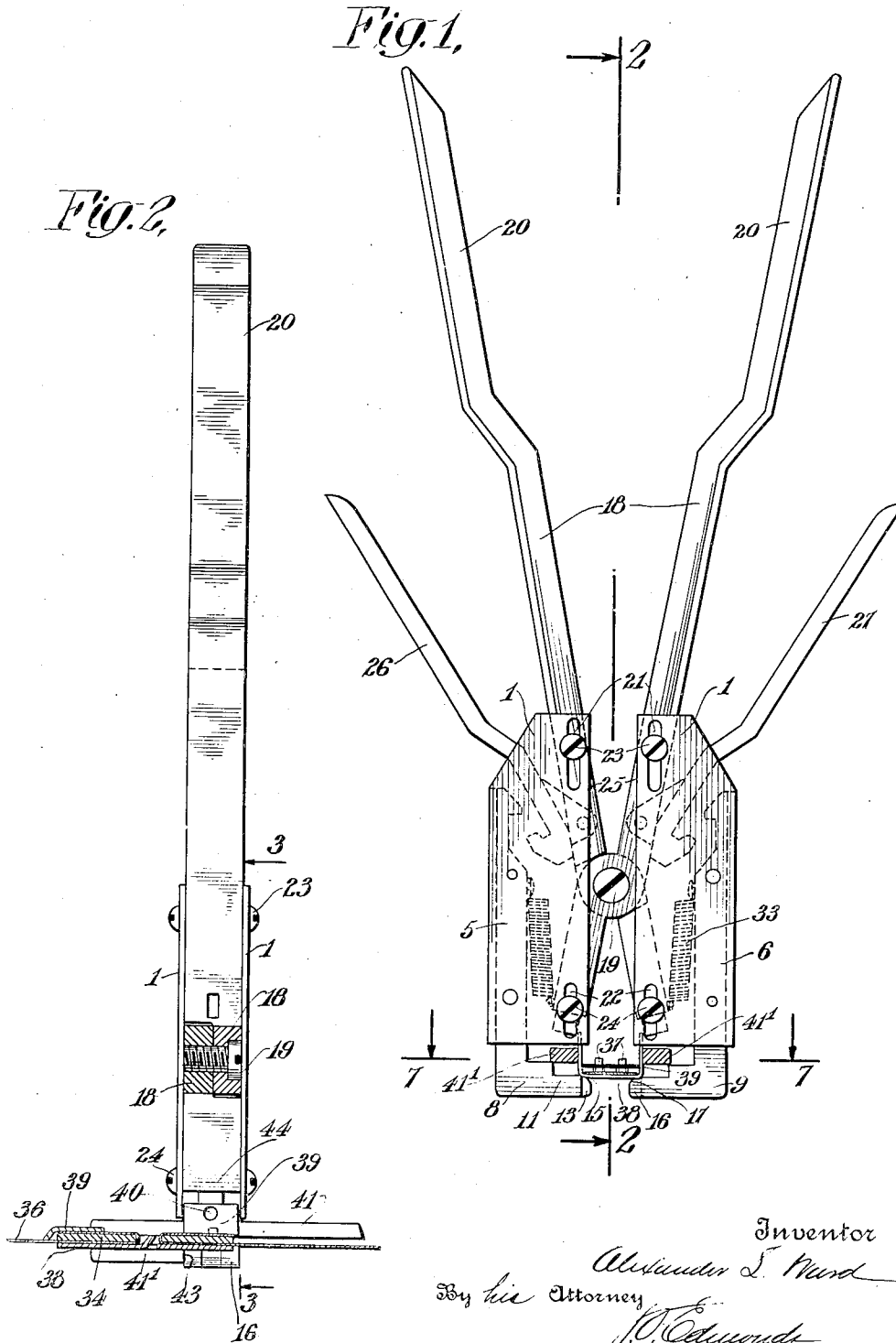


A. L. WARD.
BENDING DEVICE FOR STRAP FASTENERS.
APPLICATION FILED JAN. 10, 1919.

1,354,150.

Patented Sept. 28, 1920.
2 SHEETS—SHEET 1.



