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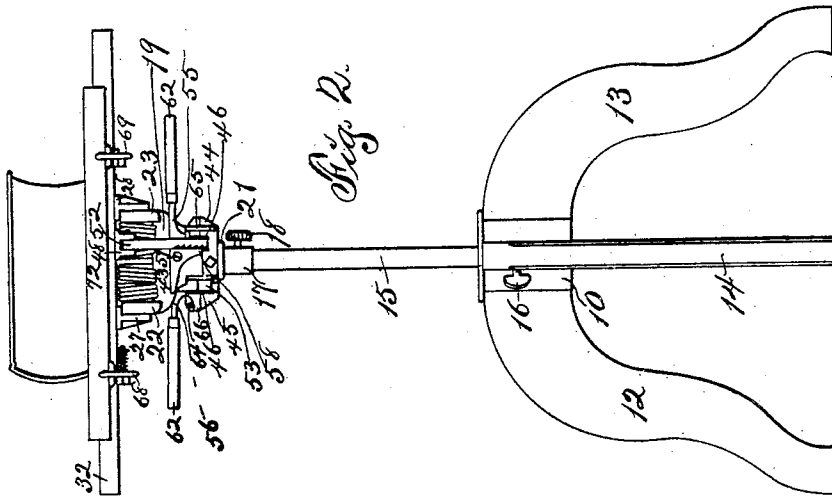
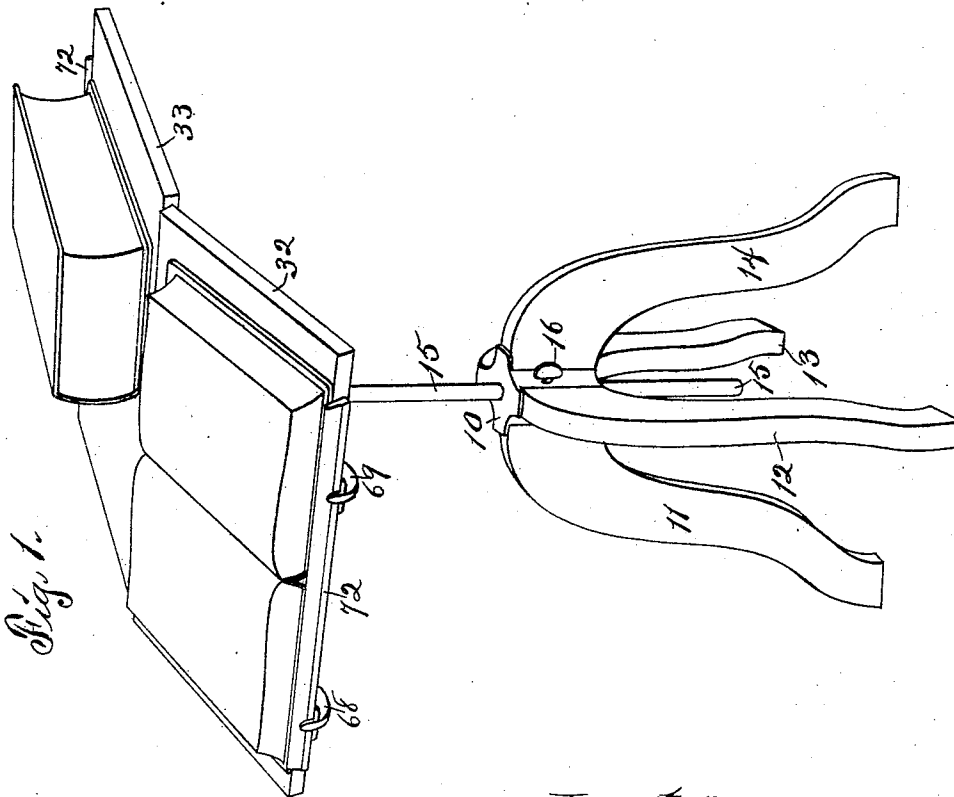
Patented Oct. 14, 1902.

