No. 793,790. PATENTED JULY 4, 1905.

A. D. HULQUIST.

LOCK FOR ADJUSTABLE BACK FRAMES OF ACCOUNT BOOKS, LEDGERS, &c.

APPLICATION FILED MAR. 16, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

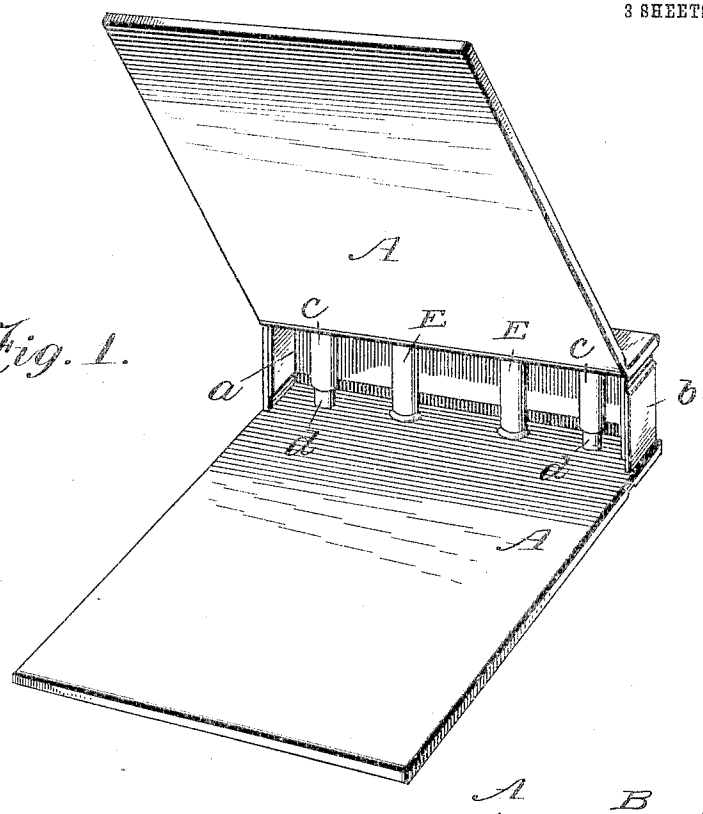


Fig. 2.

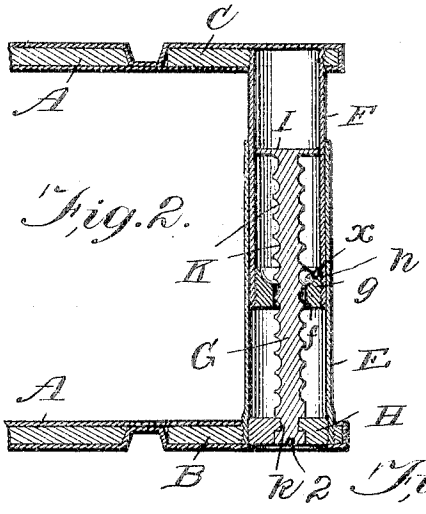


Fig. 3.

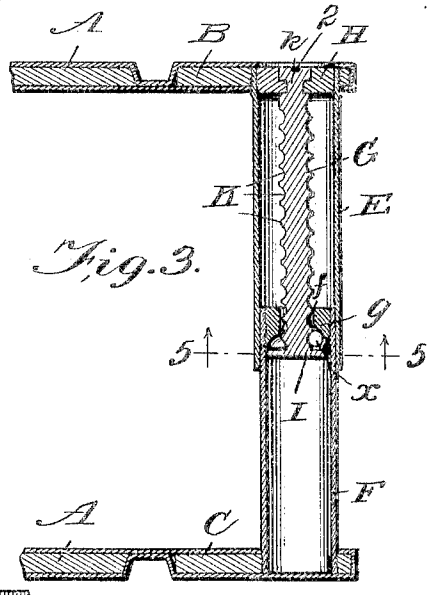
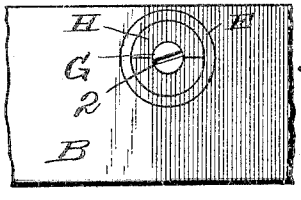


Fig. 4.



