No. 702,011. Patented June 10, 1902.

J. KINVALL.

DEVICE FOR REMOVING BROKEN TAPS.

(Application filed Mar. 15, 1902.)

(No Model.)

Fig. 4

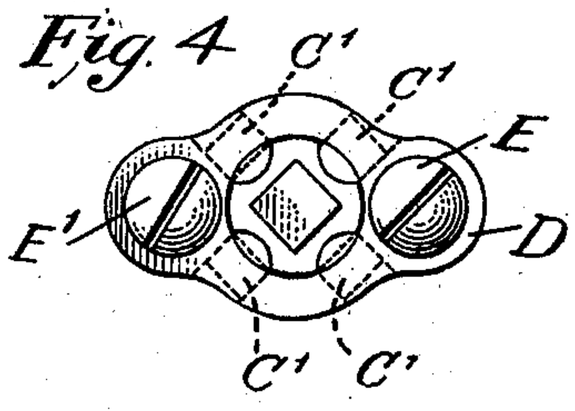


Fig. 1

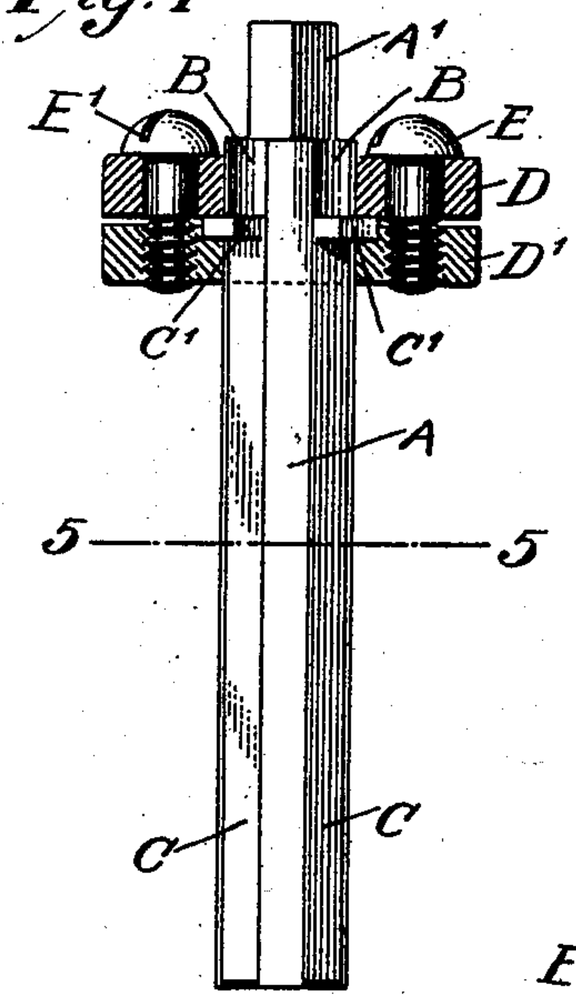


Fig. 2.

