

STARTRITE

OPERATING INSTRUCTIONS AND PARTS LIST

18V10.

T, V and R series
BANDSAWING MACHINES

HANDBOOK 9/70

T, V and R series
BANDSAWING MACHINES

HANDBOOK 9/70

PLANT and SERVICE DEPOT FOR THE U.K.

Startrite Engineering Co. Ltd.,
Waterside Works,
Gads Hill,
Crayke

EXPORT SALES

Startrite Machine Tool Co., Ltd.,
69/71 Newington Causeway,
London SE1 England

PARTS LIST

Abrasive band guide —62
Air pipes: V, RWF and RWS models —44, 53
Airpump: V, RWF and RWS models —42
Bandwheels —46
Bandwheel mounting bracket (third bandwheel)
 all models except 14RF, 14RWF and 14RWS models —56
Bandwheel hub (fixed): all models except 14RF, 14RWF and 14RWS models —46
Band wheel hub (tracking): all models —46
Bandwheel brush and details: all models —46
Bandfile guides —64
Cradle assembly: RWS models —48
Cradle assembly: T, V, RF and RWF models —60
Disk sawing attachment —60
Door latch assembly: all models —58
Gearbox: all models —39
Machine body assembly: all models —58
Manual feed assembly: RWS models —51
Motor pulley and details: all models —44
Motor platform and details: all models —44
Pusher attachment (ungeared) —68
Pusher attachment (geared) —66
Saw guard (standard): all models —53
Saw guard (intermediate) 30RF, 30RWF and 30RWS models —58
Saw guides (standard): all models —56
Saw guides (combination) —70
Table and details: T and V models —42
Table and details: RF and RWF models —42
Table and details: RWS models —51
Table (auxiliary) and details: 30RF, 20 RWF and 30RWS —58
Tension indicator: all models —54
Top bandwheel bracket assembly: all models —53
Vee belts: all models —44
Work light: V, RWF and RWS models —60

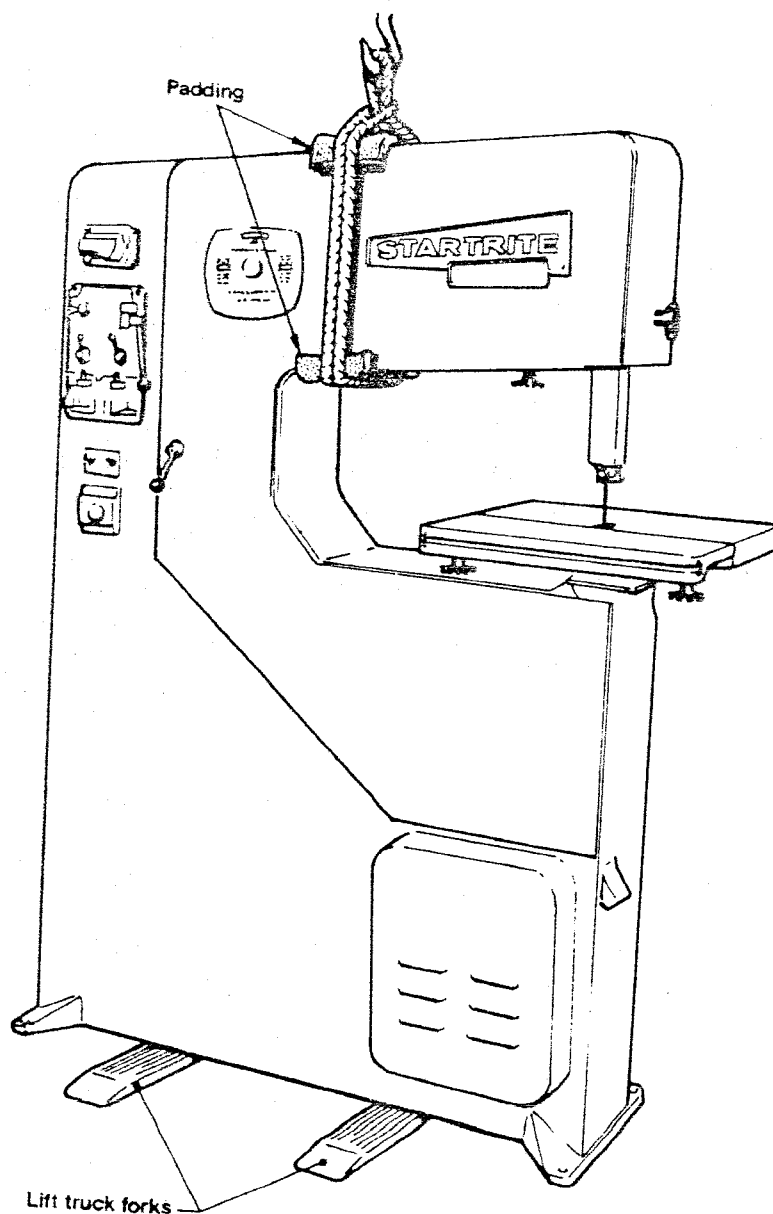
ORDERING PARTS

State:—

1. Quantity required.
2. Part No. (where applicable) and description.
 Specify power supply for electrical components.
3. Machine model and Serial No.

We reserve the right to change design and specification without notice.

MACHINE SERIES	MOTOR 3 PHASE 50 CYCLES					OVERLOAD UNIT	
	HP	R.P.M.	Voltage	Starting Amps.	F/L Amps.	Part No.	Amps. Range
T-V	1½	1000	380/440	13	2.7	47 LO 108	2.7-4.2
			200/220	26	5.3	47 LO 109	4.0-6.2
RF-RWF-RWS	1½	750	380/440	17	3.4	47 LO 108	2.7-4.2
			200/220	29	5.9	47 LO 109	4.0-6.2



TO LIFT MACHINE

Use fork lift truck with forks under base of machine (steady machine during transport)
OR
Use hoist with sling positioned as shown.

WARNING

Attachment of sling to table may damage the machine.

THROAT SIZE	APPROXIMATE MAXIMUM WEIGHTS
14"	700 lbs (318 kg.)
18"	600 lbs (272 kg.)
20"	800 lbs (363 kg.)
24"	700 lbs (318 kg.)
30"	950 lbs (431 kg.)

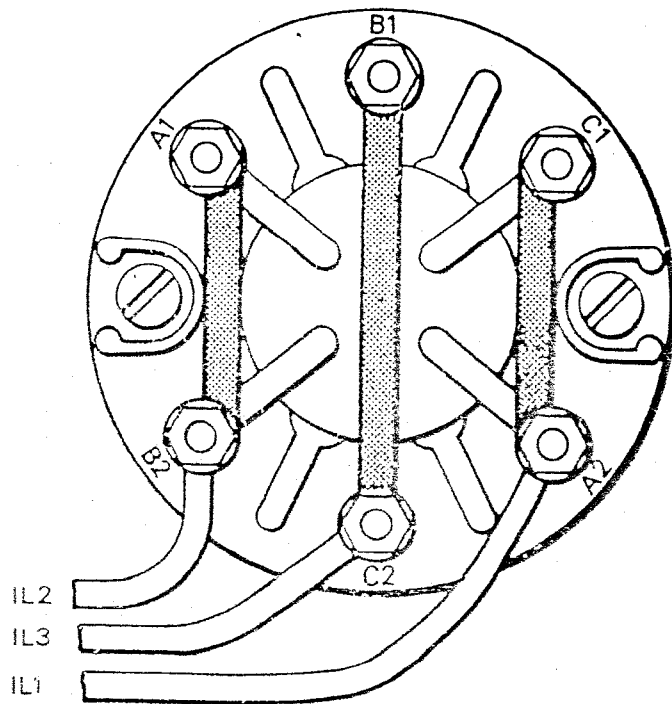
Fig.1

Position the machine and check that it stands with equal firmness on all feet.

Fix the machine in position by means of anti-vibration pads secured by adhesive or use four 3/8" dia. anchor bolts (Not supplied).

Adequate working space is essential do not site the machine in a cramped position in the workshop.

Bandsaw blades tend to get tangled and damaged if hung from a hook or stacked on the floor, therefore ample cupboard space for blade storage should be provided adjacent to the machine.



3 LINKS FITTED FOR
220V 3PH SUPPLY

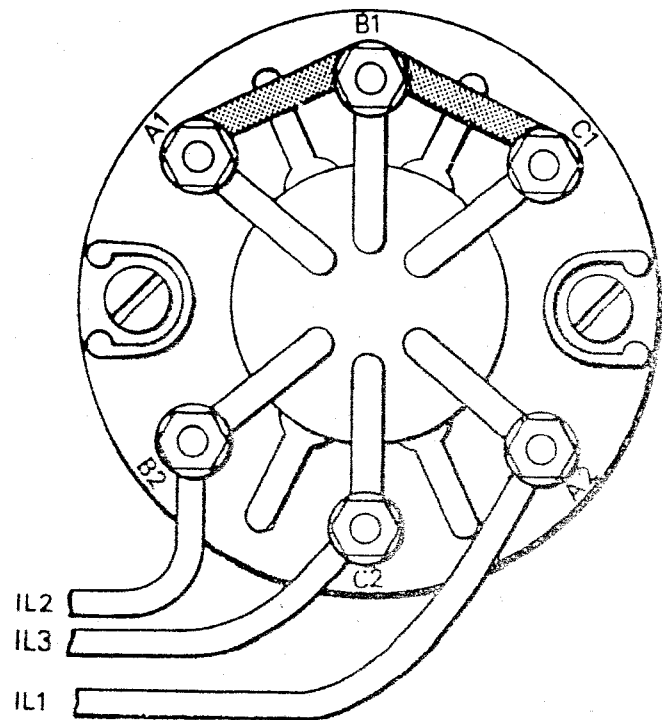
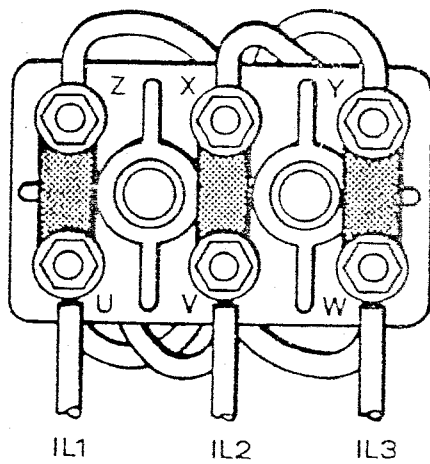