A. F. HAWKINS, JR.
BOOK AND STUDY TABLE.

(Application filed Oct. 24, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Attest:
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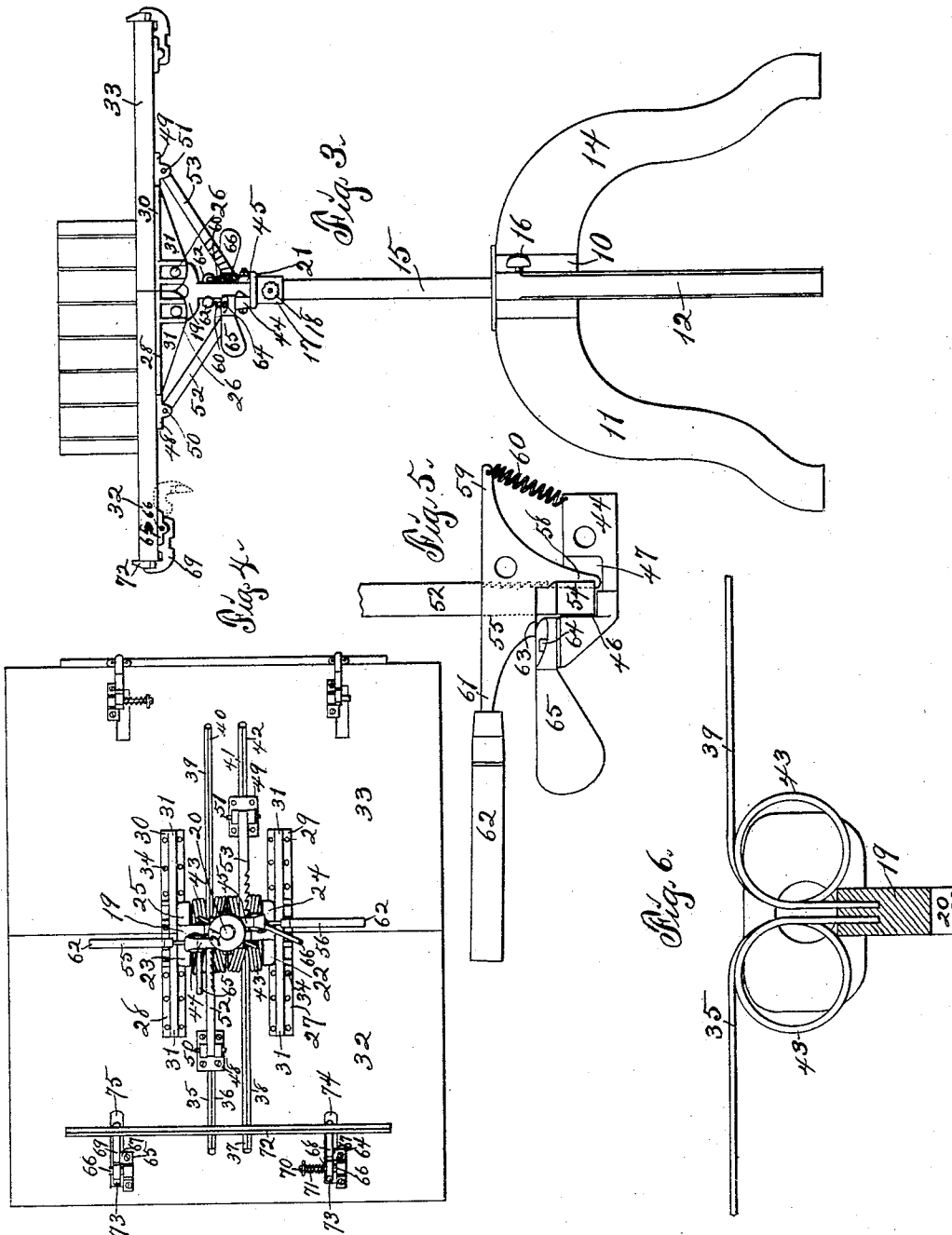
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

AMASA F. HAWKINS, JR., OF ASHTON, SOUTH DAKOTA.

BOOK AND STUDY TABLE.

SPECIFICATION forming part of Letters Patent No. 711,048, dated October 14, 1902.

Application filed October 24, 1901. Serial No. 79,849. (No model.)

