(No Model.)

H. F. SANGER.

MULTIPLE SCREW DRIVER.

No. 532,823. Patented Jan. 22, 1895.

Fig. 1.

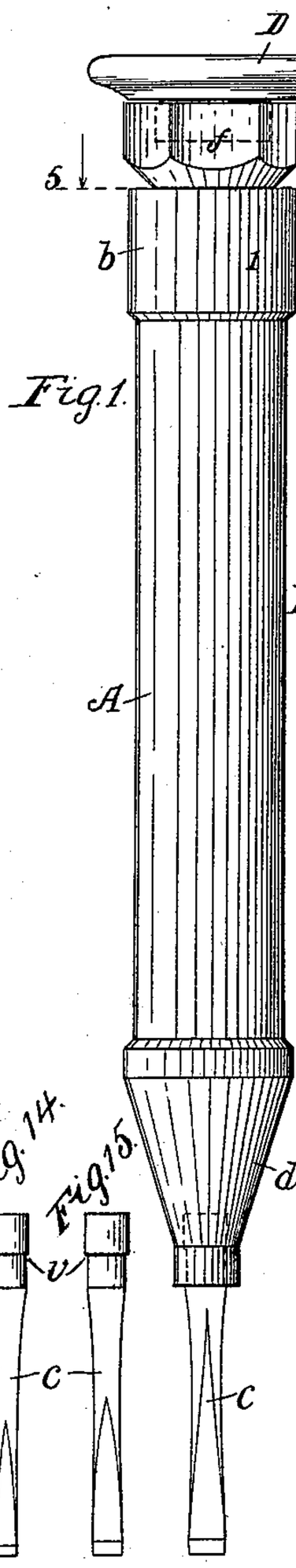

Fig. 2.

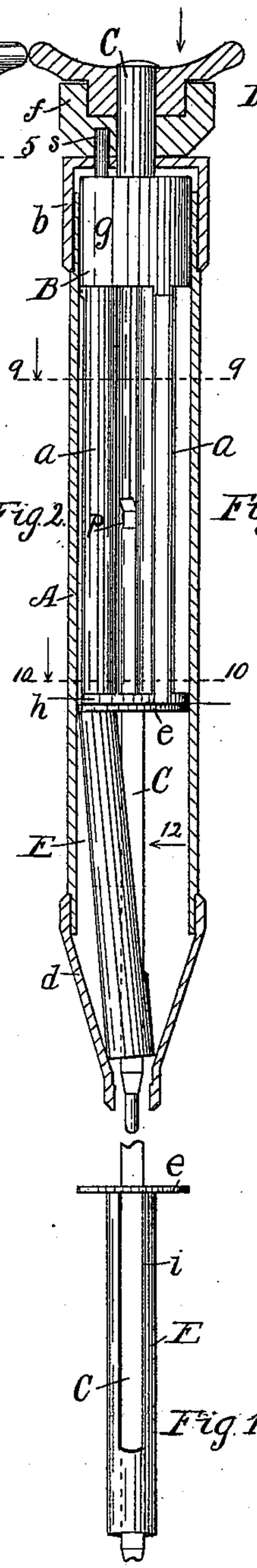

Fig. 3.

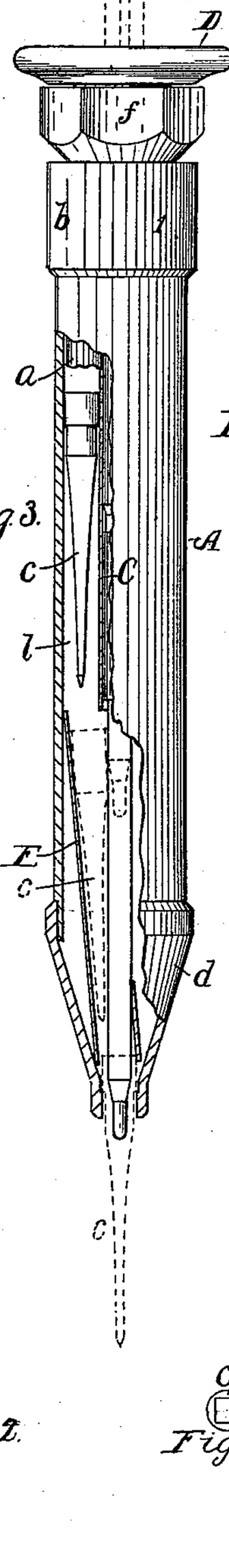

Fig. 4.