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By his Attorney
J. O. Edwards

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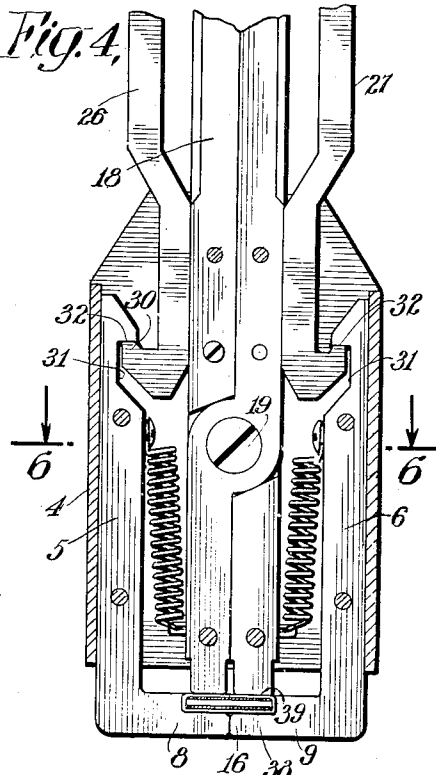
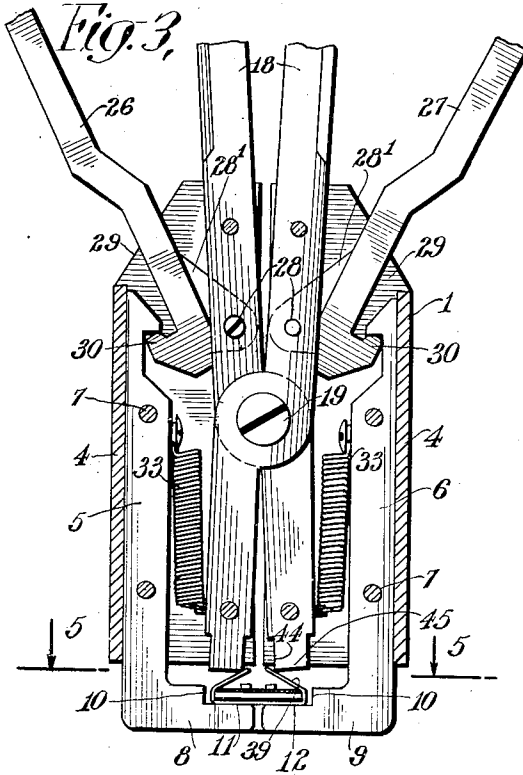


Fig. 5.

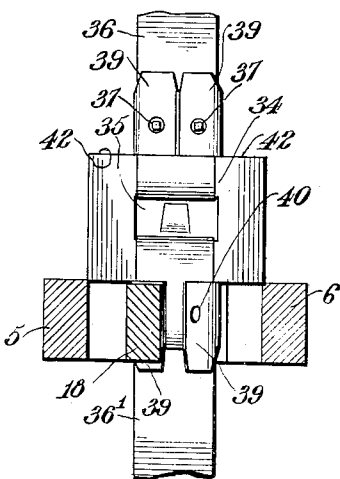


Fig. 6.

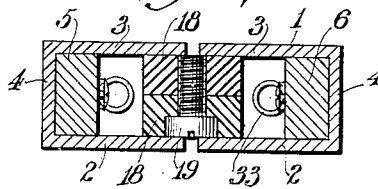
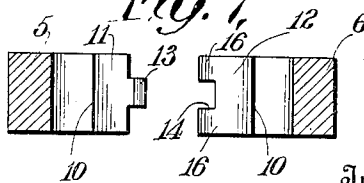


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALEXANDER L. WARD, OF NEW YORK, N. Y.

BENDING DEVICE FOR STRAP-FASTENERS.

1,354,150.

Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed January 10, 1919. Serial No. 270,448.

To all whom it may concern:

Be it known that I, ALEXANDER L. WARD, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Bending Devices for Strap-Fasteners, of which the following is a specification.

