United States Patent [19]

Lemieux

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[54] **MULTIPLE DRIVER TOOL**

[76] Inventor: **Roland G. Lemieux,** 7655 Kelly Rd., Prince George, British Columbia, Canada

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[52] **U.S. Cl.** **145/64,** 401/31

[51] **Int. Cl.** **B25g 1/08,** B43k 27/14

[58] **Field of Search** ..... 145/62, 63, 64, 50 C; 401/31, 32, 33

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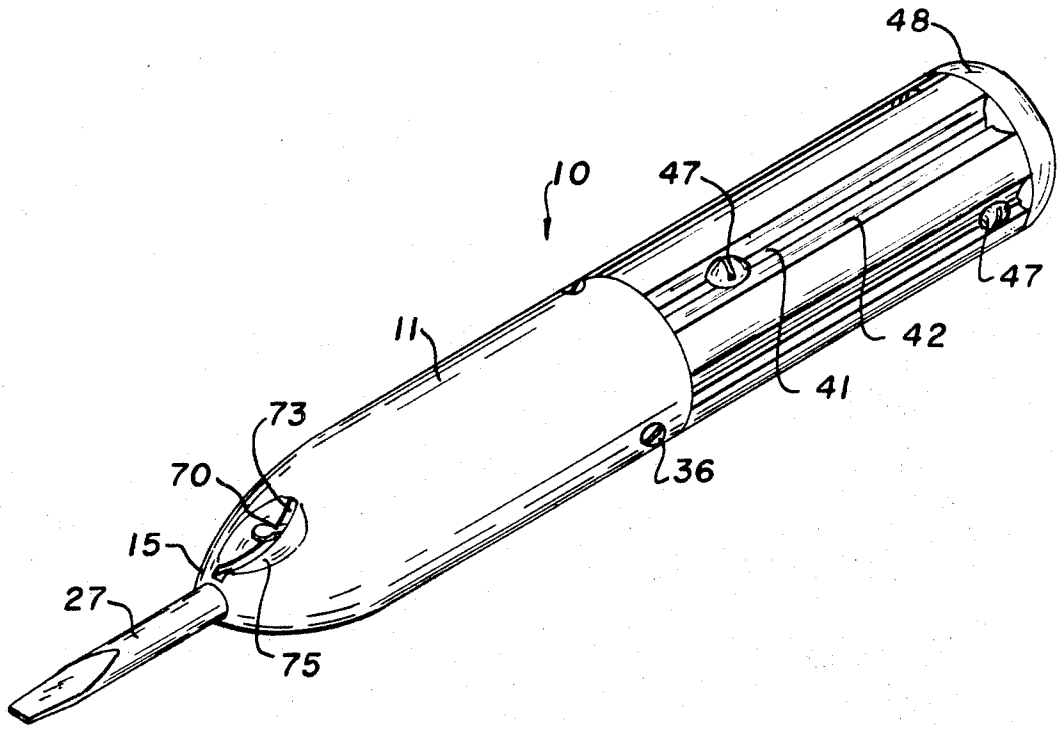
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Primary Examiner—Robert C. Riordon
Assistant Examiner—Mark S. Bicks
Attorney—Fetherstonhaugh & Co.

[57] **ABSTRACT**

A multiple driver tool having a chamber for holding a plurality of drivers for screws and the like, and a guided slide connected to each driver by means of which the driver can be selectively moved to a passage extending away from an end of the chamber. Guide means in the chamber directs each driver towards and into the passage during movement of that driver, each driver being long enough when in the passage to project beyond the end of the multiple tool.

5 Claims, 9 Drawing Figures



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SHEET 1 OF 2

Fig. 1.

