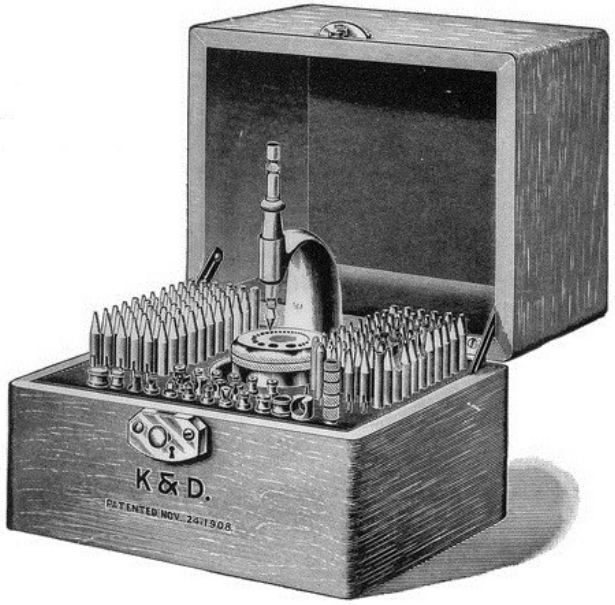
Getting to Know your Staking Tool



Shaun Clarke

NAWCC San Jacinto Chapter 139

Content

Uses of a Staking Tool

- Adjusting friction for cannon pinions
- Closing hairspring collets
- Closing hour and second hand holes
- Closing pivot holes
- Closing tips of case sleeves
- Driving out balance staffs and arbors
- Final staking of balance staffs and arbors
- Installing plate bushings
- Pressing hairspring collets onto balance wheels
- Removing roller tables
- Spreading undercut of staffs and arbors
- Staking roller tables
- Stretching wheel arms
- Tightening roller tables

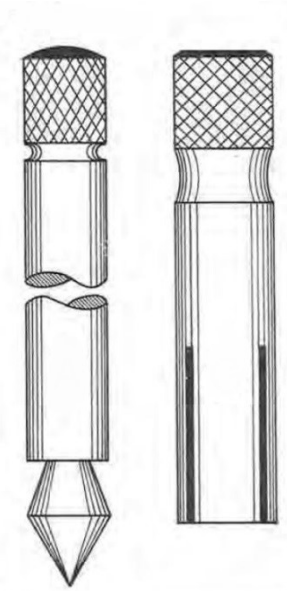
Purchasing a Staking Tool

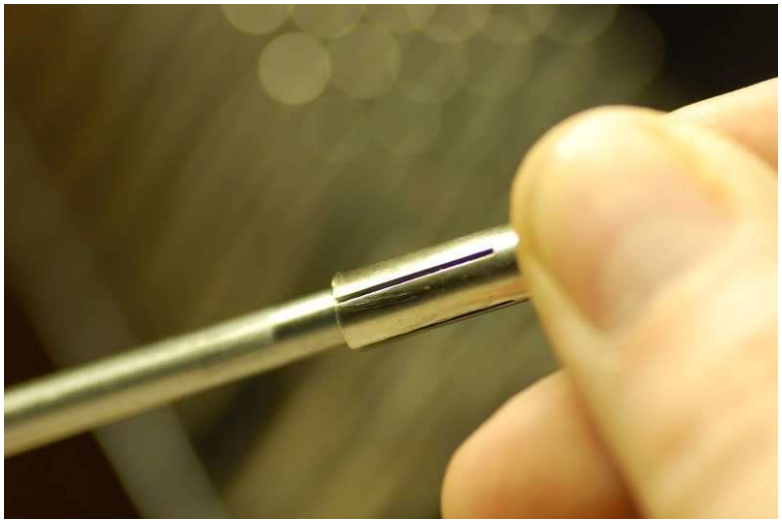
- Buy a complete set
- You don’t have to buy the biggest!
- Avoid rust
- Check for damage to punches

