

April 30, 1946.

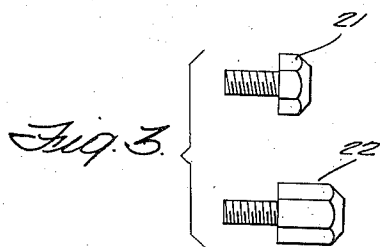
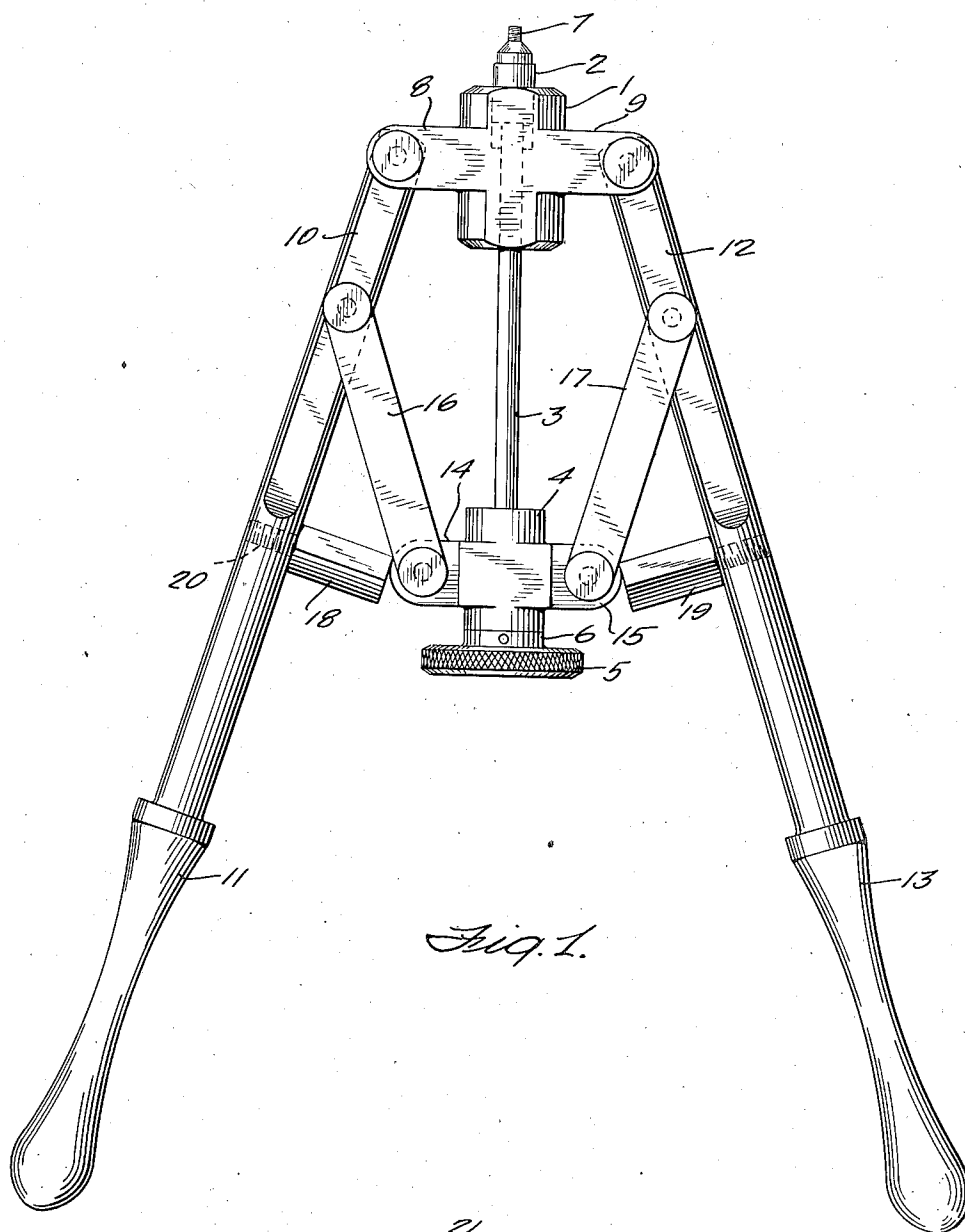
R. W. LUCE

2,399,442

TOOL

Filed June 19, 1942

2 Sheets-Sheet 1



INVENTOR
RICHARD W. LUCE
BY *George F. Hill*
ATTORNEY

April 30, 1946.

