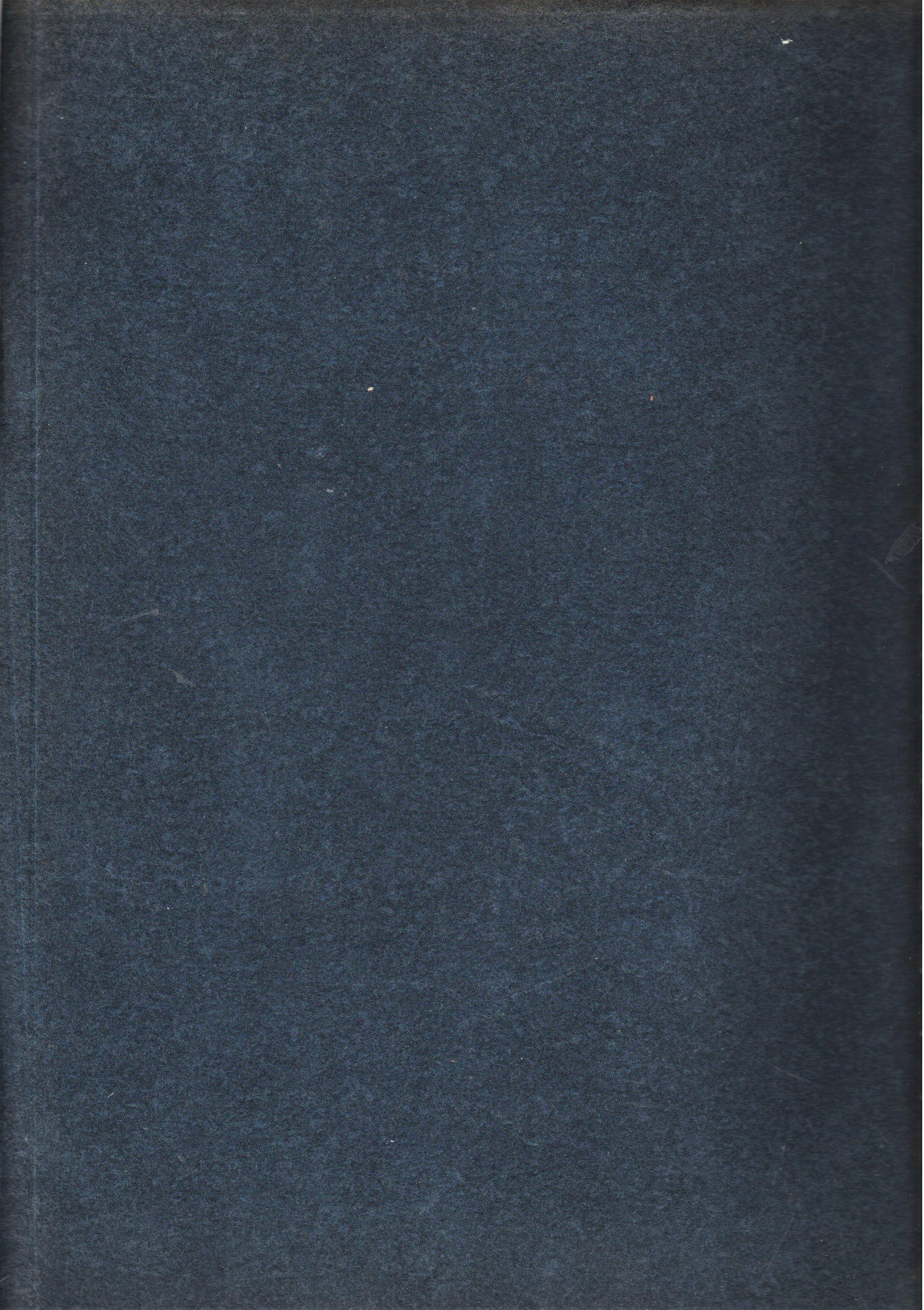


PHILIPS

Cinema







DIRECTION FOR THE OPERATION AND MAINTENANCE OF PROJECTOR FP 20 S

CONTROLS and SWITCHES (fig. 1)