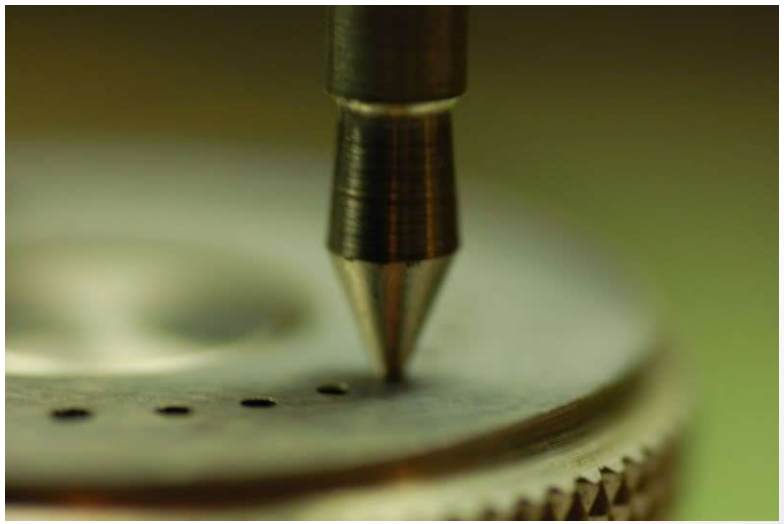
Punches

Centering Punch & Punch Lifter

- *for centering the die plate*
- *for remove punches from storage holes*



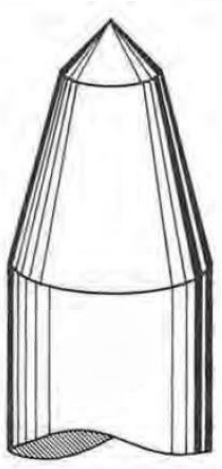




Punches

Prick Punch

- *for marking centers*



Punches

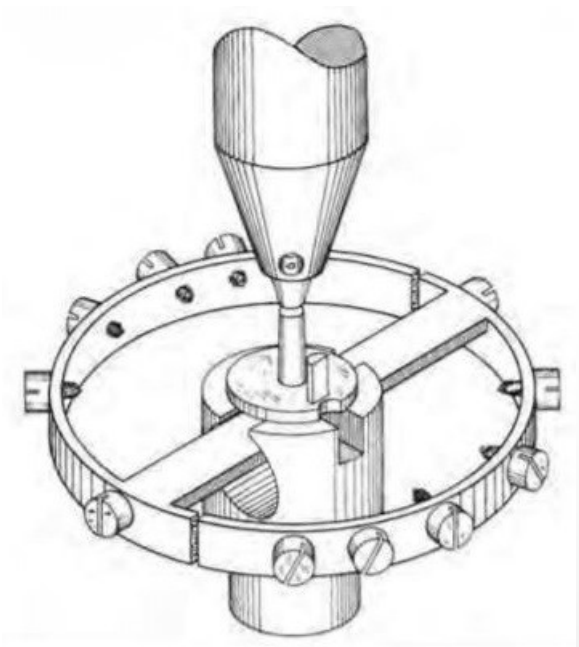
Pivot Punch

- *for driving staffs in and out from rollers*
- *for driving friction staffs in and out*

The hole is shaped so that the punch rests on the shoulder of a cone-shaped pivot.

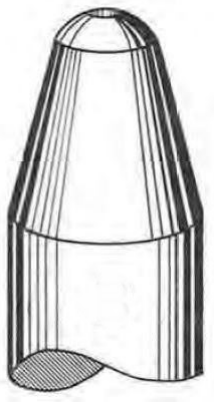
The hole in the side is for observation and to facilitate the removal of a pivot that might become broken and lodged in the hole.

Care must be taken in selection of the correct hole size so that the punch fits the pivot snugly, but not tight.



Punches

Round Face Hole Punch

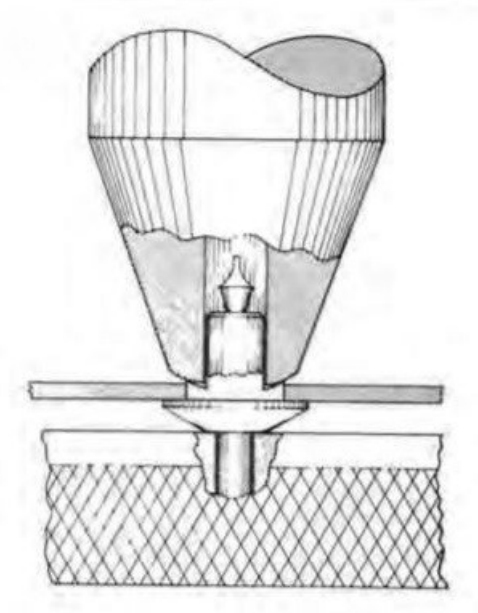


- *for spreading undercut of staffs and pinions prior to finishing with a flat face hole punch*

This punch is used to rivet over the countersinks of staffs pinions and arbors.

Press the balance wheel firmly over the riveting surface with a flat faced hole punch.

Make sure that the shoulder of the staff extends far enough through the wheel to provide sufficient stock to form a rivet.



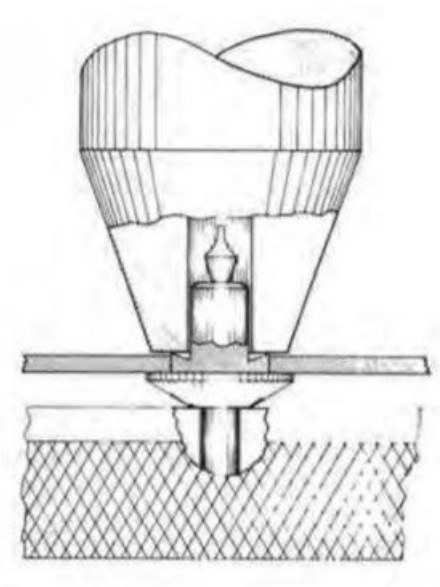
Punches

Flat Face Hole Punch

- *for final staking of balance staffs*
- *for final staking of train pinions*
- *for pressing hairspring collets on balance wheels*

This punch is used chiefly to replace wheels upon pinions, to flush-finish riveting on balance staffs after they have been riveted to the balance, and in the replacement of friction-type balance staffs.

A proper fitting punch should fit freely over the collet hub with a clearance of about 0.2 to 0.3 mm.



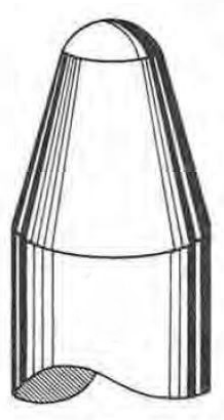
Punches

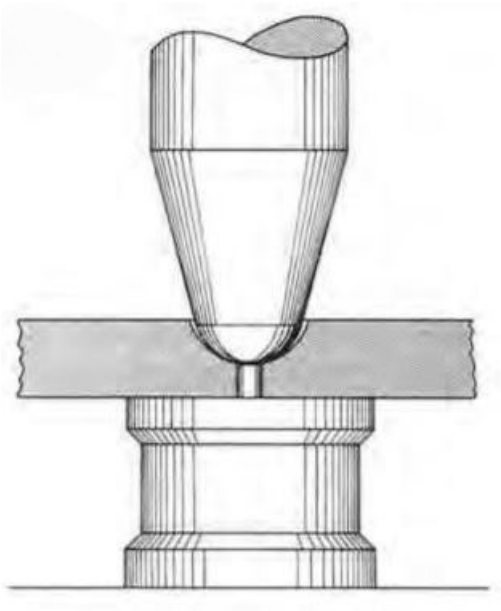
Round Face Solid Punch

- *for closing pivot holes*
- *for closing minute hand holes*
- *for closing holes in rollers*

Generally used for closing pivot holes etc. The proper size of punch to use is determined by the size of the oil cup.