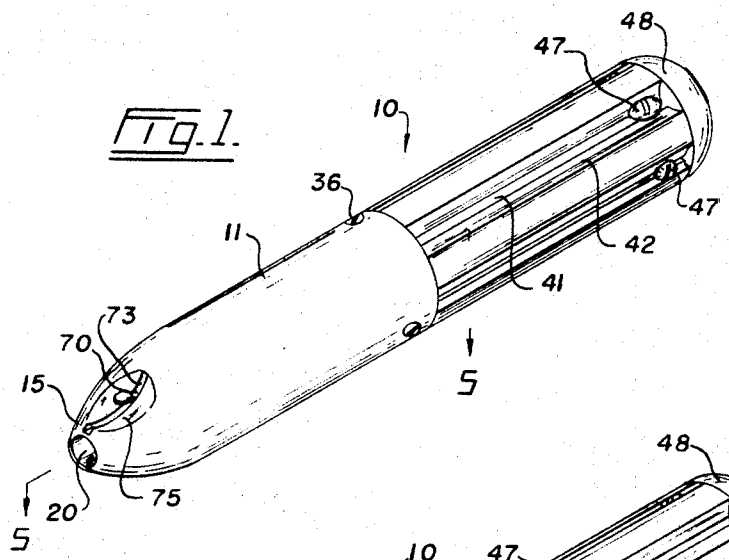


Fig. 2.

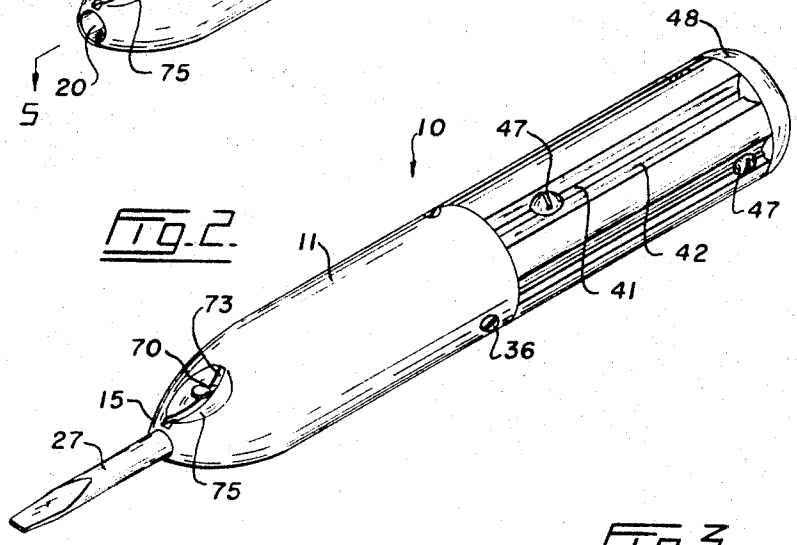


Fig. 3.

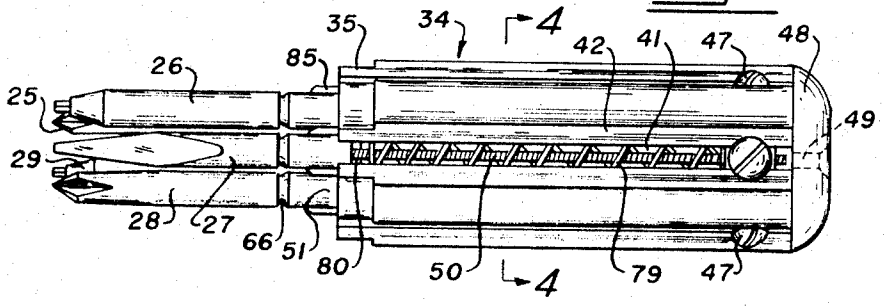


Fig. 4.

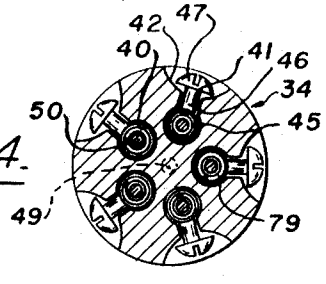
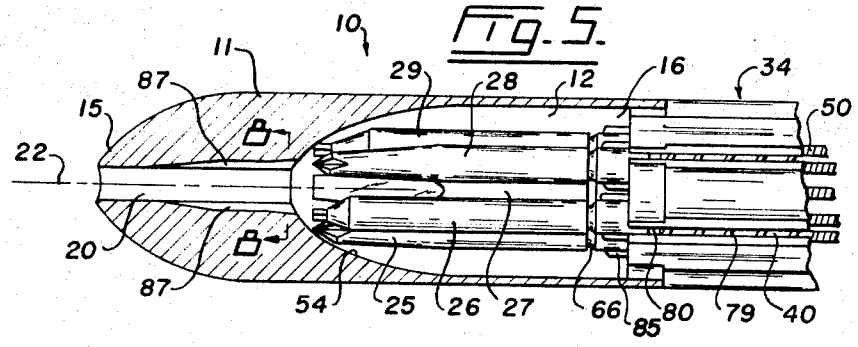


