

(No Model.)

3 Sheets—Sheet 1.

A. AMANNS.
BALE TIER.

No. 574,699,

Patented Jan. 5, 1897.

FIG. 1.

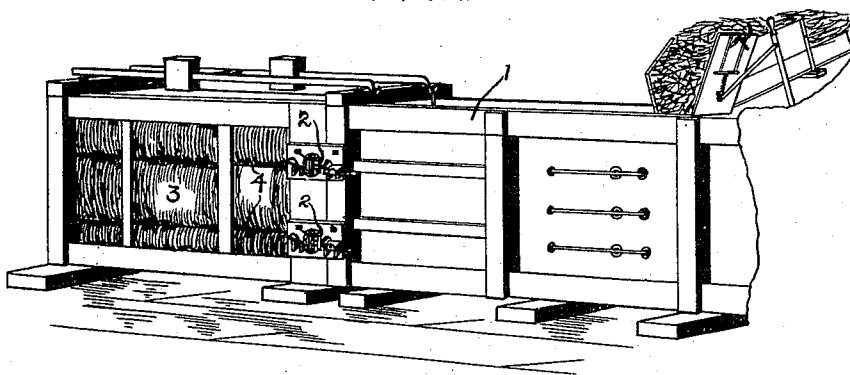


FIG. 6.

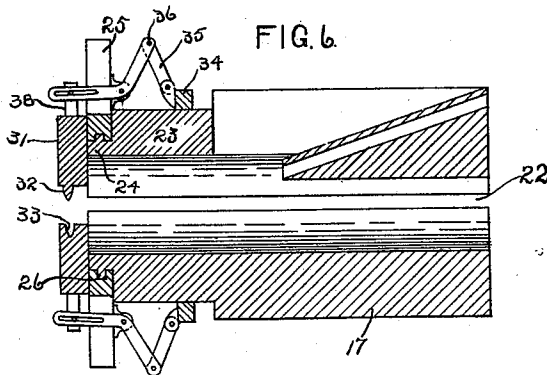


FIG. 10.

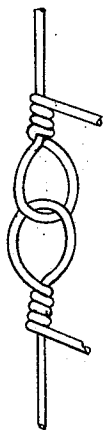


FIG. 8.

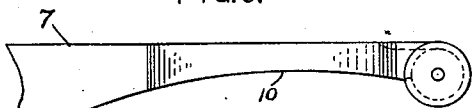


FIG. 9.

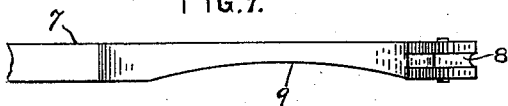


FIG. 7.

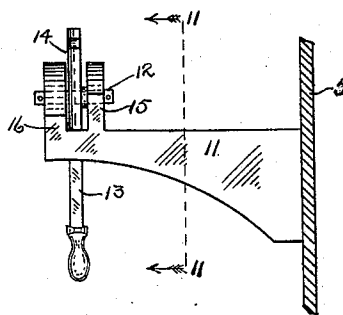
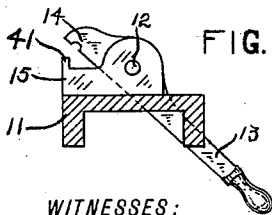


FIG. 11.



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FIG. 2.

