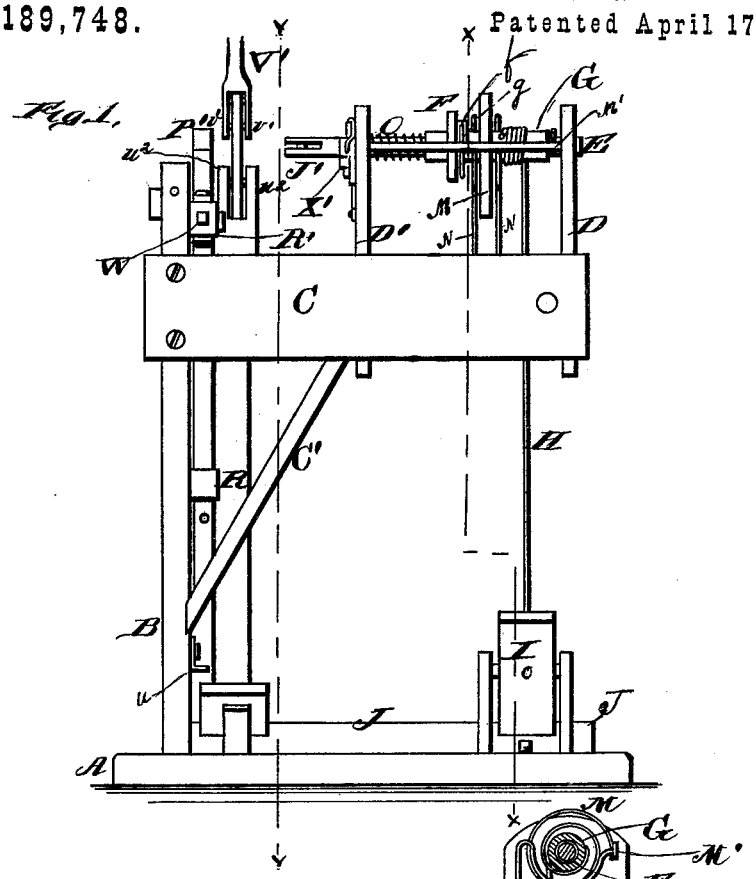
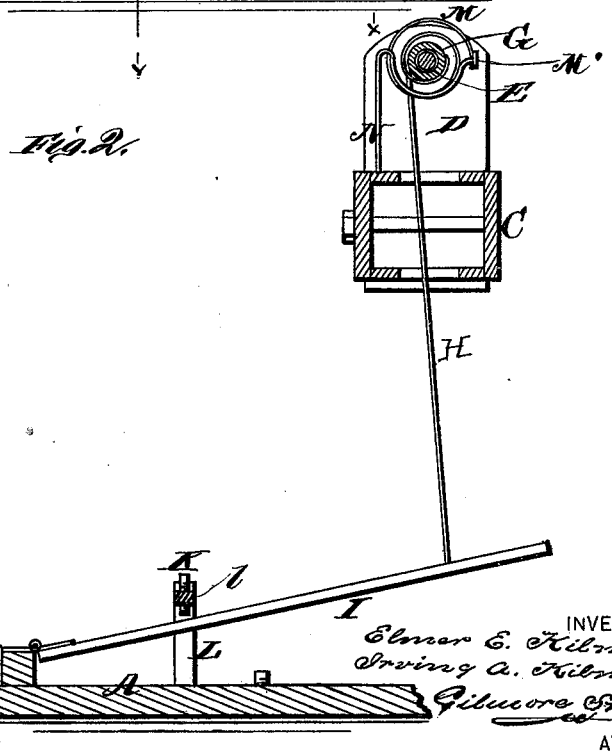
2 Sheets—Sheet 1.

