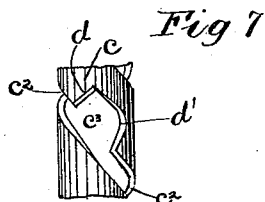
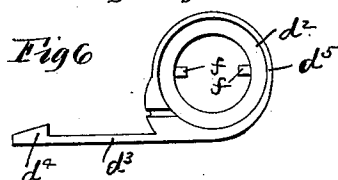
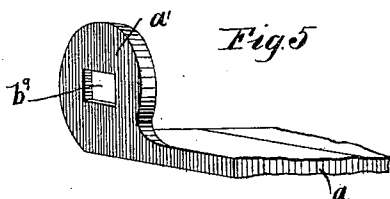
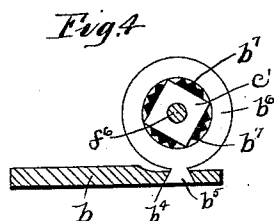
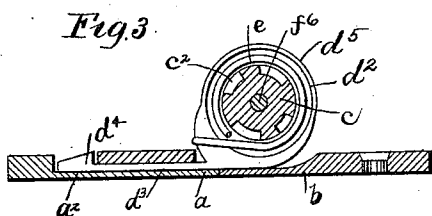
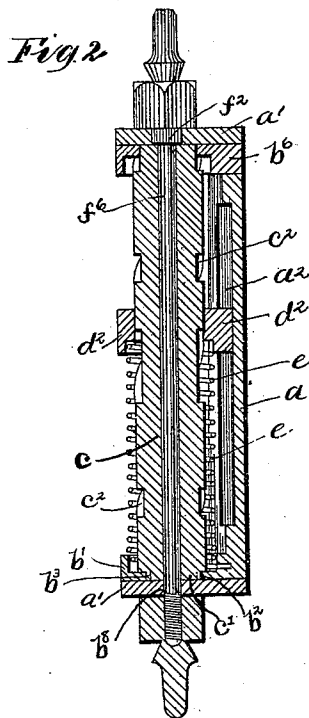
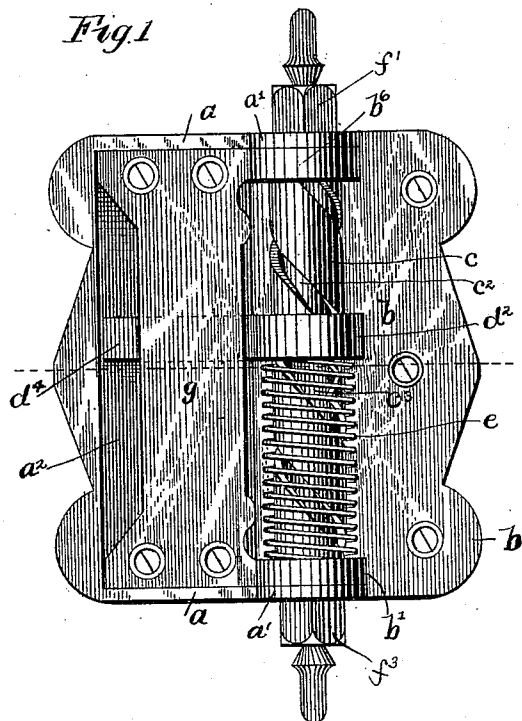


(No Model.)

A. J. McCAULEY.
SPRING HINGE.

No. 471,059.

Patented Mar. 15, 1892.



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UNITED STATES PATENT OFFICE.

ANDREW J. McCAULEY, OF COLUMBUS, OHIO.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 471,059, dated March 15, 1892.

Application filed June 11, 1891. Serial No. 395,949. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. McCAULEY, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Hinges, of which the following is a specification.

