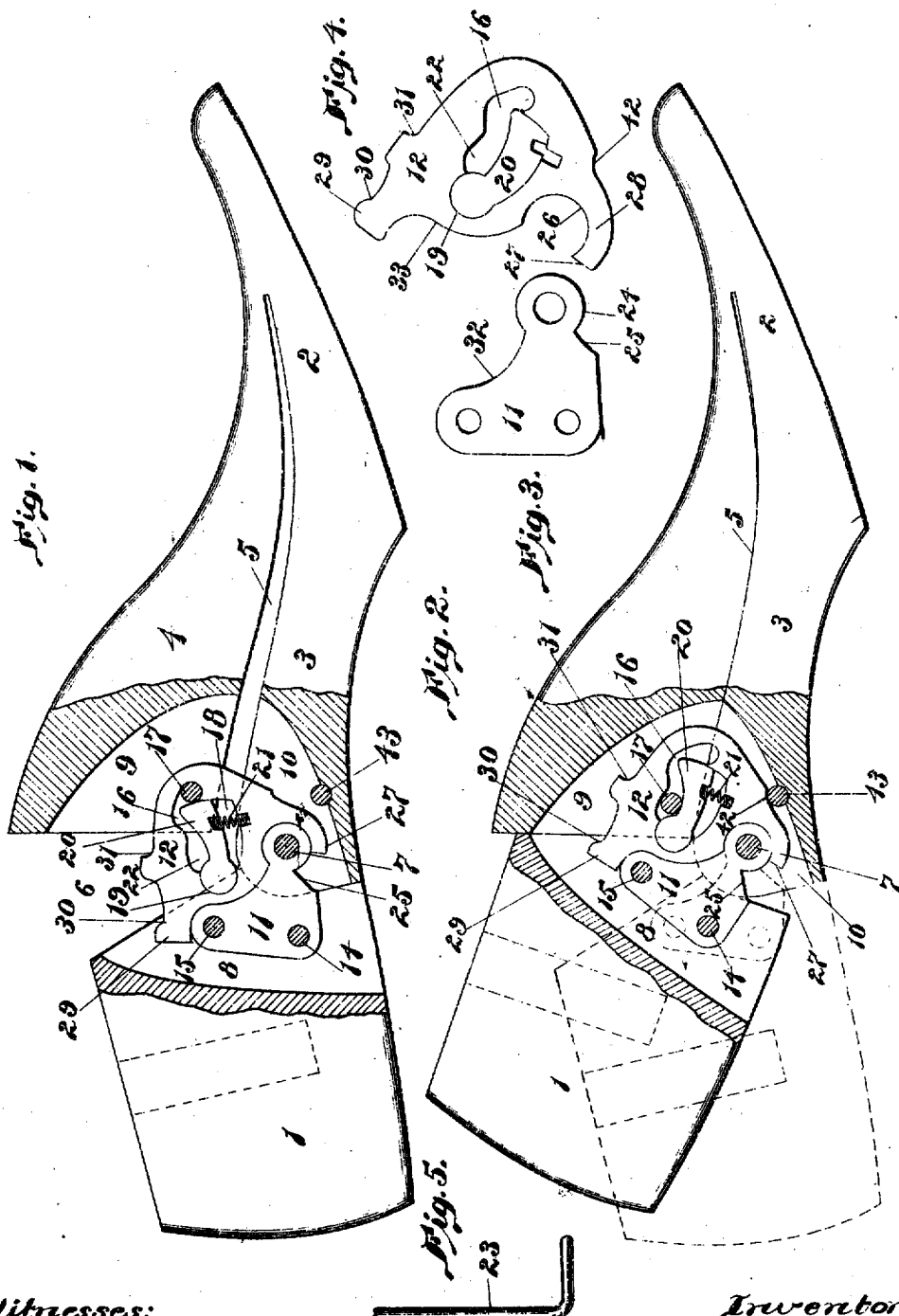


F. J. SHAINSEY, SR.
COLLAPSIBLE LAST LOCK
APPLICATION FILED APR. 24, 1906.

1,006,137.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.



Witnesses:

Walter H. Maylor
Wm. J. Pike.