When using to close minute hand holes, avoid direct contact with the die plate by first placing the hand on a solid face stump.





Punches

Flat Face Solid Punch

- *for installing friction-type bushings*
- *for riveting where a hole punch is not required*
- *can be used as an inverted stump*

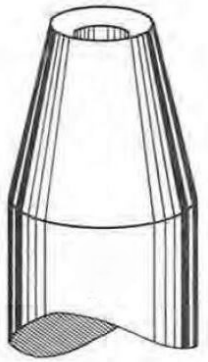
This punch is used to replace friction-type jewel bushings or brass bushings in watches or clocks.

Occasionally, it may be used to stretch flat steel or brass pieces and to drive out friction pins.

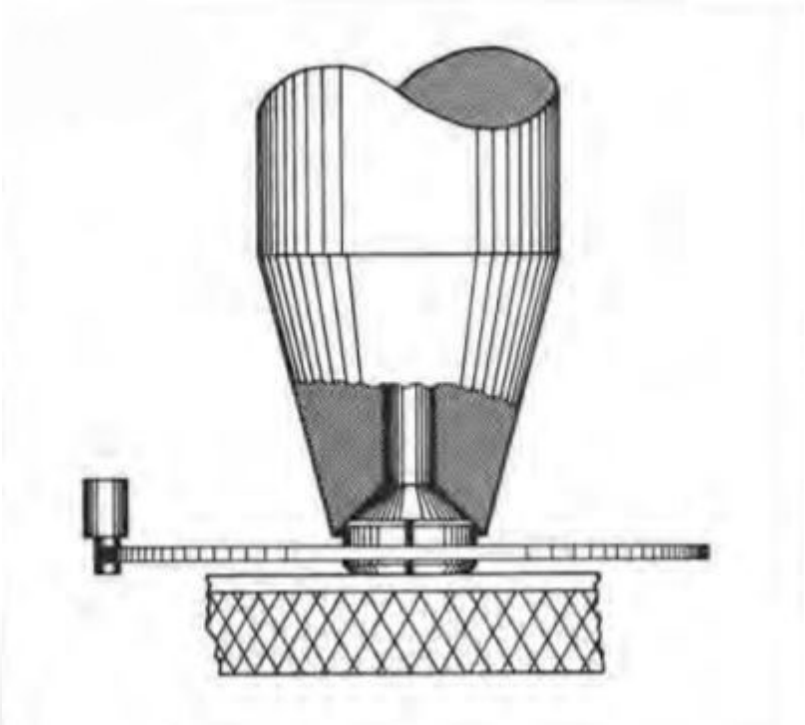
In K&D 'Inverto' Staking Tools, the Flat Face Solid Punch can be inverted and used as a stump.

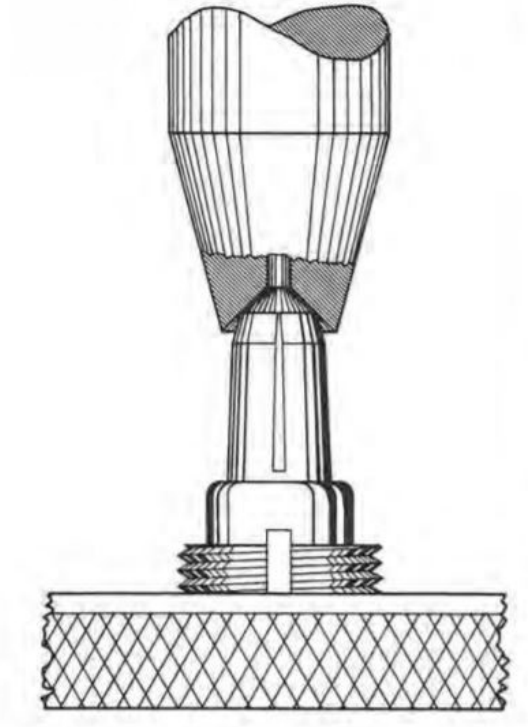
Punches

Taper Mouth Closing Punch



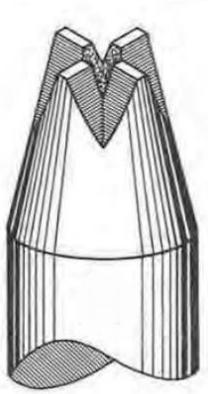
- *for closing hairspring collets*
- *for closing tips of sleeves*
- *for closing holes in sockets of hands*





Punches

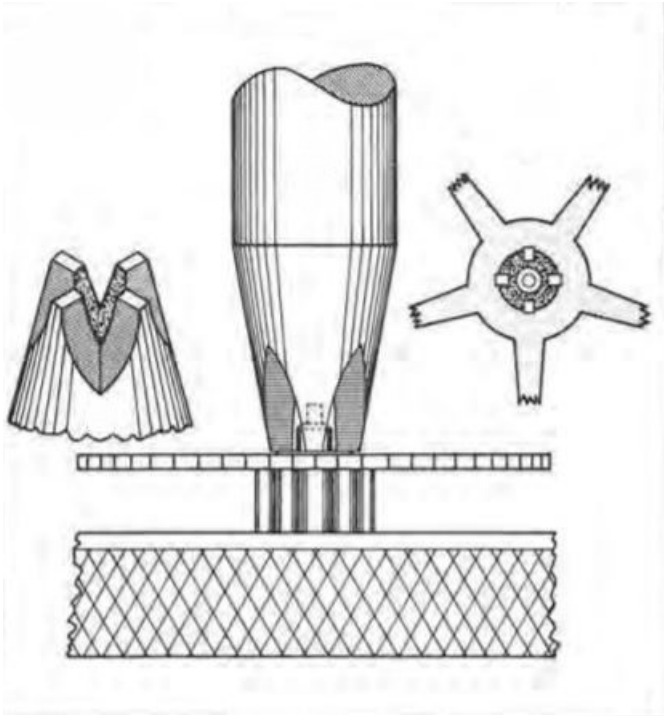
Center Wheel Punch



- *for indenting the riveting of safety pinion staffs*

This punch is used to stake wheels onto pinions. It is used where plain riveting will not hold, such as on clock pinions.

