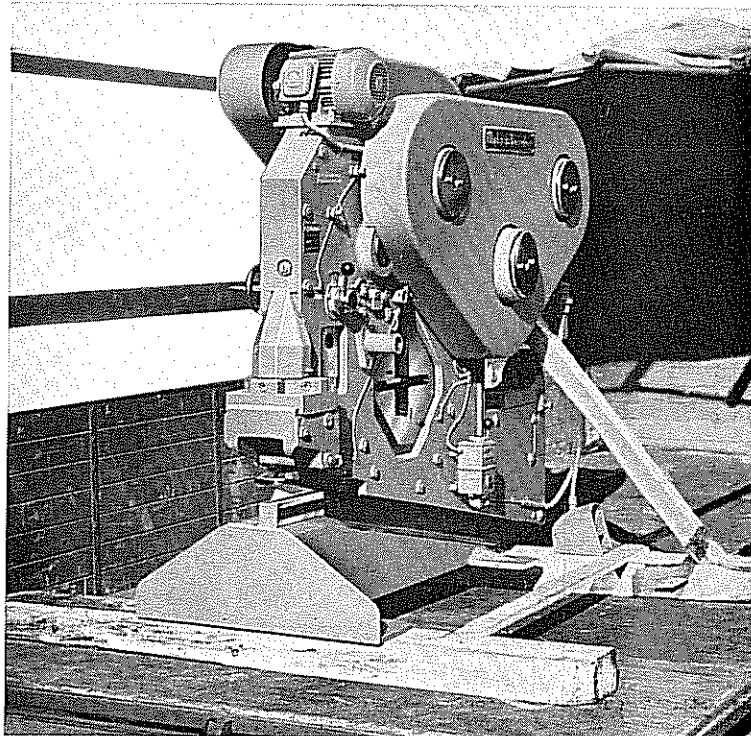


Transportation

When handling the machine with a crane, hook it up in the eye bolt provided for that purpose.

Fig. 1: Transporting the machine with a crane



When transporting the machine on a truck, stabilize by bolting it to sturdy planks and secure against lateral tilting.

The weight of your machine is stated in the brochure attached.

Fig. 2: Transporting the machine on a truck

Erection

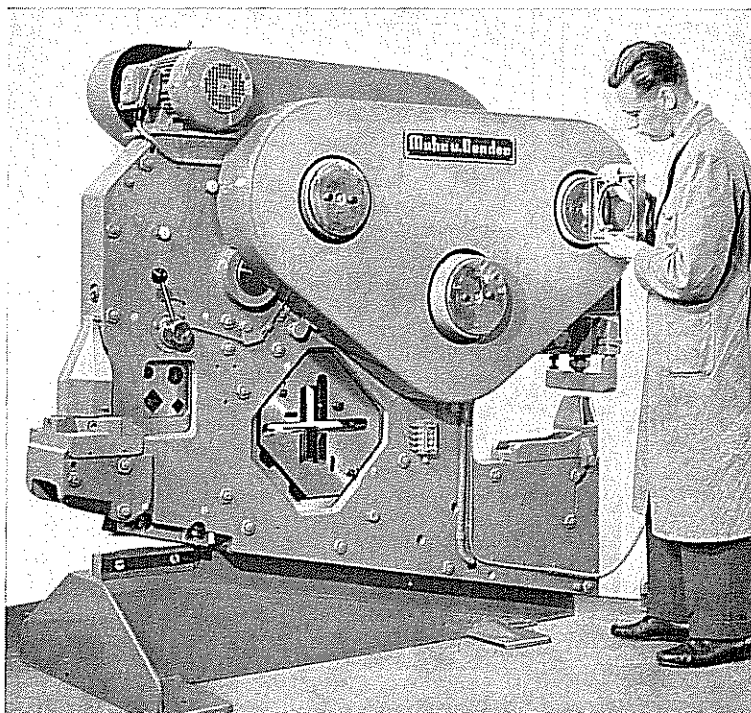
Machines ordered with a steel base can be placed on the level shop floor without further fixing (the steel base is readily obtainable from us and saves you the foundation work otherwise necessary).

For concrete foundations use the foundation plan enclosed. Securely tighten foundation bolts after the grouting has set.

It is advisable to place the machine in as near vertical position as possible to insure proper distribution of weight on moving parts.

Instead of the steel base, a guidable chassis can be supplied. If you have one already, make sure to place it on a level surface and block the wheels.

Fig. 3: Checking for suitable erection and footing



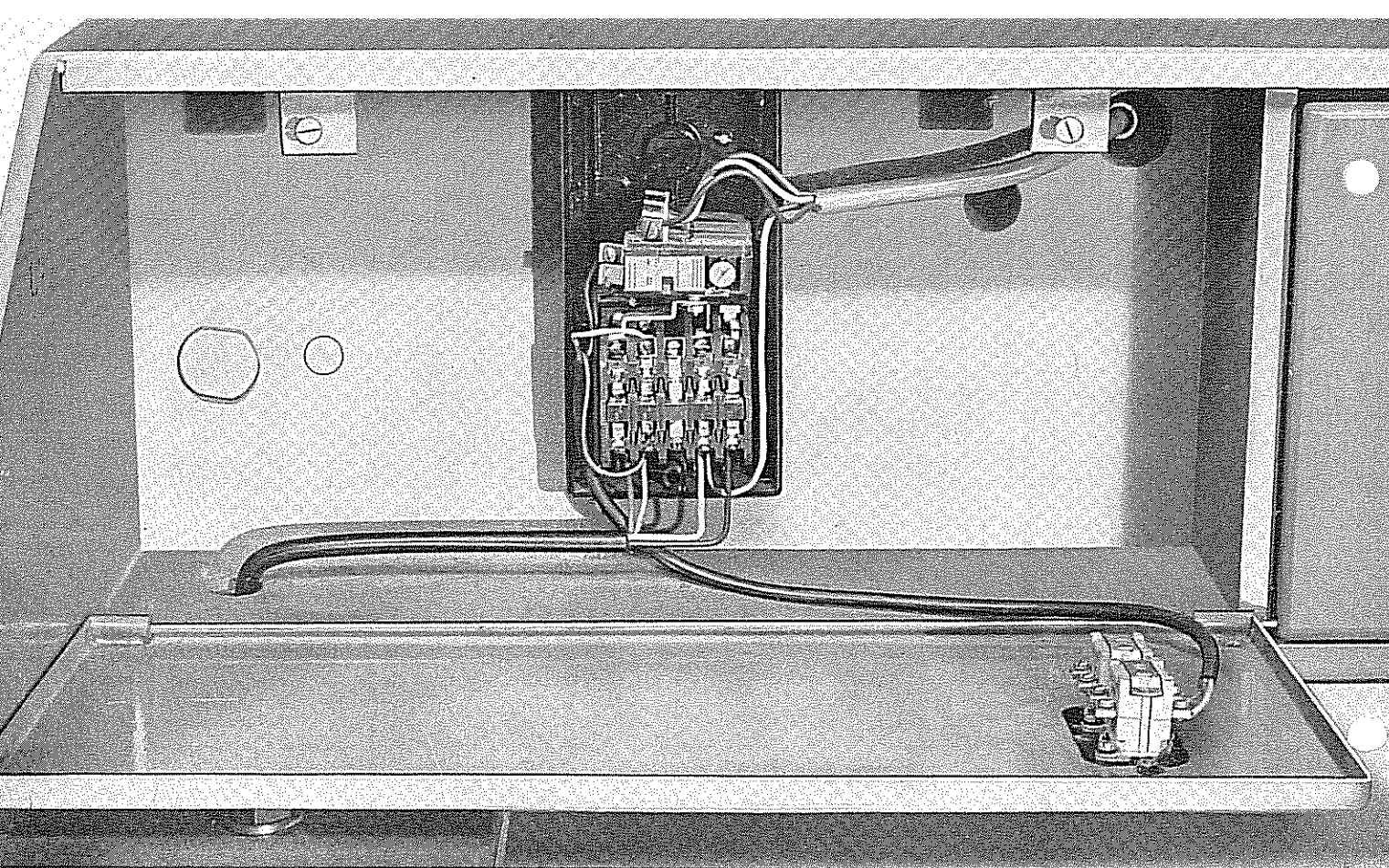
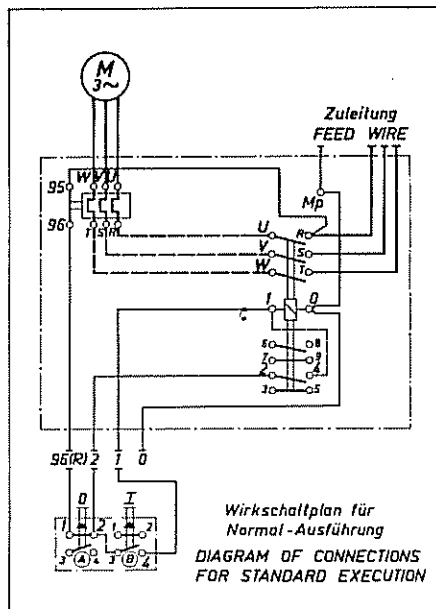


Fig. 4: Connection of the power supply

Connection and Operation

The machine is ordinarily shipped ready for operation. For proper connection of the motor, see the wiring diagram. The steel base is provided with a hole to pass the wiring through. If a concrete foundation is used, it should have an electrical duct provided in it.

Rotate the flywheel by hand in the direction of the arrow prior to operation, setting the engagement to continuous stroke (see ENGAGEMENT section) to make each slide move up and down several times. Simultaneously check the working slides for correct performance and the tools for proper adjustment.



For machines equipped with solenoid actuated clutches, pull the rod mechanism downward (see SOLENOID ENGAGEMENT section).

Now start the motor briefly and if the flywheel does not rotate in the direction of the arrow, stop the motor and exchange any two of the three entering the motor terminal box wires.

Lubricate the machine thoroughly (see LUBRICATION CHART).

Fig. 5: Make sure flywheel rotates in the proper direction



Clutch and Engagement

1. Clutch

On all MUBEA machines each working slide has its own drive and thus also its individual clutch and engagement. The

MUBEA clutch is a robust and absolutely dependable rolling key type.

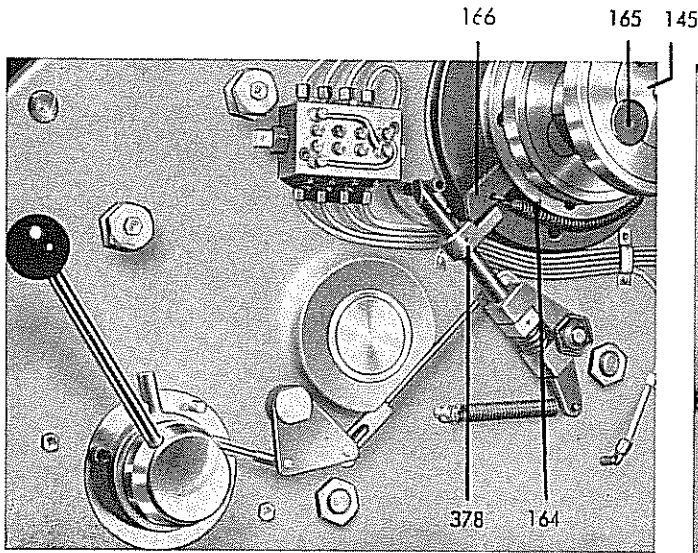


Fig. 6: Rolling key in disengaged position

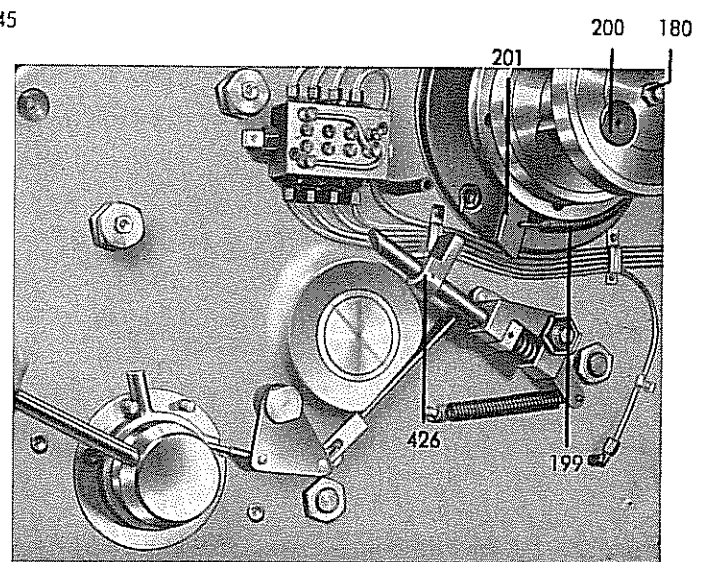


Fig. 7: Rolling key in engaged position

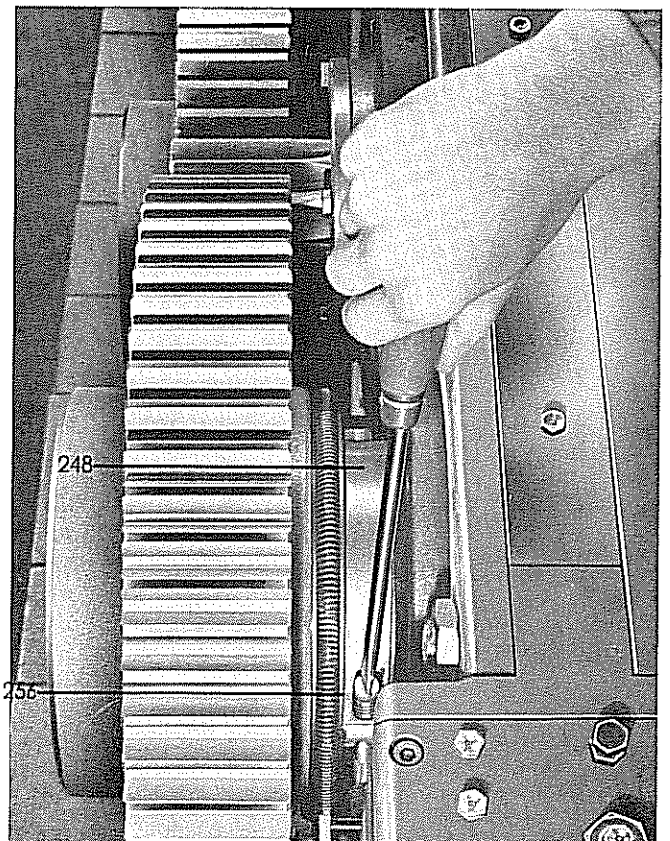
When the clutch is disengaged, the eccentric shaft is at rest in the upper dead center of the slide, while the clutch gear rotates on its bearing. When actuating the engagement, the rolling trip arm stop No. 378 (plate shear), No. 426 (section shear), No. 461 (punch) is swung away and the rolling key lever Nos. 166, 201, or 241 is released. The rolling key Nos. 165, 200, or 240 is pulled into engagement position by means of the tension spring Nos. 164, 199, or 239, thus positively connecting the eccentric shaft Nos. 145, 180, or 220 with the drive gear Nos. 154, 189, or 229 via the coupling sleeves Nos. 155, 190, or 230. The rotating drive gear now forces the eccentric shaft to follow the rotation and thus moves the slide.

When the engagement lever is released, the rolling key stop returns to its original position. After one full revolution of the eccentric shaft, the rolling key encounters the stop and is rotated out of engagement so the eccentric shaft is again at rest in the upper dead center while the clutch gear continues to rotate freely.

In time the rolling key will make a clicking noise which indicates the brake band Nos. 248 (plate shears and punch) or 260 (section shears) requires tightening by turning the brake adjusting screw, Nos. 256 or 268, clockwise until the clicking stops.

The clicking noise may also be due to excessive slide clearance. Check the slide guides and readjust if necessary (see section ADJUSTMENT OF THE SLIDE GUIDES for plate shear, section shear, and punch).

Fig. 8: Adjustment of the brake band



If the machine stops during cutting for any reason (electrical failure, blown fuse) immediately turn off the power. If there is work in the cutting tool, the machine is under high compression stresses. To relieve these, turn the flywheel in reverse. This relieves the rolling key which may then be swung out.

As the eccentric is fixed in a given position, the stop plate must be retained by hand. Then restart the motor, have the

flywheel and gear pick up full speed, and release the rolling key. This will snap into place and the shearing can be finished.

If the stopping of the machine is due to overloading (excessive material section or tensile strength), first make sure that the machine is not damaged. Stop the machine entirely, engage the various slide, and turn by hand (see section CONNECTION AND OPERATION).

2. Engagement

The machine is normally equipped with a hand engagement system. The engagement lever is within easy reach of the operator. A selective switch is provided which can be set for single stroke or continuous stroke.

a) Single Stroke

With the selective switch set to SINGLE STROKE, pull the engagement lever Nos. 418, 457, 492 steadily downward against the stop and release immediately. After releasing, the engagement lever swings back into its original position and the working slide stops after completion of one full stroke.

b) Continuous Stroke

With the selective switch set to CONTINUOUS STROKE and the engagement lever pulled downward against the stop, it is locked in its lower position and the working slide continues moving.

Fig. 10: Selective switch in the CONTINUOUS STROKE position

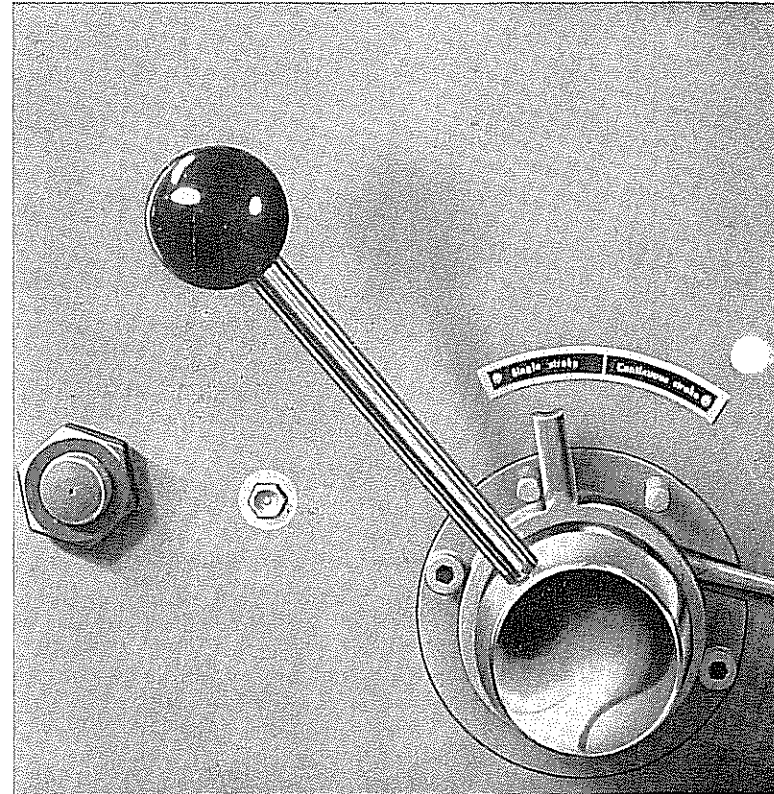
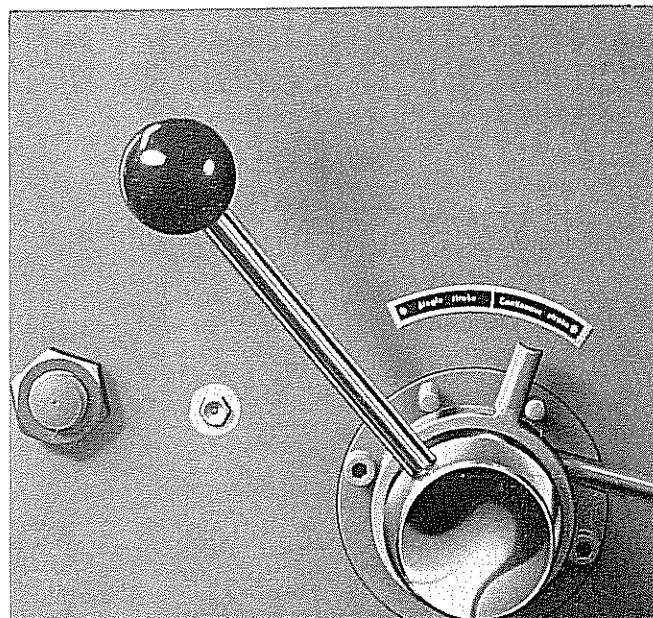
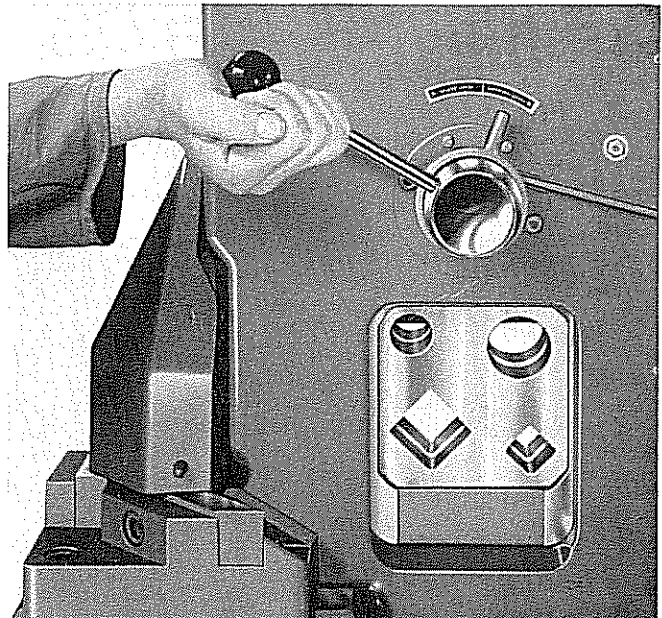


Fig. 9: Selective switch in the SINGLE STROKE position

When the working slide is to be stopped, simply move the engagement lever upward by hand. The working slide will then come to rest in normal manner.

Fig. 11: Switching from continuous stroke to single stroke



3. Foot Engagement

Each clutch may also be equipped with a foot engagement by means of a flexible cable. This enables the operator to hold the work with bolt hands, and he may also actuate the engagement anywhere around the machine depending upon the length of the cable. The foot engagement system is recommended for all 3 working stations. It can be installed at any time. Installation instructions will be supplied with the attachment.



Fig. 12: Foot engagement set

4. Solenoid Engagement

Each clutch may also be operated by means of a solenoid engagement which is far easier to actuate than a mechanical engagement system. The rolling key stop is connected to the solenoid which is actuated either with a hand push button or a foot pedal switch. The pedal switch is merely connected with the machine by

means of a cord and plug system and can be placed anywhere it is most convenient for the operator.

The solenoid clutch engagement may also be attached at any time by the shop electrician. Detailed installation will be supplied with the attachment.

