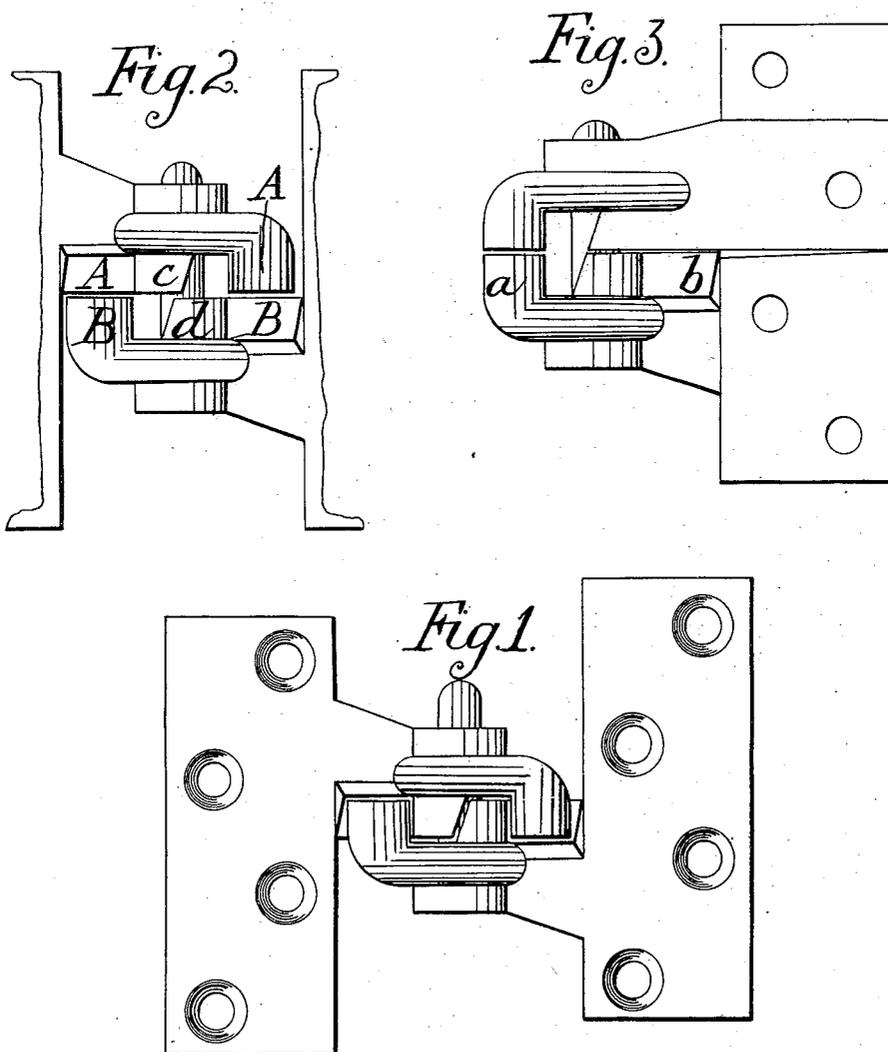


No. 10,477.

PATENTED JAN. 31, 1854.

H. LULL.  
SHUTTER HINGE.



# UNITED STATES PATENT OFFICE.

HARVEY LULL, OF SOUTH COVENTRY, CONNECTICUT, ASSIGNOR TO H. LULL AND RICHD. PORTER.

## SHUTTER-HINGE.

Specification of Letters Patent No. 10,477, dated January 31, 1854.

*To all whom it may concern:*

Be it known that I, HARVEY LULL, late of Wheeling, in the county of Ohio and State of Virginia, but now of South Coventry, in the county of Tolland and State of Connecticut, have invented certain new and useful Improvements in Self-Locking Hinges; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1, represents the hinge as open and locked. Fig. 2 represents the hinge in its position when the shutter is drawn from the wall sufficiently far, to unlock it, and Fig. 3, represents the hinge when the shutter is closed.

There are several varieties of shutter and door hinges, the greater portion of which in being opened bring two inclined planes in action causing the shutter or door to rise,—the object being to cause doors especially to swing clear of the carpet. Some of these are provided with a fastening which is formed of a separate piece. Another method is to make a series of planes, which admits of the door rising and falling several times in the act of swinging it open and shut. I do not lay claim to any of these hinges, for they are almost useless for shutter hinges, for which purpose my hinge is especially designed.