To all whom it may concern:

Be it known that I, AMASA F. HAWKINS, JR., a citizen of the United States of America, and a resident of Ashton, Spink county, South Dakota, have invented a new and useful Book and Study Table, of which the following is a specification.

The object of this invention is to provide improved means for supporting a dictionary or other heavy volume, whether closed or open, in a horizontal or inclined position.

A further object of this invention is to provide means for changing the position of the book-support relative to the horizontal readily and conveniently and for maintaining the desired position of the support automatically.

A further object of this invention is to provide means for pivoting the book-support on a vertical axis in such manner that a book thereon, whether open or closed, horizontal or inclined, may be turned laterally relative to the user or in respect of the direction of the light utilized.

A further object of this invention is to provide means for locking the book-support in inclined or horizontal position, to the end that said support may resist excessive and unusual weight.

A further object of this invention is to provide means for retaining a book on the support when said support is inclined.

A further object of this invention is to provide yielding pressure devices operating in opposition to the weight of and on the book-support, the devices in normal expanded position supplying sufficient resistance to sustain the support at the horizontal and yielding to the added weight of a dictionary or similar heavy volume.

A further object of this invention is to provide means for adjusting the support at varying altitudes irrespective of the other possible arrangements and adjustments thereof.

This invention consists of the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a perspective illustrating my complete device in position for use, two relatively large and heavy volumes being mounted thereon, the one closed and in horizontal

position, as best suited to the preservation of the binding thereof, and the other open and in inclined position, as best adapted for reading or inspection. Fig. 2 is a front elevation of the device, a closed book being mounted thereon in horizontal position and in such relation to the support and the user as is best adapted to initiation of the operation of inspecting the volume or preserving the form and binding thereof. Fig. 3 is a side elevation of the device, showing both tables or supports in horizontal position, the dotted lines indicating the inoperative position of one of the retaining-rails. Fig. 4 is a bottom plan of the supporting-tables and stem detached from the base and standard. Fig. 5 is a detail rear view of the mechanism employed to latch and lock one of the supporting-tables. Fig. 6 is a detail cross-section illustrating the construction and mounting of the springs employed to sustain and lift the supporting-tables.

In the construction of the device as shown a base is provided, which base preferably consists of a metallic hub 10, having a central aperture perpendicular to the surface on which the base rests and seats in its sides, and legs 11, 12, 13, and 14 entering the seats of and fixed to the hub. I make no claim to the particular construction of the base, since any suitable base may be employed without departing from the spirit of my invention. A tubular standard 15, preferably made of metal, is mounted in the central aperture of the hub 10 and is retained therein by a set-screw 16, seated in the hub. By means of the set-screw 16 the tubular standard may be adjusted to any desired altitude within its length as required to change materially the altitude of the table or tables supported thereon. A collar 17 is formed on or fixed to the upper end of the standard 15, and a set-screw 18 is seated in and extends horizontally outward from said collar, the inner end of said set-screw extending to and intersecting the bore of standard. A hinge-block 19, preferably made of metal by molding and casting, is formed with a central stem 20, circular in cross-section and of such diameter as to fit snugly for rotation in the bore of the standard 15. A peripheral flange or shoulder 21 is formed on or fixed to the stem 20 at the

point of jointure of the stem and hinge-block and rests for rotation on the upper ends of the standard 15 and collar 17. The set-screw 18 is arranged to engage at its inner end on the periphery of the stem 20 to lock said stem at times against rotation in the standard. Ears 22, 23, 24, and 25 are formed on the upper corners of the hinge-block 19, and pivot-studs 26 are formed on or fixed to said ears and extend horizontally outward therefrom. Hinge-plates 27, 28, 29, and 30 are provided and formed with longitudinally-disposed ribs 31, tapering from material width at their inner ends to the plane of the plates at their outer ends. Each rib 31 is apertured transversely of its wider (inner) end portion for the reception of one of the pivot-studs 26, whereby each of the hinge-plates 27, 28, 29, and 30 is hinged to one of the ears 22, 23, 24, and 25. A series of screw-holes is formed in each of the hinge-plates on each side of the ribs 31, and tables 32 33 are mounted on said plates and fixed thereto by screws 34, traversing said holes and seated in said tables. The hinge-plates are located, preferably, on the extreme outer surfaces of the ears of the hinge-block and are held by the tables against further separation and release from the pivot-studs 26. Thus are the tables 32 33 hinged to and supported by the hinge-block 19. The tables 32 33 are of uniform size and preferably made of wood finished and polished in the style of good furniture. A series of holes, in this instance eight in number, are formed in the hinge-block 19 perpendicular to the surface on which the base rests. These holes are arranged in two parallel rows and in pairs in the rows, the individuals of each pair being closely related, while the pairs are spaced apart material distances.

