

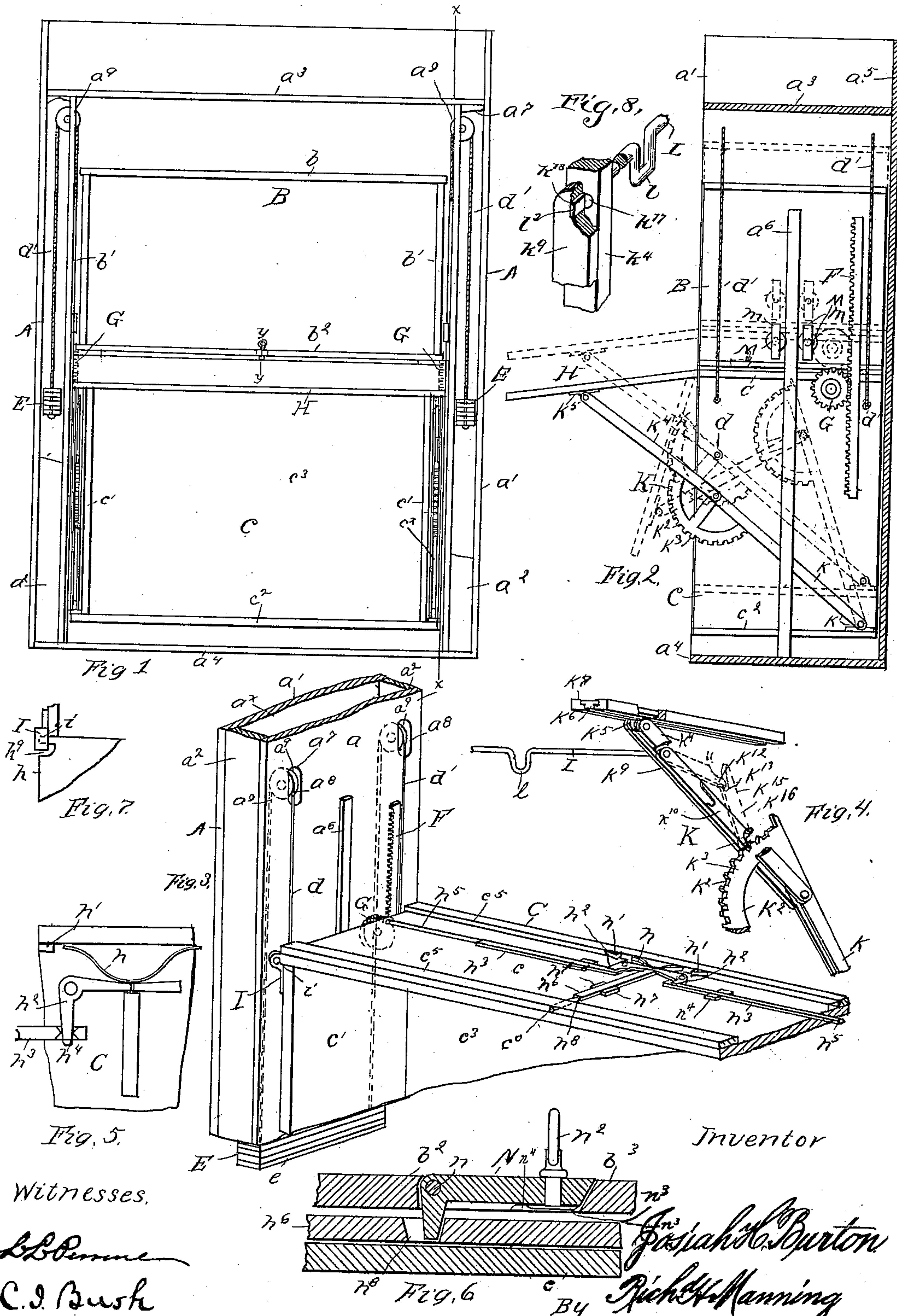
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J. H. BURTON.  
ADJUSTABLE DESK.

(Application filed July 10, 1899.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## ADJUSTABLE DESK.

SPECIFICATION forming part of Letters Patent No. 639,661, dated December 19, 1899.

Application filed July 10, 1899. Serial No. 723,418. (No model.)

