

The Universal Lathe Chuck and its assembly (Order No. 1001):

In the box you will find:

The lathe chuck, a chuck flange, 3 countersunk screws and 2 tension pins.

Fitting the flange to the three-jaw or four-jaw chuck :

Should you receive the chuck with the flange already mounted, the work described in the next paragraphs has already been done by us. The flange must not, therefore, be further machined. Before commencing to fit the UNIMAT Chuck, make sure, that both headstock and tail-stock centres are exactly opposite to one another; if this is not so, this setting must be corrected, as explained in the chapter "Conical (taper) turning". Fitting of the chuck can then be proceeded with, the following sequence of operations being observed.

1.) After cleaning the threads of the chuck flange and the spindle nose, screw the flange on to the lathe spindle, as shown in the adjoining diagram (17), taking care that there is no play at the face surface of the flange.

2.) Clamp a point tool in the tool holder and carefully turn down the smaller diameter (turning diameter) of the flange, until the chuck bore (0.669" diameter) may be slid over this without any force, though without any play. Then cleanly face-turn the bearing (contact) surface.

The finished turned flange, after cleaning away the swarf, is lubricated with machine oil, the cleaned lathe chuck is fitted on and screwed firm with the three countersunk screws supplied.

If the chuck flange should have been turned down too small, you will notice this by undue knocking of the chuck. In such case a new chuck flange must be turned, which can always be obtained from us or from a tool shop.

We regret we cannot save you the work of fitting, as completely satisfactory running is only possible by turning the flange on the same machine on which the chuck will be used.

In the chuck supplied by us the jaws are mounted, stepped outwards. With this arrangement workpieces of smaller diameter (up to about 3/4") can be centrally tensioned from the outside, or ring-shaped or tubular parts from the inside, by means of the stepped guides (of the jaws). If the lathe chuck is to be used for clamping discs or parts of large diameter, the jaws must be mounted in reverse. The jaws are reversed in the following way :

The jaws are unscrewed and cleaned. Thereafter you must turn down the knurled tension ring until the beginning of the spiral thread comes immediately opposite the No. 3 groove of the jaw. Jaw No. 3 is then inserted in reverse and the tension ring rotated, so that this jaw is held firmly.

In the same way jaw No. 2 is then inserted in the guide groove No. 1 and finally jaw No. 1