Fig. 13: Solenoid clutch engagement

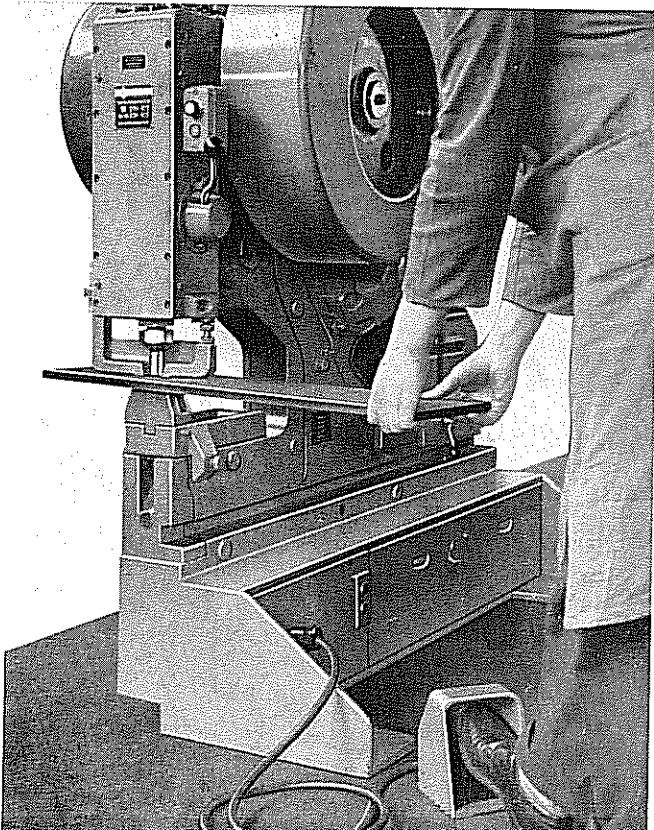
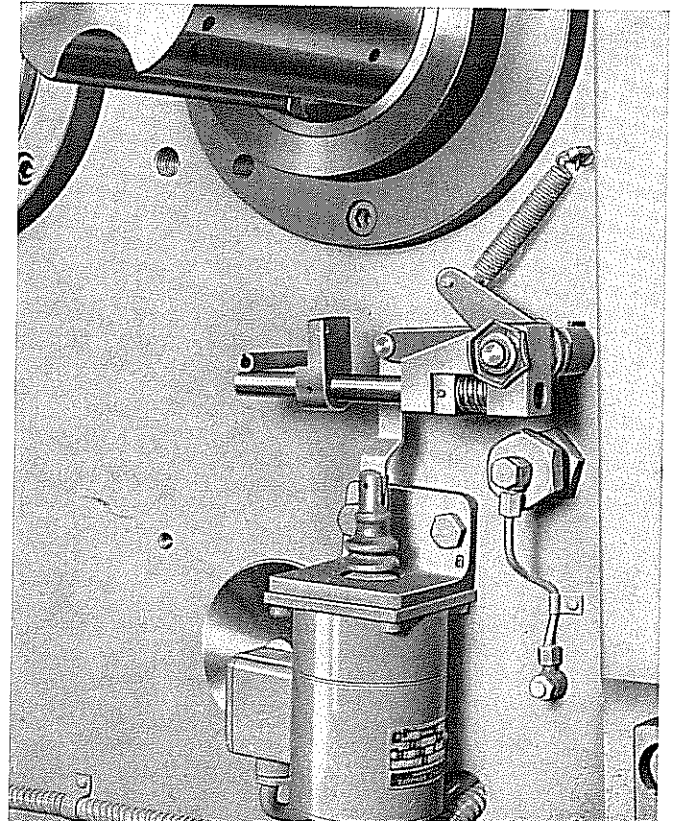


Fig. 14: Clutch solenoid



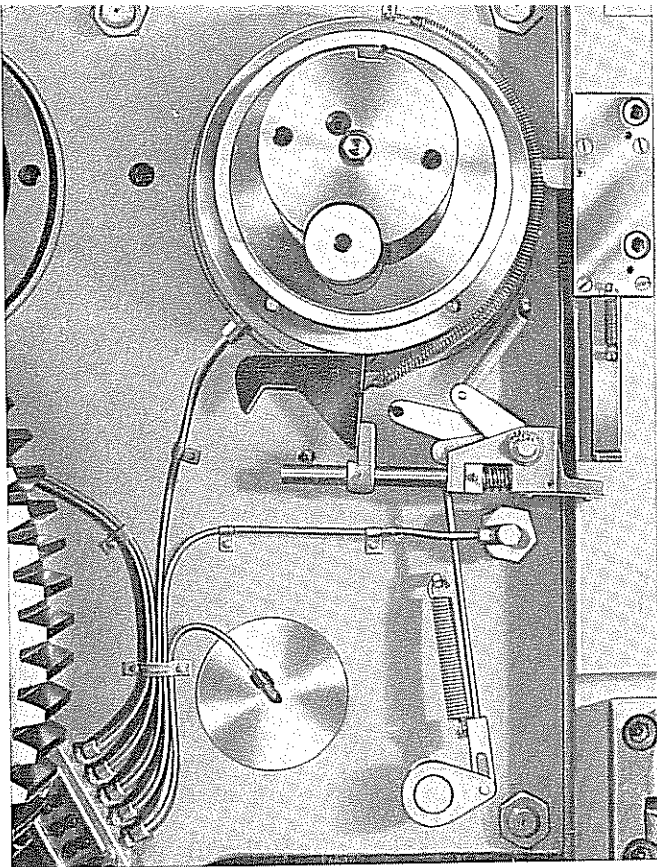


Fig. 14 a : Rotating key in neutral position

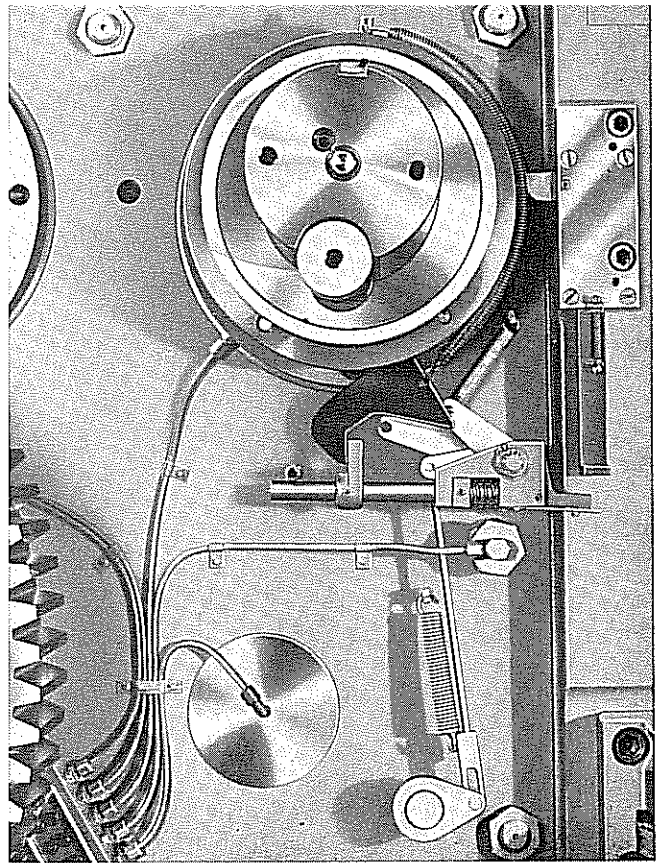
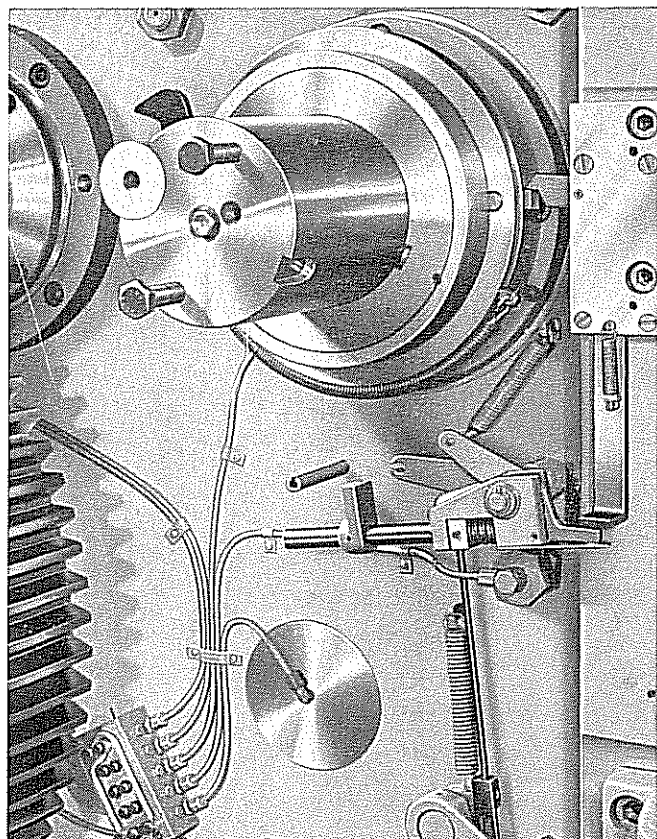


Fig. 14 b : Single-stroke safety device becomes effective via second control lug

5. Device to prevent accidental engagement and starting

Each rolling key clutch has a device to prevent accidental starting and engagement. This device functions reliably and does not permit the machine to be engaged while not working. If the engagement lever is actuated while the machine is stationary, a second control lug on the rolling key plate prevents the rolling key engaging when the machine is started.

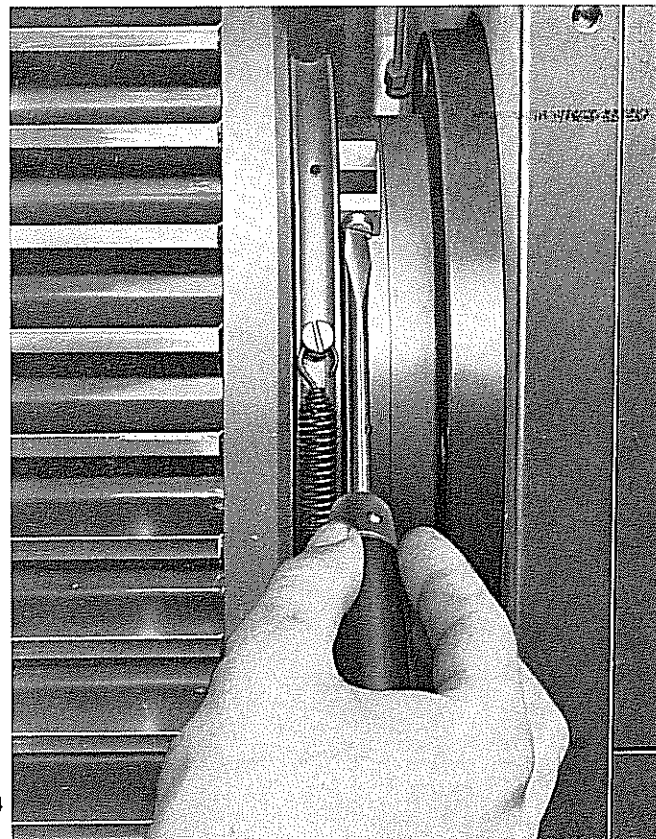
Fig. 14 c : The single-stroke safety device



6. Single-stroke safety device

The device for preventing repetition of a single stroke is absolutely reliable and conforms to the safety regulations. This is equally true for engagement by hand, foot or solenoid. This device prevents the working stroke being repeated, even if the engagement lever is held in the engaged position. If the machine is to work continuously, the safety device has to be rendered inoperative by removing the engaging bolt. The disengaging bolt 247 b in Fig. 14 has to be removed. Single stroke and continuous operation are then actuated as described in sections a and b.

Fig. 14 d : Removing the control pin



Lubrication

a) Lubricants

The machine is principally lubricated with oil. The same oil can be used for all points of lubrication.

The following brands of oil may be used:

Maker: DEUTSCHE GASOLIN

Brand: Special Oil BSS, viscosity 12 E at 50°C

Maker: DEUTSCHE SHELL

Brand: Tonna Oil 72, viscosity 13 E at 50° C

Maker: MOBIL OIL A. G.

Brand: Vactra Oil No. 4, viscosity 12.8 E at 50°C

Maker: ESSO A. G.

Brand: Millcott K - 65, viscosity 12.5 E at 50°C

Maker: BP A. G.

Brand: Energol HP 60-C, viscosity 12 E at 50°C

Maker: BV - ARAL

Brand: BV-Oil P 20 30 A, viscosity 12 E at 50°C

b) Manual Lubrication

The oil is applied by means of the lubricating hand gun enclosed in the tool set. Stick to the Lubrication Chart attached and make sure to press in the prescribed oil quantities regularly.

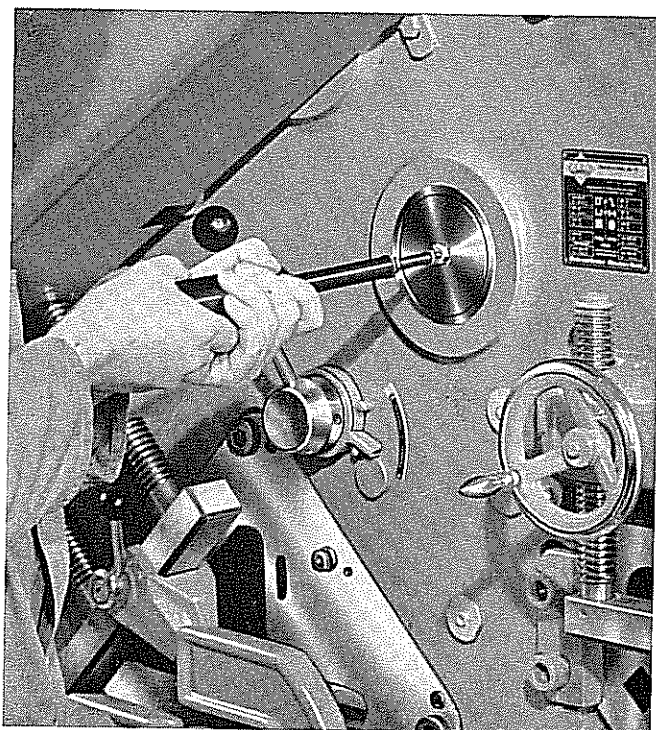


Fig. 15: Lubricating with the hand gun

c) Centralized Lubrication

In the Tecalemitte one-shot pressure lubrication system, substantially the same oils can be used as for manual lubrication, using the hand pump attached to the machine. A plate giving lubricating instructions is fixed beside the hand pump. Please follow those instructions closely. The hand lubricating pump is operated by steadily pulling the pump lever against its stop, at the same time making sure that oil flows out in the sight glass at the head of the pump. Count that gun stroke as the first one which causes the oil to overflow.

To enable the dispensing valves to operate properly, wait for about 15 seconds between the pump strokes. You will find detailed instructions on the maintenance of the lubricating system in the Maintenance and Serving Instructions by the Tecalemitte Company, enclosed in this manual.

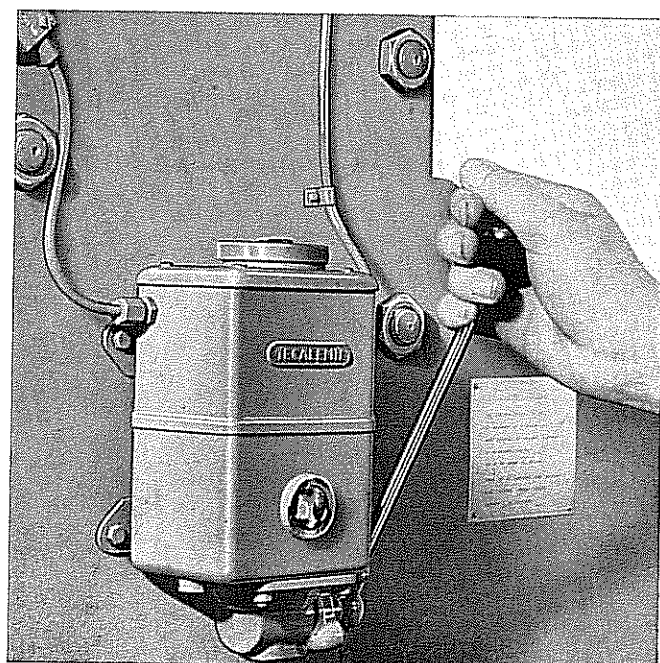


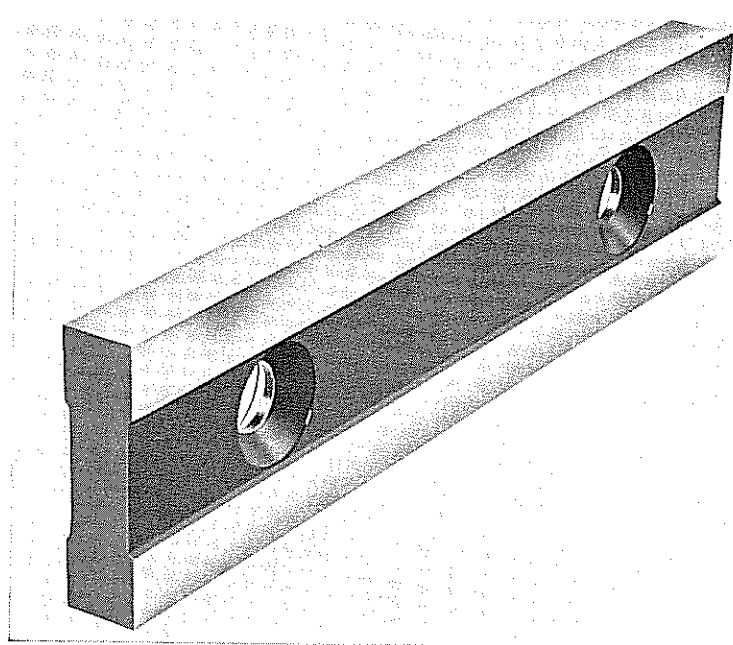
Fig. 16: Tecalemitte lubrication

The Plate Shear

1. The Blades

The upper and lower blades are interchangeable and can be used on four edges.

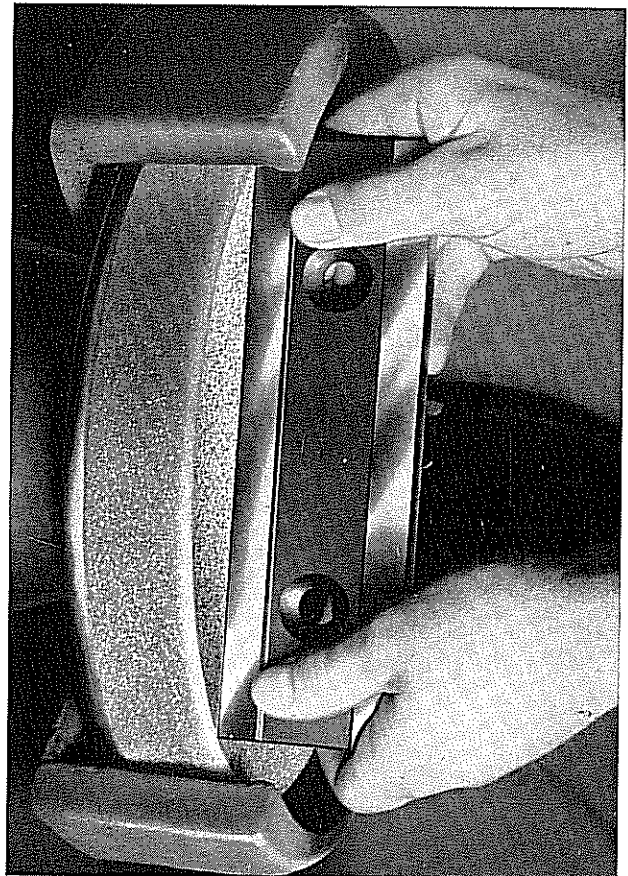
Fig. 17: Plate shear blades with four cutting edges



2. Sharpening

Always sharpen the blades immediately when they appear dull. Sharpen by surface grinding only the two largest faces of the blades. All four surfaces on each blade must be flat and parallel to insure perfect contact in the slide and/or body at all times and to avoid a change in the rake angle. Worn blades must be replaced by new MUBEA blades (part No. 610).

Fig. 18: Sharpening the plate blades

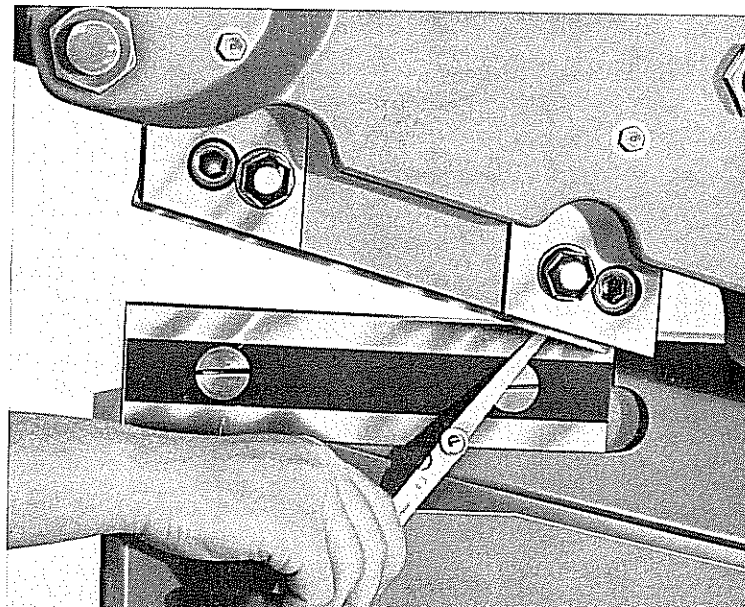


3. The Shearing Gap

After sharpening, a shim should be placed between the lower blade and machine body to compensate for the steel removed in grinding. Check the shearing gap between the blades to be sure the gap is from 5 to 10 per cent of the plate thickness to be cut by using a feeler gauge and simultaneously turning the knife slide down slowly. The shearing gap should be approximately .008 to .012 of an inch narrower in front than at the rear. The setting is made at the factory for average material thickness.

For cutting extremely thin sheets, reduce the shearing gap by backing the lower blade with a metal shim.

Fig. 19: Checking the shearing gap



4. Adjusting the Hold-down

The material to be cut must be securely held in horizontal position. Faulty adjustment of the hold-down results in damage to the blade edges or serious damage to the slides.

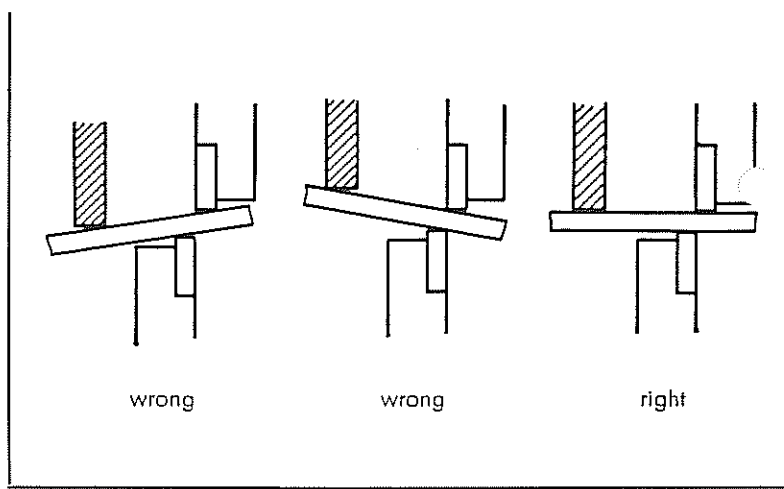


Fig. 20 : Right and wrong adjustment of the hold-down

5. Cutting Flat Bars

For the distortion-free cutting of flat bars, a non-deform upper blade (Part No. 618) is available as an extra accessory. Such a blade has a smaller rake angle, thus lowering the capacity.

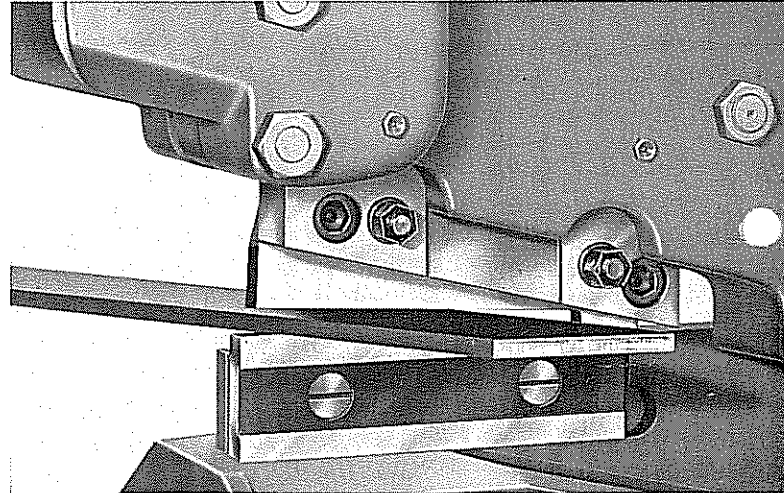


Fig. 21 : Distortion-free cutting of flat bars

6. Exchanging the Knives

Loosen the lock nut No. 614 and hexagon nut No. 613 and remove the screws bolts No. 611 and No. 612. Now withdraw the knives. When installing, proceed in reverse order.

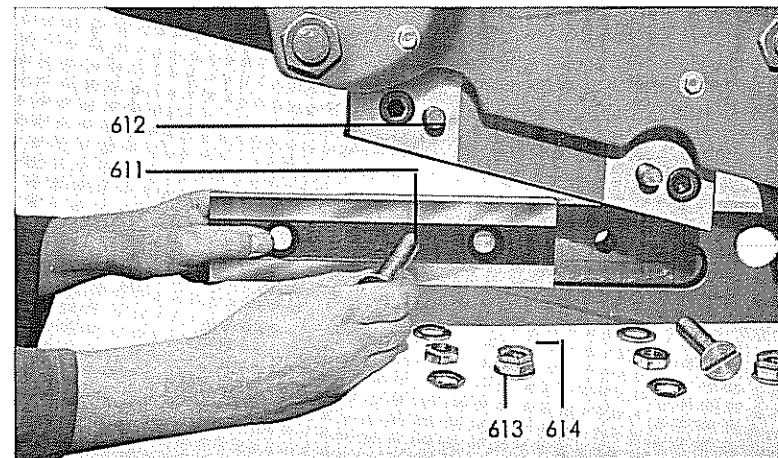
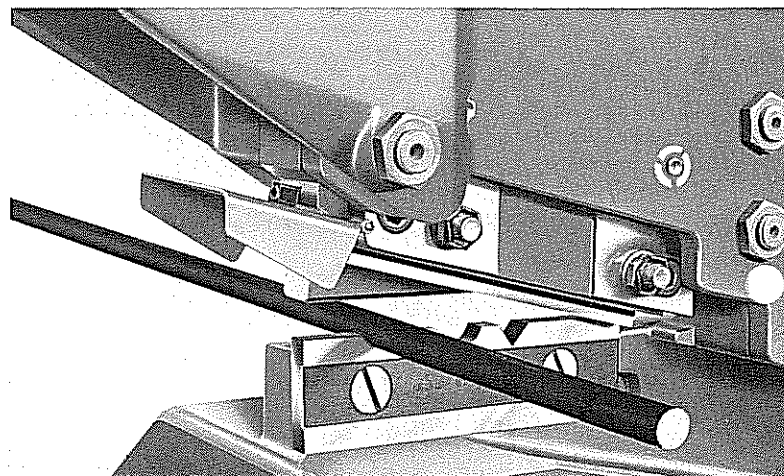


Fig. 22 : Exchanging the plate knives

Fig. 23 : Profile plate knives

7. Special Knives

The plate shear can be equipped with special profile knives for cutting rounds, squares, or hexagon bars. Sometimes an oily or very smooth and slippery surface on flat bars or plate will have a tendency to force the stock out. A serrated blade is available to overcome this.



8. Adjustment of the Slide Guides

The plate slide is adjustable on all sides.

a) At the face (Figs. 24 and 25).

Loosen the upper and lower lock nuts No. 57, turn two adjusting screws No. 56 to the right until a marked resistance is felt. Give the adjusting screws No. 56 $\frac{1}{16}$ turn to the left and re-tighten the lock nuts No. 57.

b) Across the machine (Fig. 26).