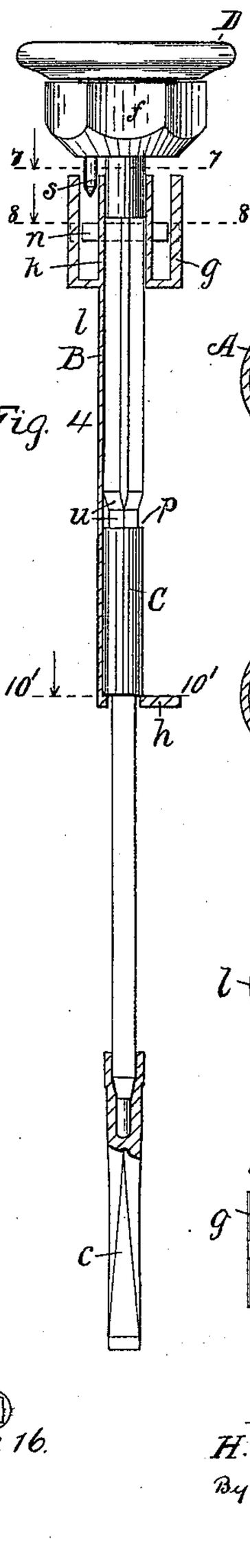

Fig. 5.

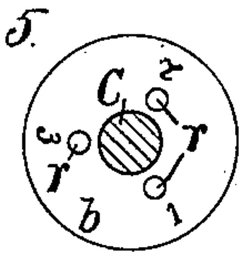

Fig. 6.

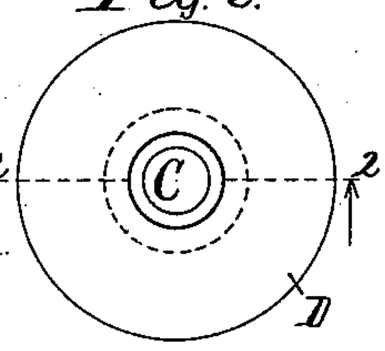

Fig. 7.

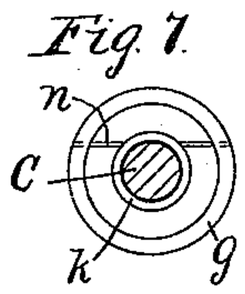

Fig. 8.

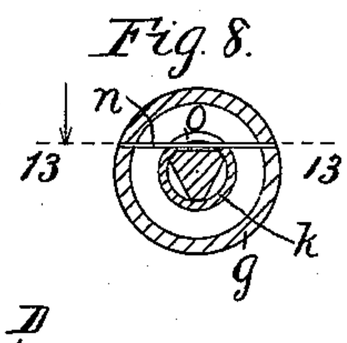

Fig. 9.

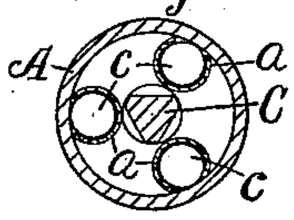

Fig. 10.

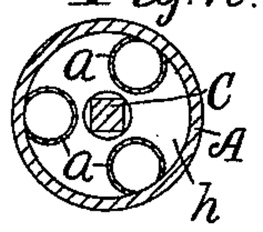

Fig. 11.

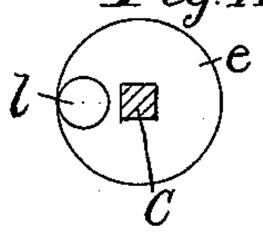

Fig. 13.

