S. H. GILMAN.

Band Tightening and Tying Apparatus.

No. 216,844. Patented June 24, 1879.

Fig 1.

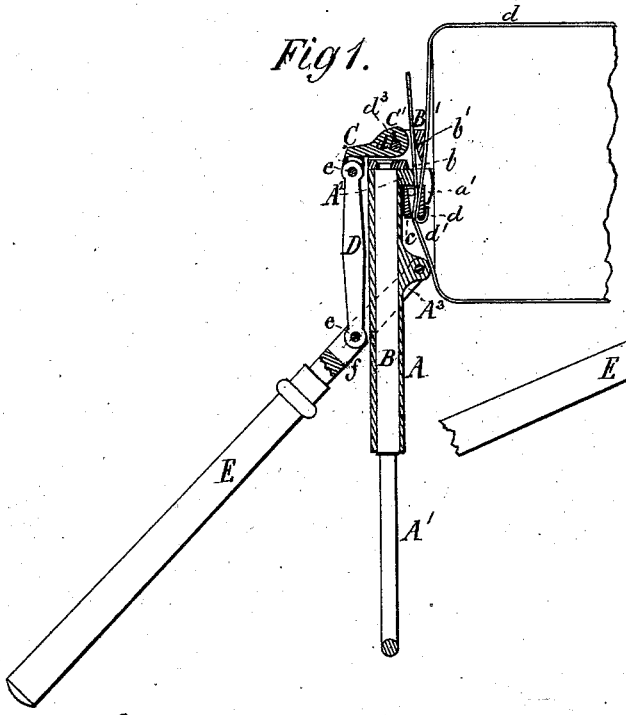


Fig 2.

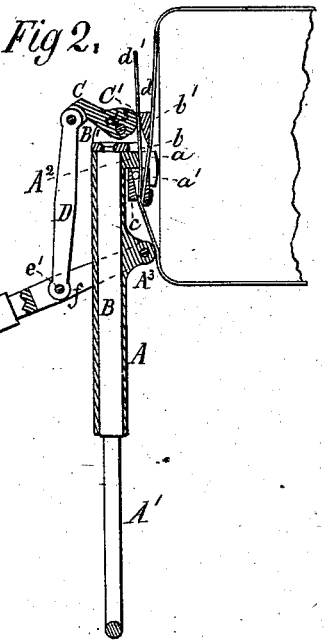


Fig 3

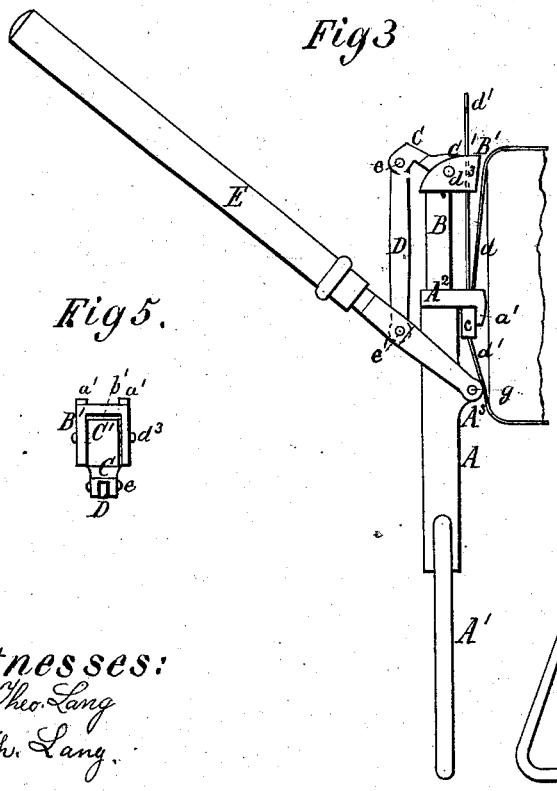


Fig 4

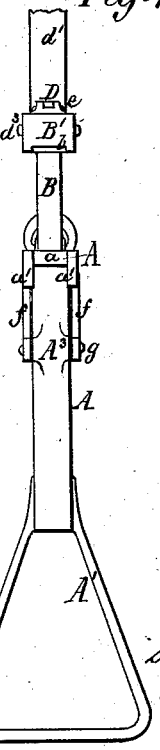
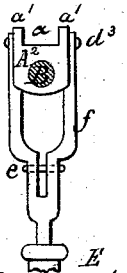


Fig 5.

Fig 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

SAMUEL H. GILMAN, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN BAND TIGHTENING AND TYING APPARATUS.

Specification forming part of Letters Patent No. **216,844**, dated June 24, 1879; application filed May 15, 1879.

To all whom it may concern:

Be it known that I, SAMUEL H. GILMAN, of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented a new and useful Improvement in Band Tightening and Tying Apparatus for use with Baling-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of the band-puller as applied to a bale-band ready for being tightened and tied upon a bale. Fig. 2 is a similar view of the puller as it appears after the pulling-griper has griped the upper free end of the bale-band and just before the pulling operation has begun. Fig. 3 is a side elevation of the puller, the parts while in the position shown in Fig. 2 having been operated so as to tighten and tie the band upon the bale. Fig. 4 is a rear elevation of the puller, the parts being in the position shown in Fig. 3. Fig. 5 is a top view of the griping-box and its cam, the parts being in the position shown in Fig. 1. Fig. 6 is a horizontal section of Fig. 3, showing a portion of the apparatus.