My invention relates to spring-hinges of that class adapted for use in connection with doors, gates, &c.; and the objects of my invention are to provide a spring-hinge of this class of superior construction and operation and of such form and arrangement of parts as to not only perform the usual closing office of this class of hinges, but to admit of the same being so set or regulated as to limit the open movement of the door; to so construct said device as to admit of the door to which the same is attached being caught and held thereby at its open limit; to construct said spring-hinge in a simple, neat, and reliable form, and to produce the same at a reasonable cost of manufacture. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my improved hinge, showing the sections thereof connected for use. Fig. 2 is a central vertical section through the joint of said hinge-section. Fig. 3 is a transverse section on line *xx* of Fig. 1. Fig. 4 is an end view of one of the hinge-plates. Fig. 5 is a detail view in perspective of one end of the remaining hinge-plate. Fig. 6 is an end view in detail of a guide-ring employed in the construction of my device; and Fig. 7 is a view in detail of the central portion of the screw which carries said guide-ring.

Similar letters refer to similar parts throughout the several views.

In forming my improved hinge I employ two hinge-plates *a* *b*, which are jointly connected as hereinafter described. The hinge-plate *a* is provided at each end with an inwardly-extending and outwardly-projecting bracket-arm *a'* of an approximately disk shape, the lower bracket-arm having a rounded central opening *b⁸* therein and the upper bracket-arm a squared opening *b⁹*. The front face of the plate *a* is, as shown at *a²*, de-

pressed below its outer and end edges. The inner edge of the hinge-plate *b* has projecting outwardly therefrom, near the lower end thereof, a cup-shaped ring or disk *b'*, which is provided with a central opening *b²*, the boundary of said opening being formed by a series of notches formed by the production therein of small inwardly-projecting teeth *b³*. Near the inner edge of the plate *b* is provided in that end thereof which is opposite that occupied by the ring *b'* a dovetailed recess or incision, as indicated at *b⁴*. Into this dovetailed recess fits a rearwardly-projecting dovetail lug *b⁵* of a cup-shaped bracket-ring *b⁶*, which corresponds in form with the ring *b'*, and which, as prescribed for the latter, is provided with a central opening having notches, as indicated at *b⁷*, said notches corresponding in size and number with those of the ring *b'*.

c represents a tubular screw, each extremity of which is provided with a squared head or nut-shaped termination *c'*. The threaded portion of the hollow screw *c* is of such length as to extend between and abut against the inner cup-shaped faces of the rings *b'* *b⁶*, said screw being formed by the production in the periphery of the body thereof of a continuous spiral groove, as indicated at *c²*.

At the center of the length of the screw *c* and on opposite sides thereof its thread-groove *c²* is provided with enlargements or offsets *c³*. The upper portion of each of these enlargements leads from said thread-groove at such angle as to form an inclined shoulder *d*, from the end of which said offset curves outwardly and thence inwardly to again meet the thread-groove, forming thereby a curved or inclined shoulder *d'*. Loosely surrounding the screw *c* is the ring-shaped inner end or head *d⁵* of a traveling guide *d²*. Formed with the rear side of this head *d⁵* and extending outwardly from one side thereof is a guide-arm *d³*, the outer end portion of which is provided with a shoulder or enlargement *d⁴* on its forward face. The guide-ring *d⁵* has projecting within its central opening from opposite points on its inner side two lugs *f*, which bear and travel in the thread-groove *c²* of the screw *c*. Surrounding the screw *c*, between the guide-head *d²* and the cup depression of the

ring b' , is a coiled spring e , the ends of which are respectively connected with said parts, between which it bears.

In assembling the above-mentioned parts of my improved hinge the square lower termination of the screw is inserted within the notched opening of the lower ring b' , the four corners of said square entering and engaging with the desired four notches of said ring-opening. The square upper end c' of the screw is similarly fitted within the corresponding notches b'' of the upper ring b'' , the latter being connected with the plate b by the insertion of the dovetail lug b^5 within the correspondingly-shaped recess b^4 . The plate a is then connected with the plate b by joining the inner edges of said plates and causing the rings b' b'' to abut against the inner sides of the bracket-arms a' . A central hinge-pin f^6 is then inserted vertically through the square opening b^9 and thence through the hollow of the screw c and through the opening b^8 of the lower bracket-arm a' . The upper end of the hinge-pin is provided with an enlarged head f' , the lower side of which has, as shown, a square projection f^2 , which enters the correspondingly-shaped opening b^9 in the upper bracket-arm and serves to prevent any rotation of the pin and thereby prevent any tendency toward the loosening or reversing of the nut f^3 , which, as shown, is screwed upon the lower threaded end of said pin. The parts being thus connected, the arm d^3 of the guide d^2 bears, as shown, in the depressed surface a^2 of the plate a , said arm being prevented from being elevated from said plate by a filling-plate g , which, as shown, is secured within the depression a^2 and above the arm d^3 . With the exception of the end portions thereof of the plate g is of such width as to cover only that portion of the arm d^3 which is between the head d^5 and the shoulder d^4 . Each of the hinge-plates a b is secured, respectively, to a door or door-frame in the usual manner.

