J. H. MATTHEWS & C. R. MOREHEAD, Jr.

Bale-Band Tying-Machine.

No. 220,541. Patented Oct. 14, 1879.

Fig. 1.

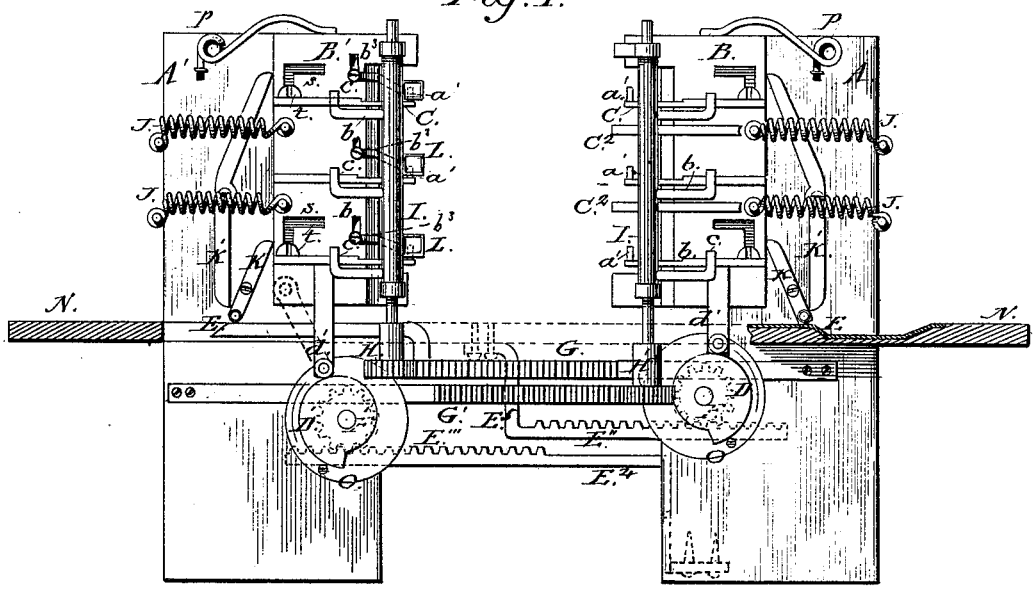


Fig. 2.

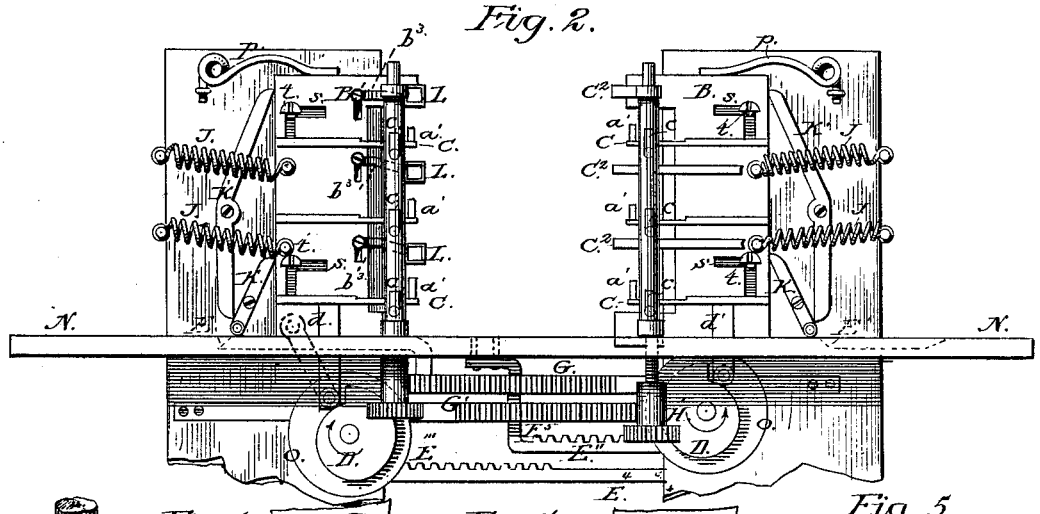


Fig. 4.

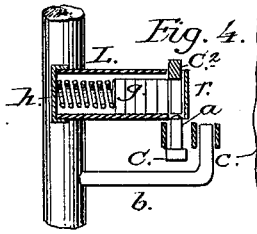


Fig. 3.

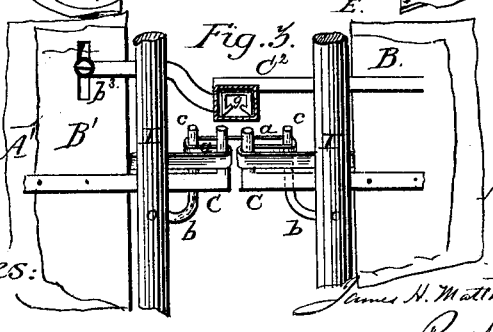
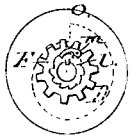


Fig. 5.