My invention relates to a device for bending vertical end portions or flanges of a metal band over and down upon the horizontal portion of the band, or upon an interposed member which is thus clamped between the horizontal portion of the band and the bent down flanges. My device is particularly designed for bending over the flanges of a securing device for a metal strap which is adapted to be secured about a packing box or the like under tension. In my application Serial No. 242,581, filed June 29, 1918, for band securing devices, I have described a device for fastening together the opposite end portions of a flat steel strap, such straps being in common use for binding boxes, bales, etc. This securing device comprises a body portion with a transverse opening therethrough through which the opposite strap ends are passed and bent back. An additional metal member extends under this frame and has vertical flanges which are adapted to be bent downwardly over the bent back strap ends and clamped thereto. My present device is adapted to bend these vertical flanges, or vertical flanges of similar securing devices, down into clamping position. This is accomplished either before the strap has been passed around the box or bale, or after the same has been done and the strap placed under tension, as by the use of a tensioning device such as that described in my application, strap securing apparatus, Serial No. 244,702, filed July 13, 1918.

My present invention comprises a pair of parallel frame members to which are secured a pair of vertical members having horizontal bottom portions which are inwardly directed and which are adapted to engage under the horizontal portion of the band or securing device which has the vertical flanges which are to be bent over. A pair of levers are pivoted together between the frame members to constitute pliers, and are connected to the frame members by vertical slots and pins so that movement of the handle portions of these levers toward and away

from each other will move the frame members toward and away from each other. The lower ends of the levers are adapted to engage the vertical flanges of the band to be bent as they move toward each other, to bend these flanges toward each other and downwardly to a certain extent. A pair of additional levers are pivoted to the long arms referred to and extend outwardly through openings in the frame members. These levers are adapted to co-act with the vertical members which are secured to the frame members, when the main arms or levers have been moved into their inner or closed position, the short levers being then movable toward the main arms or levers so as to cam upwardly against the vertical members referred to, and thereby depress the plier levers. This results in relative vertical movement between the foot portions of the vertical members which rest on top of the packing box and the bottoms of the plier levers, with the result that the flanges of the band are pressed down firmly into clamping position. The same result might, of course, be obtained by a different manner of mounting the said additional levers.

The objects of my invention are to provide improved devices of the character referred to above.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application and illustrating certain embodiments of my invention. In the drawings, Figure 1 represents a front elevation of my device when the same is first adjusted into relation to the band to be bent; Fig. 2 is a vertical section taken on line 2—2 of Fig. 1; Fig. 3 is an enlarged vertical section which may be considered as taken on line 3—3 of Fig. 2, the main pivoted arms of the device having been operated nearly into closed position; Fig. 4 is a similar view showing the positions of the parts when the main pivoted arms have been completely operated and the short supplemental levers have also been operated; Fig. 5 is a horizontal section taken on line 5—5 of Fig. 3, certain parts being omitted for clearness; Fig. 6 is a horizontal section taken on line 6—6 of Fig. 4; and Fig. 7 is a horizontal section taken on line 7—7 of Fig. 1, certain parts being omitted.

Referring to the drawings, the device comprises a pair of frame members 1, 1,

each of which comprises a hollow metal frame having front and back portions 2 and 3 and end portions 4. Vertical members 5 and 6 are rigidly secured within these frame members by means of rivets or other securing devices 7, 7. These vertical members are provided with inwardly directed foot portions 8 and 9, the upper surfaces of which are cut away to provide shoulders 10, 10. The horizontal inwardly directed surfaces 11 and 12 which are formed immediately below shoulders 10, 10, are provided on their inner edges, the one with an inwardly extending centrally arranged projection 13 and the other with a corresponding recess 14. The upper surface of the projection 13 slopes upwardly and rearwardly, as shown at 15, and the upper inner surfaces of the projections 16, 16, which appear at opposite sides of the recess 14, slope upwardly and rearwardly, as is shown at 17.