To secure the staff to the wheel firmly these punches are used to indent the riveting of the staff in four places with one blow.



Punches

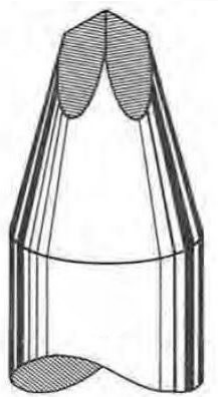
Triangular Pointed Punch

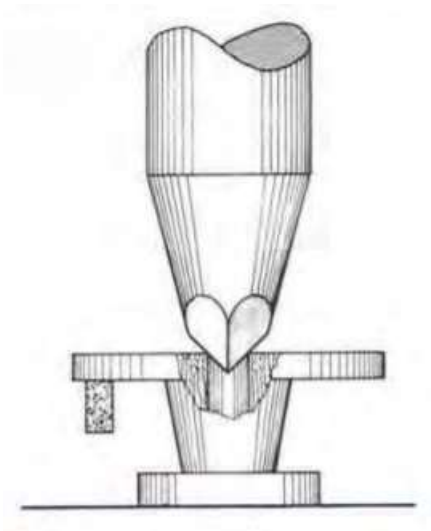
- *for tightening roller tables*

This punch is used to used to close the hole in the roller.

It raises three slight burs equidistant about the hole of a roller.

Actually, an emergency measure when a proper fitting roller or staff cannot be obtained.

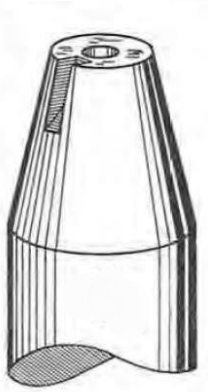




Punches

Roller Punch

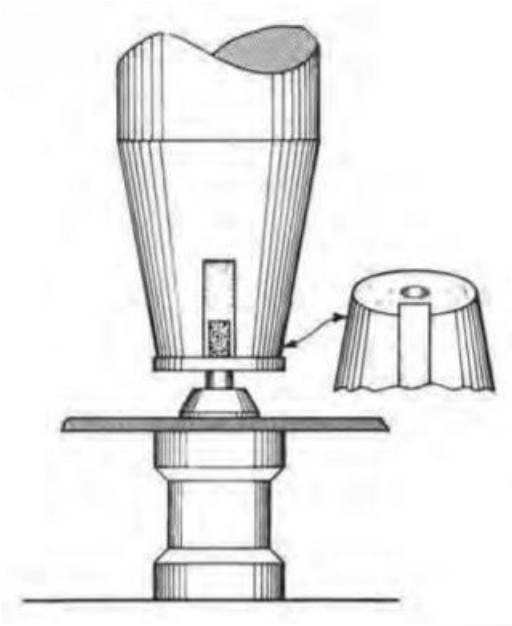
- *for driving single or impulse double rollers on balance staffs*



This punch is used to drive the roller on the staff.

Care should be used in selecting the proper punch to avoid breaking the roller jewel.

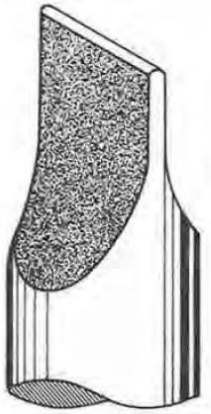
Some watchmakers prefer to use these punches inverted in the frame allowing the roller to rest on the top of the punch and driving the staff down into the roller with a flat face hole punch.



Punches

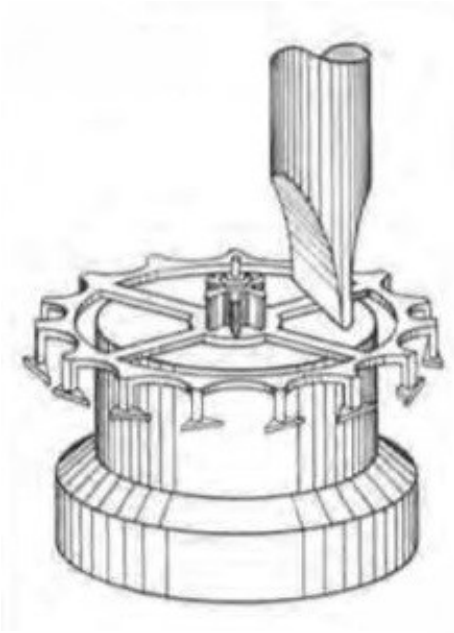
Peening Punch

- *for stretching balance arms*
- *for stretching metal*



This punch is used for stretching metal without cutting or parting the metal in two.

When stretching wheel arms, place the gear in the hole of a flat faced hole stump. Place the peening punch on the wheel arm close to the pinion and tap the punch with a series of light blows.