Fig. 5.



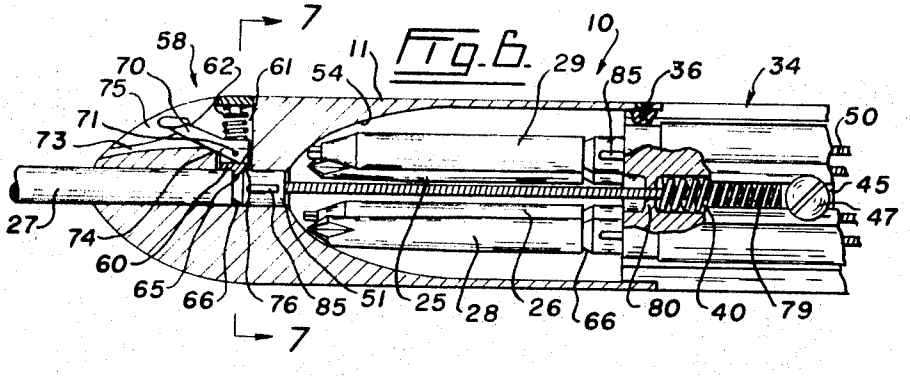


Fig. 8.

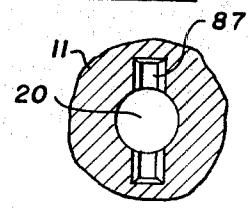


Fig. 7.

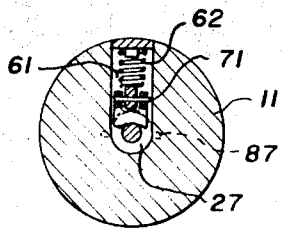
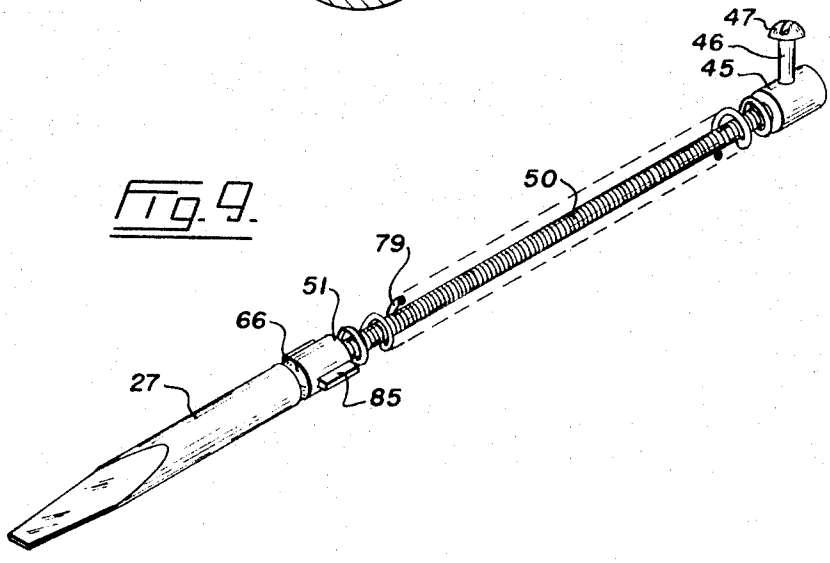


Fig. 9.



