

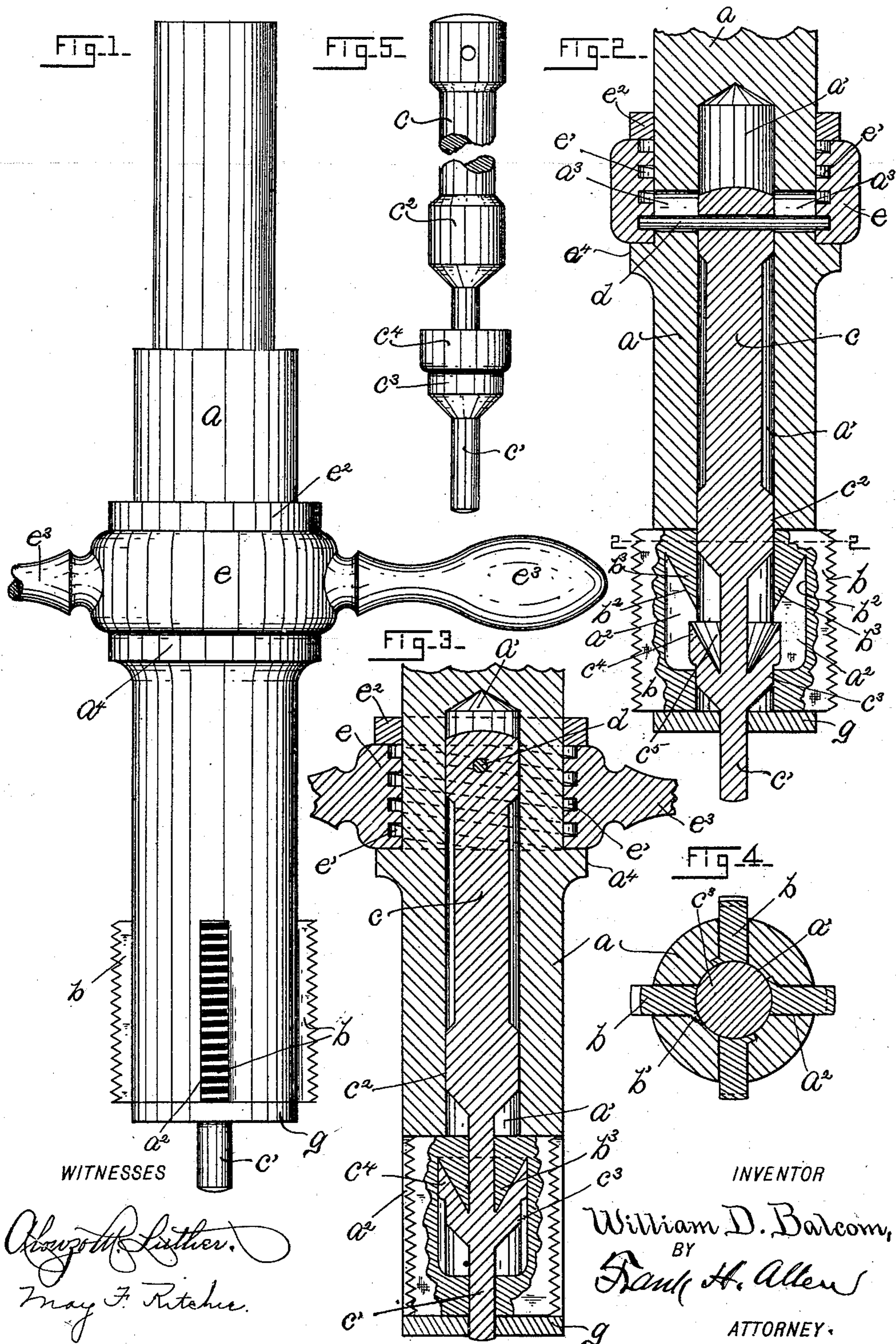
No. 624,157.

Patented May 2, 1899.

W. D. BALCOM.
COLLAPSIBLE TAP.

(Application filed Jan. 23, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

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COLLAPSIBLE TAP.

SPECIFICATION forming part of Letters Patent No. 624,157, dated May 2, 1899.

Application filed January 23, 1899. Serial No. 703,113. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. BALCOM, a citizen of the United States, residing at Norwich, in the county of New London, State of Connecticut, have invented certain new and useful Improvements in Collapsible Taps, of which the following is a full, clear, and exact description.