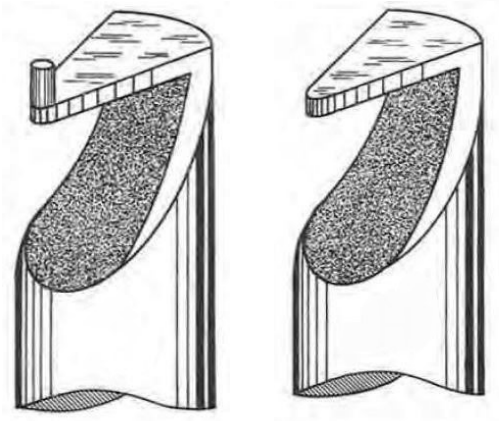
The result should be checked often as overstretching is difficult to correct.

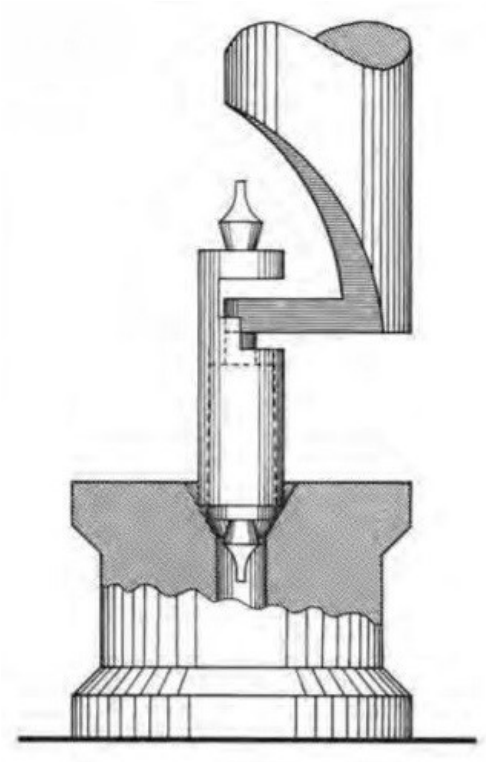
Punches

Cylinder Punch

- *for inserting and removing cylinder tampons*

These specialised punches are used for inserting and removing cylinder balance tampons.

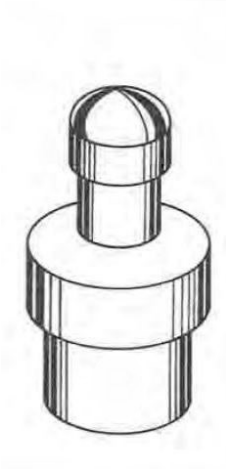




Stumps

Round Face Solid Stump

- *for closing holes in conjunction with Round Face or Solid Punches or*



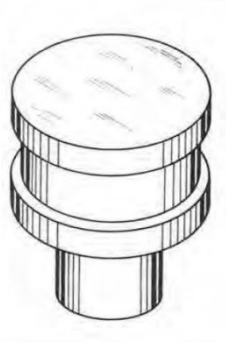
This stump is used in conjunction with Round or Flat Face Solid Punches for closing holes.

K & D makes 20 of these in different diameters.

The one with the largest diameter is Number 25 which has a diameter of 5.78 mm, and the smallest is Number 44 with an 0.84 mm diameter.

Stumps

Flat Face Solid Stump

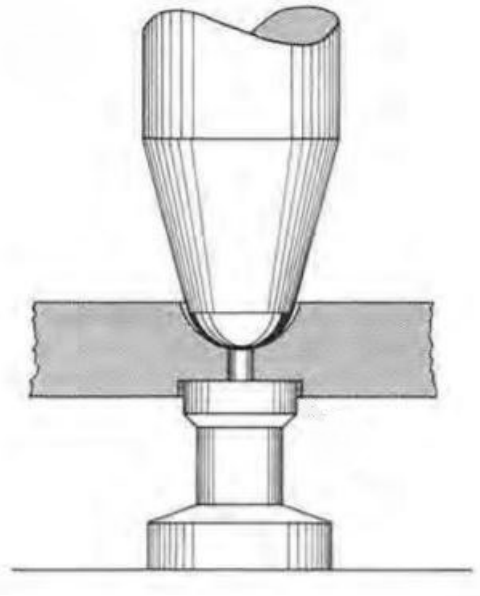


- *for closing holes in conjunction with Flat Face Solid Punch or Round Face Solid Punches*

These stumps are used for supporting watch plates and bridges while pivot holes are being closed with a round face solid punch.

These stumps are also used for riveting and peening.

K & D makes 24 of the stumps. Number 1 is the largest with a diameter of 9.52 mm to Number 24 which is the smallest with a diameter of 0.84 mm.



Stumps

Flat Face Hole Stump

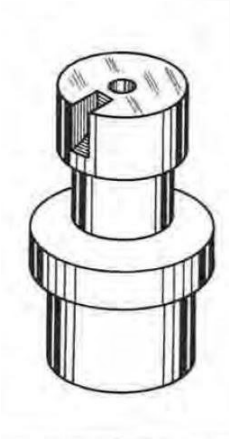
- *for resting wheels for driving out staffs, pinions, etc.*

  This style of stump be used for staking riveted balance staffs instead of resting the staff directly on the die plate.

  Some balance staffs are extremely hard and, if staked on the die plate, the die plate could be damaged.

Stumps

Roller Stump



- *for driving single rollers on balance staffs in an inverted position*

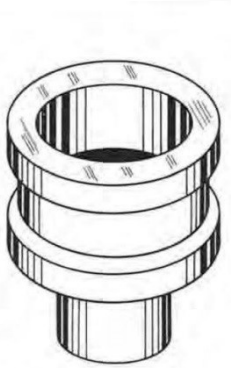
This Roller Stump is a variant of the flat face hole stump, with a side groove to clear the roller jewel.

This style of stump is made in four sizes by K & D.

The sizes are Number 76 for large pocket watches, Number 77 for small pocket watches, Number 78 for large wrist watches, and Number 79 for small wrist watches.