R. W. LUCE

2,399,442

TOOL

Filed June 19, 1942

2 Sheets-Sheet 2

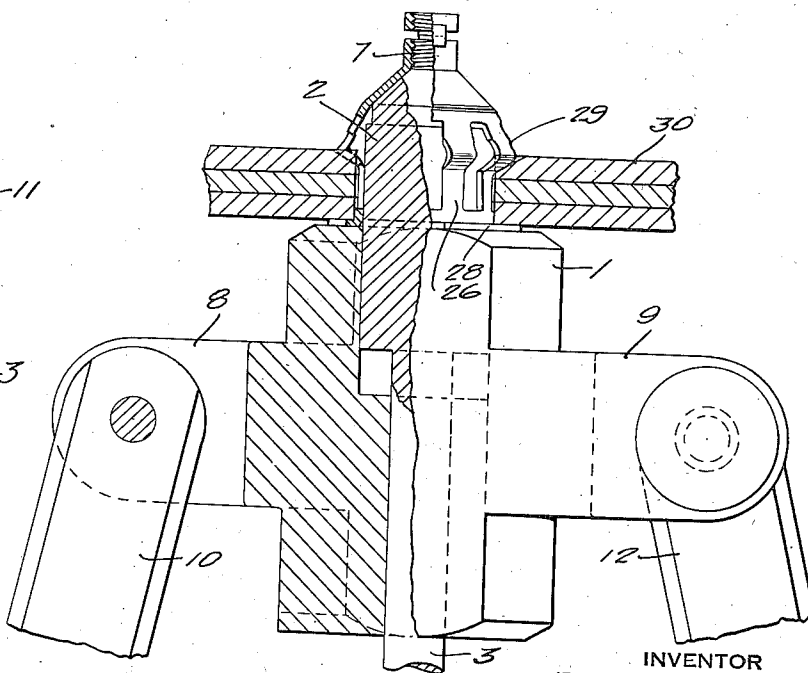
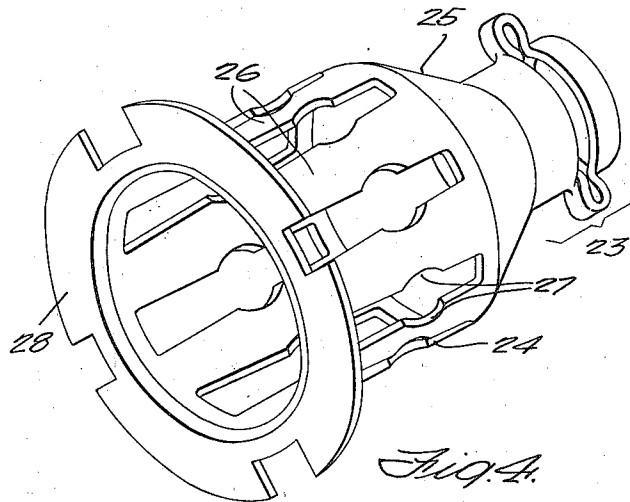
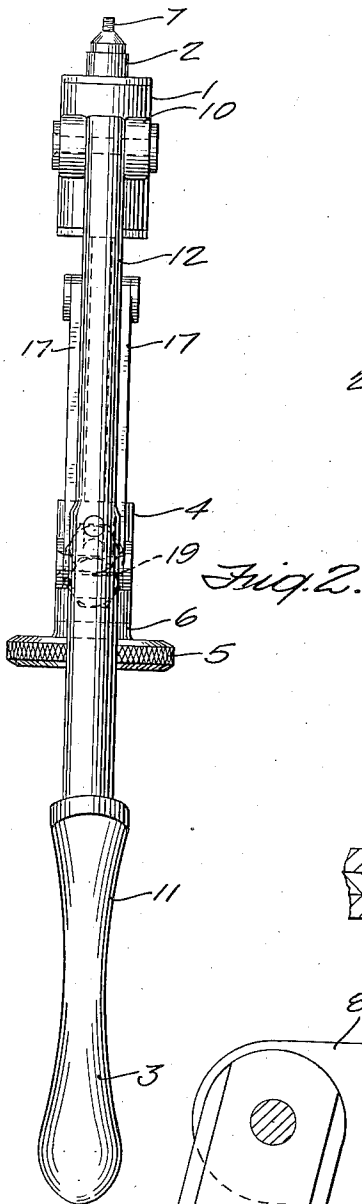