The arms 18, 18, are pivoted together on a screw or other suitable horizontal pivot 19 so that they may be swung from the open position shown in Fig. 1 into the closed position in which the inner surfaces of the arms are in closed contact with each other, as shown in Fig. 4. These arms, constituting a pair of pliers, extend for a suitable distance above frame members 1, 1, and are provided with suitable handle portions 20, 20, for engagement between the palm and fingers of one hand. The front and rear portions 2 and 3 of the frame members 1, 1, are provided with vertical slots 21, 21, and 22, 22, above and below the pivot 19 of the arms 18, within which slots slidably engaged screws or headed pins 23, 23, and 24, 24, which extend outwardly from the arms 18, 18. The result of this construction is that the frame members 1, 1, move in parallel relation toward and away from each other as the arms 18, 18, move toward and away from each other, the inner edges 25, 25, of the front and rear portions of frame members 1, 1, being adapted to engage against each other as the inner surfaces of arms 18, 18, engage against each other. At this time also the foot portions 8 and 9 of vertical members 5 and 6 are brought into engagement with the projection 13 of foot member 8 engaging within the recess 14 of foot member 9, as is indicated in Fig. 4.

The short levers 26 and 27 are pivoted adjacent their lower ends, as is indicated at 28, 28, to the arms 18, 18, extensions 28' of levers 26 and 27 extending within suitable slots in levers 18, 18. The end and side portions of the frame members 1 are cut away on an upwardly and inwardly directed angle, adjacent their upper ends, as is indicated at 29, 29, to form openings through which the levers 26 and 27 extend. Levers 26 and 27 are provided adjacent their

lower ends with outwardly and upwardly directed toes or lugs 30, 30. The vertical members 5 and 6 which are secured rigidly to the frame members terminate adjacent the upper edges of the end portions 4 of the frame members 1, and are provided with recesses 31, 31, a short distance below their upper ends so as to provide inwardly directed horizontal shoulders 32, 32, beneath which the lugs 30, 30, of levers 26 and 27 are adapted to engage. Spiral springs 33, 33, are mounted within the frame members and secured at their upper and lower ends respectively to the vertical members 5 and 6 and to the lower portions of the arms 18, 18. These springs act to normally hold the arms 18, 18, separate, as well as raised in frames 1, 1, and also when the arms 18, 18, are in closed position, springs 33, 33, tend to hold levers 26 and 27 in their outer positions.

The device to be clamped by this apparatus is illustrated particularly in Figs. 5 and 2. A buckle 34 is illustrated having a transverse slot 35 therethrough. One end of the strap 36 is passed through the opening 35 of the buckle from the under side and bent back over the edge of the buckle, the buckle having a longitudinal extension from which projections 37, 37, are stuck up. The strap being passed around the box or other object to be baled, the other end of the same is passed through the slot 35. The fastening device includes in addition to the buckle 34 a sheet metal member 38 which extends under the buckle 34, and has at both ends of the same vertical flanges 39 which extend upwardly at each side of the extension of the buckle at each end from which the projections 37 extend upward. When the strap is first positioned on the box or other object to be baled and one end of the strap 36 is extended through slot 35 as stated and bent back, the vertical flanges 39, 39, at that end of member 38 are bent downwardly, as shown in Fig. 5, so as to securely hold that end of the strap to the buckle, the strap having openings therethrough through which projections 37 extend and the vertical flanges 39 having similar openings 40 therethrough through which the lugs 37 also extend.

When the strap has been placed around the box and its opposite end extended through slot 35, as stated, the strap is placed under tension by a device such as that described in my application Serial No. 244,702, above referred to. This device embodies a ratchet bar indicated at 41, this bar having a bifurcated end 41', 41', which hooks around the shoulders 42, 42, of the buckle 34, the ratchet bar then being moved rearwardly by a pawl and lever device or the like to tension the strap, the loose end 36' of the strap moving freely through the slot 35 of the buckle. When the strap has been

sufficiently tensioned, the loose end 36' of the strap is bent back over the adjacent longitudinal extension of the buckle, is cut off to the proper length and provided with a pair of openings 40 to register with the lugs 37, 37, extending upwardly from the buckle.