Loosen the lock nuts No. 64 (2 each at the upper and lower front side of the machine), turn the slide adjusting screw No. 61 to the right until a marked resistance is felt. Give the clamp bolts a $\frac{1}{16}$ turn to the left and tighten the lock nuts No. 64.



Fig. 24: Adjustment of the slide guides, upper face

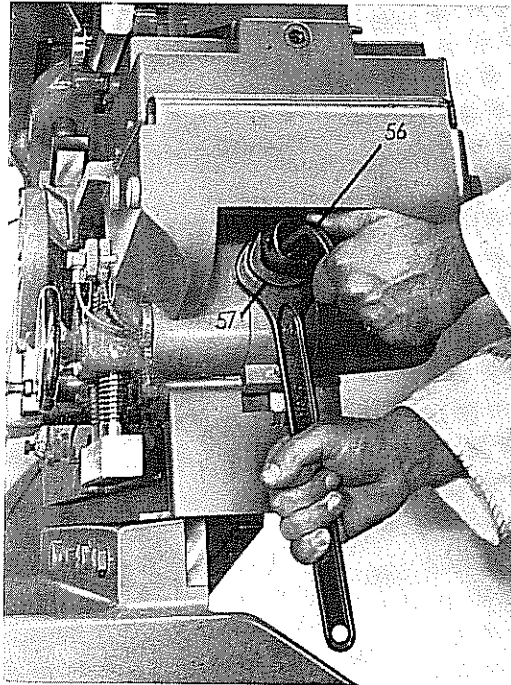


Fig. 25: Adjustment of the slide guides, lower face

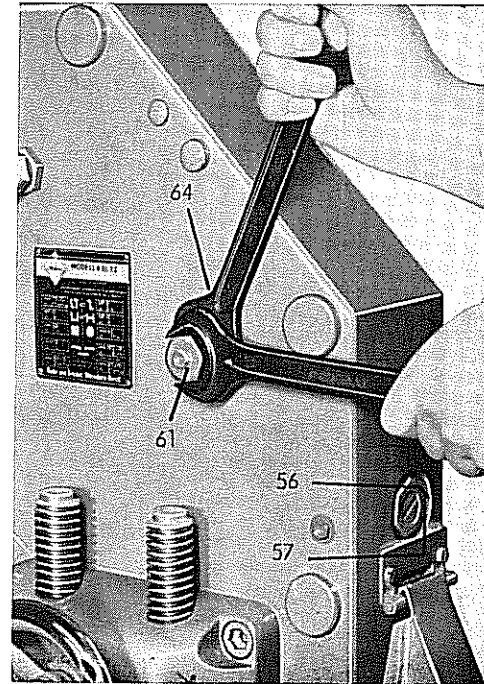


Fig. 26: Adjustment of the slide guides, sides

The Coper-Notcher

1. General

The machine was supplied to you with either a triangular or rectangular notcher. You may obtain either tool later on, and they are easily interchangeable.

2. The Triangular Notcher

Particularly suitable for the economical manufacture of frames from angles and tees. The tip of the triangular notcher is flattened to eliminate distortion at the section root after the bend is made.

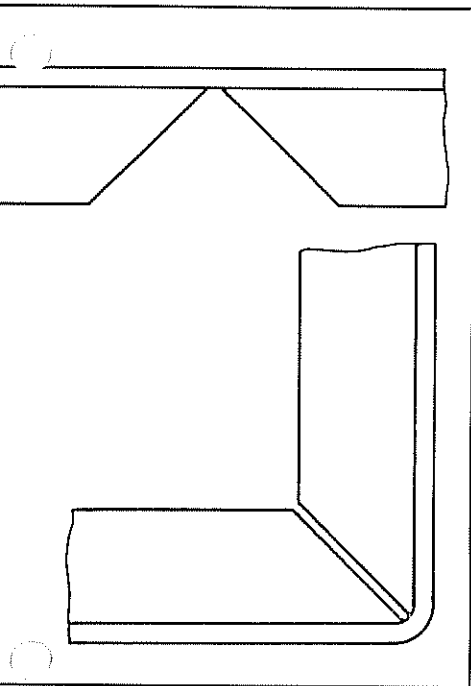


Fig. 27: Triangular notching for frame bending

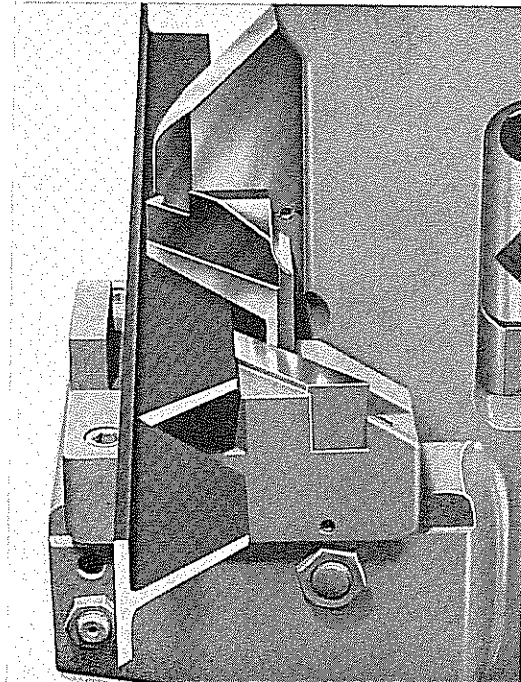


Fig. 28: Notching the web of a tee

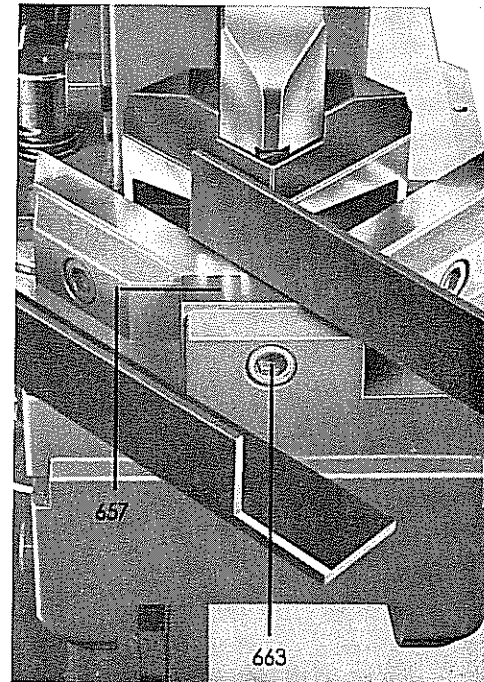


Fig. 29: Rectangular coping with the triangular notcher

When notching tees in the web, remove the front blade No. 657 by loosening the screws (Part No. 663) to accommodate the flange of the tee.

By Means of the triangular notcher, angles can be rectangularly coped at the ends by placing them at an angle of 45°. Any length may be coped by successive feeding in.

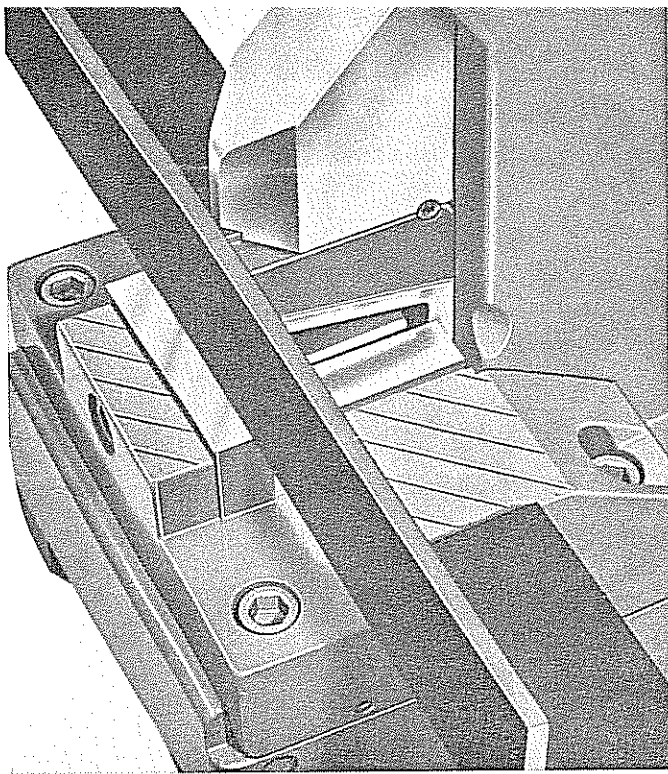


Fig. 30: Wide rectangular notching

3. The Rectangular Notcher

Particularly suitable for notching and coping the flanges and webs of various sections.

Wider notches are achieved by successive cuts as is a greater notching depth.

When triangular notches are to be made, the material is placed at an angle of 45 degrees by following the convenient guide lines.

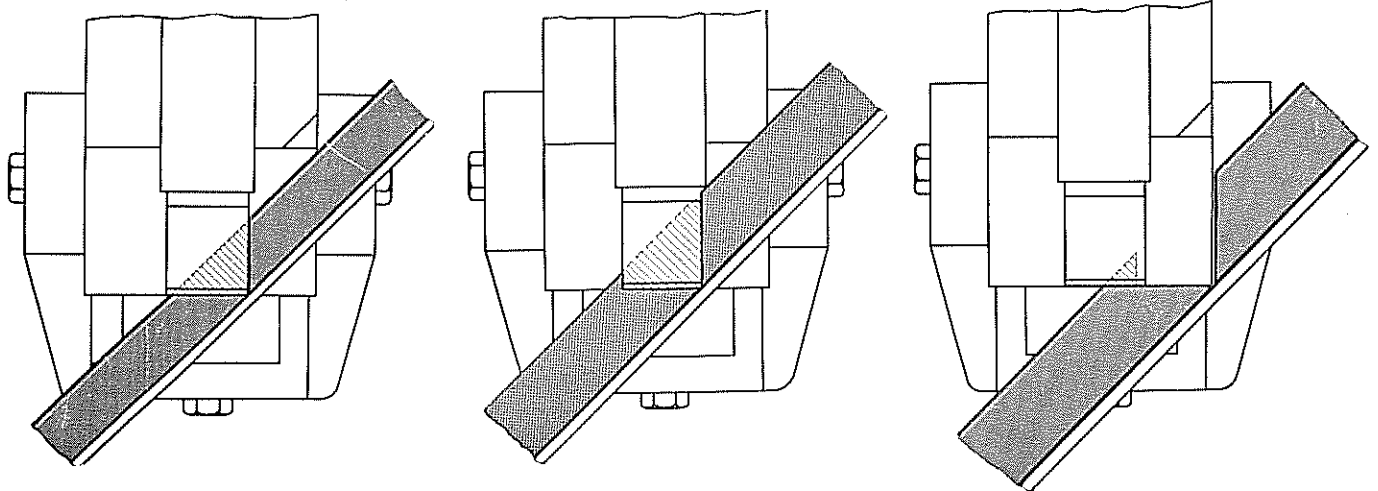
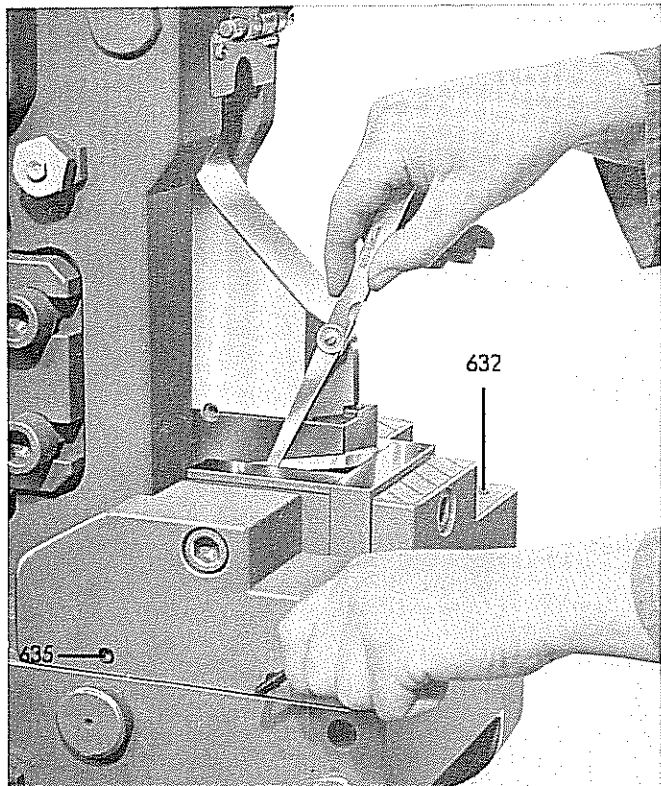


Fig. 31: Triangular notching with the rectangular copier

Fig. 32: Checking the shearing gap



4. Adjusting the coping and notching tools

The notching saddle is adjustable, thus making it easy to set the lower blades relative to the upper blade. Make sure the shearing gap is uniform.

The shearing gap should be 5 to 10 per cent of the thickness of the material to be notched. Lower the knife slide until the upper knife dips into the lower part of the tool. Check by means of a feeler gauge.

For adjustment, loosen saddle screws No. 632 on rectangular, or No. 652 on triangular, and move the saddle into correct position by means of the set screws No. 635 on rectangular, or No. 655 on triangular. Finally securely tighten the saddle screws.

5. Sharpening the Rectangular and Triangular Notchers

Regrind the upper blades at their lower faces and the lower blades at their upper faces only. Make sure that the shearing gap is accurately reset when replacing the blades. Frequently wipe the cutting edges with oil.

6. Special Tools

The MUBEA machine may also be equipped with special notching and coping tools, such as those for rounding butt straps, coping flats for their welding to round stock or pipes, multi-diameter pipe or tube coping tools, etc.

If you want to cope or notch without previous marking, you may obtain special platform, guide rails, etc.

Please let us have your inquiries and we will work out the most economic method for you.

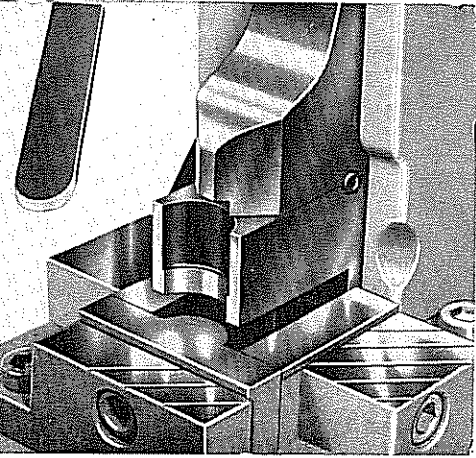


Fig. 33: Rounding of flats

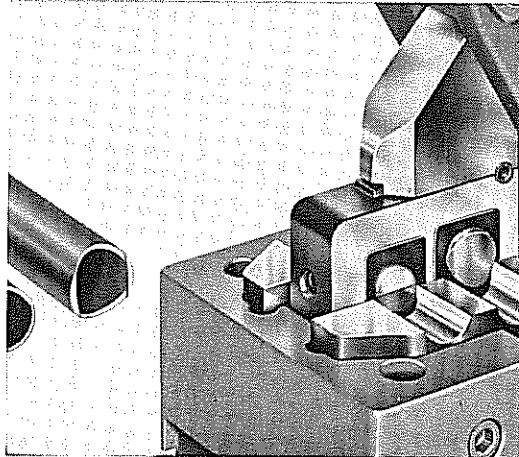


Fig. 34: Pipe coper

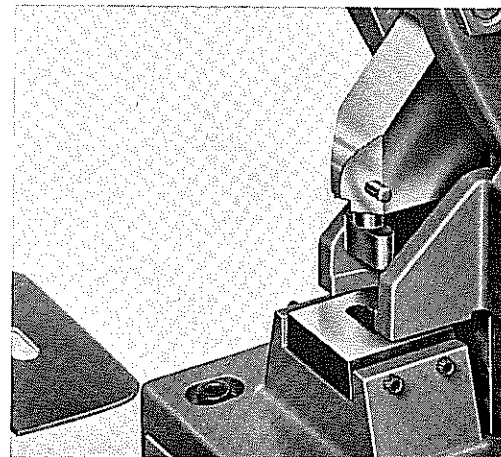


Fig. 35: Punching attachment

CAUTION

A guard is provided for the copier-notcher, which can be raised and will remain out of the way by means of a spring action. We strongly advise that this guard be kept lowered at all times when the copier-notcher is not being used.

The Bar Shear

1. Blades

The blades of the bar shear are usually provided with cutting openings for round and square bars. The blades are square in shape and have cutting edges on both faces so that eight cutting edges can be used by turning and rotating.

2. Sharpening

The blades should be ground on the faces only. Be sure to have MUBEA spare blades on hand, part Nos. 620 and 621, because dull blades necessitate a higher cutting pressure and result in poor cuts.

3. The Shearing Gap

The bar shear blades must not be closely compressed, but a shearing gap of .012 to .020 inches should be allowed. The machine is correctly adjusted on delivery.

The clamp plates No. 622 must not compress the blades. When the blades are reground, the clamp plates No. 622 must be readjusted, too.

The shearing gap is checked by tightly forcing the bar shear blades to the rear and measuring the gap between the clamp plate and the adjoining blade with a feeler gauge.

4. Hold-down

The hold-down must always be so adjusted that the work is held in a horizontal position during cutting.

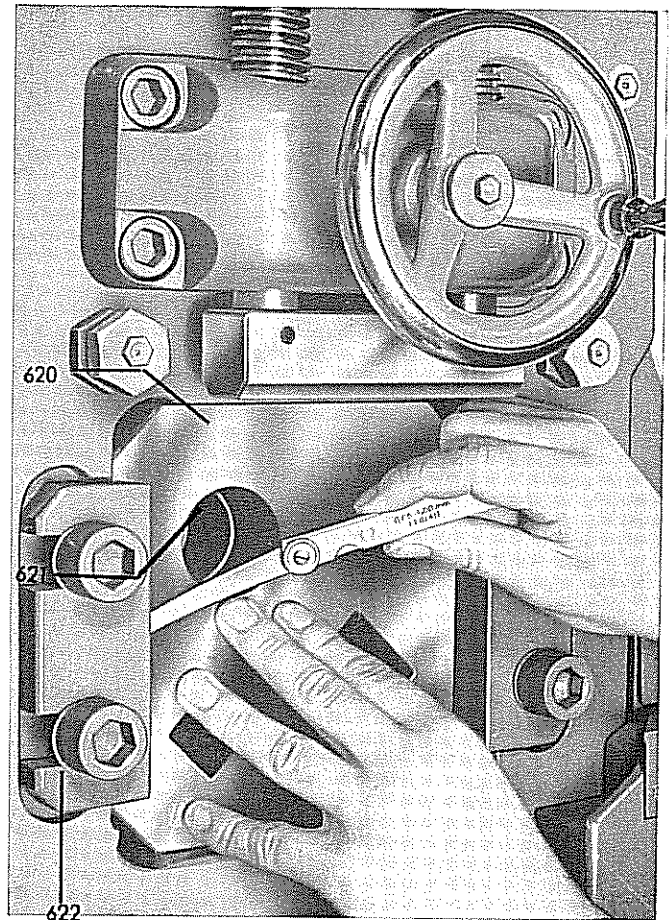


Fig. 36: Checking the shearing gap

Round stock and square are held down with the hold-down No. 773 only. If knives for angles and tees are inserted, the damping block No. 776 must be mounted on the hold-down bar to hold down the section at its root. The damping block is supplied with the machine and can be found in the tool chest.

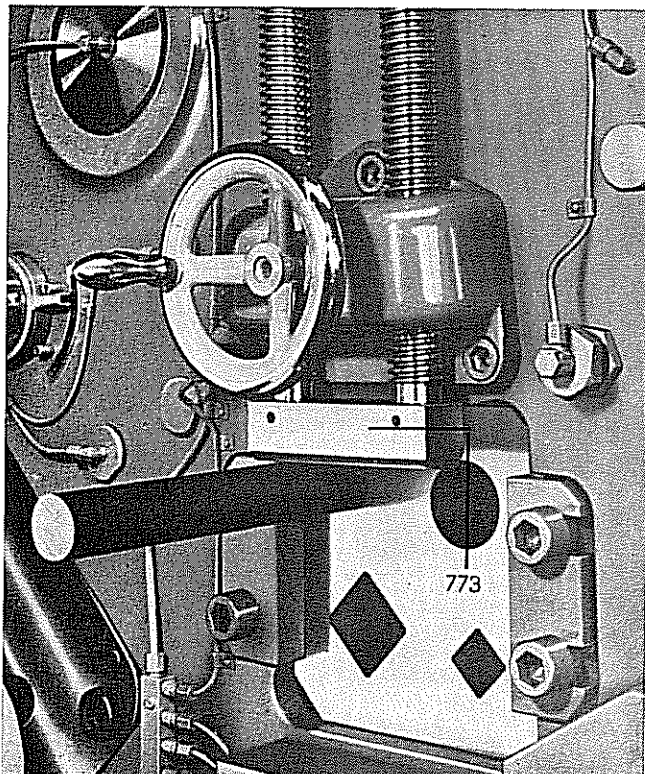


Fig. 37: Cutting round stock

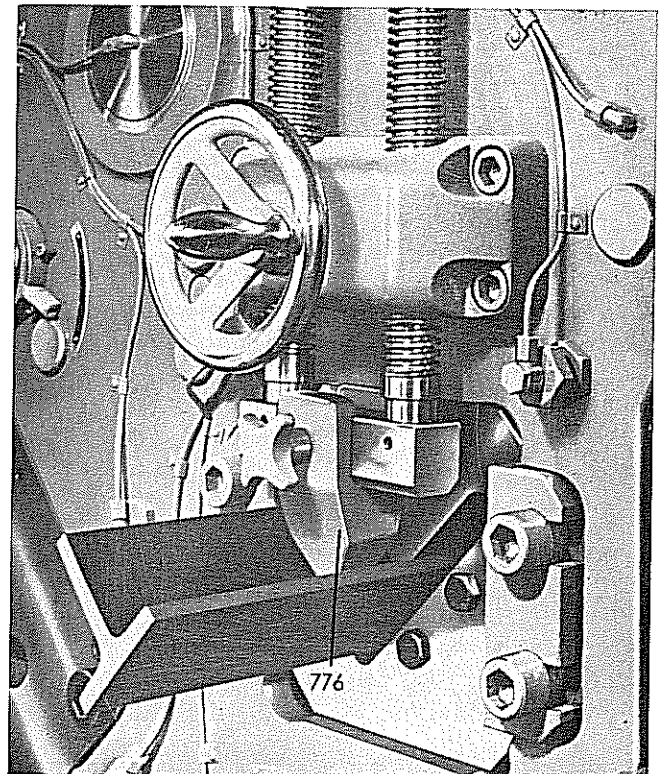


Fig. 38: Cutting tees in bar shear

5. Exchanging the Knives

Loosen clamp bolts No. 623, withdraw clamp plates No. 622 inwards, and remove knives. Install in reverse order.

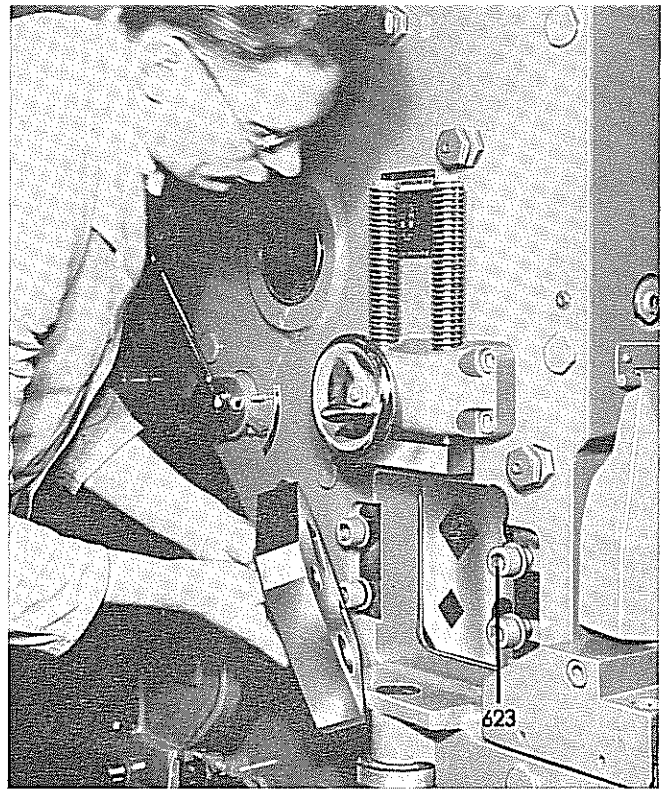


Fig. 39: Removing the knives

6. Special Knives

If you want to cut round stock only, you may obtain knives having round cutting opening only. The diameters will be held according to your specifications. If the material is to be fed and cut over a roller conveyor, please state so in your order so that all cutting openings can be located in one common plane. We also supply knives for cutting angles, tees, channels, and other standard or special shapes.

The opportunity of cutting sections in the bar shear, too, saves you frequent knife changes. Thus, if the section shear is equipped with the standard section knives, the bar shear

is available for cutting special sections. On the other hand, the bar shear can be used for cutting angles and tees when large special sections are cut in the section shear – a marked advantage of the three-slide machine.

7. Removal of Scale

Scale removal channels are machined into the slides being of such size as to make the dry mill scale drop freely. If a channel gets clogged by scale, clean out with gasoline or solvent.