Stumps

Large Flat Face Cup Stump

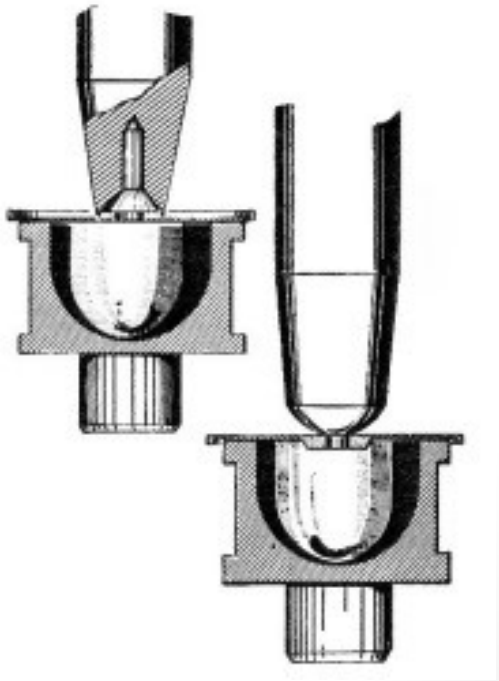


- *for endshake adjustment of plates and bridges*
- *for adjusting balance arm position*

This style of stump is used for bumping plates, bridges, mainspring barrels, and covers when the end shake needs to be increased or decreased.

It can also be used to support the balance arm during height adjustments.

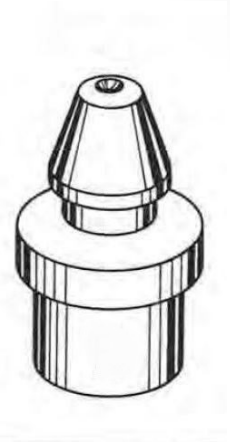
This style of stump is made in one size only. The outside diameter is 9 .60 mm and the inside diameter is 7.00 mm.



Stumps

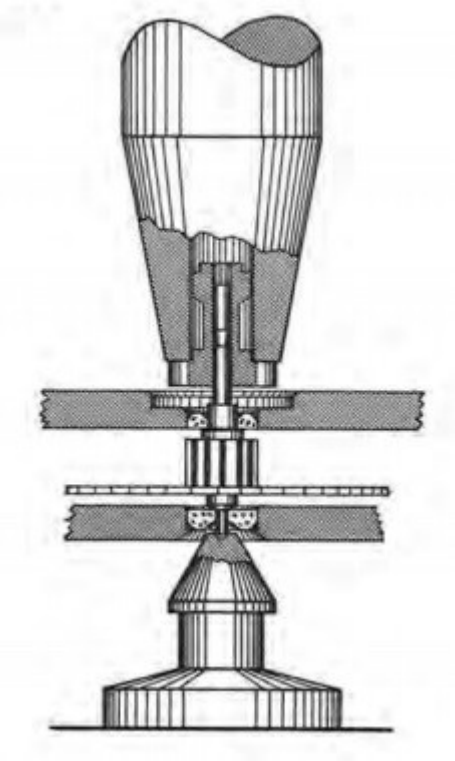
Center Arbor Support Stump

- *for supporting back end of center arbor while staking on hands or cannon pinion*



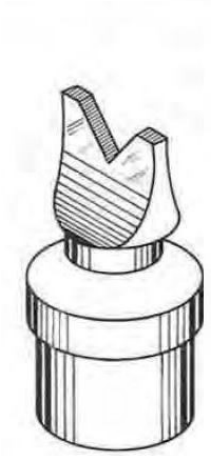
The end of the stump has a small concave depression that the end of the center staff rests in when the cannon pinion and hands are pressed on.

The stump is designed so it will not touch the jewel or its setting when it is being used. Only the end of the center staff is supported.



Stumps

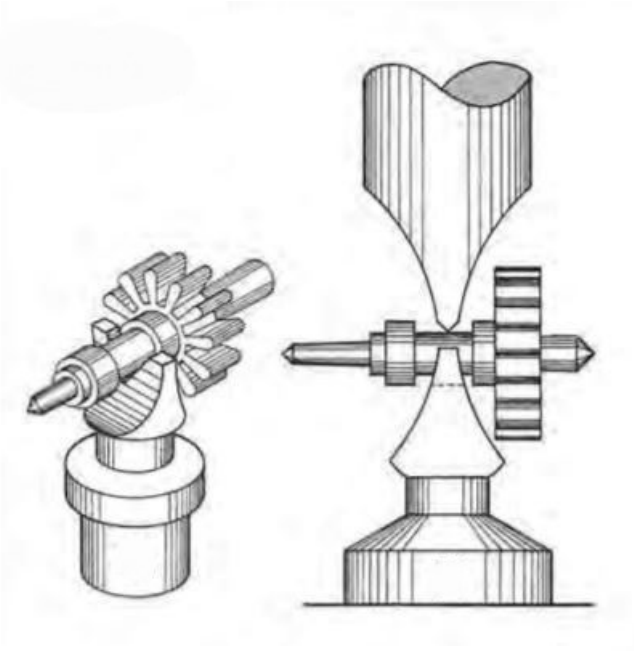
Crotch Stump



- *for supporting cannon pinion while adjusting setting friction*

This stump is used for supporting a cannon pinion while its tension is increased with a special punch.

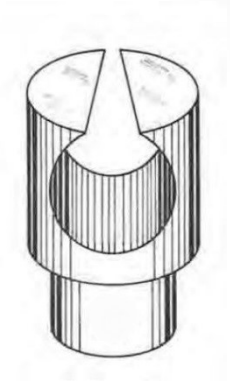
The wall of the cannon pinion is supported by inserting a tapered brass pin into the hole in the cannon pinion before it is closed with the punch.