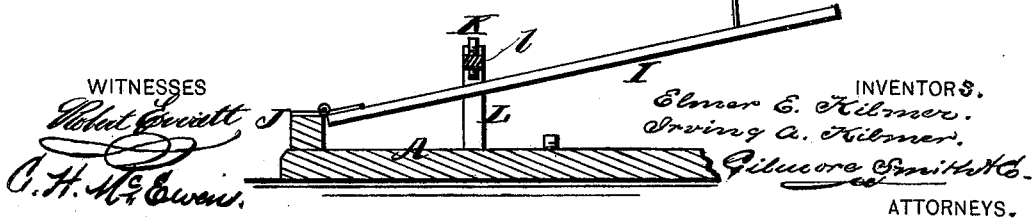
E. E. & I. A. KILMER.

BALE-TIE TWISTING MACHINE.

No. 189,748. Patented April 17, 1877.







WITNESSES

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2 Sheets—Sheet 2.

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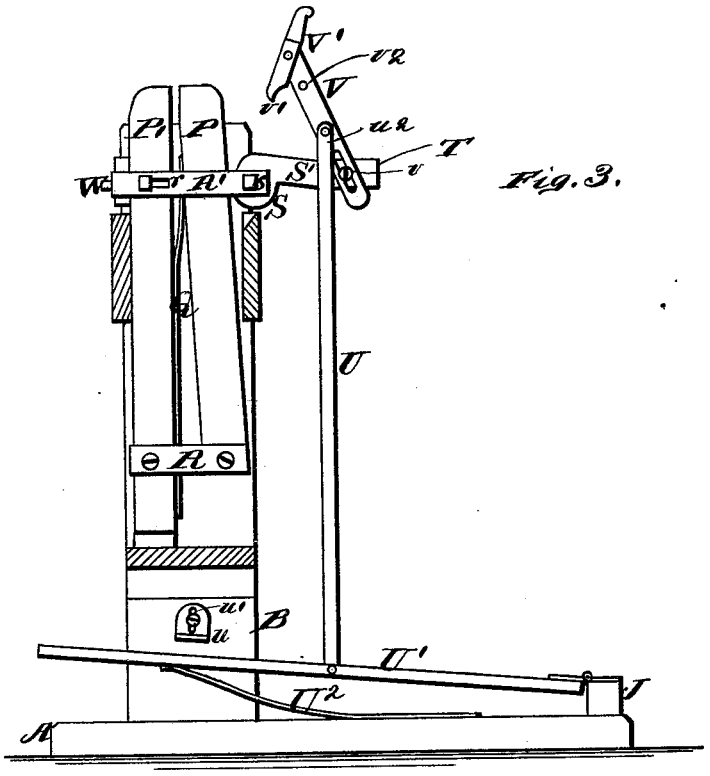


Fig. 3.

Fig. 4.

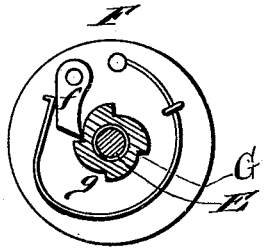
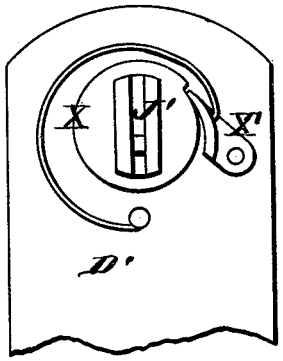


Fig. 5.



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UNITED STATES PATENT OFFICE.

ELMER E. KILMER AND IRVING A. KILMER, OF HOWE'S CAVE, NEW YORK, ASSIGNORS OF ONE-HALF THEIR RIGHT TO AUGUSTUS KILMER, OF SAME PLACE.

IMPROVEMENT IN BALE-TIE-TWISTING MACHINES.

Specification forming part of Letters Patent No. **189,748**, dated April 17, 1877; application filed February 3, 1877.