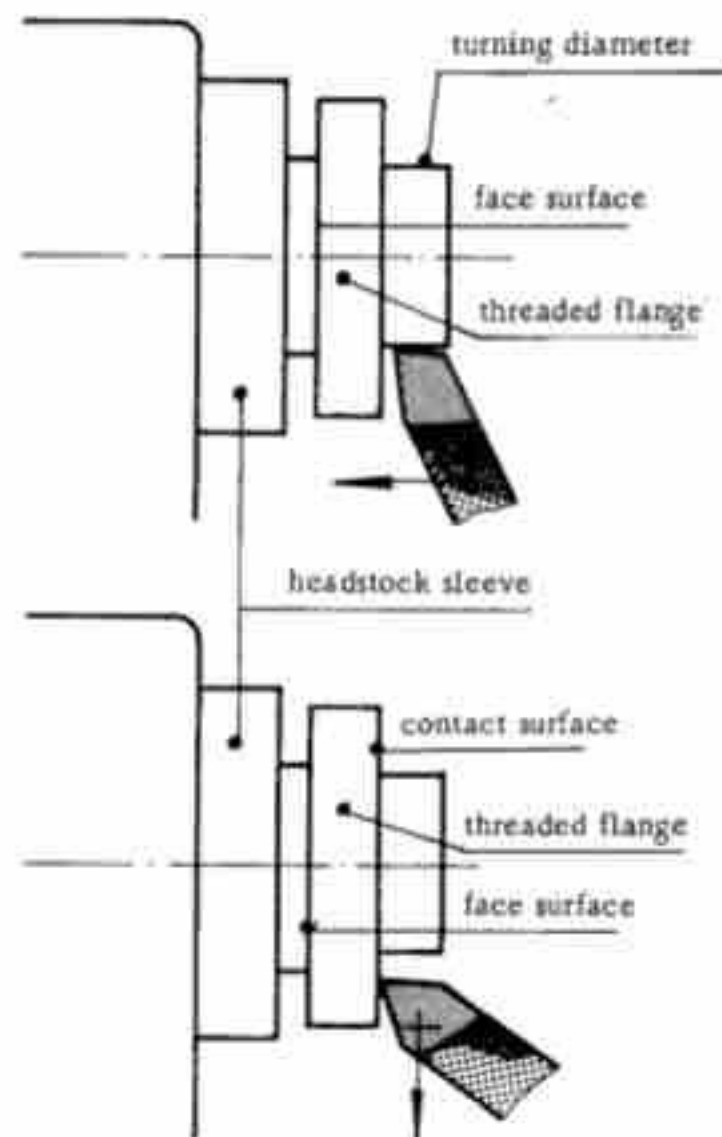


DIAGRAM 17

in the guide groove No.2. The jaws must then be screwed together at least until they can no longer hit against the guide columns (pillars) of the UNIMAT.

If the jaws should have to be remounted, as originally, as outwardly stepped jaws, the procedure is the same, except that they are inserted in the numerical sequence 1,2, 3 in the identically numbered guide grooves.

To enable firm tensioning to be achieved, 2 tension pins are supplied with the lathe chuck.

The Four-jaw Lathe Chuck (Order No. 1001a):

With the three-jaw lathe chuck only cylindrical workpiece or symmetrically profiled workpieces (circular material, triangular, hexagonal, twelve-sided material) can be tensioned. The four-jaw lathe chuck has individually adjustable jaws, thus presenting the possibility of tensioning a variety of workpiece profiles - four or eight-sided material and non-symmetrical parts.

For precision machining, cylindrical parts can also be fully centralised in the four-jaw lathe chuck. For the assembly of the Four-jaw Lathe Chuck the same procedure applies as already explained in the previous paragraph "Flanging of the Lathe Chuck".

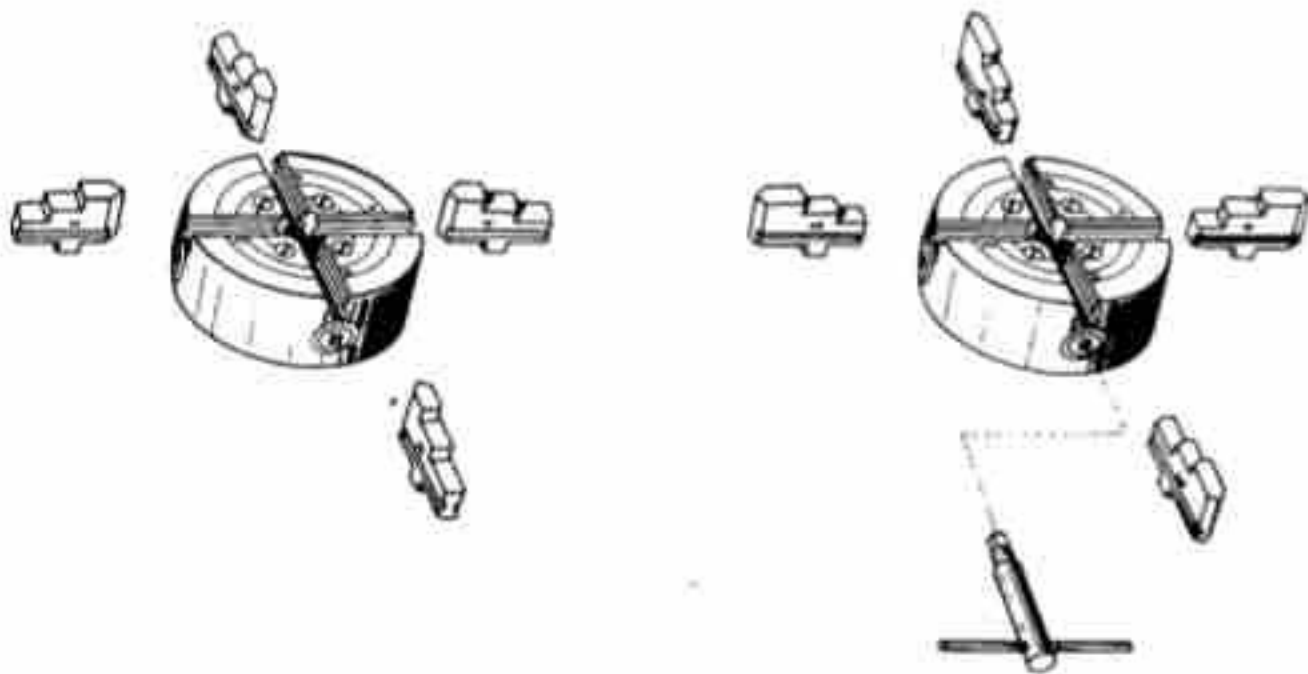


DIAGRAM 18

The Three-jaw Drill Chuck Part No.1005

This is for receiving spiral drills, centre drills, countersinks, milling and grinding cutters. It permits certain, centric tensioning of shank tools of up to 1/4" shank diameter.