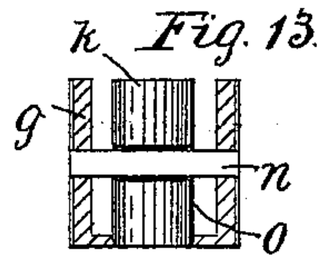

Fig. 14.

Fig. 15.

Fig. 12.

Fig. 16.

Attest:
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Henry Hart.

Inventor,
H. F. Sanger.
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Atty.

UNITED STATES PATENT OFFICE.

HARRY F. SANGER, OF LIMA, NEW YORK.

MULTIPLE SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 532,823, dated January 22, 1895.

Application filed August 22, 1894. Serial No. 521,001. (No model.)

To all whom it may concern:

Be it known that I, HARRY F. SANGER, of Lima, in the county of Livingston and State of New York, have invented a new and useful Improvement in Multiple Screw-Drivers, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is an instrument designed more particularly for jewelers' and machinists' use, consisting of a hollow cylindrical case holding certain tools useful in such trades, and convenient means for bringing any one of the different tools quickly into position for use when needed. The form and construction of the case are such that the latter constitutes a handle for the tool when in position for use.

The invention is hereinafter fully described and more particularly pointed out in the claims.

Referring to the drawings: Figure 1 is an elevation of the device when ready for use. Fig. 2 is a longitudinal section upon the dotted line 2 2 in Fig. 6, along the axis of the case, showing interior parts. Fig. 3 is a similar section of a portion of the case and interior parts, parts being broken away and other parts shown in various positions by full and dotted lines. Fig. 4 shows the spindle more fully and some associated parts longitudinally sectioned and broken away. Fig. 5 is an end view of the cap for the case, the spindle being transversely sectioned on the dotted line 5 5 in Fig. 1. Fig. 6 is a view of the upper end of the device. Fig. 7 is a transverse section of the spindle on the dotted line 7 7 in Fig. 4, showing the core-piece. Fig. 8 is a transverse section of the core head and spindle on the dotted line 8 8 in Fig. 4. Fig. 9 is a transverse section of the case, tool cells and spindle, on the dotted line 9 9 in Fig. 2. Fig. 10 is a transverse section of the case and tool cells on the dotted line 10 10 in Fig. 2, the spindle being sectioned on the dotted line 10′ 10′ in Fig. 4. Fig. 11 is an upper end view of the chute. Fig. 12 is a side elevation of the chute seen as indicated by arrow 12 in Fig. 2. Fig. 13 is a longitudinal section of the core head on the dotted line 13 13 in Fig. 8. Figs. 14 and 15 show tools of different sizes. Fig. 16 is an end view of a tool.

The figures are drawn to a scale twice the size of the device as designed for jewelers' use.

Referring to the parts shown, A is the case of the device it being made of sheet metal hollow, cylindrical in form and provided with a closing cap *b* for the upper end and a reduced open tube or nozzle *d* covering its lower end. The cap and nozzle are secured rigidly to the case by some simple means as, for instance, being screw-threaded thereon. Within the case is placed a core-piece B, Fig. 2, formed with a cylindrical head *g*, Figs. 4 and 7, at its upper end and a corresponding circular plate *h*, Fig. 10, at its lower end, the head and plate having diameters corresponding with the internal diameter of the case and held from turning therein by friction. The core-piece is further provided with a series of longitudinal, uniform, peripheral cells *a* for holding tools, *c*, which as shown are a series of screw-drivers of different sizes fully shown in Figs. 14 and 15 and other figures; the cells, which are equally spaced, extending from the head *g* to the plate *h*, as shown in Fig. 2.

C, Figs. 2 and 4, is a longitudinal, axial spindle within the case, provided with a rigid hexagonal head *f* and loose button D, at its upper end, adapted to slide longitudinally within the case. The cells *a*, which are shown as three in number, are contiguous with the wall of the case the spindle occupying the central space therein.