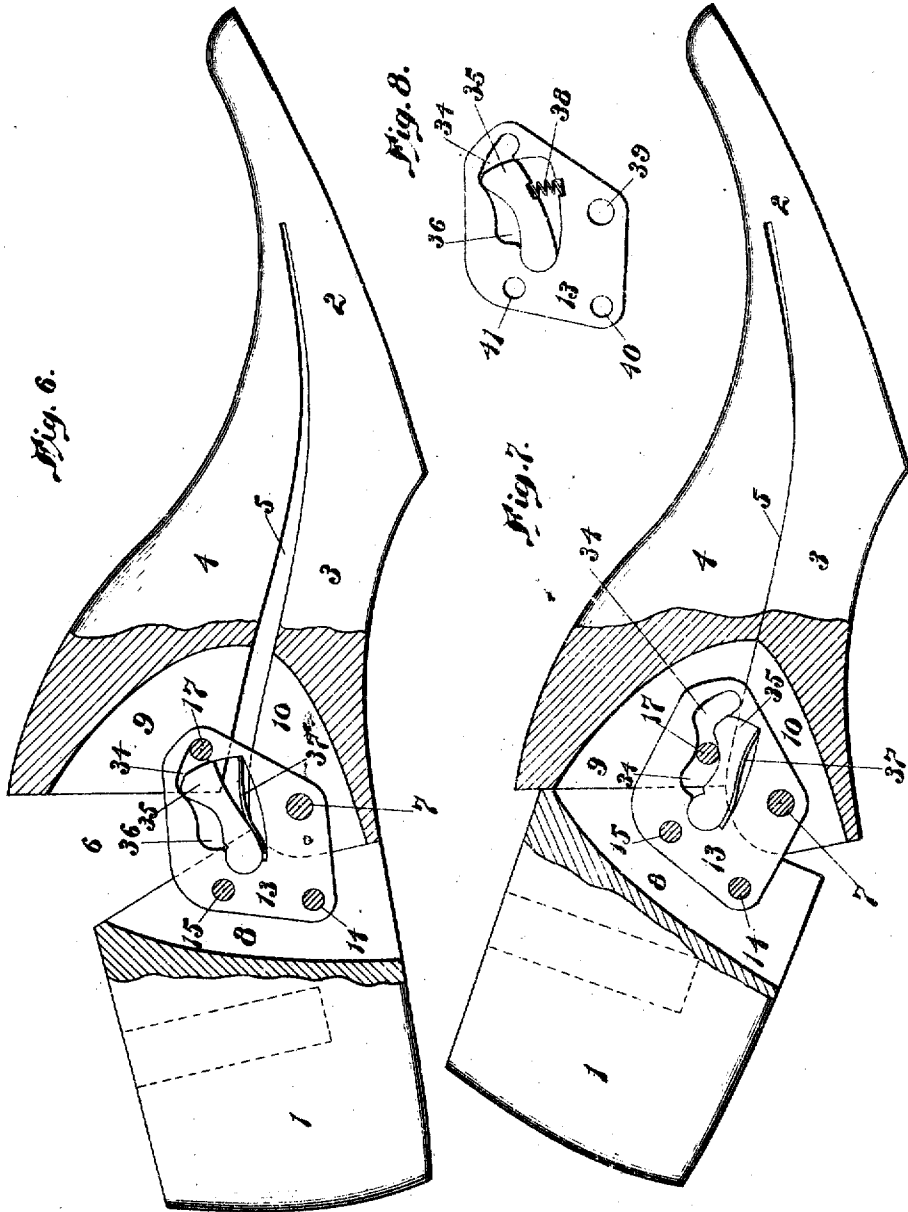
Inventor:
Frederick John Shainsey Sr.,
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Witnesses:

Walter H. Gaffa
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UNITED STATES PATENT OFFICE.

FREDERICK JOHN SHAINSEY, SR., OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KRENTLER-ARNOLD HINGE LAST COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

COLLAPSIBLE-LAST LOCK.

1,006,137.

Specification of Letters Patent. Patented Oct. 17, 1911.

Application filed April 24, 1906. Serial No. 313,612.

To all whom it may concern:

Be it known that I, FREDERICK JOHN SHAINSEY, Sr., a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented an Improvement in Collapsible-Last Locks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a collapsible last lock, capable of automatically locking the instep block of a last in expanded or distended position, one form of my invention also providing means for automatically holding the instep block of the last in collapsed position while permitting the heel part to swing independently.