To all whom it may concern:

Be it known that we, ELMER E. KILMER and IRVING A. KILMER, of Howe's Cave, in the county of Schoharie and State of New York, have invented a new and valuable Improvement in Machines for Twisting Bale-Wires; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a front view of our machine for twisting bale-wires, and Fig. 2 is a vertical sectional view thereof through the line *x x*. Fig. 3 is a vertical sectional view through line *y y*, and Figs. 4 and 5 are detail views of the same.

The object of this invention is to provide a convenient and reliable apparatus for twisting the ends of bale-tie wires, so as to adapt them to act as hooks for holding said wire firmly in place, thereby retaining the bale in shape. This object we accomplish by means of the devices hereinafter particularly described.

In the accompanying drawings, A designates the base or bed piece of our apparatus, and B designates a broad high standard supported thereon, near one of the rear corners thereof. C designates a horizontal frame, extending from the upper part of said standard, above said bed-piece, and provided with braces C′ C′, extending obliquely downward to said standard. All the foregoing parts are rigidly attached together. Said frame C supports two bearings, D D′, in which a twisting-shaft, E, is journaled. On said shaft is keyed or otherwise rigidly attached a disk, F, arranged between said bearings D and D′, and provided on the face farthest from standard B with a spring-operated click or dog, *f*, (shown in detail in Fig. 4,) which engages with ratchet *g* on the sleeve G that turns on said shaft E. H designates a cord, which is secured by its upper end to sleeve G, and by its lower end to a treadle, I, which is hinged to a block, J, secured on base or bed piece A. As the upper part of said cord is wound around said sleeve G the depression of treadle I by the operater's foot causes said sleeve to turn, and by the engagement of ratchet *g* with dog *f* the said shaft E is turned also. The end of said shaft, which extends through bearing D′ (the nearer end to standard B) is provided with a grasping-block, (or pair of jaws,) J′, of any suitable construction. The wire is bent at one end in a separate machine for bending wire, to form the loop, and the latter is then placed in the grasping-block J of the twisting device, and the free end of the wire forming the upper part of the loop, and the part forming the under side of it, are placed between the jaws of the vise. The vise-treadle is then pressed down, closing the jaws of the vise on the wires to be twisted together, by bringing down the lever S′. The twister-treadle is then operated, twisting the wires at the end of the loop, the jaws of the vise holding the end of the loop in its position in the grasping-block during the twisting operation. By releasing the vise-treadle and opening the jaws of the vise the wire having the loop at its end is automatically detached by the finger.

The amount of twist thus given is regulated by means of a limiting-screw, K, which works through a cross-piece, *l*, upheld by two small standards, L, and bears against the top of treadle I when the latter is in its highest position. Said screw limits the play of said treadle more or less, according as it is adjusted up or down through said cross-piece *l*, and thereby controls the rotation of said shaft E, and the twisting of the bale-tie wire.

As soon as the said treadle is released sleeve G is thrown back into its normal position by the action of a coiled spring, M, which is secured by one end to said sleeve, and by the other end to a bar, M′, extending from bearing D to bearing D′. Said spring is preserved from lateral displacement by means of bent guide-rods N N, which extend from said bar M′ to frame C, one of said guide-rods being arranged on each side of said spring M. The form of said rods is clearly shown in Fig. 2. Shaft E is prevented from casually detached from its bearings by means of a helical

spring, O, which bears at one end against bearing D′, and at the other against a shoulder on said shaft.

