

J. W. MACUMBER.
BALE-TIES.

No. 184,397.

Patented Nov. 14, 1876.

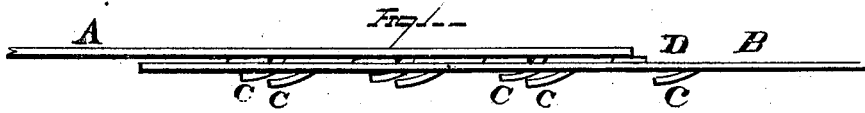


Fig. 3.

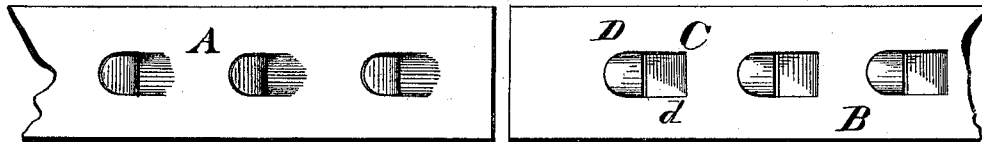


Fig. 4.

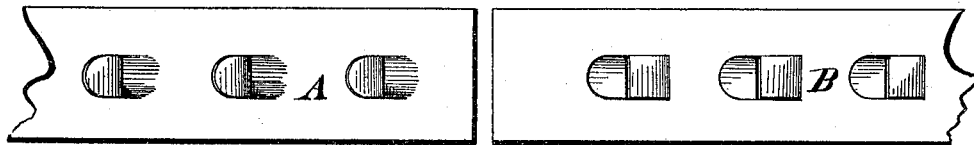
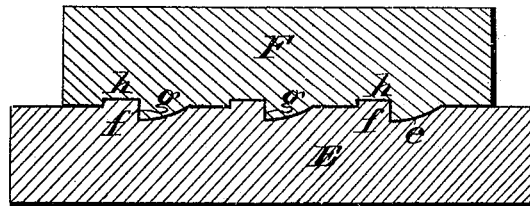


Fig. 5.



Fig. 6.



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Fig. 7-

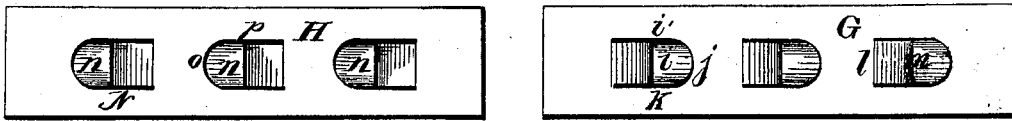
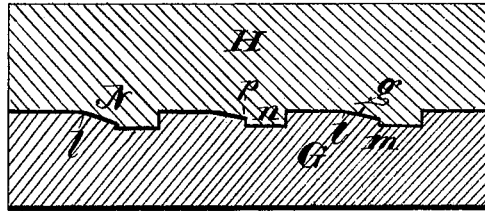


Fig. 8-



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UNITED STATES PATENT OFFICE.

JOHN W. MACUMBER, OF WILMINGTON, NORTH CAROLINA, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO DAVID CASHWELL, OF SAME PLACE.

IMPROVEMENT IN BALE-TIES.

Specification forming part of Letters Patent No. **184,397**, dated November 14, 1876; application filed November 4, 1876.

To all whom it may concern:

Be it known that I, JOHN W. MACUMBER, of Wilmington, in the county of New Hanover and State of North Carolina, have made a certain new and useful Improved Hook-and-Eye Bale-Tie; and I do hereby declare that the following is a full and true description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is an edge view of the bale-tie. Fig. 2 is a longitudinal section through *xx* of Fig. 1. Fig. 3 is a top view of the bands detached. Fig. 4 is a bottom view of the bands. Fig. 5 is a plan view of the die and punch for manufacturing the eye portion of the band. Fig. 6 is a longitudinal section of the punch and die shown in Fig. 5. Fig. 7 is a plan view of the punch and die for forming the hooked end of the band. Fig. 8 is a longitudinal section of the punch and die shown in Fig. 7.