E, Fig. 2, is an inclined chute or conductor for the tools, below the core-piece, formed at its upper end with a cylindrical head *e*, Fig. 11, having a diameter corresponding with the internal diameter of the case, the chute being adapted to turn within the case around the axis of the latter. The head of the chute is contiguous with the lower end of the core-piece the lower end of the chute resting concentrically within the nozzle, as shown in Figs. 2 and 3. The bore *l* of the chute corresponds with the bore of a cell and the upper end of the chute is inclined to one side contiguous with the wall of the case so that the upper end of the bore of the chute may be brought to register with the lower end of any cell by turning the chute within the case.

The lower portion of the spindle is prismatic, of square cross section, as shown in Fig. 10, and passes freely through a circular

opening in the plate *h* of the core-piece. This squared part of the spindle also passes through a square opening in the head *e* of the chute with a sliding fit, as shown in Fig. 11, and occupies a longitudinal slot *i* in the inclined side of the chute, see Figs. 2 and 12, with its lower end projecting below the lower end of the chute and slightly below the nozzle.

The head *g* of the core-piece is formed with a central, longitudinal sleeve *k*, Figs. 4 and 7, through which the spindle passes and within which it may either turn, or slide longitudinally, the sleeve forming a bearing for the spindle. When the spindle is turned on its axis it turns the chute within the case on account of the squared part of the spindle fitting the square hole in the head of the chute, said head constituting practically a lower bearing for the spindle. By turning the spindle (by applying the thumb and finger to the head *f*) the chute may be controlled and brought to register with any one of the cells and so form a continuous passage from the cell to the opening in the nozzle by means of which any one of the tools may be brought into position for use at will, as appears in Fig. 1.

The tools are formed with slight shoulders *v* and the bore of the nozzle is formed with a corresponding internal shoulder to meet the shoulder of the tool, which prevents the latter from passing out through the nozzle when it drops into position therein, as stated.

The heads of the tools are formed with central longitudinal cavities square in cross section a part of the way, and of a size to fit the end of the spindle so as to be turned by the latter, as shown in Fig. 4. The end of the spindle fitting the cavity in the tool enables the spindle to hold the tool from being pushed upward in the nozzle when pressed down against the work while in use. The extreme end of the spindle is reduced and made round so as to better enter the cavity in the tool. When the tool is to be returned to its cell after use, the spindle is drawn upward and the case inverted to allow the tool to drop back into its cell after which the spindle is again pushed inward to its normal position, as appears in Fig. 2 and in full lines in Fig. 3. A portion of the spindle toward its upper end is given the form of a triangular prism the three faces corresponding with the number of the tool cells. In the head *g* of the core-piece is placed a transverse detent spring *n*, Figs. 4, 7 and 8, in position to bear against a face of the triangular prism and prevent the spindle from turning. This spring has its ends secured in the outer shell of the head *g*, a notch *o* in the sleeve *k*, Figs. 8 and 13, making way for the spring where it passes said sleeve. Now, the construction of the parts is such that when a face of the prism coincides with the spring the chute is in position to register with some one of the cells, and the spring holds the parts relatively in place. The spindle is, however, formed with a reduced part or notch *p* Fig. 4, at the lower end of the triangular prism which, when opposite the spring, permits of the spindle being turned to any one of the three positions, this notch or reduced part being presented to the spring when the spindle is drawn out, as above stated, and indicated by dotted position in Fig. 3. The notch is formed with inclined and vertical flat faces *u*, being downward continuations of the respective faces of the prism, on account of which though the spindle may be turned its turning is gently resisted by the spring. This form of the spindle is for the purpose of enabling the spring to hold it relatively in such a position that when pushed downward the spring will be sure to glide onto a face of the prism and not onto an edge of the latter between two faces. When the spindle is drawn out and the detent spring occupies the notch *p*, its edge coming in contact with the larger part of the spindle below the notch acts as a stop to prevent the spindle being drawn farther out.