It is well known that window shutters must swing into the window frames several inches before they come to their seats, and to use either of the class of hinges before mentioned, would cause the shutter to rise up against the frame and bind, or else it must be cut away, which would admit rain snow &c. My hinge allows the shutter to swing around horizontally until it almost reaches the wall when it drops and locks. This is one distinguishing feature of mine over other hinges. Again my hinge is composed of but two pieces, each entirely of cast metal, while the others which are self locking are composed of three or more, and indeed many of those which work upon the planes use a friction roller to aid in causing one half of the hinge to rise on the other half, which is expensive and very liable to become disarranged, as well as adding another piece to the hinge. This constitutes a second difference. But the most essential point of difference between my hinge, and those here-

tofore essayed, consists in my being able to use a cast iron spindle with perfect safety, from the fact that when the shutter is opened and locked, the force of the wind tending to close the shutter is taken entirely off the spindle and thrown upon two cast arms—and in opening or closing the shutter its weight is partially taken upon two square shoulders, thus relieving the spindle which is really but a directrix to the other parts, without taking the weight of the shutter upon it. For this reason I can safely rely upon the cast iron spindle. I do not contend, however, that cast iron spindles have not been used, but I do contend that they are liable to be broken by any sudden slamming of the shutter, as they heretofore had to sustain its entire weight. I do not assert that my invention consists of three distinct differences between what has heretofore been done, and what I have done, but I claim, so combining these differences, as to produce in a hinge of two pieces, a very cheap, strong, and effective self locking hinge, which has not been done before.

The nature of my invention therefore consists in the so forming of a self locking hinge, cast in two pieces, as that a shutter hung thereon may swing open or shut on a horizontal plane, and lock when opened to its limit, and so that also when locked open, the strain shall be taken off the spindle and thrown onto cam arms, and thus effectually relieve the spindle from the force of the winds.

To enable others skilled in the art to make and use my invention I will proceed to describe the same with reference to the drawings.

My hinge is cast in two pieces, of iron or any other suitable metal—each piece being identical in form with the exception that, one carries the spindle, the other the socket. Instead of forming the inclined planes on the shoulder of the hinge, as is heretofore done, I place them outside of the shoulder, and as remote from the center of the hinge as possible, placing one *b*, Fig. 3, on the arm or shank of the hinge, extending from the shoulder to the wing or plate, and projecting from two-thirds to three-fourths of its inclination from the face of the hinge. The other *a*, Fig. 3, is placed directly opposite, and extends the same distance from the center of the hinge, and faces, in the opposite

direction to that *b*. The inclination of the planes should be about forty-five degrees at the extreme outer end and approach the vertical as they come nearer the center of the hinge. The shoulder is formed with the half next the arm standing even with the top of the planes, and the other half cut down level with the bottom of the planes. The bottom half of the hinge inverted makes the top half by substituting the hole for the pivot. When a shutter hung on these hinges is thrown open, resting on the shoulders of the hinges, it neither passes over notches, nor up inclined planes, but swings freely around to a position nearly parallel with the wall where the support of the shutter passes from the shoulders *c, d*, Fig. 2, to the inclined planes, and the bottoms of the planes *A, A*, are brought to the tops of the planes *B, B*, as shown in Fig. 2, and the shutter is carried to the wall by its gravity on these inclined planes, and the hinge is locked as shown in Fig. 1, one half having dropped below its general position.

In closing the shutter, a slight force only

is necessary viz: to draw the shutter four or five inches to force it up the planes, when the support of the shutter is returned to the shoulders *c, d*, on which it rests and swings horizontally to its seat, entirely preventing the planes from coming in contact as it closes as shown in Fig. 3.

Having thus fully described the nature of my invention what I claim therein as new and desire to secure by Letters Patent, is,

The so forming of a self locking shutter hinge, cast in two pieces, as that the blind or shutter hung thereon may swing open or shut on a horizontal plane, and lock when opened to its limit, and so that also when locked open, the strain shall be taken off from the spindle and thrown onto cam arms, and thus effectually relieve the spindle from the weight or strain of the shutter, substantially as described.

HARVEY LULL.

Witnesses:

W. A. LOOMIS,  
D. H. CLARKE.

C

Circuit Court,  
N.D. New York.

LULL  
v.  
CLARK and others.  
1882.

In Equity.

PATENTS FOR INVENTIONS- FORMAL VARIATION- INFRINGEMENT.