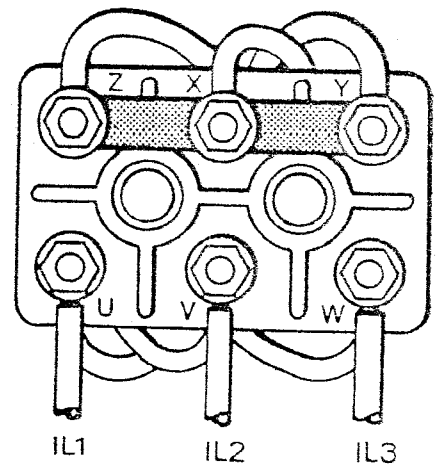
Fig. 2

2 LINKS FITTED FOR
440V 3PH SUPPLY

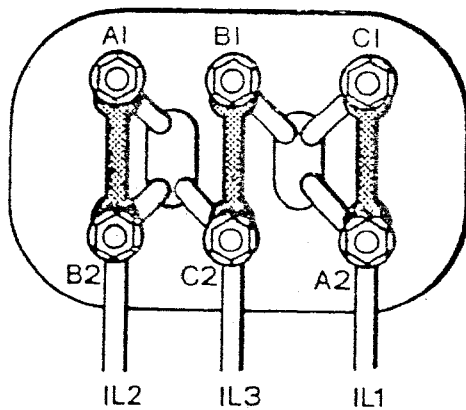


3 LINKS FITTED FOR
220V 3PH SUPPLY

Fig. 3

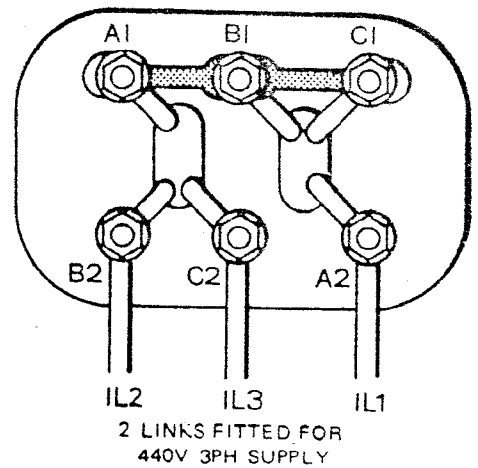


2 LINKS FITTED FOR
440V 3PH SUPPLY

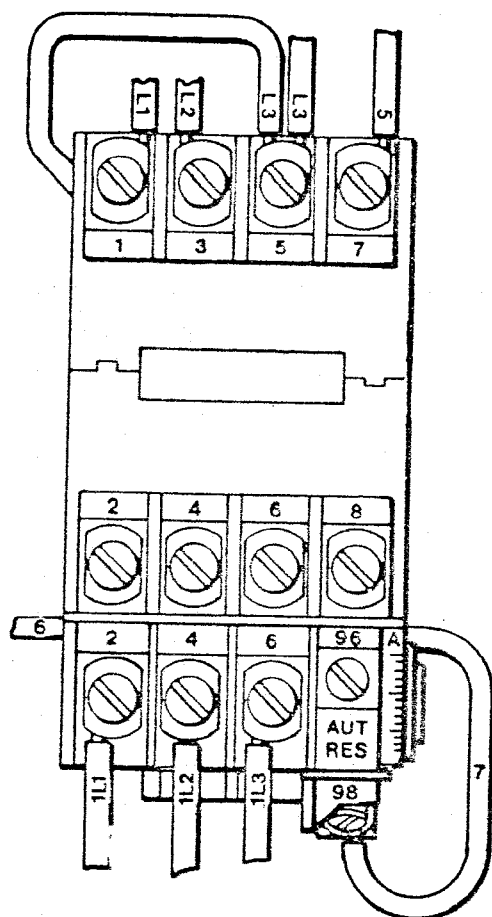


3 LINKS FITTED FOR
220V 3PH SUPPLY

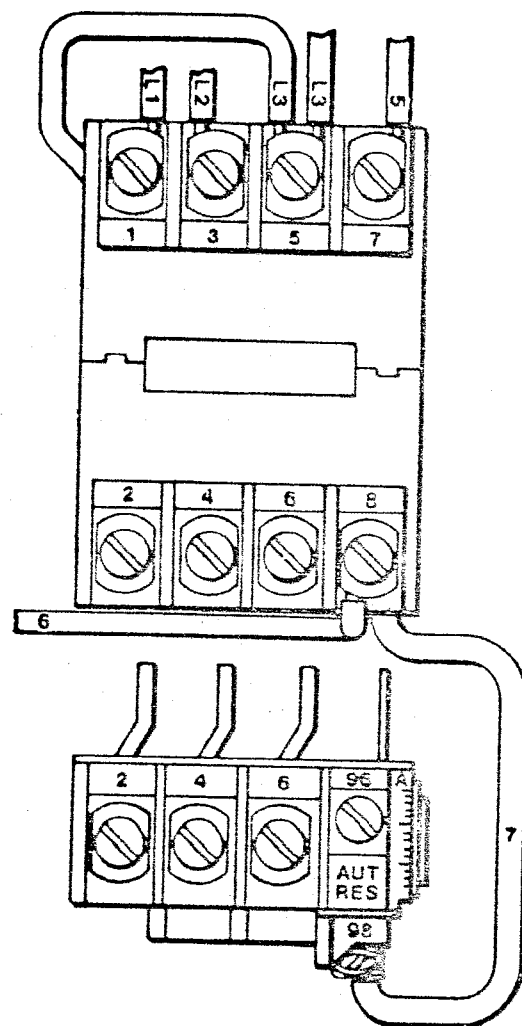
Fig. 4



2 LINKS FITTED FOR
440V 3PH SUPPLY



OVER LOAD UNIT
FITTED



OVERLOAD UNIT
DETACHED

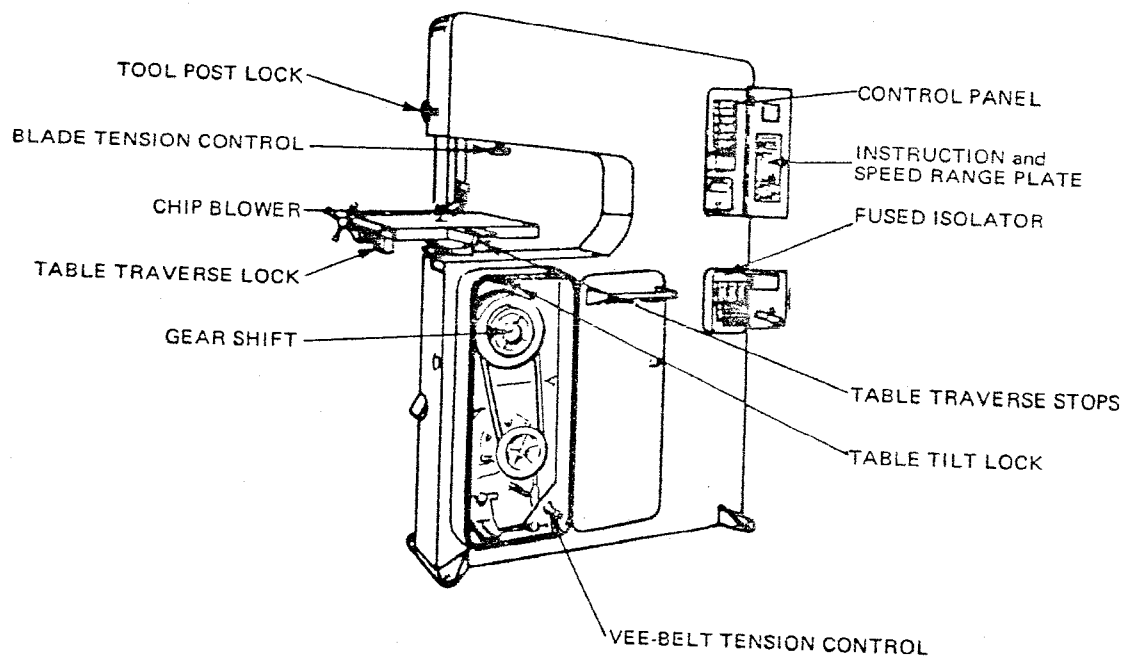
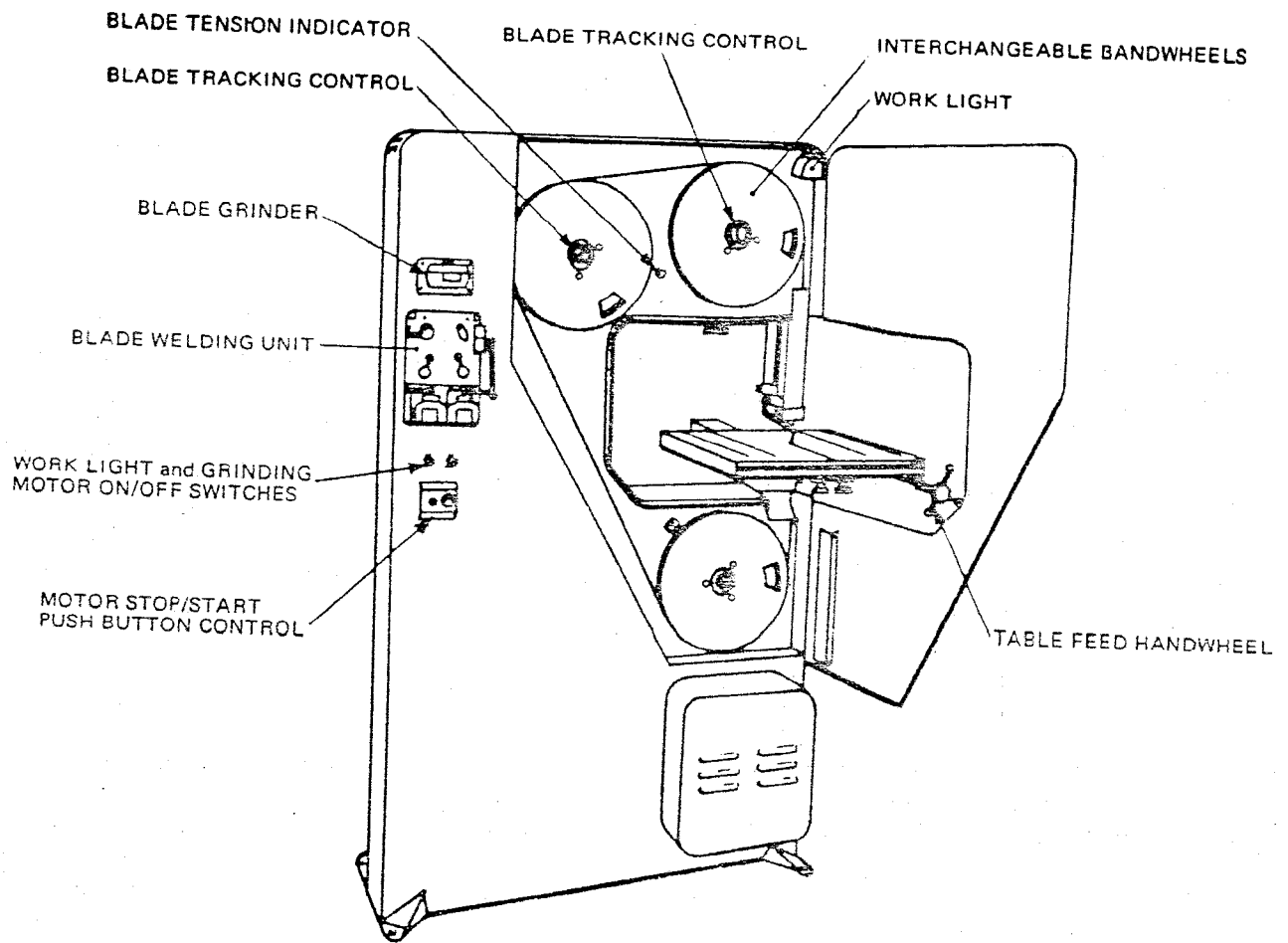
Fig 7

- C. Identify the work light transformer, see page 32.
Link transformer terminals as shown in Fig. 8 to suit voltage.
- D. The blade welder and grinder units cannot be used on an alternative voltage range for which they were supplied and must be replaced as follows:—

From the front of the machine, remove the blade welder unit (four screws).
Remove grinding wheel guard (two screws) and the grinding wheel (nut and washer).
Support the grinding motor from the rear of the machine, remove four screws
securing motor and withdraw from the rear of the machine.

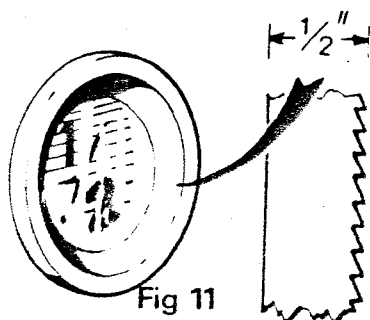
Install welding and grinding unit of suitable voltage rating viz,
220 volt units for use on 200-220 volt supply.
380 volt units for use on 360-390 volt supply.
415 volt units for use on 395-440 volt supply.

Mount the control panel into the machine body and connect wires to terminal block at
bottom of panel, see Fig. 10.



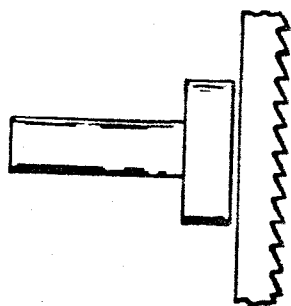
LAYOUT OF TYPICAL BANDSAWING MACHINE
Details vary according to model.

When the saw blade is tracking in a satisfactory manner, apply the appropriate blade tension as indicated on the blade tension indicator. (see Fig. 11).

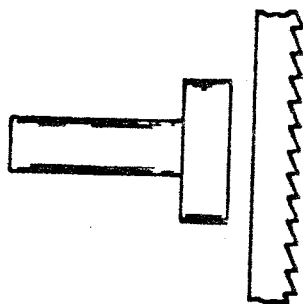


The tension scale shows tension applied in terms of blade width. Thus a $\frac{1}{2}$ " reading on the scale shows that tension has been applied to suit a blade of $\frac{1}{2}$ " width. The indicator will provide a fair guide as to correct tension but it may be necessary to increase the tension when sawing very hard materials.

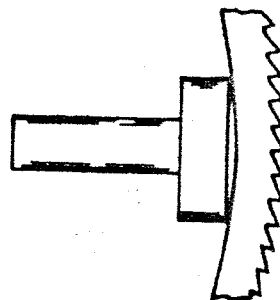
Position the thrust rollers so that their faces just clear the back edge of the blade. To adjust position of thrust rollers, slacken clamping screws in tool post and cradle.



CORRECT
Thrust roller .015"
max from back edge
of blade.

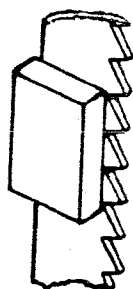


INCORRECT
Thrust roller not
supporting the blade

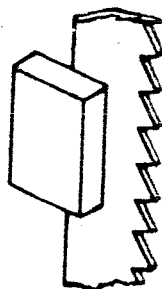


INCORRECT
Thrust roller
deflecting blade.

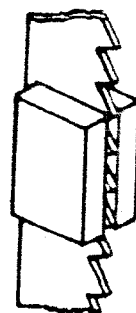
Adjust the position of the Guide Holders so that the blade is supported in its natural path with only sufficient clearance to avoid trapping the blade. Move the guide body along the Support Shaft to allow the Guide inserts to have maximum contact along the sides of the blade without snagging the set of the teeth.



CORRECT
Maximum support
to blade



INCORRECT
Insufficient support
for blade



INCORRECT
Guide inserts
snagging set of
teeth

Should the guide inserts and thrust rollers fail to support the blade in the correct manner, it will be almost impossible to obtain a true cut.

MATERIAL	MATERIAL THICKNESS					
	1/4" - 1/2"		1/2" - 1"		1" - 2"	
	TPI	Speed	TPI	Speed	TPI	Speed
Aluminium Alloy	14-10	1700	10- 8	1500	8- 6	1350
Aluminium - cast	14-10	900	10- 8	800	8- 6	700
Aluminium - rolled	14-10	2700	10- 8	2400	8- 6	2100
Asbestos	14-10	2100	10- 8	2100	8- 6	2100
Babbitt Metal	14-10	1700	10- 8	1500	8- 6	1350
Bakelite	14-10	3400	10- 8	3400	8- 6	3000
Beryllium	24-18	100	18-14	90	14-10	80
Brake Lining	14-10	220	10- 8	200	8- 6	180
Brass - cast	18-14	60	14-10	55	10- 8	55
Brass - hard	18-14	340	14-10	300	10- 8	260
Brass - soft	14-10	1500	10- 8	1300	8- 6	1200
Bronze - Aluminium	24-18	330	18-14	330	14-10	300
Bronze - Manganese	18-14	165	14-10	145	10- 8	130
Bronze - Phosphor	14-10	200	8- 6	175	6- 3S	155
Carbon	14-10	3600	10- 8	3600	8- 6	3600
Cellotex	14-10	3500	10- 8	3500	8- 6	3500
Celluloid	14-10	1200	10- 8	1100	8- 6	1000
Copper - hard	18-14	750	14-10	650	10- 8	580
Copper - soft	18-14	3000	14-10	2700	10- 8	2400
Dural	18-14	1350	14-10	1200	10- 8	1100
Duraloy	18-14	90	14-10	80	10- 8	70
Fibre Board	18-14	1200	14-10	1100	10- 8	1000
Fibre Glass	24-18	1100	18-14	1000	14-10	900
Formica	18-14	3000	14-10	2900	10- 8	2600
Frontier Metal	14-10	760	10- 8	690	8- 6	600
Graphite	24-18	2800	18-14	2800	14-10	2800
Iron - cast	18-14	140	14-10	125	10- 8	110
Iron - malleable	18-14	180	14-10	160	10- 8	140
Iron - meehanite	18-14	115	14-10	100	10- 8	90
Iron - Nickel	18-14	100	14-10	85	10- 8	80
Karmot	14-10	2200	10- 8	2000	8- 6	1800
Lead	14-10	2000	10- 8	1800	8- 6	1600
Magnesium	18-14	3200	14-10	3200	10- 8	2700
Mica	18-14	230	14-10	200	10- 8	180
Monel Metal	24-18	60	18-14	55	14-10	50
Neoprene	14-10	3600	10- 8	3400	8- 6	2600
Nickel Silver	18-14	210	14-10	190	10- 8	170
Paper	24-18	2500	18-14	2500	14-10	2200
Perspex	14-10	3200	10- 8	3000	8- 6	2700
Plexiglass	14-10	3000	10- 8	2600	8- 6	2300
Polystyrene	14-10	2000	8- 6	1750	6- 3S	1600
Rubber - Crepe	14-10	3500	8- 6	3500	6- 3S	3000
Rubber - hard	14-10	3000	8- 6	2600	6- 3S	2600
Silver alloy	14-10	2500	10- 8	2200	8- 6	2000
Slate	14-10	650	8- 6	540	6- 3S	500
Steel - armour plate	18-14	100	14-10	90	10- 8	80
Steel - manganese	18-14	115	14-10	100	10- 8	90
Steel - mild	14-10	190	10- 8	180	8- 6	160
Steel - Molybdenum	18-14	85	14-10	75	10- 8	70
Steel - Nickel	18-14	85	14-10	75	10- 8	70
Steel - Nickel Chrome	24-18	80	18-14	70	14-10	60
Steel - rolled	18-14	160	14-10	145	10- 8	130
Steel - stainless	18-14	60	14-10	55	10- 8	50
Steel - tool	18-14	70	14-10	60	10- 8	55
Tufnol	14-10	1900	10- 8	1700	8- 6	1500
Zinc	14-10	1900	8- 6	1700	6- 3S	1500

Gullet size is related to the number of teeth per inch, the fewer teeth, the larger the gullet. Thus as material thickness increases, less teeth per inch are required in order to effect efficient penetration of the material and the larger gullet capacity is necessary to accomodate swarf.

The teeth are formed so that the tips protrude beyond the body of the blade. This is called the "set" and is necessary to make the width of the saw cut (kerf) wider than the body of the blade in order to prevent the blade jamming in workpiece.