For the clamping of workpieces for grinding, milling and drilling we supply a machine vice as an additional accessory.



DIAGRAM 19

Machine Vice. Order No. 1010:

Fixing is by means of two T-nuts in the support, providing a secure tensioning device for all the operations described.

For work procedures, as described in the chapters "Grinding, Drilling and Milling" fixing direct to the support by means of tensioning claws may also be chosen as a simple method of clamping.

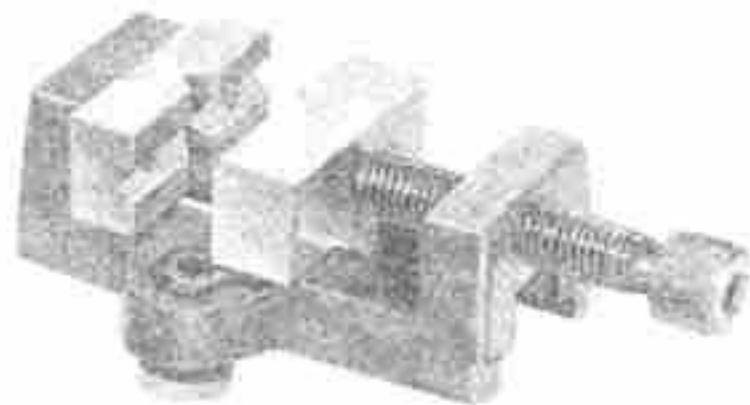


DIAGRAM 20

Milling Table. Order No. 1210 :

The milling table serves primarily for the clamping down of larger and bulky workpieces. By using this special accessory, the UNIMAT becomes an even better milling machine. The milling table has 4 fixing holes, into which two sunk hexagon headed screws with 2 T-nuts can be inserted if desired. The T-nuts are slid into the T-grooves of the transverse (or lateral) support and the table is firmly tensioned by tightening up the sunk hexagon screws. This enables the milling table to be set in the direction of the machine bed, i.e. vertical to it, as well as at an angle of 45° thereto. The type of device chosen for clamping depends both upon the kind of workpiece and on the milling work to be carried out. Clamping of the workpiece is done with the aid of the tensioning claws supplied.

The milling table is also used as a mount for drilling larger workpieces, in place of the surface plate mounted on the support, particularly where it is desirable to secure the workpiece by means of screws. The location of the individual holes can be adjusted for this purpose by means of the longitudinal or lateral support.

