

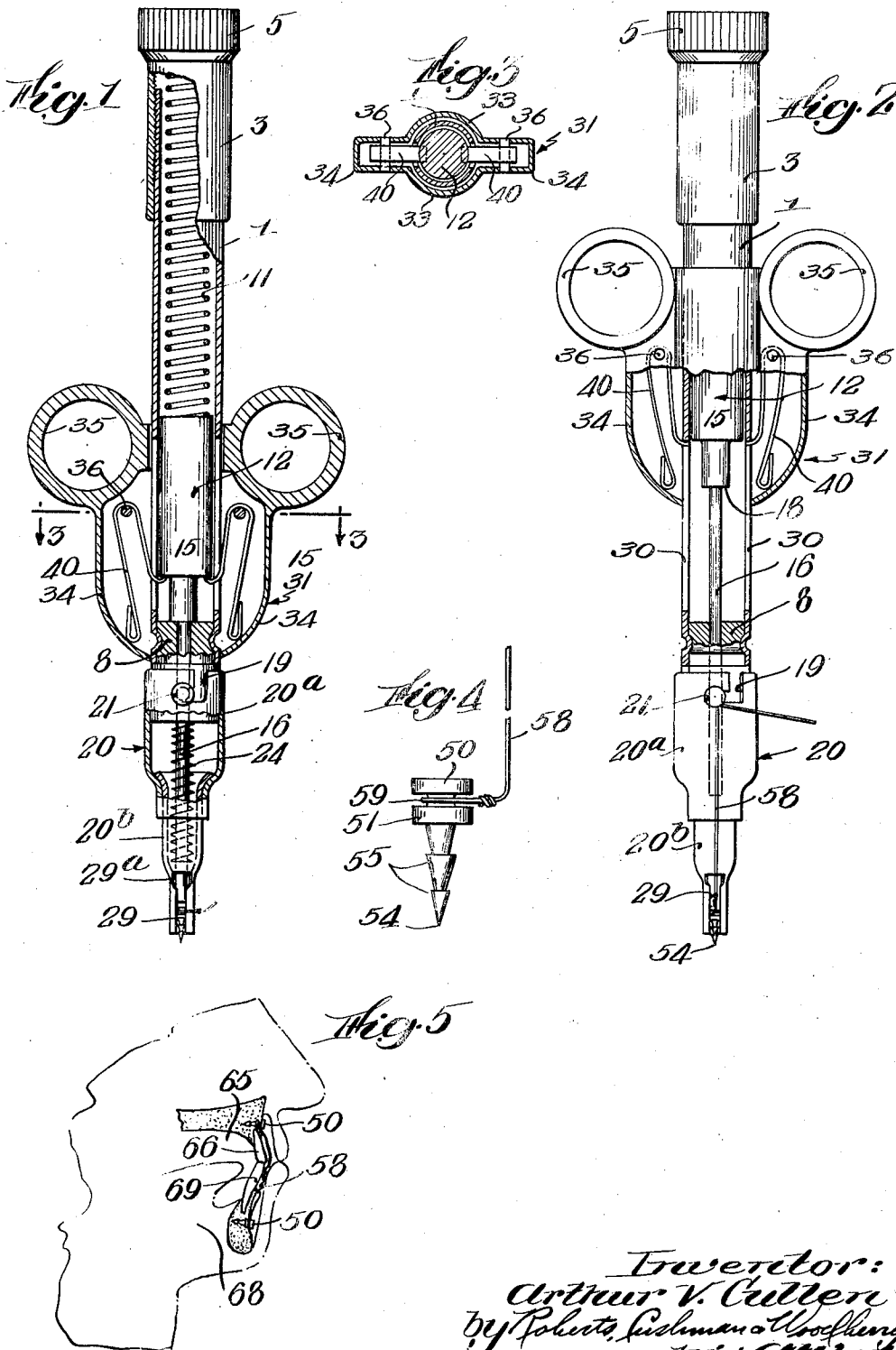
Aug. 20, 1940.

A. V. CULLEN

2,212,339

DEVICE FOR APPLYING FASTENING MEANS

Filed Oct. 27, 1936



Inventor:
Arthur V. Cullen
by Roberts, Fishman & Woodbury
His Attys.