MULTIPLE DRIVER TOOL

This invention relates to a multiple tool particularly for drivers used in connection with screws and the like, but which may also be used with other types of small tools that usually come in sets. The driver tool includes screw-drivers having blades, Robertson, Phillips and/or Allen ends, or blades or ends of these types of different sizes. However, it may include other tools of the type that project from handles.

Many workmen, such as carpenters, electricians, cabinet makers and the like, usually require screw-drivers of different sizes and different types. This means that the workman is constantly looking for different drivers, and even if he has all sizes and types in a bag with his other tools, he still has to look for the one required at the moment. This results in a great deal of frustration and wasted time. In addition, he must have available numerous tools ready for driving screws, and this represents considerable expense in buying the tools and in replacing lost tools.

The present invention provides a multiple tool containing a plurality of drivers of different types and sizes. This is not as costly as having many different tools, and the individual drivers are always immediately and readily available. The multiple tool greatly reduces the ordinary wastage of time and the frustrations involved.

A multiple driver tool according to the present invention comprises a housing, a chamber connected to an inner end of the housing, a passage in and extending longitudinally of the housing and having one end opening out from an outer end thereof and an opposite end communicating with the chamber, a plurality of drivers in the chamber normally extending generally towards the passage, a guided slide connected to each driver for moving the latter longitudinally of the chamber and housing, and guide means in the chamber for directing each driver towards and into the passage when the slide of said driver is moved towards the operative end of the housing, each driver being long enough when in the passage to project beyond the housing outer end. As stated above, the drivers in the chamber of the multiple tool may be ordinary blade screw-drivers of different sizes and/or different types of drivers, such as the Robertson, Phillips and Allen drivers.

A preferred form of the invention is illustrated in the accompanying drawings, in which

FIG. 1 is a perspective view of the multiple driver tool with all of the individual tools retracted therein,

FIG. 2 is a view similar to FIG. 1 but with a driver projecting from the end of the multiple tool,

FIG. 3 is an enlarged side elevation of the several individual drivers with the slide arrangement thereof, with the chamber and housing removed,

FIG. 4 is a section taken on the line 4—4 of FIG. 3,

FIG. 5 is an enlarged sectional view taken on the line 5—5 of FIG. 1,

FIG. 6 is a similar sectional view taken substantially at right angles to the section of FIG. 5,

FIG. 7 is a cross-section taken on the line 7—7 of FIG. 6,

FIG. 8 is an enlarged section taken on the line 8—8 of FIG. 5, and

FIG. 9 is a perspective view of one of the individual drivers with its slide, and the connecting means therebetween.

Referring to the drawings, **10** is a multiple driver tool in accordance with the present invention which consists of a housing **11** and a chamber **12.** In this example, the chamber is formed within a portion of the housing, although they could be two separate units connected together. Housing **11** preferably tapers down to an outer end **15,** while chamber **12** opens outwardly at **16** at the end of the housing remote from the end **15.**

A passage **20** is formed in and extends longitudinally of housing **11** and has one end opening out from the outer end **15** of the housing, and an opposite end communicating with the chamber **12** centrally of the adjacent end thereof. A plurality of individual drivers or tools are positioned within chamber **12** and are preferably arranged around a longitudinal centerline **22** which is also the central axis of passage **20.** In this example, there are drivers **25 26, 27, 28** and **29** in the chamber. Driver **27** is an ordinary screw-driver blade, while the other drivers are Robertson and Allen drivers of different sizes.

A guide unit **34** is connected to the end of chamber **12** remote from housing **11** in any suitable manner. In this example, the guide unit has a reduced end **35** which fits into the chamber end, and a plurality of screws **36** connect the unit to the chamber wall. This unit **34** is provided with a plurality of guide tracks **38** extending longitudinally thereof, there being one of these tracks for each of the driver tools. Each track **38** is in the form of a channel **40** in and extending longitudinally of unit **34** and opening out laterally from the unit by means of a slot **41.** Each of these slots has an enlarged section **42** opening out from the periphery of unit **34,** see FIG. **4.** A slide **45** is movably mounted in each track channel **40** and has a handle **46** projecting outwardly therefrom in a radial direction through the adjacent slot **41.** In this example, each handle **46** is in the form of a screw which is threaded into its slide **45,** and the head **47** of each screw is located within the enlarged section **42** of the adjacent slot **41** so that the head does not project beyond the surface of unit **34.** A cap **48** is secured to the outer end of the guide unit by a screw **49** in order removably to close the outer ends of channels **40.**

