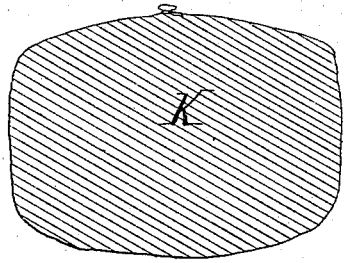
L. E. EVANS.

BALE-TIES.

No. 182,810. Patented Oct. 3, 1876.

Fig. 5.



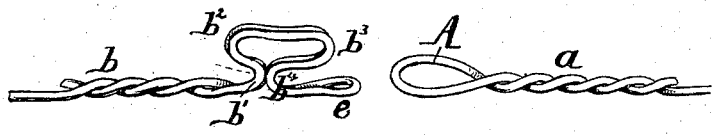


Fig. 1

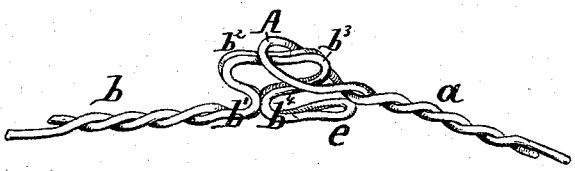


Fig. 2

Fig. 3.

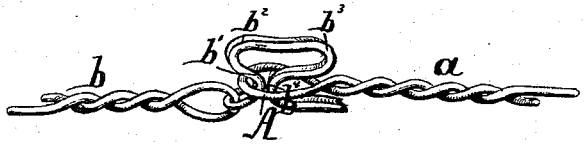


Fig. 4.

Witnesses: C. C. Stetson, A. Henry Gentner.

Inventor: L. E. Evans, by his attorney, C. C. Stetson

UNITED STATES PATENT OFFICE

LEMUEL E. EVANS, OF TREMONT STATION, ASSIGNOR TO WASHINGTON BROCKNER, OF NEW YORK, N. Y.

IMPROVEMENT IN BALE-TIES.

Specification forming part of Letters Patent No. **182,810**, dated October 3, 1876; application filed March 17, 1876.

To all whom it may concern:

Be it known that I, LEMUEL E. EVANS, of Tremont Station, in the city of New York, in the State of New York, have invented certain new and useful Improvements in Bale-Tie Fastenings, of which the following is a specification:

The accompanying drawings form a part of this specification, and represent what I esteem the best means of carrying out the invention.

Figure 1 is a perspective view of the bale-tie ends separated, the bale-tie and the fastenings at the ends being all one continuous piece of wire simply doubled and twisted, and peculiarly bent near each end. Fig. 2 shows the same in the act of being fastened or engaged together, and Fig. 3 shows the engagement complete. Fig. 4 represents a modification, in which one of the ties is terminated by a different piece of metal jointed flexibly thereto. Fig. 5 is a cross-section through a bale, showing the tie-fastening on a smaller scale.

Similar letters of reference indicate like parts in all the figures.

I form one end of the wire or analogous bale-tie material into a loop of moderate length, and form the other end into a peculiar hook, adapted to bear on the body of the bale when subjected to strain, and by virtue of such bearing on the bale to resist a straightening force. The drawings represent the two ends of my bale-tie brought together after being extended properly around a bale.

Referring to the figures, A is a loop, formed by turning a portion of one end back upon itself, and twisting the neck *a*. The other end of the tie is formed double for a considerable distance by turning a length of the wire back closely on itself, the two parts or strands lying side by side in contact with each other, and twisting a portion, *b*. The doubled wire is bent at four points, marked, respectively, b^1 b^2 b^3 b^4, the first and last of which are very close together. The point b^2 is nearer to this point than is the point b^3. The bend b^1 forms a hook. The bend b^4 forms another hook; or the entire bent end forms what I call a "double," one part directed one way, b^1 b^2, and the other directed the other way, b^4 b^3. The hook or part b^4 b^3 is longer than the hook or part b^1 b^2. The metal extending beyond b^4 I mark *e*.

To lock the tie around a bale, the bale, represented by K, must be compacted in a suitable press, (not shown,) and the tie passed around, and the ends brought together. The point b^3 is then introduced into the loop A, as shown in Fig. 2. After being forced as far as possible in that position, the loop drops over the point b^2, and the tie then attains the fully-secured position shown in Fig. 3. When the press relaxes its force, the pull of the tie tends to straighten the bend b^1; but such a straightening would force the end *e* into the body of the bale, and such movement the bale resists. The bale itself therefore strengthens and aids the hook b^1 to support the strain.

It is sometimes the case, when a bale is subjected to concussions, as in falling, the strain on a fastening is momentarily relaxed. Sometimes it is momentarily changed into a compressive strain, tending to urge the ends of the bale together. In such contingency my double hook is of service, because the part b^4 then engages the loop A, and prevents its becoming disengaged. The length from b^2 to b^3 should always be greater than the length of the loop A, so that the latter is surely retained under all concussions, however severe. The loop can be disengaged by hand when the bale is again subjected to the action of a proper press, but only by being skillfully placed in the inclined position shown in Fig. 2, which is not likely to be assumed by chance.

My improved bale-tie fastening is strong and secure. Blows or pressure on my double hook may, by deforming it, make it difficult of unlocking, but cannot diminish its security. It is difficult to derange its position seriously, because the end *e* is not only held by the bale against being forced inward, but is also pressed on by the part *a*, and thus supported against being bent outward by any disturbing force.

The twisting of the part *b* is not at all necessary, the tie being sufficiently strong without it; but it is desirable as a safeguard against the parts getting out of place.

Fig. 4 shows a modification, in which the hook made double, as before explained, is

formed from a separate piece of wire, which may be of thicker or stiffer stock than the main body of the tie. The end piece is, in this modification, formed by taking a piece of steel or hard-iron wire, doubling it closely on itself, engaging its "bight" in a small loop formed in the end of the main tie by doubling back and twisting, as shown, and producing the several bends b^1 b^2 b^3 b^4 in such added piece, as shown. The manner of locking is the same as with the other, and the end *e* extends beyond the double hook, and performs the same functions; but my invention will succeed well if the separate hook in this modification is not made of thicker or stiffer material than the main body of the tie, but only of soft and slender wire like the main body.

I am aware that a bale-tie of wire having a simple hook and loop, broadly, is not new; and such therefore I do not claim; but

What I do claim is—

1. The double hook b^1 b^2 b^3 b^4 on one end of the tie, formed by bending the doubled wire, as shown, in combination with the loop A on the other end, and adapted to serve together, as and for the purposes herein specified.

2. The end *e*, extended past the engaging hook or hooks on the tie, and arranged to be pressed against and into the body of the bale by the tension of the loop A, in combination with the double hook and said loop, and its neck *a* pressing on the outer face of the said end, all substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEMUEL E. EVANS.

Witnesses:
JNO. L. DIBBLE,
THOMAS D. STETSON.