1. Knob for focusing the lens.
 2. Framing knob.
 3. Knob for adjusting the skate pressure.
 4. "Start-Stop-Change-over" switch:
depressed = change-over,
pushed in direction of arrow "A" = start,
pushed in direction of arrow "B" = stop.
 5. Inching knob.
 6. Lever for change-over to slide projection and for moving the housing of the SPP lamp away from the runner plate (e.g. for cleaning the condenser lens).
 7. Lamp switch, switched on as indicated by arrow.
 8. Knob for changing over to standby lamp.
 9. Potentiometer for the control of the light intensity.
 10. Knob for operating the stray-light screen.
 11. Pin for replacing the lens holder.
- C. Scale for the adjustment of the skate pressure.
D. Scale for focusing the projection lens.
E. Inspection window for the water cooling.

LENS HOLDER (fig. 2)

The lens holder is suitable for lenses with a diameter up to 2.78" (70.6 mm). It can slide over a support fixed to the projector housing.

The lens can be focused without any backlash with the aid of the fine-adjusting screw in conjunction with a pressure spring. The unit "lens holder + lens" can be removed from the support by a simple manipulation so that, when changing over to another aspect ratio, it can easily be replaced by another unit.

When the projector is installed, the lenses are adjusted in their holders in such a way that after replacement they are automatically focused correctly, apart from a possible correction imposed by the film itself. Focusing can be checked with the aid of a scale.

Replacement of the unit "lens holder + lens"

Removal:

- . Close pressure skate "1".
- . Push lens holder "2" as far as possible in the direction of the runner plate. Pin "3" then points obliquely to the non-operating side of the projector and is retained in this position.
- . Take lens holder "2" from support "4".

Mounting:

- . Place lens holder "2" on support "4" and push it in the direction of the runner plate.
- . Place pin "3" in a vertical position and let the lens holder come forward carefully.



APERTURE PLATES (fig. 2)

With each projector are supplied four aperture plates, viz.:
for normal film (aspect ratio 1:1.37), marked "N",
" CinemaScope (" " 1:2.34), " "C.O.",
" Wide Screen (" " 1:1.85), " "1:1.85",
one blind aperture plate.

The aperture plates are inserted through a slit located close behind the runner plate; they are held in position by a snap-in device. They can easily be replaced, even during projection. To facilitate removal and insertion, each aperture plate is provided with a small knob ("6").

The mark on the aperture plates ("N", "C.O." or "1:1.85") must face the film.

RUNNING FACES OF THE RUNNING PLATE and LATERAL PRESSURE ROLLERS (fig. 2)

The curved runner plate which, after the excellent experiences with the Philips Universal Projector DP 70, is also used in the FP 20 S projector, ensures a perfectly steady picture. Moreover, it prevents the film from buckling so that the picture is well focused all over the width of the screen.

The running faces of the running plate are formed by the strips "7" and "8"; they can be replaced after removal of the screws "5". Two sets of strips are supplied with each projector, viz.:

1. a pair of Novotext strips (thickness $\frac{1}{16}$ " = 1.5 mm); these strips have a very long life since, when the running faces are worn out at one side, they can be interchanged; moreover, each strip can be turned over and used again;
2. a pair of steel strips with one face covered with velvet; the same as the Novotext strips, these strips can be interchanged, by which their life is doubled; they can also be turned over and then have plain steel running faces; in this case the filling pieces supplied with the projectors have to be placed under the running faces.

Lateral pressure rollers

For correct lateral guiding of the film there are pressure rollers at both sides of the runner plate, viz.:
guide rollers "9" at the top of the runner plate and
guide rollers "10" at the bottom of the runner plate.

The rollers can easily be removed for cleaning them and the space in which they turn. The roller need only be pulled by hand in the direction of the projection-room window. It is mounted again by simply pushing it back into the original position.