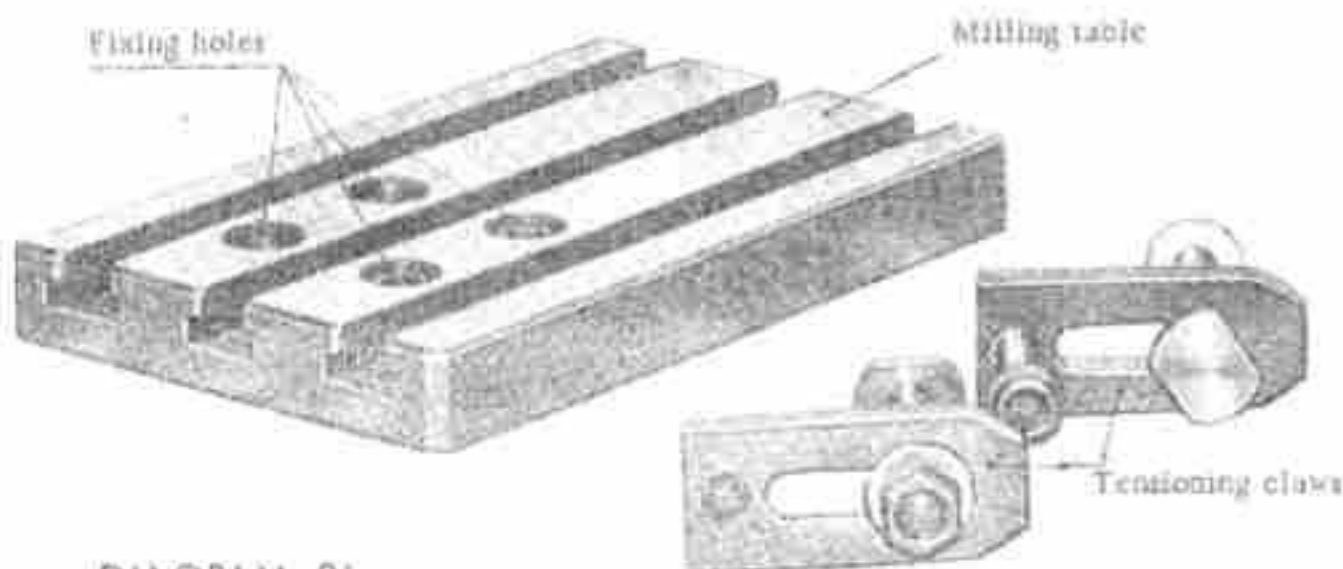


DIAGRAM 21

Flexible Shaft. Order No. 1250:

This device is intended for carrying out drilling, grinding, polishing, engraving and similar operations on larger or irregular workpieces, which cannot be executed on the stationary machine. The machine itself is used here purely as a driving unit. The hand spindle has the same spindle nose as the main spindle on the stationary machine, so that all the tools of the standard machine accessory, such as drill chuck, lathe chuck, grinding wheel flange, can also be used

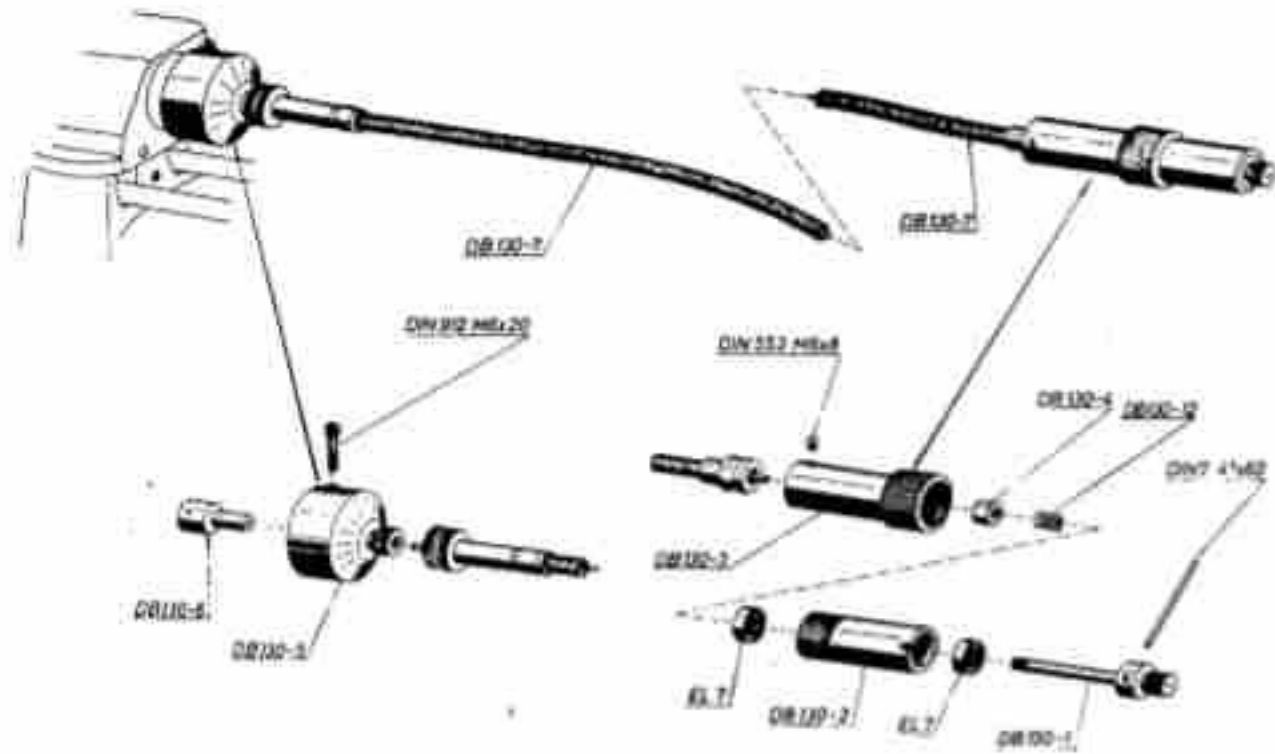


DIAGRAM 22

Assembly of the flexible shaft :

The internally threaded carrying bush (see Diagram 22) is screwed on to the spindle nose of the UNIMAT. Slide the cup over the spindle stock sleeve and securely clamp by means of the clamping screws. Then insert the square head of the flexible shaft into the square hole of the carrier bush and screw the knurled union (or cap nut) of the flexible shaft on to the thread of the cup, thus connecting the shaft securely (against pull-out) to the drive. (No rough milling, use only drills up to 1/8" maximum diameter, speed 3750 r.p.m. maximum). The tool must not jam, otherwise there is a danger of fracturing.