Fig. 5.

INVENTOR
RICHARD W. LUCE
BY
George T. Gill
ATTORNEY

UNITED STATES PATENT OFFICE

2,399,442

TOOL

Richard W. Luce, Southport, Conn.

Application June 19, 1942, Serial No. 447,733

1 Claim. (Cl. 218—19)

The invention herein disclosed relates to a tool that is especially suitable for compressing or crimping a fastener between its ends to secure the fastener within an opening provided therefor.

In the copending application Serial No. 447,732, for Fastener, there is disclosed a so called crimp nut fastener. The particular fastener illustrated is a threaded fastener that is particularly suitable for mounting at the inaccessible or blind side of a structural element. To this end, the fastener is arranged so that it may be inserted in an opening provided therefor from the accessible side of the structure. It is provided with a collapsible portion which when collapsed engages the structure to retain the fastener in position on the structure.

By the invention herein disclosed, there is provided a tool especially adapted for inserting such crimp nuts and effecting an axial compression thereof to expand the collapsible portion. In one form, the tool comprises an abutment against which the end of the fastener is engaged. A plunger is slidably mounted in the abutment and receivable in the fastener. The plunger is provided with means for engaging the fastener at a point spaced from the abutment and means are provided for withdrawing the plunger within the abutment to crimp the fastener between the fastener engaging means of the plunger and the abutment.

Such a tool, and a fastener with which it may be used, is illustrated in the accompanying drawings in which:

Fig. 1 is a side elevation of the tool;

Fig. 2 is an end elevation of the same;

Fig. 3 is a side elevation of limit stops;

Fig. 4 is an isometric of a fastener; and

Fig. 5 is a side elevation, partly in section of a fastener crimped by the tool, part of the tool being broken away.

The tool illustrated in the drawings includes an abutment block 1, having a recess extending in from one surface in which recess a plunger 2 is slidably mounted. A plunger rod 3 extends from the plunger through an opening in the abutment block between the plunger recess and the opposite end of the abutment block. An operating block 4 is spaced from the abutment block and the plunger rod extends through this operating block in which it is slidably and rotatably mounted. On the end of the plunger rod, there is secured to the rod a knurled finger wheel 5 having a boss 6 thereon positioned to engage the operating block when the operating block moves, axially of the rod, in a direction away from the

abutment block. Through the movement of the operating block, the plunger may be withdrawn in the recess in the abutment block. The plunger is provided with a threaded end section 7 for engaging a fastener at a point spaced from the adjacent surface of the abutment block.

For effecting movement, with substantial force, of the operating block, a system of links and levers are provided. To this end, the abutment block 1 is provided with oppositely extending lugs 8 and 9 having bifurcated end sections. Received in the end of the lug 8 and pivotally secured therein is one end of a hand lever 10 having on the opposite end a hand grip 11. A like lever 12 having a hand grip 13 is pivotally secured in the bifurcated end of the lug 9.

The operating block 4 is likewise provided with oppositely extending lugs 14 and 15. To the lug, corresponding ends of a pair of links 16 are pivotally secured, one on each side of the lug. The opposite ends of this pair of links embrace the hand lever 10 and they are pivotally secured thereto. A like pair of links 17 are pivotally secured at one end to the lug 15 and at the other end to the hand lever 12.

As the point at which the links 16 and 17 are secured to the hand levers 10 and 12 is intermediate the operating and abutment blocks, movement of the hand levers in a direction to separate them will cause the operating block to move towards the abutment block. Conversely, movement of the hand levers towards each other will cause the operating block to move away from the abutment block, to engage the boss 6 on the finger wheel 5 and to draw the plunger into the recess in the abutment block.