O P E R A T I O N

THREADING THE FILM (figs 3 and 4)

- Place the framing device in its centre position with the aid of knob "2" (fig. 1); this has been achieved when the white dot on this knob is at the top.
- Check whether the projector is equipped with the lens holder containing the correct projection lens (for interchanging the lens holders see page 1).
- Check whether the correct aperture plate has been inserted.
- Open the doors of the upper and the lower spool box.
- Open pressure skate "1" (fig. 2).
- Place a spool with film in the upper spool box and an empty spool in the lower one.

Note: The film must be wound in such a way that the emulsion side lies outwards.

- Pull about 6 ft (2 m) of film from the upper spool and thread it as follows:

1. In projectors with optical and with magnetic soundhead:

- 35 mm film with magnetic track: as indicated by dotted line in fig. 4;
- 35 mm film with optical track: as indicated by plain line in fig. 4.

2. In projectors without magnetic soundhead:
as indicated in fig. 3.

- Make sure that a whole frame is in the gate; then close pressure skate "1" (fig. 2).
- Check whether the upper film loop (between the take-off sprocket and the pressure skate) has the correct size. If it is too large, it will put the film-rupture device into operation and if it is too small, framing in one direction is impossible.
- Thread films with magnetic sound tracks as follows:
 - Put the film so over sprocket "1" (fig. 4) that spring "4" is pulled so under bracket "2" that it forms a continuation of the marking line "3" on this bracket.
- Close the doors of the upper and lower spool boxes.
- Check, by turning knob "5" (fig. 1) whether the film has been threaded correctly; check especially:
 - the size of the upper film loop;
 - the running of the film through the magnetic soundhead;
 - the running of the film through the optical soundhead.
- Turn knob "5" until the desired start number on the film appears in the gate and the intermittent sprocket has just finished a movement.

The projector is now ready for operation.



PROJECTION (fig. 1)

- Open fully the main cock in the water-supply tube (the control cock in the base has already been adjusted when the projector was installed).
- Switch on lamp switch "7" (by pushing it in the direction of the projection-room window).
- Start the projector by pushing knob "4" in the direction of arrow "A"; as soon as a predetermined film speed is attained the lamp is switched on automatically.
- If necessary, adjust the framing with knob "2".
- Adjust the skate pressure in the following way:
 - first turn knob "3" in an anti-clockwise direction (decrease of the pressure) until the projected picture becomes unsteady;
 - then turn knob "3" in a clockwise direction (increase of the pressure) until the picture is just steady again.
- Always keep the skate pressure as low as possible.
- Focus the picture with knob "1".

LAMP SPP-800

The long positive contact wire projects obliquely from the stamped end of the lamp. The positioning of this wire is important; therefore never bend it by hand but leave it in its original state.

Mounting:

- Strew some talcum-powder in the bore of the rubber plug of packing bush "2"; this facilitates the mounting and the removal of the lamp.
- Push packing bush "2" in the position indicated in fig. 5 over the stamped end of lamp "1" until the glass rod protrudes about $\frac{3}{16}$ " (5 mm) from the other end of the packing bush.
- Insert the packing bush with lamp into the bore of lamp holder "2" (fig. 6) and turn the bush with lamp until the latter is as close as possible to the mirror, but does not touch it.
- Screw the nylon contact piece "3" (figs 5 and 6) tightly by hand on the lamp holder. The optical centre of the lamp is then automatically in the centre of window "1" (fig. 6).
- Insert the lamp holder into one of the bores of the turret "6" and screw on retainer "4" (fig. 6).
- Check whether the positive contact pin makes a good contact with the contact spring; if necessary, turn nylon cap "5" slightly in retainer "4".

Removal: In reverse order.

Note: If a lamp is broken near packing bush "2", the part remaining in the bush can be removed as follows:

- Push contact pin "4" of contact piece "3" over the projecting positive connecting wire and then push the lamp out of the packing bush.



Important:

- . Replace immediately a leaking or worn-out packing of bush "2".
- . Never dismantle the lamp assembly, either partly or completely, unless strictly necessary, as this shortens its life.