Witnesses:

Elmer Wilhelms

Edw. W. Byrn

Inventors:

James N. Matthews & Charles R. Morehead Jr.

Parker & Burton & Co.

Attorneys

UNITED STATES PATENT OFFICE.

JAMES H. MATTHEWS AND CHARLES R. MOREHEAD, JR., OF FORT WORTH, TEXAS.

IMPROVEMENT IN BALE-BAND-TYING MACHINES.

Specification forming part of Letters Patent No. **220,541**, dated October 14, 1879; application filed April 29, 1879.

To all whom it may concern:

Be it known that we, JAMES HAMILTON MATTHEWS and CHARLES ROBERT MOREHEAD, Jr., of Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Bale-Band-Tying Machines; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention is a device for automatically tying the bands of cotton-bales.

It consists, primarily, of a movable metal plate provided with fingered arms fitted to the side face of a compressed plunger, which, by the action of said plunger, is moved toward a corresponding plate provided with fingered and straight arms fitted to the side of an abutment-block of a compress. Said plates, with their arms, in connection with certain rotary posts, also provided with fingered arms, are operated, in a manner hereinafter to be described, to take up the bands, forming them into loops, and fix the ties or buckles to their proper compressed dimensions.

It consists, secondly, of certain mechanical arrangements composed of bars provided with racks intended to engage pinions to move certain rotary cams having their axes or pivots respectively connected to the plunger and an abutment-block, which mechanism is operated by the movement of the press-plunger to lift or drop the plates having fingered arms, and force them forward or withdraw them when said fingered arms are in the act of co-operating with the arms of the rotary posts previously mentioned to form the loops which receive the tie.

It consists, thirdly, in providing tubes to be firmly attached to the compress-abutment, adapted to receive a number of suitable ties or buckles, which are to be forced or fed toward the end plates of said tubes, whence they are forced down in their places by the straight arms extending from the plunger-plate previously referred to at the moment the fingered arms and rotary posts are dropped by the action of the cams.

In our drawings, Figure 1 is a front elevation of our tyer, showing the principal mechanism composing it. Fig. 2 is also a front elevation, showing the plunger-plate and abutment-plate down. Fig. 3 is a detail view, illustrating the operation of forming the loops and fixing the buckles. Fig. 4 is a detached section of one of the tubes for holding the buckles, illustrating the placing of the buckle. Fig. 5 is a sectional view, showing the ratchet device as applied to the mechanism for lifting and dropping the plates.

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

Referring to drawings, A is the plunger, and A′ the abutment of the press. B B′ are plates fitted and secured, respectively, to said plunger and abutment by screws or pins *t*, with heads or some similar fastenings suitable for holding said plates closely to their bearings, serving at the same time as guides in the slots *s*. Arms C C, with fingers *a′*, are fixed permanently to said plates B B′, and move with them. They set closely to the side of the cotton-bale, and under the slack band as the plunger moves to compress the cotton.

The plate B has, besides the fingered arms C, straight arms C^2, which are located with reference to said fingered arms so that when the said plates B drop the under edges of said arms C^2 will be in a position to bear upon the ties or buckles and force them down into the loops of the bands.

Bars *d′*, provided with anti-friction rollers fixed on pins at their ends, extend from plates B B′ downward, and are intended to bear against the edges of cams D D′.

The abutment-block A′ and plunger A are extended below the floor or platform N, and these extensions have fixed to them the mechanism which in part gives movement to the plates B B′, it being acted upon by the power which moves the plunger. Of this mechanism, D D′ are eccentric cams, pivoted respectively to the extensions of the plunger and abutment, having bearings against flat plates or disks O. These cams rotate about their axes in the directions shown by the arrows.

They are so formed as to give to the plates B B′ eccentric movement; and being provided with notches, they at proper times allow said plates to drop to relieve the loops of the bands from the fingers of the arms C. These cams D D′ are moved by racks E″ E‴, fixed to suitable bars E^4 E^5, which racks engage pinions F F′, and drive the said cams in the directions shown simultaneously as the plunger approaches the abutment in the operation of pressing.

Racks G G′, fixed to the plunger and abutment, are provided to engage pinions H H′, fixed to the lower ends of posts I I. The posts I I are provided with arms *b*, having fingers *c*, which extend at right angles and radially from the axes of said posts, said fingers being formed by bending the arms upward. These posts I, being acted upon through pinions H by racks G G′, have rotary reciprocating motion about their axes, and being journaled in the plates B B′, they have also vertical motion at intervals; and by this latter motion they are alternately thrown in and out of gear. The racks G G′, which engage pinions H H′, are so placed under the floor or platform that during the movement of the plunger, when said racks are in gear, the arms of the posts I are thrown around to form the loops, and drop, with the plates to which they are fixed, out of the way as the buckles are applied. The plates B B′, which are lifted by cams D D′, and drop at the proper time afterward, are drawn back to their normal positions by spiral springs J, attached to the plunger and abutment-block of the press; but as it is necessary in tying to have the fingers *a′* approach near each other in forming the loops of the bands, we provide levers K K′, pivoted to plunger and abutment-blocks, which are operated by inclined planes E E′, the plane E being formed on the bar which supports one of the racks, and the plane E′ formed in the platform or floor, which planes, at a proper time, bear against said levers K, and indirectly move said levers K′, forcing them against the outer edges of the plates B′ B, causing them to approach each other and carry said arms toward the center of the bale.