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3 SHEETS—SHEET 2.

Fig. 5.

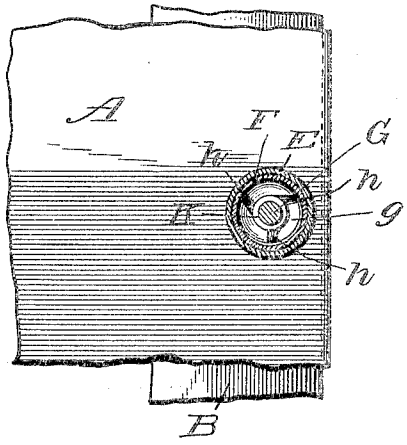


Fig. 6.

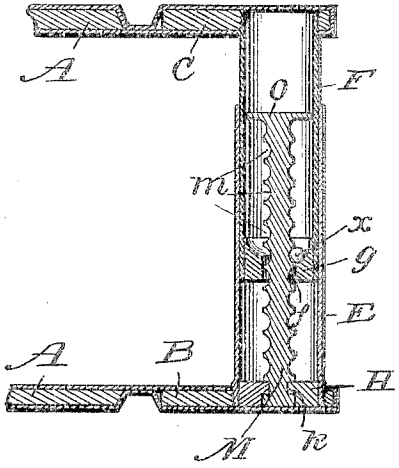


Fig. 7.

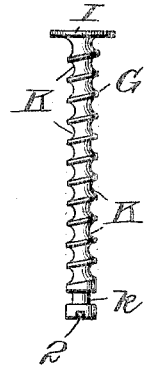


Fig. 10.

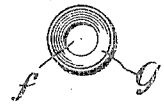


Fig. 8.

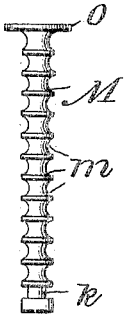
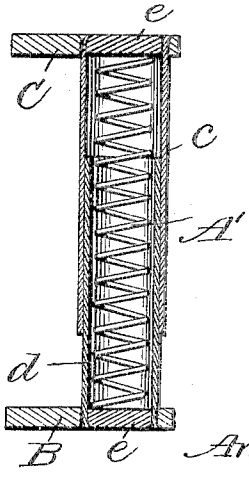


Fig. 9.



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No. 793,790. PATENTED JULY 4, 1905.

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APPLICATION FILED MAR. 16, 1903.

3 SHEETS—SHEET 3.

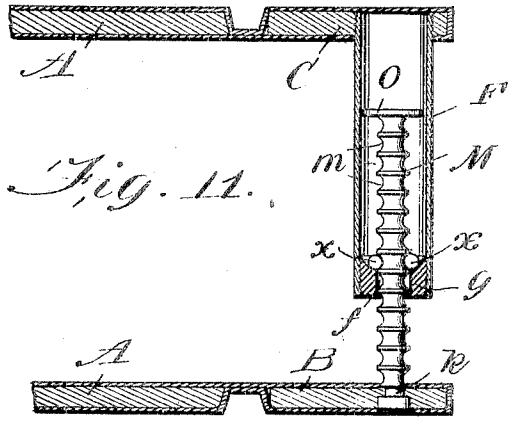


Fig. 11.

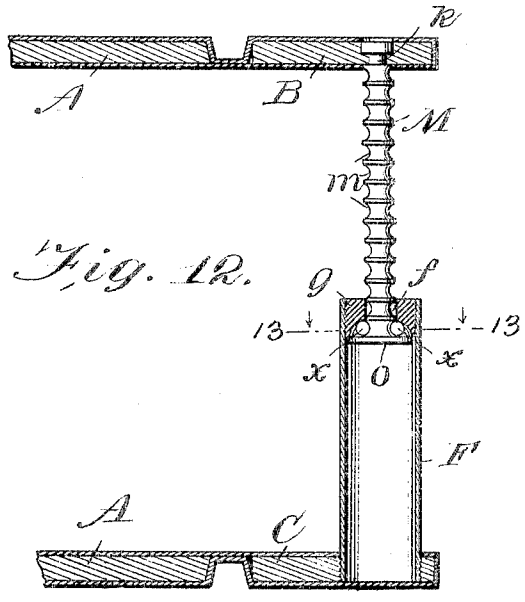
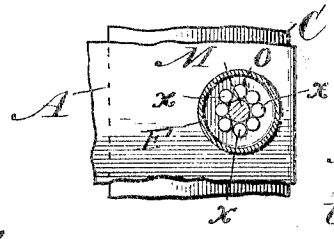


Fig. 12.