The cells, which are open on their sides next the wall of the case, are designated by numbers, marked on the cap *b* as shown in Figs. 1, 3 and 5, the numbers corresponding to the sizes of the screw-drivers; for instance, "1," "2," "3" corresponding with the screw-drivers in the order from the smallest to the largest. The cap *b* of the case is formed with three equally spaced, longitudinal perforations *r* and the head *f* of the spindle is provided with a longitudinal, rigid pin *s*, Figs. 2 and 4, in position to enter any one of these perforations. Perforation No. 3, for example, corresponds to cell holding screw-driver No. 3 size; and when the spindle is turned so the pin will enter the perforation No. 3 the chute will be in position to convey screw-driver No. 3 into the nozzle, for use. The head *e* of the chute being imperforate save as to the opening of the bore *l* and the central opening to receive the spindle, serves to close in every case the two cells other than the one then acting with the chute, and prevents the escape of the tools in those cells.

When the device is being used all parts turn together as if of one piece, except as to the loose button D which may turn independently of the other parts at all times; and it forms a carrier for the thumb and finger to ride back upon to catch a new hold of the case to turn the screw being acted upon.

In preparing to use the device at any time it is turned head downward so that all the tools will occupy the respective cells from the action of gravity. The spindle is then drawn out and turned to the number of the particular tool required when the case is again turned nozzle downward which causes the selected tool to drop into the nozzle, through the chute. The spindle is then forced down into and against the tool, as stated, the device then being ready for use.

In case when picking up the instrument for use at any time the spindle is in position for

the particular tool desired, the case being turned nozzle downward the tool will drop into the chute against the side of the spindle, as shown by dotted lines in Fig. 3; when by raising the spindle, the tool will drop into the nozzle, after which the spindle is pressed down upon it as in the other case mentioned.

What I claim as my invention is—

1. A mechanic's implement consisting of a hollow cylindrical case or handle provided with a reduced open tube or nozzle at one end and a cylindrical core piece placed concentrically within the case or handle and rigid therewith, formed with peripheral longitudinal tool cells, in combination with a conductor or chute within the case adapted to communicate between any cell and the nozzle, and an axial, longitudinally-movable and rotatory spindle within the case to control the chute, substantially as shown and described.

2. An implement for mechanics' use comprising a hollow case or handle provided with an end nozzle, and a rigid core piece in the case or handle and concentric therewith formed with longitudinal tool cells, in combination with a chute within the case adapted to turn therein and form a communication between any cell and the nozzle, and a longitudinally-movable and rotatory spindle in the case to control the chute, formed with longitudinal flat faces, and a detent spring held by the core piece adapted to engage any one of said flat faces, substantially as and for the purpose specified.

3. A mechanic's implement comprising a hollow case or handle provided with an end nozzle, and a rigid core piece within and concentric with the case, having longitudinal tool cells, in combination with an inclined tubular conductor co-acting with the core piece to form a communication between any tool cell and the nozzle, and an axial spindle within the case to control the chute, passing through the side of the latter into the interior thereof, substantially as shown.

4. A mechanic's implement, such as a screw-driving device, comprising a hollow case provided with a closing cap and a reduced nozzle at its respective ends and a core-piece within the case formed with longitudinal cells, in combination with an inclined, movable conductor or chute within the case, coacting with the core-piece, and an axial spindle adapted to turn or to slide longitudinally in the case to control the chute, the closing cap being formed with perforations and the spindle provided with a pin in position to enter said perforations, substantially as shown and described.

5. A mechanic's implement comprising a holding case provided with a closing cap and a reduced nozzle at its respective ends and a core-piece within the case formed with longitudinal cells, in combination with an inclined, movable chute within the case adapted to form a communication between any cell and the nozzle, and an axial spindle held within the case and adapted to turn or to slide longitudinally therein and to control the chute, the closing cap being formed with perforations, and the spindle provided with a pin in position to enter said perforations, with means to indicate the position of the chute relative to the various cells, substantially as shown and described.

In witness whereof I have hereunto set my hand, this 15th day of August, 1894, in the presence of two subscribing witnesses.

HARRY F. SANGER.

Witnesses:

JAS. T. GORDON,

R. C. WORKS.