H. B. FOULDER.

TOOL FOR TWISTING TIES.

APPLICATION FILED MAR. 20, 1920.

1,387,249.

Patented Aug. 9, 1921.

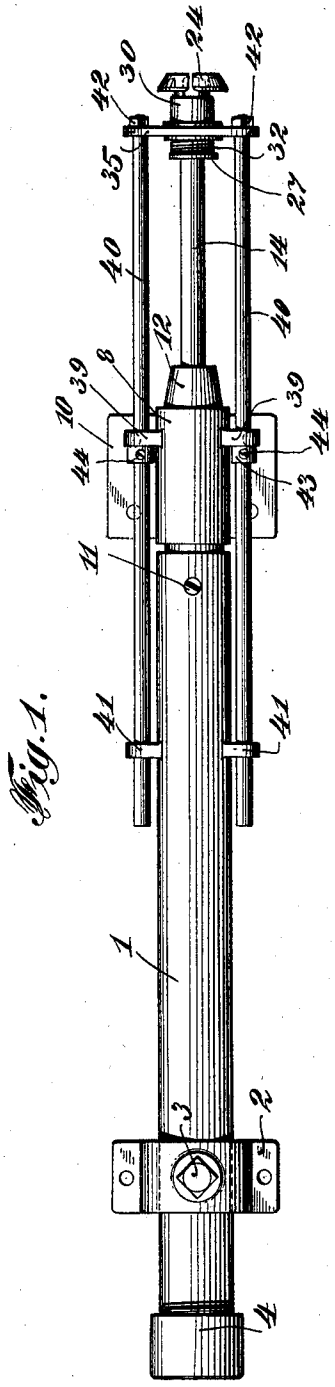


Fig. 1.

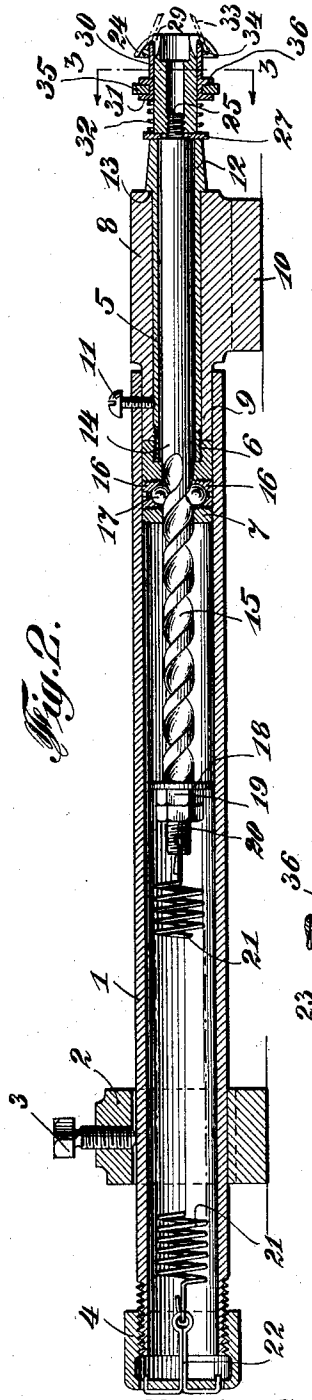


Fig. 2.

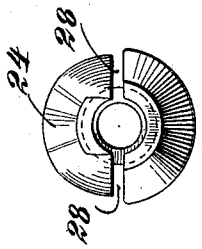


Fig. 5.

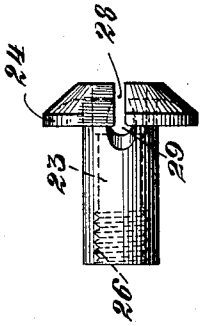


Fig. 4.

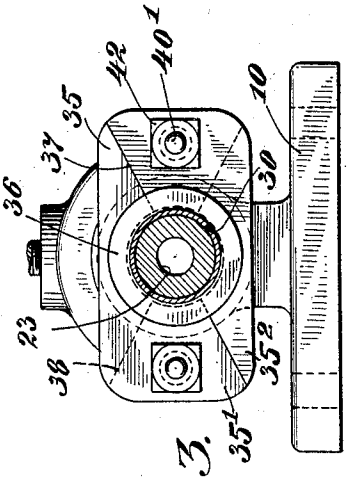


Fig. 3.

Inventor

Henry B. Foulder

By his Attorney

J. Edmonds

# 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 TIES.

1,387,249. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed March 20, 1920. Serial No. 367,312.

*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 Ties, of which the following is a specification.