Where the mechanism used by defendant's shutter hinge is a mere formal variation from that of plaintiffs' invention, having the same mode of operation, it is an infringement of the patent.

\*456 Livingston Gifford, and Philip J. O'Reilly, for plaintiff.

George J. Sicard, for defendants.

BLATCHFORD, Justice.

This suit is brought on [letters patent No. 10,477](#), granted to Harvey Lull and Richard Porter, on the invention of Lull, January 31, 1854, for 14 years from January 2, 1854, for an 'improvement in shutter hinges,' extended for seven years from January 2, 1868, and again extended for seven years from April 29, 1876, under the provisions of a special act of congress approved on that day. The specification says:

'Figure 1 represents the hinge as opened and locked; figure 2 represents the hinge in its position when the shutter is drawn from the wall sufficiently far to unlock it; and figure 3 represents the hinge when the shutter is closed. There are several varieties of shutter and door hinges, the greater portion of which, in being opened, bring two inclined planes in action, causing the shutter or door to rise, the object being to cause doors especially to swing clear of the carpet. Some of these are provided with a fastening which is formed of a separate piece. Another method is to make a series of planes, which admits of the door rising and falling several times in the act of swinging it open and shut. I

do not lay claim to any of these hinges, for they are almost useless for shutter hinges, for which purpose my hinge is especially designed. It is well known that window shutters must swing into the frames several inches before they come to their seats, and to use either of the class of hinges before mentioned would cause the shutter to rise up against the frame and bind, or else it must be cut away, which would admit rain, snow, etc. My hinge allows the shutter to swing around horizontally until it almost reaches the wall, when it drops and locks. This is one distinguishing feature of mine over other hinges. Again, my hinge is composed of but two pieces, each entirely of cast metal, while the others which are self-locking are composed of three or more; and, indeed, many of those which work upon the planes use a friction roller to aid in causing one half of the hinge to rise on the other half, which is expensive and very liable to become disarranged, as well as adding another piece to the hinge. This constitutes a second difference. But the most essential point of difference between my hinge and those heretofore essayed consists in my being able to use a cast-iron spindle with \*457 perfect safety, from the fact that, when the shutter is opened and locked, the force of the wind tending to close the shutter is taken entirely off the spindle and thrown upon two cast arms, and, in opening or closing the shutter, its weight is partially taken upon two square shoulders, thus relieving the spindle, which is really but a directrix to the other parts, without taking the weight of the shutter upon it. For this reason I can safely rely upon the cast-iron spindle. I do not contend, however, that cast-iron spindles have not been used, but I do contend that they are liable to be broken by any sudden slamming of the shutters, as they heretofore had to sustain its entire weight. I do not assert that my invention consists of three distinct differences between what has heretofore been done and what I have done, but I claim so combining these differences as to produce in a hinge of two pieces a very cheap, strong, and effective self-locking hinge, which has not been done before. The nature of my invention, therefore, consists in the so forming of a self-locking hinge, cast in two pieces, as that a shutter hung thereon may swing open or shut on a horizontal plane, and lock when opened to its limit, and so that, also, when locked open, the strain shall be taken off the spindle and thrown on to cam arms, and thus effectually re-

lieve the spindle from the force of the winds.

‘To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings. My hinge is cast in two pieces of iron, or any other suitable metal, each piece being identical in form, with the exception that one carries the spindle, the other the socket. Instead of forming the inclined planes on the shoulder of the hinge, as is heretofore done, I place them outside of the shoulder, and as remote from the center of the hinge as possible, placing one, b, figure 3, on the arm or shank of the hinge extending from the shoulder to the wing or plate, and projecting from two-thirds to three-fourths of its inclination from the face of the hinge. The other, a, figure 3, is placed directly opposite, and extends the same distance from the center of the hinge, and faces in the opposite direction to that, b. The inclination of the planes should be about 45 degrees at the extreme outer end, and approach the vertical as they come nearer the center of the hinge. The shoulder is formed with the half next the arm standing even with the top of the planes, and the other half cut down level with the bottom of the planes. The bottom half of the hinge inverted makes the top half by substituting the hole for the pivot. When a shutter hung on these hinges is thrown open, resting on the shoulders of the hinges, it neither passes over notches nor up inclined planes, but swings freely around to a position nearly parallel with the wall, where the support of the shutter passes from the shoulders, c, d, figure 2, to the inclined planes, and the bottom of the planes, A, A, are brought to the top of the planes, B, B, as shown in figure 2, and the shutter is carried to the wall by its gravity on these inclined planes, and the hinge is locked, as shown in figure 1, one-half having dropped below its general position. In closing the shutter a slight force only is necessary, viz., to draw the shutter four or five inches, to force it up the planes, when the support of the shutter is returned to the shoulders, c, d, on which it rests, and swings horizontally to its seat, entirely preventing the planes from coming in contact as it closes, as shown in figure 3.’