At the top of the plunger and abutment are secured springs *p p*, provided with arms, which bear on the plates B B′ to force them down onto the lifting-cams.

To the abutment A′ are immovably fixed square tubes L through the medium of arms b^3, adapted to receive a number of ties or buckles of the pattern shown at *g*, which are pressed forward by a spring, *h*, fixed in the caps of the tubes, toward the openings at their outer ends and against a plate or shoe, *r*, ready to be forced down into the loops of the bands. Immediately behind the pinions or spur-wheels F F′ are ratchet wheels and pawls, arranged in the usual way, to lock the said wheels to the shafts that carry the cams when the plunger is approaching the abutment, but to allow said wheels to revolve independently when said plunger is being withdrawn. Smooth and true bearings may be provided on the floor or platform N for rollers to be journaled in the plunger to facilitate the movement in baling.

The operation of our tyer is as follows: The bale being in position on the floor or platform N and the plates down and back to their normal positions, the plunger A is moved toward the abutment A′. The incline planes E E′ engage the levers K simultaneously, and they acting upon levers K′, the two sets bear against two points of the plates B B′ and force them forward, they being guided by the slots *s* and pins *t*. When the plates B B′ reach their limit of independent horizontal motion the cams D D′, being moved by racks E″ E‴ and pinions F F′, lift the said plates, so as to bring the fingers *a′* under the bands of the bale, where they remain, as the plunger moves, until the arms *b* of the posts I I are brought around inward by the racks G G′. The slack of the bands is taken up by said arms *b* to form loops around the fingers *a′* of the arms C. When the loops are complete the notches of the cams D D′ will have reached the bars *d d′*, which extend from plates B B′. The said plates, being forced down by springs P, carry the posts I I with them, throwing the pinions H H′ out of gear. Springs J now draw the plates back out of the way. Just before the plates are dropped the arms C are near together, under the tubes L, and the straight arms C^2 immediately above them, both being in line with the tie or buckle. As the said plates drop the arms C^2 fall upon one buckle each and force them home to their places in the loops of the band. At this point the plunger is withdrawn to release the bale. The back movement of the plunger does not affect the position of the cams, they being locked by the ratchets and pawls previously described. The pinions H H′ being out of gear, the arms *b* may be thrown out of the way and in position ready for the next bale.

In our drawings we show the movable plates provided with three arms and fingers each, when in practice we will probably use twice this number. It is also our design to have the entire mechanism repeated on the opposite side of the plunger and abutment-block, so that the bands of the bale may be buckled on both sides by the same operation.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The plates B B′, adapted to fit loosely against flat bearings on the side faces of the plunger and abutment-block of a cotton-press, said plates and armed posts I I being automatically moved through the agency of cams, levers, and springs with and by the same power that compresses the bales to form the loops of the bands and fix the ties, as specified.

2. In a device for tying the bands of cotton-bales, the plates B B′, provided with fingered arms fixed thereto, and having slots which,

together with pins fixed to the plunger and abutment-block of a cotton-press, form guides to the movement of said plates, as and for the purpose set forth.

3. In a cotton-bale tyer, the plate B, provided with straight arms C^2, fixed thereto and extending inward therefrom, which in the downward movement of said plate performs the function of placing the buckle, as specified.

4. In combination with plates B B′, the rotary posts I I, provided with arms *b*, arranged to co-operate with the arms C of said plates in forming the loops of the bands, as and for the purpose set forth.

5. The plates B B′, adapted to move upward, downward, and laterally by means of cams D D′, incline planes E E′, levers K K′, and springs J and P in the operation of forming and tying the bands of cotton-bales, as set forth.

6. The combination of plates B B′, held in place by springs J and P, and levers K K′, operated by incline planes E E′, the fingered and straight arms C C^2, posts I I, provided with arms *b* and fingers *c*, and pinions H H′, adapted to engage the racks G G′, cams D D′, pinions F F′, racks E″ E‴, plunger A, and abutment-block A′, as and for the purpose set forth.

7. The tubes L, attached to abutment-block A′ through the medium of arms b^3, and provided with a spring to feed the buckles forward to the loops of cotton-bale bands, as and for the purpose set forth.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

JAMES HAMILTON MATTHEWS.
CHARLES ROBERT MOREHEAD, JR.

Witnesses:
T. H. MCMAHON,
J. G. WILLIAMS.