It is constructed thus: 118 represents a vertical lever, which is pivoted at *o* to a lug on the post 71. Its upper or shorter arm extends up near to the pivotal point of the central sector and is provided with a lateral projection 120, which lies adjacent to the back edge of said sector in the same horizontal plane as the pivotal point. The lower extremity of the longer arm of the lever 118 normally engages a notch or tooth 121 in a horizontal latch-arm 122. This arm is pivoted to a lug or bracket 123, rising upward from the cross-bar 34, and it is held in action with the lever by means of a spring 123^a, secured thereto and to said bar. The lever is thus locked in its vertical position. The free end of the arm 122 extends below the path or are traversed by a set-screw *e'*, working in one side of the longer arm of the crank-lever 63, whereby when the point of said screw in its downward course strikes the opposed portion of the arm 122 it depresses the latter, and thus disengages the tooth or catch from the vertical lever. Pivoted at a suitable point on the longer arm of the latter is the lower end of a bracket 124, its upper end being equipped with a set-screw 124^a, which takes against the opposed edge of the lever. Secured to the bracket is one end of a flat spring 125, its other end extending down to the lower portion of the lever and bearing against the same. The lower end of this spring is connected with a stud 126 on the forward rocking-shaft 57 by means of a rod 127. By this construction it will be evident that when the shaft is turned forward by the act of depressing a key, as above explained, the rod 127 and therewith the spring on the vertical lever will be drawn forward; but the instant the catch-arm is released by the action of the screw on the crank-lever the outdrawn spring will pull the longer arm of the lever forcibly forward, thus throwing backward the upper arm of the lever and causing its head to strike against the active sector and force or tilt it toward the paper. To add to the force of the movement, I usually attach a weight 128 to the lower end of the vertical lever. By properly manipulating the screw 124^a so as to adjust the head of the bracket, and thus cause the lower end of the spring to bear with more or less force against the lever, the tension of the spring, and perforce the degree of pressure applied to the sector, may be nicely regulated. When the rocking shaft resumes its normal position upon the removal of pressure from the key, all the parts return to their original condition for a successive operation. It will be apparent that when the active sector is forced toward the point of impression the sector-frame is tilted against the action of the flat spring 16, hereinbefore described; but the instant the sector is relieved from pressure this spring returns the frame to its previous position.

In order positively to cause the upthrown sector to return to its down position after the impression has been made, I pivot concen-

trically with the sectors a yoke-frame 129, the horizontal member of which rests upon the upper edges of the sectors, being held yieldingly thereon by the action of a small spiral spring 129^a, connected with one end of the yoke and with a lower lug 1 on the upper section of the sector-frame. (See Fig. 2.) In this way when one of the sectors is thrown upward the yoke will be raised thereby against the action of the spring; but the instant the sector is free the yoke-frame and therewith the sector will be drawn downward by the spring. As before stated, there are two series of sectors—five in each series—which are adapted to be thrown into or out of action. That series carrying the lower-case characters is normally in operative position; but if it be desired to use any of the upper-case characters—viz., the capital letters—it is required to throw the series A² out of and the other series A' into that position. The means whereby I am enabled to do this is shown in Fig. 3 of the drawings, and is of the following description: 130 is a bell-crank lever, which is mounted on the face of the cross-bar 4 at a point near the left side wall of the supporting-frame. The longer arm of this lever is connected with the end of the slide-plate 5 by means of a rod 131, and the shorter arm of the lever is connected by a similar rod 132 with a pivoted bar E, extending to the front of the machine. Thus by depressing the outer end of the bar the slide-plate and therewith the sectors are drawn toward the left-hand side of the machine a distance sufficient to throw the series of sectors A' into action. I usually connect the longer arm of the crank-lever 130 with the end of the bracket 70 by means of a spiral spring 133, which acts to draw this arm forward, and thus to keep the series of lower-case sectors normally in the operative position. In order to hold the outer end of the shifting-bar in the down position so as to maintain the upper-case sectors in action, I provide on the proper side of the main frame a spring-catch 134, Fig. 1, of any suitable construction, with which said bar is engaged at the proper time. That the action of the impact-levers upon the sectors shall be such as to move the sectors of the new series into the central positions precisely as the other series were moved thereby, I have provided the pivoted arms 23, to which the ends of the links 27 30 are jointed (at a)—that is to say, when the plate, with its adjuncts, is shifted in the manner described the links 27 will be thrown into an oppositely-inclined, though parallel, position. Thus the relative horizontal planes of the pivotal connections of these links with the impact-levers and the arms will not be changed. (See dotted lines in Fig. 3.)

