

H. S. DUKES.

WORK HOLDER ATTACHMENT FOR TYPE WRITER DESKS.

APPLICATION FILED FEB. 1, 1900. RENEWED AUG. 25, 1909.

992,931.

Patented May 23, 1911.

6 SHEETS—SHEET 1.

Fig. 6.

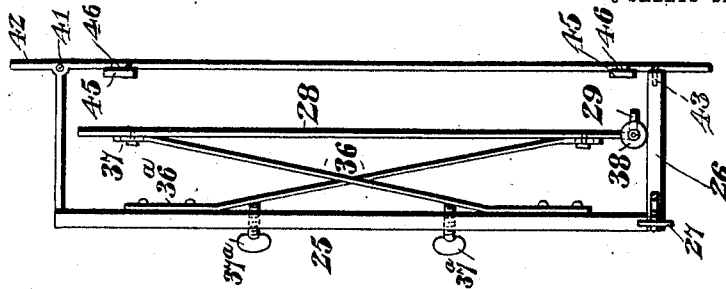
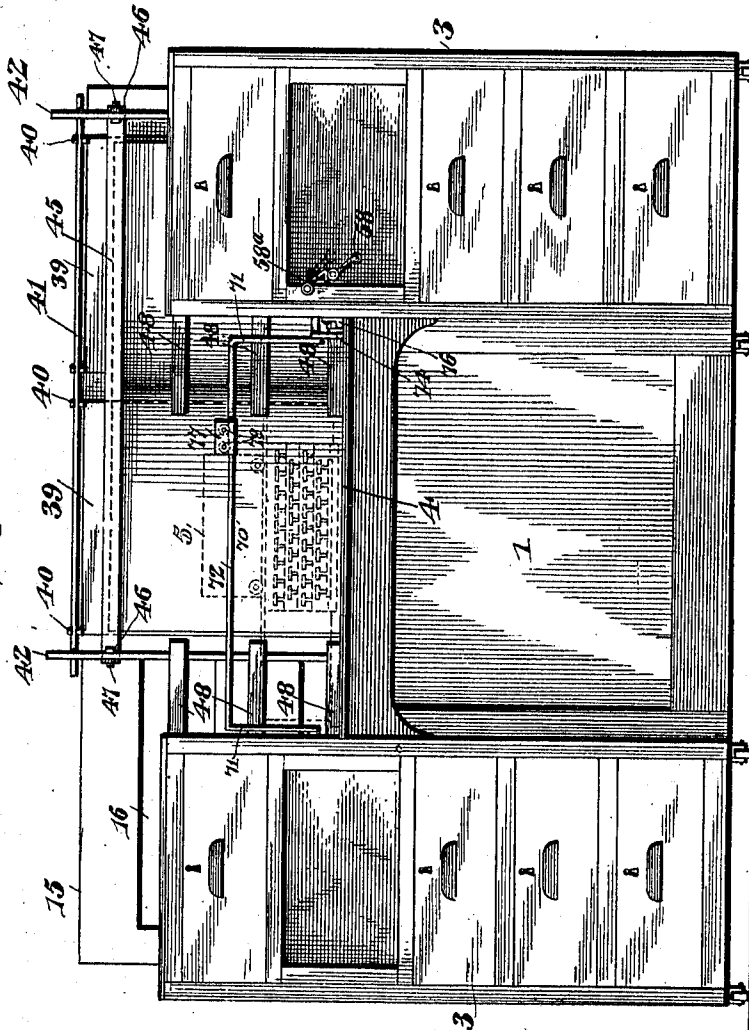


Fig. 1.



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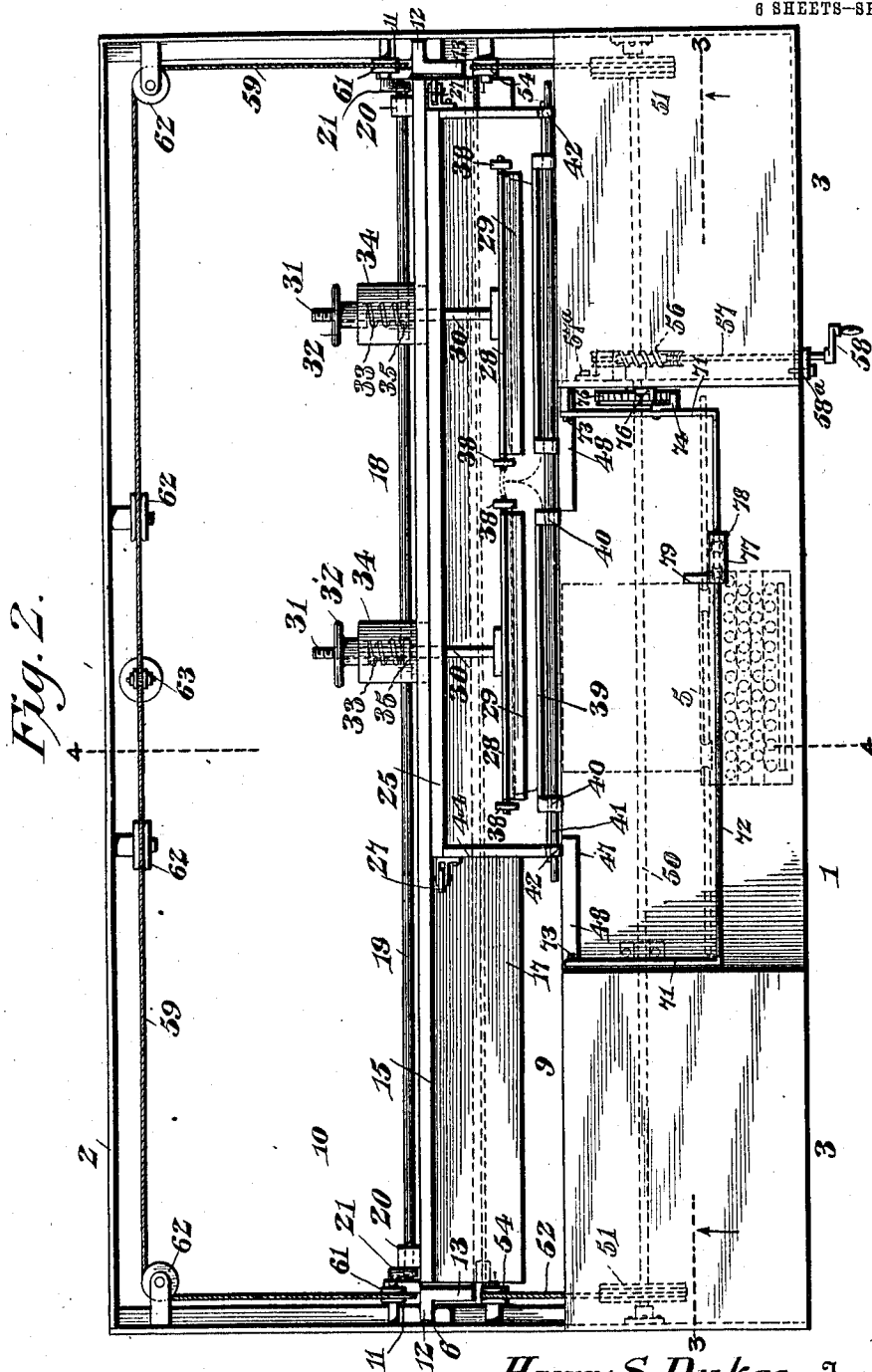
Witnesses
James K. McLaughlin
S. P. McLaughlin

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6 SHEETS-SHEET 2.



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6 SHEETS-SHEET 3.