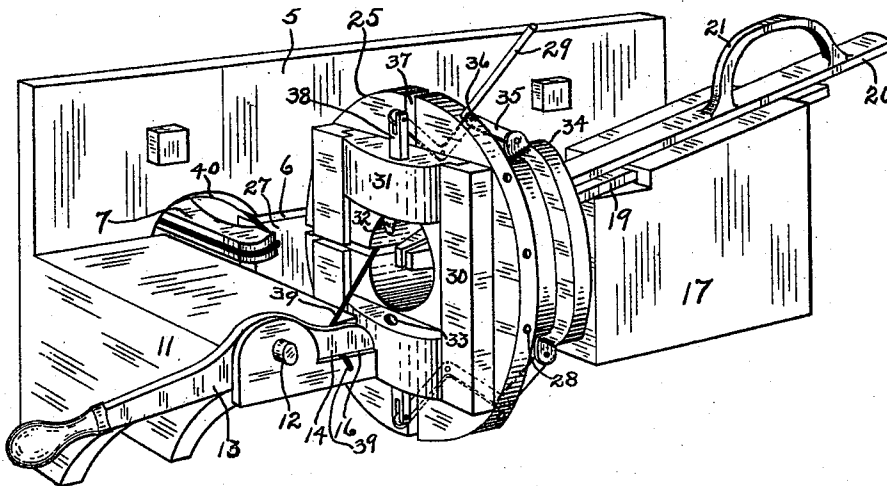
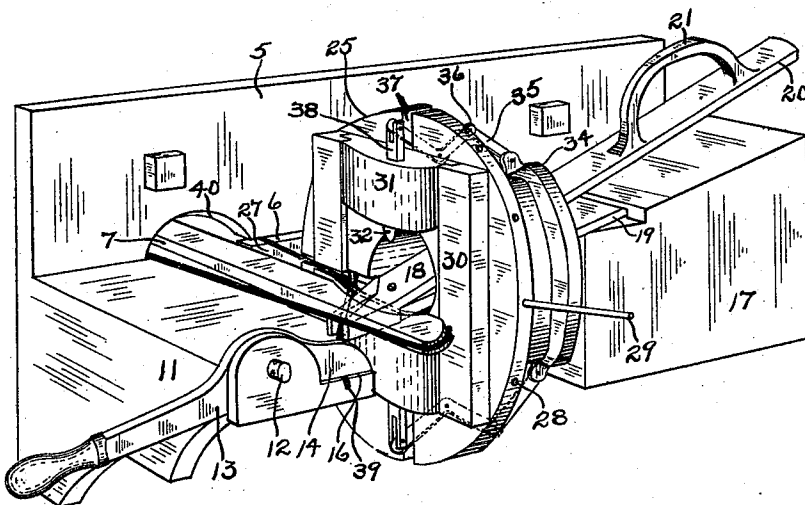


FIG. 3.



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3 Sheets—Sheet 3.

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BALE TIER.

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FIG. 4.

