F. S. HEATH.

Bale-Tying Machine.

No. 200,059. Patented Feb. 5, 1878.

Fig. 1.

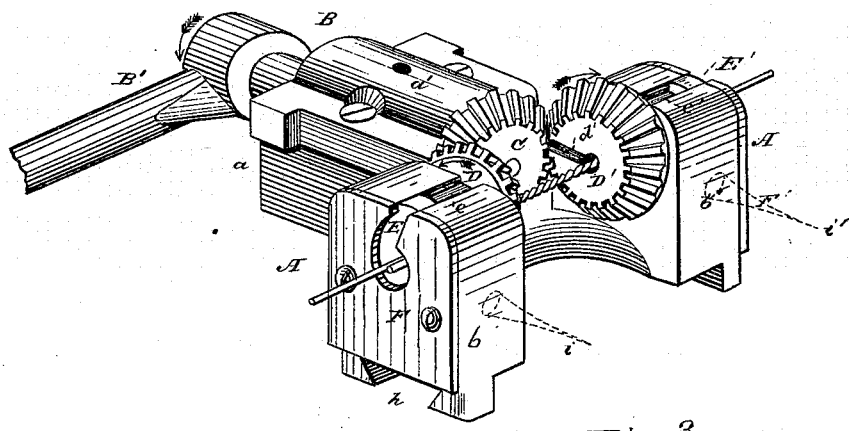

Fig. 3.

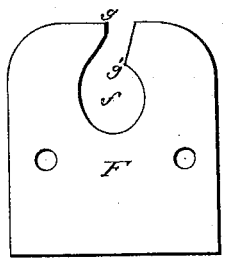

Fig. 2.

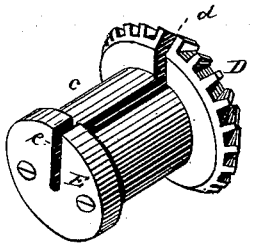

Fig. 4.

Attest:
R. N. Dyer.
L. W. Seely

Inventor:
Frank S. Heath.
by Geo. H. Dyer & Co.
Attys

UNITED STATES PATENT OFFICE.

FRANK S. HEATH, OF CORRY, PENNSYLVANIA.

IMPROVEMENT IN BALE-TYING MACHINES.

Specification forming part of Letters Patent No. **200,059**, dated February 5, 1878; application filed December 3, 1877.

To all whom it may concern:

Be it known that I, FRANK S. HEATH, of Corry, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in Bale-Tying Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object I have in view is to produce a light and convenient hand-machine to be used in connection with baling-presses for the purpose of locking the ends of wire bale-ties in the peculiar manner described in my application for patent upon the method of binding bales by twisting together both parts of the lapped ends of the wire into a uniform continuous twist; and my invention therein consists, first, in the peculiar combination and arrangement of the slotted pinion, slotted journals, and the operating-gear, so that the lapped portions of the wire will be held at the ends of the lap, and twisted from such ends in opposite directions to form the continuous twist; second, in the peculiarly-slotted guiding-plates for gathering the ends of the lapped wires to their proper positions in the revolving slotted pinions; and, further, in the combination, construction, and arrangement of the various parts composing my bale-tying machine, as fully hereinafter explained.

To enable others skilled in the art to manufacture and use my machine, I proceed to describe the same, having reference to the drawings, in which—

Figure 1 is a perspective view, showing the lapped ends of the bale-tie in position to be locked; Fig. 2, a separate view of one of the slotted pinions; Fig. 3, a separate view of one of the guiding-plates, and Fig. 4 a view of the ends of a wire bale-tie as locked by my machine.

Like letters denote corresponding parts.

A represents the frame of the machine, made preferably of cast metal, and consisting of a part, *a*, carrying the journal-box of the counter-shaft, and two wings, *b b'*, for carrying the slotted pinions. On the part *a* is journaled the counter-shaft B, having a crank-handle, B', keyed on its outer end, and inside of the cap *a'* of the journal-box is attached to the end of this shaft a beveled-gear wheel, C. The wings *b b'* of the frame A are properly bored out at right angles to the counter-shaft, to receive the journals *c c'* of beveled pinions D D'. These journals are inserted into the bearings in the wings from the inside, and the beveled pinions D D' revolve against the inner faces of the wings meshing with the beveled gear C on the counter-shaft, by which they are operated. Slots *d d'* are formed in the beveled pinions, and their journals extending down a short distance below the center; and the wings *b b'* are also slotted on their upper portions, to permit the placing of the lapped parts of the wire in the slots *d d'* and the removal of them after being twisted.