Standard set teeth are set alternatively to the left and to the right, a style which is so popular for soft materials and woodcutting.

Raker set teeth have one tooth set to the left, one without set and the next set to the right etc., and are to be preferred for general use, particularly for sawing large slabs.

Wavy set blades have the teeth set in groups or waves, one group being set to the left and the next to right. Blades of very fine pitches are usually set in this fashion as it is impractical to set the individual teeth. Wavy set blades are to be preferred for sawing thin sections or pipes as the progressive set tends to relieve the shock loading on the teeth.

A skip tooth blade has alternative teeth omitted, a design which permits greater gullet capacity without unduly weakening the body of the blade. Providing the thickness of the material permits, a skip tooth blade will give the best performance on aluminium, soft brass and copper. Fast economical sawing of wood and plastics is also possible with this style of blade.

Composite or bi-metal blades which consists of hard teeth welded to a flexible band will prove superior for sawing very hard materials. Although the initial cost is higher than for carbon steel blades, the extended tool life which can be expected usually coupled with faster sawing times may well make them an economic proposition on batch production.

BLADE WIDTH

For straight sawing use the widest blades the machine will accept.

$\frac{1}{2}$ " wide x .025" gauge on V and T series models.

$\frac{3}{8}$ " wide x .032" gauge on RF, RWF and RWS series models.

For contour sawing, the width of blade must be chosen with regard to the smallest radius that is to be sawn, thus a small radius will demand the use of a narrow blade.

Since the beam strength of a blade falls off rapidly and the permissible tension decreases with narrow blades, it follows that the widest possible blade that will negotiate the curve should be used. It is impossible to be precise as to the minimum radius that a given blade will saw as so much depends upon the type of material, its thickness, the condition of the blade and the skill of the operator. A guide to blade width selection is given in the chart below.

WIDTH OF BLADE	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "
MINIMUM SAWING RADIUS	$\frac{5}{16}$ "	$\frac{5}{8}$ "	1"	1 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	4"

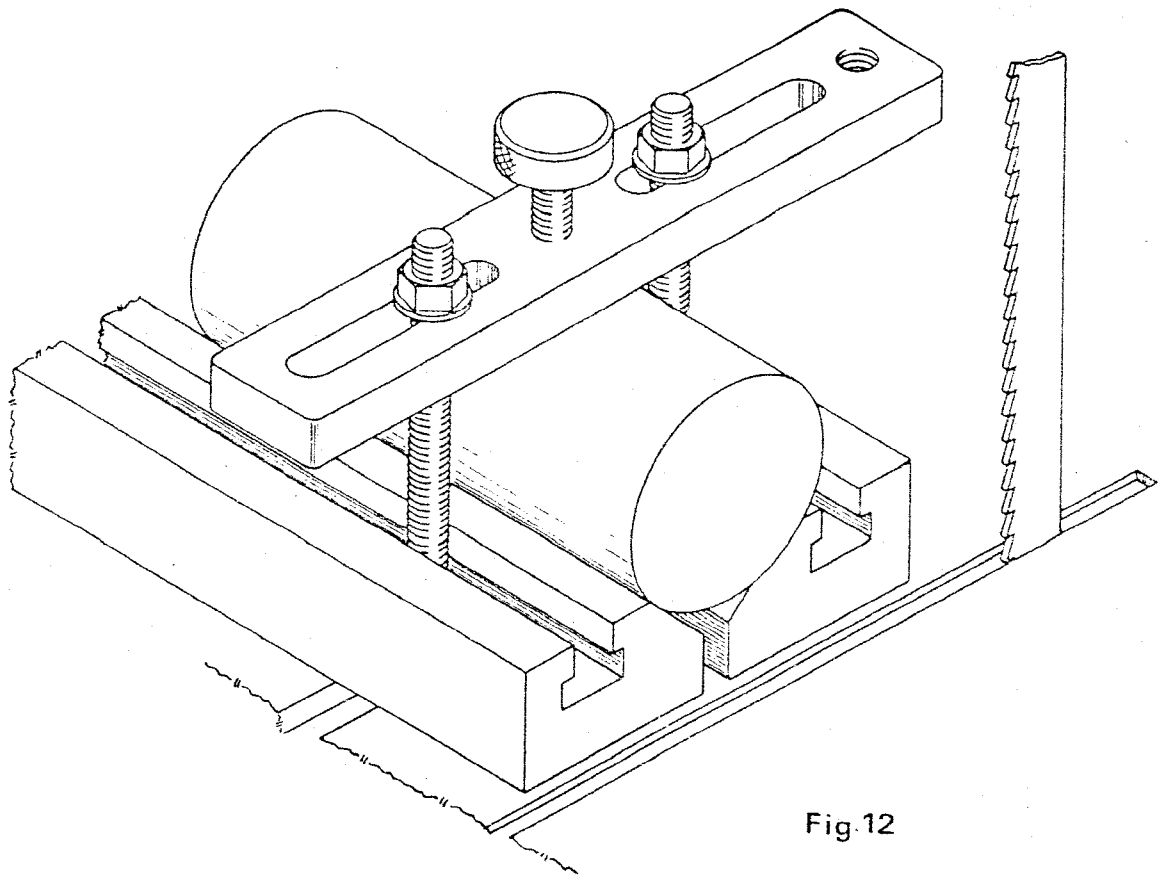


Fig.12

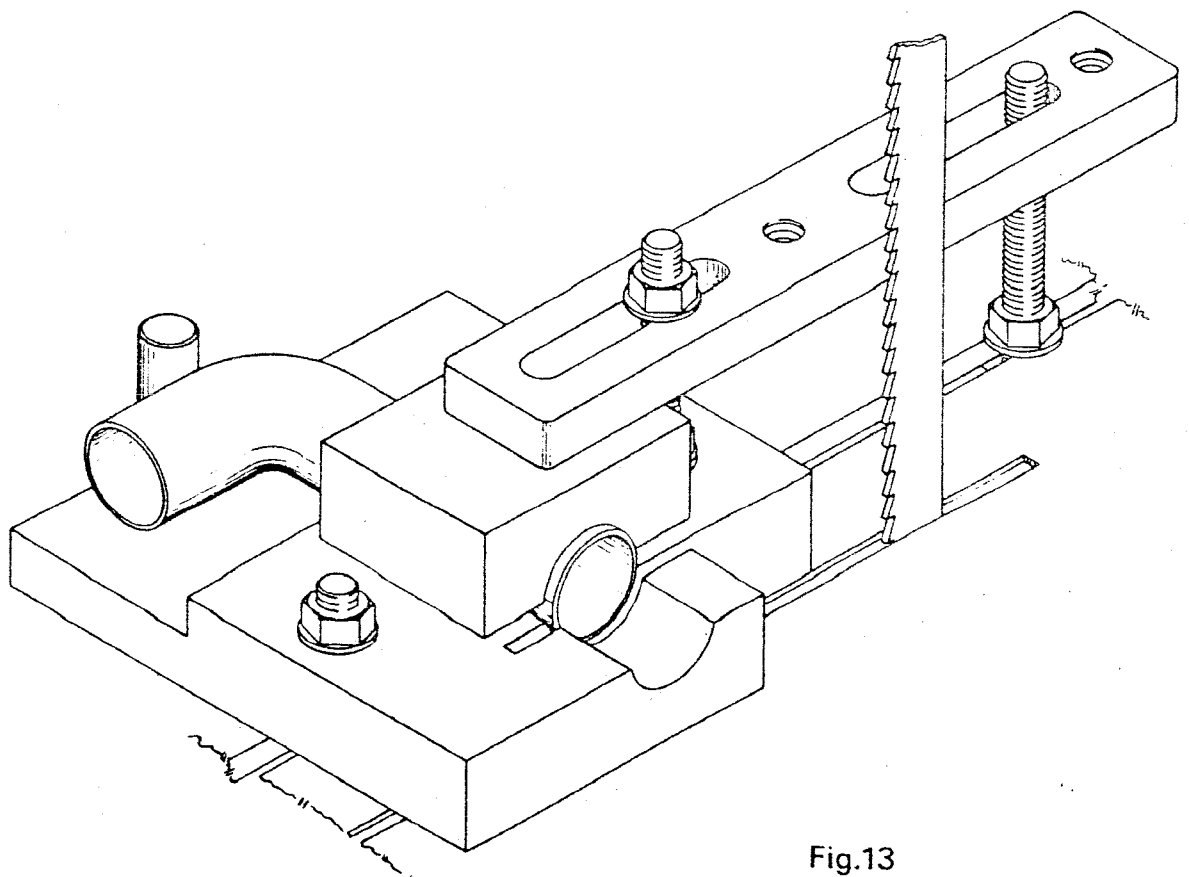


Fig.13

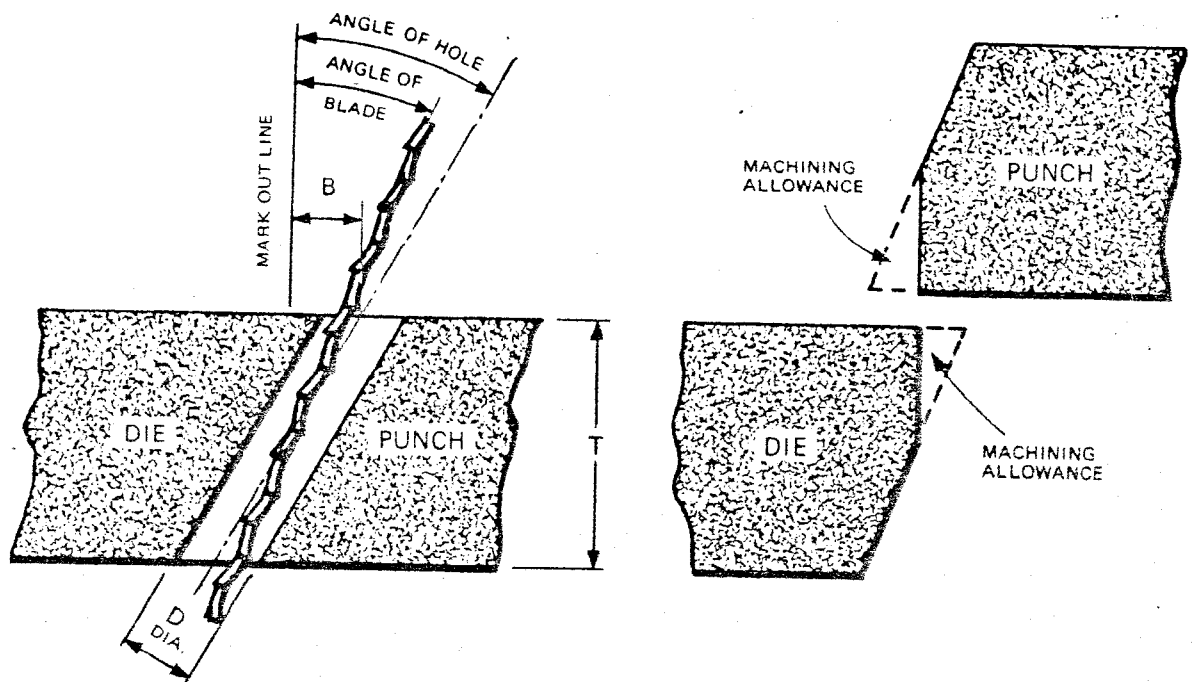


Fig 15

DIE THICKNESS T	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	2"	$2\frac{1}{2}$ "	3"
BLADE WIDTH B	$\frac{1}{8}$ "	$\frac{1}{8}$ "	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "
ANGLE OF HOLE	37°	26½°	20½°	24°	20½°	18°	15½°	16½°	14°
HOLE DIA. D	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{9}{32}$ "	$\frac{9}{32}$ "	$\frac{9}{32}$ "	$\frac{9}{32}$ "	$\frac{3}{8}$ "	$\frac{3}{8}$ "
ANGLE OF BLADE	26½°	18½°	14°	16½°	14°	12°	10½°	11½°	9½°

TANGENTS OF ANGLES											
TANGENT	.017	.035	.052	.070	.087	.105	.123	.140	.158	.176	.194
ANGLE	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°
TANGENT	.213	.231	.249	.268	.287	.306	.325	.344	.364	.384	.404
ANGLE	12°	13°	14°	15°	16°	17°	18°	19°	20°	21°	22°
TANGENT	.424	.445	.466	.488	.510	.532	.554	.577	.601	.625	.649
ANGLE	23°	24°	25°	26°	27°	28°	29°	30°	31°	32°	33°
TANGENT	.675	.700	.727	.754	.781	.810	.839	.869	.900	.933	.966
ANGLE	34°	35°	36°	37°	38°	39°	40°	41°	42°	43°	44°

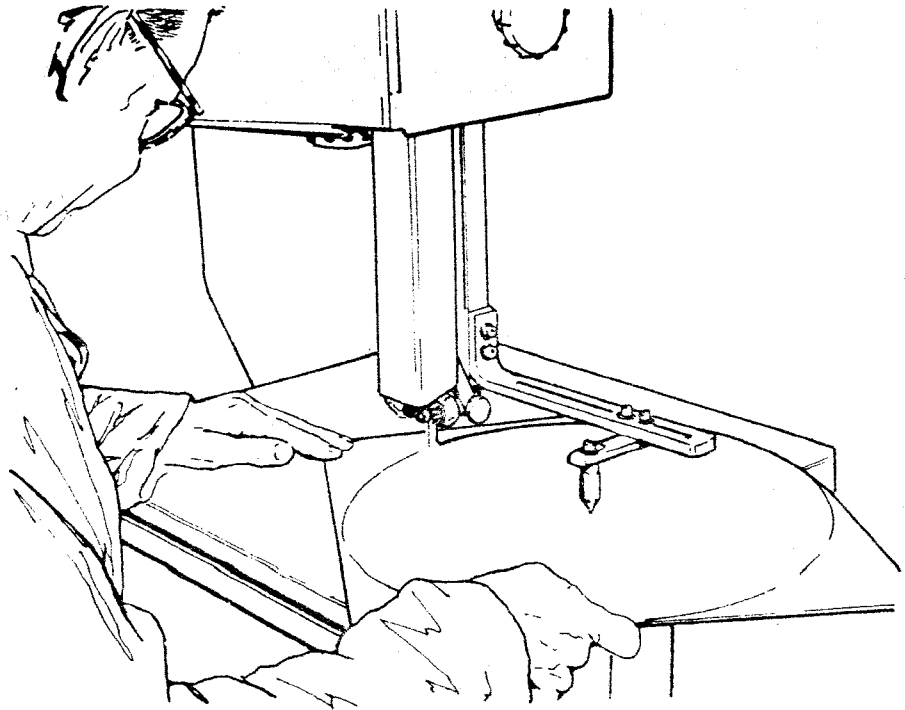


Fig 18

The SP260 Circle Cutting Attachment (see Fig. 18) is an optional accessory which facilitates the production sawing of circular blanks up to 18" dia. The unit is easily fitted to the tool post and thus may be raised and lowered when feeding blanks without disturbing the setting of the location pin.

A drilled or punched location will be required in each blank, the location being positioned at a distance equal to the sawing radius from one edge.

Sufficient material should be allowed on the other sides of the blank to prevent the blade emerging from the cut until the full circle has been completed. Select the blade width according to the radius to be sawn, see page 17.