My invention relates to tools for twisting wire ties for use in tying bags, bundles, pairs or groups of reinforcing rods, and other objects which are to be tied or closed by twisting a tie about the same.

The construction described and claimed herein is a modification of that described and claimed in my application tie twisting tool, Serial No. 364,632 filed March 10, 1920. In said application mechanism is described by which a relative movement of the operating parts in one direction twists the tie until a determined point is reached, after which a continuation of the operating movement in the same direction results in the automatic release of the tie. In the application referred to I have claimed the invention generically and have also specifically claimed the forms of construction illustrated in said application, in which a hand tool was illustrated. The present application will describe and claim a specific embodiment of the invention which is illustrated as being embodied in a bench tool although in some of its aspects the present invention may be embodied in a hand tool.

In my present invention, when the same is embodied in a bench tool, a spindle having a spiral groove therein and a twisting head at its forward end is mounted within a cylindrical casing which may be secured to a suitable support, the spindle being rotated by suitable means as the same is drawn forwardly from the casing. The twisting head embodies means for retaining the ends of a wire tie until the same has been twisted and for then automatically releasing the ends of the tie. In the embodiment illustrated herein the flanged head has one or more slots therein through which the end portions of the wire tie extend and by which the enlarged portions at the ends of the tie are held. This slot means in the flanged head communicates with an enlarged slot means in an axial portion of the tie-holder, through which the enlarged ends of the tie will pass to release the tie when the ends are allowed to pass through the same. A sleeve normally extends over the axial portion of the tie-holder to cover the enlarged slot means. At a determined point in the operative movement of the tool the sleeve is forced back, against the pressure of a spring, to uncover the enlarged slot or slots. In the specific form of device illustrated herein the sleeve has a cross-head secured thereto with rods running backwardly therefrom through guiding lugs on the stationary casing. Lugs on these rods engage against the lugs on the casing, when the tie has been sufficiently twisted, to prevent further forward movement of the cross-head and sleeve, the twisting head then continuing to move forwardly to uncover the enlarged slot means, the sleeve being held back against the pressure of a spring which normally holds the sleeve forward against the flanged head of the tie-holder.

One of the features of the present invention consists in means for adjusting the point in the operative movement of the tool at which the tie will be released. It is therefore possible to cause a greater or less number of turns to be imparted to the tie during the twisting movement. In the specific embodiment of the device briefly described above this is accomplished by making the lugs on the two longitudinal rods adjustably in position on these rods, so that these lugs will contact against the lugs on the cylindrical casing after a greater or less forward movement of the spindle and twisting head.

In order that my invention may be more clearly understood attention is hereby directed to the accompanying drawings forming part of this application and illustrating one embodiment of my invention. In the drawings Figure 1 represents a top plan view of a bench tool for twisting wire ties embodying my invention, the tie-holder being shown in open position, Fig. 2 is a central vertical longitudinal section through the device illustrated in Fig. 1, the spindle being shown in side elevation, Fig. 3 is an enlarged cross-section taken on line 3—3 of Fig. 2, Fig. 4 is an enlarged side elevation of the twisting head and Fig. 5 is a front view of the same.

Referring to the drawings the cylindrical casing 1 is adapted to be secured to a bench or other supporting surface by means of the

clamping head 2, which may be clamped to the casing by means of screw 3. The rear end of the casing may be screw-threaded and closed by a cap 4. The sleeve 5 of less diameter than casing 1 is mounted in the forward end of the casing to extend forwardly therefrom. The rear end of this sleeve is screw-threaded, as is shown at 6 and has screw-threaded thereon a flanged forward extension of a cylindrical block 7. An annular member 8 extends forwardly from the casing 1 with a rearwardly extending sleeve portion 9 mounted within the front end of casing 1, about sleeve 5 and abutting at its rear edge against the forward edge of member 7. Member 8 has a bottom horizontal flanged portion 10 which is adapted to be secured on the bench or support. The casing 1, sleeve 5 and member 8 are secured together by a set-screw 11. The sleeve 5 is preferably provided with a portion 12 of enlarged outer diameter forwardly of the member 8, this enlarged sleeve portion 12 having a peripheral shoulder 13 which abuts against the front surface of member 8.

The spindle 14 is slidably and rotatably mounted in sleeve 5 and extends rearwardly through a cylindrical opening in block 7 into the portion of the casing 1 to the rear thereof. The spindle 14 is provided with a spiral groove 15 with which means secured to casing 1 coact to rotate the spindle when the same is reciprocated. In the embodiment of the invention shown a plurality of screw plugs 16 are screw-threaded into the member 7 and carry anti-friction balls 17 which engage in the spiral groove of the spindle to cause the rotation of the same. The spindle may be provided toward its rear end with a thin cylindrical disk 18 which engages within casing 1 to form a rear bearing for the spindle, this disk 18 preferably being held in place by nuts 19 threaded on the rear threaded portion 20 of the spindle.