I shall now proceed to describe the construction and operation of the carriage for the paper, together with the feeding or spacing mechanism for imparting a step-by-step movement thereto. Referring to the drawings, 135

represents a flat bar, which extends longitudinally across the rear portion of the machine, being supported by and upon suitable brackets 136, secured to the respective sides of the main frame. Mounted upon this bar so as to be lengthwise movable thereon is the paper-carriage C, the end heads 137 of the latter being slotted horizontally to receive the bar. The forward edges of these heads are rounded, as seen, and they are connected at their upper portions and maintained at a proper distance apart by means of a rounded rail or plate 138 and at their lower forward portions by a similarly-shaped rail or plate 139, thus leaving the intermediate opening. To the outer face of the lower plate 139, near its ends, are secured flat springs 140, the free extremities of which are provided with in-projecting studs 141, which extend through perforations in the plate. The inner ends of these studs support the respective ends of a narrow bar 142 and maintain it longitudinally against the upper inner edge of the plate 139. Just above this bar and parallel therewith is a shaft 143, which is journaled in the end heads. One end of this shaft—to wit, the right-hand end—projects beyond its supporting-head and has fixed thereto an arm 144 of peculiar construction, as hereinafter described. The shaft is provided with a series of recesses 145, and the bar 142 is furnished with a corresponding number of fingers 146, which project into these recesses. Thus when the shaft occupies the position shown in Fig. 2 the bar is clamped against the face of the plate by the elastic action of the springs 140; but when said shaft is turned in the direction of the arrow the lower edges of the recesses bear against and force backward the fingers, thus drawing the clamping-bar away from the plate. Of course if the shaft be turned but slightly the springs will operate to return the bar normally to its clamping position; but, on the other hand, if the shaft be turned sufficiently far to free the fingers from the recesses the shaft will maintain the bar in the retracted position against the action of the springs. Journaled in the end heads near their upper rear edges is a shaft 147 on which are fixed two curved depending arms 148. These arms are mounted on the shaft adjacent to the inner edges of the end heads, respectively. They are curved rearwardly beyond the edge of the flat supporting-bar, their lower ends extending just above the rear edge of the plate 139. These ends support a narrow curved plate 149, which lies adjacent to the upper edge of the curved plate 139 and corresponds with the latter in curvature, Fig. 2. In and between these lower ends of the arms is mounted a shaft 150, on or near the right-hand end of which is secured an up-projecting stud 151. This shaft is also provided with a series of forwardly-projecting fingers 152, the free ends of which lie normally just above the inner face of the curved plate 149. The arms 148 and their connections are maintained in

the normal positions by means of a spring 153, which is secured to one of the end heads, so as to act upon a shoulder on the adjacent arm. On the right head at *m* is pivoted a lever 154, the longer arm of which extends forward and is curved or shaped so that it may be readily grasped by the operator. The rear or shorter arm of the lever is curved downwardly and bent laterally inward so that its end lies just back of the projection or stud 151 on the shaft 150, whereby when the longer arm of said lever is raised this end will strike against the projection, and thus turn the shaft with its fingers forward. The latter, impinging against the opposed surface of the curved plate, will prevent the turning of the shaft, and as a consequence said shaft, with its adjuncts, will be moved forward—that is, in the direction indicated by the adjacent arrow.