*To all whom it may concern:*

Be it known that I, JOSIAH H. BURTON, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Adjustable Desks; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its objects, first, a desk the body of which may be raised and lowered and retained in position at the desired height to accommodate a standing or sitting posture of the user of the desk; second, to secure the desk from vertical movement after adjustment in position; third, to adjust the position of the lid of the desk at any desired angle of inclination and to permit of the self-adjustment of the adjusting devices, and, fourth, to connect the lid with the body of the desk so as to move in the arc of a circle without variance at the pivotal point.

The invention consists in the novel construction and combination of parts, such as will be first fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a front elevation of the improved desk with portions of the hollow sides of the supporting-frame broken away to show the desk-elevating device. Fig. 2 is a vertical sectional view taken upon line  $xx$  of Fig. 1. Fig. 3 is a broken view in perspective of one of the hollow side supports, showing a portion of the top and end of the lower adjustable case of the desk with the lid removed and the case elevating and securing devices. Fig. 4 is a detail view in perspective of a portion of the toothed sector and its support, also showing the pivoted brace-bars on the support and a portion of the lid of the desk with which they are pivotally connected, one of said bars being broken away to show the self-fastening knee-jointed lever engaging with the toothed segment and the releasing-rod. Fig. 5 represents a broken portion in plan of the top of the lower movable case, showing the bell-crank lever and spring portions of the bolt-releasing bar and bolt as seen in Fig. 3. Fig. 6 is a sectional view taken upon

the line  $yy$  of Fig. 1, showing portions of the top of the upper case and the bottom of the lower case and the intermediate bolt-releasing bar and the lever operating the bar. Fig. 7 is a broken view in plan of the rear end of the lid, showing the hinge connection. Fig. 8 is a detail view of a portion of one of the brace-bars supporting the lid of the desk and of the upper part of the knee-jointed lever partially broken away, also showing a broken portion of the releasing cranked rod and the flattened portion of the end of the rod in the upper part of the knee-jointed lever.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, A A represent separate hollow upright side supports extending from the floor upwardly a considerable height to permit of the elevation of the adjustable parts of the desk and which supports are also arranged at a suitable distance from each other. Each support A consists of an inner side  $a$  and an outer side  $a'$ , arranged a short distance apart, the outer side  $a'$  extending in height a short distance above that of the inner side  $a$  of the hollow support. The sides  $a a'$  are connected together by front and rear end plates  $a^2 a^2$ , and between which sides and ends is a rectangular-shaped opening  $a^x$ . The upper ends of the supports A A are connected by a horizontal shelf  $a^3$ , and the lower ends of said supports are connected together by a bed or flat plate  $a^4$ , both shelf and plate being the same width as the sides  $a a'$  of the supports A A. At the rear ends of the supports A A is a back  $a^5$ , connecting the rear ends of said supports with each other and extending the same height as the outer sides  $a'$  of said support. On the inner side of each support A, at a point equidistant from the front and rear ends  $a^2$  of said support, is a guide-strip  $a^6$ , extending vertically nearly the height of the said supports.

The vertically-adjustable portions of the desk consist of separate upper and lower cases B and C, respectively. The frame of the lower case C consists of the top  $c$ , sides  $c' c'$ , bottom  $c^2$ , and back  $c^3$ . In width the sides  $c'$  of case C are nearly as wide as the sides  $a a$  of the side supports A A, and between said sides and the sides  $a a$  of said supports are



wide spaces  $c^x$ , sufficient to receive the lid-adjusting levers, hereinafter described. The bottom  $c^2$  extends longitudinally beyond the outer surface of the sides  $c' c'$  of case C and  
 5 nearly to the outer edge of the guide-strips  $a^6$  on the sides  $a a$  of the supports A A. Upon the top  $c$  of the case C and secured thereto are longitudinal strips  $c^5 c^5$ , which are narrow in width and are in the planes of the front and  
 10 rear of the said top  $c$ , respectively.

In each of the sides  $a a$  of the supports A A, a short distance below the plane of the shelf  $a^3$ , are separate elongated openings  $a^7$  opposite in position, in which are secured the  
 15 sheave-casing  $a^8$ , having sheaves  $a^9$ .

With the outer portions of each of the respective sides  $c' c'$ , at a point a short distance below the plane of the top  $c$ , are connected the staples  $d d$ , one end portion of the  
 20 case elevating ropes or cables  $d' d'$ , the other ends of which cables are extended over the sheaves  $a^9$ .

Within the hollow space  $a^x$  of the supports A A and in a position nearly opposite the  
 25 ends secured to the case C and upon said ends of the ropes within the space  $a^x$  are secured the weights E, composed of separate plates  $e$  nearly the length and width of said opening and both weights being adapted to  
 30 compensate or counterbalance the weight of the cases B and C.