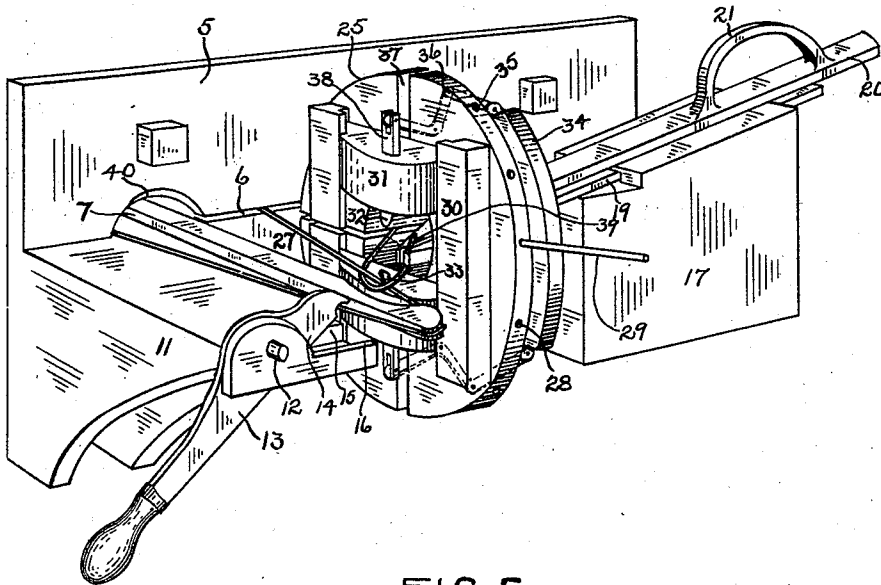
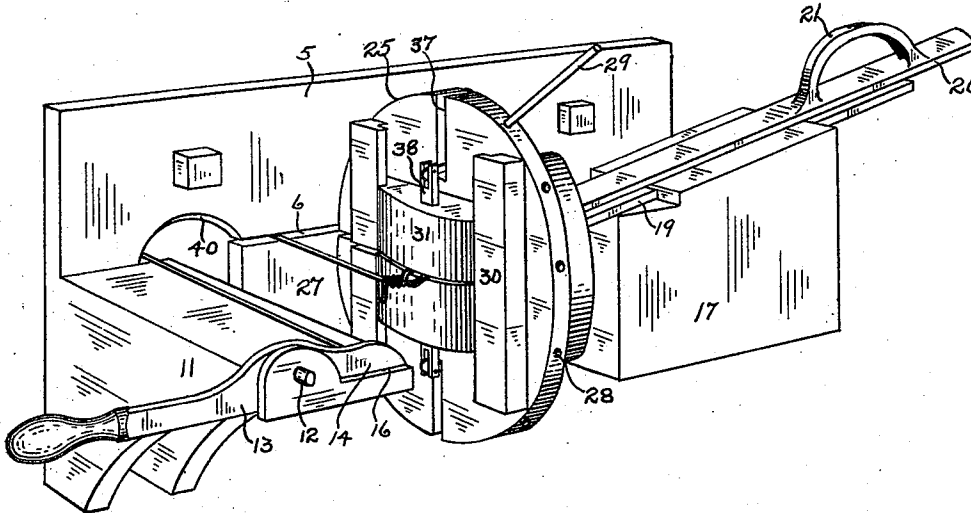


FIG. 5.



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UNITED STATES PATENT OFFICE.

ABRAHAM AMANNS, OF GRAMMER, INDIANA, ASSIGNOR OF ONE-HALF TO
JAMES V. WRIGHT AND JAMES CHILDERS, OF SAME PLACE.

BALE-TIER.

SPECIFICATION forming part of Letters Patent No. 574,699, dated January 5, 1897.

Application filed May 7, 1896. Serial No. 590,547. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM AMANNS, of Grammer, county of Bartholomew, and State of Indiana, have invented a certain new and useful Bale-Tier; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

My invention relates to a mechanism for tying bale-ties.

Heretofore, so far as I am aware, mechanisms for this purpose have caught the tie near its two ends and while holding the two ends together twisted them about each other in spiral form. Objections are raised to this tie because it is not strong. The bend in the wire necessary to make the tie is too sharp after the strain comes upon it and the whole strain is brought on one point. The strain also tends to untwist the wires and loosen the tie.

The tie which my mechanism makes cannot untwist and the strain is distributed. It makes no sharp bends in the wire, but loops the two ends about each other, making a loop-knot that is unusually strong, and the wire forming it is nowhere weakened, but retains its original strength, and the only change in it that can be made by the strain is the gradual elongation of the loops until they reach the limit of such movement.

In the drawings, Figure 1 is a perspective view of a power hay-press with my attachment connected therewith. Fig. 2 is a perspective of the tying attachment in the first stages of the tying process. Fig. 3 is the same in the second stage of the process. Fig. 4 is the same in the third stage of the tying process. Fig. 5 is the same in the fourth stage of the tying process. Fig. 6 is a central vertical longitudinal section of the rear portion of the attachment. Fig. 7 is a rear elevation of the front portion of the attachment. Fig. 8 is a plan view of the forward end of the needle. Fig. 9 is a rear view of the same. Fig. 10 shows the knot tied by my mechanism. Fig. 11 is a section on the line 11 11 of Fig. 10.

