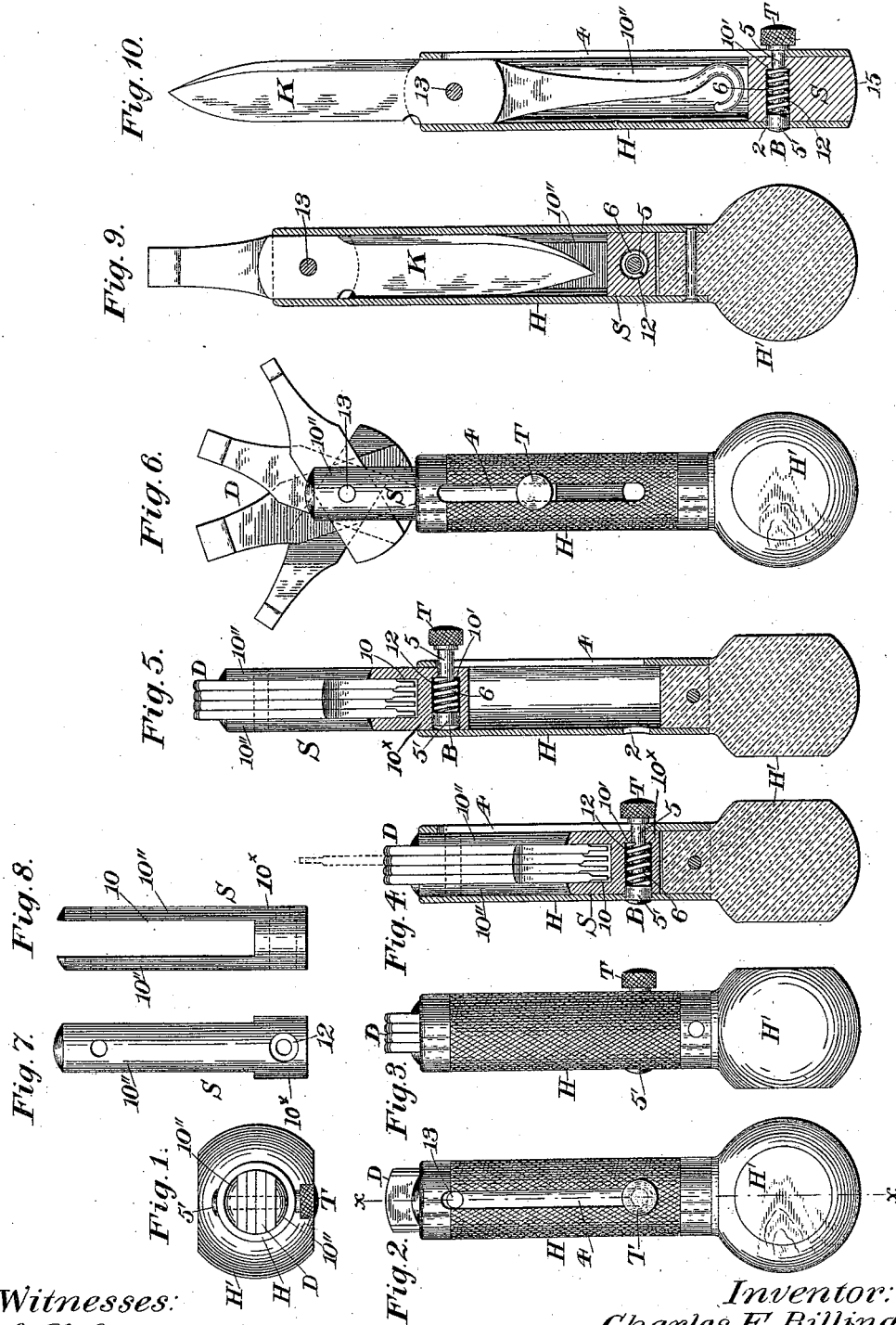


(No Model.)

C. E. BILLINGS.  
COMBINATION TOOL.

No. 554,046.

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# UNITED STATES PATENT OFFICE.

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## COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 554,046, dated February 4, 1896.

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*To all whom it may concern:*

Be it known that I, CHARLES E. BILLINGS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Combination-Tools, of which the following is a specification.

This invention relates to combination-tools of that class adapted for carrying a plurality of tools or other members within a small compass, the object being to provide an improved device of this class in which a number of such tools or members are pivotally mounted for oscillation upon a carrier reciprocatory within an inclosing sheath or barrel, and in which, also, each of the several tools or swinging members is (when the carrier is secured in its locked position) maintained against lateral movement within the barrel of the device, irrespective of whether said swinging member is in its working or inoperative position.

Another object of my invention is to so organize a plurality of swinging tools relatively to a common carrier and relatively to an inclosing barrel, in which said carrier is adapted to be reciprocated into and out of working position, that each of said tools is maintained against lateral movement in one direction relatively to the carrier by the remaining tool or tools of the set and by the carrier, and is maintained against lateral movement in a direction at right angles to the direction of such first-mentioned lateral movement by the walls of the inclosing barrel, and to provide, in connection with the carrier, a locking-bolt, slidable in a longitudinal slot in the barrel, for normally holding the carrier and the barrel in engagement with each other and for releasing the carrier from such engagement, so that the carrier may be reciprocated longitudinally within the barrel and the tools projected therefrom into position for use.