The bale-wire is held by a stationary vise composed of jaws or clamping-blocks P P′, one of which, P′, is fixed to the inner side of standard B, the other jaw or block P being pivoted to said standard at its lower end. Q designates a spring, secured by its lower end to fixed jaw P′, and operating against the upper end of jaw P, so as to turn the latter back upon its pivot. R designates a metal strap or brace connecting the lower ends of said blocks or jaws P P′, and R′ designates a similar but longer strap bent round fixed jaw P′, and extending both inside and outside of said jaw past movable jaw P to a bolt, *s*, which forms the pivot for a cam, S, that operates to force the upper end of jaw P against jaw P′, thus clamping the wire. Said cam is pivoted by said bolt to the ends of said strap R′, and is formed upon one end of a short lever, S′, that is pivotally attached to the cleft upper end of a vertically-reciprocating bar, U. Said bar rests upon and is operated by a treadle, U^1, which is hinged, like treadle I, to block J, and provided with a replacing-spring, U^2. Said spring is attached to base or bed piece A, and bears against the under side of treadle U^1, so as to throw the latter up when the pressure of the operator's foot is withdrawn. The upward movement of said treadle U^1 is limited by an angular stop-plate, *u*, which may be adjusted up or down by means of a vertical slot, *u′*, made in the vertical part of said angular plate, through which slot passes the screw whereby said plate is fastened to the inner side of standard B. This adjustment regulates the upward movement of the wire-detaching devices hereinafter described.

Between bearings or lugs u^2 u^2, on the upper end of reciprocating bar U, is pivoted a wire-raising bar, V. The front end of said bar is slotted longitudinally, and said slot works over stud or bolt *v* secured to arm T at the side thereof. The rear end of said wire-raising arm or bar V is provided with a pivoted finger, V^1, the base of which is furnished on each side with a small hook, v^1, that engages with a stud, v^2, on the side of said arm V, whenever the end or point of said finger is depressed, thereby holding said finger straight, but allows it to turn upward freely on its pivot.

When treadle U^1 is depressed to close jaws P P′ the arm V is forced down, and the under side of finger V′, coming into contact with the bale-wire, is turned backward, so as to allow said finger to slip under the same. When the pressure is removed from the top of said treadle the spring U^2 throws up said arm V. The upper side of finger V′ then comes in contact with the under side of the bale-tie wire, and, being held stiffly, as already described, raises the said wire out of the jaws P P′ at the same time that cam S is removed therefrom, and spring Q opens them, as stated.

In the bend of strap R′ is a set-screw, W, which bears against jaw P in such a way as to draw cam S toward pivoted jaw P′, the front of strap R′ being slotted at *r*, where the bolt passes through it, whereby the same is secured to fixed jaw P in order to allow such adjustment of said strap and cam. By said adjustment the said vise is adapted to be used with wires of different sizes. When strap R′ is adjusted toward said screw the jaws P P′ are clamped more tightly. The reverse adjustment produces the opposite effect.

Shaft E is prevented from turning backward by means of a notched or toothed disk, X, on said shaft, and a retaining spring-pressed click, X′, as shown in detail in Fig. 5. The form of the spring interposed between jaws P and P′ may be varied at will, and the other devices shown may also be considerably modified without departing from the spirit of our invention.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a bale-wire-twisting machine, the combination of a rotating twisting-shaft with a sleeve turning thereon, a ratchet-and-pawl connection between said sleeve and shaft, and a spring for throwing said sleeve backward, substantially as and for the purpose set forth.

2. In a bale-wire-twisting machine, the combination of a rotating shaft with a relatively-fixed vise and screw for adjusting the vise to wires of different sizes, substantially as and for the purpose set forth.

3. The combination of treadle I, adjustable limiting-screw K, cord H, sleeve G, and twisting-shaft E, substantially as and for the purpose set forth.

4. The combination of sleeve G with a spring for throwing said sleeve backward, and guide-rods for said spring, substantially as and for the purpose set forth.

5. The combination of treadle U^1 and spring U^2 with reciprocating bar U, lifting-arm V, and finger V′, adapted to bend upward but not downward, substantially as set forth.

6. The combination of vise-clamping cam S′ and lifting-finger V′, with reciprocating bar U, which operates both of them, substantially as set forth.

7. The combination of lifting-arm V slotted at its rear end, with pivoted upward-bending finger V′, a fixed guiding-stud which sets in said slot, and a vertically-reciprocating bar and treadle, substantially as set forth.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

ELMER E. KILMER.
IRVING A. KILMER.

Witnesses:
J. W. LENERGY,
EZRA HILTS.