**\*458** The claim is in these words:

‘The so forming of a self-locking shutter hinge, cast in two pieces, as that the blind or shutter hung thereon may swing open or shut on a horizontal plane, and lock when opened to its limit, and so that, also, when locked open, the strain shall be taken off from the

spindle and thrown on to cam arms, and thus effectually relieve the spindle from the weight or strain of the shutter, substantially as described.’

In order to construe properly the claim of the Lull patent it is necessary to understand what preceded it.

The defendants have introduced two English patents to David Redmund,- one of 1821, No. 4,607, and one of 1872, No. 9,454. The Redmund hinge is in two parts, and has inclined planes on the shoulder, and also horizontal planes. But it is arranged to be so applied to a door that the door will, when it begins to open, rise up, because the inclined planes come immediately into action, and, as the door is further opened, the inclined planes go out of action, and horizontal shoulders come into action, so that the door goes on opening without rising any more. If the horizontal shoulders are left at rest the door will remain at rest. If the door is pushed so that the horizontal shoulders lap by each other it will drop, because the socket, being unsupported, drops on the spindle and the hinge is locked, so that the entire door must be raised in order to unlock the hinge. If, when the door is supported by the horizontal shoulders, it is pushed to close so far as to bring the inclined planes into action, it will close by their action and its weight without further pushing. The inclined planes face in opposite directions, and the two parts are identical in shape, except that one carries the spindle and the other the socket. It is clear that this structure does not anticipate Lull's hinge. It is useless as a shutter hinge, for that must open horizontally at first and then drop and be locked, and not rise at first in opening and then move horizontally and be locked; and it would require the moulding of the window to be cut away; and it could not be unlocked by merely pulling the shutter. It is plainly referred to in Lull's specification, and distinguished from his invention.

The Cryer hinge is substantially like Redmund's. Inclined planes come into action first, and then horizontal planes. There is no locking when the gate or door is open. To say that Redmund's and Cryer's hinges can be made to operate on a shutter by so arranging them that the horizontal planes will act before the inclined planes, is merely to say that Lull's invention might have been made by Redmund and Cryer if they had made it.

**\*459** The Stewart hinge, patented April 24, 1847, locks by gravity, but it has no inclined planes, and has

more than two parts, and cannot be unlocked by pulling or pushing the shutter.

Whatever there is in the Baker patent of April 13, 1852, it is shown that Lull made his invention before June 6, 1851.

The Reed patents of 1848 and 1849 are of no moment, and may be passed without observation; and so may the Robison patent of 1848, and the Peck patent of 1847, and the Palmer patent of 1843.

None of these prior hinges accomplished the object attained by Lull. One feature may be found in one structure, and another in another. But no one before Lull made a shutter hinge, cast in two pieces, which would swing open horizontally and then come to a self-locking position by the action of the weight of the shutter through inclined planes, allowing the shutter to drop, and then permit the shutter to rise by pulling it so as to bring the inclined planes into action and elevate the shutter so as to admit of its closing horizontally as it opened. In the Lull hinge, also, the strain is taken off of the spindle and is thrown onto the arms as far as possible by having the inclined planes on the arms and as far from the spindle as possible, and by having these planes face in opposite directions, and having the two parts alike, so as to reduce to a minimum the risk of breaking a cast-iron spindle.

The defendants' hinge is of the form described in [letters patent No. 156,277](#), granted to Charles B. Clark, October 27, 1874. The specification of that patent says:

'My invention relates to that class of blind hinges which are self-locking, or those which fasten the blind, when opened, by the half of the hinge to which the blind is attached sliding down an incline on the half attached to the house, and it has for its object the more effectually to secure the blind when in an open position, and prevent its being closed by the wind or other accidental cause, and yet admit of its ready closing by hand when required; and it consists in the combination, with a gravity-locking hinge provided with gravitating locking inclines, of a projecting catch or stop formed upon the pin of the hinge, which, when the blind is swung open and the male portion descends, the inclines of the knuckle on the female portion of the hinge drops into a notch formed in the eye of the female half, and acts in conjunction with and auxiliary

to the locking inclines, to increase the resistance, and thus serve to hold the blind securely in an open position. Figure 1 of the accompanying drawings is a perspective view of my improved hinge when closed; figure 2 is a plan and part section of the same when open; and figure 3 a plan of the parts detached, in which A represents the male portion inverted, and B the female portion of the hinge. In the drawings A represents the male portion of the hinge provided with the pin, c, and B the female \*460 portion having the eye, e. The pin, c, is surmounted by the knuckle, k, and the flange, d, on which are formed the inclines, m', n'. Corresponding inclines, m, n, are also formed on the proximate side of the knuckle, h. The part A being rotated upon the part, B, the weight of the blind is borne by the under surface of the lower part of the flange, d, bearing against the upper surface of the higher part of the knuckle, h, until the blind is nearly open, bringing the double machines, m, m', n, n', coincident, when the blind gravitates to the bottom of the inclines, in which position it rests, being fully opened and locked against accidental causes. When desired to close it, it is disengaged by steadily pulling, the force of the hand overcoming the resistance caused by the inclines. The pin, c, and socket, e, are preferably formed cylindrical on one side, and angular on the opposite one, as seen in figure 3, leaving, however, sufficient room in the socket to admit of the pin turning freely. In gravity-locking blind hinges, constructed with inclines which engage by the gravitation or descent of one-half upon the other, when the blind is open, to lock it in that position, it is found that, although the locking inclines offer sufficient resistance to ordinary winds to prevent the closing of the blind, yet they will yield to unusually strong winds, and it is hence desirable to provide such hinges with a means which will increase the resistance to unintentional closing, and effectually prevent the same. To this end I provide the hinge with a stop, f, on the circular side of the spindle, situated so as to come into action when the blind gravitates down the inclines. The stop, f, projects radially on one side. Its other side is beveled, and its outer face inclined to correspond with the inclines, m', n', and its base joined with the flange, d. The female portion has a corresponding recess, g, formed in the eye next the bearing surface of the knuckle, h. One side of which is abrupt, and the other beveled like the stop, f. The positions of this projection and its recess are such that when the blind is opened to the fullest extent their abrupt sides approximate, and the blind is so firmly held by the engagement of this stop, aided by the inclines and the pin bearing against the side of the

eye, that it is secure against accidental causes, such as sudden gusts of wind, etc., unlocking the blind, and yet it yields to the effort of the hand, the steady lateral pull of which raises the stop, f, out of the recess by the movement of the inclines, m, m', n, n', upon each other. It will be observed that the stop and recess offer no resistance to this movement, as they are formed parallel with or with the same inclination as the inclines, m, n, m', n', so that the blind may thus be closed by the hand with as much ease as if the stop were not used. The construction is such that the blind may be thrown violently open without straining the hinge, and it may be moulded and cast as readily as the old form.'

The claim of the Clark patent is this:

'In combination with the locking inclines m, n, m', n', the auxiliary locking stops, f, and recess, g, said inclines, stop, and recess, arranged and operating in conjunction with each other, as and for the purposes herein set forth.'

In the printed copy furnished in the printed record, of the specification of the Clark patent, there are some manifest errors, which are \*461 corrected in the foregoing copy. Whenever the knuckle, h, on the female portion of the hinge, is intended to be mentioned, which is three times, it is misprinted k, which is the designation, in the drawings, of the knuckle on the male portion of the hinge. So also 'the double inclines' are called on the print 'the double inclines, m, m';' but it should read, 'the double inclines, m, m', n, n'.' And in regard to raising the stop out of the recess, the print reads, 'the movement of the inclines, m, m', upon each other,' whereas it should read, 'the movement of the inclines, m, m', n, n', upon each other.'

It is contended for the defendants that the Clark hinge does not infringe the Lull patent for these reasons:

(1) The two parts of the Clark hinge are not identical in form, except as to spindle and socket; (2) the inclined planes on its are formed on the shoulder of the hinge, and not outside of it; (3) it does not have two inclined planes placed diametrically opposite and facing in opposite directions, but the two principal inclined planes on each shoulder face in the same direction, and there is no inclined plane on the same shoulder which faces in an opposite directions; (4) the strain is not taken off the spindle and thrown upon cam arms, there being no cam arms nor anything taking their

place.