The centre pin must be set to lie tangential to the blade otherwise blade wander will result. If the blade tends to cut away from a true circle, the pin position is incorrect or possibly, the blade too wide.

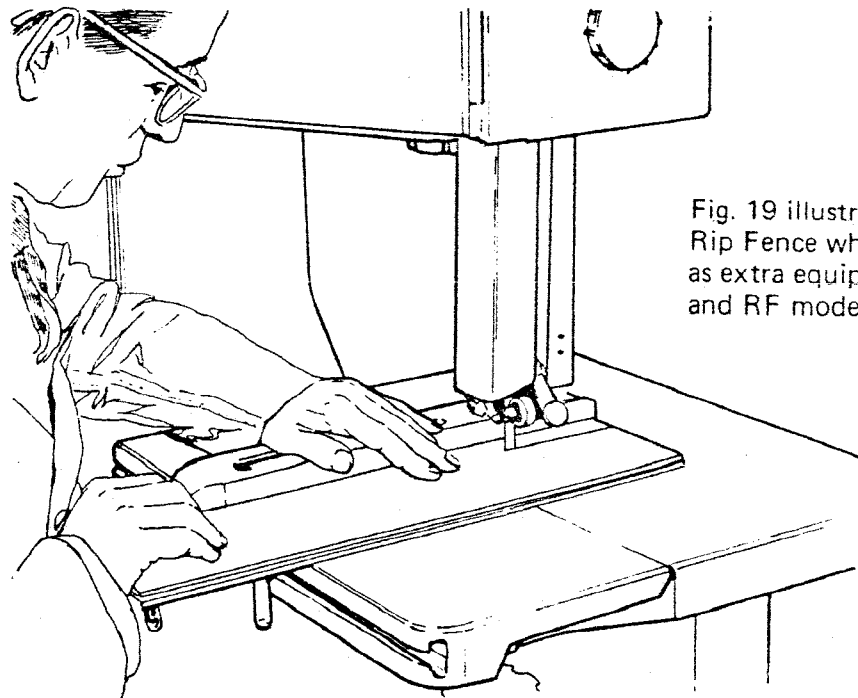


Fig. 19 illustrates the SP302 Rip Fence which is available as extra equipment for T and RF models.

Fig 19

The machine may be adapted for power filing by fitting the SP287 Bandfile Guides which are available as an optional accessory. Bandfiling presents an economic method of production machining straight and contour faces. Because there is no tendency for the file to rock, wide faces can be finished to fairly close tolerances.

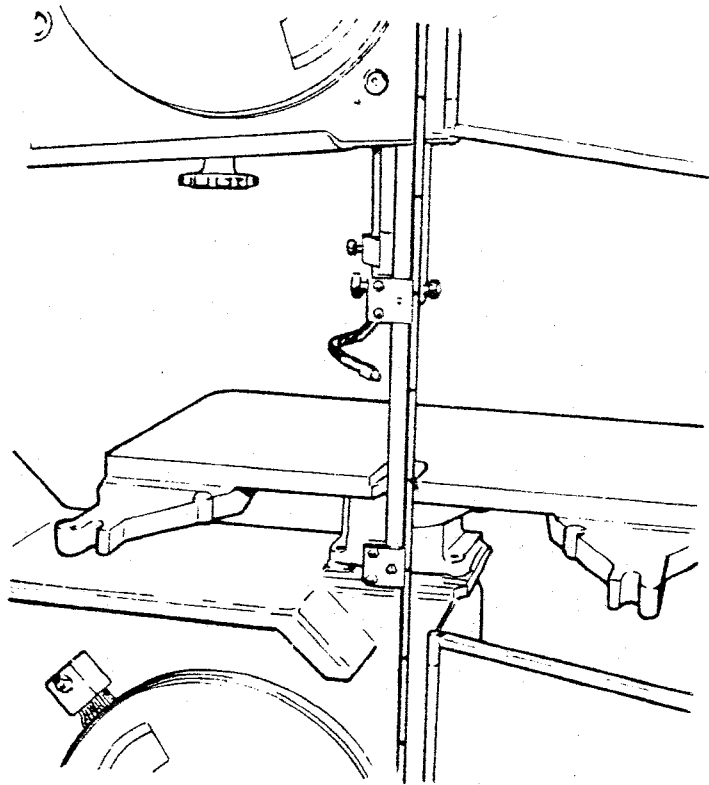


Fig 22

Bandfiles consist of short lengths of file sections attached to a flexible steel band which has a joint for unlocking and re-joining thus permitting the filing of internal contours. The guides will accommodate standard files of $\frac{1}{4}$ ", $\frac{3}{8}$ ", or $\frac{1}{2}$ " width.

To set the machine for bandfiling:—

Remove the saw blade, blade guides and table insert.

Assemble back guide and spacers to suit width of file to be used.

Insert the support arms into the same holes as used to locate the blade guides.

Mount the bandfile on the bandwheels and track in a similar way to a saw blade. Apply only sufficient tension to keep the fileband on the bandwheels without slipping, excessive tension will damage the band.

Position the fileband backguide just clear of the back fence of the band. Fit special table insert provided.

WARNING: An incorrectly adjusted file guide may prevent the file segments from interlocking in the correct manner and thus result in the segments being torn from the backing band. It is important that a new file band is only lightly loaded when first used in order to allow the file segments to bed down.

Use a filing speed of around 60 feet per minute for die steel and up to 120 feet a minute for mild steel. Speeds in excess of 300 feet per minute may damage the fileband.

Embedded swarf should be periodically removed to prevent the workpiece being scored. This problem can be reduced by a light application of tallow or chalk.

Care must be taken to avoid kinking the backing band in storage and for this reason, the bandfile should be stored in its original container when not in use.

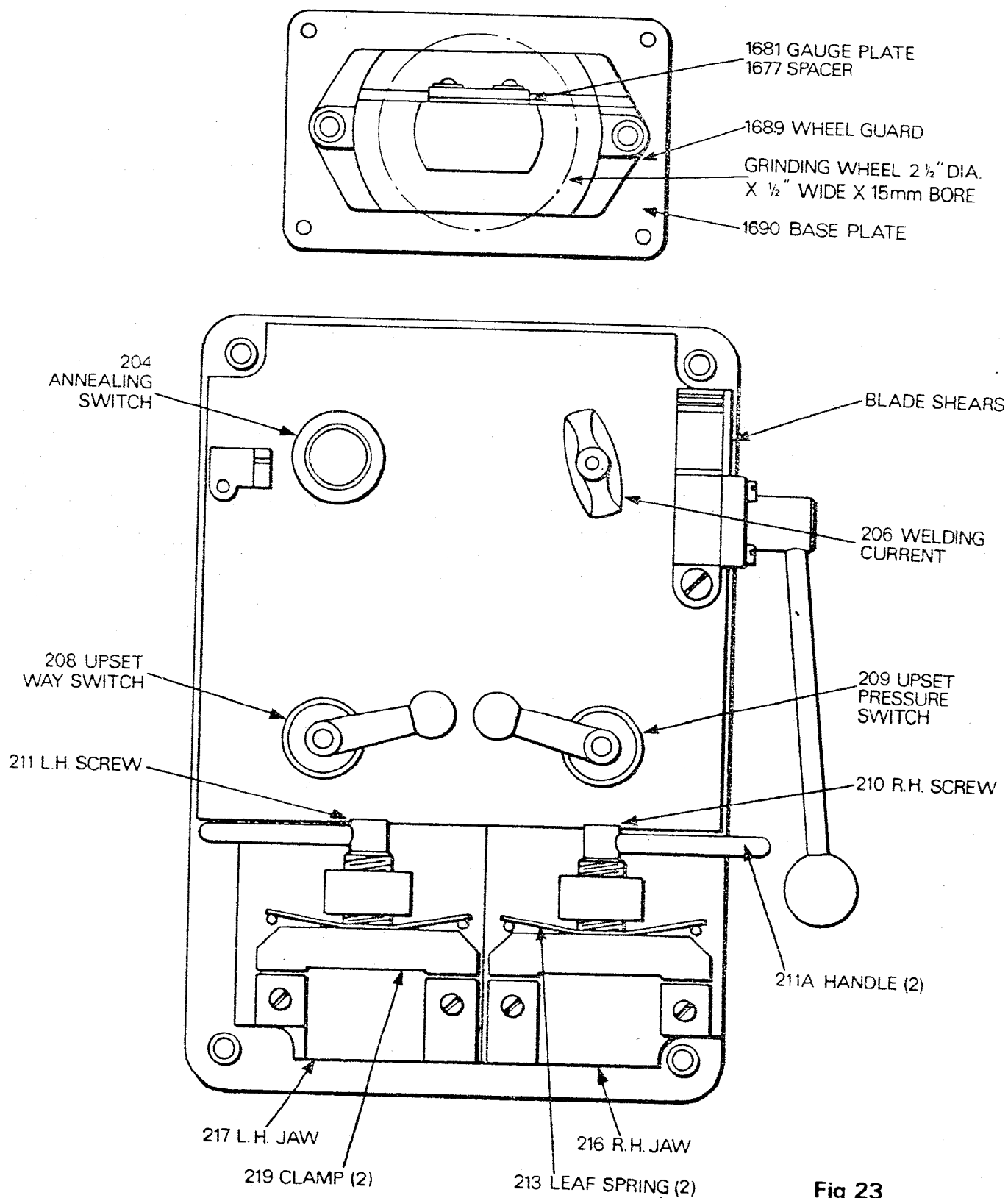


Fig 23

The bronze jaws should not be filed.

The moving jaws are mounted on a sensitive ball bearing track and therefore should not be forced in any way.

GRINDING UNIT

Wheel Size: 2½" Dia. x ½" Wide x 15mm Bore.

Grade: 46 Grit – Resin Bonded.

Wheel speed – no load: 14000 R.P.M.

Wheel speed – full load 8000 R.P.M.

The grinding motor will produce excessive whine if allowed to run with an unbalanced wheel. Dress new wheel upon replacement and if necessary, adjust wheel clamping washer to run eccentric in order to improve dynamic balance. Dress periphery of wheel occasionally to remove embedded swarf.

WEEKLY MAINTENANCE

Clean bandwheel tyres and remove embedded swarf.
Lubricate upper and lower thrust rollers.

BP ENERGOL HP30
MOBIL VACTRA HEAVY MEDIUM
ESSO ESSTIC 50

MONTHLY MAINTENANCE

Check vee belts for correct tension.

Check top bandwheel slide for free movement and lubricate if required. (Remove top bandwheel to gain access).

BP ENERGOL HP30
MOBIL VACTRA HEAVY MEDIUM
ESSO ESSTIC 50

Clean table slideways and lubricate wipers.
(RWS models only).

BP ENERGOL HP30
MOBIL VACTRA HEAVY MEDIUM
ESSO ESSTIC 50

Remove air filter from pump and insert oil into pump body. (V, RWF and RWS models).

BP ENERGOL HP30
MOBIL VACTRA HEAVY MEDIUM
ESSO ESSTIC 50

GEARBOX

Drain and refill to level of filler hole after 500 hours running and annually thereafter.

BP ENERGOL CS300
ESSO PEN-O-LED EP3
MOBIL DTE OIL AA
WAKEFIELD ALPHA 817

BANDWHEEL BEARINGS

The bandwheels are mounted on lubricated-for-life ball bearings and these will not require further attention throughout their working life. Occasionally remove the tracking control knob(s) by unscrewing from the bandwheel hub and coat screw thread with grease.