To the outer ends of the journals *c c'* are attached slotted plates E E', the slots *e e'* of these plates coinciding with the slots in the journals. These slots *e e'* are made narrower than the slots *d d'*, so as to prevent the lapped parts of the wire from turning in them, while the slots *d d'* are of sufficient width to allow the parts of the wire to turn freely therein. The plates E E' are shown as secured by screws to the journals *c c'*, and this is essential where the plates are made larger than the journals; but I have designed, in practice, to make these plates of the same size as the journals, and to cast them with such journals, which would be, in effect, a mere extension of the journals *c c'*, except that the slots would be reduced in size at the outer ends of the same as when the plates are used. The plates E E' are set into the wings *b b'*, and on the outer faces of these wings are secured the guiding-plates F F'. These guiding-plates have peculiarly-shaped eccentric slots *f f'*. (Shown more particularly in Fig. 3.) Each of these slots commences at the point *g*, where the wire enters, and curves downwardly below the revolving center of the slotted plate E or E' on that end of the machine, and then upwardly for a short distance, gradually nearing the center until it reaches the point *g'*, from which it takes the same direction as the slot in the adjacent plate when all the slots are in line.

When my tying-machine is made especially for attachment to the "perpetual" baling-press the bottom of the frame A is provided with a dovetail groove, *h*, to slide upon a stationary

bar attached to the top of a beam extending along the side of the bale-chamber, thus allowing the machine to be moved back and forth sufficiently to always be in position for tying. But for use with other styles of presses this dovetail groove is omitted, thus allowing the frame to be made lighter, and two sharp-pointed spikes, *i i'*, (shown in dotted lines in Fig. 1,) are attached to the front of the wings *b b'*, and, instead of the crank-handle B', I use a brace, similar in construction to an ordinary carpenter's brace, by which the machine is operated.

In use with the perpetual baling-press the wires or bands of proper length are placed around the bale endwise, and the ends lapped together on the side thereof. The machine is moved on the bar to the required position, and the lapped portions of the wire are placed across the wings *b b'* and through the slots, the crank-handle being turned so as to bring all the slots in line. The crank-handle is then turned to the right, thus imparting a revolving motion to the slotted pinions and journals and the plates on the outer ends of the journals in the direction shown by the arrows in Fig. 1. By this motion it will be seen that, since the ends of the lap are held from turning in the revolving slotted plates E E', the slots *d d'* in the pinions and their journals revolve around the lap in opposite directions, both parts of the lapped ends of the wire will be twisted from the ends of the lap in opposite directions, thus forming a continuous and uniform twist, as shown in Fig. 4.

In using my machine with other than the perpetual press, the operator stands in front of the bale and forces the spikes *i i'* into the bale, so that the slots, when in line, shall run in the same direction as the tie when lapped together around the bale. The lap is then placed in the slots, and the machine is operated by the brace the same as by the handle, as before described.

In operating the machine the ends of the wire have a tendency to twist out of the slots in the revolving plates E E', and, to prevent this, the eccentric slotted plates F F' are attached, as shown. The slots of these plates gather and confine the wires to their proper position in the revolving slotted plates.

The advantages of this machine lie principally in the lightness and compactness with which it can be constructed, its convenience in handling, and the ease with which the twisted wire can be removed from it.

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

1. In a bale-tying machine, the combination, with the frame A, of the two slotted pinions D D', revolving in opposite directions, substantially as described, for the purposes set forth.

2. In a bale-tying machine, the combination, with the frame A, of the revolving slotted pinions D D' and the journals *c c'*, having slots adapted to hold the wire at their outer ends, substantially as and for the purposes set forth.

3. In a bale-tying machine, the combination, with the frame A, of the beveled gear-wheel C, the revolving slotted pinions D D', the revolving slotted journals *c c'*, and the slotted plates E E', secured to the ends of such journals, substantially as described and shown.

4. In a bale-tying machine, the combination, with the revolving slotted pinions for twisting lapped wire, of means to prevent the wire from twisting out of such slots, substantially as described and shown.

5. The combination, with the revolving slotted pinions, of the stationary guiding-plates F F', having the eccentric slots *f f'*, constructed substantially as described and shown.

6. The combination, with the frame A, of the counter-shaft B, gear-wheel C, slotted pinions D D', slotted journals and plates *c c'* E E', and guiding-plates F F', all constructed and arranged substantially as described and shown.

This specification signed and witnessed this 16th day of November, 1877.

FRANK S. HEATH.

Witnesses:
R. N. DYER,
L. W. SEELY.