To determine the extent of movement of the plunger under the action of the operating block, limit stops are provided. These limit stops consist of rods 18 and 19. These are identical. The rod 18 is provided with a threaded end section 20 that is received in a threaded hole in the handle 10. When so mounted in the handle, the rod is positioned so that the end thereof will, at a predetermined point in the withdrawal of the plunger, engage the end of the lug 14. Likewise, and at the same position, the end of the rod 19 will engage the lug 15 on the operating block. Thus, further movement of the hand levers towards each other is prevented.

Materials of different thicknesses require a compression of the fastener to different extents, determined by the amount the plunger is drawn into the recess in the abutment block. For this purpose limit stop rods of different lengths are

provided. In Fig. 3, two such limit stop rods 21 and 22 are illustrated. These are used in pairs. For different adjustments, the rods 18 and 19 are removed and a pair of the rods 21 or a pair of the rods 22 are threaded into the handles, depending upon the adjustment desired.

The specific tool above described is especially adapted for use with a threaded fastener such as that illustrated in Figs. 4 and 5. This fastener includes an internally threaded end section 23 that constitutes a nut. The particular arrangement is a lock-nut of the kind illustrated in United States Patent No. 2,265,661 issued December 9, 1941. Uniting the nut portion of the fastener and a cylindrical, collapsible portion 24 of the fastener there is a frustro-conical section 25. The cylindrical, collapsible section of the fastener consists of a series of strips 26 which are notched as at 27 to determine the plane at which, upon compression of the fastener, these strips will bend. At the end of the collapsible section of the fastener, there is an outwardly extending, radial flange 28.

In using the tool with this fastener, the hand levers are spread apart so that the abutment block 1 will be retracted along the plunger 3 resulting in the plunger being extended from the abutment block. The fastener is then placed over the plunger, the flanged end towards the abutment block. The finger wheel 5 is then rotated, while the fastener is held against rotation, to effect engagement of the conical portion 25 of the nut against the corresponding conical portion of the plunger. The hand levers are then brought together until the abutment block engages the flange 28 of the fastener. With a hand on each of the hand grips, the operator inserts the fastener on the end of the plunger in an opening, such as the opening 29, in the element 30 to which the fastener is to be secured. The flange of the fastener is pressed tightly against the surface of the element 30 and the handle levers are forced toward each other until the limit stops prevent further movement in this direction. Then the handle levers are separated slightly and the finger wheel rotated to disengage the plunger from the fastener.

As the plunger is drawn into the abutment block, the fastener is compressed axially. The plunger acts as a mandrel and the strips 26 of the collapsible section bend outwardly to engage the element as illustrated in Fig. 5.

From the foregoing description of the embodiment of the invention illustrated in the drawings, it will be seen that there is provided, a simple, efficient tool for securing fasteners that are crimped in place. The tool is such that it is easily operated and effects a proper and tight securing of the fastener without the danger of injuring the fastener.

It will be obvious that various changes may be made by those skilled in the art in the details of the specific embodiment of the invention illustrated in the drawings and described in detail above within the principle and scope of the invention as expressed in the appended claim.

I claim:

A tool for crimping a fastener in an opening therefor comprising in combination an abutment block presenting an end face and including lugs on opposite sides thereof, a plunger slidably mounted in the abutment block and receivable in the fastener, the plunger including means for engaging the fastener at a point spaced from the abutment, an actuating block arranged in spaced relation with respect to the abutment block and having lugs on opposite sides thereof, a plunger rod extending from the plunger through and slidable in the abutment and actuating blocks, means on the plunger positioned to engage the actuating block, and means for effecting relative axial movement of the abutment and actuating blocks including a hand lever pivotally secured to each of the lugs on the abutment block, and a link pivotally secured at one end to each lug on the actuating block, one of said links being pivotally secured to one of the hand levers intermediate the ends thereof and the other being pivotally secured in like manner to the other hand lever.

RICHARD W. LUCE.