S. H. GILMAN.

BALE-TIE.

No. 173,119. Patented Feb. 8, 1876.

Fig 1.

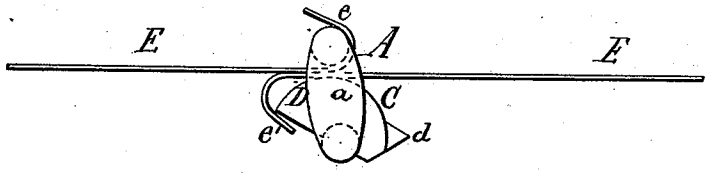


Fig 2.

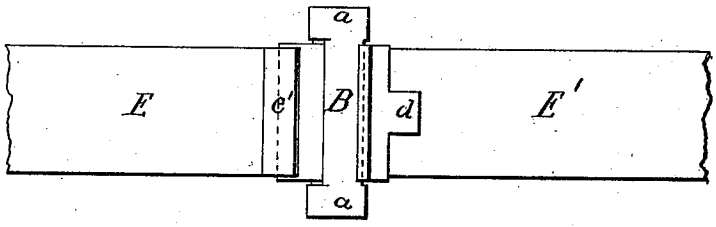


Fig 3.

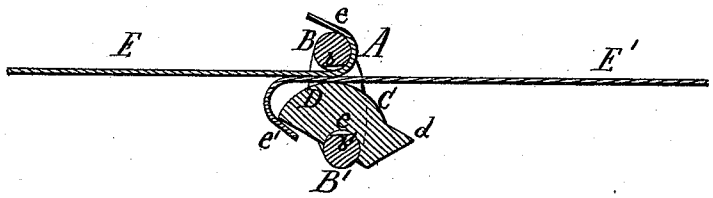


Fig 4.

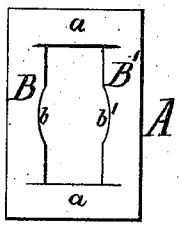
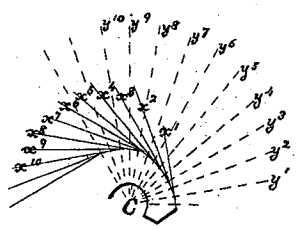


Fig 5.



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UNITED STATES PATENT OFFICE.

SAMUEL H. GILMAN, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO THE LOUISIANA COTTON-TIE COMPANY, OF SAME PLACE.

IMPROVEMENT IN BALE-TIES.

Specification forming part of Letters Patent No. **173,119**, dated February 8, 1876; application filed January 14, 1876.

To all whom it may concern:

Be it known that I, SAMUEL H. GILMAN, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Improvement in Bale-Ties, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of my improved bale-tie. Fig. 2 is a bottom view of the same, and Fig. 3 a longitudinal section. Fig. 4 is a detail view of the buckle-frame; Fig. 5, a diagram, illustrating the construction of the operating surface of the tie-cam.

The object of this improvement is to make a self-fastening tie which will hold the ends of the bale-band together at any point of tension to which the band may be drawn. This object I attain by the use of two separate pieces of metal, acting conjointly in such a manner that a portion of the inner surface of the one, which is concentric, and a portion of the outer surface of the other, which is eccentric, shall, by their forms and movements when in operation, describe two curves which are eccentric to one another on a converging angle of not more than ten degrees.

In the drawings, A denotes an oblong buckle-frame, consisting of end pieces *a* and cylindrical bearings B B′, the latter having each a depression, as at *b b′*, opposite one another, and the end pieces being far enough apart to admit the bands through the frame. A cam, C, having a cylindrical groove, *c*, and a surface, D, which is eccentric to the groove, is so inserted into the buckle-frame A as to bear, with the grooved surface *c* on one of the cylindrical bearings B in such a manner that the surface D will stand opposite the other bearing, B′. The cam C has, at the surface D, near its smallest radius, a lug, *d*, which prevents the slipping of the cam C out of the buckle-frame A after the first end E of the bale-band is inserted, and previous to the insertion of the other end, E′. The said lug passes one or the other of the depressions *b* when the cam C is inserted into the buckle-frame A. The eccentric surface D of the cam C is an evolution curve, beginning with the tangent x^1 upon the smallest radius y^1, which tangent is extended to the next radius y^2. From the point of intersection of the tangent x^1 and the radius y^2 the tangent x^2, belonging to the radius y^2, commences and extends to the radius y^3, where it is joined in a similar manner by the tangent x^3, and so on.

The inclination of the said radii must not exceed ten degrees to insure an effective biting-surface.

It is to be understood that the corners of the successive tangents are so rounded as to produce a continuous curve, as represented by Figs. 1 and 3.

In the manufacture of the tie there must be a full allowance for easy play of the movable parts, and for strength in the said parts to resist the highest available degree of tension.

Operation: When the band of a bale has been drawn tight, the buckle-frame A, with the cam C on the bearings B′, is slipped upon the end E of the band, which has been bent into a hook, *e*, to receive the upper bearing B. The other end, E′, of the said band is now slipped into the buckle between the end E and the cam C. The end E′ is then bent over the highest point of the cam-surface D, thereby forcing the cam slightly around on its bearing B′, and its higher surface D toward the opposite bearing B. The said movement of the cam brings the two ends of the band in closer contact, and thus constitutes the beginning of the bite upon the ends E E′, which is increased by the tension of the band when the band is released from the band-tightening machine. The hooks *e e′* serve, after the locking of the band, to keep the movable parts—viz., the buckle A and cam C—in position, and to prevent them from getting separated by the many jerks to which the bales are subjected during their transportation.

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

1. The buckle-frame A, having cylindrical bearings B B′, in combination with the cam C, having a transverse semi-cylindrical groove, *c*, and a surface, D, substantially as and for the purpose described.

2. The buckle-frame A, having the cylindrical bearings B B′, in which are depressions *b*

b', in combination with a cam, C, having a lug, d, formed on it, substantially as and for the purpose set forth.

3. The cam C, having a semicircular bearing, c, and lug d, and the cam-surface D, substantially as and for the purposes set forth.

Witness my hand in the matter of my application for improvement in bale-ties this 3d day of January, 1876.

SAMUEL H. GILMAN.

Witnesses:
JAS. A. LAFITTE,
W. A. S. WHEELER.