A suitable connector **50** connects each slide **45** to one of the drivers **25–29.** This connector must be comparatively stiff but still must be bendable. In this example, each connector **50** comprises a tube formed of a spirally-wound strip of material, such as metal or suitable plastic. This provides a comparatively rigid but bendable connector. Each connector **50** is fixedly connected at **51** to the inner end of its driver, and at its opposite end fits into its slide **45** where it is secured by handle screw **46.** This arrangement enables slide **45** to be adjusted longitudinally of the connector. When the slides **45** are positioned near the outer end of guide unit **34,** the drivers **25–29** are completely within chamber **12.** Suitable means is provided for guiding each of these drivers into passage **20** when the slide of that driver is moved forwardly of the multiple tool. This is accomplished by providing an annular wall **54** within chamber **12** at the end thereof adjacent passage **20.** This annular wall tapers inwardly to the inner end of the passage so that when any one of the drivers is moved forwardly of the chamber, its outer end is guided into the inner end of passage **20.** Continued movement of the selected driver causes the latter to project outwardly from the outer end **15** of housing **11,** as shown in FIGS. **2** and **6,**

driver 27 being shown in this position. The selected driver is moved outwardly in this manner by moving its slide 45 by means of the handle 46 thereof longitudinally of unit 34. The rigidity of connector 50 makes this possible, while the flexibility of the connector allows the outer end of the selected driver to ride along the conical wall 54 and into passage 20.

A latch 58 is provided for releasably securing each of the drivers 25–29 in passage 20. In this example, latch 58 is in the form of a plunger 60 mounted in a radial passage 61 in housing 11, and opening into passage 20. The plunger is biased towards the passage by a spring 62. Plunger 60 has a lug 65 projecting from its inner end which is adapted to fit into an annular notch 66 formed in each of the drivers. This lug locks each driver in the passage when said driver has reached its operative position.

Plunger 60 is retracted out of the passage by means of a lever 70 swingably mounted on a pin 71 carried by plunger 60. This lever extends outwardly through a slot 73 formed in and extending longitudinally of housing 11, and the lever rests against a fulcrum point 74 formed at the bottom of said slot. The outer end of lever 70 is located within a depression 75 formed in the outer surface of the housing at slot 73. Spring 62 normally biases the plunger towards the passage, and when the outer end of lever 70 is depressed, it pivots about fulcrum 74 and withdraws the plunger from passage 20 against the pressure of spring 62. Lug 65 has an inclined surface 76 facing chamber 12 so that when one of the drivers is moved along passage 20, it engages this inclined surface 76 and shifts plunger 60 out of the way. When recess 66 reaches the plunger, lug 65 drops into this recess to lock the driver in place.

It is preferable to bias each driver so that when it is released by plunger lug 65, the driver will be automatically withdrawn from passage 20. For this purpose, a spring 79 is provided on each connector 50 and extends between slide 45 thereof and a shoulder 80 in the adjacent channel 40, see FIG. 6. Thus, when slide 45 is moved to shift the driver connected thereto into the passage, spring 79 is compressed, and is held in this state by latch 58. When the latch is operated to release the driver, spring 79 asserts itself to shift its slide 45 back to the outer end of the slide track, thereby withdrawing the driver from the passage 20.

Suitable means is provided for preventing each driver from rotating when it is latched in passage 20. Each of the drivers 25 to 29 is provided with one or more radial keys 85 on its inner end which move into slots 87 formed in housing 11 and extending parallel to passage 20. These slots 87 open laterally into the passage so that when one of the drivers is moved into and along the passage, the keys 85 thereof enter slots 87, and this prevents the driver from rotating in passage 20 when the multiple tool 10 is turned around its longitudinal axis during a screwing operation.