The steady rest. Order No. 1040:

This constitutes an auxiliary guide for long, thin diameter turning parts and prevents vibration and knocking of the workpiece. The steady rest is mounted on both guide columns of the bed and firmly clamped. The pass through aperture goes up to 1.378".

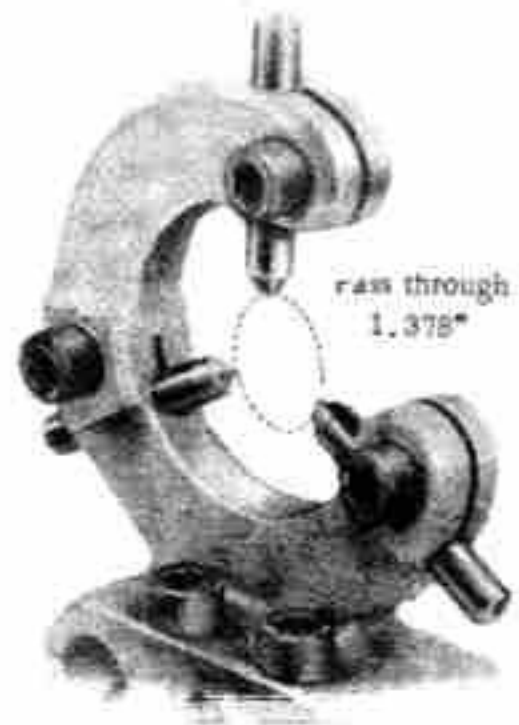
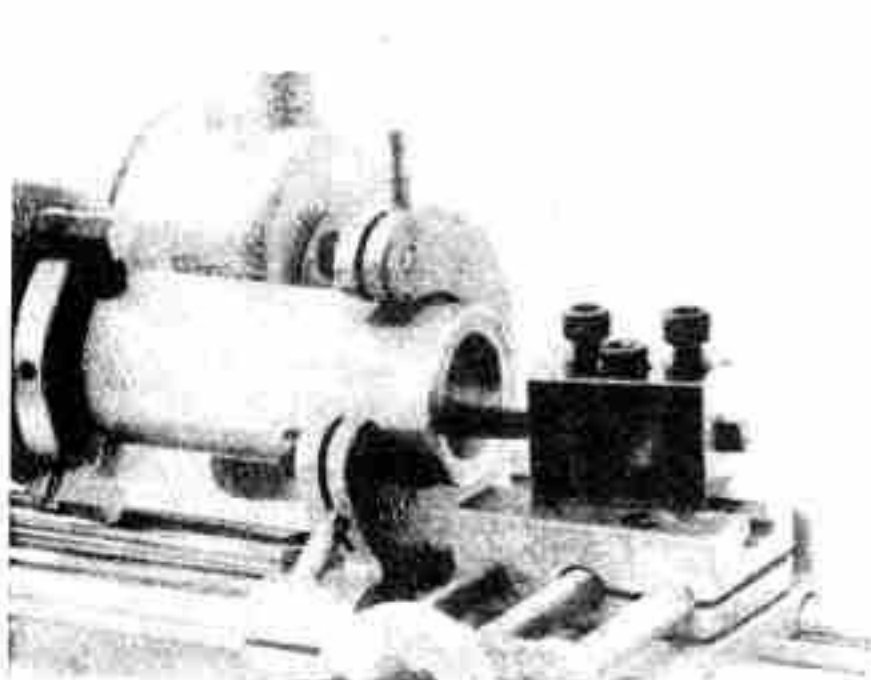
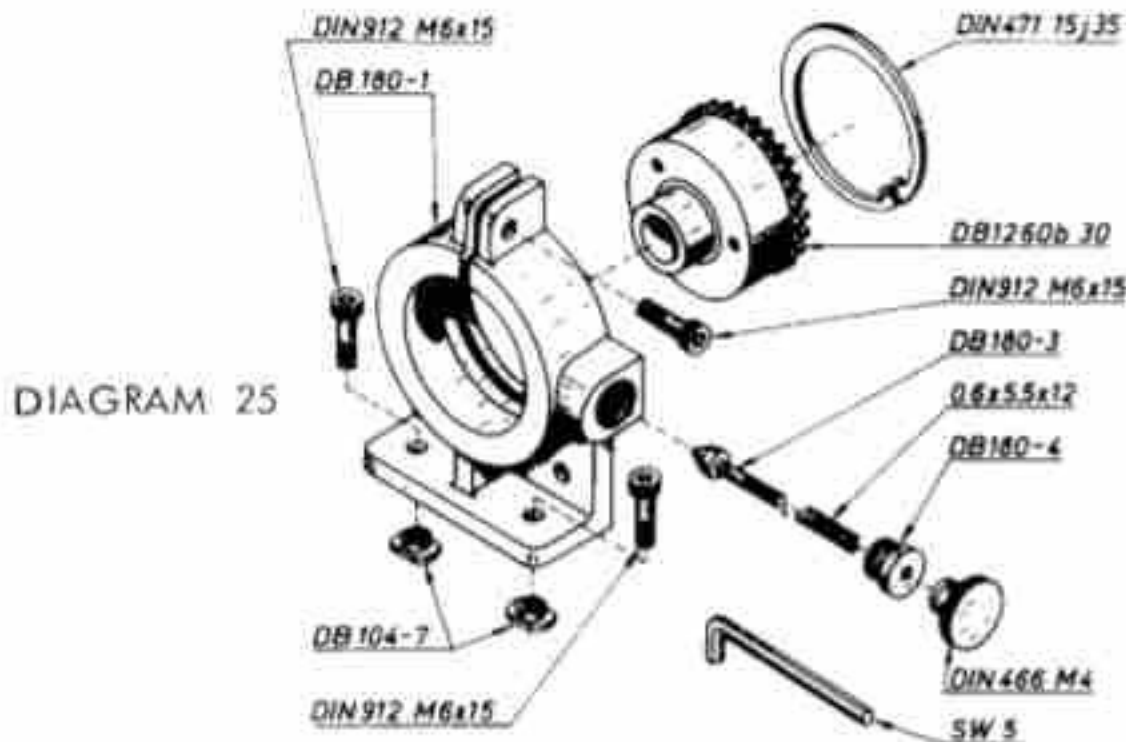