Fig. 13.



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No. 793,790. Patented July 4, 1905.

UNITED STATES PATENT OFFICE.

ANDREW D. HULQUIST, OF CHICAGO, ILLINOIS, ASSIGNOR TO J. S. McDONALD, OF CHICAGO, ILLINOIS.

LOCK FOR ADJUSTABLE BACK-FRAMES OF ACCOUNT-BOOKS, LEDGERS, &c.

SPECIFICATION forming part of Letters Patent No. 793,790, dated July 4, 1905.

Application filed March 16, 1903. Serial No. 148,003.

To all whom it may concern:

Be it known that I, ANDREW D. HULQUIST, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locks for Adjustable Back-Frames of Account-Books, Ledgers, &c., of which the following is a full, clear, and exact description.

The object of my invention is to provide a simple, cheap, and effective gravity-controlled lock for locking the telescopic back-sections of books, and particularly heavy books, such as account-books, invoice-books, ledgers, &c., together in such manner that said backs may be expanded for the insertion or removal of matter for the accommodation of which such books are intended and then easily and quickly locked, so as to clamp and secure such matter in book form between them. This I accomplish largely by constructing the parts thereof of commercial forms of materials in the manner hereinafter fully described and as particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a book having my improvements applied thereto. Fig. 2 is a cross-section through the back and a portion of the covers thereof, drawn to a larger scale and showing the relative position of the parts of the lock when locked together. Fig. 3 is a similar view showing the relative position of the same when unlocked. Fig. 4 is a plan view of a portion of one of the back-clamping plates and end of one of said locks secured therein. Fig. 5 is a section taken on dotted line 5 5, Fig. 3, looking in the direction indicated by the arrows. Fig. 6 is a longitudinal central section of a modified construction of said improved lock. Fig. 7 is a detail view showing a side elevation of the bolt used in connection with the preferred form of my invention. Fig. 8 is a detail view showing a side elevation of the bolt used in connection with the modified form of my invention. Fig. 9 is a central longitudinal section of one of the tubular connecting-posts of the preferred form. Fig. 10 is a detail view of the bearing-cup or bushing used in the preferred form of my invention. Figs. 11, 12, and 13 are detail views of a modified form of my invention.

Referring to the drawings, A represents the covers of a book to the back of which my improvements are to be applied, and these covers have their rear edges attached in any suitable manner to the parallel clamping-plates B and C, respectively, of the adjustable back-frame of the book. Plates B and C are of a length corresponding to the width of the covers, and each have their rear end edges provided with walls *a b*, of stiff material, that project at right angles to their inner flat surfaces toward the opposite plate, which are so arranged that the walls of one plate telescope within those of the other, substantially as shown. Clamping-plates B and C are connected, preferably, near each end by tubular posts, each of which comprises a tube *c*, secured to and projecting from one plate, into which a tube *d*, secured to and projecting from the other plate, telescopes. The ends of these post-tubes are secured into the openings made therefor in the plates, and then a tight-fitting plug *e* is inserted in the mouth of such attaching end and the edges of the tube swaged, thus making a strong, tight, and secure joint. A coil expansion-spring A′ is housed within these post-tubes and creates a normal tendency of the clamping-plates to separate farther apart.

