June 24, 1924.

1,498,616

H. B. FOULDER

TOOL FOR TWISTING WIRE TIES

Filed Oct. 18, 1922

2 Sheets-Sheet 1

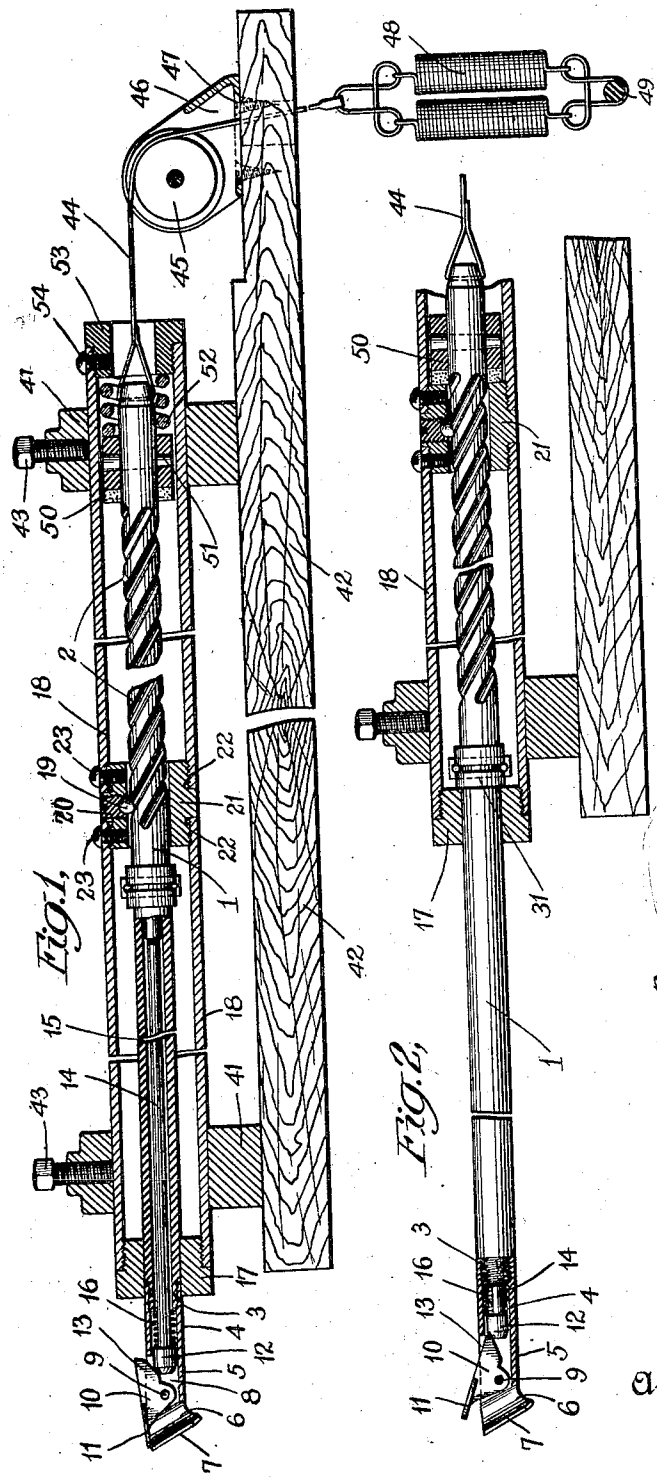


Fig. 1.

Fig. 2.

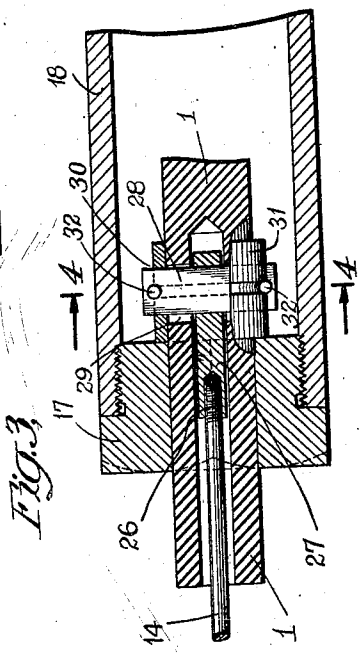


Fig. 3.