One of the most difficult problems to solve in this art is the proper locking of hinged lasts without introducing complicated or expensive accessories. Of course the lock must be located adjacent the transverse cuts or openings of the last, and these must not be cut away to any extent because the strain which is brought upon the last is greatest at this middle region, and hence all the material must remain for strength. Accordingly my present invention includes the provision of a latch or bolt, stamped out of the connecting plate and retained within the boundaries of the latter in one and the same plane therewith, being automatically projected behind the collapsing pin or rivet when the last is in expanded position.

Further advantages of my invention and the constructional details thereof will be more apparent from the following description, taken in connection with the accompanying drawings, in which I have shown several out of many embodiments of which my invention is capable.

In the drawings, Figures 1 and 2 represent in side elevation, partly broken away, a last provided with one form of my invention, Fig. 1 showing the last in its lengthened or expanded position, and Fig. 2 in its collapsed position; Figs. 3 and 4 are views of the two parts of the compound hinge connection; Fig. 5 shows a hook for unhooking the last; Figs. 6 and 7 are views similar to Figs. 1 and 2, showing a simpler form of my invention; Fig. 8 is a side view of a modified form of hinge.

My invention applies more particularly to what are known as the Pym collapsible lasts, sometimes called also Krentler collapsible lasts on account of the various Krentler improvements on the original Pym construction. This type of last, as shown in the drawings, comprises a heel part 1 and forepart 2, comprising also a body portion 3 and an upper or instep part 4. I have omitted in the drawings to show the various usual last trimmings, and will confine my description to the improvements which constitute my invention.

The last parts are severed as usual, by a longitudinal downwardly curved slot 5, extending forwardly into the forepart to permit the instep block to rise and fall, and the V-shaped gap 6 between the rear end of the instep block and the forward end of the heel part for permitting the latter to be turned on the pivot pin 7 as a center. The heel part is provided with a vertical kerf 8 and the forepart with an aligned vertical kerf 9, 10, in which, in the last of the drawings, Figs. 1 and 2, plates 11 and 12 are mounted standing in one and the same plane, and in Figs. 6 and 7 a single plate 13. The plate 11 is secured at its forward end on the pivot 7 and at its rear end is made rigidly fast by transverse pins or rivets 14, 15, while the forward plate 12, which together with the plate 11 constitutes the compound hinge connection between the three parts of the last, is provided with a cam-shaped slot or opening 16, in which works a transverse pin 17, operating on the general principle explained for example in the Pym Patent No. 673,889. The slot 16 is provided with a lower recess 18 and a semi-circular portion 19, in which I mount a tongue or bolt 20, held under a normal tendency to rise, by means of a spring 21, secured in notches as shown plainly in Figs. 1, 2, 4 and 8, in the opposite edges of the adjacent parts, so that the bolt is normally held in the position shown in the drawings Figs. 1, 2, 8, Fig. 1 showing the bolt locking directly against the pin 17, whereby the last is held unyieldingly extended. In Fig. 4 the spring is omitted and the latch is down in the recess 18. The recess 18 and bolt 20 are preferably of such a length and so located that in whatever position the parts are, the bolt is engaged at its opposite sides and preferably also adjacent

its opposite ends, by the walls of the adjacent kerfs, so that it is impossible for it to drop out or be inadvertently pushed out or loosened. The bolt turns up on its socket recess 19 with a hinge-like action, and is always in proper position, being stamped from the same piece of metal of which the hinge is formed. Above the bolt is an enlargement or extension 22 in the cam slot 16, see Fig. 1, for receiving a prong or hook 23, Fig. 5, for depressing the latch or bolt 20 when the parts are in the position shown in Fig. 1, and for receiving the pin 17 when the parts are in the position shown in Fig. 2.

The plate 11 has an annular boss or ear 24 concentric with the perforation or opening for the pin 7, and a shoulder 25, and the plate 12 has a correspondingly shaped recess 26 fitting snugly on the ear 24 in the same plane therewith, and terminating in a stop 27. The hook-shaped end 28 of the plate 12 at the lower side of the recess 26 slides on the arc surface of the ear 24, which it partially embraces, and cooperates with the cam slot 16 and pin 17 in compelling the instep block to close down into collapsed position as shown in Fig. 2, when the plate 12 has been turned forward about the pin 7 as a center, to the position shown in Fig. 2.