Torsional springs 35 and 36, 37 and 38, 39 and 40, 41 and 42 are each made of wire circular in cross-section and formed with coils 43, in this instance three in number, intermediate of its ends. Each of the torsional springs is formed with a shorter end portion or arm seated in one of the holes of the hinge-block 19 and a longer arm lying in a groove in the lower surface of one of the tables. The torsional springs are arranged in pairs, as indicated in Fig. 4, their shorter arms engaging the hinge-block 19 and their longer arms engaging the tables and within the grooves thereof. Thus the shorter arms of the springs serve as means of attachment to the hinge-block, and the longer arms sustain and tend to raise the tables into a common horizontal plane. It will be observed, Fig. 3, that the inner edges of the tables, as well as the inner ends of the hinge-plates, contact with each other in the median line of the hinge-block 19, and since the plates are hinged on ears projecting from corners of said hinge-block in the depression or inclined positioning of either of said tables the inner edge thereof moves in an arc upward and outward relative to said median line, the table tilting on

the axis of its pivot-studs. Such tilting of either of the tables applies a downward pressure to the long arms of the torsional springs attached thereto, which pressure is received and resisted by the coils of said springs and reacts upon the hinge-block 19 through the engagement of the short arms of the springs with said block. Hence any depression of the long arms through the tilting of a table has the effect of contracting the coils of the springs and accumulating resilience therein sufficient to return the table to its original position on the relaxation of the depressing force. The springs may have such degree of resilience as to counterbalance a portion of the weight of a book in addition to the weight of a table and depend partially, if not wholly, on hand-pressure for the desired inclination of the table. Under such conditions the inclined positioning of a table dependent wholly on the springs for support would be unstable and vascillating and the table would return too quickly and abruptly on the removal of the book. Hence provision is made for governing the return of the table under the control of manual operation in manner following: Brackets 44 45 are fixed to opposite sides of and project horizontally in opposite directions from the hinge-block 19. Notches 46 are formed in and transversely of the projecting portions of the brackets 44 45, and recesses 47 are formed in the inner faces of said brackets adjacent the notches and are of such form as to produce spaces or seats between the brackets and the contiguous faces of the hinge-block. Ear-clips 48 49 are fixed to the lower faces of the tables 32 33, overlaying pairs of the arms of the springs 35 36 41 42, and the ears of said clips are horizontally apertured for the reception of pivot-pins 50 51. The pins 50 51 are parallel with the axes of the pivot-studs 26 and the axes of the loops of the torsional springs. Ratchet-bars 52 53 are pivoted at their outer ends on the pins 50 51 and extend inward and downward therefrom through the notches 46 of the brackets 44 45. The ratchet-bars are arranged parallel with each other on opposite sides of the stem 20 and at right angles to the meeting-line of the tables. Ratchet-teeth 54 are formed in and transversely of the inner faces of the bars 52 53. By "inner" faces is meant those faces opposing each other and nearest to the stem 20. The faces of the teeth 54 are at oblique angles of varying degrees relative to the upper and lower faces of the ratchet-bars, those teeth nearest the centers of the bars having their faces more nearly at right angles than the teeth at the ends of the bars. The degree of angularity of the faces of the teeth depends on and is determined by lines radiating from the axes of the pivot-studs 26, varied slightly by the location of the faces of the hinge-block between the planes of said axes, as will hereinafter be made clear.