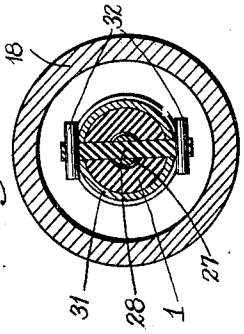


Fig. 4.

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2 Sheets-Sheet 2

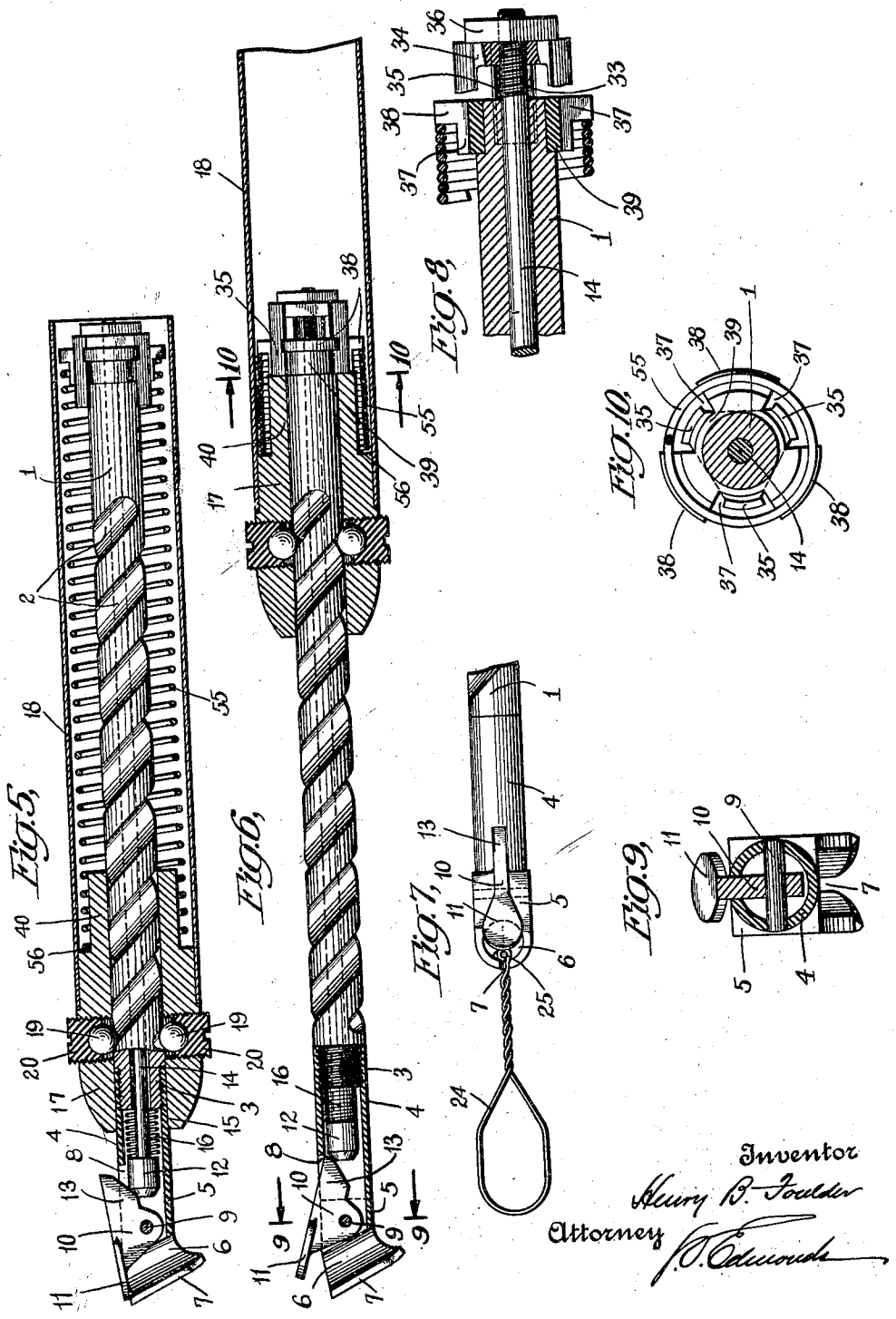


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE.

HENRY B. FOULDER, OF BROOKLYN, NEW YORK, ASSIGNOR TO J. P. CURRY MFG. CO., INC., OF STAMFORD, CONNECTICUT, A CORPORATION OF NEW YORK.

TOOL FOR TWISTING WIRE TIES.

Application filed October 18, 1922. Serial No. 595,239.