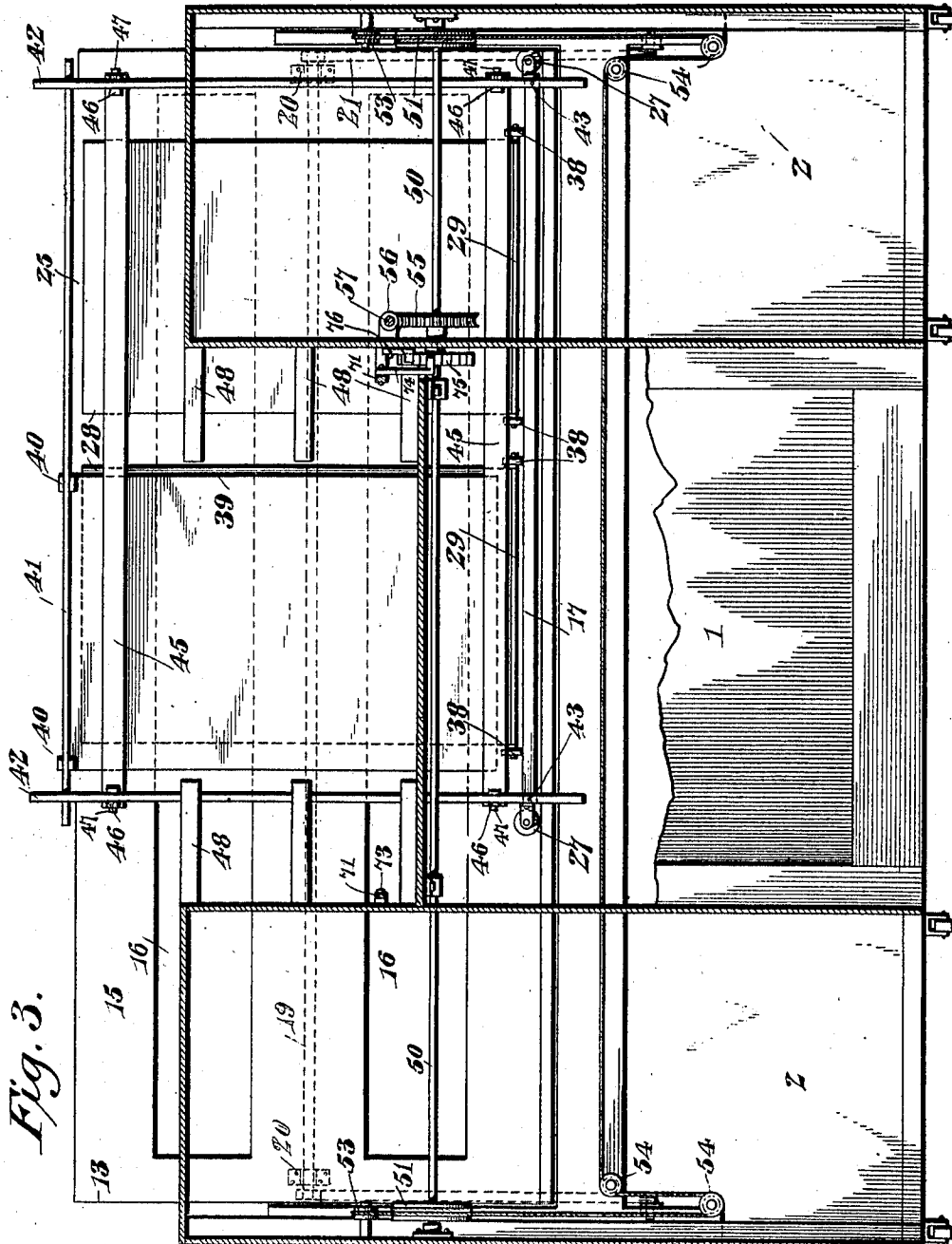


Fig. 3.

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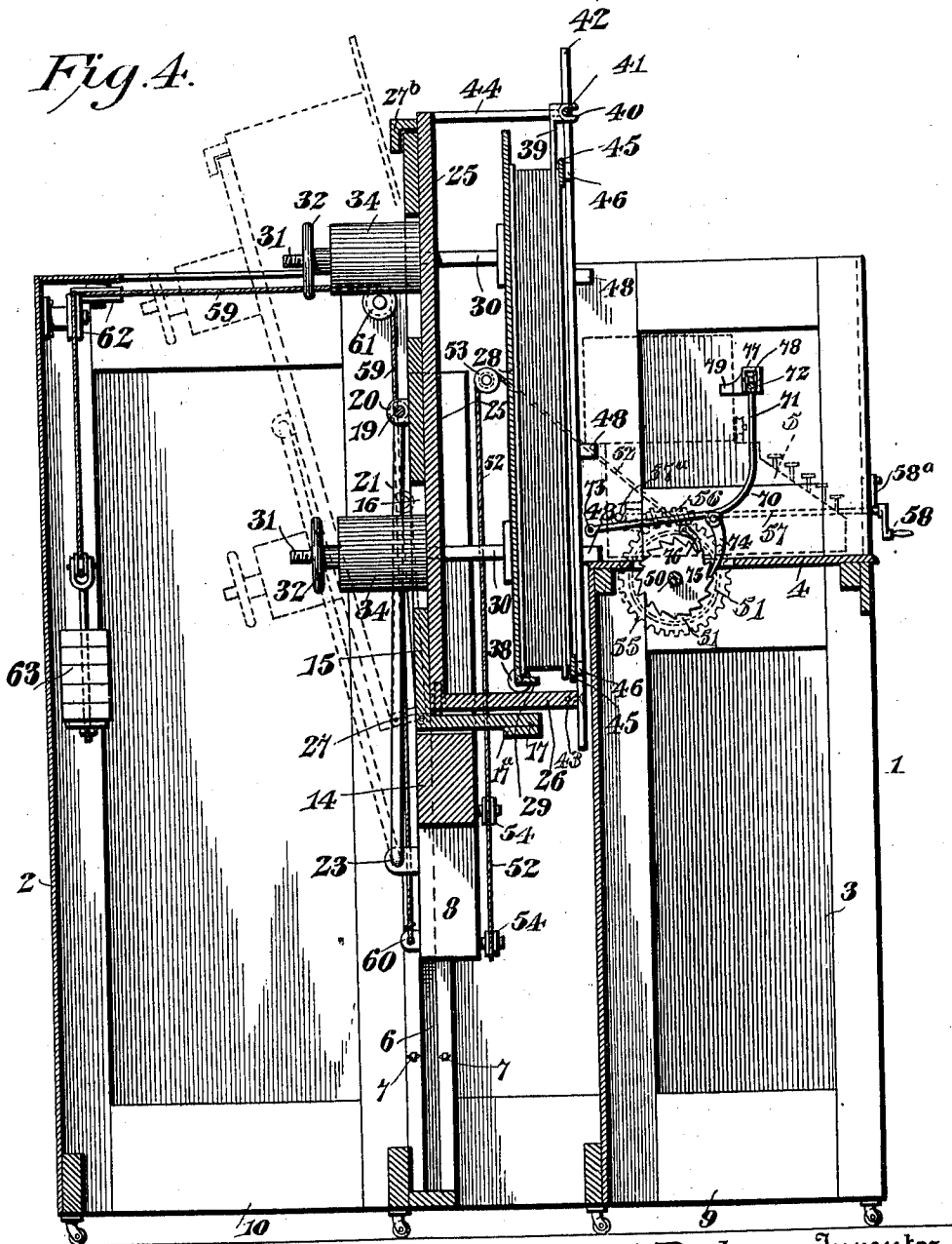
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6 SHEETS—SHEET 4.