Stumps

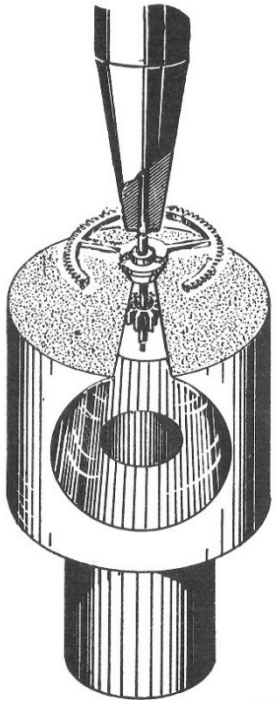
Vee-Slot Stump

- *for staking out escape wheel pinions and other pinions which are staked into wheels that have a center bushing*



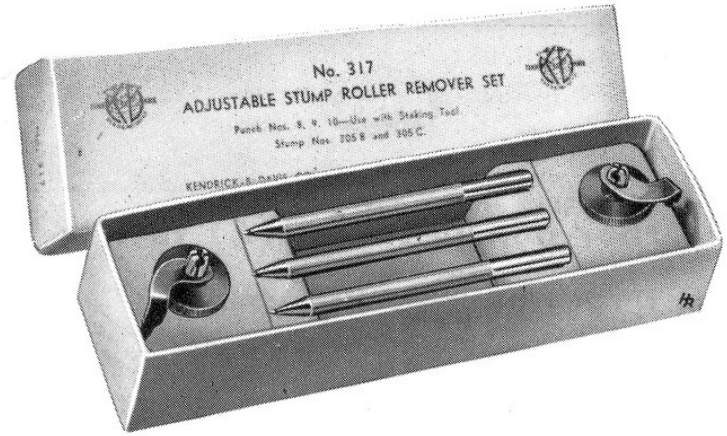
This method of removing pinions helps prevent the bushing from being disturbed in the wheel.

This stump can also be used to remove roller tables from the balance staffs of large balance wheels.



Specialist Accessories

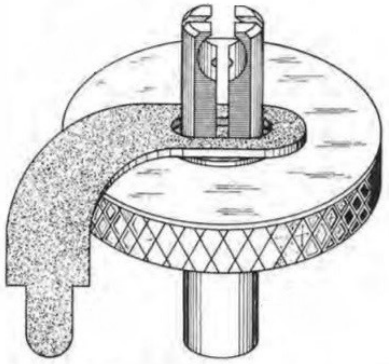
Adjustable Roller Remover



ADJUSTABLE ROLLER REMOVERS

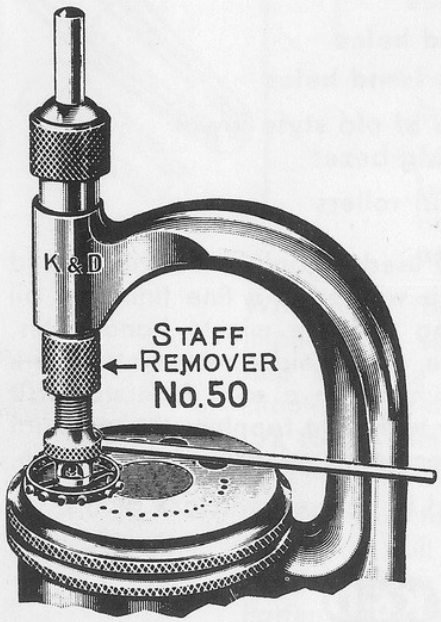
The tool fits in the dieplate of the staking tool and the bent arm fits into one of the die holes, or the center hole in the dieplate. The balance, with the roller attached, should be inverted, and slipped in between the jaws, so that the jaws come between the balance hub and the top of the roller table. The gap in the jaws is adjusted by turning the knurled collet. Using one of the roller remover punches, the balance is tapped lightly, and the roller will slip off the balance staff shoulder.

No. 317 set contains 3 cross hole punches and 2 adjustable stumps



Specialist Accessories

Balance Staff Remover



BALANCE STAFF REMOVER

With this tool staffs can be extracted quickly and efficiently. The balance arms are protected against distortion and splitting.

Before using the tool select a hole in the dieplate of the staking tool frame which fits over the hub of the staff closely. Center the hole with the centering punch and place the staff in the hole so that the balance arms rest on the dieplate.

The remover is then placed over the balance as shown in the illustration. The hole in the bottom of the remover fits over the hairspring shoulder of the staff. Pass the extracting punch through the staking tool frame and remover so that it rests on the pivot of the staff.

Turn the upper knurled sleeve counter-clockwise so that it moves upward against the staking tool arm. The stop arm of the tool will swing against the body of the staking tool and prevent the body of the tool from turning. Tighten the sleeve just enough so that the remover sits firmly in the staking tool frame.

Strike the punch a sharp blow with a brass hammer and the staff will come through the hole in the dieplate.

To select the proper remover for your staking tool, measure the opening in the frame and subtract approximately 3/16". The removers are supplied in five sizes: 5/8", 3/4", 7/8", 1" and 1 1/8".

No. 50 for Pocket Watches, specify size for correct opening.
No. 50B for Bracelet and Baguette Watches, specify size for correct opening.

No 50 Balance Staff Remover
An attachment for your K. & D. Staking Tool
New - Accurate - Quick

DIRECTIONS

Select proper hole in Staking Tool die to let hub of staff through: place balance with staff to be removed in same. Set remover over same and insert its punch through staking tool and main body of remover. Holding punch in position over pivot with finger of right hand tighten knurled remover nut upwards against staking tool arm. Stop arm of remover will swing against body of Staking Tool and prevent body of tool turning while tightening knurled sleeve. Do not over tighten this sleeve: it is not necessary. Now strike punch a sharp blow with light hammer and staff will come out without injury to Balance; riveting of staff simply being sheared off.