Appropriate spring means may be used to draw the spindle back into the casing, into the position shown in Fig. 2, after its forward movement in which a tie is twisted. This spring means may take the form of a spiral spring 21 which is secured at its forward end to the rear end portion 20 of the spindle, the spring extending rearwardly through the casing and having its rear end secured to the cap 4 as is indicated at 22.

The twisting head, in the embodiment of the invention illustrated, takes the form of an axial portion 23 and a flanged head 24. The spindle 14 is provided at its forward end with a screw-threaded portion 25 of reduced diameter and the axial portion 23 of the tie-holder or twisting head is provided with an internally threaded axial opening 26 at the rear end thereof by which the axial portion 23 may be secured to the spindle. A disk 27 is mounted on the threaded extension 25 of the spindle so as to be clamped in position between the forward end surface of the main body-portion of the spindle and the rear surface of the axial portion 23 of the tie-holder, when the latter is screwed into position on the threaded extension 25. When so positioned the disk 27 extends radially beyond the outer surface of the axial member 23 so as to form a spring abutment.

The flanged head 24 of the tie-holder is provided with one or more slots 28 extending therethrough and the axial portion 23 of the tie-holder is provided with a corresponding number of longitudinal slots 29 which communicate with the slot or slots 28 and are of a greater width than the latter. A sleeve 30 is mounted on the axial portion 23 of the tie-holder so as normally to cover the enlarged slot means 29 and to be drawn rearwardly at the proper times to uncover the same.

In the embodiment of my invention illustrated the sleeve 30 has a radial flange 31 at its rear edge. A spiral spring 32 is coiled about member 23 between flange 31 and the disk abutment 27, so as normally to press the sleeve forwardly into the position shown in Fig. 2, in which the axial slots 29 are covered by the forward edge of the sleeve.

When a wire tie, indicated in Fig. 2 at 33, is to be twisted its end portions are passed through the radial slots 28 through which the enlarged ends 34 of the tie cannot pass. When the tie is twisted its ends 34 press against the rear surface of the flanged head 24 and the outer periphery of the sleeve 30. When, however, sleeve 30 is moved rearwardly relatively to the spindle 14, the enlarged slots 29 will be uncovered so that the enlarged ends 34 of the tie will immediately pass through the same.

In the embodiment of my invention illustrated a cross head 35 is secured to the sleeve 30. The cross-head may be secured in position between the rear flange 31 of the sleeve and a flange 36 which extends outwardly a short distance forwardly from flange 31. The cross-head 35 may be formed of a pair of mating segments $35'$, $35^2$ which meet along the diagonal line 37, at the front portion of the construction. The members $35'$ and $35^2$ have their end portions split so that these end portions overlap, meeting, as stated, along the diagonal line 37 at the front, and along the diagonal line 38 at the rear.

The forward portion 8 of the casing is provided with a pair of lugs 39, 39 extending horizontally from its opposite sides. A pair of rods 40 are slidably mounted in lugs 39 and in similar lugs 41 which extend laterally from the casing 1. These rods are provided at their forward ends with screw-

threaded extensions 40′ of a reduced diameter which extensions pass through openings in cross-head 35, nuts 42 being screwed on the forward ends of the rods to secure the cross-head to the rods. The rods pass through overlapping portions of the two members 35′ and 35² of which the cross-head is composed and so hold the two members of the cross-head together.

The rods 40 have enlargements 43 thereon to the rear of lugs 39 which are adapted to abut against the lugs 39 when the spindle has been sufficiently extended. These enlargements 43 are preferably adjustably mounted on rods 40 so that the engagement of the same with lugs 39 will occur at a point in the forward movement of the spindle which may be varied as desired. As shown the enlargements 43 take the form of sleeves which may be positioned at any desired point on rods 40 and secured in position by means of set-screws 44 which extend through the members 43 into binding engagement with the rods 40.

The operation of my device will now be clear. The ends of a wire tie being slipped into the slots 28 and a turn of the tie taken about the neck of a bag, or other object or objects to be tied, the latter is drawn forwardly so as to draw the spindle out of its casing. The twisting head is rotated and the tie twisted until the members 43 engage against lugs 39 when the cross-head is prevented from further forward movement. A slight continuation of the forward movement of the spindle beyond this point serves to separate the twisting head from sleeve 30, spring 32 being compressed and the slots 29 uncovered. The ends of the tie immediately pass through slots 29, releasing the tie, whereupon the spring 21 immediately draws the spindle back into the casing. In Fig. 1 the twisting head is shown somewhat separated from sleeve 30 as it appears at the moment when the ends of the tie pass through slots 29 and in Fig. 2 the device is shown in its normal position with the spindle in its rear position and the sleeve 30 in its normal forward position. It will be obvious that the device may be operated with great rapidity.