LAMP MIRROR (fig. 7)

More than half the light radiated by the lamp is thrown on to the film via mirror "3". Consequently, it is very important to replace this mirror in time, as a rule each time when replacing the lamp.

Mounting:

- . Hold the mirror holder "2" as follows at the end with slit "1":
forefinger against the hollow side; thumb and middle finger against the convex side.
- . Hold mirror "3" at either of the oblique ends in the other hand: forefinger at the hollow side and thumb at the convex side.
- . Pass the mirror through slits "5" of the mirror holder and push it carefully further until the front end of the mirror passes over cam "6" (if necessary, tilt the mirror slightly).
- . Insert mirror holder "2" in the lamp holder as far as the stop, thereby holding the mirror holder so that the mirror faces window "7".

Removal:

- . Hold the nail of the thumb in slit "1" of mirror holder "2" and push the latter out of lamp holder "4".
- . Dismantle the lamp assembly further in the reverse order.

Note: If it is difficult to take the mirror out of holder "2", pull it out with the aid of tweezers or pliers.

MIRROR OF THE LAMP HOLDER (fig. 6)

The glass disc "1" serves as an ultraviolet filter; moreover, it protects the optical system against damage. This glass disc is absolutely indispensable and in case of damage, it has to be replaced immediately. It can easily be pushed into its holder.

WATER COOLING

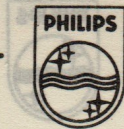
The water supply has to be 1 to 1.5 gallons per minute; it can be controlled with the cock located in the projector.

The temperature of the cooling water supplied should not exceed 95° F (35° C).

a. Water filter

To avoid blockage, it is advisable to remove this filter every three months for cleaning. For this purpose:

- . Close the main supply cock.
- . Remove the two screws of the rear cover and open this cover.



- . Put a moist cloth under the water lock in the housing.
- . Remove the four nuts "2" (fig. 8).

. Keep the water lock in the position in which it is mounted and take it out in an upright position.

- . Remove the centre fixing screw of the gauze filter and take out the filter.

- . Rinse the filter in clear water; replace it if it is damaged.

Mounting: In the reverse order.

b. Water sprinkler

This sprinkler is mounted at the end of the bore in turret "6" (fig. 6); it has the following functions:

- . to form the negative contact of the SPP-800 lamp;
- . to ensure the correct water distribution round the lamp;
- . to interrupt the water supply when the lamp breaks or no lamp has been inserted.

A stoppage of the sprinkler can be detected as follows:

- . If the water supply is insufficient, change over to the standby lamp; if now the water supply is correct, this indicates that the sprinkler is choked.

To clean a choked sprinkler, it can be taken out with the aid of the special spanner supplied with the equipment; it is advisable to do this after the performance, but it can also be done during the performance.

As choking of the sprinkler is always caused by a damaged gauze filter, the latter has to be replaced immediately after the performance (see under a.).

GATE LENS (fig. 9)

Removal:

- . Push the lamp compartment away from the runner plate with the aid of lever "6" (fig. 1). Push this lever only so far that support "4" (fig. 9) of the mirror for slide projection still stands vertical.
- . Loosen screw "1" a few turns and take out lens holder "2".
- . Tilt lens "3" in its holder so that it becomes perpendicular to the front face of the holder it can then easily be pushed through the slit in the holder.

Mounting: In the reverse order.



CLEANING

LAMP SPP-800 (fig. 6)

- Every morning take the lamp holders out of the turret and inspect the lamps through window "1". Even the slightest deposit of dirt must be removed immediately. For this purpose, immerse the lamp partially in a cleaning agent of the following composition:

- Cleaning agent:

50 volume per cents of distilled water,
25 " " " " alcohol (96 %),
25 " " " " phosphoric acid (H_3PO_4) - industrial
grade - spec.weight 1.75).

Have this solution made up and poured into a bottle with a neck-width of 1" (25 mm) by a pharmacist or chemist.

- Cleaning:

Immerse the lamp holder with lamp up to $1\frac{1}{2}$ " to 1" (1-2 cm) from the flange in the cleaning agent, i.e. do not immerse the contact piece "3", the flange and the packing in lamp holder "2".