DIAGRAM 23

The Indexing Attachment. Order No. 1260 :

The indexing attachment is secured to the transverse support by means of 2 T-nuts (use the short 'Allen' type key supplied).

Two tensioning positions of the indexing attachment, vertical to each other, on the machine are possible.



With the working axis in the horizontal position, as illustrated, the indexing attachment is used for the milling of all types of gear wheels and the milling of grooves (keyways) in the shell of cylindrical workpieces. With the working axis in the vertical position radial grooves can be milled, dial plates drilled, etc. The indexing possibilities of the index plate supplied by us number 48 maximum, and accordingly the index numbers 2, 3, 4, 6, 8, 12, 16, 24 and 48 are possible. Should you require other divisions, you can purchase other index plates from us. The indexing possibilities may be seen in the adjoining tabulation.

Tensioning the workpiece in the indexing attachment :

We differentiate between 2 possibilities :

The Universal-Lathe-Chuck (without threaded flange) is used for the tensioning of studs, plates, rings. The lathe chuck is screwed to the indexing attachment with the 3 countersunk screws M4 x 25 (as otherwise on the threaded flange).

The Circular Table. Order No. 1261 :

is secured to the indexing attachment in the same way (with 3 countersunk screws) and serves to tension asymmetrical workpieces by means of tensioning claws. In the round table there are, besides, 3 M6 threaded holes for the insertion of retaining screws (locking screws). These provide a further clamping possibility, particularly for workpieces which are drilled and slotted. The workpiece is secured to the round table by means of M6 screws and shims. It sometime suffices for the screw to be located at the very edge of the workpiece, so that



Diagram 26

the screw grips into workpiece
the screw grips into workpiece

As an example of work let us explain the milling of spur gear wheels. The UNIMAT is set up as a vertical machine. Mount the indexing attachment, complete with lathe chuck installed thereon on the transverse support in such a manner (see Diagram 27), that the work axis is horizontal. Clamp the workpiece in the universal lathe chuck (gear wheel with shaft can be clamped direct in the chuck, gear wheel without shaft, but drilled, is provided with a drift for working, the drift being clamped in the lathe chuck). Insert the index bolts (Diagram 25) into one of the grooves of the index plate. Fix the index plate with the clamping screws - clamp the tooth shaping cutter on to the tension drift, which is screwed on to the spindle stock sleeve - adjust height with the spindle stock sleeve rack (tooth tip of milling cutter must be at the height of workpiece centre) - clamp spindle stock sleeve.