It should be understood that my invention is not limited strictly to the details of construction described but that the same is as broad as is indicated by the accompanying claims.

What I claim is:

1. In a tie-twisting tool, the combination of a tie-holder adapted to retain the ends of a wire tie during the twisting of the same, members, one of which is movable relatively to the other in one direction to twist the tie, means adapted to engage against each other at a determined point during said relative movements of said members, one of said means being adjustable in position so that the engagement of said means may occur after a greater or less relative movement of said members, and means operable upon the continuation of such relative movement past said point to release the ends of the tie.

2. In a tie-twisting tool, the combination of a tie-holder adapted to retain the ends of a wire tie during the twisting of the same, members, one of which is movable relatively to the other to twist the tie, adjustable means for determining the number of twists to be given to the tie, and means for releasing the tie from the tie-holder as the twisting operation ends.

3. In a tie-twisting tool, the combination of a pair of members adapted jointly to hold the ends of a wire tie during the twisting of the same, means operable in one direction to a determined point for rotating one of said members to twist the tie, means adjustable in position to locate said point at one position or another relative to the travel of said first named means and means operable as said first named means passes said point, in the same direction, to move one of said members out of tie-retaining position.

4. In a tie-twisting tool, the combination of a spindle having a twisting head, a cylindrical casing in which said spindle is mounted, means for rotating said spindle as the same is progressed through said casing, said head having slot means for holding the enlarged ends of a wire tie and enlarged slot means through which, when uncovered, said ends will pass, a member normally covering said enlarged slot means, a cross head secured to said member, longitudinal rods secured to said cross head, abutments on said casing and stops on said rods adapted to contact against said abutments toward the end of the forward movement of said spindle, and spring means tending to hold said covering member in forward position relative to said spindle and head.

5. In a tie-twisting tool, the combination of a cylindrical casing, means for securing the same to a support, a spindle mounted to be moved through said casing and having a twisting head, means for rotating said spindle as the same is progressed through said casing, means for retaining the ends of a wire tie on said head during the twisting operation, comprising a sleeve movably mounted on said spindle, an abutment on said spindle, a spring surrounding said sleeve, bearing against said abutment and normally pressing said sleeve forwardly against said twisting head and means for preventing further forward movement of said sleeve at a determined point in the progression of said spindle through said casing.

6. In a tie-twisting tool, the combination of a cylindrical casing, means for securing

the same to a support, a sleeve therein secured thereto, and extending forwardly therefrom, a spindle having a spiral groove therein, mounted in said sleeve, means for causing said spindle to rotate as it is drawn through said sleeve, a spring in said casing for retracting said spindle, a tie-holder comprising a flanged head and an axial portion, secured on the forward end of said spindle, said head having slot means and said axial portion enlarged slot means communicating therewith, a sleeve normally covering said enlarged slot means, means movable with said sleeve, a spring arranged to press said sleeve forwardly relatively to said tie-holder and means on said casing arranged to co-act with said means movable with the sleeve, at a determined point in the forward movement of said spindle and tie-holder, to prevent further forward movement of said sleeve.

7. In a device of the character described, the combination with means for twisting a wire tie and retaining-means for holding the tie in operative association with said twisting means, of adjustable releasing-means for rendering said retaining-means inoperative at any predetermined one of a number of different times during the effective operation of said twisting means to prevent further twisting of the tie.

8. In a device of the character described, the combination with means for twisting a wire tie and retaining-means for holding a tie in operative association with said twisting means, of adjustable releasing-means to automatically cause the said retaining-means to be inoperative at any predetermined one of a number of different times during the effective operation of said twisting means, and means for adjusting said releasing means to become automatically effective at the desired time.

9. In a device of the character described, the combination with a pair of members, one of which is movable relative to the other to twist a wire tie, and a tie-holder comprising a pair of members, normally coöperating to retain the ends of the tie, and adapted to be moved relatively one to the other into non-coöperating position to release the tie, of adjustable means for automatically moving one of said tie-holder members relatively to the other to place said members in non-coöperating position at any predetermined one of a number of different stages of the relative movement between said pair of members first mentioned.

This specification signed and witnessed this 18th day of March, 1920.

HENRY B. FOULDER.

Witnesses:

DYER SMITH,

I. MCINTOSH.