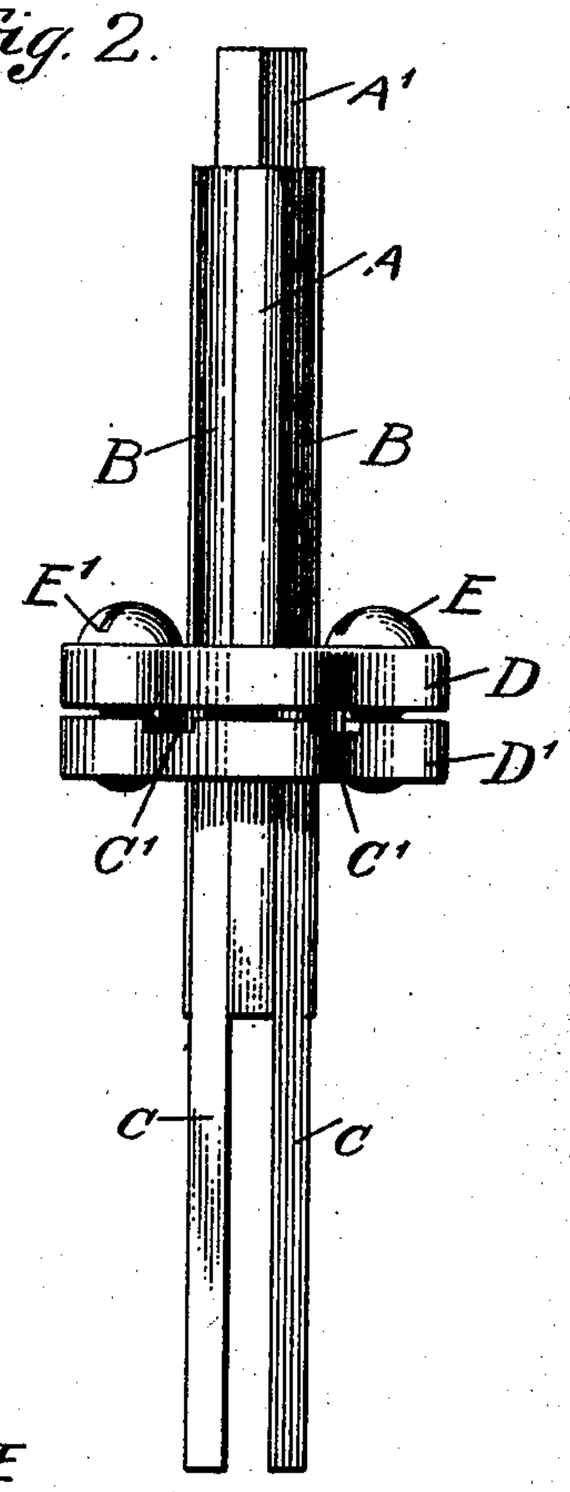


Fig. 3

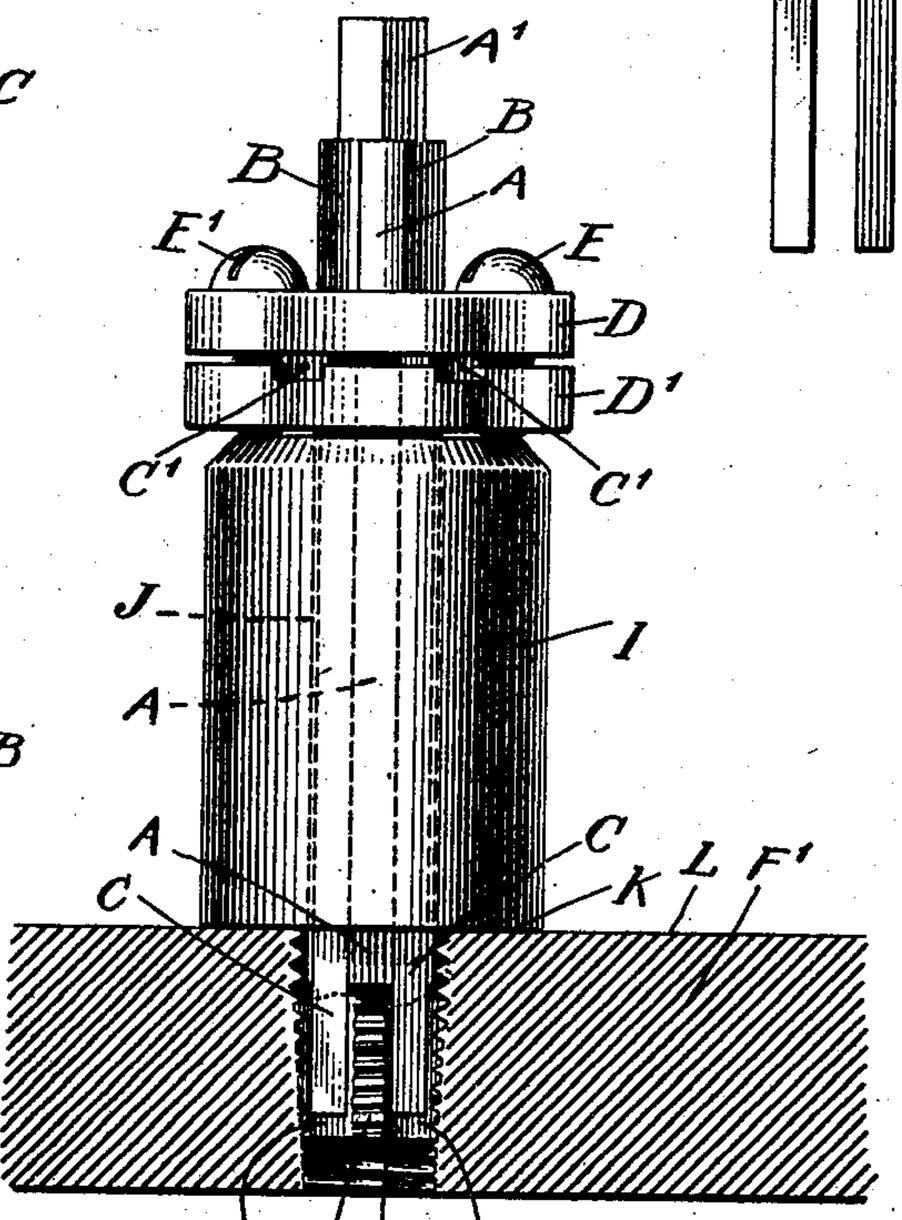
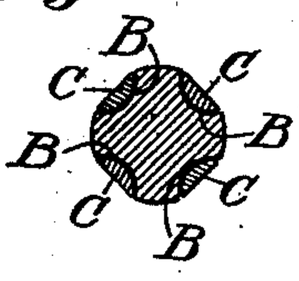