It is obvious that the contact of the ring-arm d^3 with the plate a will serve to prevent any upward movement of the guide-head upon the screw c when the latter is stationary. In connecting the screw ends with the notched ring-openings of the rings b' b'' , as hereinbefore described, the squared heads of said screw are so set with said ring-notches as to bring the lugs f of the guide-head d^5 at the desired height in the thread-groove above the offset or recess c^3 .

It is obvious that when the door to which one of said hinge-plates is attached is opened the screw c will be rotated and that this rotation of the screw will result in not only driving downward the guide-head d^5 until its lugs f enter the offsets c^3 , but will result through said downward movement of said head in both twisting and compressing the coiled spring e and increasing the tension of the latter in proportion to the distance the door is moved. This combined pressure and twist

imparted to the spring will serve to compensate for any injurious torsional strain on the spring, which, as is well known, results from the simple twisting movement. Thus it will be seen that the spring employed in my device will be durable and at all times retain its spring qualities. The lugs f having reached the offsets c^3 of the screw, it is obvious that the tension of the spring e will serve to drive said lugs upward into engagement with the shoulder d' of the offset, and the further outward movement of the door from its frame will be prevented by contact with the shoulder d' of said offset. It will readily be seen that with the lugs f in this position the shoulders d d' will serve, respectively, to prevent the door springing shut through the action of the spring and the further opening of said door. It is obvious that this limitation of the opening movement of the door is dependent upon the distance traveled by the lugs f within the thread-groove before entering the offsets and that the traveling distance of said lugs is dependent upon the position of the screw-heads within the openings of the notched rings b' b'' . The space between the plates g and a will serve as a guideway for the guide-arm d^3 during the movement above described.

From the construction herein shown and described it will be observed that by removing the screw and changing the positions of the heads thereof within the bearing-notches therefor the opening swinging movement of the door may be limited to any desired angle with the door-frame. It will also be seen that a hinge of this construction and operation will be of great utility in places where the arrangement of show-cases or other furniture is such as to admit of the door being opened only a certain distance, and that in all spring-actuated doors, gates, &c., my improved hinge may be made to serve the purposes of a prop for holding the same open, which is often temporarily required. The guide-ring lugs f being within the recesses or offsets and in contact with the shoulder d , it is obvious that closing pressure upon the door will result in said lugs traveling down the incline of said shoulder until they enter the thread-groove, within which by pressure of the ring they will be driven upward until the door is closed.

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

1. In a spring-hinge, the combination, with the jointly-connected hinge-plates a b , of a screw c , rigidly connected with plates b and having offsets c^3 , forming, as described, shoulders d d' in said screw-thread grooves, guide d^2 on said screw, lugs on said guide entering the thread-groove, a guide-arm d^3 , sliding and supported against said plate, and a coiled spring surrounding said screw, as described, beneath the guide-head d^5 , substantially as specified.

2. In a spring-hinge, the combination, with the hinge-plates *a b*, a fixed and detachable ring projection on plate *b*, and notched openings, as described, in said ring projections, of
5 a tubular screw *c*, having squared ends fitting within said ring-notches and having off-sets in the thread-grooves thereof, forming, as described, shoulders *d d'*, guide *d²*, surrounding said screw, lugs *f* on said guide en-
10 tering the screw-thread groove, a guide-arm *d³*, sliding and supported against plate *a*, and a coiled spring inclosing said screw between guide-head *d²* and lower plate projection *b'*, substantially as specified.

ANDREW J. McCAULEY.

In presence of—

C. C. SHEPHERD,
BARTON GRIFFITH.