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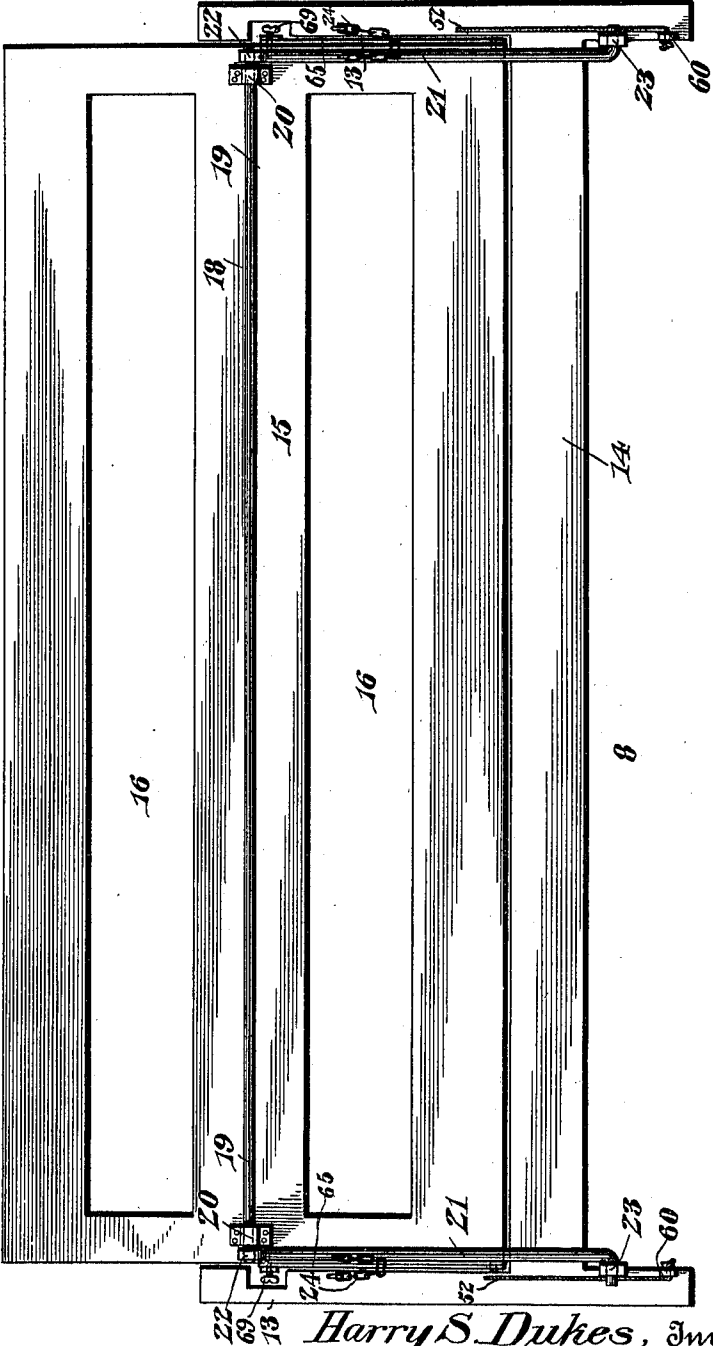
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6 SHEETS—SHEET 5.

Fig. 5.



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6 SHEETS—SHEET 6.

Fig. 7.

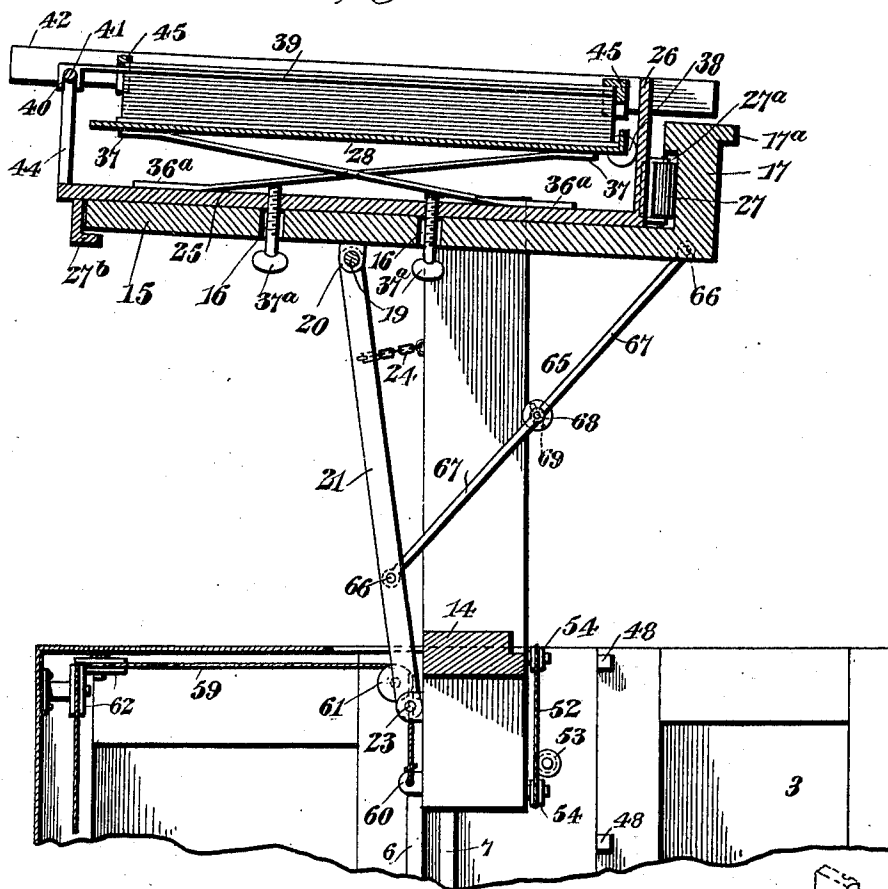
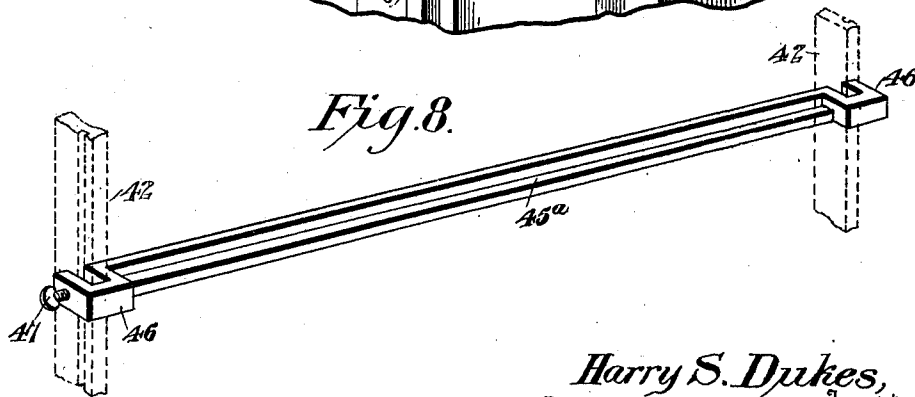


Fig. 8.



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UNITED STATES PATENT OFFICE.

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WORK-HOLDER ATTACHMENT FOR TYPE-WRITER DESKS.

992,931.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed February 1, 1900, Serial No. 3,598. Renewed August 25, 1909. Serial No. 514,607.

To all whom it may concern:

Be it known that I, HARRY S. DUKES, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented a new and useful Work-Holder Attachment for Type-Writer Desks, of which the following is a specification.

This invention relates to an improved work holder for typewriting machines, preferably associated with a desk which is designed for the support of the machine proper, while at the same time providing for holding the paper and the necessary appurtenances of a complete typewriting machine outfit.