The longer arm of the hand-lever 154 is provided with a projecting stud 155, adjacent to which is a curved spring-plate 156, which is fastened at its rear end to the extremity of the arm 144, before mentioned. Normally the free end of this plate rests upon the pin; but when the hand-lever is raised to effect the operations just described the pin rides against the under edge of the plate 156, and thus raises the arm, the latter thereupon turning the shaft 143 and drawing out the clamping-bar in the manner before stated. Upward movement of the spring-plate is prevented by a pin *r*, projecting from the arm. When the hand-lever has been raised a certain distance, the stud 155 escapes beyond the upper edge of the spring-plate, whereupon the spring clamping-bar returns the shaft 143, and perforce the arm 144, to the first or normal position. If the hand-lever 164 now be released, it will drop to its first or down position, the spring-plate yielding to the pin on the lever-arm and permitting it to pass below the plate. The latter thereupon assumes its up position, and the parts are in position for a succeeding operation. The arm 144 is provided with a knob 157, whereby the arm may be raised to draw out the clamping-bar without operating the other devices. This done, the paper *F*, Fig. 2, is run into the carriage from the front of the machine—that is to say, it is run upon the outer face of the rail 138 and downward on the inner face of the lower rail 139, being passed between the plate 149 and fingers 152. The clamping-bar is then allowed to resume its normal or clamping position. It thus binds the paper on the carriage in position to be acted upon by the type-sectors. In order that the paper shall be passed positively between the plate and the "gripping-fingers," as they may be termed, and not be slipped between said plate and the lower rail 139, I provide the latter with a series of transverse ribs *w* just above the upper edge of the plate, so that the paper will be directed by these ribs upon said plate. The plate is of course slotted in line with these ribs, so that the upward movement of the former will not be affected by the ribs.

When a line or part of line has been printed and it is desired to take up a new line, the hand-lever is raised, as before explained, the clamping-bar 142 thereupon being opened, and the fingers 152 bearing upon the paper *F*, clamping it upon the opposed surface of the curved plate 149 and advancing it upward the predetermined distance, and so on successively. The back support for the paper at the point where the impression is made may consist of a fixed block or head of any suitable construction. I, however, prefer to use for this purpose the device represented in the drawings—namely, a rotatable horizontal wheel 158, mounted on the flat bar *att*, and provided with a peripheral band 159 of rubber or similar yielding material. This band may be sprung upon or removed from the wheel at pleasure. The paper lies against the adjacent part of the band, so that the latter supports the paper when the impression-stroke is delivered. It will be apparent that as the carriage is moved to and fro the wheel will be more or less rotated by the frictional action of the paper, thus presenting always to the latter a changed bearing-surface, and consequently obviating the undue wearing away of the rubber at one point. Such wearing would ensue if the wheel or support for the rubber were not rotatable in the manner mentioned.

160 is a yoke, which is pivoted to the end heads 137 so that its horizontal member rests upon that part of the paper which lies on the upper rail 138. One of the pivoted ends of the yoke is flattened or cam-shaped, as seen, and a flat spring 161, secured to the adjacent head 137, bears against this cam-shaped end, and thus tends to maintain the yoke against the paper, yet permits the yoke to be moved up away from the paper when desired—that is, upon the introduction of a new sheet of paper to the carriage. The purpose of this yoke-frame is obvious—namely, to direct the sheet backward and also to keep the lower portion of the sheet taut, so to say.

The spacing mechanism—that is to say, the mechanism which moves the carriage forward step by step, so as to bring a fresh portion of the paper to the impression-point each time the keys are manipulated—is constructed as follows, reference being had to Figs. 2, 4, and 8: 162 represents a bar which is fixed in and between the end heads so as to extend parallel with and just above the rear edge of the bar 135. Mounted on this bar 162, at about the middle of the machine, is a clutch device 163, which consists in the present instance of a frame 164, which embraces the bar 162, and a plate 165, which is pivoted loosely between the walls of said frame so as to lie just below the said latter bar, and a vertical cam-headed lever 166, that is also pivoted between the walls of the frame so as to support the pivoted plate 165. The shape of the head of the lever is such that when the lower portion of the lever is drawn lat-