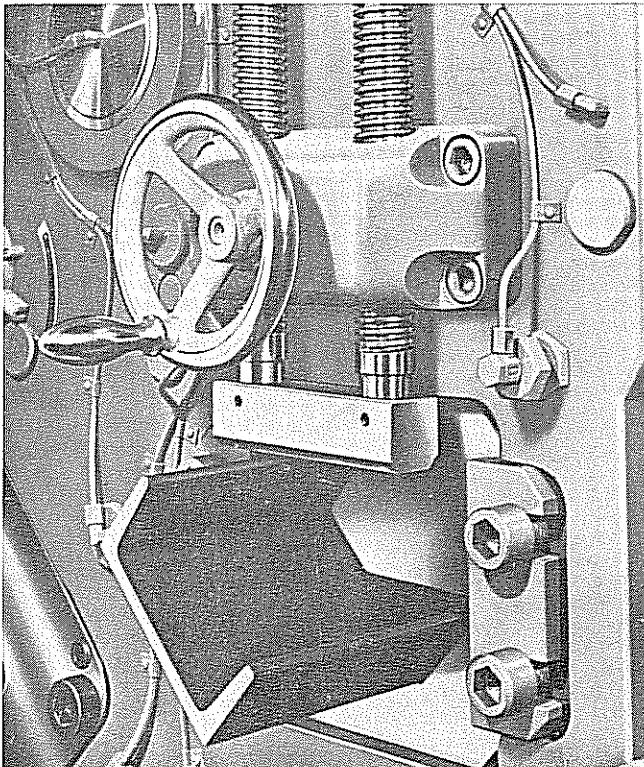


Fig. 40: Cutting channels

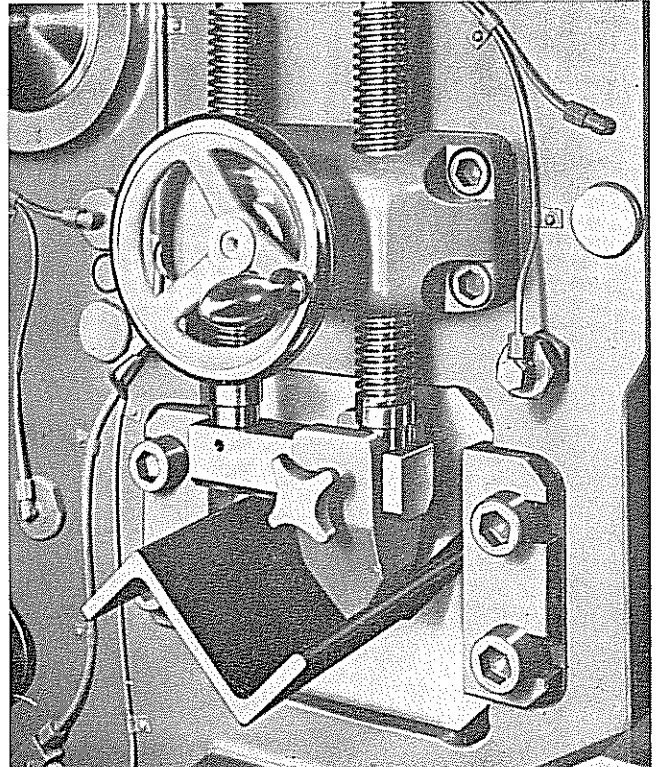


Fig. 41: Cutting zee-sections

The Section Shear

1. General

As a particularly advantageous feature the section shear has a very long and sturdy slide. The movable section knife is fixed in a recess in the slide. The knife proper does not move, so that damage to the knives is not possible.

2. Adjustment of the Slide Guides

The guides on which the long slide moves are of special purpose material and are adjustable, thus insuring correct alignment on all sides even after prolonged operation – an essential feature of safety in view of the great forces encountered in the section shear.

Adjustment is made as follows:

For Size 0 (11)

a) Adjustment across the machine:

Loosen 4 lock nuts No. 64 by turning to the left, tighten the slide adjusting screws 61 until a marked resistance is felt, then releasing the screws by backing off a $\frac{1}{16}$ turn, and tighten the lock nuts 64.

b) Adjustment along the faces:

Loosen two hex head bolts No. 40 on the back side of the machine and two set screws No. 42 on the front side.

Tightening the two set screws No. 41 from the throat of the

Fig. 42: Secure retinment of the movable section knife in the section slide

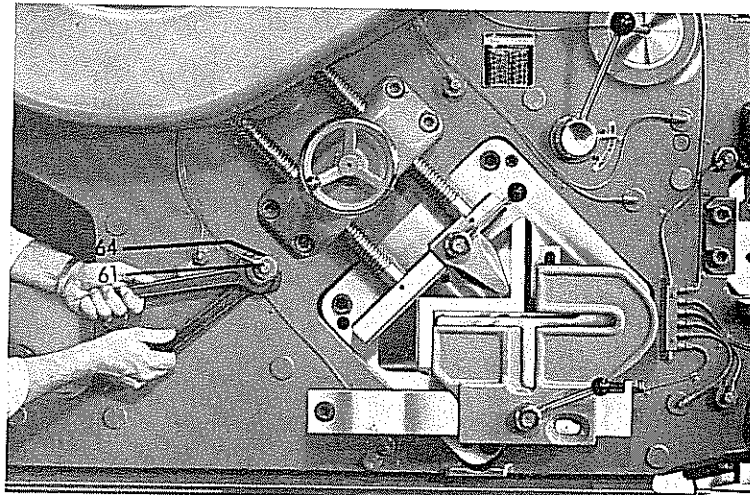
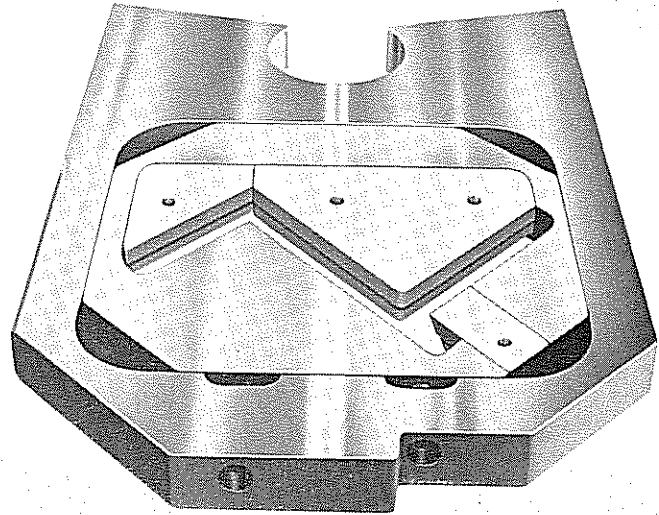
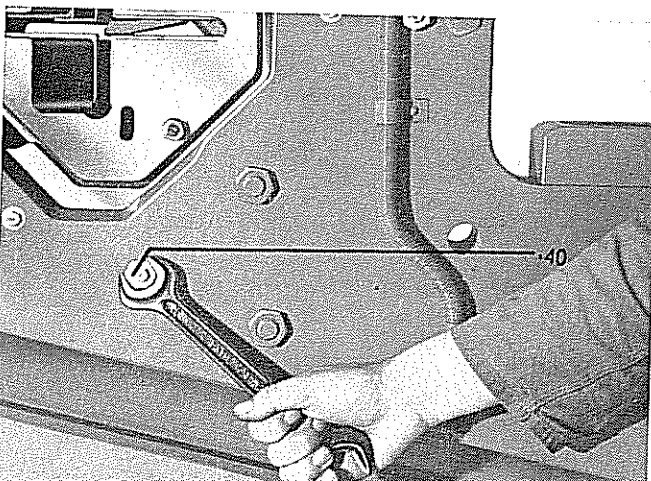


Fig. 43: Adjustment of the slide guides across the machine

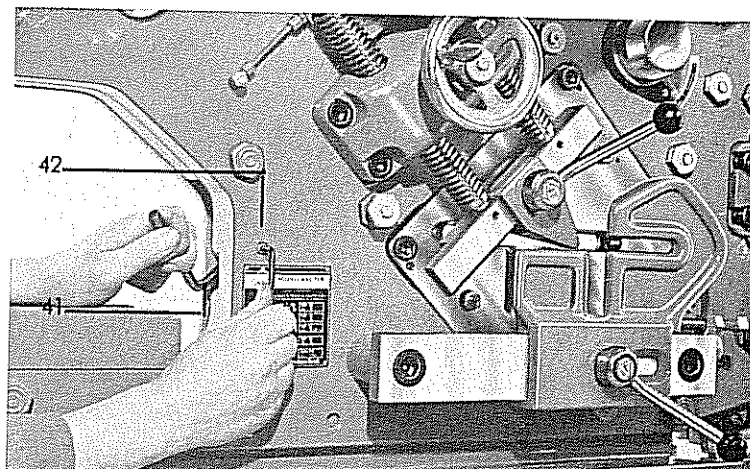
punch and the inclined plate feed-through channel at the back of the machine. When a marked resistance is felt, release the set screws No. 41 by giving them a $\frac{1}{16}$ turn. Then securely tighten the set screws No. 42 and hex head bolts No. 40.

Fig. 45: Adjustment along the faces of the slide guide, size 0 (11)

Fig. 44: Adjustment along the faces of the slide guides, size 0 (11)



F 1



For Sizes 1/2 thru 3 1/2 (13-25)

a) Adjustment across the machine:

See under Size "0" (11)

b) Adjustment along the faces:

Loosen 2 hex head bolts No. 36 on the back side of the machine by three full left-hand turns and 2 hex head bolts No. 40 on the front side by one full left-hand turn. Tighten 2 hex head bolts No. 35 on the front side until a marked resistance is felt. Then release hex head bolts No. 35 by giving them a 1/4 turn to the left and securely tighten hex head bolts No. 36 and No. 40.

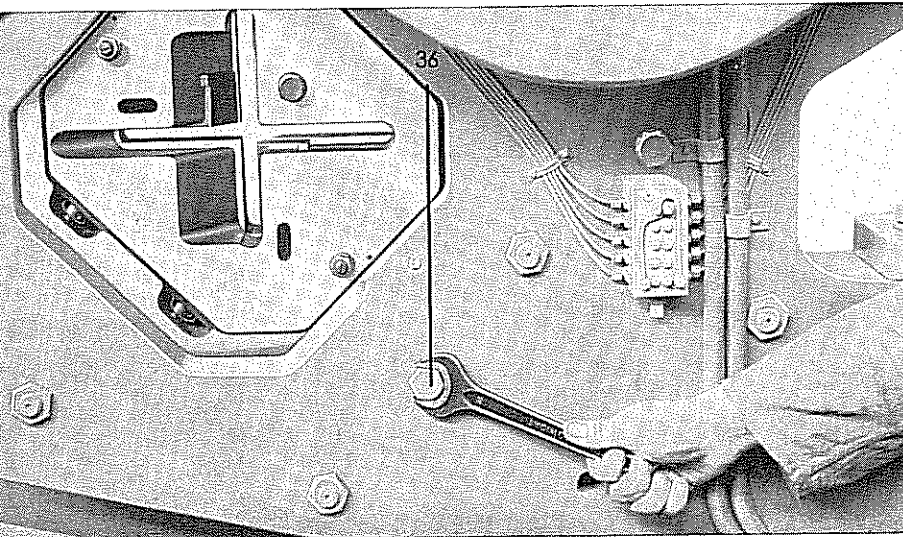


Fig. 46: Adjustment along the faces of the slide guides

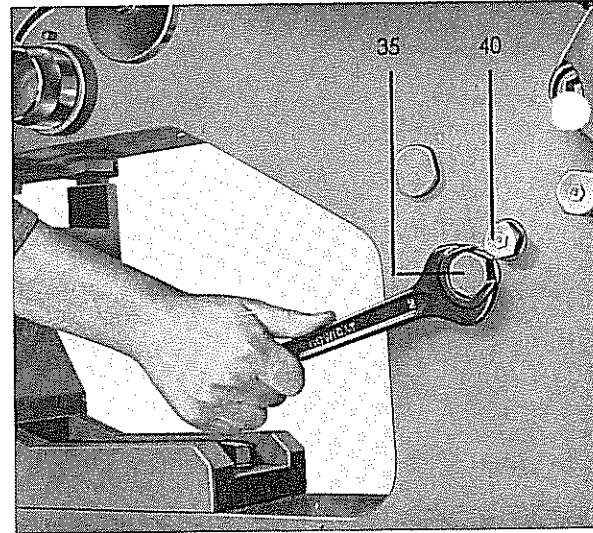


Fig. 47: Adjustment along the faces of the slide guides

3. Removal of Scale

It is recommended to clean the scale channel in the machine regularly with gasoline or solvent.

4. Designs of Knives

a) Normal Design

Knives for cutting angles and tees are standard equipment. For a detailed description, including maintenance and operating instructions, see the following pages.

b) Special Designs

For cutting channels, I-beams, zeos, or other special sections, we can supply special section knives. Depending upon the size of the sections, several cutting openings can be machined into a pair of knives.

All sections can be cut not only at 90°, but also with mitres on flanges and webs.

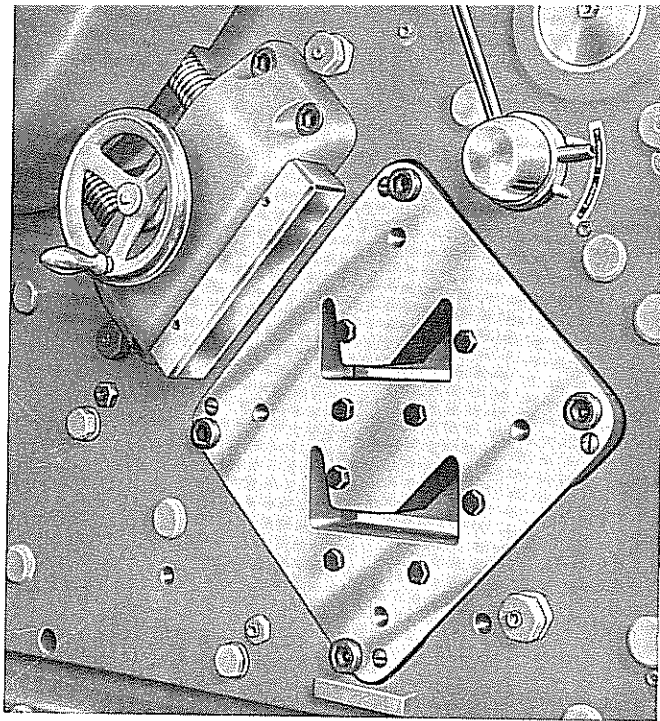


Fig. 48 : Section knives for channels – Execution PMF

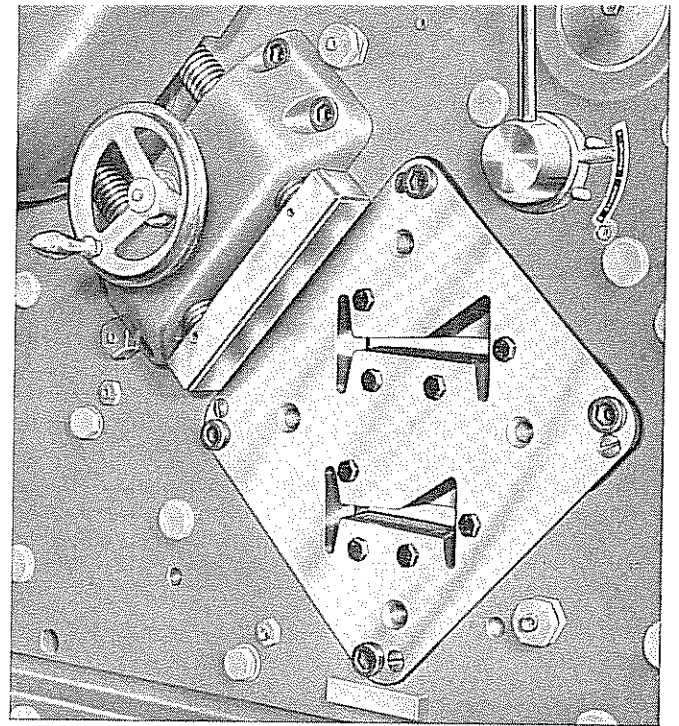


Fig. 49 : Section knives for beams – Execution PMF

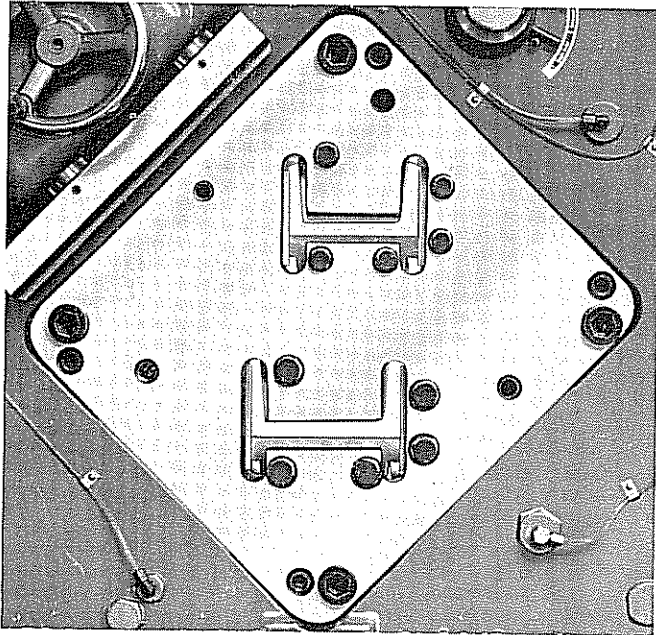


Fig. 50 : Combined Section knife PME adjusted for channels

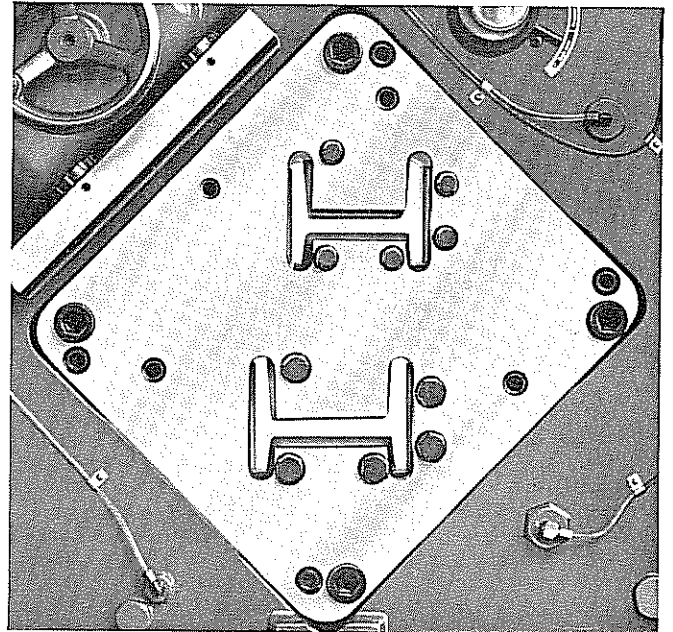
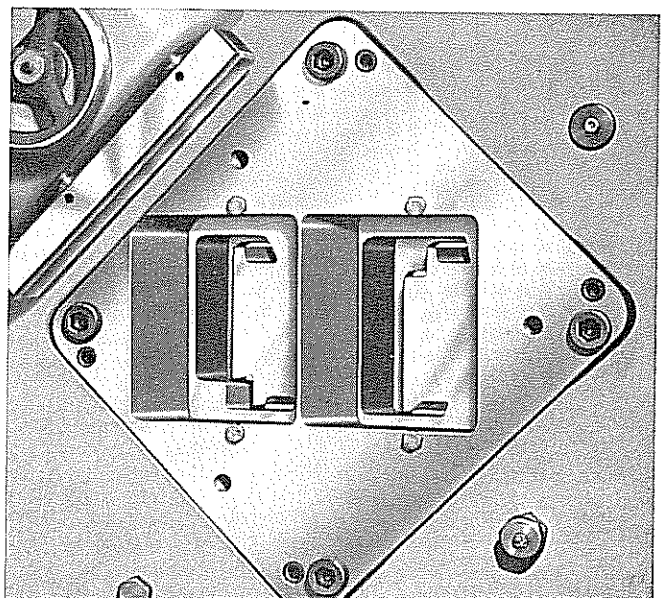
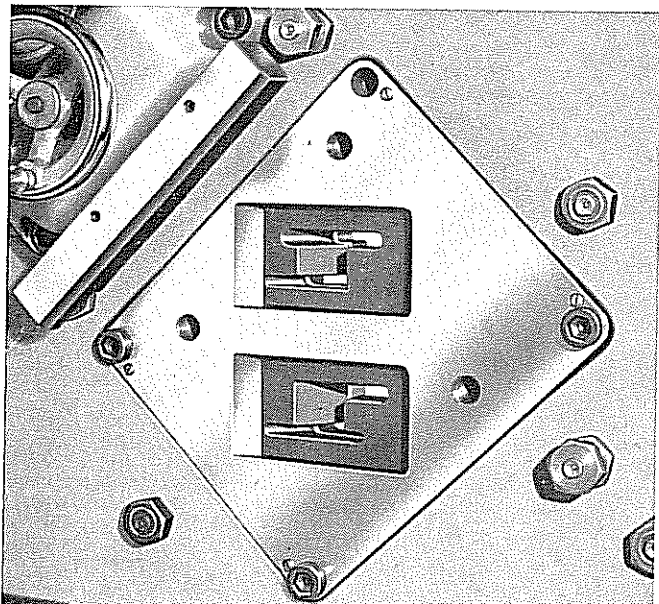


Fig. 51 : Combined Section knife PME adjusted for beams

Fig. 52 : Section knives for special sections on mitre (45°)

Fig. 53 : Section knives for special sections on mitre (45°)



QUICK-CHANGE KNIVES

If you must often change the channels, beams and other sections to be cut, it is recommended to use Mubea quick-change knives comprising the knife frame and insertion blades. When working with this special equipment, the considerably lower-priced insertion blades only must be bought for each section to be handled. Above all, the replacement of the blades requires a few seconds only. Without any tools, the clamping levers can be released, the insertion blades removed and the new ones inserted.

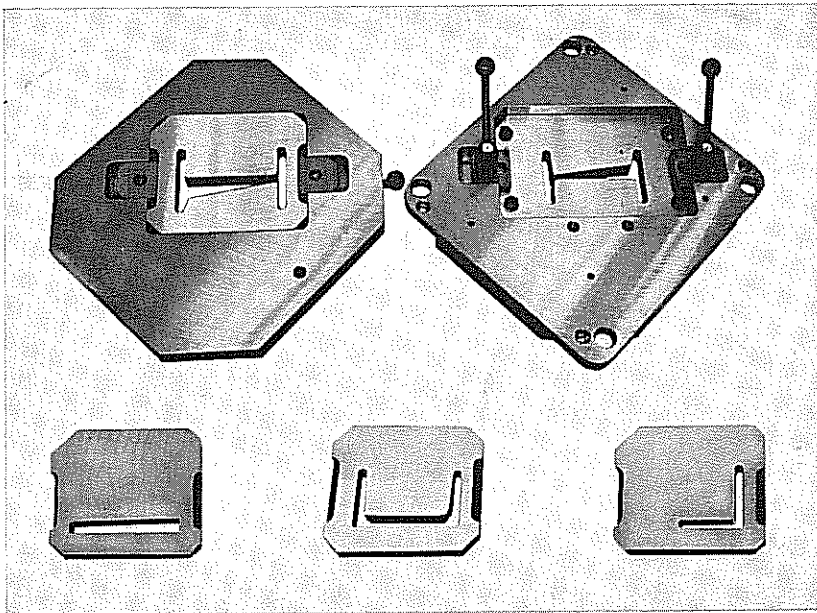


Fig. 54 : Quick-change knives for section shear

Type PMA Knives 1. General

Type PMA section knives serve to cut angles and tee-sections squarely and at any mitre up to 45 degrees. The sliding blades close and open automatically and are self-adjusting to any size of section. This is an advantage when angles and tee-sections of various sizes have to be cut in a quickly alternating sequence.

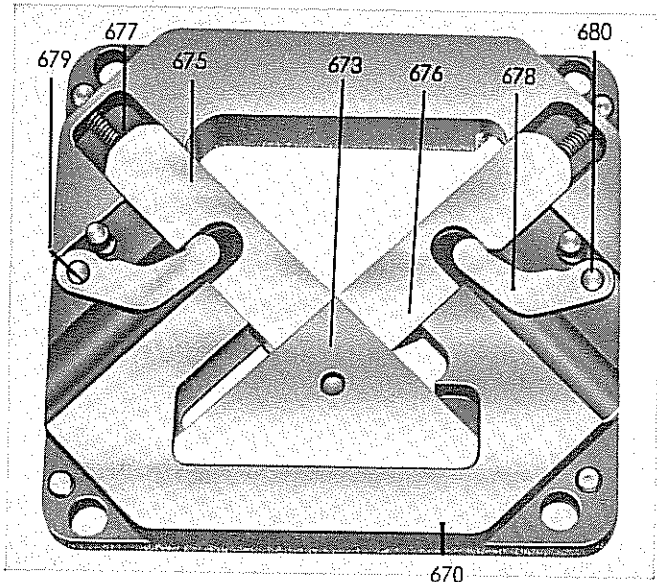


Fig. 55: Fixed type PMA section knife

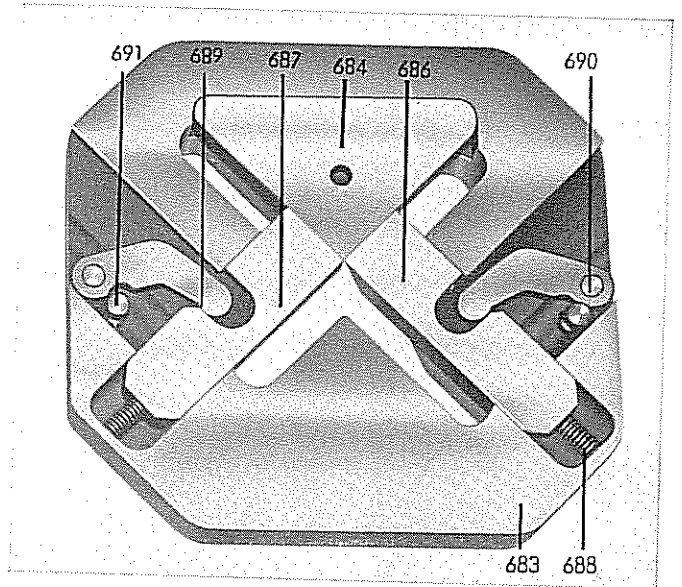


Fig. 56: Movable type PMA section knife

2. Removal of type PMA knives

- Lower section slide until sliding blades are closed and the automatic system is relieved.
- Lift the clamp lever 823 and remove the section stop 820 (by pulling the lever head the clamp lever can be disconnected and moved into any position desired).
- Turn the double-spindle hold-down entirely upwards.
- Loosen 4 socket head screws 671 (do not change the position of the set screws 672).
- Withdraw the fixed section knife 670 from the machine body.
- Loosen the cross-slit screws 326 in the section slide 325.
- Withdraw the movable section knife 683 from the machine (if the knives shall be cleaned only, the knife 683 may remain in place). For dismantling and installation of section knife parts see para. 4, page PMA 2 E.