After cleaning, rinse in clear water.

CONDENSER LENSES IN THE TURRET

- Once a week clean the inside of the condenser lenses in the turret with a soft-hair brush moistened with the cleaning agent for the lamp.
- Rinse after cleaning by having the projector run with lamp switched on and pulsator switched off.

GATE LENS

- Clean the side of the lens which faces the aperture plate daily with a clean cloth.

ULTRAVIOLET FILTER

- Check the ultraviolet filter "1" (fig. 6) daily. If any dirt has deposited, push the glass disc out of the holder and clean it with metal polish.



L U B R I C A T I O N

INTERMITTENT MECHANISM

The Maltese cross is located in a fully enclosed oil bath. The oil level can be checked by means of oil-level gauge "8" (fig. 8); the green circle on this glass indicates the highest and the red circle the lowest admissible oil level.

- . Check regularly whether the oil level is somewhere between these circles; if necessary, replenish with projector oil.
- . In the case of newly installed projectors and after replacement of the Maltese cross, drain the oil after 20 running hours and replenish with fresh oil.

Drainage of the oil:

- . Hold a receptacle under drain plug "5" (fig. 8), remove this plug and let the oil run out completely.
- . Fit plug "5" again and fix it tightly.

Replenishing with oil:

- . Remove the lid of oil level gauge "8".
- . Fill the oil bath with projector oil until its level lies just under the upper (green) circle.

Change the oil again after 50 running hours, then after 100 running hours and finally every 250 running hours.

LUBRICATION OF THE OTHER PARTS

- . Once a week:

Part	Fig.	Oil or grease (see page 9)	Quantity
Gear-wheel transmission "6"	8	type 8657	some drops
Chain "7" and chain wheels	8	type 8657	some drops
Flywheel on motor shaft "4"	8	projector oil	one drop
Spindle "1" of the Start-Stop-Change-over switch	10	Esso-Handy oil	some drops
Locking piece of both spool boxes	10	type EL 4852	grease sparingly
Stop for film spool in both spool boxes	-	type EL 4852	grease sparingly
Friction coupling of upper spool box	-	type EL 4850	tighten cap half a turn; if necessary refill with grease

. Once a month:

Part	Fig.	Oil or grease (see below)	Quantity
Sliding faces at the bottom of lens holder "2"	2	type 8657	lubricate
Sliding faces at the top of support "4"	2	type 8657	lubricate
Spindles of the guide rollers (for this purpose, remove the rollers)	-	Esso-Handy oil	one drop; spread with finger
Spindle of turret "5"	9	Esso-Handy oil	one drop
Pivot "6" of the lever for shifting the lamp compartment	9	Esso-Handy oil	one drop
Spindle of roller "7"	9	Esso-Handy oil	one drop
Pivot "8"	9	Esso-Handy oil	one drop
Pivots and running faces of rollers "9"	9	Esso-Handy oil	one drop
Pin "11" of light dowsers	9	Esso-Handy oil	one drop
Hinge-joint "12"	9	Esso-Handy oil	one drop
Ball-bearing of pressure roller "11"	2	Projector oil	some drops
Pivot of pressure roller "11"	2	type 8657	lubricate sparingly

. Once every three months:

Pin and spring of support "4"	2	type 8657	some drops
Screw spindle of focusing knob "1"	1	type 8657	some drops
Pivot "12" for adjusting the skate pressure	2	type 8657	one drop
Felt disc "2" of lower friction coupling	10	type 8657	immerse in oil
Hinges "3" of rear door	10	type 8657	one drop

. After overhaul:

- . Ball bearing of sound shaft: with grease EL 4850.

Projector oil to be used:

type 3671 = light oil:
at 40° F (5° C) and below
type 3672 = medium oil:
at 40-80° F (5-25° C)
type 3673 = heavy oil:
at 80° F (25° C) and
above

At all temperatures:

type 8657 = cardan oil
No. C1 602 17 = Esso-Handy oil,
light
type EL 4850 = ball-bearing grease
type EL 4851 = consistent grease
type EL 4852 = graphitic grease



LOCATING FAULTS AND PUTTING THEM RIGHT

In FP 20 S installations, defects may occur:

1. because of wrong operation;
2. because of a defective lamp SPP-800, fuse or pulsator valve, the latter having, of course, a limited life.