erally to the left, as indicated by the arrow, the head will jam the pivoted plate tight against the under side of the bar, whereupon if the draft be continued the carriage will be drawn or moved longitudinally. The lower arm of the lever is connected by means of a link or rod 167 with the upper extremity of a lever 168, that is pivoted at *j* to the left supporting-bracket 136. The lower arm of this lever is turned inward and is connected by means of a link 169 with the end of a hinged or rock frame 170, which is mounted immediately above the rearward extensions of the key-bars in such manner that when one of said extensions is raised (by the depressing of a key) it will strike against and correspondingly raise the opposed end of the frame, whereupon the latter will act upon the lever, and this, through the intermediate connections, will draw upon the clutch device with the effect above stated. When the freed key-bar returns to its original condition, the frame descends, as before, and the lever, assuming its normal position, moves the rod backward—*i. e.*, to the right—thus correspondingly moving the lower arm of the lever, and perforce relieving the clamping-plate from pressure and pushing the clutch device back to its first position, and this without acting upon or affecting the position of the carriage. This done, the parts are in condition for a succeeding operation. The sides of the clutch-frame 164 project into a recess *g* in the back edge of the bar 135, the end of the recess on the right serving as a permanent stop to limit the range of the backward movement of the clutch device. Obviously the distance to which the rock-frame 170 is raised determines the distance to which the clutch and therewith the carriage are moved forward, in this way permitting of a proper spacing of the letters—that is to say, by properly forming the rear ends of the key-bars the frame may be raised to effect a spacing commensurate with the width of the character to be printed. I effect this end by suitably notching or cutting away the rear ends of the key-bars in such manner as to vary, according to the space required by the letters, the distance through which the rear ends of the several key-bars must be raised before they impinge against the frame 170, and thereby act upon the clutch device. This frame 170 is of such construction that when the series of upper-case sectors are brought into play, as above described, the frame is moved slightly forward, so as to throw its acting portion beyond the notches—*i. e.*, above the plane upper edges of the bars. Thus the spacing for the upper-case characters is slightly greater than that for the lower-case characters, in order to compensate for the greater width of the former.

The frame is constructed and connected with the shifting-bar E in the following manner: 171 indicates a rocking shaft that is mounted in and between the lower portion of

the walls of the main frame near the rear of the machine. Fixed to the ends of this shaft are two vertical arms 172, in and between the upper ends of which is journaled a rod or shaft 173. Fixed on this rod near its ends are two rearwardly-extending horizontal arms 174, the outer ends of which are connected by a bar 175, which constitutes the working edge of the frame—that is, the edge against which the key-bars work. Thus it will be seen that this bar 175 may be vibrated vertically. The rock-shaft 171 is provided at one of its ends with a stud 176, which is connected by means of a rod 177 with the shifting-lever E, whereby when the latter is operated, as above stated, the rock-shaft is turned forward and the position of the frame upon the shaft changed accordingly.

In order to operate the spacing devices independently of the printing mechanism above described, I may use the construction represented (partly in dotted lines) in Fig. 2 of the drawings—that is to say, 178 and 179 are bell-crank levers, which are mounted on the front and rear walls of the main frame and are connected by means of a link or rod 180. The unconnected arms of the forward lever is linked with a central key-arm that is suitably pivoted to the main frame, as at *v*, while the like arm of the rear lever is provided with a vertical rod 182, that extends up to or nearly to the bar 175 of the rocker-frame, this rod being guided in a perforated lug 183 on the rear wall of the frame. Thus if the key-arm be depressed the rod 182, through the intermediate connections, will be raised, so that it will impinge against and move upward the rocker-frame, with the effect above mentioned. When this arm is released, a spring 184, which bears against the shorter arm of the lever 178, will return the parts to their original position.

Although I have herein shown and described the inking medium for the type in the nature of a pad device, yet it will be apparent that the mechanism of my machine may be used with equally good effect in connection with an inked-ribbon device—such, for example, as that used in various well-known type-writers. In this connection I remark that I do not limit myself to the particular constructions and combinations of parts herewith presented, as it is obvious that they may be liberally modified by a mechanic without departing from the principles of the invention.

I claim as new and wish to secure by Letters Patent—

1. In a type-writer, the combination of a series of pivoted type-bearing sectors arranged side by side, adapted to be moved laterally simultaneously, and adapted to be moved vertically independently of each other, mechanism for laterally moving said sectors so as to bring any one of the series to a given or central point, a mechanism for upthrowing the adjusted or central sector so that a predetermined character thereon may be brought into active position, and a mechanism for impart-

ing the impression movement to said sector, together with the series of keys connected with said mechanisms and adapted relatively to actuate the same, substantially as described.