This invention is in taps for machinists' use; and my immediate object is to provide a novel form of tap in which the threading-dies may be "collapsed" so soon as the threading operation is completed in order that said tap may be quickly withdrawn without having to unscrew it.

My said invention is fully illustrated in the accompanying drawings.

Figure 1 is a view of the same complete. Fig. 2 is a central longitudinal sectional view of said tap, showing the threading-dies in their operative or cutting positions. Fig. 3 is a view similar to Fig. 2, showing the said dies collapsed. Fig. 4 is a cross-sectional view taken on the line 2 2. Fig. 5 is a detached view of a plunger or spindle of peculiar form, by means of which the cutting-dies are expanded and collapsed.

Referring to the drawings, the letter *a* indicates the shank of my newly-invented tap, said shank being bored out at one end to form a central chamber *a'*, whose circumferential wall is slotted radially, as at *a²*, to receive the threading-dies *b*. As here shown, four of the said threading-dies are provided, but the number is not material. Each of said dies has formed upon its inner edge one or more lips *b'*, that hook under the shell of shank *a*, as seen in Fig. 4, and serve to prevent the dies from leaving the slots *a²*.

Within the chamber *a'* is a plunger having a shank portion *c*, that extends well into said chamber. Said plunger is adapted to move endwise in the chamber *a'*, and to attain such endwise movement a pin *d* is passed through the head thereof, whose opposite ends extend outward through slots *a³* in the shank *a*. The said opposite ends of the pin *d* enter an internally-cut double thread *e'*, cut in a collar *e*, which latter is mounted upon the shank *a* and is adapted to revolve thereon between an annular flange *a⁴* formed on said shank and a collar *e²* properly located thereon. The

collar *e²* is provided with oppositely-extending handles *e³*, by means of which the same is rotated, such rotation causing the opposite ends of pin *d* to travel on the thread *e'* and causing the said pin to travel in the slots *a³* and correspondingly moving the plunger *c* within the chamber *a'*, the direction of such movement being dependent of course upon the direction of rotation of the collar *e*. The outer or free end of the plunger is turned down, as at *c'*, to enter a cap or plate *g*, that is fastened to the otherwise open end of the chamber *a'*. Plate *g* thus serves to support the end of the plunger centrally in chamber *a'*, but does not prevent the free endwise movement of said plunger.

That portion of the plunger that is adjacent to the inner edges of the threading-dies is peculiarly formed and serves to force the dies outward and hold them there during the threading operation when the plunger is slid in one direction, and also serves to draw inward or "collapse" the said dies when slid in the opposite direction, as I shall explain.

Near the front and rear ends of the inner edges of the dies *b* the plunger is provided with shoulders or enlargements *c²* *c³*, that nearly fill the chamber *a'* and which lie immediately under the ends of the dies when the plunger is moved outward—that is to say, toward the plate *g*—as illustrated in Fig. 2 of the drawings. These shoulders *c²* *c³* form a substantial backing to support the dies during the threading operation.

The dies are recessed in their inner edges, as at *b²*, to provide wedge-shaped portions *b³*, that point toward the plate *g*, and the plunger *c* is formed with an enlargement *c⁴*, whose inner end portion is cupped to provide a sharp annulus *c⁵*, that is of such diameter that it extends into the recesses *b²* of the dies, as seen in Figs. 2 and 3 of the drawings.

When the plunger is slid inward, the sharp edge *c⁵* of the annulus engages the sharp edges *b³* of the threading-dies and draws the said dies inward, (toward the plunger,) as seen in Fig. 3.

It will thus be understood that the simple act of sliding the plunger outward results in forcing the dies into their operative or cutting positions and that the act of sliding said plunger inward results in "collapsing" said

dies and allowing the complete tool to be withdrawn out of the tapped hole without having to unscrew said tap.

Having thus described my invention, I
5 claim—

A hollow shaft having its ends slotted to receive the dies, a series of dies placed in the slots and provided upon their inner sides with recesses, the wedge-shaped portions b^3 , and
10 the plate g , applied to the end of the shank to keep the dies in position, combined with an endwise-moving plunger, provided with the enlargements c^3 c^4 , and an extension c'

which passes through the plate g , the inner end of the enlargement c^4 being recessed so 15 as to receive the wedge-shaped portions and the enlargement c^3 fitting between the outer ends of the dies so as to support them while in operation, substantially as described.

Signed at Norwich, Connecticut, this 7th 20 day of January, 1899.

WILLIAM D. BALCOM.

Witnesses:

ALONZO M. LUTHER,
FRANK H. ALLEN.