To this end the invention primarily contemplates a work holder attachment for typewriter desks, so constructed and arranged as to provide for holding the work in a perpendicular plane or in a plane approximately perpendicular, so that the type-carrying bars of the machine will operate against the work while sustained in an upright position, as contra-distinguished from machines of the character which operate upon the work in a horizontal or approximately horizontal plane.

A further object of the invention is to provide simple and reliable means for sustaining in an upright position any kind of work, such as pages of bound books, pamphlets, pads, and folded sheets, as well as upon ordinary single sheets of paper. In carrying out this object, the invention makes special provision for supporting in operative relation to the typewriting machine, small and large record books, thereby permitting of the convenient and rapid printing upon the pages of the book.

Another object of the invention is to provide the attachment with improved means for arranging the parts so that the transverse plane of writing may be maintained at a constant point, or in a fixed horizontal plane, while the book or other piece of work to be written upon may be raised or lowered to provide for the necessary line spacing, and the invention also contemplates novel and efficient means for properly backing up the work to the machine, and also for shifting the work laterally, vertically, backward and forward, as well as providing a novel

expedient for facilitating the removal and replacing of the work.

With these and many other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of construction underlying the invention are necessarily susceptible to a variety of modifications without departing from the spirit or scope thereof, but the preferred embodiment of the improvements is shown in the accompanying drawings, in which,—

Figure 1 is a front elevation of a desk structure equipped with a work holder attachment constructed in accordance with the present invention. Fig. 2 is a top plan view of the construction shown in Fig. 1, showing the cover for the desk casing removed. Fig. 3 is a vertical longitudinal sectional view on the line 3—3 of Fig. 2. Fig. 4 is a vertical transverse sectional view on the line 4—4 of Fig. 2. Fig. 5 is a detail elevation of the vertically movable supporting frame, and the tilting carriage holder carried thereby. Fig. 6 is a detail elevation showing a modification of the spring-supports for the back-rests for the work. Fig. 7 is a detail vertical sectional view embodying a slight modification of the structure and illustrating the work holder elevated and swung to a substantially horizontal position. Fig. 8 is a detail in perspective of the lower one of the work clamping strips shown in Fig. 7.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

While the present invention is essentially a work holder attachment for use in connection with a typewriting machine, capable of writing upon work held in an upright position, or in a vertical plane, still the same is preferably associated with a desk that provides also for the support of the machine proper, so for illustrative purposes, a desk structure is shown in the drawings which provides a casing for housing the working parts of the attachment.

Referring particularly to the drawings,

the numeral 1 designates a typewriter desk constructed in the form of a casing 2 and provided at the front thereof with the oppositely arranged side drawer cabinets 3, and between the said cabinets with an elevated stationary machine platform or table 4, which provides a support for the typewriting machine 5. The typewriting machine 5 forms no part of the present invention, and is therefore only indicated in dotted lines, but it will be understood that this machine must necessarily be of a type capable of printing upon the work in an upright or vertical position, and also constructed with suitable escapement mechanism which permits the machine to travel horizontally across the page or sheet being printed upon to insure the proper spacing of the letters and words. The essential feature, however, of the present invention is that a suitable stationary platform 4 will be provided for the machine, and that the casing in rear of the platform be left open so as to expose the work to the type-carrying bars of the machine, such construction being plainly shown in Figs. 1, 2, 3, and 4 of the drawings. At this point it may be further observed that inasmuch as it is only necessary to provide a suitable platform or table for supporting the machine and a casing or housing for the working parts of the attachment, the desk proper may be of any suitable kind, and constructed according to the skill of the cabinet-maker, without affecting the working parts of the invention, and it will also be understood that the desk is preferably provided with a suitable top or cover, but as this forms no part of the invention it has not been deemed necessary to illustrate the same.

To provide for properly guiding the work holder attachment in its vertical movements, the desk casing 2 has fitted to the opposite inner sides thereof, the oppositely-located, vertically-disposed grooved guide-ways 6, which guide-ways extend substantially the full height of the casing and are preferably adjustably secured in position by means of suitable fasteners 7, whereby the same may be readily adjusted at any time to correct any tendency of the main supporting frame 8 to side play as it is adjusted up and down within the casing. The vertical guide-ways 6 are arranged at a point intermediate the rear edge of the platform 4 and the back of the desk casing 2, in order to permit of the free movement of all parts in rear of the plane of the platform 4, as plainly shown in Fig. 4 of the drawings, and at this point it may be observed that in constructing the casing 2, whether in the form of a desk structure or not, the same is preferably formed of front and rear sections 9 and 10, suitably joined together at their meeting portions 11, by any well known carpenter's expedient. This sectional construction of

the casing permits of the ready separation thereof to gain access to the working parts of the attachment for purposes of adjustment, as well as for convenience in assembling the same in operative relation.

The main supporting frame 8 is held to a fixed reciprocation in a vertical plane by the grooved guide-ways 6, and the said frame may be provided with laterally-projecting slide flanges 12, engaging in the grooves of said guide-ways 6, as plainly shown in Fig. 2 of the drawings. The vertically-movable supporting frame 8 is preferably of a skeleton formation and may be conveniently constructed in an H-form, consisting of the parallel side bars 13 engaging with the guide-ways, and a horizontal cross bar 14 connecting the said side members, preferably near their lower ends, so as to leave within the upper portion of the said supporting frame an open space within which registers a tilting carriage holder 15. The tilting carriage holder 15 preferably consists of a rectangular frame which is of a sufficient length to permit of the necessary play of the carriage, as it travels horizontally lengthwise of the casing. The tilting carriage holder frame 15 may also consist of a skeleton framework, and is preferably provided with longitudinal slots 16, extending from end to end thereof and arranged in substantial parallelism, and at its lower edge, the carriage holder frame 15 is provided with a horizontal, forwardly-projecting guide-rail or ledge 17, the function of which will be presently referred to. To provide for the proper support of the carriage holder frame 15 within the main supporting frame 8, and at the same time to permit of the tilting or swinging movement of said carriage holder frame, there is employed a swinging supporting bail 18. The swinging supporting bail 18 essentially consists of a hinge rod 19 extending longitudinally of the frame 15 at the rear side thereof, and held thereto by the clip plates 20 fitted to the rear side of the frame 15, preferably at points contiguous to the opposite ends thereof. The swinging supporting bail 18 not only includes the longitudinal hinge rod 19, but also the swinging side arms 21 having a pivotal connection, as at 22, with the extremities of the rod 19, and having their lower ends hinged or pivoted by means of a suitable pivotal connection 23 to the vertically-movable, main supporting frame 8 at a point preferably below the horizontal cross-bar 14 thereof. The bail 18 consisting of the separate members 19—21, is in effect a U-shaped supporting bail, which not only provides for the pivotal mounting of the carriage holder frame 15, so that it may properly adjust itself to the work, but at the same time permits said frame 15 to be swung or tilted backward out of the supporting frame

8, to a position in rear thereof, as indicated in dotted lines in Fig. 4 of the drawings.