The vertical side flanges 39 at the adjacent end of the member 38 of the securing device are now to be bent over and down into clamping position before the pawl and ratchet device which has placed the strap under tension is removed. It is for this operation that the device described and claimed herein is particularly designed, as well as for clamping down the flanges 39 at the opposite end of the member 38, before the tension has been applied.

The bifurcated ends 41', 41', of the ratchet bar 41 extend around the shoulders 42, 42, of the buckle as stated, these bifurcated ends preferably extending back on the under side of the buckle a sufficient distance so that their extreme ends exactly aline with the edges of the vertical flanges 39 which are to be bent over, the ends of the bifurcated arms referred to being indicated in Fig. 2 at 43. The device described herein is now slipped over the buckle and the bifurcated ends 41' of the ratchet bar, the foot portions 8 and 9 of the vertical members 5 and 6 of the bending device sliding underneath the member 38 of the strap securing device and the vertical flanges 39, 39, which are to be bent over, being positioned in alinement with the lower end portions of arms 18. This positioning of the vertical flanges 39 is facilitated by the fact that the ends 43 of the ratchet member 41 are in alinement with the edges of the vertical flanges 39, so that the bending device may be quickly slipped along the bifurcated ends 41' of the ratchet bar until the foot portions 8 and 9 of the device come in contact with the ends 43 of the ratchet bar, when the vertical flanges 39 will be exactly in alinement with the lower end portions of arms 18. Flanges 39 will fit between side portions 2 and 3 of frame members 1.

The lower end portions of arms 18 are recessed slightly, as is shown at 44. When the device is positioned as described, the levers 18 are grasped between the palm and fingers of one hand and drawn together, which results in the lower end portions 44 of arms 18 pressing the flanges 39 toward each other and downwardly at an angle, as is indicated in Fig. 3. When the arms 18 have been completely closed, the bottom surfaces 45 of arms 18 will stand in parallel relation above the bent flanges 39. At this time also the toe 13 of one foot portion 8 will have engaged within the corresponding recess 14 of the other foot portion. It will be noted that when the device is first positioned, the upwardly and rearwardly slanting surfaces

15 and 17 of toe 13 and lugs 16 will engage under the bottom of strip 38 of the fastening device so as to insure the surfaces 11 and 12 of the foot portions 8 and 9 sliding under the strip 38 as the arms 18 are brought together. The engagement of toe 13 and lugs 16 of the foot portions 8 and 9 under the strip 38 also insures the horizontal position of the strap 36 and its securing device during the operation of the arms 18, etc.; that is to say, the strap 36 and its fastening device are prevented from being turned into a tilted position by any unequal application of the pressure.

As soon as the arms 18 have been operated as described and while the same are held in closed position, the levers 26 and 27 are grasped between the fingers and palm of the other hand and are pressed inwardly against the outer surfaces of the arms 18. Levers 26 and 27 will move idly, when oscillated, so long as the arms 18 are in their open position. When arms 18 are in their closed position, however, operation of levers 26 and 27 are described results in the engagement of toes 30, 30, of levers 26 and 27 with the shoulders 32, 32, of the vertical members 5 and 6, and the consequent pressing down of levers 18, 18, with relation to frame members 1, 1, and foot portions 8 and 9. This action occurs, of course, because levers 26 and 27 are pivotally connected to levers 18, 18, and frame members 1, 1, are connected to levers 18, 18, by pin and slot connections. Accordingly, operation of levers 26 and 27 against resistance of springs 33, 33, results in the vertical flanges 39 being pressed downwardly into their closed clamping position with the projections 37 which extend upwardly from the buckle member extending through the alined openings in the strap end and in the vertical flanges 39. A very considerable pressure may be applied to the flanges 39 by the operation of levers 26 and 27 because the lever arms from pivots 28 to the toes 30 are very short in proportion to the lengths of the long arms of the levers 26 and 27. This operation being completed, the levers 26, 27, and arms 18 are released and the device removed from the strap and securing device.

It will be obvious that my invention is not limited strictly to the exact details of construction described, but is as broad as is indicated in the accompanying claims.