Keys (detents or levers) 55 56 are fulcrumed

on lag-screws 57, seated in opposite faces of the hinge-block 19, above the brackets 44 45, and project beyond said hinge-block. The keys 55 56 are formed with lips 58, entering the recesses 47 of the brackets 44 45 and normally entering one or another of the notches of the ratchet-bars and engaging with one or another of the teeth 54 thereof. Arms 59 are formed on the keys 55 56, and retractile coil-springs 60 connect the extremities of said arms to the brackets. It is the function of the springs 60 to tend to hold the lips 58 of the keys in the notches of the ratchet-bars and yield expansively to permit the keys to oscillate and move said lips aside for the passage of the teeth of the ratchet-bars. Arms 61 are formed on the keys 55 56 and extend therefrom opposite on the arms 59, and handles 62 may be formed on or fixed to said arms 61 for manual use in oscillating said keys. In the employment of the keys, as shown, or their equivalents the lips 58 recede for the passage of teeth of the ratchet-bars when the tables are depressed, and said bars move downward through the notches of the brackets. Upon a relaxation of the downward pressure on the tables the torsional springs press the tables upward and contact faces of teeth 54 with the lips 58, said lips holding the bars against further upward movement pending the release thereof by manual depression of the handles 62. It is desirable that the faces of the teeth 54 contact flat on the inner faces of the lips 58. Hence the variations of the degree of angularity thereof. Shoulders 63 are formed on the keys 55 56 at right angles to the engaging edges of the lips 58 and normally parallel with and spaced apart from the upper faces of the projecting portions of the brackets 44 45. Latches 65 66 are pivoted on studs 64 on and rising from the projecting portions of the brackets 44 45, and the upper faces of the body portions of said latches are formed as helices or spiral inclines. When a latch is in the position shown in Fig. 5, the cam or helical face is spaced apart from the shoulder 63 and permits the key to descend to the extent of releasing the lip 58 from the ratchet-bar. When the latch is turned forward manually into the position shown in Figs. 2 and 3 and above the stem 20 in Fig. 4, the helical or cam face engages at its highest point with the shoulder 63 and locks the key stationary, with the lip 58 seated in a notch of the ratchet-bar. In such position the latch prevents release of the key from the ratchet-bar and locks the table against oscillation. When either table is locked as above described, the removal of a book therefrom or the application of an additional load thereto will not affect its stability nor position in any manner. Upon the manual release of the latch from the key and the disengagement of the key from the ratchet-bar the table may be raised to a level position by expansion of the torsional springs alone or, if the weight of the

book or other load be too great, by the assistance of slight lifting force applied by the other hand of the user, it being understood that one hand is employed to hold the key against the resistance of the retractile coil-spring 60.

One of the primary advantages arising from the use of this invention lies in the arrangement of the springs as a counterbalance to the load and the coacting ratchet-bar and spring-held key, whereby the load alone or slightly aided manually will depress the table to a desirable incline. If a greater incline is desired, a little more manual pressure applied to the table will affect it, and the ratchet-bar and key will respond automatically and hold against the resilience of the torsional springs. On the other hand, when the table is loaded normally and steeply inclined it is only necessary to release the key from the ratchet-bar with one hand, and the torsional springs will raise the table and its load nearly to the horizontal. If at the same time the user should apply slight finger-tip pressure with the other hand to complete the upward movement of the table, he may withdraw the first hand from the key and with it turn the adjacent latch and lock the key to the ratchet-bar. Thus it will be noticed that the holder is operative with a minimum of effort and the exercise of the minimum of physical force on the part of the user—a desideratum of no small importance in a library or study. When engaged in study, any interruption by which the mind is drawn from the work in hand is an annoyance and irritation, and the greater the interruption the more serious the irritation. Therefore the arrangement of devices whereby the student may hold a manuscript, model, volume, or drawing in one hand and with the other hand conveniently and readily adjust a dictionary or other reference-volume in desirable position for inspection makes for a lessening of the enforced interruption, a saving of time, and a consequent avoiding of the aggravation of annoyance and distracting of thought attendant upon the expenditure of unnecessary time and effort through the use of crude and inefficient means or devices.