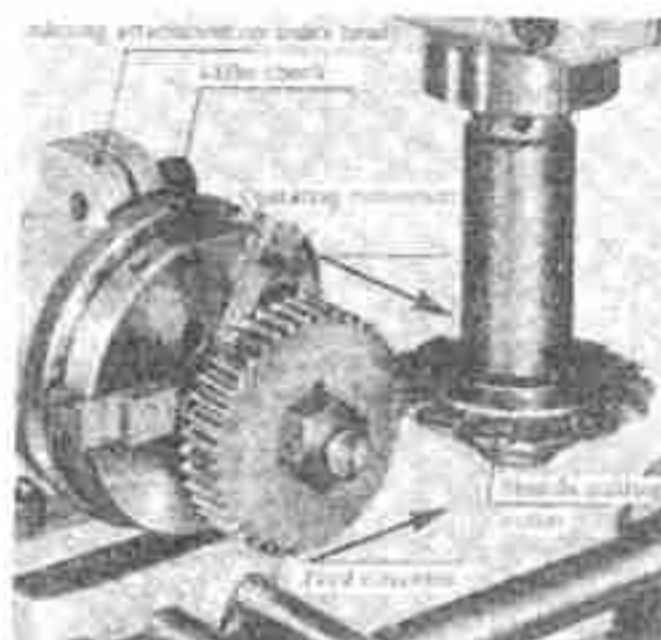


DIAGRAM 27

Set the first shaving by means of the transverse support (milling cutter touching outside diameter of workpiece). Move back workpiece and indexing attachment by means of the transverse support and set depth of teeth by turning the longitudinal spindle. Clamp the longitudinal support firmly during operation (otherwise it will chatter) and with the transverse support mill the bottom land of the tooth.

Second tooth : Move back the workpiece with transverse support - undo the clamping screw - withdraw the index bolts slightly - index again to the desired index amount - let the index bolt rest in the groove and clamp tight - otherwise proceed as before.

Note : By glancing at the clamp slot the number of division marks on the index plate can be seen.

In the position of workpiece and milling cutter described other types of work can also be carried out. Milling of keys, hexagons and squares of screw heads, radial grooves (keyways) in plates, etc.

Operations with working axis of index head in vertical position :

(Drilling of dial plates, Face cutting of keyways (grooves), etc.)

Fix indexing attachment to support with T-nut (same procedure as before, but swing index head through 90 degrees). Clamp workpiece in lathe chuck or on to round table, indexing procedure as for gear wheel milling.