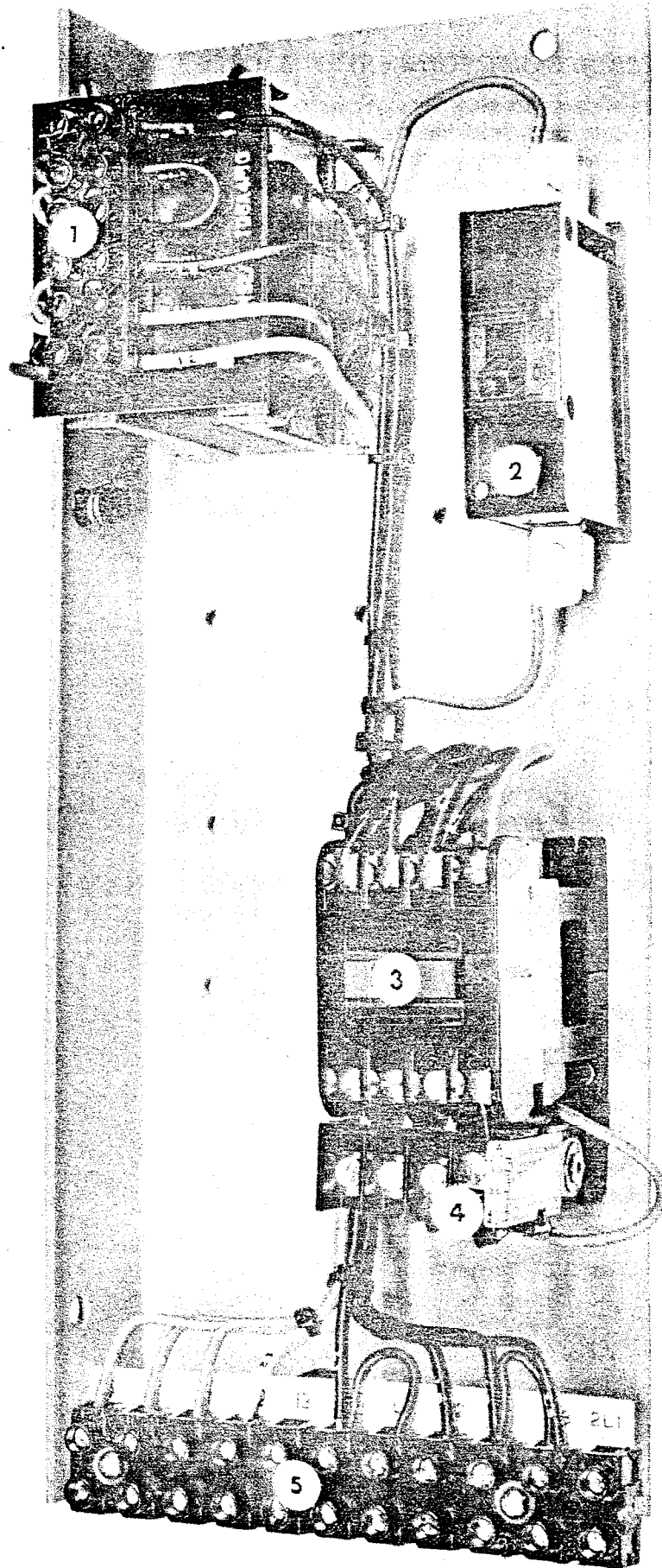
MOTOR

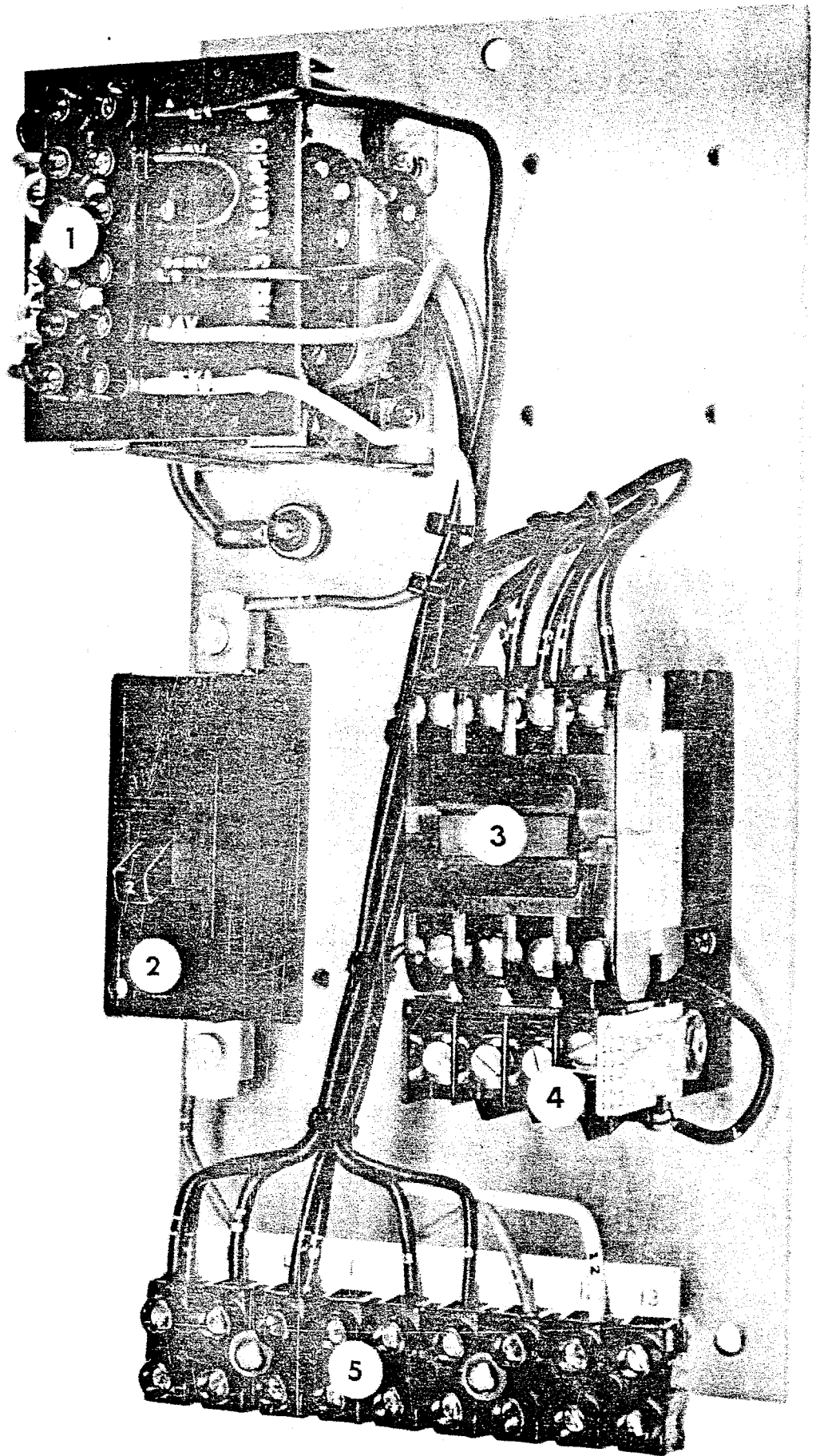
The motor bearings are pre-packed with grease and will operate for long periods between lubrication. Do not pack the grease tightly or over heating will result. Ensure grease is in contact with the bearing cages when grease caps are re-assembled.

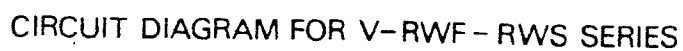
BP ENERGREASE LS3
ESSO BEACON 3
MOBILPLEX 48

BUTT-WELDER (V, RWF and RWS models)

Periodically inspect the welding unit, see section CARE OF BUTT-WELDING UNIT (page 29) Dress grinding wheel upon replacement.







SEE FIG 29

GEARBOX — ASSEMBLY No. SP141C

ITEM	PART NUMBER AND DESCRIPTION	NO. OFF
1	2561 Bandwheel Hub	1
2	Hex. Hd. Screw $\frac{5}{16}$ " Whit. x $\frac{1}{2}$ "	3
3	Standard Washer $\frac{5}{16}$ " I/Dia.	3
4	Socket Set Screw $\frac{1}{4}$ " Whit. x $\frac{5}{16}$ "	2
5	1148 Key	2
6	Standard Circlip $1\frac{7}{8}$ " Dia. Internal	2
7	Standard Circlip $\frac{3}{4}$ " Dia. External	1
8	1027 Key	2
9	1029 Output Shaft	1
10	1030 Spacer	1
11	Ball Bearing Hoffmann LS8 RSS	2
12	Mills Pin GP3 $\frac{1}{8}$ " Dia. x $\frac{3}{4}$ "	1
13	1036 Liner	1
14	1035 Clutch Plate	1
15	1044 Gear	1
16	Steel Ball $\frac{1}{4}$ " Dia.	1
17	Compression Spring Terry 757/15	1
18	1024 Pin	1
19	1037 Control Shaft	1
20	1032 Input Shaft	1
21	Snap Hd. Rivet $\frac{1}{8}$ " Dia. x $\frac{7}{8}$ " — Mild Steel	8
22	Compo Bearing SNO87 x $\frac{1}{4}$ "	1
23	"O" Seal Hallprene O11	1
24	Ball Bearing SKF EE6	2
25	1031 Spacer	1
26	Standard Circlip $1\frac{5}{8}$ " Dia. internal	2
27	Oil Seal Weston W16211231-R4	1
28	1209 Cork Sealing Washer	1
29	Handknob 1037 x $\frac{5}{16}$ " Whit.	1
30	Fibre Washer $\frac{1}{4}$ " I/Dia.	1
31	Hex. Hd. Screw $\frac{1}{4}$ " Whit. x $\frac{3}{8}$ "	1
32	Needle Bearing Torrington M1081	2
33	3253 Lay Shaft (Replaces separate shaft and gear)	1
34	1147 Key	1
35	3252 Gear (Replaces fibre gear assembly)	1
36	1026 Gearbox Lid	1
37	1025 Gearbox	1
38	1026A Gasket for gearbox Lid (Not Illustrated)	1
39	Hex. Hd. Screw $\frac{3}{8}$ " Whit. x $\frac{1}{2}$ "	1
40	Fibre Washer $\frac{3}{8}$ " I/Dia.	1
41	Standard Nut $\frac{1}{4}$ " Whit.	6
42	Standard Washer $\frac{1}{4}$ " I/Dia.	12
43	Hex. Hd. Screw $\frac{1}{4}$ " Whit. x 1"	6
44	Dowel $\frac{5}{16}$ " Dia. x $\frac{3}{4}$ "	2
	1228 Pulley	1