I show in Fig. 1 a power hay-press 1 with my tying attachment connected therewith

at 2. It can be connected up with any sort of power-press. The one herein shown is used merely for illustration. It is observed that in the rear end of the power-press shown the bale 3 has about it two wires 4. There is space in the framework at the front end of the bale for passing the wires through the framework. The wires are passed through the press at that point and their ends are held by the tying attachment. Then the hay or other material is driven into the press against these wires, so that when the bale is in the wires will extend about three sides. Then by passing them through the press with the needle, as shown, the entire circuit about the bale is made.

In Fig. 2 there will be observed a base-board 5, on which my attachment is mounted. This base-board is secured to the side of the frame of the press, as shown in Fig. 1, at the point where the tying is to take place. Instead of the base-board 5 the attachment might be without difficulty secured directly to the frame if the frame is provided with sufficient surface for its attachment. Horizontally through this base-board there will be observed a slot 6, through which the wire passes during the operation of tying. In considering this figure one must assume the presence of a bale of hay back of the base-plate, with its front end coming up to the needle 7. This needle is a bar or slat long enough to extend entirely through the frame of the press. In its end there is a grooved wheel 8, about which the wire extends. The needle is cut out preferably on the under side at 9 and on the inner or rear edge at 10, as shown in Figs. 8 and 9.

There are two parts of the attachment, the front portion being shown in Fig. 7 and the rear portion in Fig. 6. When mounted, they are separated slightly from each other. On the front portion of the framework 11 I provide a mechanism for holding and cutting the wire. At 12 I pivot the lever 13, which has on it a jaw 14, that operates in a recess of greater width that is located between the holding-block 15 and the cutting-block 16. The jaw is set snugly against the cutting-block 16, so that when a wire is placed on such block it will be cut by the jaw and block. The jaw is placed some distance away from

the holding-block, so that a wire lying on said holding-block will be caught between such holding-block and jaw and held. In the tying process the wire lies across both blocks. Hence when the jaw is brought down on the wire it is first bent over the holding-block 15 and down to a point level with the cutting-block. The lug 41 on such block prevents the wire from being pulled out endwise. If the lever is further operated, the wire will be cut by the engagement of the jaw and cutting-block, but the end of the wire will still be held between the jaw and the holding-block by friction. The purpose of this arrangement will appear when the mode of operation is described.

The rear portion of the attachment consists of the frame-piece 17, which is centrally and longitudinally bored out. The front end of the bore is seen in Figs. 2, 3, and 4. The bore also appears in a sectional view in Fig. 6. The upper portion of this block is either cut away, as shown in Fig. 6, or provided with an opening through which the pliers 18 may be reciprocated. The pliers consist of one handle or portion 19 that is reciprocable in a suitable guideway in the upper portion of the block 17, as seen in Fig. 2. The other handle 20 rests upon the first portion as well as upon the block 17, so that it can have lateral movement, whereby the pliers may be opened or closed. On this I place a handle-piece 21. With this handle-piece I not only reciprocate the pliers, but I also open and close them. Through the inner side of the block I provide a longitudinal horizontal slot 22, that registers with the slot 6 in the base-board 5. The front end of this block 17 at 23 is rounded. The extreme front end of such block is cut down or rounded to form a hub 24 for the wheel or disk 25. The wheel is interiorly and annularly grooved, the groove fitting over an annular flange 26 on the hub. This flange holds the wheel or disk on the hub and prevents its escape. The wheel has a radial slot 27, which may register with the slot 6 in the base-board and 22 in the frame-piece 17. In the construction herein shown I provide the periphery of this wheel with a series of sockets 28, adapted to receive the lever 29, whereby the wheel may be rotated; but since slight power is necessary to rotate the wheel I have found it more convenient to revolve it by the hand alone, applied to the periphery of the wheel.