UNITED STATES PATENT OFFICE

2,212,339

DEVICE FOR APPLYING FASTENING
MEANS

Arthur V. Cullen, Jamaica Plain, Mass.

Application October 27, 1936, Serial No. 107,763

7 Claims. (Cl. 1—47)

This invention relates to an improved device for driving tacks or the like, and particularly to a device of the type disclosed in my copending application Serial No. 738,421, filed August 4, 1934 which issued as United States Patent No. 2,065,659 on December 29, 1936. As disclosed in that application, devices of this character may be advantageously employed with fastening means in the form of tacks with attached wires which are employed to secure the jaws of a corpse in closed position.

The present invention provides an automatic tack driving device which is shaped so that its end may conveniently be inserted into the mouth of the corpse and positioned to drive a tack or fastening element into the bone of the jaw. The tack driving tool comprises a spring and a cooperating plunger having a heavy hammer portion, associated with means to compress the spring so that the latter may be released to impel the plunger against the tack and thus drive it with considerable force into an object, such as the jaw bone of a corpse or the like.

The tool may be provided with a slidable assembly which may be conveniently actuated by the fingers of the user and which includes spring elements engageable with the hammer portion of the plunger to move the latter to its retracted position and compress the main spring. The spring elements normally extend through slots in the casing of the device, the ends of these slots acting as cam means to disengage the elements from the plunger to release the latter and the main spring.

The plunger also includes a small-diametered extension which projects into a bore in an auxiliary housing which preferably has a portion movable relative to the casing, normally being held in a projected position by a light coil spring. This arrangement permits a tack to be disposed in the end of the bore of the auxiliary housing, which cooperates with the plunger in affording a socket when the plunger is in its projected position. Thus there is little possibility of injury to the hand of the user of the device if the tack is positioned when the plunger is in its projected position. When the plunger is to be released, the end of the device may be pressed against the object in which the tack is being driven so that the light spring associated with the auxiliary housing is slightly compressed, permitting the end of the plunger at the end of the driving stroke to be juxtaposed to the end of the retracted auxiliary housing portion so that the tack is firmly driven into the bone of the jaw. The casing of the de-

vice preferably is provided with a screw-threaded cap which may be adjusted to vary the compression of the main spring and thus to vary the force of the blow imparted by the plunger to the tack.

Preferably the auxiliary housing is detachably connected to the main casing by a bayonet slot and stud connection, the stud being arranged so that it may provide a convenient point of a temporary attachment for the wire which is associated with the tack. The tip of the auxiliary housing which receives the tack is provided with a slotted side portion through which the wire may project.

In the accompanying drawing:

Fig. 1 is a vertical section of the tack driving device, with parts broken away and shown in elevation;

Fig. 2 is a similar view but showing the plunger in its retracted position and at the instant it is being released to perform the driving stroke;

Fig. 3 is a section indicated by line 3—3 of Fig. 1;

Fig. 4 is an elevational detail of the fastening device which may be applied by a tool constructed in accordance with the present invention; and

Fig. 5 is a central section of the portion of the jaw structure of a human corpse showing my improved fastening means applied thereto, a portion of the face and mouth being diagrammatically outlined in dot and dash lines.

In the accompanying drawing, the numeral 1 designates a generally tubular or cylindrical casing of the tack driving device, which is provided with a screw-threaded end portion receiving the internally threaded cap 3, the latter being provided with a corrugated head 5 to facilitate its manual rotation. When desired, the cap may be unscrewed from the casing 1 to afford access to the interior thereof. The lower end of the casing is provided with an annular plug or wall 8.

A heavy main spring 11 is disposed within the upper part of casing 1, and its upper end engages the inner face of cap 3, while its lower end engages the plunger 12, that includes the relatively heavy cylindrical hammer portion 15 which slides in casing 1. The lower part of the plunger is shaped to afford an annular shoulder 18 engageable with the lower portion 8 of the casing 1, while a small diametered rod portion 16 of the plunger projects through a bore in this portion of the casing.