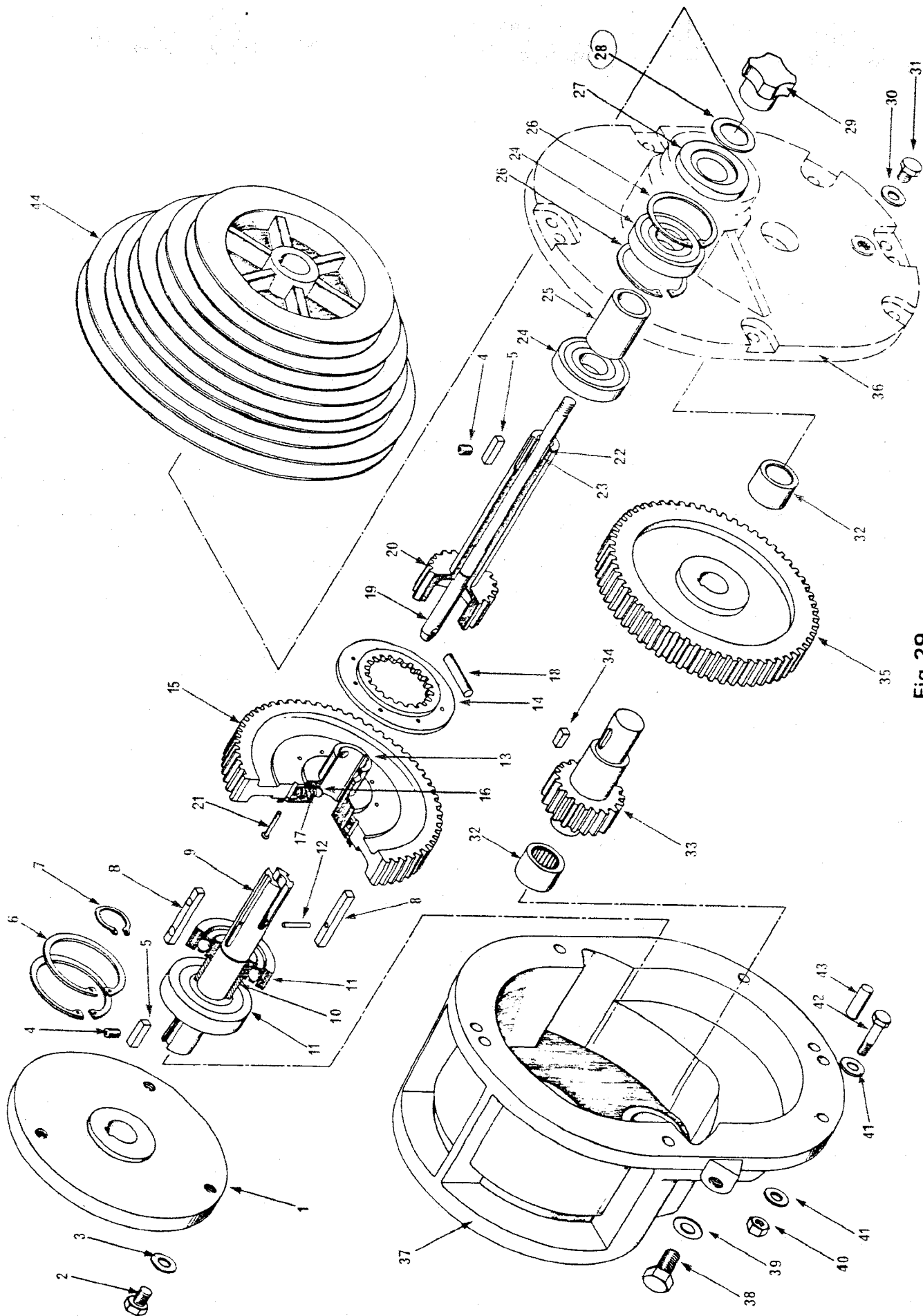


Fig. 29

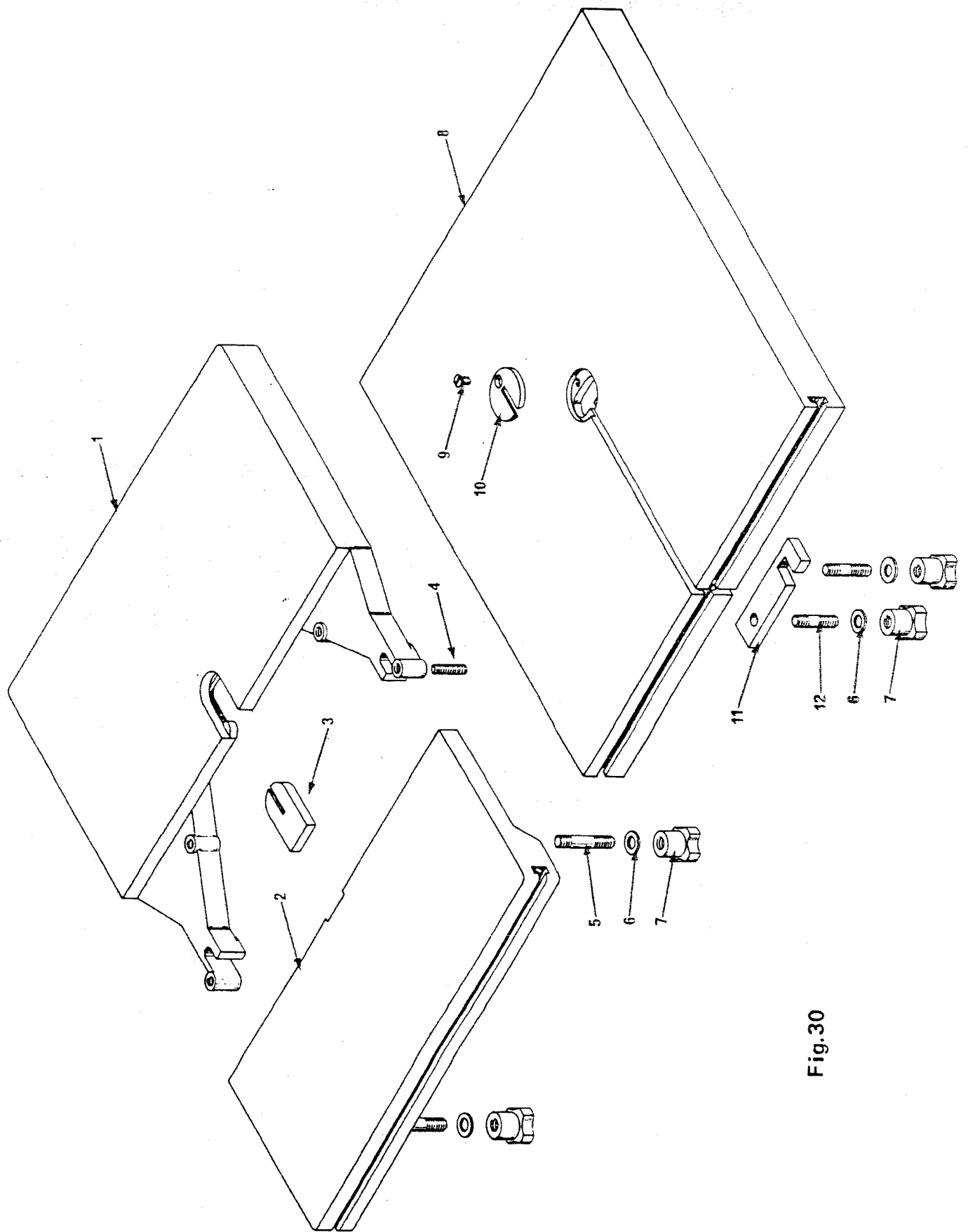


Fig. 30

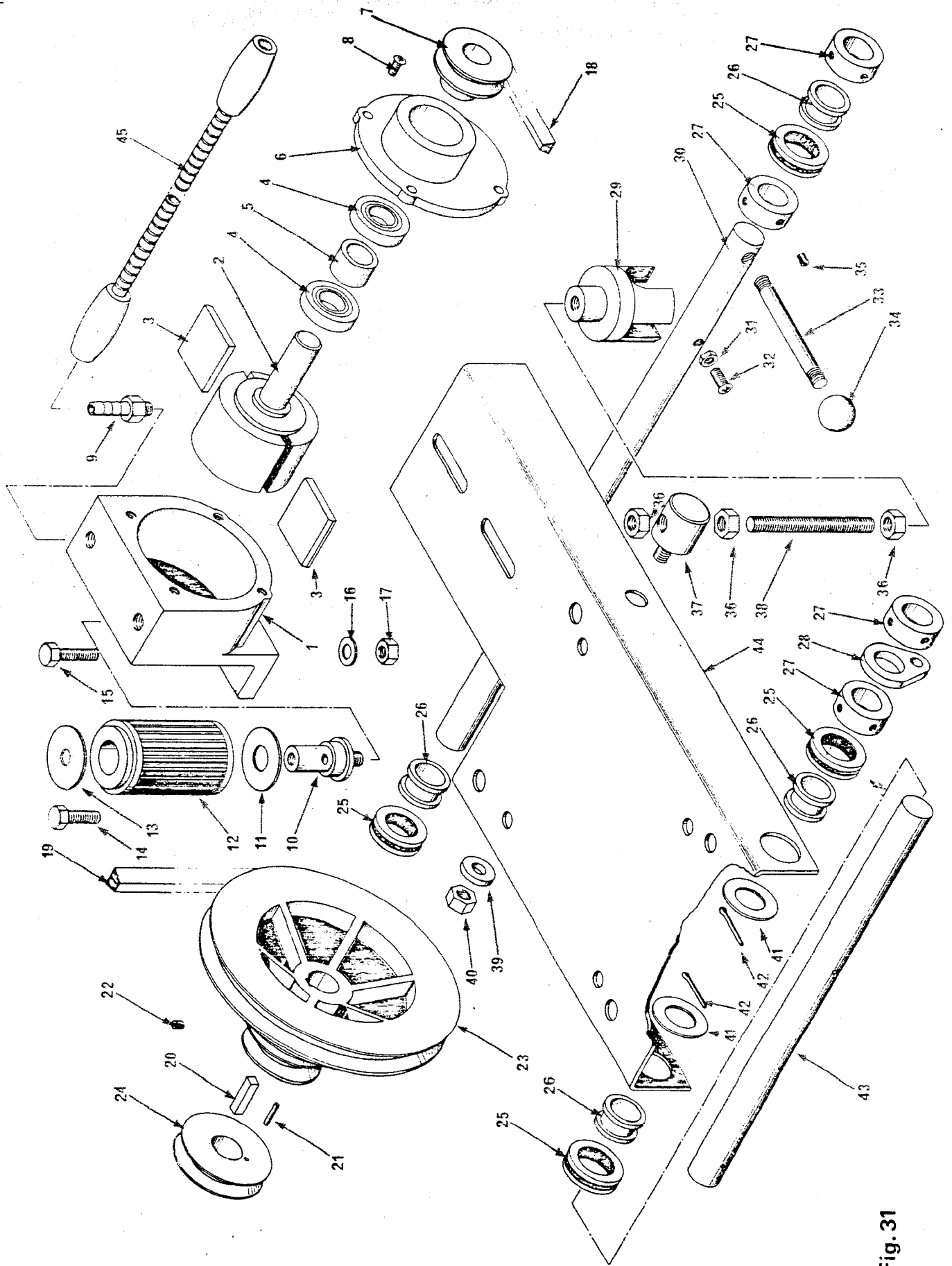


Fig. 31

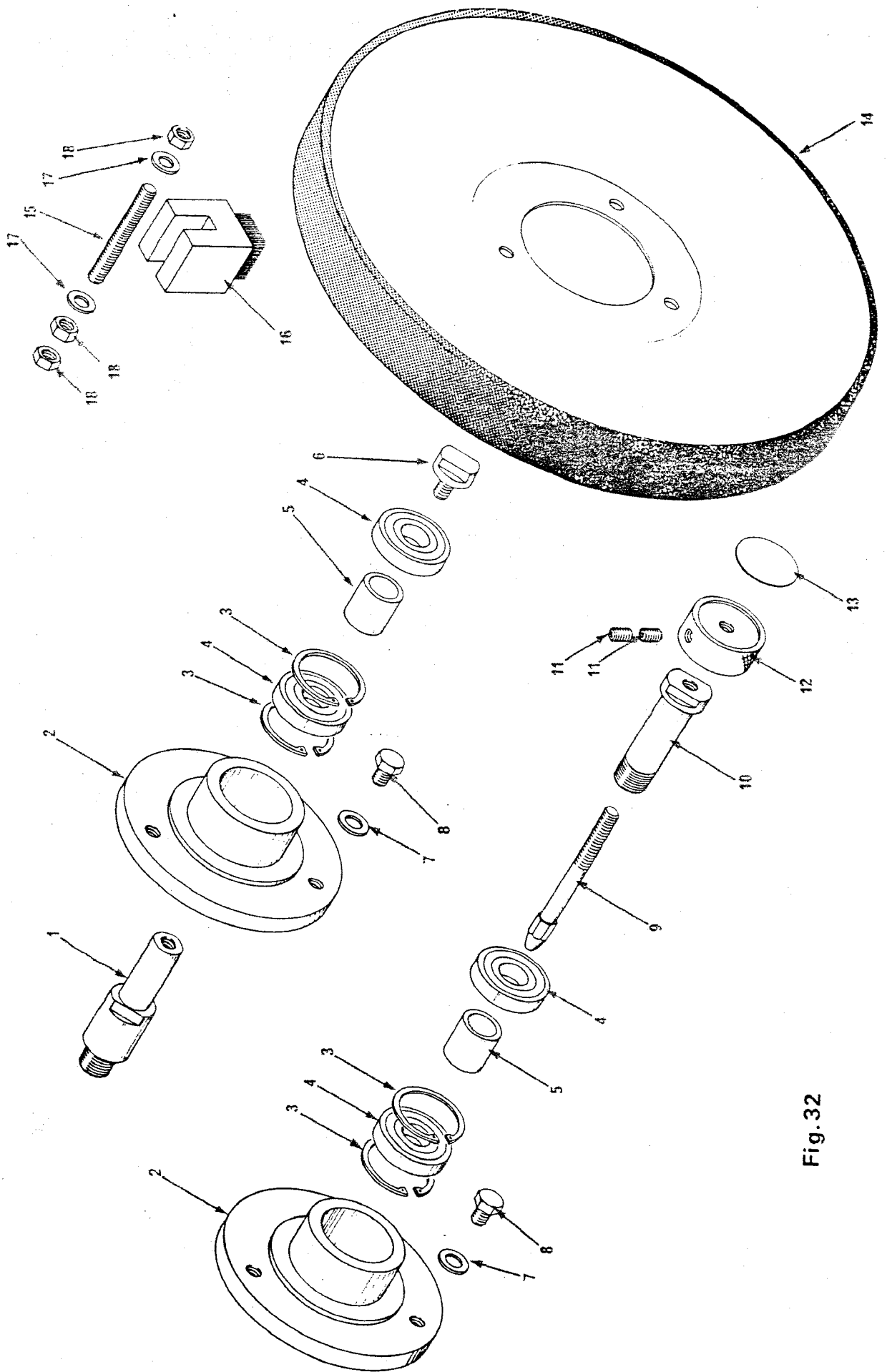


Fig. 32

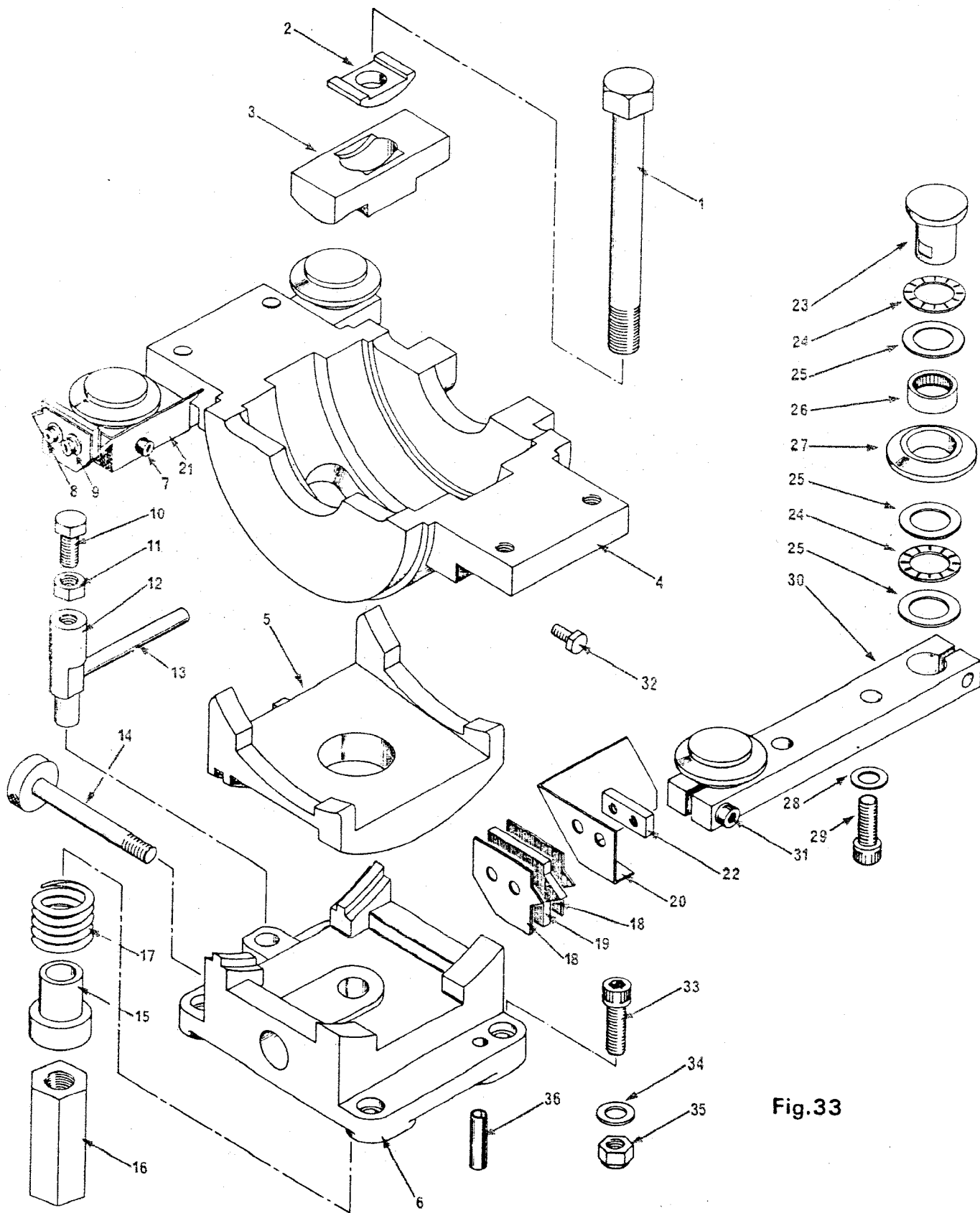


Fig.33

SEE FIG34 SLIDING TABLE – RWS model.

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
1	2825 Sliding Table	1
2	Standard Stud $\frac{3}{8}$ " Whit. x $1\frac{1}{4}$ "	2
3	2828 Swing Latch	1
4	Standard Washer $\frac{3}{8}$ " I/Dia.	2
5	Handknob HK150 x $\frac{3}{8}$ " Whit.	2
6	Countersunk Hd. Screw – Slotted 2BA x $\frac{1}{2}$ "	2
7	2821 Table Insert	1

SEE FIG34 MANUAL FEED ASSEMBLY – RWS model.

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
8	2826 Hub	1
9	2831 Feed Handle	4
10	Ball Knob Rencol 302 x $\frac{3}{8}$ " Whit.	4
11	Mills Pin GP3 $\frac{3}{16}$ " Dia. x $1\frac{1}{4}$ "	1
12	Compo Bush SN066 x $\frac{3}{8}$ "	2
13	2827 Feed Shaft Bracket	1
14	Socket Hd. Cap Screw $\frac{5}{16}$ " Whit. x $\frac{3}{4}$ "	4
15	2822 Outer Feed Shaft	1
16	Compo Bush SN030 x $\frac{3}{8}$ "	3
17	Thrust Washer Torrington TRB815	4
18	Needle Thrust Bearing Torrington NTA815	2
19	2715 Bevel Gear	2
20	2829 Bevel Gear Housing	1
21	SP354 Rack Cover	1
22	Socket Hd. Cap Screw $\frac{1}{4}$ " Whit. x $\frac{1}{2}$ "	6
23	Socket Hd. Cap Screw $\frac{5}{16}$ " Whit. $\frac{7}{8}$ "	4
24	2830 Rack Housing	1
25	2817 Rack	1
26	2956 Rack Coupling	1
27	2820 Feed Stop Bracket	1
28	Mills Pin GP3 $\frac{3}{16}$ " Dia. x $\frac{7}{8}$ "	3
29	Standard Washer $\frac{3}{8}$ " I/Dia.	2
30	Turret Nut $\frac{3}{8}$ " Whit.	2
31	SP426 Feed Stop Screw	1
32	3210 Collar	2
33	663 Locking Ring	4
34	Standard Circlip $\frac{5}{8}$ " Dia. external	1
35	2819 Locking Screw Knob	1
36	2818 Locking Screw	1
37	2823 Inner Feed Shaft	1
38	2836 Feed Pinion	1

SEE FIG35 TOP BRACKET ASSEMBLY

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
1	2336 Pivot Screw	2
2	Lock Nut $\frac{5}{16}$ " Whit.	2
3	2454 Slide Bar (for 14T, 14R, 30T and 30R models)	1
4	2342 Slide Bar (for 18T, 18V, 24T and 24V models)	1
4	2518 Slide Bar (for 20T and 20R models)	1
5	2332 Tilt Bracket (for 14T, 14R, 30T and 30R models)	1
6	Cotter Pin $\frac{1}{16}$ " Dia. x $\frac{3}{8}$ "	2
7	2379 Reel Spindle	1
8	Compo Bearing SN026 x $\frac{1}{4}$ "	2
9	2380 Reel	1
10	2378 Reel Bracket	1
11	Tensator Spring 802	1
12	Round Hd. Screw — Recessed 2BA x $\frac{1}{4}$ "	1
13	Standard Washer 2BA	1
14	2344 Locking Spring	1
15	2520 Collar (for RF, RWF and RWS models)	1
16	2517 Compression Spring (for RF, RWS and RWF models)	1
17	2337 Cap	2
18	2341 Register Block	1
19	2490 Compression Spring	1
20	Mills Pin GP3 $\frac{1}{8}$ " Dia. x $\frac{5}{8}$ "	1
21	Hex Hd. Screw 2BA x 1"	4
22	2340 Tensioning Screw (for V and T models)	1
22	2519 Tensioning Screw (for RF, RWF and RWS models)	1
23	2525 Spacer (for RF, RWF and RWS models)	1
24	Lock Nut $\frac{3}{8}$ " Whit. — Left hand thread.	1
25	Handknob Evans 351 x $\frac{3}{8}$ " Whit. — Left hand thread	1
26	Mills Pin GP3 $\frac{1}{8}$ " Dia. x $\frac{3}{4}$ "	1
27	Hex. Hd. Screw 2BA x $\frac{7}{8}$ "	2
28	2343 Tool Post (for V and T models)	1
28	2518 Tool Post (for RF, RWF and RWS models)	1
29	2331 Capping Plate	1
30	2339 Stud	1
31	Hex Hd. Screw 2BA x $\frac{5}{8}$ "	4
32	Lock Nut $\frac{3}{8}$ " Whit.	1
33	Mills Pin GP3 $\frac{1}{8}$ " Dia. x $\frac{3}{4}$ "	1
34	Handknob Evans 351 x $\frac{3}{8}$ " Whit.	1
35	2364 Blade Guard	1
36	2455 Thumb Screw (for V, RWF and RWS models)	1
37	2453 Blade Guard Bracket (for T and RF models)	1
38	2412 Blade Guard Bracket (for V, RWF and RWS models)	1
39	2501 Thumb Screw	1
40	2330 Top Bracket (for V and T models)	1
40	2330A Top Bracket (for RF, RWF and RWS models)	1
41	Socket Hd. Cap Screw 2BA x $\frac{1}{2}$ "	2
42	2338 Thumb Screw	1
43	Socket Countersunk Screw $\frac{5}{16}$ " Whit. x 1"	4
44	SP299 Air Pipe	1