The so-called hook-and-eye bale-ties have heretofore been constructed with hooks punched from the band to project below its surface, and the upper surface of the band left flat. When ties thus constructed are brought together and locked around a bale, the expansive force of the compressed cotton exerts itself against, and is solely resisted by, the dependent shoulders of the hooks, and the tendency is to bend or break the hooks from the band at their shoulders.

The object of my invention is to remedy the defects above noted; and to that end it consists in a hook-and-eye bale-tie, having a swell formed adjacent to each slot, and on the top surface of one end of the band, so that the raised edges of the several swells of one end of the band shall enter the slots formed in the opposite end of the band, and abut against their angular edges.

In a bale-tie thus constructed the strain is taken off the shoulders of the several hooks, and is transferred to the body of the band, and the tie is thereby rendered correspondingly durable and efficient in use.

In the accompanying drawings, A B are the ends of the band, and C are the hooks, one or more, formed in the same by punch and

die, or in any manner found most expedient. On the upper surface of the end A swells D are struck up, to form a raised edge, *d*, which projects about the thickness of the metal of which the band is composed above the upper surface of the band. When the ends of the band are locked, as shown in Fig. 2, the edges *d* of swells D abut squarely against the body of the band at *a*, and thereby constitute a firm and unyielding tie. The hooks C, after the tie is secured, simply prevent the lateral displacement of the ends of the band, and do not serve to resist the strain exerted by the expansive force of the cotton, as this strain is wholly resisted by the edges of the several swells abutting against the edge of the slots formed in the opposite end of the band. The die E (shown in Fig. 5) is formed with concavities or recesses *e*, provided with cutting-edges *e'*, while raised upsetting-surfaces *f* are formed adjacent to each one of the recesses or concavities *e* of the die. The punch F is constructed with any number of cutting and upsetting punches *g*, which latter are made of the desired size of openings to be formed in the end of the band, and the punches *g* extend sufficiently below the plane of the punch to depress the hooks C below the lower surface of the band. The punch F is constructed with recesses *h*, corresponding in number and size with the raised portions *f* of the die, whereby the swells D of the band are formed.

From the description above given it will be understood that the end of the band wherein the eyes are formed is prepared at a single operation of the die and punch E F, which latter may be made of any desired length, according to the number of eyes required to be made in the end of the band, to admit of varied adjustment of the tie.

The die G (shown in Fig. 7) serves to form the hooks on the attaching end of the band, and is formed with elongated recesses *i*, provided with cutting-edges *j k*. A portion of the interior surface of the cut-away portion *i* extends from the base portion *l* of the recess, on a gradual incline, to about the center of the recess, where a square shoulder, *m*, is formed, and the recess made of increased depth, for a purpose hereinafter described.

The punch H is constructed with one or more cutting and bending punches, N, which are formed of a raised portion, *n*, having an oval or circular cutting-edge, *o*, and a shoulder or bending-edge, *p*. The punches N are constructed to incline from about half the width of the raised portion *n* gradually till it merges into the plane of the punch H, thus forming the inclines *g*. The die and punch G H serve to form the hooked end of the band. The raised portions *n* cut the hooks C from the band, and as the punch descends it forces the hooks downwardly until the shoulder *p* of the punch comes adjacent to the shoulder *m* of the die, when the square shoulder is formed on the several hooks. The inclined projecting portions of the punch serve to depress the shoulders of the hooks below the lower surface of the band, so that said shoulders shall be on a plane with the edges of the swells D when the tie is locked, and thus insure the

line of direction of the applied pressure within the plane of the swells D and the shoulders on the hooks.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a bale-tie, the combination of the ends A B, having hooks C and swells D, substantially as and for the purpose described.

2. The combination, with the die and punch E F, for forming the eye portion of the band, of the die and punch G H, for forming the hooked end of the band, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of November, 1876.

J. W. MACUMBER.

Witnesses:

THOMAS B. HALL,
F. O. McCLEARY.