The following fault-finding chart will make it possible to discover the cause of the most common defects and to remedy them.

Defect	Cause	Remedy
Brightness control does not work.	Two phases inverted during operation at mains or pulsator.	Reverse the mains leads.
Turret "5" (fig. 9) does not change-over automatically.	Pivoting of turret not smooth enough.	Lubricate pivot shaft of turret with Esso-Handy oil.
	Pulsator valve B11 (PL 2D21) defective (fig. 11).	Replace the valve.
	Locking device ("7" and "8"- fig. 9) out of position.	Re-adjust.
One of the SPP-800 lamps gives too little light.	Forgotten to mount mirror "3" (fig. 7).	Mount the mirror
	Dirt deposit on lamp SPP-800.	Clean the lamp with the cleaning agent (page 7).
	Dirty lenses.	Clean with lens cloth.
	Light dowsers does not open wide enough.	Lubricate the pivots of the dowsers (page 9).
	Lamp itself worn out.	Replace the lamp.
One of the SPP-800 lamps flickers irregularly.	Leakage in lamp holder.	Dry the positive contact piece "3" (fig. 5) and fix it tightly; if necessary, replace packing bush "2".
	Bad contact at input or output side of lamp.	Correct the contact.



Defect	Cause	Remedy
One of the SPP-800 lamps does not burn.	Insufficient water supply because of choked sprinkler.	Clean the sprinkler and replace the gauze filter (page 6).
	Pin "4" (fig. 5) makes no contact with the pos. contact spring because of wrong position of nylon cap "5" (fig. 6).	Turn the nylon cap slightly in retainer "4" (fig. 6).
	Neg. contact piston sticks.	Remove the sprinkler and check the bore.
	Lamp itself is defective.	Replace the lamp.
Travel ghost with both SPP-800 lamps.	Furthermost of the three micro-switches (in the rear of the lamp housing) sticks in its position for slide projection: a. because the lever of the switch jams; b. because the micro-switch is defective.	Eliminate the jamming. Replace the switch.
	Pulse generator out of adjustment with respect to the Maltese cross.	Re-adjust the pulse generator.
Both SPP-800 lamps flicker regularly.	One of the fuses V11, V12 or V13 (fig. 11) is defective.	Replace the defective fuse.
	One of the pulsator valves is defective (fig. 11): B3...B8 (PL 5557), B14 or B15 (DCG 1/250).	Replace the defective valve.
Both SPP-800 lamps flicker irregularly.	A mains phase fails.	-
	Irregular water supply.	Trace and, if possible, eliminate the cause (perhaps too much water consumption somewhere else).
	Too much air in the water.	-
	Leakage on both lamp holders.	Dry the pos. contact piece "3" (fig. 5) and fix it tightly; if necessary, replace packing bush "2".
	Fuse V1 6 is defective.	Replace the fuse.



Part	Cause	Remedy
Neither of the SPP-800 lamps burns, whether with film or with slide projection.	Lamp not switched on.	Switch on the lamp with switch "7" (fig. 1).
	Insufficient water flow:	
	a. Main cock in supply tube not far enough opened.	Open main cock fully.
	b. Sprinkler and/or gauze filter choked.	Clean the sprinkler and replace the gauze filter (pages 5 and 6).
	c. Armature or coil of water lock "3" defective (fig. 8).	Loosen the tube from the water lock; remove the locking spring and take out the armature; replace the armature or the coil immediately after performance.
	Pulsator does not work:	
	a. Not switched on.	Put pulsator switch in position "1" (fig. 11).
	b. Pulsator valves not yet warm enough.	Wait; in future, switch on earlier before the performance.
	One of the pulsator fuses V14, V15 or V16 defective (fig. 11).	Replace defective fuse.
	One of the pulsator valves B12 or B13 (PL 2D21), B9 (PL 5684) or B1 (4152) defective (fig. 11).	Replace defective valve.
	A mains phase fails.	-
	Pin "4" (fig. 5) makes no contact with pos. contact spring owing to wrong position of nylon cap "5" (fig. 6).	Turn nylon cap "5" slightly in retainer "4" (fig. 6).
	Both lamps defect.	Replace the lamps.
The lamps burn with film but not with slide projection.	One or more of the three micro-switches at the rear in the lamp housing do not operate.	Check the switches; replace them if necessary.
<p>6.59.</p>		