An auxiliary housing 20 is secured to the lower part of the casing 1, and the rod portion 16 of the plunger extends into the end of this auxiliary casing. The auxiliary casing preferably may be

formed in two parts, including a larger portion 20a, which has a bayonet slot 19 engaging a stud 21 projecting from the lower part of casing 1. The lower part of the casing section 20a receives the flared end of a tip portion 20b which is held in the normal position illustrated in Fig. 1 by a light auxiliary spring 24 disposed about the plunger. Thus the section 20b may slide inwardly relative to the section 20a. The end of the tip section 20b of the auxiliary housing fits closely about the end of the projected plunger rod 16. Thus when the plunger is in its normal position and the tip portion 20b of the auxiliary housing is in the position shown in Fig. 1, these parts cooperate in providing a small cylindrical recess or socket in which a tack may be received. If desired, these parts may be magnetized to aid this effect. The wall of the end portion of member 20b is cut away to provide a slot 29, and the upper end of this slot may be provided with an enlargement 29a.

The casing 1 is provided with opposite longitudinal slots 30 (Fig. 2) above the plug 8 and a sliding assembly 31 is mounted upon this portion of the casing. This assembly may comprise opposite portions 33 (Fig. 3) shaped to fit about portions of the cylindrical surface of the casing 1 and opposite, diametrically disposed chambers 34 connecting these portions. These chambers 34 may have integral extensions in the form of finger rings 35 which may be engaged by the fingers of the user of such a device. Pins 36 extend between the walls of each of the chambers 34, and leaf spring elements 40 are mounted upon each of these pins, these elements each having one leg bearing against the outer wall of the corresponding chamber 34, as shown in Figs. 1 and 2, and having a second leg with an inverted end portion engageable under a shoulder of the plunger 12 when the latter is in its projected position, as shown in Fig. 1.

A device of this character may be employed to drive a tack, the head of the tack being inserted in the socket provided by the end of the auxiliary housing 20. The hand of the user of the device may then be engaged with the casing 1 and with the finger pieces 35 so that the sliding assembly 31 may be moved away from the housing 20, the elements 40 remaining in engagement with the shoulder 18 of the plunger so that the latter is moved to retracted position and the spring 11 is compressed.

At the upper end of this stroke of the plunger, the legs of the elements 40 have a cam-like engagement with the ends of the slots 30, this position of the parts being shown in Fig. 2. At this instant, the elements 40 are thus moved out of engagement with the plunger, which is released and driven downwardly against the tack under the force of the spring 11. If the tack engages an object such as the bony structure of the jaw, the tack is impelled outwardly, the auxiliary housing portion 20b being pressed inwardly or retracted while the light spring 24 is compressed, so that the tack is almost entirely exposed as the plunger reaches the outer end of its path with its end portion in substantial co-planar relationship with the end of the housing. After the plunger has returned to its normal position, the sliding assembly 31 may be moved toward the housing 20, the inner ends of the spring elements 40 engaging the plunger during this movement until the assembly reaches the point at which the ends of these elements may snap under the

shoulder 18 of the plunger to the position illustrated in Fig. 1.

Obviously this construction permits the tack to be disposed in the cylindrical socket afforded by the housing 20 before the heavy spring 11 is compressed, thus avoiding danger of accidental release of this spring as the tack is being inserted in the device. The arrangement of the cap 3 in screw-threaded engagement with casing 1 permits adjustment in the effective size of the housing containing the spring 11 so that the degree of compression of the latter may be varied, thus permitting adjustment to alter the force of the blow with which the plunger may drive the tack.

A device of this character is particularly advantageous when employed in conjunction with fastening elements of the type illustrated in Fig. 4. Such an element may comprise a tack with a conventional disk-like head portion 50 and an adjoining annular flange 51 spaced from the head 50 and cooperating with the same and the shank of the tack to afford an annular groove. Below the flange 51 the shank may extend to a pointed end 54 and may be provided with one or more barbs 55 in the form of conical or frusto-conical sections terminating in substantially flat annular shoulders. Thus when a tack of this character is driven into an object, the barbed portions, and particularly the shoulders 55, may catch upon the material surrounding the opening made by the tack so that the latter is very firmly anchored in place.