NO. 50 BALANCE STAFF REMOVER

In ordering our No. 50 measure the gap between your Staking Tool die and bottom of Goose Neck. Table below will show the size No. 50 which will fit your Staking Tool.

"K. & D." Staking Tools No.	No. 50 Sizes	Will fit any S.T. Die Gap of
5	5-8in.	13-16in.
504	3-4in.	15-16in.
K. & D. Sp.	7-8in.	1 1-16in.
16 B & 18 old	1in.	1 3-16in.
New 18 B & 18 R	1 1-8in.	1 5-16in.

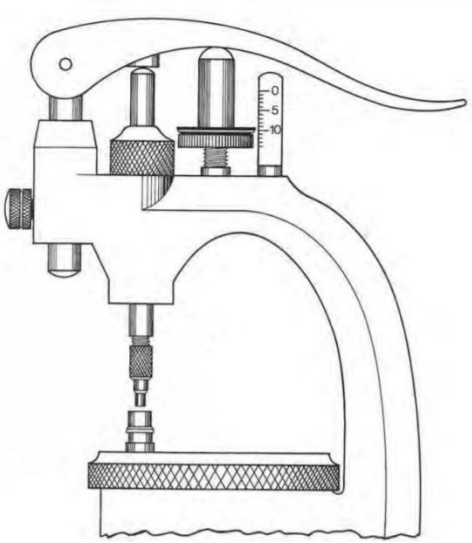
All the above No. 50 sizes can be furnished for Bracelet size Balances but in ordering add the letter "B".

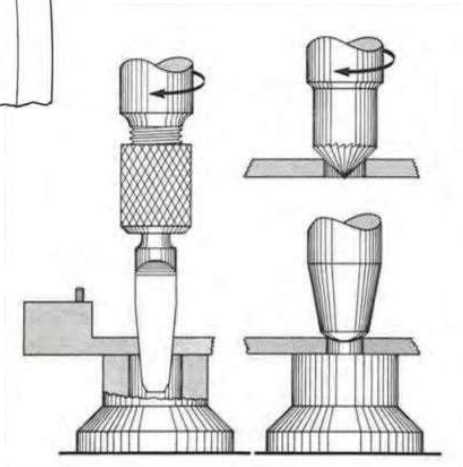
Price for All Styles is $1.75

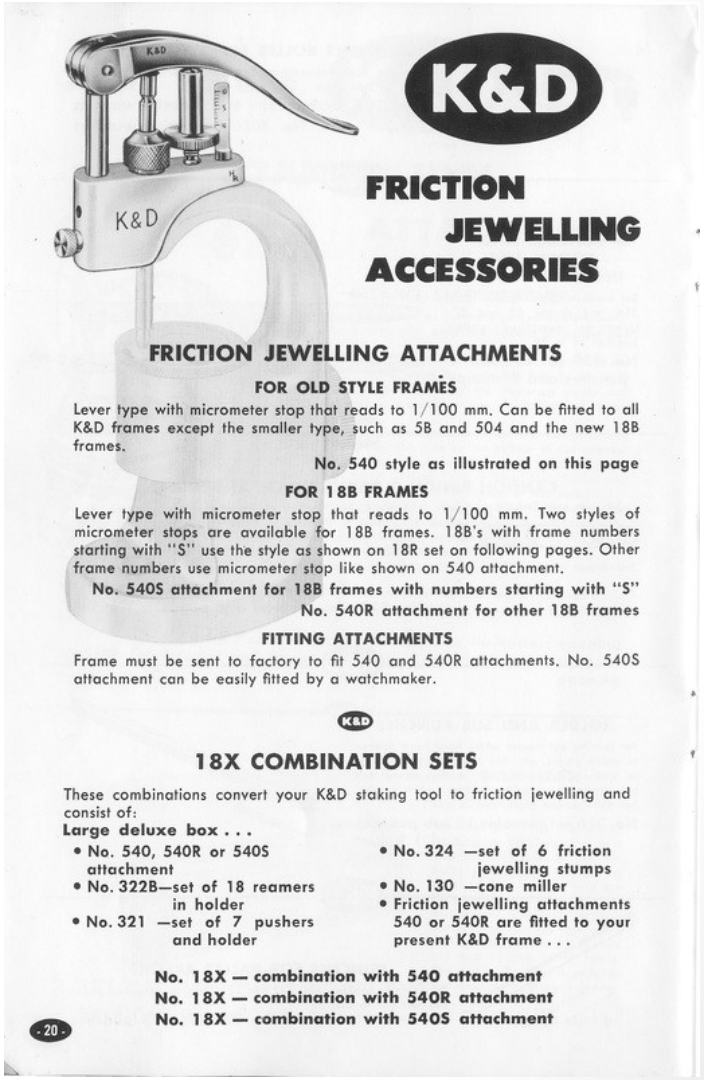
Kendrick & Davis Co., Inc. Lebanon, N. H.

Specialist Accessories

Friction Jeweling Accessories







Correct Use of Staking Tool

- Use a brass hammer
- Light tapping
- When riveting, turn about one quarter of a turn after each blow
- Wipe down punches and base after each use
- Use silica gel packets in the storage box

References

- ARCHIE B. PERKINS, Horological Times (American Watchmakers Institute). **The Staking Tool (And How to Use It)** 16-part series; January 1984 (VOLUME 8, NUMBER 1) to April 1985 (4 VOLUME 9, NUMBER 4)
- HENRY B. FRIED, D. Van Nostrand Company, Inc. **The Watch Repairer's Manual**, 1961, pp. 260–263.
- HENRY B. FRIED, Columbia Communications , Inc. **Bench Practices for Watch and Clockmakers**, 1974, pp. 123–139.
- “Kendrick and Davis Inverto Staking Tools“ website https://kanddinverto.weebly.com/