Fig. 57: Type PMA section knife seen from body side

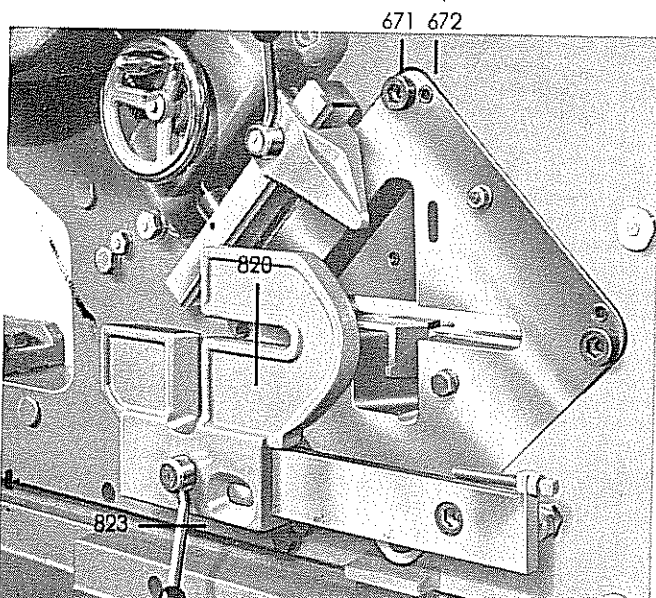
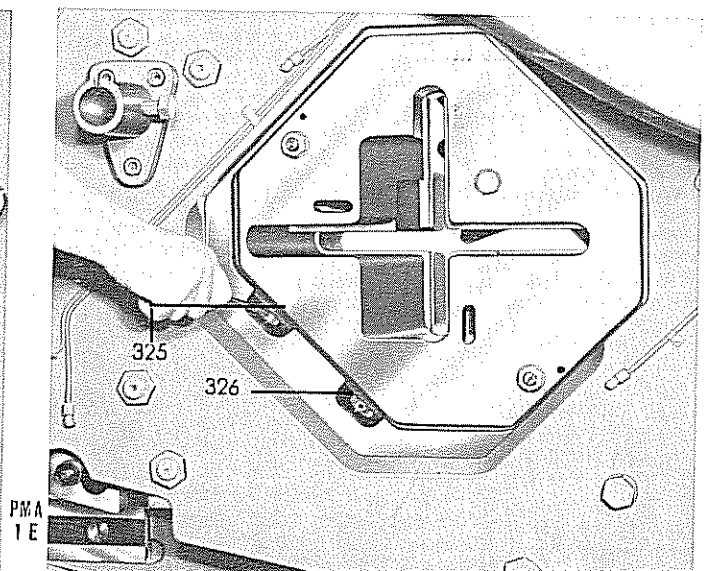


Fig. 58: Type PMA section knife seen from cover plate side



3. Installation of Type PMA Knives

- a) Insert movable section knife 683 into section slide and push to the rear against the stop.
- b) Tighten cross-slit screw 326.
- c) Turn section slide 325 downward for about $\frac{1}{4}$ of its stroke so that the adjusting eccentrics 680 and 691 do not touch the slide levers 678 and 689.
- d) Insert the stationary section knife 670 into the body.
- e) Securely tighten the socket head screws 672.
- f) Tighten headless screws 672.
- g) Release socket head screws 671 one full turn and retighten all of the 4 headless screws 672 by giving them about $\frac{1}{2}$ of a turn. This is necessary to avoid compressing of the knives and maintain a shearing gap. After this please check the play between the blocks by a feeler gauge which is supplied with the machine.
- h) Clamp section stop 820 by means of clamp lever 823.
- i) Tighten solidly socket head screws 671.
- k) Rotate the machine by hand and check for regular opening and closing of the sliding blades.

If the knives close irregularly, it will be necessary to readjust the eccentrics 680 and 691 by R. H. or L. H. turning. For moving the adjusting eccentrics, loosen the lock nuts and re-tighten them after the adjustment is finished.

The adjustment is correct if the sliding blades have just fully opened in the upper position of the slide or are tightly closed when the slide is in its bottom position.

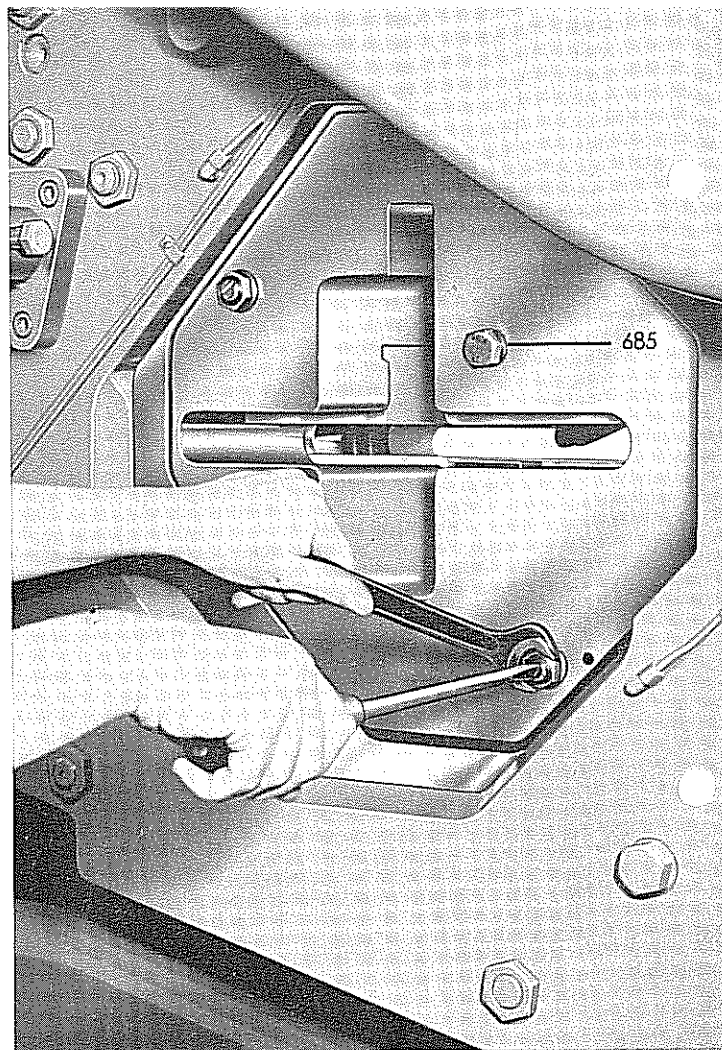


Fig. 59: Adjusting the sliding blades

4. Cleaning the Section Knives

The type PMA knives must be carefully serviced and cleaned.

Since the sliding blades are spring-operated, contamination may result in a failure of the automatic system, which in turn causes poor cuts or even breakage of the knives. Therefore, watch the function of the knives closely and clean them in time.

- a) Withdrawal of the section knives according to the instructions under para. 2.
- b) Remove slide levers 678 and 689.
- c) Remove sliding blades 675, 676, 686, 687 from their holders.
- d) Remove springs 677 and 688 from the sliding blades.
- e) Clean the sliding blades and section knives, taking particular care to clean the holders to prevent obstruction of the sliding blade movement.
- f) Assemble the type PMA knives in reverse order.

In order to ensure and maintain precision and continuity in operation, it is important that you insist on MUBEA spare knives.

Caution:

The section knives must remain free from grease to keep the dropping mill scale dry. Only the rear sides of the sliding blades and the bearings of the slide levers have to be slightly greased.

- g) Installation of the section knives according to the instructions under para. 3.

5. Regrinding the Section Knives

The sliding and insertion blades must only be reground at their cutting faces, i. e. uniformly at all faces to keep the cross shape concentric. Naturally, grinding must only be done as far as the stroke of the section slide permits, i. e. the cross must be completely closed when the section slide is in its bottom position.

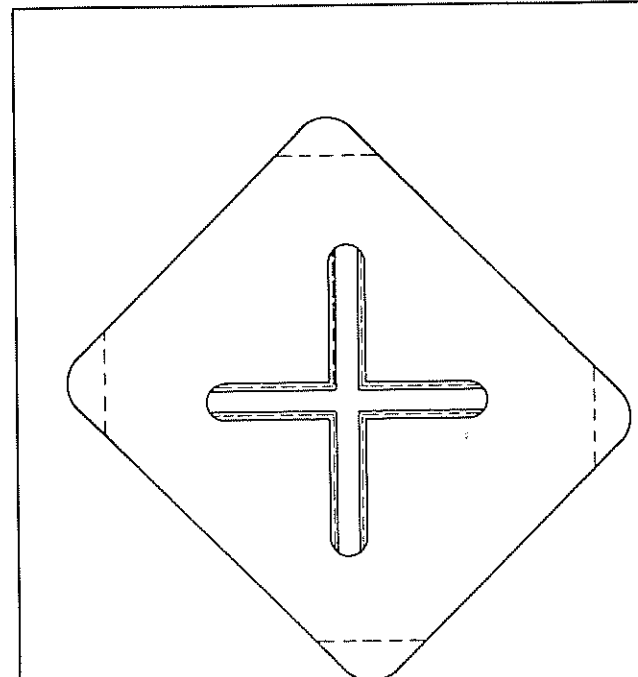


Fig. 60: Regrind knives uniformly

The part number (which also is the Order No.) is stamped on the knives. Remember that MUBEA knives are of special quality, so it pays to specify MUBEA brand when ordering spare parts.

The sliding and insertion blades are pointed so that all sections — even sharp-edged ones — can be cut. For cutting angles of a certain size having root fillets, the insertion blade 684 can be provided with a radius corresponding to the fillet. Squeezing at the section root is thus eliminated.

We supply these insertion blades also with various radii — from the smallest up to the maximum capacity of the machine, always grouping several section sizes together. Please state in your order what kind of angles is to be cut or whether tee-sections are to be handled.

By turning the slide a little bit down, the insertion blades can be removed without dismantling the section knives.

6. Converting Type PMA into Type PMB Knives

For larger batches of identical section sizes, use type PMB knives (designed as type PMA but without using the automatic system) or the still more robust type PMG knives. These knives operate almost free of maintenance and are thus more economical for identical dimensions.

Type PMA knives are converted into type PMB knives by removing the automatic system and inserting other sliding blades knives.

a) New parts to be ordered:

- 1 sliding blade each 705, 706, 711, 712
- 1 insertion blade each 703, 709
- 2 hex head screws 707
- 2 hex head screws 713
- 1 hex head screw each 704, 710

- 4 safety plates 714
- 4 lock washers 715

b) parts to be removed from type PMA knives:

- sliding blades, 675, 676, 686, 687
- Insertion blades 673, 684
- Slide levers 678, 689
- Compression springs 677, 688

c) install the parts ordered under a) into the section knives 670 and 683.

d) Rotate the machine by hand and check for satisfactory function

The adjustment of the sliding blades for the various cuts is explained in the instructions for type PMB knives.

7. Cutting with Type PMA Knives

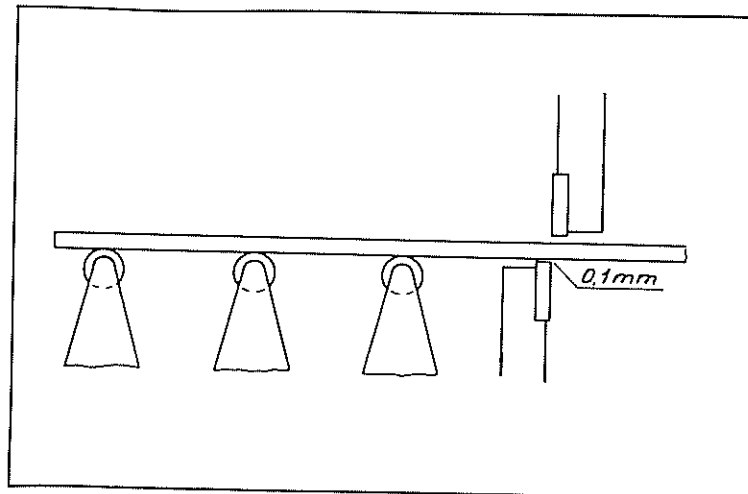
a) Inserting the sections:

Insert the section into the section opening (the section must abut against the right-hand side of the opening and slightly touch the horizontal sliding blade of the stationary knife but without clamping it). An adjustment of the knives is not necessary.

The cutting instructions below demonstrate the way in which square and mitre cuts are made.

The sliding blades are spring-operated. Particularly when cutting heavy sections, make sure that the sliding blades are not blocked. Support long section rods to avoid pressure on the sliding blades. Do not clamp the hold-down too tightly. There must be a little gap between the section and the hold-down.

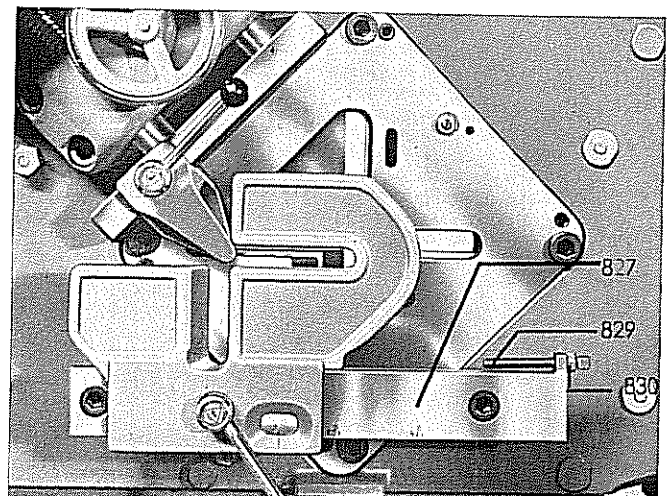
Fig. 61: Inserting an angle



b) Hold-Down and Section Stop

The section stop 820 on the stop rail 827 can be adjusted to square or mitre cuts up to 45 degrees by means of a scale. It is clamped in the desired position by means of the clamp lever 823.

Fig. 62: Section stop for mitre 45 degrees



For square (90 degrees) cuts there is a stop bolt 829 with a lock nut 830 at the right-hand side of the stop rail 827. Simply move the section stop against the stop bolt and you have the correct lateral position of the work.

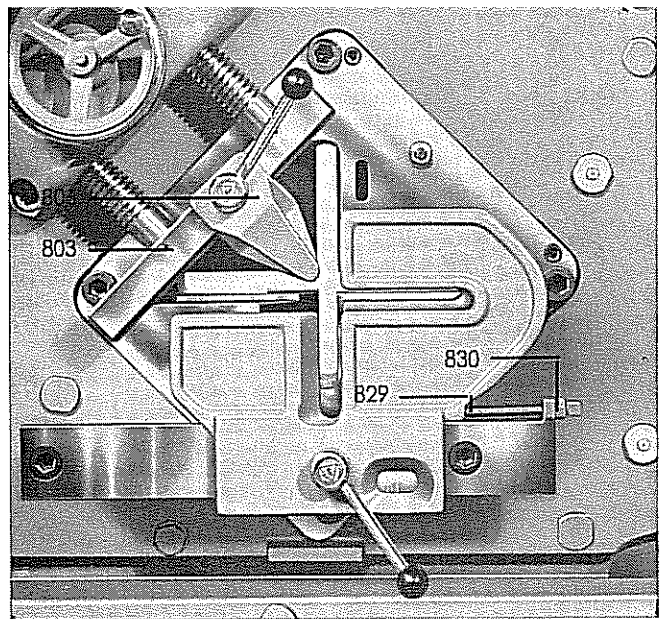


Fig. 63 : Section stop for square (90 degrees) cuts

The correct vertical position of the section is adjusted by means of the double-spindle hold-down. Move the thrust block 806 on the cross-beam 803 so that it hits the section root with its tip when the hold-down is lowered.

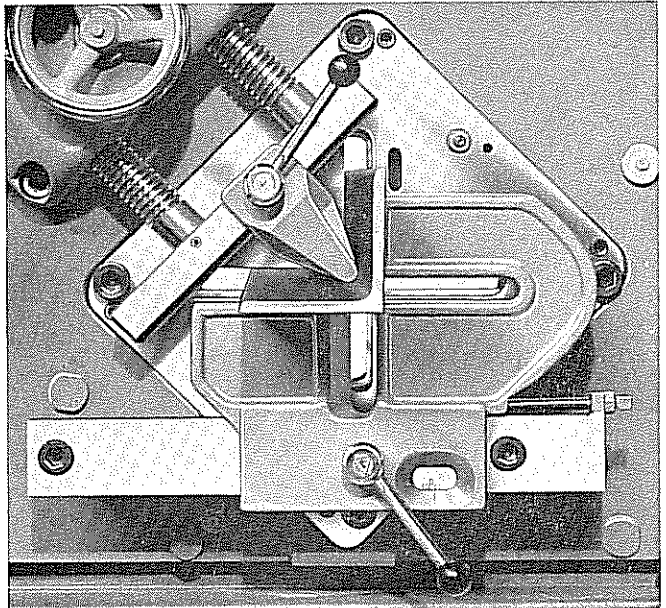


Fig. 64 : Adjusting the double-spindle hold-down

The vertical position of the section is correct if the section is in a horizontal position during cutting.

When out-of-angle vertical or horizontal legs are encountered, make the necessary corrections by means of the double-spindle hold-down or section stop respectively.

c) Cutting Extremely Small Sections

When cutting extremely small angles and tee-sections with type PMA knives, make sure the position of the section within the knife opening is correct. Sections may be brought out of line by jumping sliding blades and hence get deformed during cutting.

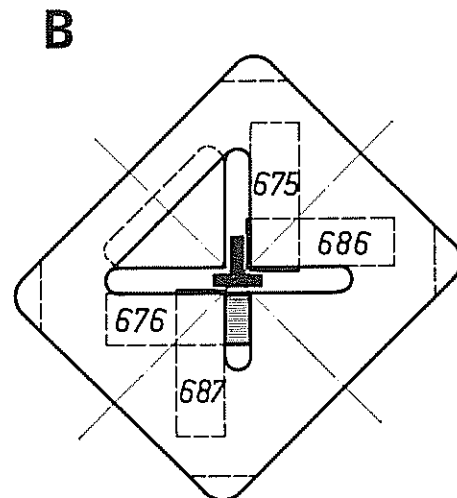
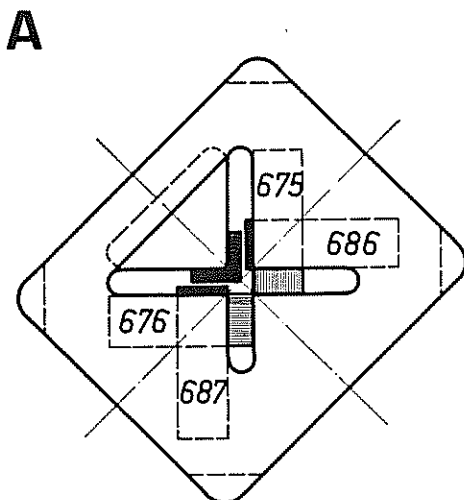
Note:

Place smaller angles against the fixed cutting insert of the movable knife (Fig. A), whereas small tee-sections must be held in the middle of the knife opening (Fig. B).

If there is a larger batch of small sections to be cut, it is advisable to set the adjusting eccentrics 680 and 691 in such a way as to make the sliding blades open only so far that the small sections can be inserted.

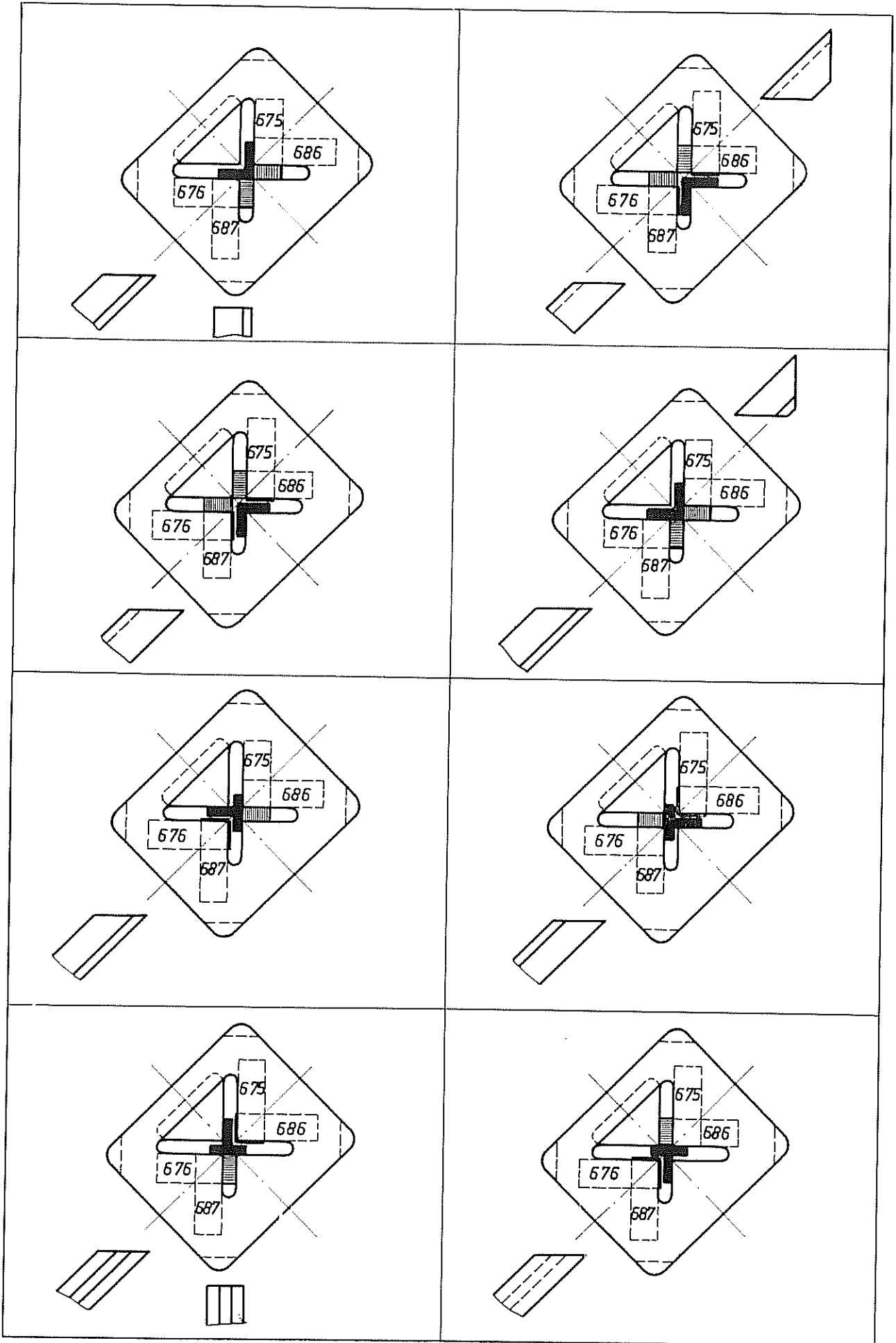
If the small sections are to be cut only squarely, it is recommended to obtain special knives for the bar shear to keep the section shear free for larger sections.

Fig. 65 : Cutting small angles and tee-sections



d) Cutting Instructions:

You will find instructions on the correct insertion of sections for the various kinds of cuts in the table contained in the general cutting instructions.



Type PMB Knives

1. General

Type PMB section knives serve to cut angles and tee-sections squarely and at any mitre angle up to 45 degrees. The sliding blades are manually adjusted to the size of section to be handled (see CUTTING INSTRUCTIONS).