When the tables are horizontal, it is desirable to have them present a plane upper surface, but when inclined some means should be furnished to retain the volume or object carried thereon. To this end provision is made for rails hinged at the outer (lower) edges of the tables in manner following: On the lower surface of the table 32 and near the front edge thereof there are mounted two clips 64 65, each formed with a pivot-stud 66, extending laterally in alinement and in the same direction therefrom. Each of the clips 64 65 also has a lip 67 extending laterally from one end portion parallel with and laterally spaced from the stud 66. Rail-arms 68 69 are provided and pivoted near one end of each on the studs 66. A headed pin 70 is screwed

into the stud 66 of the clip 64, and an expansive coil-spring 71 is mounted on said pin and is compressed between the head thereof and the arm 68. A rail 72, preferably made of the same wood and finished identically with the table, is fixed to and connects the free extremities of the rail-arms 68 69. Each of the rail-arms 68 69 is formed with a lip 73, extending from its pivoted end and arranged to engage beneath the lips 67 of the clips and serve as a clutch to prevent rotation of the arms relative to the clips. The rail-arms are moved sidewise to establish the interengagement of the lips by the expanding of the spring 71. Grooves 74 75 are cut in the lower surface of the table above the rail-arms 68 69 to permit the rotary travel of the lips 73 and to receive said arms partially and permit a close approach of the rail to the table when it is turned back, as shown by dotted lines in Fig. 3 and in solid lines at the left in Fig. 4. The rail is held in its inoperative position by the friction of the rail-arms on the studs augmented by expansive force of the spring 71. When the rail is drawn forward and upward, it assumes a position parallel with and in front of the front edge of the table, the upper edge of the rail projecting above the upper surface of the table and forming a guard to retain a book, as shown in Fig. 1. When the rail is drawn forward and upward, the rail-arms are revolved on the studs 66 to such an extent that the lips 73 pass the lips 67, at which time the spring 71 expands and moves the arms and rail to the left sufficiently to overlap said lips, to the end of holding the rail in its outermost position. It follows, therefore, that a movement of the rail manually to the right will disengage the lips and permit the rail to be turned back and beneath the table. The table 33 is provided with a rail identical in form and mounting with the rail 72.

I claim as my invention—

1. The book-holder, comprising a suitable support, a table hinged to and arranged for movement through an arc below the horizontal plane of the top of said support, yielding pressure devices interposed between the table and support, a ratchet-bar attached to the table and a spring-held key carried by the support and arranged for engagement with the ratchet-bar, the key normally resisting expansion of the yielding pressure devices.

2. The book-holder comprising a suitable support, a table hinged to said support and arranged for movement through an arc below the horizontal plane of its hinge, yielding pressure devices, auxiliary to the hinging means, interposed between the table and support, a single ratchet-bar pivoted to and depending from the table, and a spring-held key on the support and arranged for engagement with the ratchet-bar in opposition to the expansive tendency of the yielding pressure devices.

3. The book-holder, comprising a suitable support, a table hinged to said support, yield-

ing pressure devices interposed between said table and support, a ratchet-bar depending from the table, a key on the support and arranged for engagement with the ratchet-bar in opposition to the expansive tendency of the yielding pressure devices and a latch on said support arranged for engagement with said key, whereby the key is locked to the ratchet-bar.

4. The book-holder, comprising a suitable support, a table hinged to said support and arranged for movement through an arc below the horizontal plane of its hinge, torsional springs connecting said table and support auxiliary to the hinging means and ratchet-and-key mechanism connecting said table and support auxiliary to the torsional springs and in opposition thereto.

5. The book-holder, comprising a suitable support, a hinge-block on said support, a table hinged to said block, torsional springs having arms contacting the block and table respectively and coils between the arms, a ratchet-bar pivoted to and depending from the table, the lower end portion of the ratchet-bar extending through a notch adjacent the hinge-block, a key fulcrumed on the hinge-block and arranged to engage the ratchet-bar, a spring acting to hold said key in engagement with the ratchet-bar and a handle on said key.

6. The book-holder, comprising a suitable support, a hinge-block on said support, a table hinged to said block, springs connecting the block and table, a ratchet-bar pivoted to and depending from said table, a bracket on the block, the bracket being formed with a notch for reception of the ratchet-bar and a key fulcrumed on the block and spring-held in engagement with the ratchet-bar.