To all whom it may concern:

Be it known that I, HENRY B. FOULDER, a citizen of the United States, residing at Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Tools for Twisting Wire Ties, of which the following is a specification.

My invention relates to tools for twisting wire ties, for use in tying bags, bundles, or other articles. The principal object of my invention is to provide a tool which, after twisting a tie, automatically, releases the tie from the tool. Tools operable in this manner have been described by me in Patent No. 1,387,249, issued August 9, 1921, and also in an application filed by me March 10, 1920, Serial No. 364,632. In said patent and application the construction included a twisting head provided with radial, inclined slots sufficiently narrow to prevent the enlarged ends of the tie from pulling therethrough, but feeding into a central opening large enough to permit both ends of the tie to pass through. The passage of the ends of the tie into the central opening, however, was normally prevented by means of a spring pressed sleeve positioned in the path of the ends of the tie thereto, but was permitted by the coaction between the carrier or handle and the sleeve, effective after a certain extent of the twisting rotation of the spindle, which withdrew the sleeve and released the tie by permitting its enlarged heads to pass into and through the enlarged central opening.

The object of this invention is to provide a bag tying tool which is an improvement on the constructions disclosed in said patent and in said application, and constructions which are simpler, more durable and extremely efficient and easy in operation.

In accordance with my present invention the twisting head is provided with a single, narrow, inclined slot behind which is an inclined passageway for the enlarged ends of the tie. The discharging end of this passage is normally closed by a pivoted member, acting in a manner similar to a valve or trap-door to prevent a tie from leaving the head, the pivoted member being normally held in such position by a spring pressed stop member coacting therewith. I provide operable means, connected with the stop member and operable during tie twisting rotation of the twisting head, for withdrawing the stop from the closure member and effecting the release of the tie from the tool. Said means are preferably automatically operated in such manner by coaction with a member with respect to which the spindle is relatively movable and effective whenever the spindle becomes extended a certain distance from its handle or carrier, thus releasing the tie automatically at a certain time during the twisting operation. Mechanism of the character briefly referred to may be applied both to hand tools and to bench tools for twisting ties.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming a part of this application and illustrating certain possible embodiments of my invention. In the drawings, Fig. 1 is a longitudinal sectional view of a bench tool embodying my invention, certain parts being broken, the tool being shown in tie-retaining condition and before a twisting operation has begun; Fig. 2 is a view similar to Fig. 1 but shows the tool in extended position after a twisting operation has been completed, and in tie-releasing condition; Fig. 3 is a longitudinal sectional detail showing the means for withdrawing the stop from the closure member; Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 3; Fig. 5 is a longitudinal sectional view of a hand tool embodying my invention, the tool being shown in tie-retaining condition and before a twisting operation has begun; Fig. 6 is a view similar to Fig. 5, but shows the tool in tie-releasing condition and extended as at the end of a twisting operation; Fig. 7 is a detail plan view of the twisting head portion of the tool showing a tie being released therefrom; Fig. 8 is an enlarged sectional view of certain details of the construction at the rear end of the spindle; Fig. 9 is a transverse sectional view taken on the line 9—9 of Fig. 6, and Fig. 10 is a transverse sectional view taken on the line 10—10 of Fig. 6.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring to the drawings, the cylindrical

spindle 1 is spirally grooved as at 2 and at its forward end is provided with a screw threaded portion 3 engaging the rear end of the sleeve portion 4 of the tie twisting head 5, which at its forward end presents an inclined tubular passageway 6, opened at both ends, and open also along a narrow outwardly disposed slot 7 extending from end to end of the passage. Inwardly of passage 6 head 5 is recessed or slotted, as at 8, and in this recess is pivoted, as by means of a pin or rivet 9, a member 10 which has a portion 11 which is adapted to swing into or out of closing position over the discharge end of the passage 6 to prevent or to permit the passage therefrom of the enlarged ends of a wire tie positioned in passage 6. I provide means for normally holding the portion 11 in closing position over the discharge end of passage 6, and to this end I provide a movable stop 12 which is normally spring-pressed into engagement with a heel portion 13 of the member 10 to hold the portion 11 in covering position. Stop 12 is preferably secured to or formed on the end of shaft 14 which is slidably mounted in a suitable longitudinal passage 15 provided interiorly of the spindle 1. Shaft 14 is normally held in forward position with respect to spindle 1 by means of a spiral spring 16 which is collapsed between stop 12 and the threaded portion 3 of the spindle 1, and thus stop 12 is normally held in engagement with heel 13 to keep passage 6 closed. Spindle 1 is mounted in a bearing block 17 attached to the forward end of a tubular cover or handle 18 and in which the spindle is mounted for relative movement thereto. For effecting the rotation of spindle 1 I provide a plurality of balls 19 which engage spiral groove 2 of the spindle and may be held in position by screw blocks 20, which may be mounted in bearing block 17 (as in the hand tool, Fig. 5) or may be held in a separate block 21 which may be in threaded engagement with the adjacent ends of a two-piece cover 17 (as at 12) in the bench tool, Fig. 1, and secured against rotation by means of screws 23.