2. In a type-writer, the combination of two independent series of pivoted type-bearing sectors arranged side by side, a mechanism for shifting the same into and out of action, respectively, a mechanism for laterally moving said sectors so as to bring any one of the active series to a given or central point, a mechanism for upthrowing the adjusted or central sector so that a predetermined character thereon may be brought into active position, and a mechanism for imparting the impression movement to said sector, together with the series of keys connected with said mechanisms and adapted relatively to actuate the same, substantially as described.

3. In a type-writer, the combination of a series of pivoted type-bearing sectors arranged side by side, adapted to be moved laterally simultaneously, and adapted to be moved vertically independently of each other, mechanism for laterally moving said sectors so as to bring any one of the series to a given or central point, a mechanism for upthrowing the adjusted or central sector so that a predetermined character thereon may be brought into active position, a mechanism for locking said carrier in this position, and a mechanism for imparting the impression movement to said carrier, together with a series of keys connected with said mechanisms and adapted relatively to actuate the same, substantially as described.

4. In a type-writer, the combination, with the series of laterally-movable type-carriers, of the impact-levers mounted in relation to said carriers, the longitudinal levers with which said impact levers are connected, and the series of transverse levers disposed in respect to said longitudinal levers and adapted each to be acted upon by a predetermined series of key-bars, the keys of which correspond to the characters on the particular type characters, respectively, together with said key-bars, substantially as described.

5. In a type-writer, the combination, with two independent series of laterally-movable type-carriers and a mechanism for shifting the same into and out of active position, respectively, of the impact-levers mounted in relation to said carriers, the longitudinal carriers with which said impact-levers are connected, the intermediate pivoted arms jointed with the connections between said impact and longitudinal levers, and the series of transverse levers disposed in respect to said longitudinal levers and adapted each to be acted upon by a predetermined series of key-bars, the keys of which correspond to the characters on the particular type-sectors, respectively, together with said key-bars, substantially as described.

6. In a type-writer, the combination, with the key-bars, of a frame pivoted below the

same, the transverse lever fulcrumed in relation to said frame, and the frictional brake connection between said frame and lever, substantially as described.

7. In a type-writer, the combination, with the central type-bearing sector, of the upthrowing mechanism therefor, said mechanism comprising a pivoted arm mounted rearward of the sector and adapted to act against the same, a toggle-lever connected with said arm and pivoted to a suitable support, and operative devices intermediate the toggle-lever and the key-bars for actuating said pivoted arm, substantially as described.

8. In a type-writer, the combination, with the central type-bearing sector, of the upthrowing mechanism therefor, said mechanism comprising a pivoted arm mounted in the rear of the sector and adapted to act against the same, a toggle-lever connected with said arm and pivoted to a suitable support, and operative devices intermediate the toggle-lever and the key-bars for actuating said pivoted arm, together with stop devices for determining the range of movement of the latter, substantially as described.

9. In a type-writer, the combination, with the type-carriers and the central upthrowing toggle mechanism therefor, of the vertical lever with which said mechanism is connected, the longitudinally-movable slats or bars, the stop-rods extending longitudinally therefrom in vertical series in respect to the path of said vertical lever, and the cam connections between said slats and the key-bars, substantially as described.

10. In a type-writer, the combination, with the type-carriers, of the central impression-lever, the forward rock-shaft adapted to be operated by the action of the key-bars, and the spring connection between said rock-shaft and lever, together with means for regulating the tension of said spring connection, substantially as described.

11. In a type-writer, the combination, with the type-carriers provided with the lateral notches or recesses, of the bolt adapted to be engaged with said notches to lock the carriers in their various positions of vertical adjustment, and the link-and-lever connections between the bolt and the key-bars, adapted to be actuated by the latter in order to operate said bolt, substantially as described.

12. In a type-writer, the combination, with the series of laterally and vertically movable type-carriers and mechanism for operating the same, of a reciprocative pad-carrying frame pivotally mounted in respect to said carriers and adapted to be moved into and out of the path of the central carrier at predetermined intervals, and mechanism operatively connecting said pad-frame with the key-bars, substantially as described.