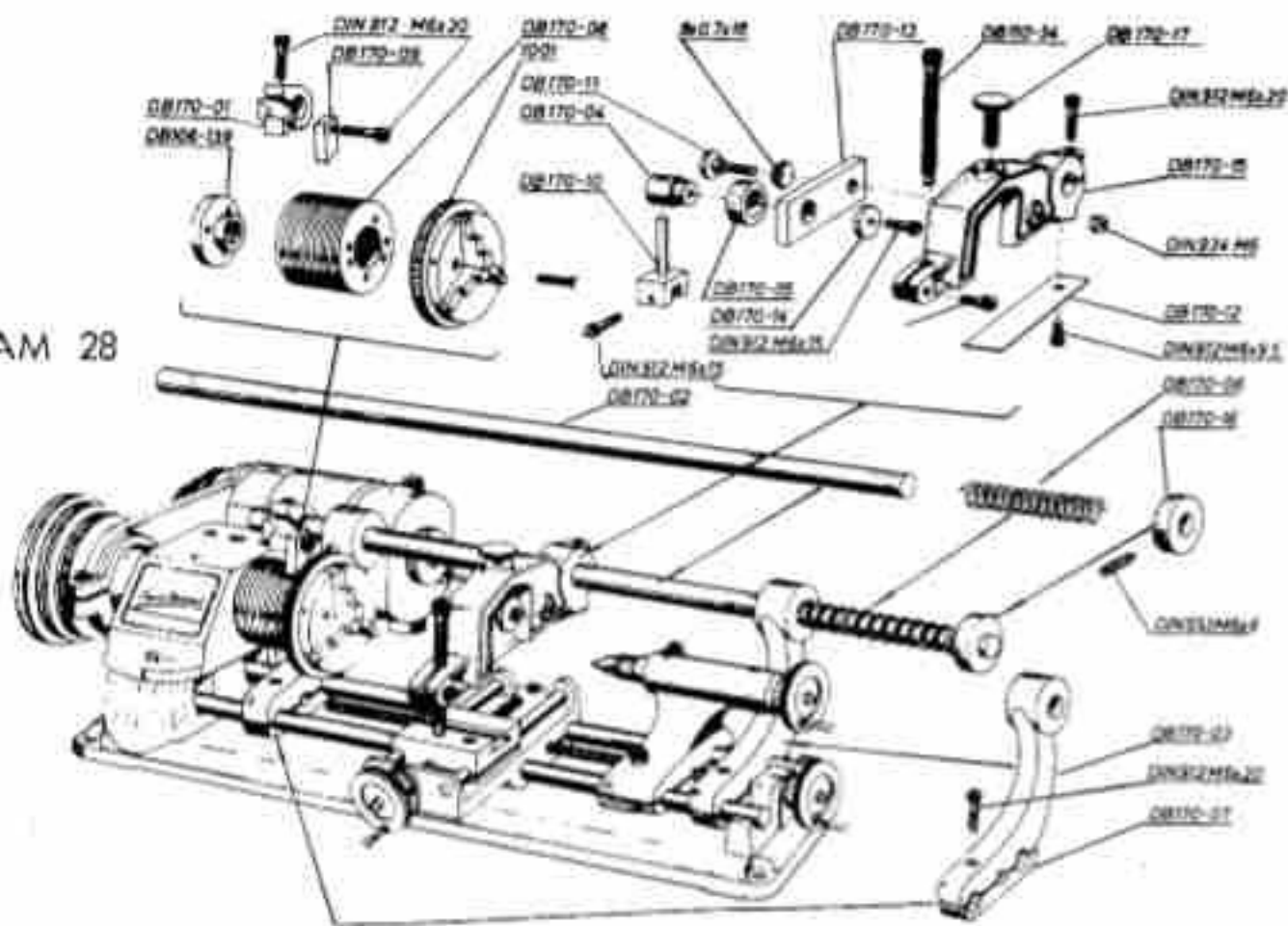
Please note : Before each work procedure always clamp index head firmly.

After removing the snap ring the index plate can be exacted and exchanged for another one. (See tabulation.)

Order No.	Index Plate Number :	Indexing possibilities
1260 b	30	2 3 5 6 10 15 30
1260 c	36	2 3 4 6 9 12 18 36
1260 d	40	2 4 5 8 10 20 40
built-in	48	2 3 4 6 8 12 16 24 48

The Thread Cutting Appliance. Order No. 1270 :

DIAGRAM 28



This is a further auxiliary equipment for the UNIMAT, on which all external and internal threads can be cut. We supply all the associated accessories for it (leaders and followers) (Diagram 28) for the production of various metric or Whitworth thread pitches.

Pitch,

metric threads : 0.5 0.7 0.75 0.8 0.9 1.0 1.25 1.5

Whitworth threads : 16 18 20 22 24 28 32 36 40 48 50 56

Threads per inch :

Thread cutters for internal and external threads may be obtained from us. For other shaped threads (trapezium, flat and round threads) appropriately ground cutters must be used. In addition you will require the Universal Lathe Chuck and chuck flange for clamping the workpiece.

The mounting of the thread cutting appliance will be clear from Diagram 28.

Mount the two angular brackets DB 170-03 on the guide columns of the machine bed. For long workpieces, for which the tailstock must be moved fully to the right you can firmly clamp the right-hand angular holding bracket also to the left of the tailstock on to the guide columns. The Universal-Lathe Chuck must be loosened on the threaded flange and then the chuck flange only screwed on to the spindle head sleeve. Fit the leader on to the chuck flange so that the cup-shaped leader locates over the pushed out spindle head sleeve. (Push the spindle head sleeve right out in the direction of the tailstock.) Then firmly tension the spindle head sleeve again by means of the two clamping screws. Mount the lathe chuck on to the rim of the threaded flange which projects through the leader and secure the chuck and leader with the 3 countersunk screws M4 x 30 to the flange.