PROPOSED STOCK OF SPARES

A set of the most important spares should be available on the cinema premises, in order to minimise programme hold-ups that may arise on account of wear or damage.

Parts for the pulsators:

Quantity	Description (see fig. 11)	Order number
4	Fuses V11, V12 and V13	974/V6300
4	Fuses V14, V15 and V16	974/V2000
2	Valves B1	4152/02
4	Valves B3 - B8	PL 5557
2	Valves B9	PL 5684
4	Valves B10 - B13	PL 2D21
2	Valves B14 and B15	DCG 1/250
1	Valve B16	85A2

Parts for the projector:

Note: The various parts can be found in the drawing bearing the same initial characters as their order numbers (e.g. part BA01 is indicated in fig. BA).

Quantity	Description	Order number
2	Micro-switches	BA01 (=BC06=BC09= =BG17=BF18)
1	Sprocket	BA03 (=BA23)
1	Torsion spring	BA04A (=BA25A)
1	Torsion spring (clockwise)	BA18
1	Glass rod	BA21
1	Intermittent sprocket	BA31
2	Lateral guide rollers	BA33
1	Set of velvet-covered runner strips	BA37A
1	Gate shutter	BB07
1	Aspherical condenser lens	BB10
4	Rubber packing rings	BD04
2	Ultraviolet filter	BD05
2	Packing bushes, complete	BE02
2	Gauze filter	BF04A
2	Rubber packing rings	BF04E
1	V-belt	BF07
1	Gun-cotton for safety switch	BF17
2	Photocell	3546PW
2	Exciter lamps	3874C (6 V, 1.48 A) or 7251C (5 V, 4 A)
2	Framing lamps	C1 408 02

The above-mentioned projector parts can be ordered together under the collective order number EL 4819/00.



ORDER NUMBERS OF THE PRINCIPAL PARTS

When ordering parts, always indicate:

1. the type of projector (FP 20 S),
2. the serial number of the projector; this number stands on the number plate on the narrow rear wall of the projector cabinet;
3. the order number of the part in question.

F i g . B A

Order number	Description	Quantity
BA01	Micro-switch	2
BA02	Metal strip for film-rupture switch	1
BA03	Sprocket, complete	2
BA04	Tightening cap	1
BA04A	Torsion spring	1
BA05	Guide shoe, complete	2
BA06	Pressure skate	1
BA07	Locking nut	1
BA08	Lens holder, dia. 2.78" (70.6 mm), type EL 4029/00	1
BA08A	Adapter tube 70.6/62.5 mm	1
BA09	Cap nut	1
BA10	Pressure spring (thin)	1
BA10A	Pressure-torsion spring (big)	1
BA11	Threaded spindle with knob	1
BA12	Framing shaft with knob	1
BA13	Lamp holder, complete	1
BA13A	Lid of lamp holder	1
BA13B	Exciter lamp: type 3874C (6 V, 1.48 A) for use with the M2 amplifier type 7251C (5 V, 4 A) for use with any other amplifier	2
BA14	Threaded spindle	1
BA14A	Knob	1
BA15	Knob	1
BA16	Slit lens	1
BA17	Lever with spindle	2
BA18	Torsion spring (clockwise)	1
BA19	Sound shaft	1
BA19A	Ball bearing for BA19	1
BA20	Pressure roller	1
BA20A	Ball bearing	2
BA20B	Locking ring	2
BA20C	Dust ring (front)	2
BA20D	Dust ring (rear)	2
BA20E	Ornamental cap with screw	1
BA21	Glass rod	1
BA22	Photocell, type 3546 PW	2
BA23	Sprocket, complete	2
BA24	Guide shoe, complete	1
BA25	Tightening cap	1
BA25A	Torsion spring	2
BA26	Knob	1
BA27	Guide roller	1
BA27A	Ornamental cap with screw	1
BA28	Spring	1
BA29	Lever	1