13. The combination of a reciprocative inking device, a bell-crank lever disposed in reference to and adapted to operate upon the same, a forward rock-shaft, a cam device

thereon adapted to operate the arm on said lever, and key-bars connected with said rock-shaft and adapted to actuate the same, substantially as described.

5 14. In a type-writer, the combination, with the type-carriers and mechanism for operating the same, of an inking-pad arranged in respect to said carriers and a brush device interposed between said pad and the point of impression, whereby the inked type is brushed
10 immediately before the impression is made, substantially as described.

15 15. In a type-writer, the inking device comprising a box or frame with a pivoted pad-block and a ribbon-holder mounted therein in respect to each other, substantially as described.

16. In a type-writer, the combination, with the longitudinal supporting-bar and the longitudinally-movable paper-carriages supported
20 thereon, of the horizontal roller pivoted upon said bar and provided with a yielding or elastic periphery, the said roller being so disposed that the paper comes into frictional contact
25 therewith during the longitudinal traverse of the carriage, thereby rotating said roller, substantially as described.

17. In a type-writer, the paper-carriage consisting of the combination of the end heads
30 and their connecting parts, the depending end arms, their connecting-bar, the shaft mounted in said arms, the fingers on said shaft, the stud fixed on one end of said shaft, and the lateral hand-lever fulcrumed on one of the
35 end heads and adapted to act upon said stud, substantially as described.

18. In a type-writer, the paper-carriage consisting of the combination of the end heads, the forward connecting-plates therefor, the
40 spring-controlled clamping-bar provided with fingers 146, the shaft provided with recesses with which said fingers engage, the end arm on said shaft, and the lateral hand-lever for operating said arm, substantially as described.

45 19. In a type-writer, the combination, with a longitudinally-movable paper-carriage, of a frictional clutch device connected with and adapted to impart a step-by-step movement to said carriage and provisions intermediate
50 the clutch device and the keys for actuating said clutch device when the keys are manipulated, substantially as described.

20. In a type-writer, the combination, with a longitudinally-movable paper-carriage, of a
55 clutch device connected therewith and a pivoted frame mounted in the paths of the respective key-bars and operatively connected with said clutch device, substantially as described.

21. In a type-writer, the combination, with 60 a paper-carriage provided with the rear longitudinal bar, of a clutch device on the bar, said device comprising a frame with a clamping-plate and a lever mounted therein, said lever adapted to be actuated through the medium of the key-bars, substantially as described. 65

22. In a type-writer, the combination, with a longitudinally-movable paper-carriage, of a clutch device connected therewith and a pivoted frame mounted in respect to the key-bars
70 and connected with said clutch device, the ends of said key-bars being notched or recessed and adapted to act against the frame, substantially as described. 75

23. In a type-writer, the combination, with a paper-carriage provided with a rear longitudinal bar, of a clutch device on the bar, said device comprising a frame with a clamping-plate and a lever mounted therein, said
80 lever adapted to be actuated through the medium of the key-bars, together with a permanent back-stop for said clutch device, substantially as described.

24. In a type-writer, the combination, with 85 a longitudinally-movable paper-carriage, of a clutch device connected therewith, a frame pivotally mounted in respect to the key-bars of the machine and connected with said clutch device, a shaft supporting said frame, and
90 means for operating said shaft to change the position of the frame in respect to the ends of the key-bars, substantially as described.

25. In a type-writer, the combination of the sector-bearing frame, the series of independent type-sectors pivoted therein, the rod upon which said frame is mounted so that the frame may be tilted forward or moved endwise on the rod, the key-bars, and mechanism adapted to be actuated thereby to effect the adjustment of said frame and to operate the sectors, substantially as described. 95

26. The combination, with the rod 7 and its supporting parts, of the two-part sector-bearing frame, one of its parts being pivotally
105 mounted upon the said shaft and the other or sector-carrying part being attachable to or detachable from said pivotal part, together with means for connecting said parts, substantially as described. 110

In testimony whereof I have hereunto affixed my signature this 24th day of March, A. D. 1891.

GEORGE S. JONES.

Witnesses:

JOHN R. NOLAN,
JOSHUA PUSEY.