In the front face of the wheel or disk 25 I provide a guideway of the strips 30 for the reciprocation of the oppositely-placed sliding heads 31, as seen in Figs. 2 and 5, the heads being beveled, as shown. One of these sliding heads has a spur 32, that penetrates a socket 33 in the opposite head. These heads are actuated by means of a collar 34, that slides upon the rounded portion 23 of the block or framework 17. This collar is connected up with the heads by means of a link 35 and a bell-crank 36, pivoted to the rear side

of the wheel or disk 25, with one arm operated through a radial slot 37 in the disk and pivoted to the extension 38, secured to the sliding head. From this description it is observed that when the collar 34 is moved toward the disk the sliding heads will be moved toward each other, and vice versa.

In making the tie the first end of the bale-tie 39 is held by the jaw 14, as seen in Fig. 2. It passes through the slots 22 and 6 and around the bale, as seen in Fig. 1, in the manner that has been heretofore described. When it has surrounded the three sides of the bale, it is placed over the grooved end of the needle-bar, which is here a long stick, and by the needle it is pushed through in front of the bale, as shown in Fig. 2. To permit this passage of the needle, I cut out a portion of the base-board at 40.

When the mechanism is in the position shown in Fig. 2, the operation of my attachment begins. The needle is pushed through farther and past my attachment, as seen in Fig. 3. Then the pliers 18 are pushed down from the position shown in Fig. 2 to the position shown in Fig. 3. When the parts are related as shown and described, the needle passes over the end of the bale-tie 39 that is held by the jaw 14, so that such end of the bale-tie is under the inner strand that is held by the needle. The pliers, however, pass above the inner strand, but under the needle, by reason of the inclined direction in which the pliers move and also the cut-out portions 9 and 10 of the needle. The pliers are caused to grab the end of the wire held by the jaw 14. The jaw is then released from its hold on such wire and the lever 13 thrown down, so as to leave the jaw open, as seen in Fig. 4. Then the pliers 18 are withdrawn, carrying with them the end of the wire which had been held by the jaw 14, into the position seen in Fig. 4. It is seen that such end of the wire is looped about the inner strand held by the needle. The wire held by the pliers is drawn farther through the opening in the wheel or disk than is shown in Fig. 4, so that the inner strand of wire held by the needle is withdrawn partially through the opening in said wheel. Then by the action of the collar 34 the sliding heads are brought together and the spur 32 catches the loop formed in the inner strand of the wire held by the needle as it is partially drawn through the wheel or disk 25. Then the wheel or disk 25 is rotated, and by reason of the beveled outer surface of the sliding heads and the fact that the inner strand of the wire that was held by the needle is now held by the spur 32 the loop in such inner strand of wire is formed. The two loops therefore are in form substantially the same as shown in Fig. 10. After the twisting is completed the outer strand of wire on the needle is cut by the jaw 14, leaving it as seen in Fig. 5. The wheel is rotated three or four times, until the wires have been twisted substantially as shown in Fig. 10 and seen in Fig. 5. The

sliding heads are then separated and the wire is drawn, by reason of compression of the bale, out of the tying attachment. Since the tying attachment is very small compared with the size of a bale, the slack necessary to effect the tie is not appreciable.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a bale-tying mechanism, means for holding one end of the tie-wire, means for looping the other end of the wire about the first and withdrawing the same until a bend or loop is formed in the first end, and a rotatable head provided with a spur to penetrate the bend or loop thus formed, whereby the wires forming the loops will be twisted, substantially as shown.

2. In a bale-tying mechanism, a needle for holding one end of the tie-wire, pliers for catching the other end and looping it about the first and withdrawing the same until a bend or loop is formed in the first end, and a rotatable bevel-faced head provided with a spur to penetrate the bend or loop thus formed, whereby the wires forming the loops will be twisted, substantially as shown.

3. In a bale-tying mechanism, a needle for holding one end of the tie-wire, a block or frame-piece, a hollow disk or wheel mounted thereon adjacent to the needle, pliers that pass through the hollow in said disk and catch the other end of the tie-wire whereby the same may be looped about the first and withdrawn until a bend or loop is formed in the first end, and a pair of bevel-faced heads mounted on the surface of the disk or wheel adjacent to the needle, one of such heads being reciprocally mounted and having a spur to penetrate the bend or loop formed by the first-named end of the tie-wire.