When in this position the forepart will remain collapsed and the heelpart can be swung up or down, as shown in full lines and in dotted lines respectively. This facilitates the entrance of the last within a shoe without disturbing the lining, and permits the heelpart to be lowered while the forepart still remains collapsed.

When the heelpart has been lowered, the forepart is distended or expanded by turning the plate 12 backwardly and downwardly upon the pin 7 as a center, and to permit this movement to be readily accomplished I have provided the plate 12 with a shouldered projection 29, which provides a notch 30 against which the hook 23 may be pressed, thereby turning the plate 12 downwardly. To facilitate the speedy final movement of the plate 12 I provide a second notch 31, against which the hook 23 may be pressed when the parts are nearly in the position shown in Fig. 1, for completing the movement. The moment that the plate 12 has been turned into its final rearward position, the latch or bolt 20 is instantly raised by its spring 21 into locking position, thereby rendering the last perfectly rigid. To give great strength to this position I have provided a curved forward edge 32 to the plate 11, and a correspondingly curved edge 33 to the plate 12, so that said edges 32, 33, meet throughout their length when the last is lengthened and expanded, said curves interlocking and preventing any tendency and possibility of shifting movement.

In Figs. 6-8 a simpler form of connection

is shown, in which the independent movement of the instep block is omitted, the hinge plate 13 there shown containing a cam slot 34 the same as the slot 16 of plate 12, and a bolt or latch 35 the same as the bolt 20 already described, said bolt 35 being operated by the hook 23 inserted in an enlargement 36 of said slot corresponding to the enlargement 22, already described. The bolt 35 is shown as held raised by a flat leaf spring 37 in Figs. 6 and 7, and by a coiled spring 38 in Fig. 8. The plate 13 has three holes 39, 40, 41, for receiving a pivot pin 7 and transverse pins or rivets 14, 15, of the last, as already described. The plate 12 is preferably provided with a shoulder or holding notch 42 to engage a transverse pin or rivet 43, as shown in Fig. 2.

In making my improved collapsible last, the last is sawed in the usual manner and is then provided with vertical saw cuts or kerfs extending inwardly, in alignment with each other, perpendicularly to the meeting faces of the adjacent secant ends, said saw cut or kerf corresponding accurately in width to the thickness of the plate and connections 11 and 12 or 13 as the case may be. In the former case the plate 12 is interlocked with the plate 11 so that the recess 26 fits tightly and accurately over the boss or ear 24 and the curved edge 33 is nested snugly against the edge 32. The circular rear end of the bolt 20 is then pressed snugly into the annular seat 19 provided therefor in the plate 12, and the spring 21 is pressed into its holding notches. The compound connection, as thus assembled, is then placed in the aligned kerfs of the last and the pins 7, 14, 15 and 17 are inserted and secured, thereby completing the last. If now it is desired to insert the last in a lasted shoe, the bolt 20 is first depressed by the hook 23 and the heelpart is then turned up to the position shown in Fig. 2, thereby automatically forcing the plate 12 forward, and as its cam slot 16 rides over the pin 17 it automatically collapses the forepart, whereupon the last is inserted in the shoe as far as practicable, by hand, and then the heelpart is turned down to the position shown in Fig. 1. This movement of the heelpart in my preferred construction, as shown in Figs. 1-4, still leaves the forepart contracted, however, so that the down-turning of the heelpart may readily push the forepart forward for carrying the lining of the shoe forward with it. When the last has thus been turned down into extended position within the shoe, the operator presses downwardly upon the notch 30 of the plate 12 and if necessary completes the down-turning of said plate by engaging the notch 31 also, whereupon the bolt 20 snaps upwardly behind the pin 17 and locks the last rigidly in expanded position, firmly supporting all parts of the shoe. It will

be seen that although I have provided a compound hinge plate, in which the part 12 is capable of operation independently of the part 11, or both parts 11 and 12 may be operated together at will, yet the last does not require any more transverse pins than formerly, and yet the hinge plates or compound connection lie all in one and the same plane so as to occupy the same narrow parallel-sided kerfs. This gives great strength to the last and also economy of manufacture, and prevents the parts becoming laterally disconnected or bent and broken.

The construction shown in Figs. 6-8 is put together in general the same as already described for the preferred construction, excepting that there is only one plate to be placed, said plate receiving its bolt and spring in substantially the way already described in the other construction.