It will be observed, particularly by reference to Fig. 5 of the drawings, that the swinging side arms 21 of the supporting bail 18 for the carriage holder frame 15, are disposed behind or in rear of the said carriage holder frame 15, thereby acting in the capacity of abutting stops to prevent the lower portion of said carriage holder frame from swinging inward within the bail, or in other words, between the said side arms 21, while at the same time permitting the carriage holder and the parts associated therewith to be swung back bodily with the said bail 18, away from the writing plane, whenever this is necessary in the manipulation of the device. This backward swing of the carriage holder and the parts supported thereby, with the supporting bail 18, may be limited or arrested by various expedients, such as providing the carriage holder frame 15, at the lower front edge thereof, with a stop projection 17^a, (see Figs. 4 and 7 of the drawings) which stop projection is arranged in a position to engage with the cross-bar 14 of the main supporting frame. This result, however, may be accomplished by depending upon the stop chains or equivalent flexible connections 24, which are connected respectively with the side arms 21 of the bail and the side members 13 of the main supporting frame 8. The said stop chains 24, however, subserve another function when the main supporting frame 8 is elevated sufficiently to carry the carriage holder frame 15 entirely out of and above the casing, as shown in Fig. 7 of the drawings. When the parts have been thus adjusted, the said stop chains or equivalent connections 24 serve to hold the swinging supporting bail 18 against further backward movement. In such position, the carriage holder, or carriage holder frame 15, can be tilted to any desired angle upon the pivot rod 19 as an axis, and held fixed in such tilted position through the medium of the hinged braces 65, or equivalent means. A pair of these hinged braces 65 are preferably employed, and are pivotally connected at their extremities, as at 66, respectively with the side arms 21 of the bail 18, and with the carriage holder, or carriage holder frame 15, as plainly shown in Figs. 5 and 7 of the drawings. Each of the hinged braces 65 essentially consists of separate members or sections 67, connected together at their contiguous ends by a hinge or knuckle joint 68, which receives a clamping screw 69. This clamping screw 69 when loosened permits the brace, 65 to break or fold at the joint 68 thereof, so as to accommodate itself to the swinging or tilting movements of the carriage holder, but when the said clamping screw 69 is tightened, the same practically

locks the joint of the brace and prevents folding thereof, thereby serving to secure the carriage holder and the parts carried thereby in any titled position upon the rod 19 as an axis, and as illustrated in Fig. 7 of the drawings, the carriage holder may be adjusted and held in approximately a horizontal plane. This adaptation of the carriage holder or carriage holder frame for various adjustments greatly facilitates the handling of the work by affording a convenient method of inserting and removing heavy record books in and out of the work holder.

When the carriage holder frame 15 is readjusted into the open space of the frame 8, above its horizontal cross-bar 14, it will remain in this position by reason of the fact that the carriage holder passes to a position forward of the vertical plane of the fulcrum or pivot points 23 for the bail 18, as plainly shown in Fig. 4 of the drawings.

The tilting carriage holder 15 provides a support, as well as a guide-way, for the horizontally-movable or traveling work-holding carriage 25. The work-holding carriage 25 is of a width substantially equaling the width of the holding frame 15, but is materially shorter than said holding frame, so as to have a traveling movement from end to end thereof, and the said work-holding carriage 25 essentially consists of a rectangular body arranged in an upright position within the holding frame 15, and provided at its lower end with a horizontal, forwardly-extending supporting shelf 26. The said work holding-carriage 25 also has fitted to the lower edge thereof, preferably at its bottom corners, the traveler wheels or rollers 27, which are adapted to travel upon the guide rail or ledge 17 at the lower edge of the holding frame 15, thereby permitting of the free movement or travel of the carriage lengthwise of the said holding frame.

To provide a more substantial bearing for the lower end of the work-holding carriage than afforded by the construction shown in Fig. 4 of the drawings, the slight modification shown in Fig. 7 may be resorted to. This modification simply involves employing somewhat wider traveler wheels or rollers 27 than those shown in Fig. 4, which may travel in a groove 27^a formed in the upper side of the guide rail 17 at the lower edge of the carriage-holding frame, such a construction necessarily preventing forward displacement of the lower end of the work-holding carriage, while similar displacement of the upper end of the carriage may be obviated by providing the same at such end with rearwardly-extending guard hooks 27^b, taking over and slidably engaging the upper edge of the carriage-holder frame, as plainly shown in Figs. 4 and 7 of the drawings.

The horizontal traveling work-holding

carriage 25 is designed to accommodate for movement and adjustment therein, one or more back-rests 28 which serve to back up the work and hold the same in proper working position with relation to the machine 5 on the platform or table 4. A pair of these back-rests 28 is preferably associated with the work-holding carriage 25 to provide for supporting a record or other book in an open position, as shown in dotted lines in Fig. 2 of the drawings. When a pair of such rests is employed as a part of the attachment, the same are spaced a sufficient distance apart to hold the separate backs and portions of the book when spread open, and are also disposed in such positions as to present the page or sheet in a perfectly flat condition to the type carrying arms or bars of the typewriting machine 5. Each of the back-rests 28 preferably consists of a flat rectangular plate or board, provided at its lower edge with a horizontal, forwardly-projecting supporting-ledge 29, upon which rests the lower edge of the book or sheet to be printed upon.

In carrying out the invention, it is necessary to provide some means for yieldingly pressing each back-rest in a forward direction, so as to take up any looseness in the sheet, and also to provide for moving the sheet, especially in book work, to the proper printing plane, it being understood that in printing in books especially, the same will be of variable thickness, even when open, but this is compensated for by the forward adjustment of each back-rest. It should be observed at this point that the back-rests 28 are entirely disconnected from each other, and also from the work-holding carriage, thereby permitting of the independent and individual adjustment of each back-rest, whereby the same may be located within the carriage wherever needed.

To secure the necessary forward adjustment of each back-rest, and at the same time to permit it to yield backwardly under strain, various expedients may be resorted to. One of these expedients is shown in Figs. 2 and 4 of the drawings, and consists in placing against the rear side of each back-rest 28 a pair of upper and lower adjusting rods 30. These adjusting rods 30 carry at their front ends heads bearing against the back-rests. Said rods also extend through and beyond the body portion of the work-holding carriage 25, and are provided with threaded rear end portions 31, on which are mounted the adjusting nuts or wheels 32, which bear against adjacent ends of the spring casings 34 fitted to the rear side of and carried by the work-holding carriage 25. Within the spring casings 34 the adjusting rods 30 may be provided with the bearing flanges or collars 35, against which abut one end of the pressure

springs 33 housed within the casing 34, so that the tension of these springs will be normally exerted against the rods 30 in a direction to move the back-rest in a forward direction, while at the same time permitting of a yielding backward movement of the rest when subjected to strain in this direction. In this form of device for each of the back-rests 28, it will be observed that the spring casings 34 housing the pressure springs 33, project through and freely work within the longitudinal slots 16 of the carriage-holding frame 15, said slots thereby permitting of the free travel of the work-holding carriage in a horizontal direction without interference.

Another expedient that may be resorted to for the purpose of yieldingly adjusting the back-rests in a forward direction, is shown in Figs. 6 and 7 of the drawings. In this modification, each back-rest 28 is shown associated with a pair of diagonally-crossed, flat pressure springs 36. These pressure springs are interposed between the back-rest and the adjacent side of the work-holding carriage 25, and are rigidly fastened at one end, as at 36^a, to the carriage, while the opposite ends of said springs are loosely connected, as at 37, with the back-rest to permit of the forward and backward movement thereof. The tension of the diagonally-crossed pressure springs shown in Figs. 6 and 7 of the drawings, may be regulated by the employment of adjusting screws 37^a working in threaded openings formed in the back of the work-holding carriage and extending through the slots 16 of the carriage holder 15.

Each of the forwardly and backwardly-movable back rests 28 is fitted at its lower end, preferably at the bottom corners thereof, with the anti-friction guide rollers 38, which ride upon the supporting shelf 26 of the work-holding carriage, and thereby sustain the back-rest in its upright or vertical position, while admitting of the movement thereof with a minimum amount of friction.

In carrying out the invention, it is necessary to furnish a firm backing for the page, leaf, or sheet being written upon, and to provide for this, there are employed platens 39. A platen is designed to be associated with each back-rest, and each of the said platens consists of a rectangular flat plate of steel or other suitable material, preferably covered with the rubber composition which is usually employed in the construction of typewriting machine platens, and each of the platens 39 used in carrying out the present invention is of approximately the same size as the back-rest 28 with which it is associated, and is designed to be inserted back of the page, leaf, or sheet being written upon, as plainly shown in Fig.