The operation of multiple tool 10 is quite simple. It is normally carried around with its individual drivers 25 to 29 retracted in chamber 12, as shown in FIGS. 1 and 5. When a desired driver is required, such as for example, driver 27, the handle 46 of the slide of that driver is moved longitudinally of the multiple tool. This shifts driver 27 into passage 20, and the movement is continued until latch 58 engages notch 66 of the driver, spring 79 being compressed at this time, as shown in FIG. 6. Tool 10 can now be operated as an ordinary screwdriver. Housing 11 or slide unit 34 is grasped in the same manner as the handle of an ordinary screw-driver. When driver 27 is no longer required, lever 70 is depressed to cause latch 58 to release the driver, at which time spring 79 moves slide 45 towards the outer end of the tool so as to draw the driver 27 back into chamber 12. Thus, any one of the drivers 25 to 29 can be very quickly and easily moved into and out of its operative position projecting from the end of multiple tool 10. When it is desired to replace any one of the drivers, it is only necessary to remove cap 48 so that the driver can be withdrawn from the slide unit, and another one inserted therein. Thus each individual driver is readily available, and no time or energy is lost in trying to find the appropriate driver for a given job. While five drivers have been illustrated in chamber 12, it is obvious that there may be more or fewer of these drivers as desired.

I claim:

1. A multiple driver tool comprising a housing, a chamber connected to an inner end of the housing, a passage in and extending longitudinally of the housing and having one end opening out from an outer end thereof and an opposite end communicating with the chamber, a guide unit aligned with and extending away from the opposite end of the chamber, a plurality of driver tools in the chamber normally extending generally towards said passage, said tools being arranged around a centerline extending longitudinally of the passage and the chamber, a plurality of guide channels in and extending longitudinally of said guide unit and opening out laterally throughout the lengths thereof in slots, said channels communicating with the chamber, a slide mounted in each of said channels for reciprocal movement therealong there being a slide for each tool, a handle on each slide and projecting through the adjacent channel slot, comparatively stiff but bendable connecting means slidably mounted within and surrounded by each guide channel and connected at one end to the slide of the latter channel and at an opposite end to one of the tools in the chamber, each channel preventing the connecting means therein from bending, an annular wall in the chamber at one end thereof extending towards and tapering inwardly to said opposite end of the passage communicating with the chamber, said annular wall directing each tool towards and into the passage when the slide connected to said each tool through one of said connecting means is moved towards the outer end of the housing, each tool being long enough when in the passage to project beyond the housing outer end, latching means for releasably securing each tool in the passage, holding means for preventing each tool in the passage from rotating relative to the housing, and means for biasing each tool out of the passage when said each tool is released by said securing means.

2. A multiple tool as claimed in claim 1 in which each tool has a notch therein, and said latching means comprises a plunger radially mounted in the housing and biased to move into said passage and to fit into the notch of a tool in the passage, and handle means connected to the plunger and projecting from the housing, said handle means being operable to move the plunger to free the tool in the passage.

3. A multiple tool as claimed in claim 1 in which said holding means comprises at least one key on each tool and extending longitudinally thereof, and at least one slot in the housing extending beside the passage and

opening laterally thereinto and opening at one end into the chamber, said slot being adapted to receive the key of a tool as the latter is moved into the passage.

4. A multiple tool as claimed in claim 1 including means releasably securing each slide to the connecting means thereof.

5. A multiple driver tool comprising a housing, a chamber connected to an inner end of the housing, a passage in and extending longitudinally of the housing and having one end opening out from an outer end thereof and an opposite end communicating with the chamber, a plurality of driver tools in the chamber normally extending generally towards said passage, each tool having a notch therein, a guided slide connected to each tool for moving the latter longitudinally of the chamber and housing, guide means in the chamber for directing each tool towards and into the passage when the slide of said each tool is moved towards the operative end of the housing, each tool being long enough when in the passage to project beyond the housing outer end, and latching means for releasably securing each tool in the passage, said latching means comprising a plunger radially mounted in the housing and biased to move into said passage and to fit into the notch of a tool in the passage, and handle means connected to the plunger and projecting from the housing, said handle means being operable to move the plunger to free the tool in the passage.

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