My improvements comprise gravity-controlled locking devices which when the book is lying on one side operate against the tendency of the clamping-plates to separate and when laid over on the other side and subjected to a slight compression automatically unlock and permit automatic separation thereof. The locking devices each comprise a housing consisting of a tube E, having one end secured to and projecting from one of said clamping-plates, and a slightly-smaller tube F, having one end secured to and projecting from the other clamping-plate, so as to aline with and telescopically engage the same. The smaller tube F has a bearing-cup or bushing *g* suitably secured in the end thereof entering tube E, the side of which facing the opposite end of said tube F is concaved

and is provided with a series of equidistant grooves *h h* therein, extending, preferably, in a tangential direction from the central opening *f* of the cup. Secured in the end of the larger tube E which is fastened in clamping-plate B is a head H, closing the mouth of the same, and journaled in the countersunk central opening of this head H is one end of a bolt G. The periphery of this bolt is preferably of the same diameter throughout its length, with the exception of its end opposite the end secured in the head, which is provided with a circumferential flange I, as shown. The end of the bolt journaled in head H is provided with a neck *k* of less diameter, which is created by providing the same with a suitable circumferential groove, and the portion of the stepped opening in said head H in which said end of the bolt which is of smallest diameter is journaled forms a bearing for such neck *k*, and thus prevents the longitudinal displacement of the bolt. Between the portion of the bolt G journaled in the head H and the opposite flanged end I of the same it is provided with a spiral groove K of slight pitch, and this grooved portion passes through the central opening *f* of the bearing-cup *g* into the tube F and between the flanged end I of said bolt, which corresponds in diameter to and fits so that it can just be moved back and forth in the bore of the smaller tube F. Between the flanged end I of the bolt and the bearing-cup I place a small bearing-ball *x*, which when the book is placed on one side will gravitate into the concave side of the said cup and into the dip of the spiral groove of the bolt and prevent the bolt moving and which when the book is laid on its opposite side will when the sides of the book are compressed so as to release it gravitate to and rest upon the flange of the flanged end I of the bolt and release said bolt, so that it can freely move through bearing-cup *g*. Owing to the presence of the circumferential groove in the end of the bolt and the correspondingly-shaped seat or bearing in said head in which said end is journaled, it is preferred to make said head in two semicircular pieces and to place the end of the bolt between the same, so that it will seat itself in the central opening when said pieces are brought together and be capable of rotary motion therein when said sectional head is inserted and secured in the retained end of the larger tube, but incapable of independent longitudinal movement. The outer extremity of the bolt is preferably flush with the outer side or surface of the head and is provided with a diametrical groove 2 therein to permit of its being rotated by a screw-driver. Such rotation of the bolt is desirable when the clamping-plates have been made to compress the paper between them so tight that the expansibility of said paper causes the bolt to hold the locking-balls so tight against the bearing-cup that said balls will not be released automatically when the book is laid on its proper side to make it gravitate out of locking relation with said parts or even when manual compression is resorted to to effect the same result. Under these circumstances when the bolt is rotated in the right direction the ball will roll in the spiral groove in the barrel of the bolt toward the flanged end thereof and permit of the gradual separation of the clamping-plates until loosened sufficient to fall out of the bearing-cup and unlock said clamping-plates. The reverse of this action can also be utilized when desired to move said clamping-plates together to a greater extent than could be accomplished by mere manual compression when the matter between them cannot be securely held in place by such a method.

In Figs. 6 and 8 I show a modified construction of my invention, in which the principal difference is due to the fact that the bolt M is provided with a series of circular grooves *m*, which gives its body a corrugated appearance, and its outer end is preferably non-rotatively secured in the head H. With the exception of the rotation feature this modification operates just the same as the preferred form of the invention shown in the first five figures of the drawings. It is therefore immaterial whether the head H is made sectional or not when used in connection with this modification.

While it is desirable to employ both tubes E and F in the construction of my invention, it is obvious that the larger or female tube E could be dispensed with, because its principal office is to form a housing for the bolt G and provide a smooth exterior for the lock which will not tear the edges of the paper matter confined between the clamping-plates that may come in contact therewith. The bolt G and the smaller tube F constitute the essential elements of the lock, and if these two elements alone were used the bolt would be secured directly to the clamping-plate from which it projects. It is also obvious that the tubes used in the construction of my invention might be any shape in cross-section. I prefer to make them cylindrical, so as to be able to use commercial sizes of pipe, and for this same reason I prefer to employ the locking-balls or shot, these being easily procurable in the market. The bolt in the lock shown in the first five figures of the drawings could be made of any ordinary screw of suitable dimensions. All such changes and modifications I desire to be understood as considering within the scope of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells, having continuous unbroken bores, the male tube pro-

vided with a restricted end, a longitudinal bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

2. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal central bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

3. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

4. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal central corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

5. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal rotatable bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

6. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal central rotatable bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

7. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal rotatable corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

8. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates, comprising telescoping tubular shells having continuous unbroken bores, the male tube provided with a restricted end, a longitudinal central rotatable corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

9. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth, and a longitudinal bolt extending from the female tube through said bushing and interlocking therewith in independent relation with each other.

10. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth, and a longitudinal central bolt extending from the female tube through said bushing and interlocking therewith in independent relation between said bushing and its unretained end.

11. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube, a longitudinal bolt extending from the female tube through said bushing and a freely-movable ball adapted to wedge between the walls of the male tube and said bolt to prevent the withdrawal of said bolt, when the book lies on one side and permits the withdrawal thereof when laid on its opposite side.

12. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth, and a longitudinal corrugated bolt extending from the female

tube through said bushing and interlocking therewith in independent relation between said bushing and its unretained end.

13. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth, a longitudinal bolt extending from the female tube through said bushing and a gravity-operated locking device adapted to prevent the withdrawal of said bolt when the book lies on one side and permits the withdrawal thereof when laid on its opposite side without coming in direct operative contact with said female tube and its unretained end.

14. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth the side farthest from said end being concaved, and a longitudinal bolt extending from the female tube through said bushing and interlocking therewith.

15. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth the side farthest from said end being concaved, and a longitudinal central bolt extending from the female tube through said bushing and interlocking therewith in independent relation between said bushing and its unretained end.

16. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the side farthest from said end being concaved, a longitudinal bolt extending from the female tube through said bushing and a ball adapted to wedge between said bolt and the sides of the male tube and prevent the withdrawal of said bolt, when the book lies on one side and permits the withdrawal thereof when laid on its opposite side.

17. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth the side farthest from said end being concaved, and a longitudinal corrugated bolt extending from the female tube through said bushing and interlocking therewith in independent relation between said bushing and its unretained end.

18. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescoping tubular shells, a bushing in the unretained end of the male tube, a longitudinal spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between said bushing and bolt adapted to interlock the same in independent relation with each other.

19. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescoping tubular shells having continuous bores, the male tube provided with a restricted end, a longitudinal central spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

20. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescoping tubular shells having continuous bores, the male tube provided with a restricted end, a longitudinal rotatable spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

21. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescoping tubular shells having continuous bores, the male tube provided with a restricted end, a longitudinal central rotatable spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

22. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescoping tubular shells having continuous bores, the male tube provided with a restricted end, a longitudinal rotatable spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed between the male tube and said bolt adapted to interlock the same in independent relation with each other.

23. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates, comprising telescopic tubular shells having continuous bores, the male tube provided with a restricted end, a longitudinal central rotatable spirally-corrugated bolt extending from one of said tubes into the other and interlocking therewith and independent means interposed

between the male tube and said bolt adapted to interlock the same in independent relation with each other.

24. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube, and a longitudinal spirally-corrugated bolt extending from the female tube through said bushing and interlocking therewith in independent relation between its unretained end and the mouth of the tube it enters.

25. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube, a longitudinal spirally-corrugated bolt extending from the female tube through said bushing and a ball adapted to wedge between said bolt and the sides of the male tube and prevent the withdrawal of said bolt, when the book lies on one side and permits the withdrawal thereof when laid on its opposite side.

26. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth, a longitudinal spirally-grooved bolt extending from the female tube through said bushing and a gravity-operated locking device adapted to prevent the withdrawal of said bolt when the book lies on one side and permits the withdrawal thereof when laid on its opposite side.

27. In a book, the combination with clamping-plates to which the covers of the same are fastened, of locks connecting said plates and comprising telescoping tubular shells, a bushing in the unretained end of the male tube the bore of which is smooth the side farthest from said end being concaved, and a longitudinal spirally-grooved bolt extending from the female tube through said bushing and means in the concavity of said bushing for interlocking said parts.

28. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube, and a bolt one end of which is secured in said head and which extends longitudinally therein, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube, and a bushing secured in the unretained end of said male tube having its bore smooth and through which said bolt extends and with which it interlocks, and gravity-controlled locking devices movable between the said bushing and the unretained end of said bolt for interlocking the same.

29. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube comprising two semicircular sections, and a bolt one end of which is secured in said head and which extends longitudinally therein, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube, and a bushing secured in the unretained end of said male tube through which said bolt extends and interlocks, and gravity-controlled locking devices.

30. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube comprising two semicircular sections, and a spirally-grooved bolt one end of which is secured in said head and which extends longitudinally therein, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube, and a bushing secured in the unretained end of said male tube through which said bolt extends and interlocks, and gravity-controlled locking devices.

31. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube, and a bolt one end of which is secured in said head and which extends longitudinally therein, and has its opposite end circumferentially flanged, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube, and a bushing secured in the retained end of said male tube through which said bolt extends and interlocks, and gravity-controlled locking devices adapted to wedge between said bolt and the sides of said male tube between said bushing and its circumferentially-flanged end.

32. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube, and a bolt one end of which is secured in said head and which extends longitudinally therein, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube,

and a bushing secured in the unretained end of said male tube having its side farthest from said end concaved and provided with grooves converging toward the central opening therein through which said bolt extends and interlocks, and gravity-controlled locking devices.

33. In a book, the combination with clamping-plates to which the covers of the same are fastened, a female tube one end of which is secured in and extends at right angles from one of said plates, a suitable head closing the retained end of said tube comprising two semicircular sections, and a bolt one end of which is rotatably secured in said head and which extends longitudinally therein, of a male tube having its opposite end secured in alinement with said female tube to the other clamping-plate and telescoping with said female tube, and a bushing secured in the unretained end of said male tube through which said bolt extends and interlocks, and gravity-controlled locking devices.

34. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinal bolt secured to and extending from one of said plates, a tube secured to and extending to the other plate in alinement with said bolt and a bushing in said tube the bore of which is smooth through which said bolt extends into the tube and means movable between the mouth of said tube and the unretained end of said bolt for interlocking the same.

35. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinally-corrugated bolt secured to and extending from one of said plates, a tube secured to and extending to the other plate in alinement with said bolt and a bushing in said tube the bore of which is smooth through which said bolt extends into the tube and means movable between the mouth of said tube and the unretained end of said bolt for interlocking the same.

36. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinal bolt secured to and extending from one of said plates, a tube secured to and extending to the other plate in alinement with said bolt and a bushing in said tube the bore of which is smooth through which said bolt extends into the tube and independently-movable gravity-actuated means movable between the mouth of said tube and the unretained end of said bolt for locking the same.

37. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinal bolt secured to and extending from one of said plates, a tube secured to and extending from the other plate in alinement with said bolt and a bushing in said tube the bore of which is smooth through which said bolt extends into the tube and independently-movable gravity-actuated means movable between the mouth of said tube and the unretained end of said bolt for locking the same.

38. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a rotatable corrugated bolt secured in and extending from one of said plates, and a tube secured to and extending from the other plate into which said bolt enters and means movable within said tube between the mouth of the said tube and the unretained end of the bolt for locking the same.

39. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinal bolt secured to and extending from one of said plates, a tube secured to and extending from the other plate into which said bolt enters, and gravity-actuated means between the mouth of said tube and the unretained end of said bolt capable of movement in planes both longitudinally and laterally within said tube and locking said bolt.

40. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a corrugated bolt secured to and extending from one of said plates, a tube secured to and extending from the other plate into which said bolt enters, and gravity-actuated means within said tube capable of movement in planes both longitudinally and laterally between the unretained end of said tube and the unengaged end of the bolt for locking the latter.

41. In a book, the combination with clamping-plates to which the covers of the same are fastened, of a lock connecting said plates comprising a longitudinal bolt secured to and extending from one of said plates, a tube secured to and extending from the other plate having a continuous unbroken bore and provided with a restricted end, and independent means interposed between said tube and bolt adapted to interlock the same in independent relation with each other.

In testimony whereof I have set my hand this 9th day of March, 1903.

ANDREW D. HULQUIST.

Witnesses:

E. K. LUNDY,

FRANK D. THOMASON.