The claim of the Lull patent must be construed as a claim for mechanism. It is awkwardly drawn. It is a claim to the so forming of a hinge cast in two pieces as that certain results will follow in the use of the hinge on a shutter 'substantially as described.' It is a claim to the 'so forming' 'substantially as described.' This is a claim to mechanism. The description must be looked to to ascertain what the mechanism is, and the results named in the claim must be taken into consideration in ascertaining what parts of the mechanism described enter into the claim. The claim is not one for the results mentioned in the claim.

It is very clear that the Clark hinge is a self-locking shutter hinge cast in two pieces; that it swings open on a horizontal plane, by the bearing of horizontal shoulders on each other, until the horizontal shoulders cease to bear on each other, and the shutter descends by gravity, by means of inclined planes in the hinge, and the hinge is locked in that position against ordinary movements; that the shutter may be shut by pulling it and bringing the inclined planes into action first, and then the horizontal planes; and that, when the shutter is locked open, the operation of the inclines bearing against each other, in case of a movement of the shutter by the wind or otherwise, is such as to throw the strain on the knuckles to which the inclines are \*462 attached, to an extent sufficient to make the strain on the spindle less than it would be if the inclines were not arranged as they are.

Lull, in his specification, describes the two parts of his hinge as like each other. They are so constructed. But this is not of the essence of the invention. It is undoubtedly the best form, and, with the two planes on each arm facing in opposite directions, and of the same size, and in the same relative position, their coaction with the other two planes gives the most perfect relief to the spindle. But a departure from these features to some extent, while producing an inferior hinge, in respect to relieving the spindle, still relieves it to some extent, and constitutes no departure from the invention of Lull, all the other features of his claim being used. Still it cannot be said that Clark's inclined planes are not on the shoulder of the hinge, or are outside of the shoulder, or are on cam arms such as the Lull patent has. But a fair construction of the Lull patent is that it really makes two claims. In stating the nature of the invention, the specification says that it

consists 'in the so forming of a self-locking hinge, cast in two pieces, as that a shutter hung thereon may swing open or shut on a horizontal plane, and lock when open to its limit.' This is a construction involving certain features and parts. It involves those parts which cause the shutter to swing open on a horizontal plane, and then to lock by the operation of inclined planes, and then to shut by being pulled and rising, through the return action of the inclined planes, until it is raised far enough to shut on a horizontal plane. This operation of mechanism is independent of any relief of the spindle. Then the specification goes on to say, 'and so that, also, when locked open, the strain shall be taken off the spindle and thrown onto cam arms, and thus effectually relieve the spindle from the force of the winds.' The specification thus states that the nature of Lull's invention consists in the so forming of a self-locking hinge cast in two pieces, as that, when it is locked open, the result named, as to strain, will take place, in addition to the so forming of such hinge as that it will have the described operation as to swinging open or shut and locking when open. The features of mechanism which provide for the horizontal swinging and the after locking may fully exist without being in such form as to produce the effect as to strain spoken of by Lull. The language of the specification is to be taken distributively, and not as for a combination of all the features. So, too, with the claim. It is, in effect, by its structure, and by reference to the descriptive part of the specification, two claims- one for such of the described mechanism as is \*463 necessary to secure the described swinging and locking, and the other for such of the described mechanism as is necessary to secure the result described as to strain. A reissue with a division of the claim into two claims would have been sustainable; the patent as it is is fairly capable of the foregoing construction.

The Clark hinge embodies the swinging and locking mechanism of Lull, which is a material part of his invention, and is thus separately claimed. Having the inclines on the shoulder or outside of the shoulder, on cam arms or not on cam arms, is not a matter affecting the swinging and locking, but affecting only the relief of the spindle. The feature which Clark has added, of the additional stop, is a feature not concerned with the swinging and locking through the action of the horizontal planes and inclined planes, but is something added to the locking. The Clark patent is granted for the auxiliary locking stop and recess added to and combined with the four inclines which allow the blind to descend by gravity, and be locked after it has

opened horizontally. The mechanism used in the Clark hinge to cause it to open horizontally and then lock, is a mere formal variation from that of Lull, having the same mode of operation. In opening, the shutter swings freely on horizontal shoulders, and then the support passes to inclined planes, and the shutter is carried by gravity down such planes and is locked, and then is pulled by the hand up the inclined planes, and the support is returned to the horizontal shoulders and the shutter is swung shut.

There must be the usual decree for the plaintiff, for an injunction and an account, with costs.

C.C.N.Y. 1882  
Lull v. Clark  
21 Blatchf. 95, 13 F. 456

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