What I claim is:

1. In a bending device, the combination of a pair of levers pivotally secured together to constitute pliers, a pair of members having vertical portions and horizontal foot portions, adapted to extend beneath said levers and to form a support for a band, said members being so secured to said levers as to move toward and away from each other as said levers are closed and opened and to be

capable of vertical movement, relatively to said levers, said foot portions being so positioned relatively to said levers, normally, that closing movement of said levers will
 5 cause the lower ends of said levers to press vertical flanges of a band on said foot portions toward each other, and lever means pivoted to said pliers and adapted, when
 10 said first levers are closed to press said first levers downwardly relatively to said vertical members, to cause flattening of said band flanges between said foot portions and the lower ends of said first levers.

2. In a bending device, the combination
 15 of a pair of levers pivotally secured together to constitute pliers, a pair of vertical members, secured, one to the upper arm of one lever and the lower arm of the other lever,
 20 and the second to the upper arm of the second lever and the lower arm of the first lever, by vertical slot and pin connections, said members having base portions adapted to form supporting surfaces for the device
 25 and to extend beneath the horizontal portion of a band so positioned that the lower ends of said levers will press vertical flanges of the band inwardly, and devices mounted on said levers and adapted to engage said
 30 vertical members, when said levers are in closed position, to press said levers downwardly, relatively to said vertical members, to cause compression of said bent vertical band flanges between the lower surfaces of
 35 said levers and the base portions of said vertical members.

3. In a bending device, the combination of a pair of levers pivotally secured together to constitute pliers, a pair of vertical members, secured, one to the upper arm of one
 40 lever and the lower arm of the other lever, and the second to the upper arm of the second lever and the lower arm of the first lever, by vertical slot and pin connections, said members having base portions adapted
 45 to form supporting surfaces for the device and to extend beneath the horizontal portion of a band so positioned that the lower ends of said levers will press vertical flanges of the band inwardly, said members having
 50 shoulders adjacent their upper ends, and a pair of levers pivoted respectively to said first named levers and having lugs thereon adapted to engage said shoulders and cause
 55 relative vertical movement between said members and first named levers.

4. In a bending device, the combination of a pair of frame members, a pair of vertical members secured thereto, having inwardly directed foot portions adapted to
 60 engage under the horizontal portion of a band having vertical flanges, a pair of

levers pivotally secured together, intermediate the height of said frame members to constitute pliers having vertical slot and pin
 connections with said frame members, to
 65 move said frame members in parallel relation toward and from each other, the lower ends of said levers being positioned to bend the said vertical strap flanges downwardly,
 70 toward each other, and a pair of levers pivoted respectively to said first levers, and adapted to engage with said vertical members, when said first levers and frame members are in inner position, to cause relative
 75 vertical movement between said vertical members and said first levers, to cause a further bending of said vertical band flanges between said foot portions and the lower surfaces of said first levers.

5. In a bending device, the combination
 80 of a pair of levers pivoted together to constitute pliers, means for supporting below the lower ends of the same a band having vertical flanges positioned so as to be bent toward each other, and downwardly, by the
 85 lower ends of said levers, on movement of the same toward each other, and lever means positioned to co-act with said pliers and with said supporting means, when said
 90 pliers are closed, to cause relative vertical movement between the lower ends of said pliers and said supporting means, to cause flattening of said band flanges between the same.

6. In a bending device, the combination
 95 of a pair of frame members, a pair of levers pivoted together, between said members, to constitute pliers, pin and slot connections between said members and pliers, such that
 100 said members move in parallelism in and out as said pliers open and close, and such that said members may move vertically relatively to said levers, said members having foot portions below said levers, adapted to support a band placed thereon, and the
 105 inner faces of said members being hollow to receive vertical flanges on said band, the lower ends of said levers being positioned to press said flanges together, and downwardly, and then override the same, when
 110 said levers close, and means for causing relative vertical movement between said foot portions and the lower ends of said levers, to flatten said flanges after said levers have acted.

This specification signed and witnessed
 115 this 4th day of January, 1919.

ALEXANDER L. WARD.

Witnesses:

DYER SMITH,
 I. McINTOSH.