On the outer portion of the sides  $a a$  of the supports A A, a short distance in rear of the guide-bars  $a^6 a^6$ , are connected the racks F F,  
 35 which are arranged in a vertical position. Upon the outer portion of the sides  $c' c'$  of case C and pivotally connected therewith are gears G G, which engage with the racks F F.

On the inner edge of the bar  $c^5$ , which lies  
 40 with the outer edge in the plane of the rear edge of the top  $c$  of case C, are the bearing ends of an outwardly-curved spring  $h$ . On the inner edge of the said bar  $c^5$ , a short distance from the ends of the curved spring  $h$ ,  
 45 are stop-blocks  $h' h'$ .

$h^2 h^2$  are bell-crank levers pivotally connected with the top  $c$  of case C, one arm of each lever being extended in the direction of each other and bearing against the outer surface  
 50 of the curved spring  $h$ , the said arms being longer than the arms at angles thereto.

$h^3 h^3$  are the locking bars or bolts upon the top  $c$  of case C. Upon the inner end and upper side portion of each bar is a transverse  
 55 notch or slot  $h^4$ , which receives pivotally the outer end of the short arms of the bell-crank levers  $h^2$ . These bars extend in the longitudinal direction of the said top  $c$  and are held by the guide-blocks  $h^4$  on the top  $c$  from lateral movement. With the end of each bar  $h^3$   
 60 is connected a short rod  $h^5$ , which extends between the teeth of the gear G on the end  $c'$  of said case C and prevents the rotation of the said gear.

65  $h^6$  is the bolt-releasing push-bar, which extends in a transverse direction of the top  $c$  of case C, one end of which bar bears upon the

ends of the bell-crank lever  $h^2$ , resting against the curved spring  $h$ , and the other end extended toward the forward strip  $c^5$ , and the extreme  
 70 outer end of said bar, which is round, is extended through the transverse perforation  $c^6$  in said strip. Upon each side of bar  $h^6$  are guide-strips  $h^7$ , secured to the top  $c$ . The rounded end of the bar  $h^6$  extends to a position  
 75 in the plane of the outer edge of the strip  $c^5$ , so as to be readily operated by the hand. In the bar  $h^6$ , however, a short distance from the inner edge of the forward strip  $c^5$ , is a slot  $h^8$  for the reception of an operating-lever,  
 80 hereinafter described.

H is the lid to the desk, which is hinged to the case C as follows: On the outer surface of the side  $c'$  of case C, near the plane of the top  $c$ , is secured a plate I, the upper end of  
 85 which plate extends beyond the forward edge of the side  $c'$  and is provided with a socket  $i$ . The side portion of the lid H is notched at  $h^9$ , a short distance from the rear end of said lid, and a portion  $h'$  of said side made round to  
 90 form a journal and fitted within the socket  $i$ .

K K are the lid supporting and adjusting devices at the ends of case C, each consisting of a bar  $k$ , of considerable length, which extends within the space  $c^x$  between the side  $a$   
 95 of support A and the side  $c'$  of case C, and its lower end is pivotally connected at  $h'$  to the extended portion of the bottom  $c^2$  of case C within space  $c^x$  and near the plane of the back  $c^3$  of said case. The upper end of bar  
 100  $k$  extends about one-half the distance from the pivotal point  $k'$  to the lid H, and upon said end and its lower edge is a semicircular plate or sector  $k^2$ , having teeth  $k^3$ . With the sides of the bar  $k$ , at a point upon said bar  
 105 upon which the curved line of the toothed sector is drawn, are pivotally connected the lower ends of the bars  $k^4 k^4$ , the upper ends of which bars are pivotally connected with a lug  $k^5$ , upon the upper portion of which lug  
 110 is a flat plate  $k^6$ , which extends within the grooved guides  $k^7$  in the under side and forward end portion of the lid H and is movable therein. Between the bars  $k^4 k^4$  is the self-fastening variable knee-jointed lever  $k^8$ ,  
 115 which consists of the upper bar  $k^9$ , short in length.