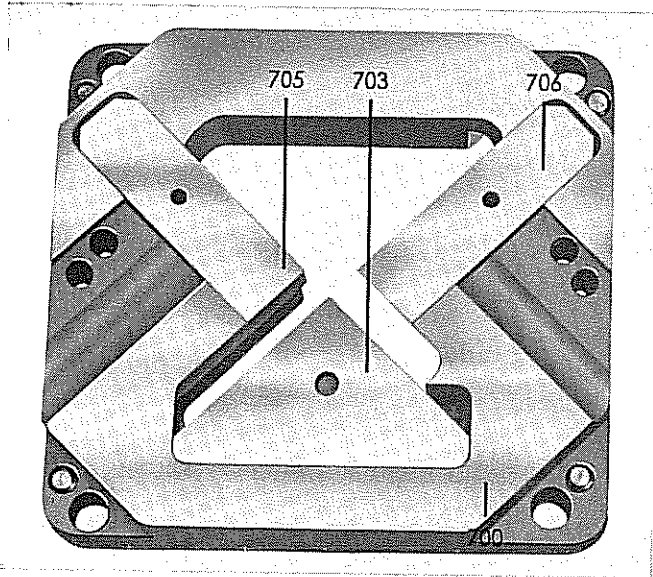


Fig. 66: Stationary type PMB section knife

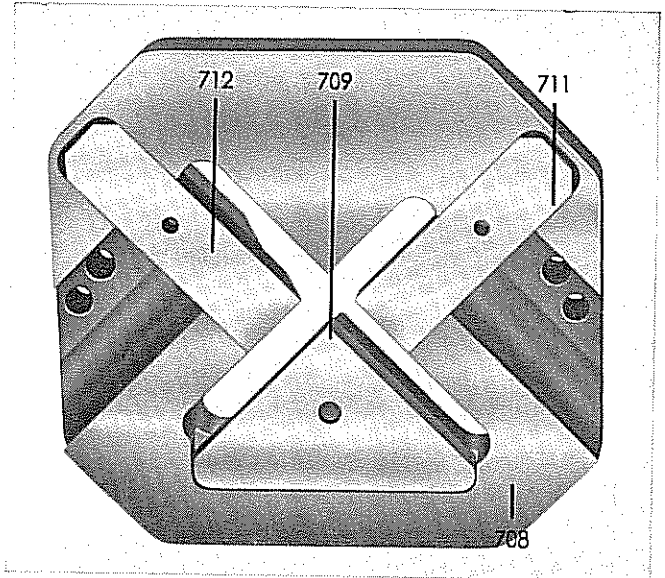


Fig. 67: Movable type PMB section knife

2. Removal of Type PMB Knives

- Release clamp lever 823 and remove section stop 820. (By pulling the lever head the clamp lever can be disconnected and turned into any position desired).
- Screw the double-spindle hold-down entirely up.
- Loosen 4 socket head screws 701 (set screws).
- Remove the stationary section knife 700 from the machine body.
- Loosen the cross-slit screw 326 in the section slide 325.
- Remove the movable section knife 708 from the machine. (If the knives are to be cleaned only, the movable knife 708 may remain in place).

Fig. 68: Type PMB section knives seen from body side

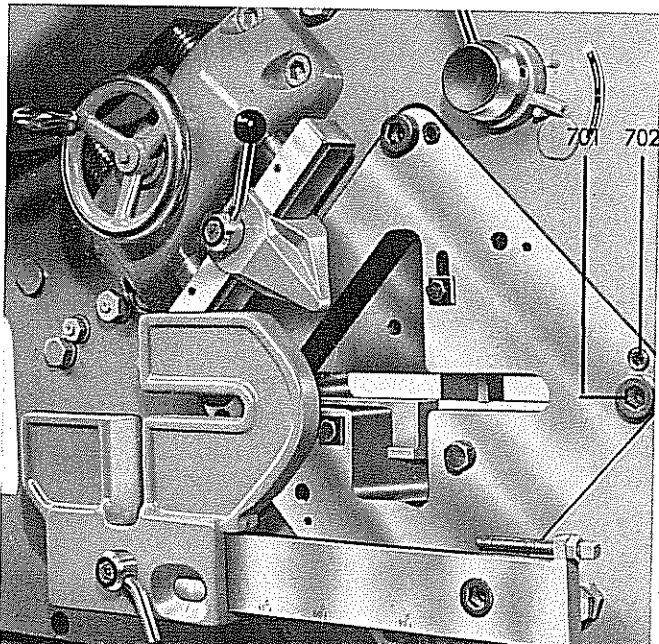
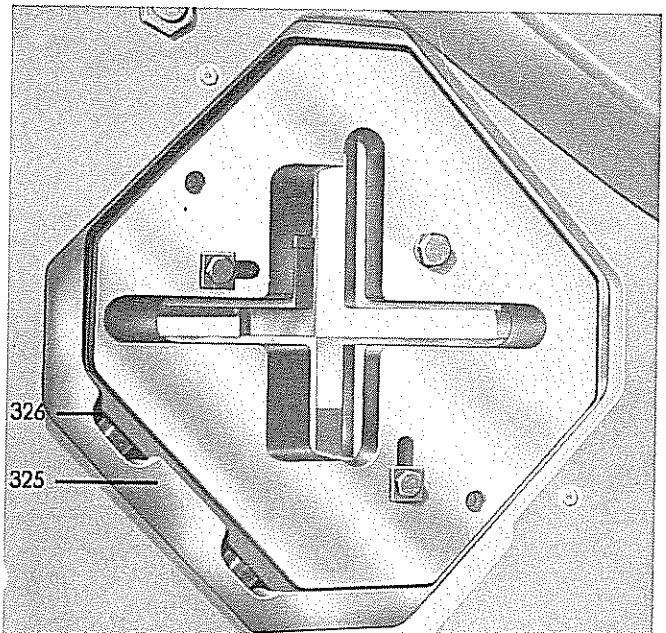


Fig. 69: Type PMB section knives seen from cover plate side



3. Installation of Type PMB Knives

- a) Insert the movable section knife 708 into the section slide 325 and push it against the stop in the rear.
- b) Tighten the cross-slit screw 326.
- c) Insert the stationary section knife 700 into the body.
- d) Securely tighten the socket head screws 701.
- e) Securely tighten the headless screws 702.
- f) Release the socket head screws 701 one full turn and retighten all of the 4 socket head screws by giving them about 1/2 of a right hand turn. This is necessary to prevent the knives from compressing and maintaining a shearing gap. Please check the shearing gap by feeler gauge which is supplied with the machine.
- g) Tighten solidly the socket head screws 701.
- h) Mount the section stop 820 and tighten the clamp lever 823.

4. Cleaning the Type PMB Knives

Type PMB knives do not require extensive maintenance as they comprise no sensitive parts. But they must be dismantled and cleaned at certain intervals depending upon the amount of mill scale encountered.

- a) Remove the section knives according to the instructions under para. 2.
- b) Remove the sliding blades 706, 705, 711, 712.
- c) Clean the section and sliding blades thoroughly.
- d) Assemble the knives.

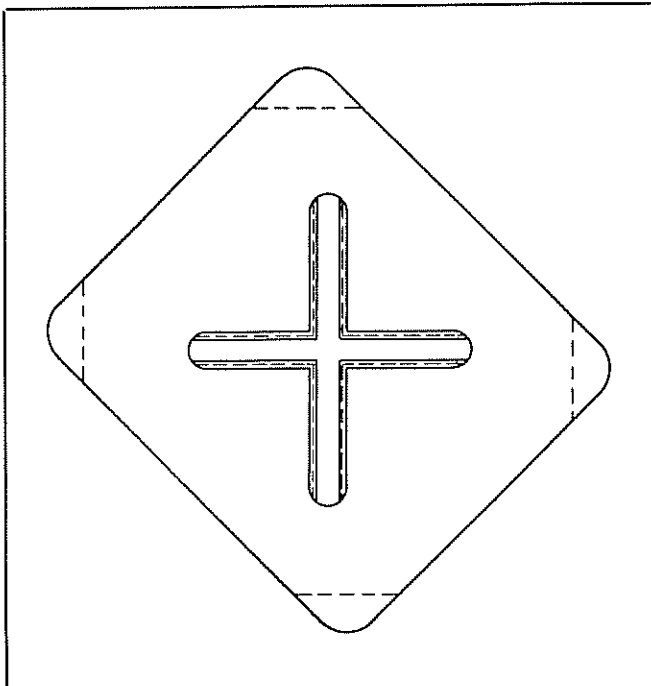
Caution:

The section knives must be free from grease to keep the dropping mill scale dry.

- e) Install the section knives according to the instructions under para. 3.

5. Regrinding the Section Knives

Regrind the sliding and insertion blades only but uniformly at their faces. On falsely ground blades, the cutting edges no longer converge at one point resulting in poor cuts.



Regrind the sliding and insertion blades only so far that the cutter cross fully and regularly covers the cutting edges when the slide is in its bottom position. If this is not the case, replace the blades by new ones (you will find the part numbers, which also are the Order Nos., stamped on the blades).

When ordering spare parts, always make sure to get genuine MUBEA blades made of special high-grade steel.

The sliding and insertion blades are pointed to cut all sections, even sharp-edged ones. For cutting angles of a certain size having root fillets, use insertion blades 709 with the proper radius to avoid squeezing at the section root.

Insertion blades with a full range of radii are available, several sizes of sections being grouped within this range. When ordering, please state what kind of angles are to be cut or whether tee-sections are to be handled.

The blades are exchanged without dismantling by turning the slide a little bit downward.

6. Converting Type PMB into Type PMA Knives

If you rearrange your production and various angles and tee-sections have to be cut in a quickly alternating sequence, type PMA knives offer greater economy.

Type PMB knives can readily be converted into type PMA knives.

- a) New parts to be ordered:
 - 1 sliding blade, each 675, 676, 686, 687
 - 1 insertion blade each 673, 684
 - 2 slide levers each 678, 689
 - 2 compression springs each 677, 688
 - 2 straight pins each 679, 690
 - 2 adjusting eccentrics each 680, 691
 - 2 washers each 681, 692
 - 2 hexagon nuts each 682, 693
- b) Install the parts ordered under a) into the section knives 700 and 708 (see TYPE PMA KNIVES, para. 3.)
- c) Rotate the machine by hand and check for satisfactory function.

When cutting, follow instructions for type PMA knives.

7. Cutting with Type PMB Knives

a) Insertion of Sections:

Insert the section between the opened knives for the first cut and adjust the sliding blades to the section according to instructions below. Loosen the hex head screws 707 and 713 and securely re-tighten them after the adjustment.

Make the adjustment so that a narrow clearance as left between the section and the sliding blade to permit the insertion of the section. The narrower the clearance the better the cut.

Fig. 70 : Regrind the blades uniformly

b) Hold-Down and Section Stop

The section stop 820 on the stop rail 827 can be set to 90 degrees by means of a graduation. It is clamped in the desired position by means of the clamp lever 823.

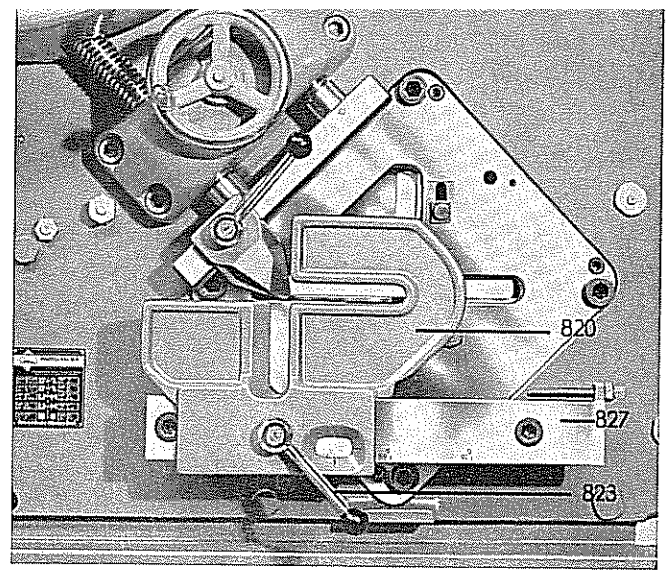


Fig. 71 : Section stop for mitre cuts 45 degrees

For square (90 degrees) cuts there is a stop bolt 829 with a lock nut 830 at the right-hand side of the stop rail 827. Simply move the section stop against the stop bolt and you have the correct position of the work.

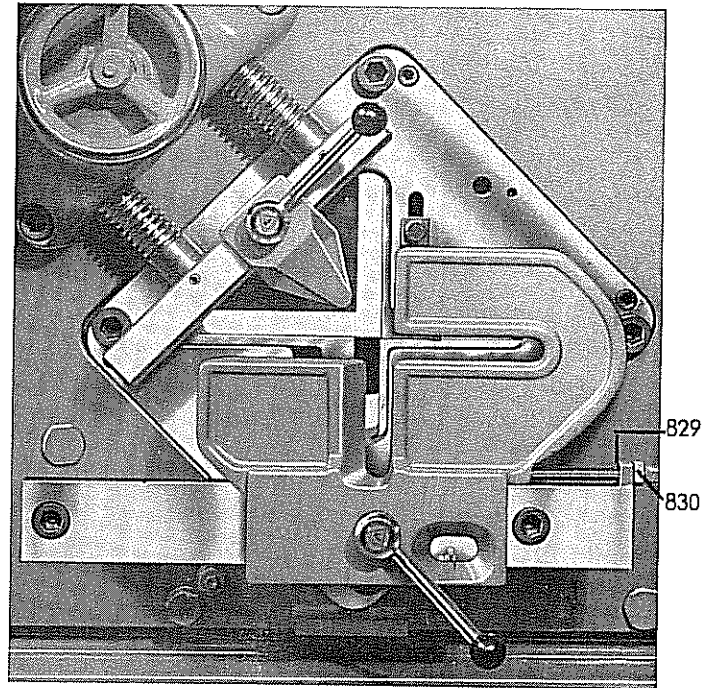
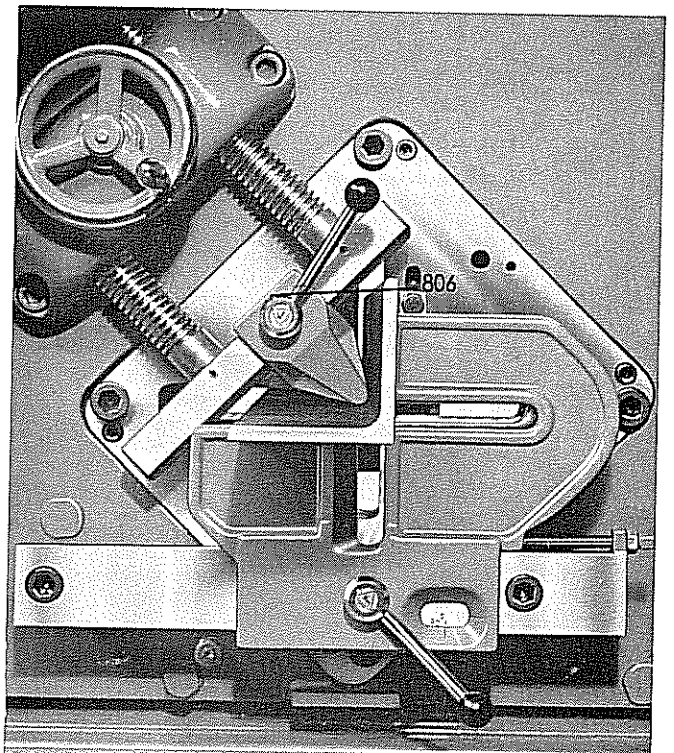


Fig. 72 : Section stop for square (90 degrees) cuts

Fig. 73 : Adjusting the double-spindle hold-down

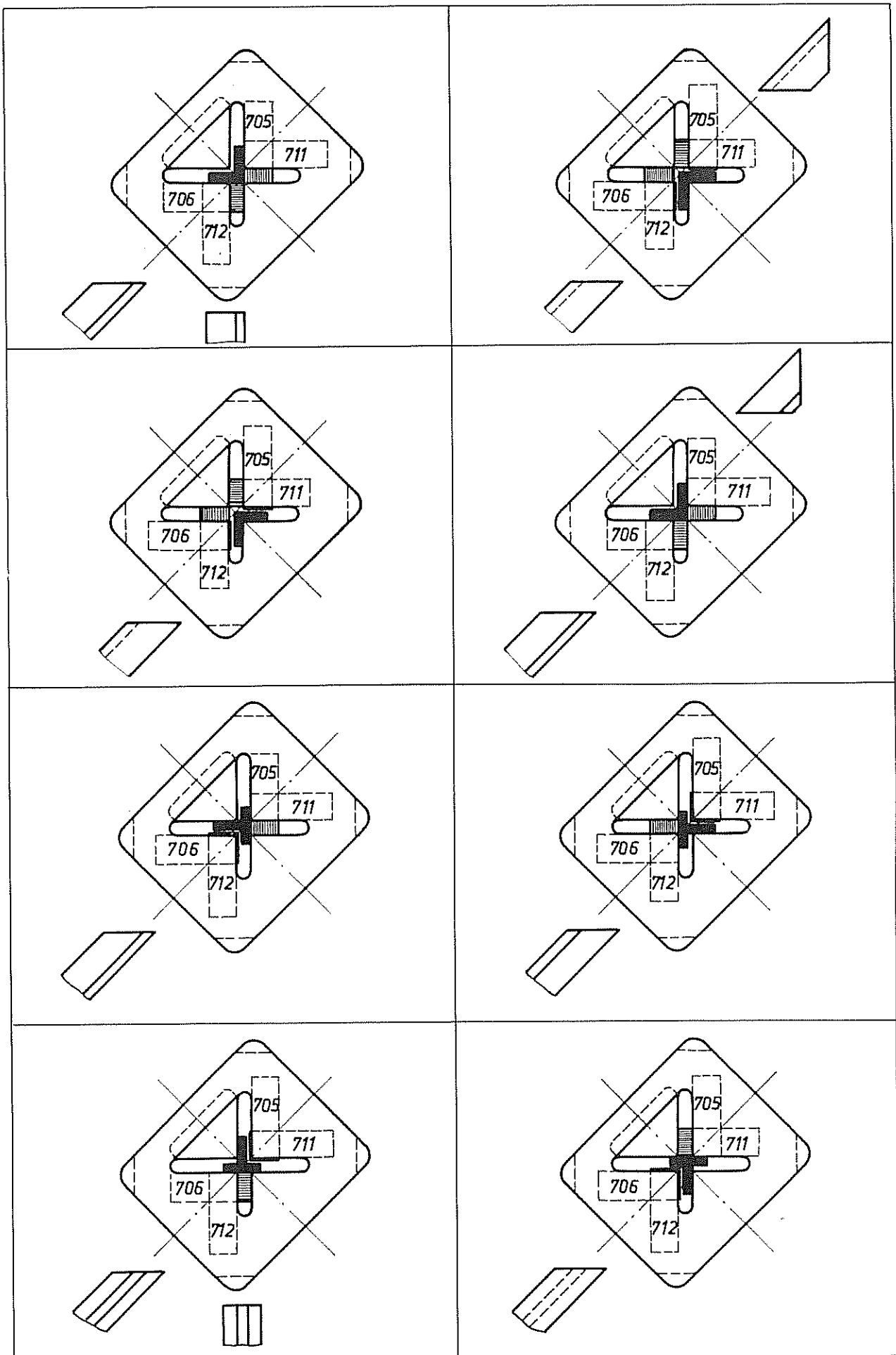
The correct vertical position of the section is adjusted by means of the double-spindle hold-down. Move the thrust block 806 on the cross-beam 803 in such a way as to make it hit the section root with its tip when the hold-down is lowered.

The vertical position of the section is correctly adjusted if the section is in a horizontal position during cutting. When out-of-angle vertical or horizontal legs are encountered, make the necessary corrections by means of the double-spindle hold-down or section stop respectively.



c) Cutting Instructions

You will find instructions on the correct insertion of the sections to be cut both squarely and at any mitre angle as well as directions for the adjustment of the sliding blades on the following page.



Type PMG Section Knives

1. General

Type PMG section knives will cut angles at 90° and at any mitre angle up to 45°. 90° cutting of tee sections can also be done on type PMG knives.

For cutting angles, no blade adjustment is necessary in changing from 90° to 45°. For cutting tee sections only two adjustable blades need be moved. These knives are extra robust and require very little servicing.

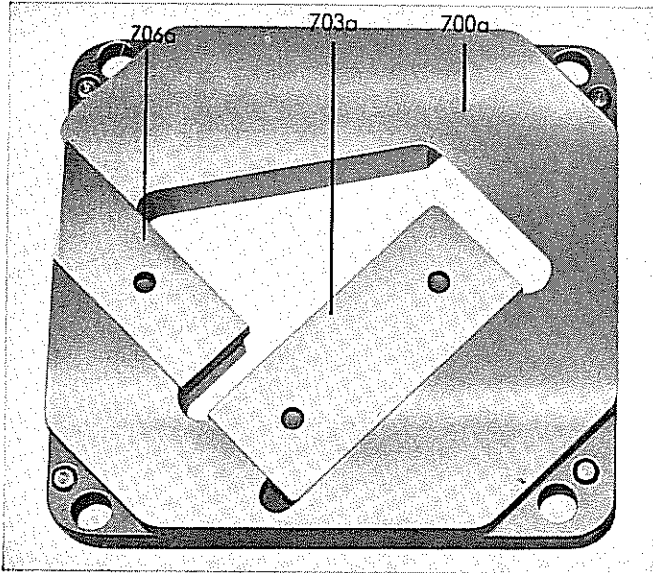


Fig. 74: Fixed PMG section knife

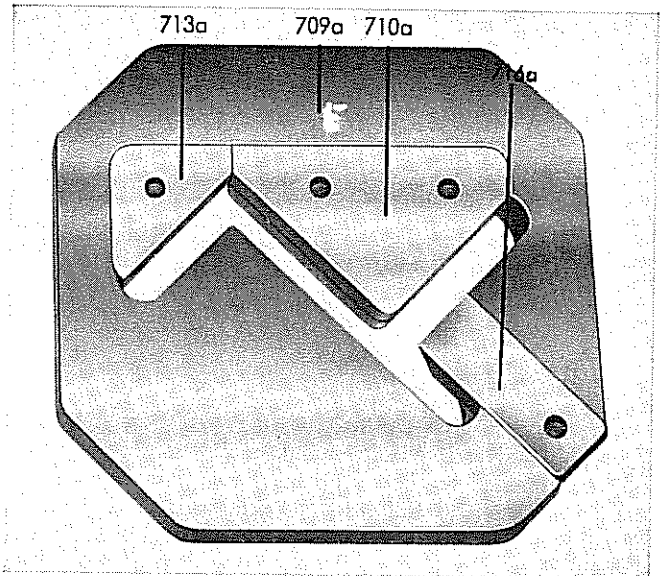


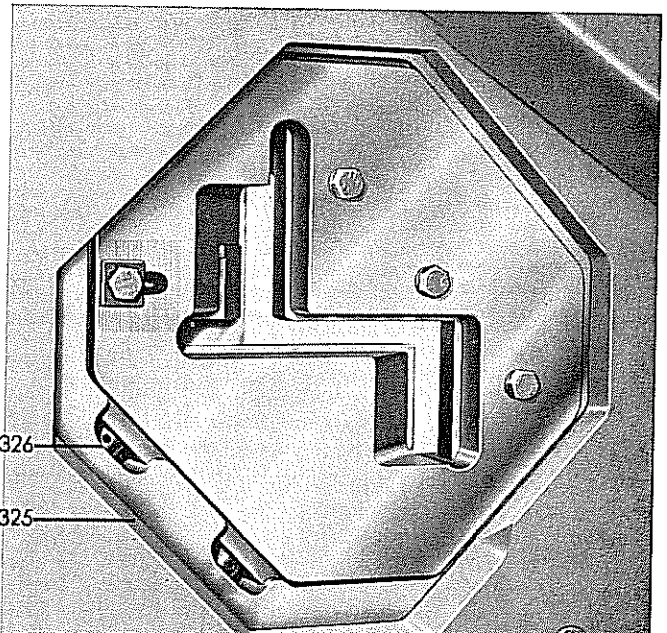
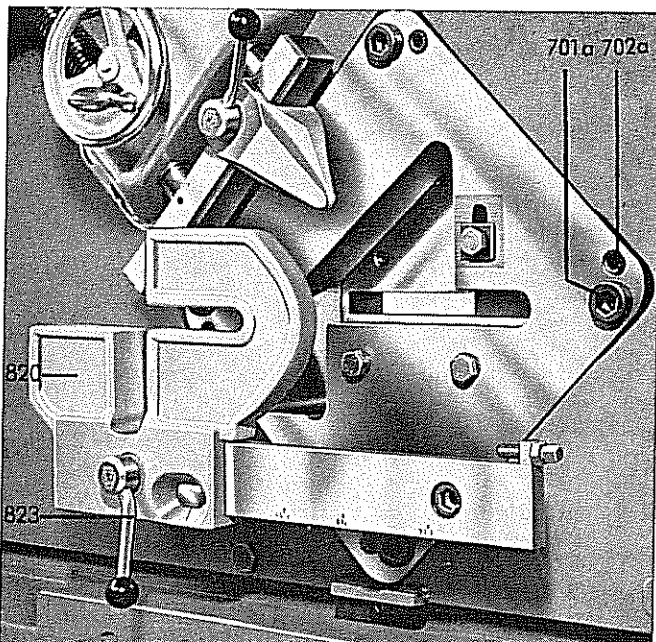
Fig. 75: Movable PMG section knife

2. Removal of Type PMG Knives

- Loosen kip lever No. 823 and remove mitre guide No. 820. (The kip lever may be swung out of the way to any convenient position, after tightening, by grasping at the center of the swivel point and lifting.)
- Screw the hold-down up all the way.
- Remove 4 socket head screws No. 701a from stationary knife.
- Withdraw the stationary section knife from the machine.
- Loosen the screw No. 326 in the slide No. 325 on the rear side of the machine using drift punch.
- Withdraw the movable section knife No. 709a from the machine. (If the knives are to be cleaned only, the movable knife No. 709a may remain in place.)

Fig. 76: Type PMG section knife seen from front side

Fig. 77: Type PMG section knife seen from rear side



3. Installation of Type PMG Knives

- a) Insert the movable section knife No. 709a into the section slide No. 325 and push it against the stop in the rear.
- b) Tighten the screw No. 326.
- c) Insert the stationary section knife No. 700a into the body.
- d) Securely tighten the socket head screws No. 701a.
- e) Securely tighten the screws No. 702a.
- f) Release the socket head screws No. 701 a one full turn and retighten all 4 screws No. 702 a by giving them $\frac{1}{2}$ of a turn to the right. This is necessary to prevent the knives from compressing and to maintain a shearing gap of from .004 to .012 of an inch. After this please check the play between the blocks by a feeler gauge which is supplied with the machine.
- g) Tighten solidly the socket head screws No. 701 a.
- h) Replace the mitre guide No. 820 and clamp into desired position by means of kip lever No. 823.