In both the hand tool and the bench tool a wire tie 24, when held in the twisting head, is twisted by pulling spindle 1 outwardly from handle or cover 18, tie-twisting rotation being effected by the coaction between balls 19 and spiral groove 2. The ends of the tie 24 extend through slot 7 and have the enlargements 25 on these ends in passage 6. As the tie is being twisted these enlarged ends continually seek to leave the discharge end of passage 6 but are prevented from doing so by the closure member 10 until stop 12 is withdrawn from this member, which allows the enlarged ends 25 of the wire tie to move member 10 aside and to leave the twisting head. In both the hand tool and in the machine tool I provide means for automatically withdrawing stop 12 from member 10 to cause the tie to leave the tool during tie-twisting movement of the spindle 1 whenever the spindle becomes extended to a certain extent from the handle or cover 18.

To this end, and as shown embodied in the bench tool construction, the inner end of shaft 14 is threaded, as at 26, and is secured into a member 27 which carries a removable transverse bar 28 extending through a slot therein. Bar 28 extends through slots 29 in the spindle 1 and through slots 30 in a sleeve member 31 encircling spindle 1, pin 32 penetrating bar 28, holding these parts in position. Slots 30 are somewhat larger than bar 28 so as to permit a certain extent of longitudinal movement to sleeve 31 and shaft 14 relative to spindle 1. The arrangement is such that the spring 16 normally holds the shaft 14 and sleeve 31 in their foremost positions relative to the spindle 1. However, when the spindle 1 has been extended by a twisting operation to a certain extent, the sleeve 31 is adapted to be stopped by coming against the inner surface of the bearing 17, so that further extension of spindle 1 causes it to move forwardly of shaft 14 thus freeing cover member 10 from the action of stop 12 and automatically effecting the release of a tie being twisted from the tool. Thus, by engaging the end of a tie in the tie-twisting head and by pulling outwardly thereon, the tie becomes twisted and automatically released from the tool.

As a modification of the mechanism for automatically releasing a twisted tie from the tool, and as shown embodied in the hand tool construction, I extend shaft 14 completely through the spindle 1 longitudinally, and provide a threaded portion 33 extending outwardly of the spindle. Screwed on said portion 33 is a member 34 which presents a plurality of forwardly extending fingers 35.

If desired, member 34 may be re-inforced and locked in adjusted position on shaft 14 by means of a nut 36 screwed on portion 33. Fingers 35 may be guided in suitable recesses 37 provided in an annular flange 38 of an annular member 39 which is secured to the end of spindle 1, and whereby member 34 is prevented from turning. When the spindle 1 has been extended from the handle or carrier 18 to a certain extent, the ends of fingers 35 of member 34 are adapted to engage against the inner surface of an inwardly extending annular boss 40 provided on the bearing member 17, so that further extension of spindle 1 from handle 18 will cause stop 12 to be withdrawn from cover member 10 and will allow the

enlarged ends 25 of a tie being twisted to brush cover portion 11 aside and to leave the twisting head.

Any suitable means may be employed for obtaining an automatic retraction of the spindle 1 into its carrier or handle 18 after a tie has been twisted and released. For instance, and as shown in the machine tool construction, the cover 18 may be suitably mounted in standards 41, supported on a table or bench 42, the cover being removably held in position by means of lock screws 43. To the rear end of spindle 1 there may be attached a belt or rope 44 which extends over a pulley wheel 45 carried by a bracket 46, secured to the bench 42, as by screws 47, the other end of belt 44 being secured to one end of a tension-spring system 48 which, at its other end, is suitably secured in fixed position, as at 49. An annular bumper member 50 may be secured to spindle 1 near its rear end by means of a pin 51, and a bumper spring 52 may be positioned between the bumper 50 and a stop member 53 secured to the end of cover 18 by being in threaded engagement therewith and held in place by screw 54. Thus, as soon as a tie being twisted becomes released from the tool, the parts are restored to original position and the tool is conditioned to twist another tie.