L represents the releasing-rod to the knee-jointed lever, one end of which rod extends pivotally through the perforation  $k^{17}$  in the  
 120 inner bar  $k^4$  a short distance from the lug  $k^5$ , and upon said end of said rod is a rectangular-shaped or flat extension  $l^2$ , which extends within a slot  $k^{18}$  in the upper end of the upper bar  $k^9$  of said knee-jointed lever. Upon  
 125 the lower end of the bar  $k^9$ , upon its upper edge, is a concave ogee depression  $k^{12}$ , the extreme lower end of the bar being curved at  $k^{13}$ . The upper end of the lower joint  $k^{10}$  of the knee-joint  $k^8$  is provided with an ogee extension  
 130  $k^{14}$ , which fits the depression  $k^{12}$  in the bar  $k^9$ , and in the bar  $k^{10}$  is a curved depression or socket  $k^{15}$ , which receives the curved end  $k^{13}$  of the bar  $k^9$ . The lower end of the bar



$k^{10}$  extends nearly to the sector  $k^2$  and is pivotally connected to the bars  $k^4 k^4$ . On the lower end and outer edge portion of the bar  $k^{10}$  is a tooth  $k^{16}$ , which extends downwardly and engages with the teeth  $k^3$  in the toothed sector  $k^2$ . The bars  $k^9 k^{10}$  are preferably made of metal sufficiently heavy to draw into alinement with each other. The other end of the rod L extends to and through the inner bar  $k^4$  on the other side of case C and is connected with the upper bar  $k^9$  of the knee-jointed lever in the manner first described, and on said rod is a laterally-extended loop  $l$ , forming a double crank for operating the knee-joint  $k^9 k^{10}$ .

The upper case B of the desk consists of the top  $b$ , the sides  $b' b'$ , and bottom  $b^2$ , said bottom resting upon the upper surface of the strips  $c^5 c^5$  on case C. The sides  $b' b'$  are close in position to the guide-strips  $a^6 a^6$  upon the supports A A, and upon the outer surface of the said sides are connected the sheave-brackets  $m m$ , in which are sheaves M M, bearing upon the opposite side of the guide-strips  $a^6$ . In order to operate the ball-releasing bar  $h^6$  on the case C from the bottom of case B, a depression is made in the forward portion of said bottom, as at  $b^3$ , and directly above the slot  $h^8$  in said bar, in which depression is pivoted at one end a lever N, on the under side pivotal portion of which is a downward extension  $w$ , which extends within the slot  $h^8$  in said releasing-bar  $h^6$ . On the forward end of the said lever is a turn-button  $n^2$ , which extends through the lever N and is provided upon its lower shank with a button  $n^3$ , which enters a suitable notch  $n^4$  in the side of the depression  $b^3$ .

In ordinary uses of the improved desk the cases B C are provided with pigeon-hole divisions and shelves for the convenient arrangement and partition of books and papers, which it is not deemed necessary to illustrate, additional weight of which, however, is compensated by the weight E E, which may be added to, so as to enable the manual operation of raising and lowering the cases B C to be accomplished with a slight degree of effort. To elevate the cases B C from the position as seen in full lines in Figs. 1 and 2 to the dotted position, the turn-button  $n^2$  is given a partial rotation, so as to release the button  $n^3$  from its engagement with the sides of the depression  $b^3$ , and the said end of the lever raised in position, which movement throws the releasing-bar  $h^6$  rearwardly and also the long arms of the bell-crank levers and depresses the spring  $h$ . At the same time the opposing ends of bars  $h^3 h^3$  are drawn toward each other, releasing the rods  $h^5$  from engagement with the teeth of gear G. The cases are then readily elevated the described height from the sitting posture of the person using the desk to a standing position with little effort by simply applying the power of the hands to the sides of the lid H. In moving the cases downward