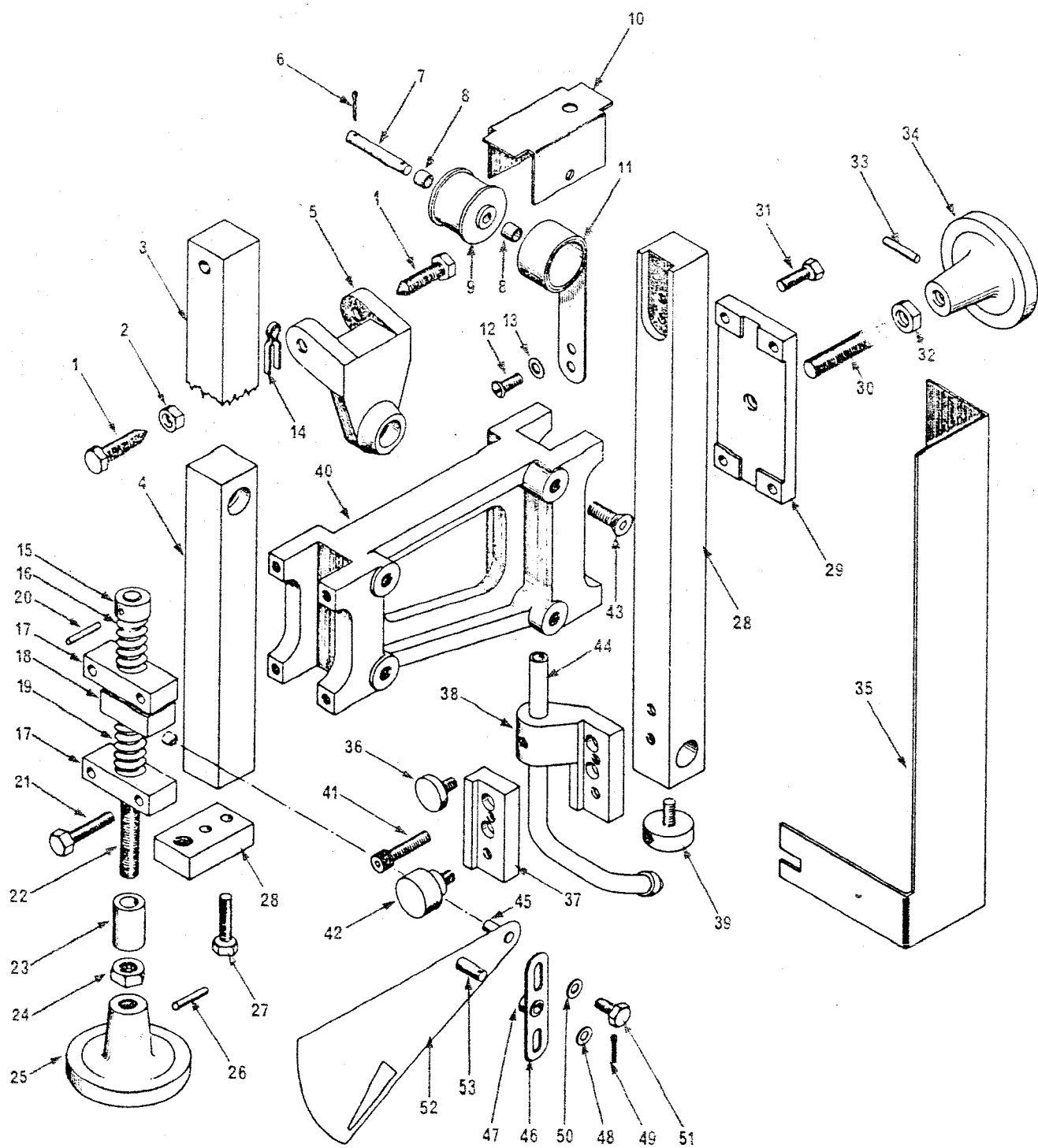


Fig. 35

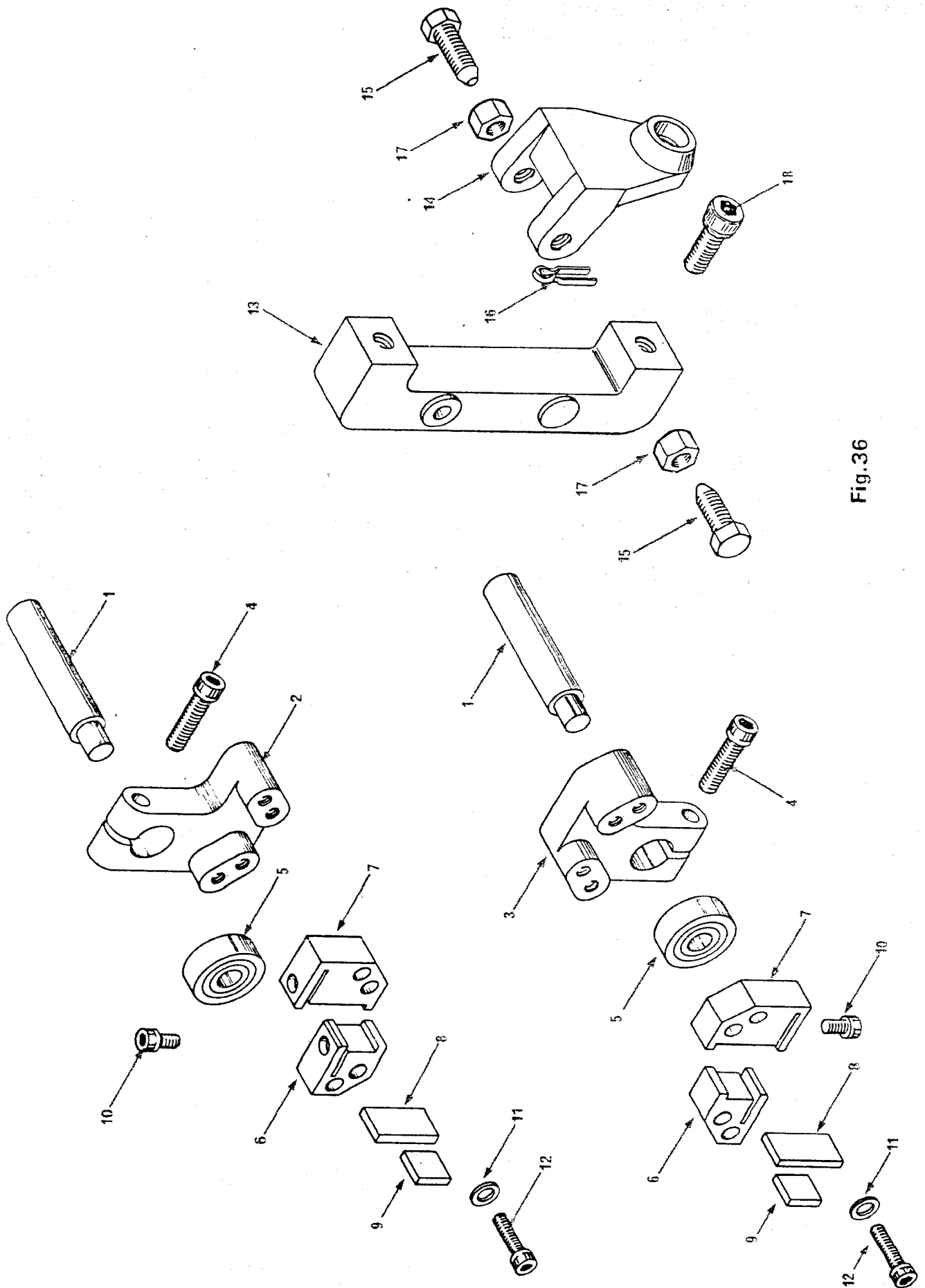


Fig.36

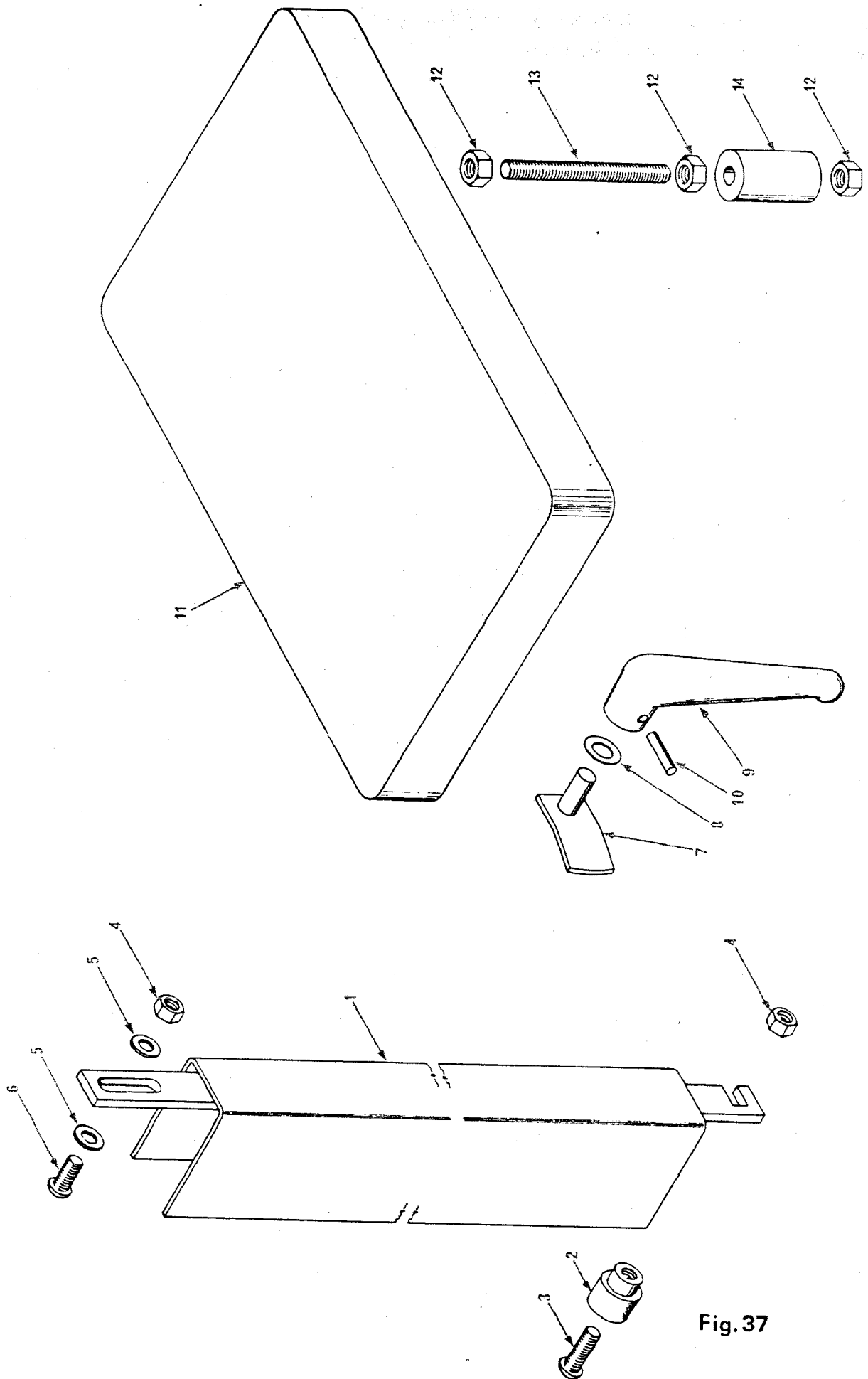


Fig. 37

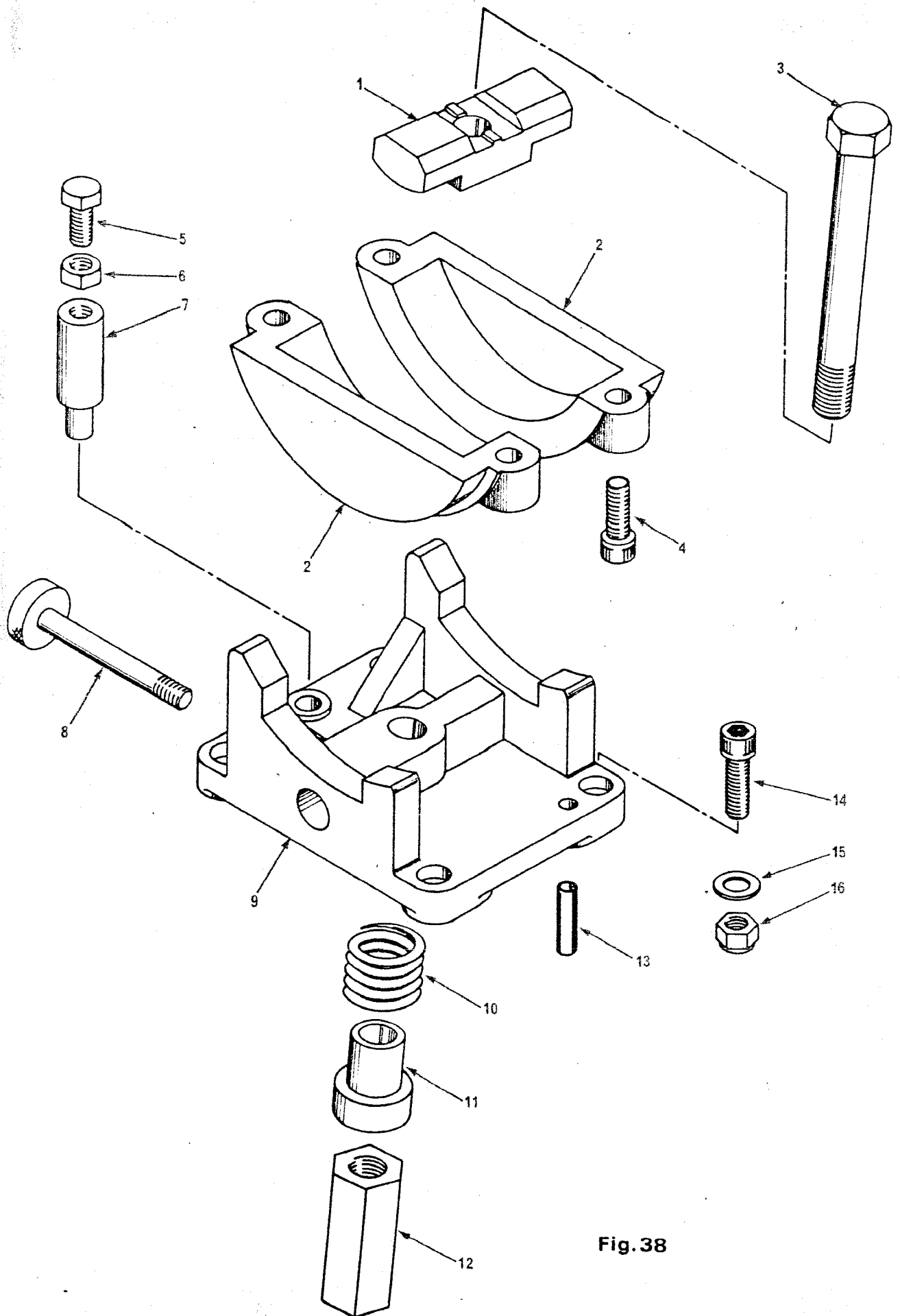


Fig. 38

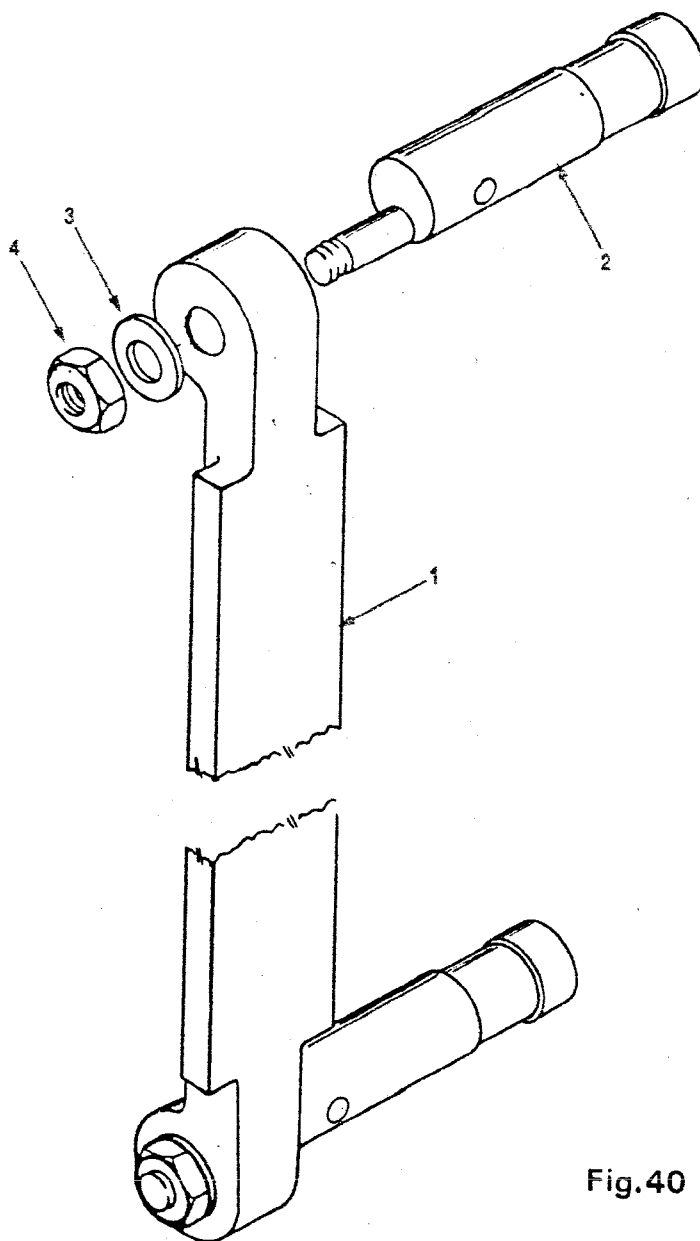


Fig.40

SEE FIG 40 ABRASIVE BAND GUIDE — ASSEMBLY No. SP298