4. Cleaning the Type PMG Knives

Type PMG knives require very little maintenance. The space between the knives should be free from oil or grease to permit the scale to fall through. Remove and clean them at intervals depending upon the amount of mill scale encountered.

5. Sharpening the Blades of the Section Knife

Grind the five removable blades only on their cutting face side. If the knives are ground the wrong way and the cutting edges no longer converge at one point, poor cuts will result.

Regrind the blades only so long as the cutting corner fully passes the cutting edges of the stationary knife when the slide is in its bottom position, or else replace them with new ones. You will find the part numbers stamped on the knives in addition to appearing in this manual.

The corners of the blades which contact the root of the angles are shaped to cut most sections. For cutting angles having root fillets, the blades should be ground to the exact radii if no deformation whatsoever is wanted in the root.

6. Cutting with Type PMG Knives

a) Inserting the Sections

When cutting angles squarely and at any mitre angle, close the sliding blade No. 706a, fully, in the stationary section knife and open the sliding blade No. 716a entirely.

When cutting tee sections, place them into position in the knife and slide the two sliding blades up to the tee as closely as possible, yet not so tight as to prevent the feeding through of the stock. The closer the adjustment, the better the cut.

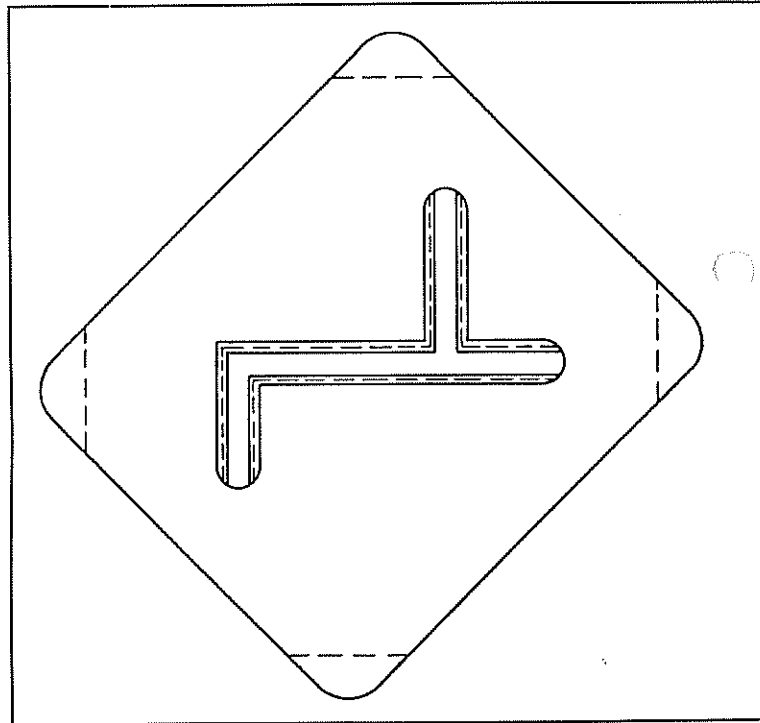


Fig. 78: Regrind the blades uniformly

You will find instructions on the correct adjustment of the sliding blades and proper insertion of sections in the cutting directions below.

b) Hold-down and Section Stop

The mitre guide No. 820 on the mitre guide rail No. 827 can be set to square (90°) or mitre cuts up to 45° by means of the graduations on the rail. It is fixed in the desired position by means of the kip lever No. 823.

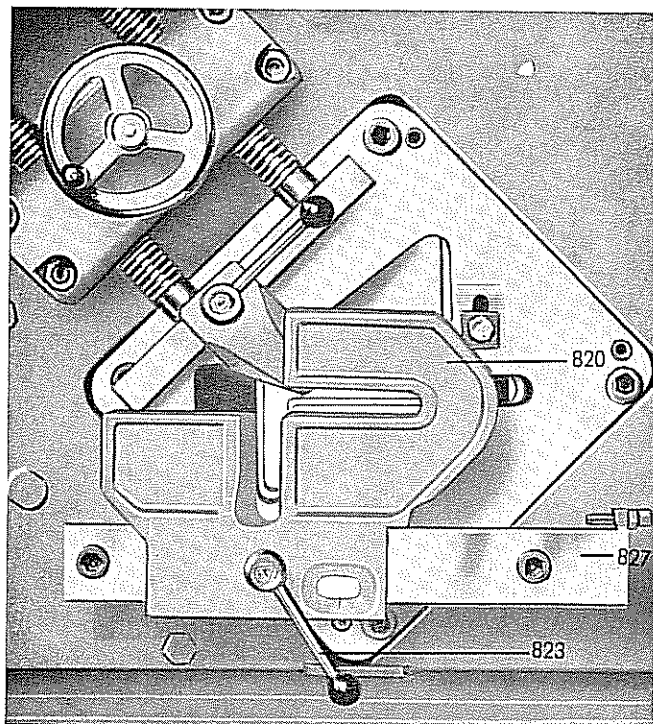


Fig. 79: Mitre guide for mitre cuts 45°

For square (90°) cuts there is a stop bolt No. 829 with a lock nut No. 830 at the right-hand side of mitre guide rail No. 827. Simply move the mitre guide against the stop bolt and you have the correct position of the work.

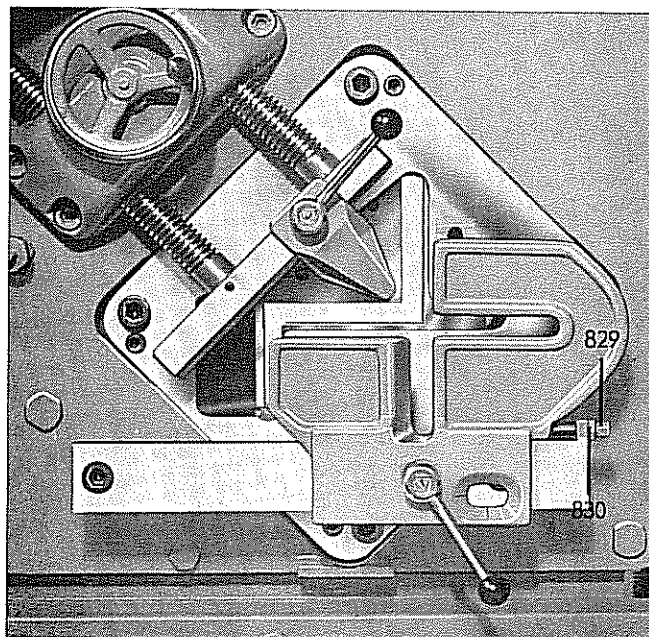


Fig. 80: Mitre guide for square (90°) cuts

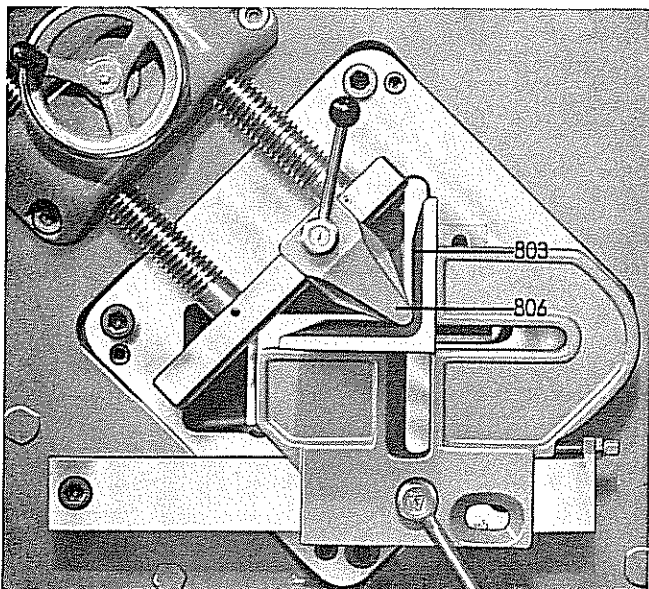
Fig. 81: Adjusting the double screw hold-down

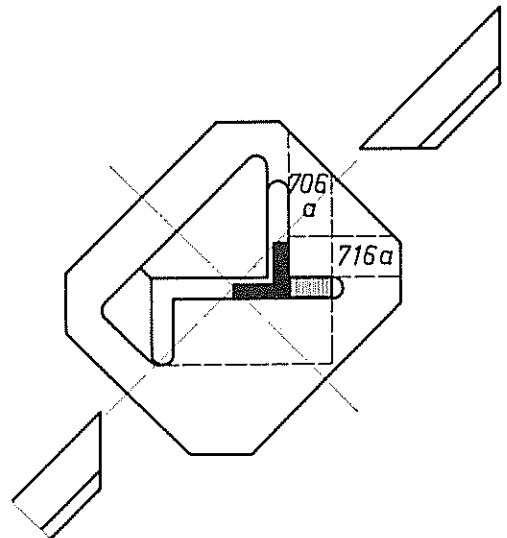
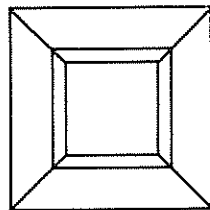
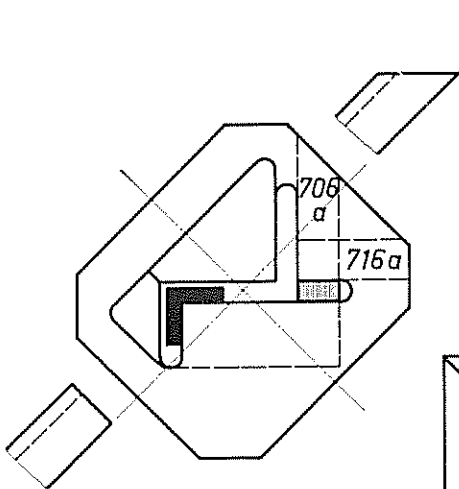
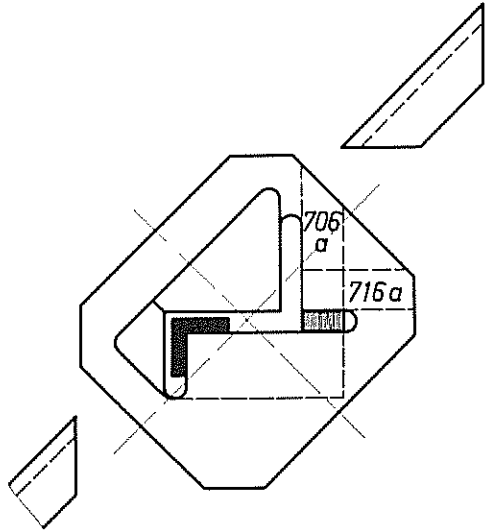
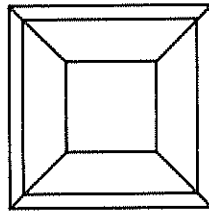
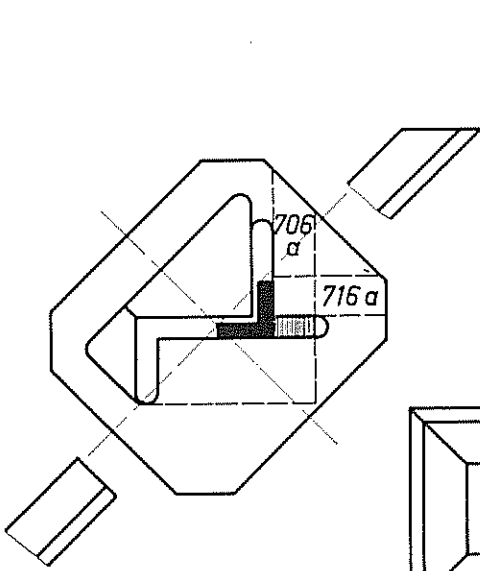
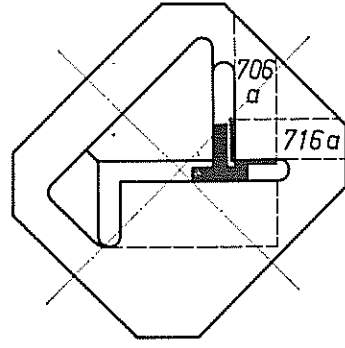
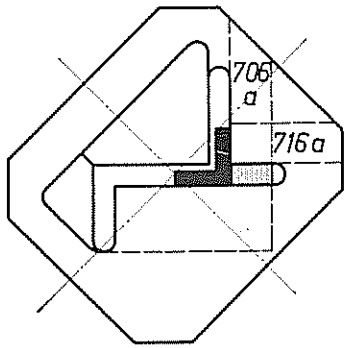
The correct vertical position of the section is adjusted by means of the double-screw hold-down. When cutting in the right-hand knife opening, the work is held down by means of the clamping block No. 806. Move this on the hold-down bar in such a way as to make it hit the section root with its tip when the hold-down is lowered.

When cutting in the left-hand knife opening, slide the clamping block out of the way. The section is held down by means of the hold-down bar.

The vertical position is correctly adjusted if the section is in a horizontal position during cutting.

If the cut is not exactly perpendicular, make the necessary corrections for the vertical and horizontal legs by means of the hold-down and mitre guide respectively. When the section is in the correct horizontal position ready for shearing, it will be slightly above the mitre guide, not resting upon it. This is to allow for the continual feeding through of the stock without the necessity of loosening the hold-down after each cut.





The Punch

1. General

The MUBEA punch is of a particularly advantageous design, exceeding by far the range of applications of an ordinary punch in that it can do many jobs which formerly could be performed on punch presses only.

2. The Punch Slide

The extremely long punch slide has a large and almost square clamping surface. Thus it is easy to mount big and deep-throated tools, as the slide, due to its length, is well suited to withstand angular forces.

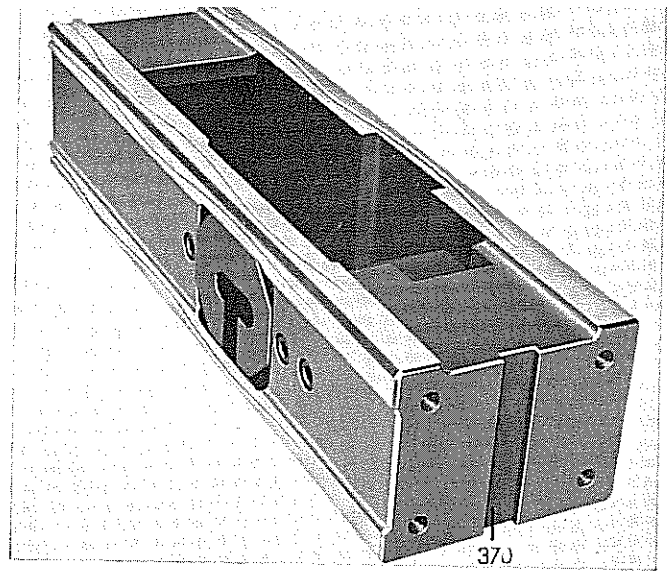


Fig. 82: Punch slide

3. Adjustment of the Slide Guides

The extra long punch slide – a distinguishing feature of all MUBEA punches – moves in long and all-around adjustable guideways. The adjustment is made by means of taper gibs. Adjustment is necessary if the punch slide No. 370, after lowering by means of the pilot lever No. 590, does not remain in its bottom position after release of the spotter lever.

Adjusting is done with the four adjusting screws No. 358 located behind and visible through the four gib lock plugs No. 360. Each adjusting screw controls a gib (No. 336 and No. 338) between the slide and the housing wall, which exert a pressure against the slide to hold it down to any position the operator places it. Rotating the adjusting screw clockwise will withdraw the gib and remove all pressure against the slide. Rotating the adjusting screw counter-clockwise withdraws the screw from the gib which lengthens the screw and allows the gib to be pushed further in when the gib lock plug is forced in against the adjusting screw.

When making the adjustments, first loosen all four gib lock plugs screws. Turn the adjusting screws counter-clockwise while exerting sufficient pressure to keep the underside of the head, against the housing. When the underside of the head begins to raise up from the housing, the gib is all the way in. With all four adjusting screws set so the underside of the head is just barely touching the housing with the gib all the way in against the slide, turn all adjusting screws clockwise $\frac{1}{8}$ of a turn and tighten the lock screws while holding the adjusting screws with a screw driver to prevent any movement. If the center spotter is still too tight, loosen the lock screws while holding the adjustment screws with a screw driver and repeat the procedure of $\frac{1}{8}$ turn clockwise until the pressure of the gibs is just sufficient to hold the slide where it is placed. Care must be taken to turn all adjusting screws equally so that all gibs have the same pressure.

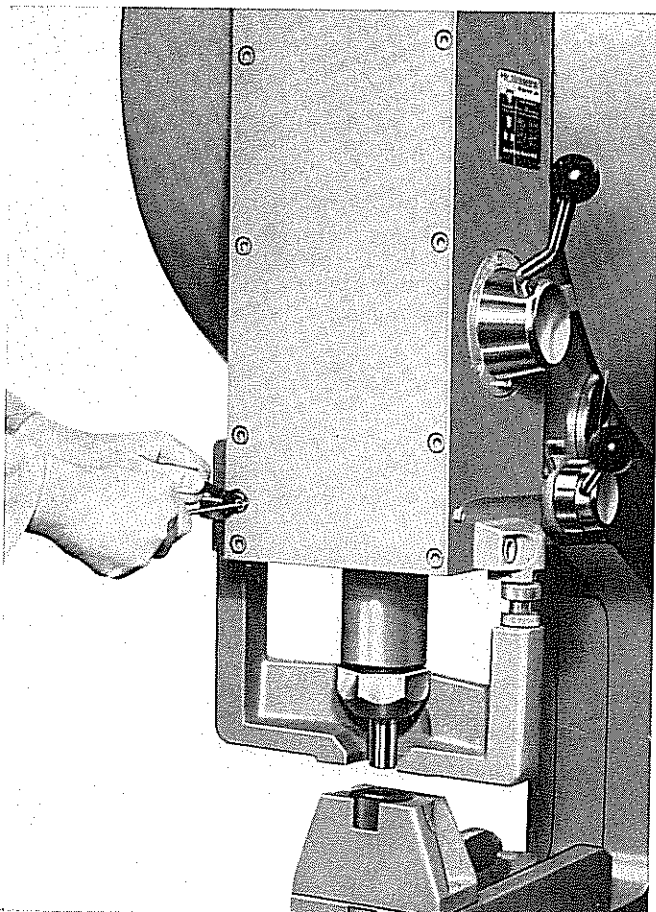


Fig. 83: Adjustment of the slide guides

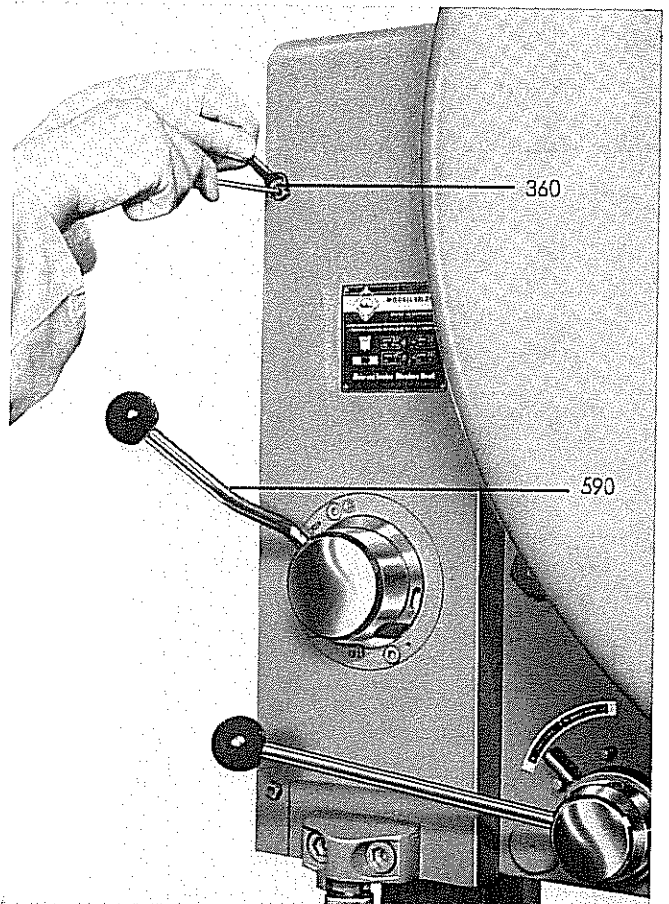


Fig. 84: Adjustment of the front slide guides

4. Saddle and Saddle Support

MUBEA punches are so designed that the punch saddle No. 720 is supported by a special saddle support No. 725. This prevents any strain in the saddle and the punching pressure is vertically introduced into the machine body.

The saddle support remains in place on all punching jobs except it is removed for punching the flanges of all channels and beams within the stated capacity of the machine. The saddle support is removed with bolt No. 726.

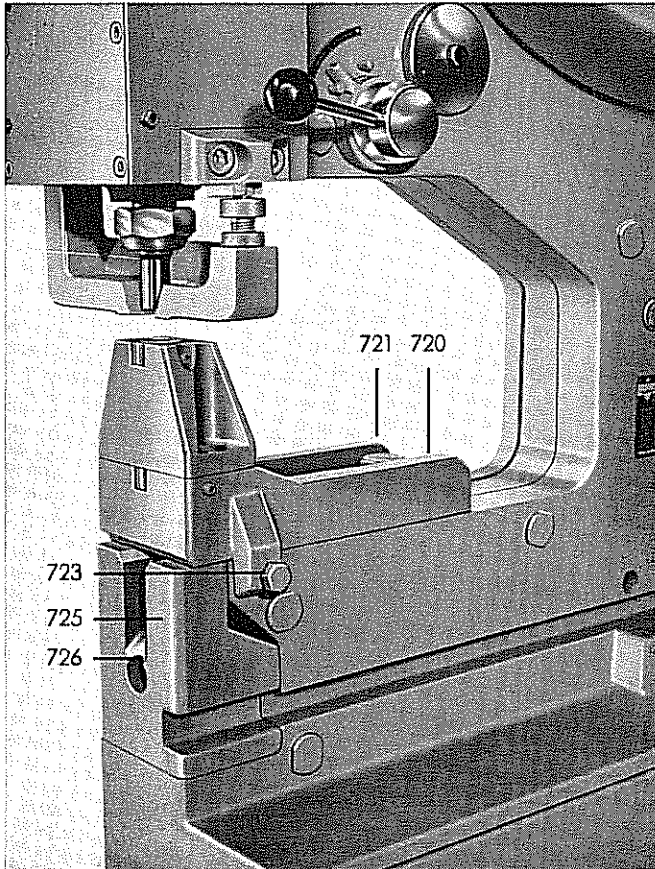


Fig. 85 : Saddle and saddle support

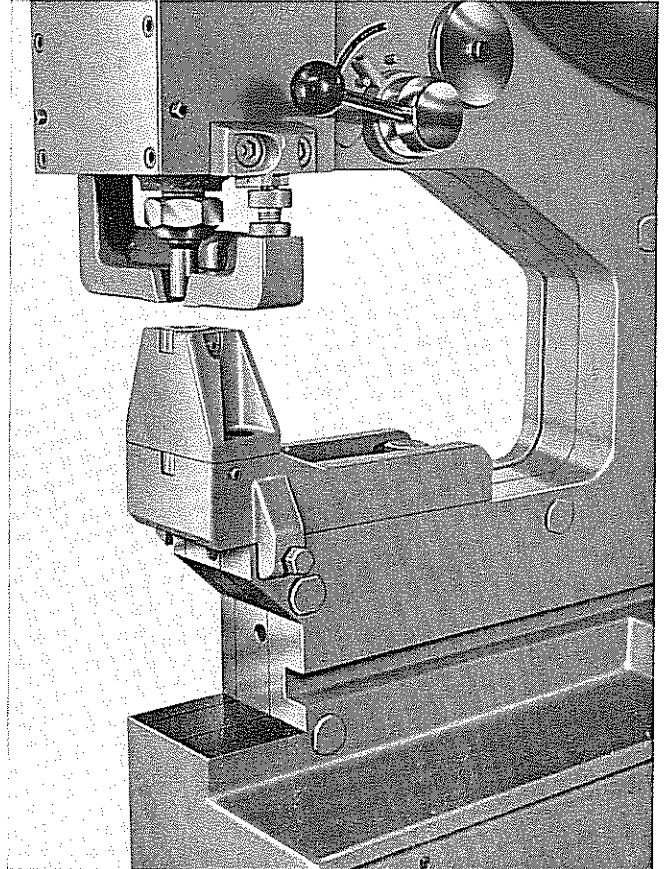
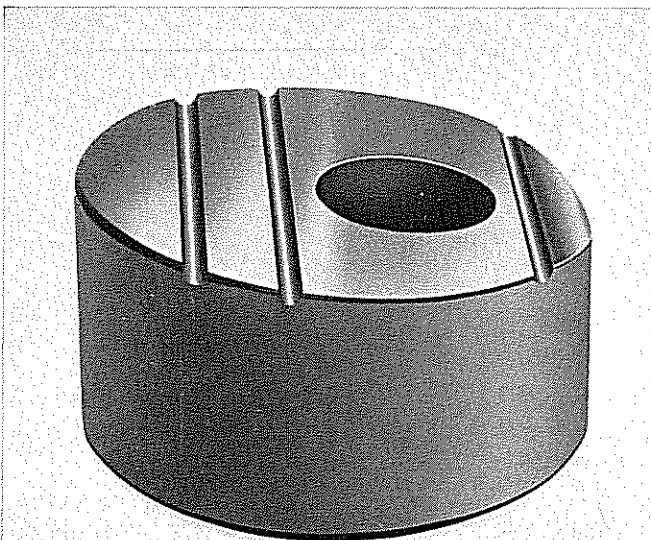


Fig. 86 : Saddle without saddle support

The arrangement is particularly useful when large and deep-throated tools are mounted on the punch, because these can effectively be used with a maximum of support.