in position the turn-button is operated as before, it being observed that when the lid H is in an open position the end of the bar  $h^6$  in the opening  $c^6$  is in rear of the rear end of the lid. When the lid is in a closed position, as seen in dotted lines, Fig. 2, the bar may be operated easily by the hand, the length of the slot  $h^8$  in the bolt-releasing bar  $h^6$ , as seen in Fig. 6, being of sufficient length to permit the moving forward of the bar without affecting the lever N. The case B may also be provided with a lid, so as to close the said case, in which instance both lids of the cases may be closed and the bolts  $h^5$  released from the gear G by operating the push-bar  $h^6$ . The adjustment in position of the lid H is effected by the movement of the double crank  $l$  by the hand rearwardly, which movement throws the lower end of the upper bar  $k^9$  of the toggle-joint upwardly and the upper end of the bar  $k^{10}$  at an angle thereto and draws the tooth  $k^{16}$  from the notch  $k^3$  in the toothed sector  $k^2$ . As soon as the lid is elevated the proper height the double crank  $l$  is released, and the weight of the portion  $k^9$  of the knee-joint throws the bars  $k^9 k^{10}$  into alinement, and the tooth  $k^{16}$  engages with the toothed sector as before. It being observed that the outer ends of the bars of the knee-jointed lever being pivotal in order to permit of the lateral movement of the meeting ends of said bars and the engagement of the tooth with the notched segment, there is sufficient play or room in the socket in the end of the lower bar to enable a variance or change in position of the curved end of the upper bar. The varied position of the lid toward that of a horizontal position is obtained by the sliding movement of the lug  $k^5$ , which, in connection with the slide  $k^6$ , enables the centers from which the lines of adjustment of the bars  $h^4 h^4$  may be drawn to be changed and enables the said bars to be withdrawn in the space  $c^x$  and also in the narrow compass of the width of the sides  $c' c'$  of case C.

My improved desk affords greater desk-space than the ordinary desk, at the same time taking up less floor-space and with a large capacity for books and papers.

The various details of construction may be varied within the scope of the invention.

Having fully described my invention, what I now claim as new, and desire to secure by Letters Patent, is—

1. The combination with separate cases of a desk, and the division-strips between said cases, of longitudinally-extended locking-bars having suitable guides, bell-crank levers having one arm pivotally connected with the inner end of said bars, and a spring in rear of the other arms of said levers, a releasing-bar having one end in contact with the arms of the bell-crank levers bearing against said spring, and a slot in the other end of said bar, one of said cases being provided with a suitable depression in the bottom thereof and a hori-



zontal lever pivoted in said depression having a downward extension within the slot in the releasing-bar.

2. The combination with separate longitudinally-extended lid-supporting bars of a variable knee-jointed lever composed of separate bars pivotally connected at their outer ends to said longitudinally-extended bars and having a curved end portion upon the upper part of the inner end and a socket in the inner end of the lower part of said bars, a depression in the edge of said inner end of said bar having the said curved end and a longitudinal extension of the inner end of the bar having said socket adapted to fit said depression and means substantially as described for operating the upper part of said knee-jointed lever.

3. An adjusting-lever for desk-lids comprising a toothed sector-plate, a suitable support for said plate and longitudinally-extended lid-supporting bars pivotally connected with said lid at one end and with the support for the sector-plate at their other end and a variable knee-jointed lever composed of separate bars pivotally connected at their outer ends with said longitudinally-extended lid-supporting bars and having a curved end portion upon the upper part of the inner end and a socket in the inner end of the lower part of said bars, said bar having the said curved end also being provided with a depression in the edge of the inner end and a longitudinal extension of the inner end of the bar having said socket one bar of which lever is provided with a tooth engaging with said teeth in said toothed sector-plate.

4. An adjusting device for desk-lids comprising a supporting-bar pivoted at one end to a suitable fixed support, and a toothed sector-plate at the other end, bars pivotally connected with the said sector-plate at one end, and with the lid of said desk at the other end and a variable knee-jointed lever comprising

two parts between, and pivotally connected at their outer ends with said bars, one bar of which lever is provided with a tooth engaging with the teeth in said toothed sector-plate.

5. The combination with a desk and with the lid of said desk, of an adjusting device upon the outer side thereof, a supporting-bar pivoted at one end to a suitable fixed support, and a toothed sector-plate at the other end, bars pivotally connected with said sector-plate at one end, and with the adjustable devices upon said lid at the other end, and a variable knee-jointed lever consisting of two parts between and pivotally connected with said bars, one part of which lever is provided with a tooth engaging with the said teeth on the sector-plate.

6. The combination with a desk and with the lid of said desk of a toothed sector-plate secured to said desk and bars pivotally connected with said sector-plate at one end and with the lid of said desk at the other end and a variable knee-jointed lever composed of separate bars the lower bar of which lever is pivotally connected at its outer end with the bars on said sector-plate and provided with a tooth on said outer end engaging with the teeth on said sector-plate and having a socket on its inner end, and the upper bar provided with a curved portion on its inner end adapted to enter said socket and having a depression in its upper edge, a longitudinal extension of said bar having said socket adapted to enter said depression and a releasing-rod extending pivotally through one of the bars connected with the sector-plate and rigidly connected with the outer end of the upper bar of said knee-jointed lever.

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Witnesses:

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