ITEM	PART NUMBER AND DESCRIPTION		No. OFF
1	2426	Back Guide	1
2	2425	Support Arm	2
3		Standard Washer $\frac{5}{16}$ " I/Dia.	2
4		Standard Nut $\frac{5}{16}$ " Whit.	2

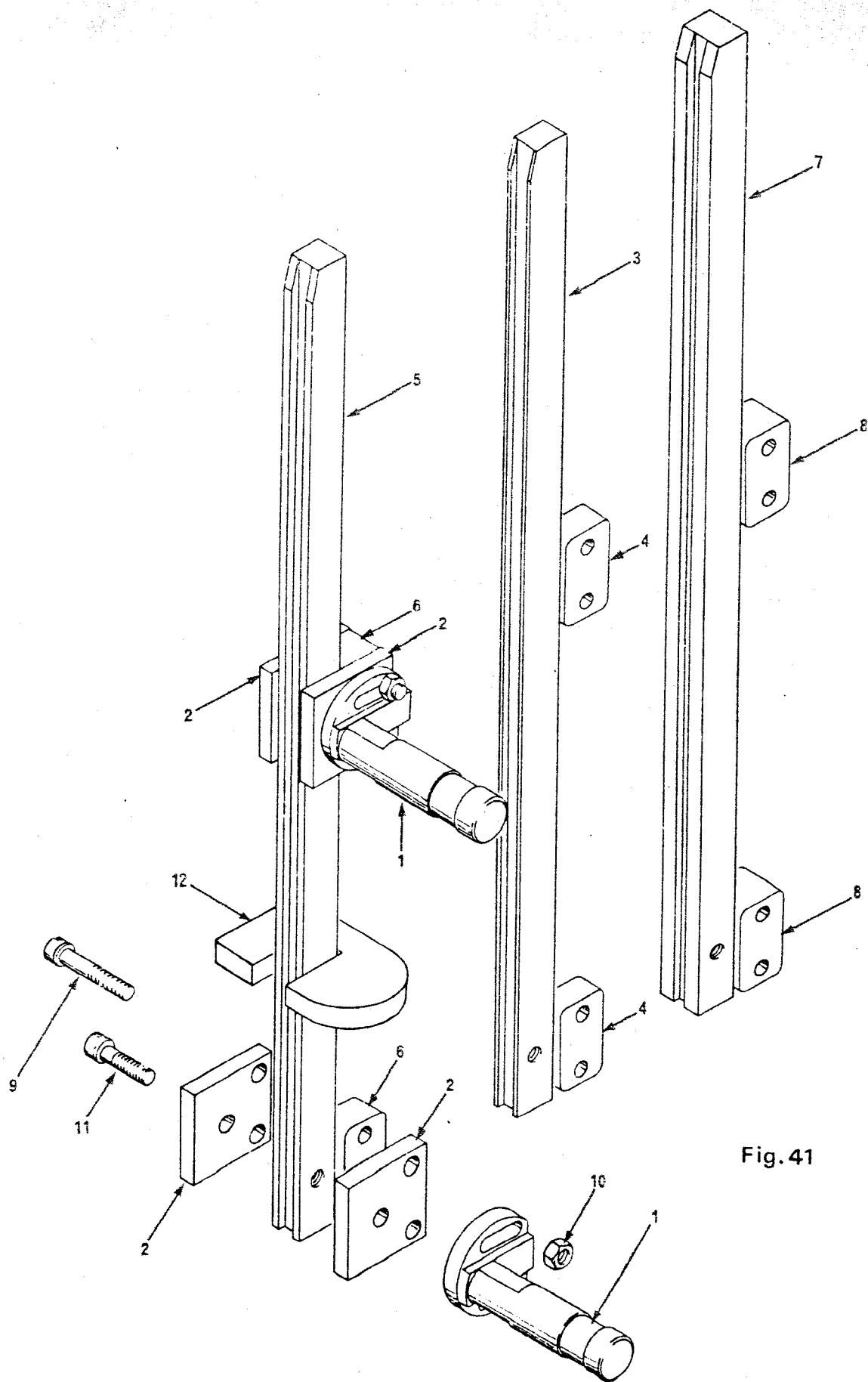


Fig. 41

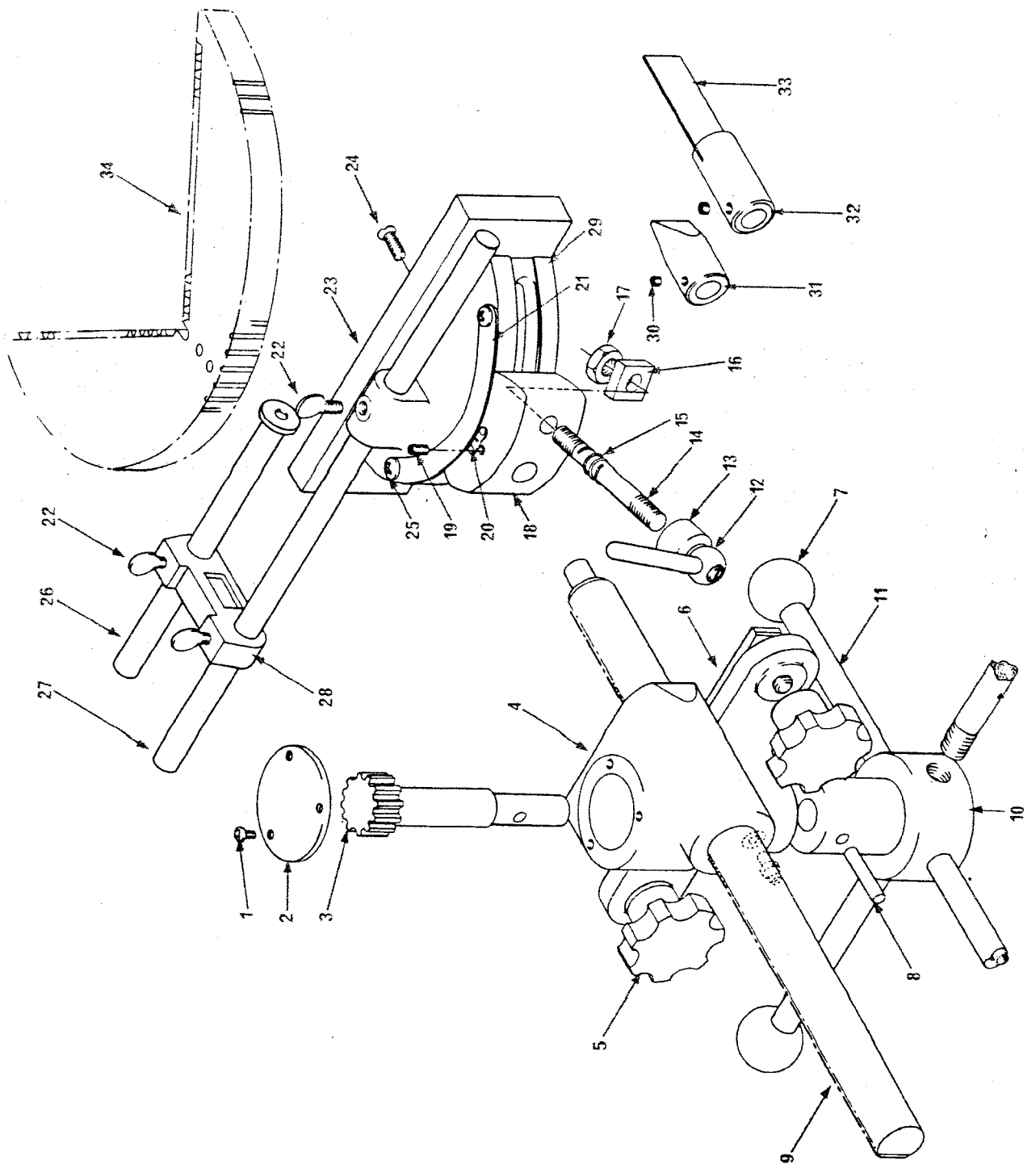


Fig. 42

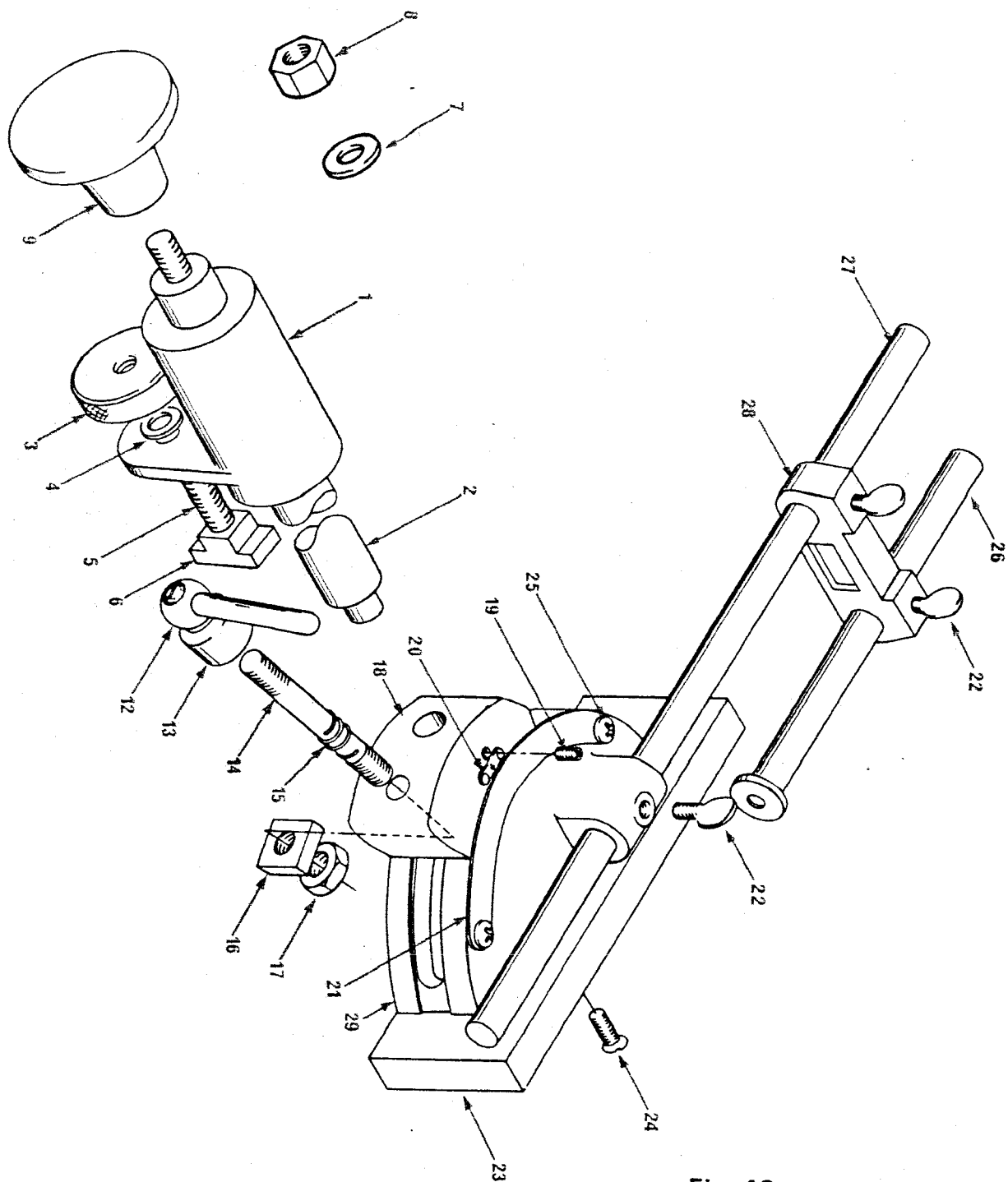


Fig. 43