Fig. 87 : Flange die for channels



5. MUBEA Standardized Punches and Dies

MUBEA punches and dies are available in 4 standard sizes fitting all machines.

Size No. I	up to 15 mm ϕ dia.
Size No. II	over 15 and including 30 mm ϕ dia.
Size No. III	over 30 and including 40 mm ϕ dia.
Size No. IV	over 40 and including 50 mm ϕ dia.

Using standard equipment, punches and dies up to Size II can be fitted on machine sizes 11, 13 and 16 and such up to Size III on machines sizes 20 and 25.

If bigger punches and dies are needed than can be accommodated by means of standard machine equipment, a larger punch holder, cap nut, saddle, saddle support, and stripper are required. With this larger set, all small punches and dies can also be clamped so that the standard equipment is no longer needed.

For punching holes in the flanges of channels or beams, we supply special flange dies with a surface inclination corresponding to the slope of the section flange.

For punching holes in small angles or beams near the web, flange or leg according to the shifting gauge, eccentric dies are required having an off-center hole near the edge of the die. When mounting eccentric dies, slide the punch saddle back until the punch and die hole are coaxial again.

Eccentric dies are needed for machine sizes 11-16 and 20-25 when angles below 45 mm and over 65 mm leg length are to be punched respectively.

6. Adjusting the Punch and Die

The punch and die must always be concentrically arranged. The shearing gap should be about 5 per cent of the thickness of the material to be punched. (When punching a thickness of 10 mm, the diameter of the die hole must be 1 mm larger than the punch diameter. The shearing gap then is 0.5 mm). Therefore, always specify the thickness of the material in your order.

After loosening the fixing screws 721, the saddle can be moved forward and backward. The set screws 723 serve to fix the saddle sideways. Securely re-tighten the set screws 723 and fixing screws 721 when the punch and die are correctly adjusted.

Regularly check the position of the tools during punching by immersing the punch into the die by means of the pilot.

7. The Punch Center Spotter

The punch center spotter enables the ram being lowered by means of the pilot lever 590 and the punch point being located on the punch mark in the work.

When actuating the spotter, push the pilot lever 590 first to the left in the direction towards the punch housing until the spotter disc has snapped into place. Lower the punch slide 370 by pulling the pilot lever 590 down.

When the pilot lever is released, the punch remains in position on the work so that it can no longer be displaced and faulty punching is eliminated. The punch can be engaged in this position for the working stroke.

If the punch does not remain in the lower position, readjustment of the slide guides (see para. 3.) is necessary.

8. Regrinding the Punching Tools

Regrind punching tools at their faces only to prevent a change to the clearance between the punch and die. To lengthen the service life of the tools, wipe the cutting edges regularly with oil.

In many cases it is more convenient to order new tools. This is more economical in the long run and the grinding finish is satisfactory.

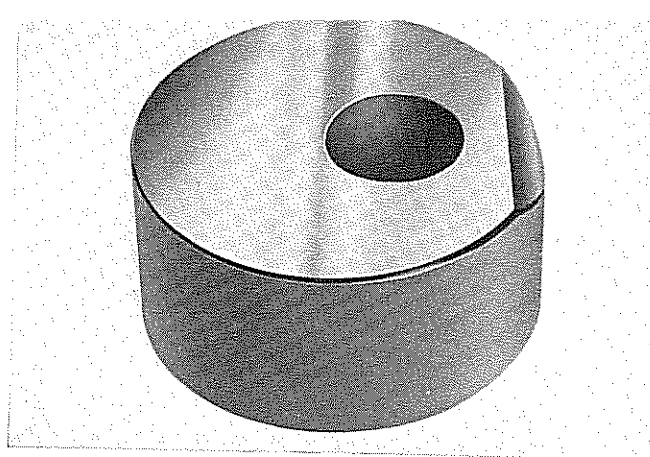


Fig. 88: Eccentric dies for punching small angles

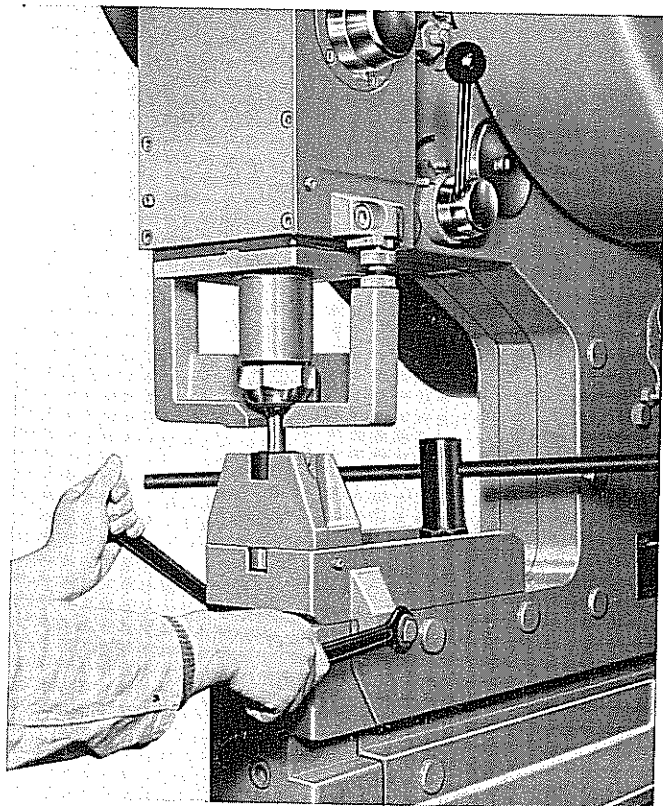
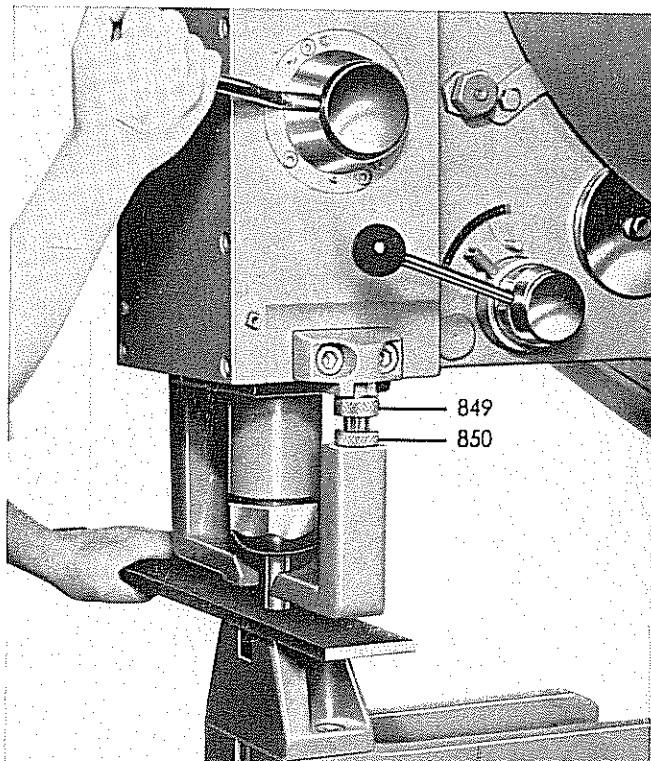


Fig. 89: Adjusting the punch and die

Fig. 90: Punch center spotter



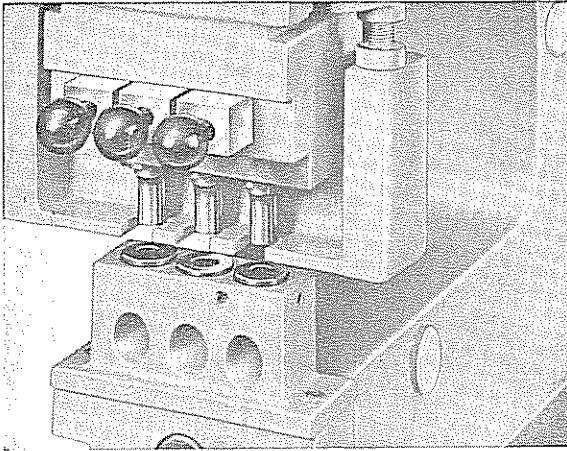


Fig. 91: Triple gang punch

9. Special Tools

Numerous customers need certain special tools which we have standardized. Moreover, it is just the MUBEA punch that has countless working possibilities which can hardly be described summarily. Neither does the enclosed prospectus contain all the combinations possible. All working problems are thus worked out by us individually.

a) Triple Gang Punch

For punching single holes of various diameters in a quickly alternating sequence, it is advisable to use a triple gang punch (see prospectus). This tool punches holes with three different diameters in one pass without involving a tool change. The desired punch is moved into working position within 2-3 seconds only by pulling a handle when holes of different diameters must be punched in long sections.

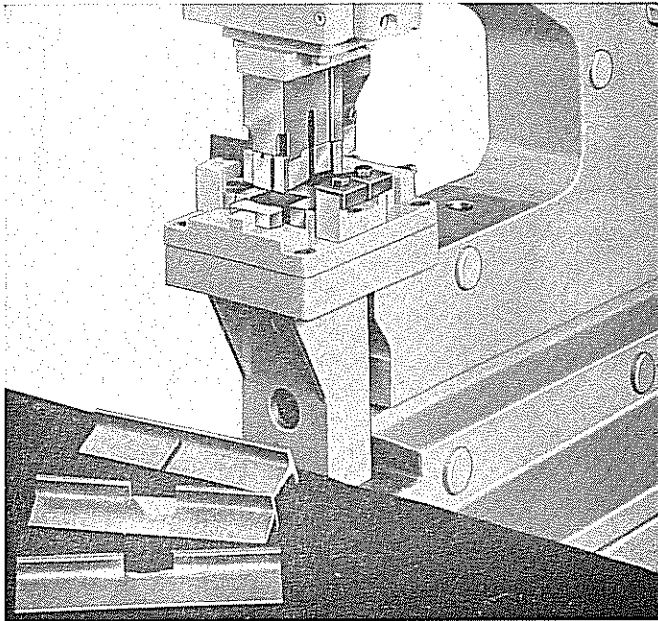
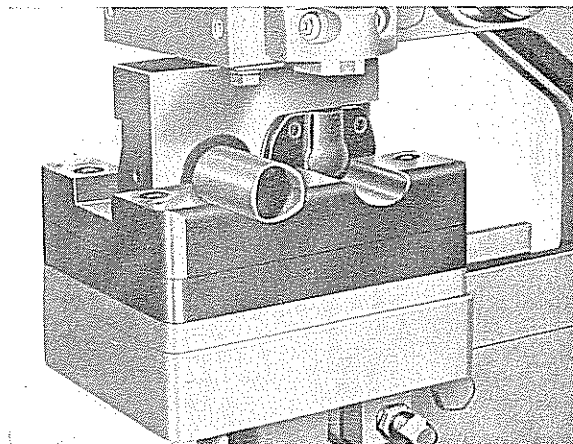


Fig. 92: Window frame tool

b) Window frame Punch

For window frame sections we supply a special tool (German Federal Utility Patent) with which to cope the flanges and webs of and notch slots in T-sections from No. 2 to No. 5. To suit the various sizes only the cutting inserts need be exchanged.

Fig. 93: Pipe notching tool



c) Pipe Notching

Pipe Notching tools serve to notch pipe or tube in such a way that they can be welded together squarely without additional finishing. A particular notching insert is required for each pipe size. One tool can accommodate up to 4 different notching inserts usable for 2 pipes.

When inquiring, please give the following data:

- a) size of pipe to be notched
- b) outside diameter of the pipe to which the notch is to fit
- c) material of the pipe to be notched

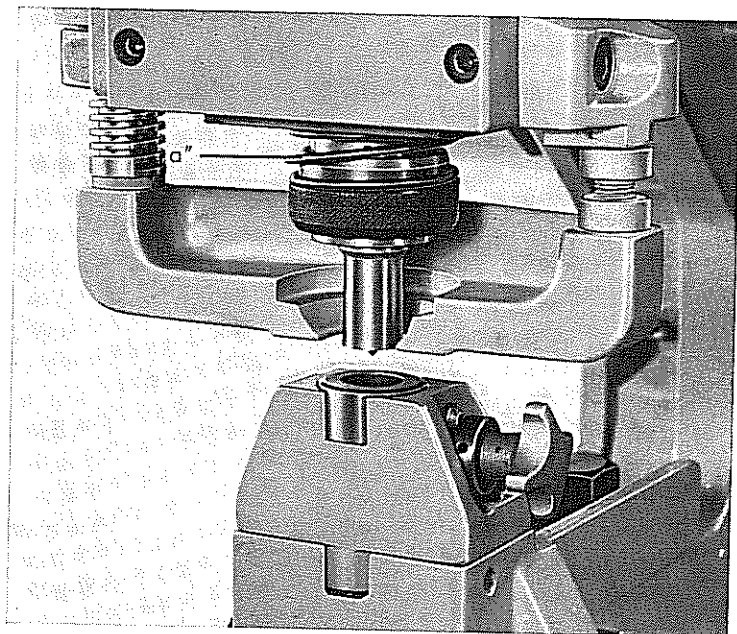


Fig. 94: Quick-change fixation for punches and dies.

Apart from the conventional punch attachment utilizing a retainer nut and the die attachment utilizing a threaded pin, we can also supply you with the time-tested quick-change fixtures for round punches and dies. Both tooling components can be switched round quickly and safely involving only a few manipulations. This type of fixture proves to be extremely efficient with regard to machining small lots requiring frequent tool changes.

Upper and lower forming dies can also be chucked in this fixture but require an inspection of the cutting slot after every tool change. It often happens in this connection that the saddle must be re-aligned. Apart from re-alignment, just like in retainer nut attachment, the locking ring for the punch must be retightened after the first punching operation as the centering pin will not have engaged in the guiding groove until after the first punching operation is completed. In the event that larger lots are to be machined it is recommended that the more robust retainer nut attachment is used to chuck the punch. To change the quick-change fixture into a retainer nut attachment, centering screw "a" must be detached so that the ball ring is released, ready to be unscrewed. Following the manipulations, the punch is ready for operation with the retainer nut attachment. The installation of the quick-change fixture is effected in reverse order of sequences. If, for any reason, a punch cannot be chucked properly, the basic position of the ball ring must be adjusted. Centering screw "a" must, for this purpose, be slackened and the ball ring be screwed somewhat higher to be locked in the new position by way of the centering screw.

Fig. 95: Punching in web of beam

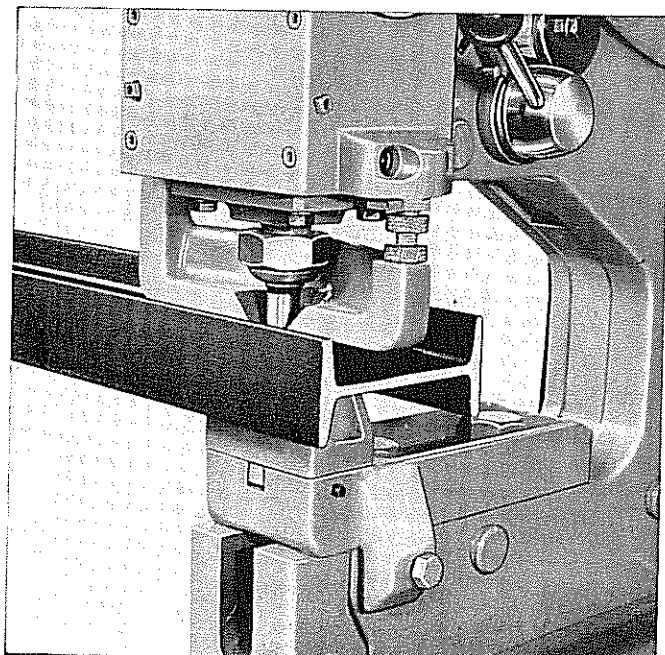
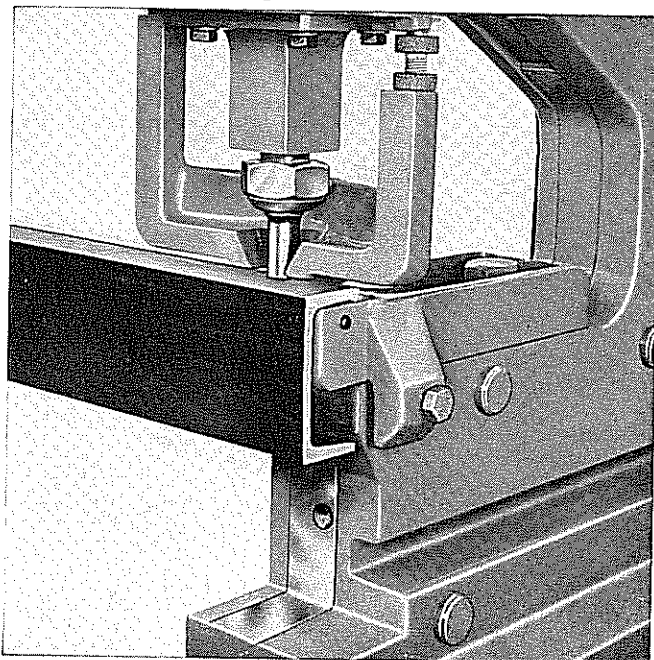
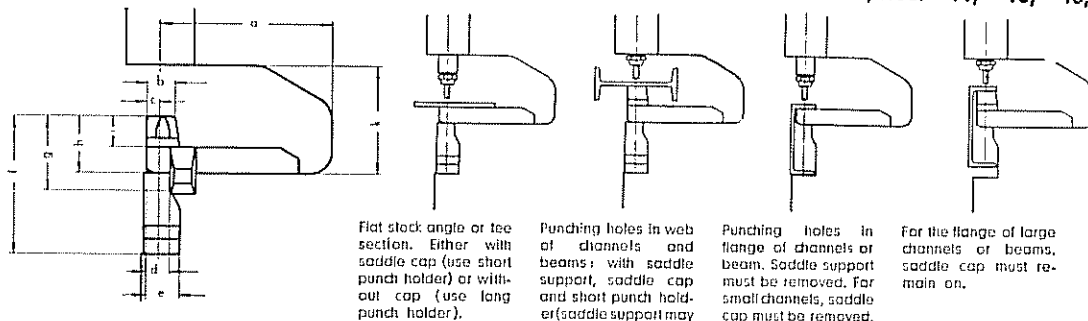


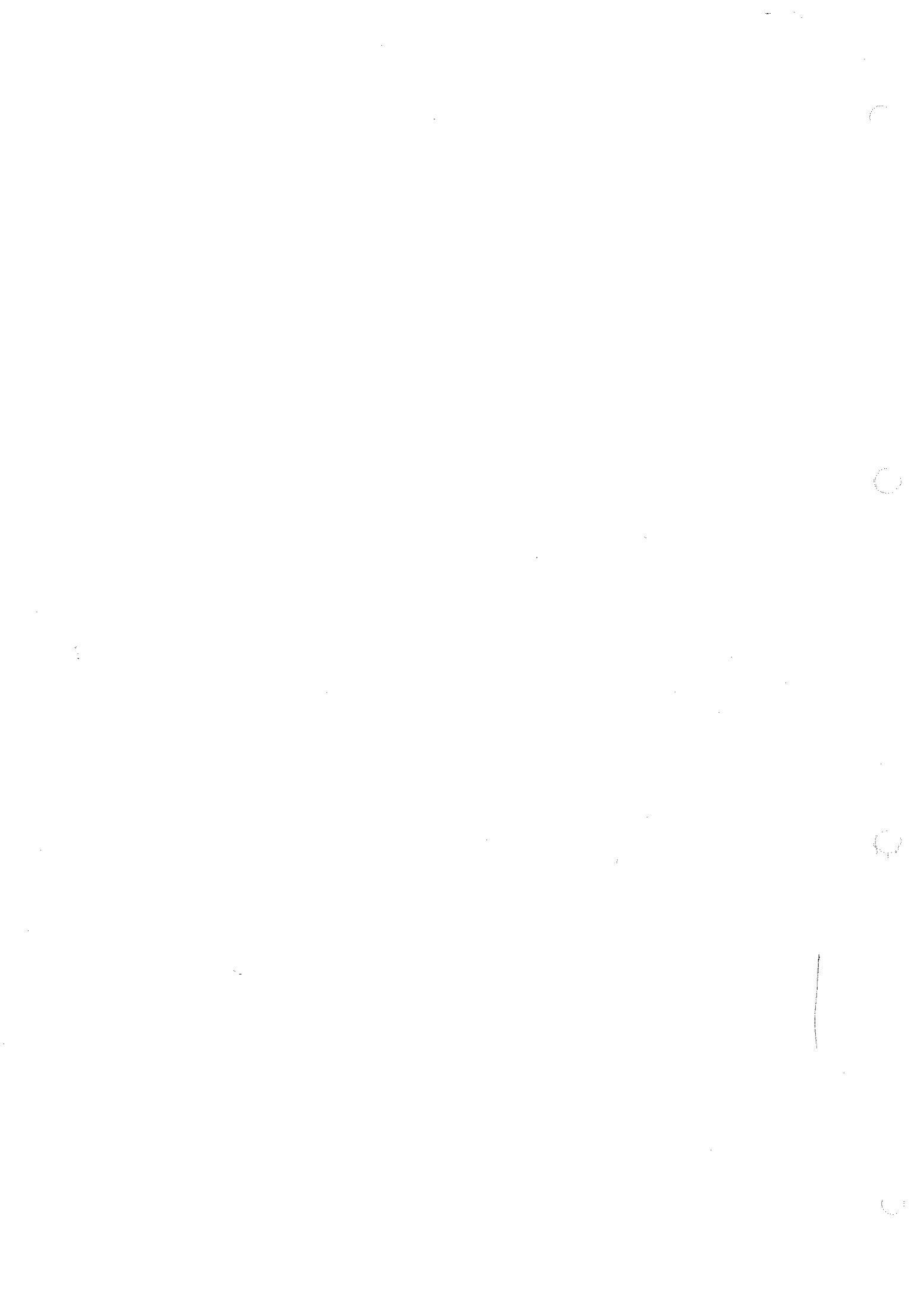
Fig. 96: Punching in flange of channel



Dimensions of punch saddle for model KBL, Sizes, Nos. 0 1/2 1 1/2 2 1/2 3 1/2 / Sizes, Nos. 11, 13, 16, 20, 25



KBL	11		13		16		20		25	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
a	320	12 ¹ / ₃₂ "	400	15 ¹ / ₄ "	500	19 ¹¹ / ₁₆ "	500	19 ¹¹ / ₁₆ "	750	29 ¹ / ₂ "
b	47,5	1 ⁷ / ₁₆ "	47,5	1 ⁷ / ₁₆ "	47,5	1 ⁷ / ₁₆ "	70	2 ⁷ / ₁₆ "	70	2 ⁷ / ₁₆ "
c	22,5	5 ⁷ / ₁₆ "	22,5	5 ⁷ / ₁₆ "	22,5	5 ⁷ / ₁₆ "	30	1 ³ / ₁₆ "	30	1 ³ / ₁₆ "
d	47,5	1 ⁷ / ₈ "	47,5	1 ⁷ / ₈ "	47,5	1 ⁷ / ₈ "	60	2 ³ / ₁₆ "	60	2 ³ / ₁₆ "
e	72,5	2 ¹¹ / ₁₆ "	72,5	2 ¹¹ / ₁₆ "	102,5	4 ¹ / ₁₆ "	120	4 ¹³ / ₁₆ "	120	4 ¹³ / ₁₆ "
f	286	11 ¹¹ / ₁₆ "	324	12 ¹ / ₄ "	380	14 ⁶¹ / ₁₆ "	445	17 ¹ / ₂ "	493	19 ¹³ / ₁₆ "
g	166	6 ¹¹ / ₁₆ "	176	6 ¹¹ / ₁₆ "	232	9 ¹ / ₈ "	222	8 ⁷ / ₁₆ "	220	8 ¹¹ / ₁₆ "
h	126	4 ¹ / ₁₆ "	134	5 ¹ / ₁₆ "	190	7 ¹ / ₂ "	180	7 ¹ / ₁₆ "	178	7 ¹ / ₁₆ "
i	66	2 ¹ / ₁₆ "	74	2 ¹ / ₁₆ "	112	4 ¹³ / ₁₆ "	102	4"	102	4"
k	240	9 ¹¹ / ₁₆ "	265	10 ¹ / ₁₆ "	325	12 ²³ / ₁₆ "	400	15 ¹ / ₄ "	400	15 ¹ / ₄ "



Operators Manual

You have made a good choice, as you will soon see for yourself. The experience of decades and the latest know-how in the field of punch and shear construction are incorporated in this Original MUBEA machine. As numerous satisfied customers have verified time and again, it is just the daily routine handling of this machine that makes its advantages particularly apparent.

In order to be able to fully utilize the machine, it is urgently recommended that you read and follow this operating manual carefully.

Shop practice will very soon show you that MUBEA machines can effectively be complemented and are thus universally usable and, at the same time, economical in operation.

To give you a general picture of the parts used in construction of the machine and how these are interacting, we refer you to the list with the designations and numbers of the components. The same parts numbers are also frequently quoted in the text with reference to that list. The same part number applies to all sizes of machines.

If there is a problem you cannot solve, or a job you cannot do yourself, please call on us. Our service Staff is always at your disposal.

Give your MUBEA ironworker the care such valuable equipment deserves. You will find many pointers on this throughout this manual.