7. The book-holder, comprising a suitable support, a hinge-block on said support, a table hinged to said block, springs connecting said table and block, a ratchet-bar pivoted to and depending from said table, a bracket on said block and formed with a notch for reception of the ratchet-bar, a key fulcrumed on the block and spring-held in engagement with the ratchet-bar and a latch pivoted on the bracket and formed with a helical face arranged for engagement with the key, whereby the key is locked in engagement with the ratchet-bar.

8. The book-holder, comprising a suitable support, a hinge-block on said support, a table hinged to said block, springs connecting said table and block, a bracket on said block and formed with a transverse notch and a recess between the bracket and block, a ratchet-bar pivoted to and depending from the table and extending through the notch of the bracket, a key fulcrumed on the block and formed with a lip extending within the recess of the bracket, a spring connecting with the key and bracket whereby said lip is spring-held in engagement with the ratchet-bar, the bracket resisting sidewise movement of the lip under the strain of the ratchet-bar, a shoul-

der on the key and a latch pivoted on the bracket and formed with a helical face arranged to engage said shoulder and lock the key in engagement with the ratchet-bar.

5 9. In a device of the class described, the base formed with a hub and legs, the hub being vertically apertured, a standard mounted in the vertical aperture of the base, a set-screw for locking the standard in the base, 10 a collar on the upper end of the standard, a hinge-block, a stem on the hinge-block mounted for rotation in the upper end portion of the standard, a set-screw in the collar and standard and arranged to engage and lock the 15 stem, tables hinged to the hinge-block, torsional springs each having an arm secured in said hinge-block and an arm resting in one or another of grooves on the bottom of each table, a ratchet-bar pivoted to each table and 20 a spring-actuated key arranged to fit into said ratchet-bar and hold each table in any desired position below the horizontal against the resilience of said springs.

10. The book-holder, comprising the base, 25 the standard rising from said base, the table comprising two parts hinged to said standard that when in a horizontal position present a continued flat surface, each part being mounted for oscillation on said standard, and expansive coil-springs acting on and tending to 30 lift each part to the horizontal.

11. The book-holder, comprising a suitable support, a table comprising two parts hinged 35 to said support that present a continued flat surface when in a horizontal position, yielding pressure devices interposed between each part and said support and tending to raise said part, and means to lock either part to the support at any desired angle, below the 40 horizontal, to the other part.

12. The book-holder, comprising a suitable support, a table comprising two parts hinged 45 to said support that present a continued flat surface when in a horizontal position, yielding pressure devices, auxiliary to the hinging means, interposed between each part and said support and tending to resist depression of each part below the horizontal, a ratchet-bar pivoted to each part, spring-actuated keys ar-

ranged to fit into the teeth of the ratchet- 50 bars.

13. The book-holder, comprising a suitable support, a table hinged to said support, yielding pressure devices interposed between the 55 table and support, a ratchet-bar attached to the table and a spring-actuated key carried by the support and arranged for engagement with the ratchet-bar, the key normally resisting expansion of the yielding pressure de- 60 vices.

14. The book-holder, comprising a suitable support, a table hinged to said support, yielding pressure devices, auxiliary to the hinging 65 means, interposed between the table and support, a ratchet-bar depending from the table, a spring-actuated key on the support and arranged for engagement with the ratchet-bar in opposition to the expansive tendency of the yielding pressure devices, and means to 70 lock said key fixedly in said ratchet-bar.

15. The book-holder, comprising a suitable support, a table hinged to said support, torsional springs connecting said table and support to the hinging means, ratchet-and-key 75 mechanism connecting said table and support auxiliary to the torsional springs and in opposition thereto, and means whereby said ratchet-and-key mechanism may be fixedly 80 locked for manual release.

16. The book-holder, comprising a suitable 80 support, a hinge-block on said support, a table consisting of two parts that present a continued flat surface when in a horizontal position, each part hinged to said block, torsional 85 springs having arms fixed in the hinge-block and arms extended beneath each part of the table and coils between said arms, which springs tend to lift each part, and means to lock either part of the table at any 90 desired angle to the other part below the horizontal.

Signed by me at Des Moines, Iowa, this 9th day of September, 1901.

AMASA F. HAWKINS, JR.

Witnesses:

O. H. THOMAS,
S. C. SWEET.