4 of the drawings. Each of the platens 39 is provided at the upper end thereof with suitable hangers 40 which are adapted to be loosely engaged with a horizontal supporting rod 41, arranged at the top of and carried by the traveling work-holding carriage 25.

The hangers 40 for each platen are preferably in the form of forked lugs, projecting laterally from the platen at the top edge thereof, and having their bifurcated portions loosely taking over the supporting rod 41. The said forked hanger lugs 40 of each platen may be projected forwardly or rearwardly thereof, according to the position of the supporting rod 41, as illustrated in Figs. 4 and 7 of the drawings, and the construction described permits the movement of each platen toward or from the vertical printing plane, to adapt the same to various thicknesses of paper for manifolding, or to meet the other requirements of the work, or in other words, furnishes a striking backing for the work, irrespective of the thickness thereof, while at the same time permitting the vertical plane of the printing surface to remain constant.

The horizontal supporting rod 41 is preferably, though not necessarily, connected at its ends to the oppositely-located side guide-rods 42 which are sustained in position at opposite side edges of the traveling work-holding carriage. These guide rods 42 may be conveniently supported in place by being held at or near their lower ends, as at 43, to the lower supporting shelf 26 of the carriage, and held at or near their upper ends by suitable top braces 44, extending forwardly from the carriage. The said side guide rods 42 of the work-holding carriage also provide supports for the horizontal work-clamping strips 45 which are arranged longitudinally of the work-holding carriage and are adapted to bind against the leaf, page, or sheet at the top and bottom edges thereof, as plainly shown in Figs. 1, 3, 4, and 7 of the drawings. The clamping strips 45 extend across the space between the side guide-rods 42, and may be provided at their ends with clips 46 adjustably embracing the side guide rods 42, and held in place thereon at any point of adjustment by binding screws 47 passing through the clips and engaging with the guide-rods, as plainly shown in Figs. 3 and 8, but any equivalent device may be resorted to for adjustably connecting the clamping strips to the guide rods, if it should be desirable to provide some means for holding these clamping strips rigidly in place when they have been properly adjusted. Also the separate fastenings for the clamping strips may be dispensed with, and said strips 46 thereof slidably engage with the guide-rods 42 to permit of the shifting or adjustment of the clamping strips, and

which would be held in position upon the guide rods 42 solely by the pressure of the work thereagainst. This modification is suggested in Fig. 6 of the drawings. It will thus be seen that the clamping strips 45, in connection with the platens 39 and the back-rests 28, provide positive and reliable means for firmly holding the book or other piece of work in place, while at the same time presenting the page or sheet to the machine in a perfectly flat condition, while the platens provide the hard writing surface which is necessary to insure nice work. In this connection it is to be observed that a slight modification of the guide-rods 42 and the clamping strips 45 associated therewith may be resorted to, such as shown in Figs. 7 and 8 of the drawings. This modification involves a widening of the guide-rods 42 and providing the lower one of said clamping strips 45 with an inwardly-projecting holding flange 45^a, which is designed to receive thereon the lower edge of the platen and the work in front thereof, so as to prevent possibility of the same being displaced during the printing operation. The said side guide-rods 42 not only perform the functions already described, but the same coöperate with a series of horizontally arranged stop bars 48 fitted to the casing 2 contiguous to the vertical plane of the rear edge of the machine platform or table 4 and forming continuations of the adjacent inner faces of the cabinet portions 3 whereby both of the rods 42 may simultaneously be in contact with practically the same stop surface. A series of these horizontal stop bars 48 is preferably arranged at each side of the plane of the machine platform or table 4, and adapted to be always engaged by the side-guide-rods 42. It will be observed that after the carriage holding frame 15 has been tilted and returned to its upright position within the open space of the frame 8, further forward movement of the frame 15 is arrested by the guide-rods 42 coming in contact with the horizontal stop-bars 48; which bars of each series are vertically alined to form rests which hold the work-holding carriage in a perpendicular plane.

It is necessary in operating the attachment to provide means for raising and lowering the work-holding carriage to secure the necessary line spacing for the work. This result may be accomplished by various means, a preferable form of which is shown in the drawings to which particular reference will now be made.

A winding shaft 50 is journaled in suitable bearings fitted to the desk casing, and may be conveniently arranged within the front part of the casing below the plane of the machine platform or table 4. The said winding shaft 50 extends longitudinally of the casing, from end to end thereof, and

has fitted on opposite ends the drums 51, to which are respectively connected the opposite ends of an adjusting cable 52. The opposite end portions of the adjusting cable 52, which are connected with the drums 51 and wind and unwind thereon, extend from their connection with said drums to the fixed guide pulleys 53, supported within the casing, at opposite ends thereof, and from the end or fixed guide pulleys 53, the intermediate portion of the adjusting cable 52 is reeved around a plurality of guide pulleys 54, mounted on the main supporting frame 8, preferably below the plane of the carriage holding frame 15, carried thereby, as plainly shown in Fig. 3 of the drawings. To provide for the rotation of the shaft 50 in either direction, the same has fitted thereon, at a suitable point between its ends, a worm gear wheel 55 with which meshes a worm gear 56 carried by a short operating shaft 57 arranged at right angles to the winding shaft 50, and journaled in suitable bearings applied to the desk casing. The outer end of said operating shaft 57 is conveniently exposed at the front of the desk, and has fitted thereto a hand crank 58, which is grasped by the operator and turned in either direction, according as it is desired to raise or lower the main supporting frame 8, and the parts associated therewith. The worm gearing 55-56 necessarily constitutes a locking device which prevents movement of the main supporting frame 8 and the parts carried thereby, after adjustment thereof to a predetermined position, but through the medium of said gearing and the reeving of the cable 52 around pulleys on the guide frame, said frame may be raised and lowered, according to the direction in which the winding shaft 50 is rotated. It will thus be seen that the same mechanism constitutes a raising and lowering device, and also a locking device for holding the parts in their adjusted positions. It will be understood that I do not wish to restrict the invention to this specific form of mechanism, as any equivalent devices, such as gearing and the like, which would accomplish the same result, may be resorted to. In connection with the raising and lowering mechanism, it may be further observed that the same may constitute a line spacing mechanism to provide for elevating the work the desired distance after each succeeding line, to secure the necessary spacing between the lines. On account of the weight of heavy record books and like work, it is necessary to provide some mechanism such as described to provide for effecting the desired elevation of the work with a minimum exertion on the part of the operator.

To permit of the raising and lowering mechanism for the work holding carriage acting in the capacity of a line spacing mechanism, there is associated therewith an

auxiliary operating device therefor. This auxiliary operating device includes a swinging pawl carrying frame 70, essentially consisting of a pair of end arms 71 and a horizontal cross-bar or rail 72 connecting the same, said end arms being pivotally supported at one end, as at 73, on the casing, preferably above the plane of the machine platform 4. The said swinging pawl carrying frame 70 has pivotally suspended therefrom a spacing pawl 74, which is adapted to engage with the teeth of a ratchet wheel 75, fast on the winding shaft 50, and with this ratchet wheel 75 is also associated a pivotal check pawl 76, mounted on the casing and arranged to prevent backward rotation of the ratchet wheel. The horizontal or longitudinal rail 72 of the swinging pawl carrying frame 70, supports thereon a traveling line spacing key 77. This key may be conveniently in the form of a block carrying traveler rollers 78 engaging with the rail 72, said block being also provided with an offset arm 79 adapted to be engaged by the traveling type carriage of the machine 5.