Fig. 5



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN KINVALL, OF WORCESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN SCHROEDER, OF WORCESTER, MASSACHUSETTS.

DEVICE FOR REMOVING BROKEN TAPS.

SPECIFICATION forming part of Letters Patent No. 702,011, dated June 10, 1902.

Application filed March 15, 1902. Serial No. 98,434. (No model.)

To all whom it may concern:

Be it known that I, JOHN KINVALL, a citizen of Sweden, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in a Device for Removing Broken Taps, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents an elevation of a device for removing pieces of taps broken in the work and embodying my invention. Fig. 2 represents a similar view with the tap-engaging bars extended beyond their cylindrical holder. Fig. 3 is an elevation of my improved device represented as engaging a piece of broken tap. Fig. 4 is a top view; and Fig. 5 is a sectional view on line 5 5, Fig. 1.

Similar reference-letters refer to similar parts in the different views.

My invention relates to a device adapted to engage and remove pieces of taps which have been broken off in a tapped hole; and it consists of a cylindrical holder whose diameter is substantially equal to the diameter of the tapped hole and which is provided with a polygonal section at one end to receive a wrench and with longitudinal grooves corresponding with the longitudinal grooves in the tap to receive sliding tap-engaging bars having their upper ends held in a sliding collar by which the tap-engaging bars are moved lengthwise the cylindrical holder.

Referring to the accompanying drawings, A denotes the cylindrical holder, having a polygonal section A′ and longitudinal grooves B B to receive the sliding tap-engaging bars C, which have upper ends bent at right angles and inclosed between the two clamping parts D D′, which are clamped together by means of the screws E E′, forming a collar E^2. The diameter of the cylindrical and longitudinaly-grooved holder A is substantially equal to the diameter of the tapped hole F in the metal piece F′, from which it is desired to remove a piece G of a broken tap. The longitudinal grooves B B correspond with the grooves H H in the tap, so that when the cylindrical holder A is inserted in the tapped hole with its end resting upon the end of the broken tap, as represented in Fig. 3, the collar E^2 can be forced down upon the holder, causing the ends of the tap-engaging bars C C to project beyond the end of the holder A into the grooves H H of the tap, and the holder and its tap-engaging bars are then rotated by the application of the wrench to the polygonal end A′, causing the piece G of broken tap to be turned and unscrewed from the tapped hole F. In order to maintain the holder A in alinement with the piece of broken tap and to retain the tap-engaging bars C within their respective grooves B, I preferably inclose the holder A and bars C between the collar D′ and the piece of metal F′, which contains the broken tap, with a sleeve I, provided with a central hole J, of the proper diameter to fit the holder A, and having its lower end K at right angles with the concentric hole J and adapted to rest upon the surface L of the piece of metal F′. The devices are made in different sizes, corresponding to taps of different diameters; but they are substantially the same in their construction and method of operation.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a device for removing broken taps, the combination of a holder provided with longitudinal grooves, of tap-engaging bars held in said grooves and capable of sliding therein, means for simultaneously sliding said bars in said grooves into engagement with the grooves in the tap, substantially as described.

2. The combination with a holder provided with longitudinal grooves for a series of tap-engaging bars, tap-engaging bars held in said grooves and capable of sliding therein, a collar for holding said bars and sliding them simultaneously in said grooves, substantially as described.

3. The combination of a holder having longitudinal grooves, tap-engaging bars held in said grooves, a clamping-collar capable of sliding on said holder and clamping the ends of said bars, substantially as described.

4. The combination of the grooved holder, tap-engaging bars held in said grooved holder and capable of sliding therein, a collar engaging said bars, and a sleeve inclosing said holder and bars, substantially as described.

Dated this 12th day of March, 1902.

JOHN KINVALL.

Witnesses:
THEODOR BERGMAN,
RUFUS B. FOWLER.