I do not herein claim broadly the provision of a combined lock-and-hinge in the form of a vertical plate and bolt lying in the same plane therewith, as that, together with other features, forms the subject matter of my copending application Ser. No. 302,678 filed February 21, 1906, and I make no claim to a compound locking hinge connection composed of two plates lying in the same plane and movable independently of each other, in its broad features, as that idea is the invention of C. F. Pym, but—

What I claim and desire to secure by Letters Patent of the United States is:

1. A last, comprising a forepart and a heelpart, arranged to swing on each other, and provided with vertical longitudinal kerfs in their meeting ends, combined with a plate hinging the heelpart and forepart together, and a locking plate standing edgewise in the same plane as said first-mentioned plate, and swinging on the same pivotal center therewith, said two plates snugly fitting and being retained by said kerfs.

2. A collapsible last, having a heel-part, a forepart body, an instep-portion, said three parts being relatively movable for insertion in a shoe and removal therefrom, each part with respect to both of the other parts, and automatic locking means mounted to be brought into position for operation by the movement of the parts to fully lengthened position and having provision to be then operated to automatically lock said three parts when fully lengthened and expanded.

3. A collapsible last, having a heel-part, a forepart body, an instep-portion, all necessarily relatively movable for insertion in a shoe and removal from the shoe, means permitting the dissimultaneous movement of said three last-parts, and automatic locking mechanism constituting part of said permitting means and responsive to movements of the last parts into lengthened and expanded position to automatically lock said three

parts in immovable position when fully lengthened and expanded.

4. A collapsible last, having a heel-part, a forepart body, an instep-portion, said three parts being relatively movable, each with respect to both of the others, and automatic locking means adapted to move into operative position automatically when said three parts are fully lengthened and expanded to lock the same in said fully lengthened and expanded relation, said locking means remaining inoperative until the last parts are approximately in said lengthened and expanded position.

5. A collapsible last, having a heel-part, a forepart body, an instep-portion, all relatively movable, means permitting the dissimultaneous movement of said three last-parts, and automatic locking mechanism constituting part of said means and movable separately from the rest of said means automatically to lock said three parts in immovable position when fully lengthened and expanded.

6. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, and means standing vertically in said kerfs for connecting said three parts, and automatic locking mechanism carried by said connecting means for locking said parts automatically when the last-parts are moved to full lengthened and expanded position.

7. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, means standing vertically in said kerfs for connecting said three parts, said connecting means having a cam slot for collapsing the instep portion, the latter being provided with a transverse pin occupying said slot, and a locking device movable into said slot across the path of said pin.

8. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, means standing vertically in said kerfs for connecting said three parts, said connecting means having a cam slot for collapsing the instep portion, the latter being provided with a transverse pin occupying said slot, a locking device movable into said slot across the path of said pin, and a spring for automatically maintaining said locking device under a tendency to occupy locking position.

9. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, means standing vertically in said kerfs for connecting said three parts, said connecting means having a cam slot for collapsing the instep portion,

the latter being provided with a transverse pin occupying said slot, there being a recess connecting with said slot, and a spring-pressed locking bolt mounted in said recess in the plane of said kerfs.

10. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, means standing vertically in said kerfs for connecting said three parts, said connecting means having a cam slot for collapsing the instep portion, the latter being provided with a transverse pin occupying said slot, and a spring-actuated swinging locking bolt carried by said connecting means, to swing automatically into the path of said pin for maintaining said three last-parts in lengthened and expanded position.

11. A collapsible last, having a heelpart, forepart body and instep portion, all relatively movable, with vertical longitudinal kerfs in their meeting ends, plate-like connecting means standing vertically in said

kerfs, said means being provided with a cam slot adjacent said instep portion, the latter having a transverse pin occupying said slot, and there being a recess connecting with said slot provided with a swinging bolt lying in the same plane as the adjacent connecting plate.

12. A collapsible last, having a compound hinge connection formed of two plates lying in the same vertical plane and occupying vertical kerfs in the meeting ends of the collapsible last-parts, and a single pivot pin for said two plates, one of said plates having an annular ear mounted directly on said pin, and the other of said plates having an embracing portion partially surrounding said ear and turning independently thereon.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FREDERICK JOHN SHAINSEY, Sr.

Witnesses:

MAY B. MATHER,
E. J. FINKE.