In the drawings accompanying and forming a part of this application, Figure 1 is a front elevation of a combination-tool, illustrating one embodiment of my present invention. Fig. 2 is a side elevation of the same, looking from the under side in Fig. 1. Fig. 3 is a side elevation of the same, looking from the left hand in Fig. 1. Fig. 4 is a central

longitudinal section taken in line *xx*, Fig. 2, and showing the tools and carrier withdrawn into the barrel of the device, one of the tools being shown in dotted lines in its projected position. Fig. 5 is a view similar to Fig. 4 and showing the carrier and its tools in their extreme outer or projected position, but with the tools disposed in the same relative position to the carrier as in Fig. 4. Fig. 6 is a side elevation corresponding to Fig. 2 and showing the carrier projected to the point where the tools are entirely without the barrel, said tools being shown as swung slightly upon their common pivot to different radial positions. Fig. 7 is a side elevation of the carrier upon which the tools or other members are mounted. Fig. 8 is an edge elevation of the same. Fig. 9 is a central longitudinal section of a combination-tool, illustrating another embodiment of my present invention; and Fig. 10 is a similar view of another modification.

Like characters designate like parts in all of the figures.

In all of the embodiments thereof herein shown and described my invention comprises, in combination with an inclosing sheath or barrel, a carrier mounted for reciprocation within the barrel, co-operating locking devices upon the carrier and the barrel and adapted for holding the carrier in either of its extreme positions, and one or more tools or implements pivotally mounted upon the carrier for oscillation relatively thereto when the carrier is in its forward or projected position.

Referring first to Figs. 1 to 8, inclusive, H designates in a general way an inclosing sheath or barrel adapted for receiving the several operative parts of the device. This barrel is shown herein as of uniform internal size throughout the length thereof, and as also similarly formed as to the exterior thereof, although it is, of course, not essential that the exterior of the barrel should have any special form. This barrel is also shown at 4 as provided upon one of its sides with a longitudinal slot, and with a locking recess or perforation 2 adjacent to the rear end of the barrel and between the ends thereof and preferably disposed opposite the end of the slot. A supplementary handle or knob H' is shown in these views and in Fig. 9 as closing the

rear end of the barrel H, and as preferably having a pair of flat sides for the purpose of obtaining a firmer grasp upon the device in operating the same.

5 As a means for mounting a plurality of tools or implements within the barrel H, while permitting these tools or members to be projected without and swung relatively to the barrel, a carrier S is shown herein as mounted  
10 for reciprocation within such barrel, and as having an external contour conforming for a portion of the length of the carrier to the internal form of the barrel. Adjacent to its rear end, in the base portion 10<sup>x</sup> thereof, this carrier is also shown as formed with a transverse bore of two diameters, that portion of the bore which is defined by the longer diameter constituting a recess for receiving the major portion of a spring-pressed bolt, and  
20 that portion of the bore which is defined by the shorter diameter being adapted to snugly engage the stem of the bolt working therein. This transverse bore 12 of the carrier is adapted for receiving a locking-bolt for holding the carrier in engagement with the barrel, as will be hereinafter described.

The carrier S is shown herein as a divided or bifurcated slide, the bifurcation 10 of which is formed by removing the central longitudinal portion of a cylindrical carrying member.  
30 Adjacent to its forward end this carrier is also shown as having a pivot-pin 13, passed transversely therethrough, and it is upon this pin that the tools or other members supported  
35 by the carrier are mounted for swinging movement.

As will be seen by reference more particularly to Fig. 5, the bifurcation 10 in the carrier S is of such a length that when said carrier is projected to its extreme forward position the rear stop-wall of the bifurcation will be substantially in the plane of the forward end of the barrel. By so organizing the carrier and the walls of this bifurcation relatively to the barrel the tools mounted upon the carrier may be of such length that the working ends thereof will extend practically to the rear wall of the bifurcation, only sufficient clearance space being left, between  
45 the working ends of the said tools and the back wall of the bifurcation, to permit swinging of these tools into position for use, thus utilizing a minimum space in longitudinal direction for the storage of the tools mounted  
50 upon the carrier.