The nature of my invention consists, mainly, in a puller or band tightening and tying apparatus which retains the "tie" ready to be forced downward, takes hold of the free end of the band above the tie, and then draws up the free end of the band and forces down the tie end thereof, the force required to be exerted being applied through a hand-lever and a foot-stirrup or equivalent device, and the operation being such that the bite or gripe upon the free end of the band is caused to gradually increase as the strain upon the band increases.

My invention also consists in certain constructions, arrangements, and combinations of parts, as will be hereinafter described and specifically claimed.

In the accompanying drawings, A is a tube having a foot-stirrup, A^1, at its lower end, a tie-retaining head, A^2, at its upper end, and a fulcrum-bearing, A^3, about midway of its length. The head A^2 is forked or notched, as at *a*, on its rear side and on each of the prongs a vertical hook or finger, *a'*, is provided, as shown.

B is a vertical slide-rod fitted snugly in the tube A, and having on its upper end an enlargement in form of a box, B', which is open at top and front, and is also provided with a transverse slot, *b*, partly in its rear side and partly in its bottom, so that it is on one side of the shaft B and in line with and over the notch *a* of the head A^2 of the tube A.

The inner side of the back of this box is beveled from its top to its bottom, as shown at *b'*, so as to assist in keeping the two ends *d* d^1 of the bale-band separated while the tie end is being passed down below the notched head A^2, and the free end of the band is passed up through the tie *c* and box B', as illustrated.

In the box B' an inclined lever, C, having a cam or eccentric surface, C', is pivoted at d^3. This lever is bent downward vertically at its front end, and by this end it is pivoted at *e* to a connecting-rod, D, of an inclined lever, E. The lever E is forked at its inner end, as shown at *f*, and the respective prongs of the forked end pass on opposite sides of the tube A to the fulcrum-bearing A^3, and a pivot, *g*, confines them to said bearing.

The pivot *g* is directly under the notch of the head A^2, and the pivot *e*, which connects the rod D with the lever E, is just far enough back from the pivot *g* to permit the connecting-rod to lie parallel with the tube when the parts are out of action, and also to stand in the same position when the parts have been fully put in action.

By this adjustment of the parts *e* and *g* the strain upon the band is in a line with the band, and the downward thrust of the lever E upon the tube and upon the band is almost directly in line with the upward strain upon the band.

The operation is as follows: The end of the band, having one of my improved globe-ties, *c*, or griping-ties upon it, is passed down far enough below the prongs *a'* of the head A^2 to permit the band to be passed into the notch *a* and the tie to be drawn up behind the prongs or fingers *a'*. Thus applied the tie cannot pass out of the notch *a* until the apparatus is withdrawn from the bale. The free end of the band is now passed up through the tie *c*, between the tie end of the band and friction-ball

of the tie, and also through the notch *a* and box B′, between the cam-surface C′ of the cam-lever C and the beveled surface *b′* of the box, as shown. The operator now places his foot in the stirrup A^1 and lays hold of the lever E with his hand, and, while pressing the apparatus up firmly against the bale with his foot, raises the lever E with sufficient force to cause the band to be first griped by the cam-lever and box B′ and then to be carried up far enough to cause the band to be tightened around the bale and the tie to be fastened, the upward thrust of the lever E causing the tube and its forked head A^2 to be thrust downward simultaneously with the upward movement of the box and griping cam-lever, thus fastening the tie upon the band in a firm manner.

Trials with this invention on plantation-presses show that the bale can be reduced from forty-two to thirty-two inches in bulk.

What I claim is—

1. The band tightening and tying apparatus having its hand-lever pivoted to the downward-thrusting portion A, and connected by means of a link and a lever-cam to the upward-pulling portion B, whereby the tie end *d* of a bale is retained, and the free end d^1 griped, during a partial up movement of the lever, and then an up pull upon the free end and a downward thrust upon the tie end of the band produced during the further upward movement of the lever, said downward thrust producing a strain almost in line with the upward strain upon the band, as and for the purpose set forth.

2. The griping-box B′ on the end of the shaft or rod B, in combination with the notched head A^2 on the end of a guide or tube, A, in which said shaft slides, substantially as and for the purpose described.

3. The tube A, having a notched head, A^2, under which the tie rests, and which is provided with prongs or fingers *a′* for holding a tie, *c*, in its place under the head and against the tube, substantially as described.

4. The shaft or rod B, having a box, B′, on its end, in which is applied a lever-cam, C C′, which is connected to the hand-lever E by a link, D, substantially as described.

5. The combination, with the lever-cam C C′, link D, and lever E, with a pulling portion, B, having a griping-box, B′, as described, and with a thrusting portion A, having a notched head, as described, of the puller, whereby the double effect of causing the cam to bite on the bale-band and then of raising the shaft and its griping-box is produced all by one movement of the lever, the result being to increase the gripe of the cam as the tension increases, and to produce a downward thrust on the tie end of the band and an upward pull on the free end of the same, substantially as described.

6. The combination of a pulling-shaft, B, and a pushing-tube, A, the shaft being fitted within the tube and guided thereby, and the effect being to push the tie downward and to pull the band upward, substantially as described.

7. The lever E, attached at A^3 to the guide-tube A directly in line with the notch in the head thereof, whereby the downward strain of the puller upon the band is brought almost directly in the line of the upward strain upon the free end of the band, as set forth.

8. The combination of the stirrup A^1 with the band-puller, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand.

SAMUEL H. GILMAN.

Witnesses:
ANDREW HEROD,
D. I. DOWERS.