To permit of the rotation of the winding shaft 50 under the influence of the actuating device just described, it is necessary to make provision for the disengagement of the worm 56 from the worm gear wheel 55. This may be accomplished by hinging the operating shaft 57 at its inner end, as at 57^a, whereby the same may be swung in a vertical direction, either to engage or disengage the worm 56, and the said operating shaft 57 is held in either its operative or inoperative positions through the medium of the spring catch 58^a, which may be conveniently arranged at the front side of the casing, and adapted to engage above or below the shaft 57, as shown in full and dotted line positions in Fig. 1 of the drawings. With the operating shaft 57 held in its elevated position so that the worm 56 thereof is disengaged from the worm gear wheel 55, it will be seen that the depression of the swinging pawl carrying frame at intervals during the operation of the machine, will cause the step-by-step rotation of the shaft 50 to effect the necessary line spacing for the work. As the traveling type carriage of the machine advances the same engages with the frame of the traveling line spacing key 77, and carries such key along the rail of the pawl carrying frame, so that it is simply necessary for the operator to place his fingers upon said key and depress the swinging pawl carrying frame to space up a line, and without removing the fingers from the key, the same is run backward along the rail 72, thereby carrying the type carriage back.

It will of course be understood that when it is necessary to simply raise or lower the entire device through the medium of the op-

erating shaft 57 and its worm, the pawls 74 and 76 must necessarily be disengaged from the ratchet wheel 75.

In using heavy record books or other heavy articles to be printed upon, it is desirable to use in connection with the attachment, a system of counterbalancing, to provide for counterbalancing the weight of the main supporting frame 8 and the parts sustained thereby. A preferable way of accomplishing this result is shown in the drawings, and involves the employment of a weight cable 59 strung within opposite end portions and the back of the desk casing and attached at opposite ends, as at 60, to the main supporting frame 8, preferably at a point below the horizontal cross-bar 14 thereof. The adjusting cable 59 extends from its point of connection 60 with the main frame 8, upwardly to the top portion of the desk casing, and there passes around fixed guide-pulleys 61 mounted within the casing at the ends thereof. From the fixed guide pulleys 61, the said cable 59 is reeved around horizontally and vertically disposed guide pulleys 62, which direct the cable to the central rear portion of the desk casing where it loosely receives thereon a counterbalance weight 63. This weight may be increased or diminished according to the nature of the work sustained by the carrying frame 8, but by reason of employing the counterbalancing weight and connecting the same, through the medium of the cable 59, to the frame 8, it will be readily understood that the parts are so counterbalanced that the raising and lowering operation will be performed with a minimum effort, and the vertical movement of the frame 8 will respond to the slightest turn of the winding shaft 50.

In using the attachment, for instance, in book work, with the parts arranged as shown in Fig. 1 of the drawings, one entire page of the book may be printed upon the machine, and during this operation, it is simply necessary to elevate the main supporting frame through the medium of the mechanism described, after the printing of each succeeding line. After the page has been printed upon, it is simply necessary to grasp the carriage 25 at any point, push it backward sufficiently to relieve it from pressure against the front rests 48, and then to move the same horizontally along the carriage holding frame 15 until the opposite page of the book is brought opposite the printing point, when it is permitted to fall to the printing position. Reference has already been made to the adjustable mounting of each platen, but it may be further explained at this point, that owing to the guide-rods 42 resting against the stop bars 48, and the clamping strips 45 against the rods 42, the printing plane is always constant relatively to the

machine, irrespective of the thickness of the writing material, or in other words the writing plane is always coincident with the rear faces of the clamping strips 45. To remove or replace the book, the main supporting frame 8 may be elevated sufficiently to carry the carriage holder clear of the casing, after which the said carriage holder or carriage holding frame can be tilted to any position and held in such position by the means already described, thus permitting of ready access to all of the parts, for the purpose of the removal of a book or other piece of work, as well as to permit of placing the same in proper position for being printed upon, and in its elevated or tilted position, the carriage-holder provides a support for the weight of the book or other work, while being properly fitted in place. In this connection however, it is obvious that the tilting and swinging movement of the work carriage toward and from the printing plane can take place at any and all elevations to permit of erasures, alterations, or handling of the work for any purpose. It may also be observed that when the carriage-holder and its associated parts are replaced within the casing, the swinging bail not only facilitates the back and forth movement of the carriage, as already explained, but at the same time permits of the carriage holder being tilted back to facilitate erasures or other alterations in the work, as well as for the readjustment of the parts.

From the foregoing it is thought that the construction, operation, and many advantages of the herein described work holder attachment for typewriter desks will be readily apparent to those familiar with the art without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters-Patent, is:—

1. In a work-holder for typewriter machines, the casing having a machine platform, a traveling work-holding carriage, a carriage holder, and a support for the carriage holder, said carriage holder having a swinging movement toward and from the printing position, and the holder also having a tilting movement independent of the swinging movement.

2. In a workholder for typewriting machines, the casing provided with a machine support, a separate swinging member independent of the machine support, and a work-holding carriage having a pivoting mounting upon the said swinging member.

3. In a work holder for typewriting machines, the casing provided with a machine

platform, a traveling work holding carriage, a carriage holder, and a support for the carriage holder, said carriage holder having a swinging movement toward and
5 from the printing position.

4. In a work-holder for typewriting machines, the casing provided with a machine platform, a swinging member, a work-holding carriage having a pivotal mounting on
10 the member, means for limiting the movement of the swinging member, and separate means for holding the carriage in a tilted position.

5. In a work-holder for typewriting machines, the casing provided with a stationary machine platform, a swinging member movable at any elevation toward and from the
15 printing plane, a carriage-holder mounted on said swinging member, and a traveling work-holding carriage carried by the carriage holder, substantially as described.

6. In a work-holder for typewriting machines, the casing provided with a machine platform, a swinging member, a carriage
25 holder pivotally mounted on the member, a traveling work-holding carriage carried by the carriage holder, means for limiting the movement of said swinging member, and separate means for holding the carriage-holder in a tilted position, substantially as
30 described.

7. In a work-holder for typewriting machines, the casing provided with a machine platform, a carriage holder, a traveling work
35 holding carriage supported by the carriage holder, means for raising and lowering the carriage holder, and a swinging member connected with the carriage holder and movable at any elevation bodily toward and
40 from the printing plane, said swinging member having a fulcrum below and at one side of the plane of the operative position of the carriage and carriage holder, substantially as described.

8. In a work holder for typewriting machines, the casing provided with a machine platform, a traveling work-holding carriage, a swinging member having a fulcrum below
45 and at one side of the plane of the operative position of the carriage, said carriage also having a pivotal mounting on said swinging member.

9. In a work-holder for typewriting machines, the casing provided with a machine
55 platform, a traveling work-holding carriage, and a swinging bail having a fulcrum support below the carriage, and a pivotal connection with the carriage.

10. In a work-holder for typewriting machines, the casing provided with a machine platform, a vertically-adjustable work-holding carriage, a swinging supporting bail for
60 the carriage to permit of the free swinging thereof at any elevation toward and from the printing position, a folding brace hav-

ing means for holding the carriage in a tilted position and raising and lowering means for the carriage.

11. In a work-holder for typewriting machines, the casing provided with a machine
70 platform, a vertically-adjustable supporting frame, a work-holding carriage, a swinging bail having a pivotal connection respectively with said vertically adjustable frame and with the carriage, and folding braces con-
75 nected respectively with the carriage and said bail, and having means for securing the carriage in a tilted position.

12. In a work-holder for typewriting machines, the casing provided with a machine
80 platform, a vertically-adjustable supporting frame, a swinging member mounted on said supporting frame, a carriage-holder pivotally mounted on said swinging member, and a work-holding carriage arranged for longi-
85 tudinal movement on the carriage holder.