As before stated, the transverse bore 12, which is disposed in the solid base 10<sup>x</sup> of the carrier, is adapted for receiving a locking-bolt for holding the carrier in locked engagement with the barrel of the device. This locking-bolt, in the form thereof herein illustrated, is shown at B as a draw-bolt, having a stem 5 adapted to the portion of the bore 12 which is defined by the shorter diameter  
65 thereof, and this bolt is also shown as formed with an enlarged point 5', adapted to be engaged by the walls of the recess or perfora-

tion 2 in the barrel or main handle of the device. A coil-spring is shown at 6 as surrounding the stem of the bolt and as held  
70 between the inner side of the point 5' of said bolt and the wall 10' in the recess, which wall is included between those portions of the bore 12 which are defined by the respective longer and shorter diameters of said bore.  
75 The spring 6 is normally under compression, and when the carrier comes opposite a point which will bring the point of the bolt into alignment with the holding recess or perforation 2 in the barrel this spring tends to force  
80 the bolt into locking engagement with the walls of this recess or perforation. As a means for releasing this locking-bolt or draw-bolt B, to permit longitudinal movement of the carrier relatively to the barrel H, an actuating device is shown at T as connected  
85 with the locking-bolt B and guided within the slot 4 in the barrel and adapted to release said bolt from the walls of the recess or perforation 2. In the form thereof herein shown  
90 this actuating device comprises a nut carried upon the end of the stem of the bolt and preferably screw-threaded thereon into rigid engagement therewith. When this actuating device or thumb-piece is grasped, it will re-  
95 lease or retract the locking-bolt, and the carrier may then be projected from the barrel to its forward position, and the tool which it is desired to use may be swung in position  
100 for use.

A series of tools, which are designated in a general way by D, are shown herein as pivotally carried upon the pin 13 and between the oppositely-disposed segmental arms 10'' of the carrier of resilient material. It will be evi-  
105 dent that any desired number or kind of tools may be so mounted upon this pivot-pin, those shown herein being a series of substantially similar screw-driver bits. In order that these tools may be properly held in position in lat-  
110 eral direction, the same are shown herein as of a width at the shanks thereof corresponding to the distance between the inner walls of the barrel at the points adjacent to the edges of the tool when such tool is in position, or,  
115 in other words, of the same width, in the organization of parts herein shown, as the length of the chord passing through the shank at the point where said shank is located between the arms of the carrier. These arms 10'' of the  
120 carrier tend to bind upon the shanks of the tools at the pivotal point thereof, and to positively hold the same when any one of the tools is in its working position, and irrespective of the holding action of the walls of the barrel,  
125 this clamping action of the walls of the carrier being entirely independent of the position of the carrier in the barrel, and being exerted to best advantage when one of the tools is swung forward into its working position. It  
130 will be seen also that, as the shanks of the tools are formed with flat sides, the tools not in use co-operate to maintain a substantially solid relation at all times between the carrier

and the tools in lateral direction at and adjacent to the pivotal axis in the pin 13.

In Fig. 9 the construction and organization of the parts are substantially the same as those described with reference to the preceding figures, the main difference being that the carrier and the barrel are somewhat longer, and, therefore, have a somewhat greater longitudinal movement relatively to each other, and that the longer tools swing upon a longer radius, this device being especially adapted for holding a long knife-blade, as shown at K.

A further modification is shown in Fig. 10, in which the barrel H is open at both ends and has no supplementary handle H'. The handle H is of uniform cross-section throughout and the carrier is adapted to slide from end to end thereof, the distance of the holding recess or aperture 2 from the rear end of the barrel being such that the rear wall of the carrier will close the corresponding end of the barrel, and form the closer for this end of the barrel. It is obvious that such an organization of parts is especially adapted for use in connection with the devices shown in Fig. 10, and in using which it is not necessary to impart a rotary movement to the handle of the device.

From the foregoing description it will be obvious that my improved combination-tool forms a very simple and perfect device of this class, and one in which the maximum number of tools may be stored within a minimum amount of space, and in which also any one of said tools may be positively locked in working position, without danger of releasing the same, by the grasp upon the handle of the implement.

Having thus described my invention, I claim—

1. A tool comprising a tubular handle having a longitudinal slot; a tool-carrier with a substantial, solid base closely fitting, and conforming to, the bore of said handle, said base having a transverse chamber; arms projecting from said base and having their outer

surfaces conforming to the inner wall of the handle; a locking-bolt mounted in the chamber of said base and traveling in the slot of the handle; and a tool or tools pivotally mounted between the arms of said base.

2. A tubular handle having a longitudinal slot in one side and a perforation in the opposite side; a tool-carrier having a substantial, solid base closely fitting, and conforming to, the bore of said handle, said base being transversely chambered; resilient arms projecting from said base; a spring-actuated locking-bolt seated in the chamber of said base with its stem fitted in the slot of the handle; and a tool or tools pivotally mounted between the arms of said carrier.

3. A combination-tool comprising a tubular, longitudinally-slotted handle; a carrier having a substantial, solid transversely-chambered base closely fitting and conforming to the bore of the handle; and provided with integral arms of resilient material; a series of tools pivoted between said arms; and a spring-actuated locking-bolt having its stem projecting through the slot of said handle and its point adapted to engage a socket in said handle when the carrier is in its retracted position.

4. A tool comprising a longitudinally-slotted handle open at both ends, a tool-carrier having a substantial solid, transversely-chambered base closely fitting and conforming to the bore of the handle and adapted to close the end thereof when the carrier is in its retracted position; resilient arms attached to said base; a series of tools pivoted between the resilient arms; and a spring-actuated locking-bolt having one end projecting through the slot in said handle and the other end adapted to engage a socket in the handle and hold the tool-carrier in its retracted position.

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