The annular groove adjoining the head of the tack is adapted to receive a strand of material which may be in the form of a ductile wire. Thus, as shown in Fig. 4, a wire 58 may have a looped portion 59 received by the annular groove at the head of the tack, a length of the strand extending from the looped portion for engagement with any suitable object, such as a similar strand extending from a similar tack. It is evident that when a tack of this character is inserted in the socket portion of a tool such as illustrated herein, the strand portion extending from the head of the tack may be received in the slot 29 in the wall of the socket. Furthermore, the strand or wire 58 may conveniently be looped about the stud 21, thus serving to hold the tack in the socket provided by the end of the auxiliary housing 20.

Means of the character described may be employed to secure the jaws of a corpse in closed position. The tack driving tool is particularly advantageous for this purpose, since its end portion has a small diameter and may be inserted beneath the lip of the corpse properly to position the tack for insertion in the bony structure of the jaw. Thus when a tool of this type is to be used for this purpose, a tack of the character illustrated in Fig. 4 may be disposed in the position illustrated in Fig. 2, the end of the tool being inserted under the lip of the corpse so that the end of the tack pricks the flesh of the jaw. The slidable assembly 31 may then be slid toward the cap 3 so that the spring 11 is compressed and the plunger is moved to its retracted position, this movement being continued until the elements 40 are moved out of engagement with the hammer portion of the plunger which is thereupon released and impelled by spring 11 so that it strikes the tack with a sharp blow. As this occurs the auxiliary housing 20 is pressed back due to its engagement with the flesh over the bony structure so that the entire length of the tack below flange 51 may be driven into the

flesh and bone of the jaw. The wire 58 may then be disconnected from the stud 21.

Obviously this operation may be followed in driving a tack into the bone of the upper jaw in the general position illustrated in Fig. 5, above or between the roots of the upper teeth 66. In a similar manner a tack may be driven into the bony structure 68 of the lower jaw between or below the lower teeth 69. Each of these tacks is provided with a strand 58, the strand portions being brought into engagement and tied or twisted in position to hold the jaws properly closed with the teeth in engagement, as illustrated in Fig. 5, the lips of the corpse then being readily positioned over the strands so that a natural appearance is imparted to the mouth and lips. When the plunger 12 is first released the slidable assembly 31 remains in the position shown in Fig. 2. In this position of the parts the inner ends of the spring elements 40 engage the cylindrical surface of the head 15 of the plunger and the slidable assembly can then be slid downwardly on the casing 1 with the ends of the spring elements 40 sliding along this cylindrical surface until they snap into engagement with the shoulder beneath the head of the plunger, i. e., into the position illustrated in Fig. 1. It is evident that the device may be conveniently manipulated with the upper part of the casing 1 held in place by one hand of the user which is grasping the cap member 3 at the upper part of the casing, while the other hand of the user can readily cause the sliding movement of the assembly 31 by engagement of the fingers in the finger rings 35.

It is evident that the present invention affords a simple, effective and convenient tool for driving tacks or fastening elements of the type of tacks. It is furthermore evident that the device is particularly useful in applying fastening elements comprising tacks and attached strands or wires of the general type disclosed in my above-identified copending application.

I claim:

1. A tool of the class described, comprising a casing, a plunger having a head slidable in the casing, a coil spring adapted to actuate the plunger, a slidable assembly upon the casing including means to retract the plunger and compress the spring, parts of said assembly cooperating with a part of the casing to release the plunger and spring, an auxiliary housing into which a portion of the plunger extends, said housing providing a recess to receive a tack which may be driven from the auxiliary housing when the plunger is released, said auxiliary housing being slidable relative to the casing, and a spring normally holding the housing in projected position, whereby the housing and the plunger portion of small diameter cooperate to afford a socket to receive a tack when the plunger is in its unretracted position, the spring associated with the housing being capable of compression when the device is employed in driving a tack into an object so that the end of the released plunger may move substantially into juxtaposition to the end of said housing.

2. A tool of the class described comprising a casing, a plunger having a head slidable in the casing, a coil spring disposed in the casing and arranged when compressed to actuate the plunger, a slidable assembly upon the casing including opposite chambers and spring elements mounted in the chambers, said elements having parts projecting from the chambers into slots in

the walls of the casing and engageable with the head of the plunger whereby the slidable assembly may be moved relative to the casing to effect the retractive movement of the plunger and compression of the spring, the ends of the slots in the walls of the casing being arranged to engage said spring elements with a cam-like effect to move them out of engagement with the plunger so that the latter may be released to permit the end of the plunger to strike a blow upon a tack or the like.