4. In a bale-tying mechanism, a needle for holding one end of the tie-wire, a suitable block or framework hollow at one end, a hollow disk or wheel rotatably mounted thereon adjacent to the needle, a pair of pliers slidably mounted in the block or framework in such position with relation to the needle that when the pliers protrude through the disk they will pass over the end of the tie-wire held by the needle and under the needle and catch the other end of the tie-wire, whereby it may be withdrawn through the opening in the disk until a bend or loop is formed in the end of the tie-wire held by the needle, and a rotatable head provided with a spur to penetrate such bend or loop, whereby the wires forming the loops will be twisted, substantially as shown.

5. In a bale-tying mechanism, the combination with a suitable frame or block hollowed longitudinally and having a longitudinal horizontal slot on the side adjacent to the bale-press, of a rotatable disk mounted on the end of such block hollowed in the center and provided with a radial slot from center to circumference, a guideway on its front face, reciprocating heads in said guideway

one being provided with a spur and the other with a socket to receive the spur when the heads meet, and means for reciprocating such heads.

6. In a bale-tying mechanism, the combination with a suitable block or frame rounded at one end, a disk or wheel rotatably carried on said end, a guideway on the front face of such disk, sliding heads in such guideway, one being provided with a spur and the other with a socket to receive such spur when the heads meet, a sliding and rotatable collar mounted on the frame or block behind the disk, bell-cranks pivoted to the disk and connected at one end with the sliding heads, and links connecting the other end of the bell-crank with the sliding collar.

7. In a bale-tying mechanism, means for holding and guiding the tie-wire which comprises a frame provided with a holding-block and cutting-block separated by a recess, the holding-block being higher than the cutting-block, and a jaw whose thickness is less than the width of the recess between the blocks so pivoted in the frame as to closely engage the side of the cutting-block but be slightly removed from the side of the holding-block.

8. In a bale-tying mechanism, means for holding one end of the tie-wire, a needle to insert and hold the other end over the first-named end, and pliers slidably mounted at such an angle that they will pass under the needle and over the inner strand of wire held by the needle and catch the first-named end of the wire.

9. In a bale-tying mechanism, means for holding one end of the tie-wire, a needle to insert and hold the other end over the first-named end, the same being cut out somewhat on its rear and under surfaces, the pliers slidably mounted at such an angle that they will pass under the needle at the cut-out portion and over the inner strand of wire held by the needle and catch the first-named end of the wire.

10. A bale-tier comprising a front framework having a holding-block and a cutting-block with a recess between them, the cutting-block being lower than the holding-block, a jaw whose thickness is less than the width of the recess so pivoted in such frame as to closely engage the cutting-jaw, a rear frame or block centrally hollowed out having a horizontal slot on the side adjacent to the bale-press and rounded at the end adjacent to the first-named frame, a disk or wheel rotatably mounted on the rounded portion of such frame and radially slotted from the center to the circumference, a guideway provided on the front face of such disk, sliding bevel-faced heads mounted in the guideway, one head having a spur and the other a socket to receive the spur when the heads meet, a sliding collar mounted on the rounded portion of the frame behind the disk, a bell-crank connection between the collar and the sliding heads whereby the latter are reciprocated, pliers

mounted in an inclined guideway in the rear
frame and adapted to be moved through the
disk, and a needle grooved about its end and
cut out on its inner and under faces that move
5 in a plane above the pliers, and a cutting and
holding jaw, substantially as shown and de-
scribed.

In witness whereof I have hereunto set my
hand this 21st day of April, 1896.

ABRAHAM AMANNS.

Witnesses:

V. H. LOCKWOOD,
J. M. CHILDERS.