In the application of my invention to a hand tool, the automatic retraction of the spindle from extended position may readily and easily be obtained by providing a coil spring 55 about the spindle 1 and interiorly of the handle 18. This spring encircles the boss 40, and when the spindle is extended is compressed between a shoulder 56 provided by the bearing 17 and the flange 38 of annular member 39.

The operation of the hand tool is similar to the operation of the bench tool except that with the hand tool the handle 17 is usually pulled away from the tie while with the bench tool the tie is usually pulled away from the carrier 17.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:—

1. In a tie-twisting tool, a twisting head having a narrow slot and a co-extensive open-ended passageway behind said slot for enlarged ends of wire ties, and means, comprising a pivoted cover member movable into and out of covering position over an end of said passageway, for releasably confining the ends of a wire tie in said passageway.

2. In a tie-twisting tool, a twisting head having a narrow slot and a co-extensive open-ended passageway behind said slot for enlarged ends of wire ties, and means, comprising a pivoted cover member movable into and out of covering position over an end of said passageway, for releasably confining the ends of a wire tie in said passageway, and means coacting with said pivoted cover member for movably holding said cover member in covering position over said end of the passageway.

3. In a tie-twisting tool, a twisting head having a narrow slot and a co-extensive open-ended passageway behind said slot for enlarged ends of wire ties, and means, comprising a pivoted cover member movable into and out of covering position over an end of said passageway, for releasably confining the ends of a wire tie in said passageway, means, comprising a movable stop engaging said cover member, for holding said member in covering position, means for withdrawing said stop from said cover member to permit the release of said ends from said passageway, and means for rotating said twisting head.

4. In a tie-twisting tool, a twisting head having a narrow slot and a co-extensive open-ended passageway behind said slot for enlarged ends of wire ties, and means, comprising a pivoted cover member movable into and out of covering position over an end of said passageway, for releasably confining the ends of a wire tie in said passageway, a spring-pressed stop member, coacting with said pivoted cover member, normally holding said member in covering position, operable means, connected with said stop member, for withdrawing said stop from said cover member, means for operating said operable means during tie-twisting rotation of said head, and means for rotating said twisting head.

5. In a tie-twisting tool, in combination, a twisting head presenting an inclined, slotted passageway for the ends of a wire tie, a cover member pivoted on said head for movement into and out of covering position over the discharge end of said passageway, to prevent or to permit the passage of said tie-ends therethrough, means, comprising a movable stop member adapted to engage said cover member, for holding said cover member in covering position, means, automatically operable during the twisting rotation of said twisting head, for withdrawing said stop from said cover member to permit the passage of said tie-ends out of the discharge end of said passageway, and means for rotating said twisting head.

6. In a tie-twisting tool, in combination, a spindle, a cover therefor, a twisting head on said spindle and having an inclined, slotted passageway for the enlarged ends of

a wire tie, a closure member for said passageway pivoted on said head, a shaft mounted for longitudinal movement relatively to said spindle, a stop on said shaft, adapted when said shaft is in forward position relatively to said spindle, to engage said closure member to hold said member in covering position, and adapted, when said spindle is retracted relatively to said spindle, to release said closure member for movement into uncovering position, spring means normally holding said shaft in forward position relative to said spindle, means, effective whenever said spindle has been extended to a certain distance out of said cover, for retracting said shaft relatively to said spindle, and means for rotating said spindle as it becomes extended from said cover.

7. In a tie-twisting tool, in combination, a spindle, a cover therefor, a twisting-head, means, associated with said head and operable into tie-retaining condition and into tie-releasing condition, for retaining a tie on said head for twisting and for releasing a tie therefrom, a spring-pressed stop coacting with said means and normally holding said means in tie-retaining condition, and means for retracting said stop to place said means in tie-releasing condition, and including a shaft attached to said stop and carried longitudinally in said spindle for relative movement thereto and a radially extending member on said shaft and a stop in the path of said member, adapted to engage said member whenever said spindle extends to a certain extent from said cover.

This specification signed and witnessed this 16th day of Oct., 1922.

HENRY B. FOULDER.