3. A tool of the class described comprising a casing, a plunger having a head slidable in the casing, a coil spring disposed in the casing and arranged when compressed to actuate the plunger, a slidable assembly upon the casing including opposite chambers and spring elements mounted in the chambers, said elements having parts projecting from the chambers into slots in the walls of the casing and engageable with the head of the plunger whereby the slidable assembly may be moved relative to the casing to effect the retractive movement of the plunger and compression of the spring, the ends of the slots in the walls of the casing being arranged to engage said spring elements with cam-like effect to move them out of engagement with the plunger, an auxiliary housing receiving a small diametered portion of the plunger and cooperating therewith to provide a socket, the wall of said housing being provided with a slot so that the socket may receive a tack with a strand extending from its head portion through the slot in said housing wall.

4. A tool of the class described comprising a casing, a plunger having a head slidable in the casing, a coil spring disposed in the casing and arranged when compressed to actuate the plunger, a slidable assembly upon the casing including opposite chambers and spring elements mounted in the chambers, said elements having parts projecting from the chambers into slots in the walls of the casing and engageable with the head of the plunger whereby the slidable assembly may be moved relative to the casing to effect the retractive movement of the plunger and compression of the spring, the ends of the slots in the walls of the casing being arranged to engage said spring elements with a cam-like effect to move them out of engagement with the plunger, an auxiliary housing receiving a small diametered portion of the plunger and cooperating therewith to provide a socket, the wall of said housing being provided with a slot so that the socket may receive a tack with a strand extending from its head portion through the slot in said housing wall, and a stud extending from the casing for temporary connection to the end of a strand extending through said slot.

5. A tool of the class described comprising a casing, a plunger having a head slidable in the casing, a coil spring adapted to actuate the plunger, a slidable assembly upon the casing including means to retract the plunger and compress the spring, parts of said assembly cooperating with a part of the casing to release the plunger and spring, an auxiliary housing receiving a small diametered portion of the plunger and providing a recess to receive a tack which may be driven from the auxiliary housing when the plunger is released, said auxiliary housing being slidable upon a fixed extension of the casing, and a spring normally holding the housing in projected relation to said extension, whereby the housing and the plunger portion of small

diameter cooperate to afford a socket to receive a tack when the plunger is in its unretracted position, the spring associated with the housing being capable of compression when the device is employed in driving a tack into an object so that the end of the released plunger may move substantially into juxtaposition to the end of said housing, a stud projecting from the wall of the casing and engaging a bayonet slot in the wall of the auxiliary housing, whereby the auxiliary housing may be readily detached from the casing to afford access to said auxiliary spring.

6. A tool of the class described comprising an elongate casing, a plunger having a head slidable in the casing, a coil spring in said casing for actuating the plunger, a slidable assembly upon the casing including opposite chambers with symmetrically disposed finger rings secured thereto, spring elements mounted in the respective chambers, said elements having parts projecting from the chambers into slots in the wall of the casing and engageable with the head of the plunger, whereby the slidable assembly may be moved relative to the casing to effect the retractive movement of the plunger and compression

of the spring, the ends of the slots in the walls of the casing being arranged to engage said spring elements with a cam-like effect to move them out of engagement with the plunger so that the latter may be released, an extension of said casing receiving an extension of the plunger and providing a socket for a tack to be struck by said extension of the plunger when the latter is released.

7. A tool for applying a fastening device to the bony structure of the jaws of a corpse, which device consists of a tack-like element with a wire strand extending from the head portion thereof, said tool comprising a casing, a plunger slidable in said casing between a retracted and an advanced position, said plunger in its retracted position cooperating with the end portion of the casing in providing a socket for receiving said element of the fastening device, the wall of said portion of the casing being provided with a slot through which the wire strand may extend, and a stud on the wall of the casing spaced from said end portion about which the free end of the wire strand may be temporarily looped.

ARTHUR V. CULLEN.