13. In a work-holder for typewriting machines, the casing having a machine plat-
90 form, a vertically-adjustable main supporting frame, a swinging member pivotally mounted on said frame, a carriage holder pivotally mounted on the swinging member, a work-holding carriage arranged for longitudinal movement on the carriage
95 holder, means for limiting the movement of the swinging member, and means for holding the carriage holder in a tilted position, substantially as described.

14. In a work-holder for typewriting machines, the combination of the casing hav-
100 ing a machine platform, a vertically-movable supporting frame mounted within the casing, a carriage-holder pivotally supported upon said frame and movable therewith, and a work-holding carriage supported by
105 said carriage holder and having a horizontal movement lengthwise and independently thereof said carriage being also movable when at any elevation toward and from the printing plane, substantially as set forth.

15. In a work-holder for typewriting machines, the combination of the casing hav-
110 ing a machine platform, a vertically-adjustable, upright supporting frame mounted to work within the casing, a tilting carriage-holding frame adapted to register within
115 said supporting frame, a swinging supporting bail having a hinge connection with the supporting frame and said carriage-holding frame, and a traveling work-holding carriage supported by the carriage-holding
120 frame, and arranged to travel in a horizontal direction lengthwise thereof, substantially as set forth.

16. In a work-holder for typewriting machines, the casing having a machine plat-
125 form, an upright, vertically movable supporting frame mounted to work within the casing, a tilting carriage-holding frame loosely registering within said supporting
130

frame, a swinging bail having a hinge rod mounted at one side of the carriage-holding frame, and terminal side arms extending downward from said hinge rod and pivotally connected at their lower ends to the vertically-movable supporting frame, means for limiting the swinging movement of the bail and the carriage-holding frame supported thereby, and a horizontally-movable or traveling work-holding carriage supported by the said carriage holding frame, and movable longitudinally thereof, substantially as set forth.

17. In a work-holder for typewriting machines, the casing having a machine platform, a vertically-movable upright supporting frame mounted to work within the casing, raising and lowering means for said frame, a separate tiltable carriage-holding frame carried by the supporting frame and provided at its lower edge with a guide-rail, and a horizontally-movable work-holding carriage arranged to travel longitudinally of the separate carriage-holding frame, and carrying traveler wheels riding on the guide-rail, substantially as set forth.

18. In a work-holder for typewriting machines, the casing having a machine platform, an upright, vertically-adjustable supporting frame mounted to work within the casing, a separate tiltable carriage-holder carried by the supporting frame and provided with a guide-rail, said carriage holder having a swinging movement toward and from the printing plane, a horizontally-movable, work-holding carriage supported by the separate carriage-holder and traveling on the guide-rail thereof, and an upright back-rest for the work, supported by and movable with the said carriage, substantially as set forth.

19. In a work-holder for typewriting machines, the combination with the casing having a machine platform, an upright, vertically-adjustable supporting frame mounted to work within the casing, a horizontally-movable work-holding carriage sustained by the supporting frame for movement in unison therewith, and also arranged to travel lengthwise thereof, said carriage being provided at its lower edge with a forwardly-extending supporting shelf, an upright back-rest mounted within the carriage and provided at its lower end with a rest flange for the work, anti-friction rollers riding on the supporting shelf of the carriage, and adjusting devices for yieldingly pressing the back-rest in a direction toward the printing plane, substantially as set forth.

20. In a work-holder for typewriting machines, the casing having a machine platform, and a plurality of stop bars, a work-holding carriage, work-holding devices carried by the carriage and including guide

rods engaging against the stop bars, clamping strips engaging the guides and the work, and a platen adjustable toward and from the clamping strips, whereby the clamping strips will determine the constant printing plane.

21. In a work-holder for typewriting machines, the combination of the casing having a machine platform, a vertically and horizontally movable carriage arranged for adjustment in rear of said platform, a back-rest for the work mounted within the carriage, side guide-rods supported by the carriage, a supporting rod arranged at the upper side of the carriage, a flat platen having hangers adapted to engage with the supporting rod, and upper and lower work-clamping strips arranged longitudinally of the carriage and connected with said guide-rods, substantially as set forth.

22. In a work-holder for typewriting machines, the combination of the casing having a machine platform, an upright vertically and horizontally movable work-holding carriage arranged for adjustment in rear of the platform, an upright back-rest mounted within the carriage and yieldingly pressed in a direction toward the platform, an upright adjustable platen loosely suspended from the carriage in front of the back-rest, and adjustable clamping strips for the top and bottom edges of the sheet or page arranged longitudinally of the carriage in front of the platen, substantially as set forth.

23. In a work-holder for typewriting machines the combination of the casing having a machine platform, an upright vertically-movable supporting frame mounted to work within the casing, a work-holding carriage sustained by said supporting frame, and raising and lowering mechanism for the frame including a winding shaft, means for operating said shaft, cable drums applied to the winding shaft, and an adjusting cable connected with said drums and reeved around pulleys applied to said supporting frame, substantially as set forth.

24. In a work-holder for typewriting machines, the combination of the casing having a machine platform, an upright, vertically-movable supporting frame mounted within the casing, an independently-movable, work-holding carriage sustained by the supporting frame, raising and lowering mechanism having operative connection with said supporting frame, and a counterbalancing weight having cable connection with said supporting frame, substantially as set forth.

25. In a work-holder for typewriting machines, the combination with the casing having a machine platform, and the vertically-movable work-holding devices, of raising and lowering mechanism for said work-holding devices, operating means for said raising and lowering mechanism, and an auxiliary

actuating device for said mechanism to effect a line spacing of the work, substantially as set forth.

26. In a work-holder for typewriting machines, the combination with the casing having a machine platform, and the vertically-movable work-holding devices, of raising and lowering mechanism for said work-holding devices including a single shaft having operative connections with the work-holding devices, means for operating said shaft, and an auxiliary line spacing device arranged to also actuate the shaft.

27. In a work-holder for typewriting machines, the combination with the casing having a machine platform, and the movable work-holding devices, of raising and lowering mechanism, including a single shaft for operative connection with the work-holding devices, gearing for turning said shaft, said gearing including a member adapted to be thrown in and out of mesh, and an auxiliary line spacing mechanism arranged to also actuate said shaft.

28. In a work-holder for typewriting machines, the combination with the casing having a machine platform, and the vertically-movable work-holding devices, of raising and lowering mechanism having a single shaft operatively connected with the work-holding devices, gearing for rotating the shaft in either direction, the said gearing including a member capable of being thrown in and out of mesh, and an auxiliary line spacing device including a ratchet wheel fast on the shaft, and a swinging frame carrying a pawl coöperating with the ratchet wheel.

29. In a work-holder for typewriting machines,

the combination with the casing having a machine platform, and the vertically-movable work-holding devices, of raising and lowering mechanism having a single shaft operatively connected with the work-holding devices, gearing for turning said shaft in either direction, said gearing including a member adapted to be thrown in and out of mesh, and an auxiliary line spacing device comprising a ratchet wheel fast upon the shaft, a vertically swinging frame having a longitudinal rail and carrying a pawl engaging with the ratchet wheel, and a traveling line spacing key mounted upon the rail of said frame and adapted to engage with the type carriage of the machine, substantially as set forth.

30. In a work-holder for typewriting machines, the combination with the casing having a machine platform, and the vertically-movable work-holding devices, of raising and lowering mechanism having a shaft operatively connected with the work-holding devices, and a line spacing device comprising a ratchet wheel fast upon said shaft, a vertically-swinging frame carrying a pawl engaging with the ratchet wheel, and having a rail portion, and a line spacing key arranged to travel on said rail portion of the frame and adapted to engage with the type carriage of the machine, substantially as set forth.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HARRY S. DUKES.

Witnesses:

JOHN H. SIGGERS,

EDWIN E. VROOMAN.