Fig. B A - Continued

Order number	Description	Order number
BA30	Guide roller	1001
BA30A	Ornamental cap with screw	1001A
BA31	Intermittent sprocket	1002
BA31A	Shaft of intermittent sprocket	1003
BA32	Spigot	1003A
BA33	Lateral guide roller	1004
BA33A	Bush	1005
BA33B	Spring	1006
BA34	Screw	1006A
BA35	Mask for normal film (1:1.37)	1007
BA35A	Mask for Wide Screen (1:1.85)	1008
BA35B	Mask for CinemaScope (1:2.34)	1009
BA35C	Blind mask	1010
BA36	Fire plate	1011
BA36A	Exciter lamp, No. C1 408 02	
BA37	Set of Novotext runner strips	
BA37A	Set of velvet-covered runner strips	

Fig. B B

Order number	Description	Order number
BB01	Shutter for slide projection	1001
BB02	Metal mirror	1002
BB03	Box with coils	1003
BB04	Pin	1004
BB05	Lever	1005
BB06	Ring	1006
BB07	Gate shutter	1007
BB08	Milled screw	1008
BB09	Lens holder	1009
BB10	Aspherical condenser lens	1010
BB11	Lever	1011
BB12	Roller	1012
BB13	Rubber tube	1013
BB13A	Clamp for rubber tube	1013A
BB14	Lever	1014
BB15	Relay	1015
BB16	Pin, complete with spring, spacer and nuts	1016
BB17	Contact spring	1017
BB18	Contact holder, complete	1018
BB19	Flexible tube	1019
BB19A	Clamp for BB19	1019A
BB20	Tension spring	1020
BB21	Pin	1021



F i g. B C

Order number	Description
BC01	Potentiometer
BC01A	Knob
BC02	Roller
BC03	Lever
BC03A	Roller
BC04	Spring
BC05	Insulating cap
BC06	Micro-switch
BC06A	Vane
BC07	Toothed segment
BC08	Gear wheel (nylon)
BC09	Micro-switch
BC10	Condenser
BC11	Lamp switch

F i g. B D

Order number	Description
BD01	Nylon cap
BD02	Screw cap, complete
BD03	Lamp holder, complete with mirror holder
BD04	Rubber packing ring
BD05	Ultraviolet filter
BD06	Plastic covering plate (green)
BD07	Plastic covering plate (red)
BD08	Condenser lens
BD08A	Packing ring for BD08
BD09	Locking ring
BD09A	Packing ring
BD10	Turret, complete
BD11	Leaf spring
BD12	Sprinkler
BD12A	Spring for BD12
BD12B	Special key for the mounting and the removal of BD12
BD13	Spring for fixing BD01 in BD02

F i g. B E

Order number	Description
BE01	Nylon contact cap
BE02	Packing bush, complete
BE03	Lamp SPP-800, complete with mirror (Code No. 57356X/51)



F i g. B F

Order number	Description	Order number
BF01	Rubber grommet	BG09
BF02	Insulating plate	BG09A
BF03	Tube clamp	BG10
BF04	Water lock, complete	BG11
BF04A	Gauze filter	BG12
BF04B	Coil of water lock	BG13
BF04C	Armature	BG14
BF04D	Locking spring for BF04C	BG14A
BF04E	Rubber grommet	BG14B
BF05	Pulley	BG15
BF05A	Pin	BG16
BF05B	Plug	BG17
BF06	Asynchronous motor, 110 and 220 V, 50 c/s	BG18
BF06A	Synchronous motor, 220/380 V, 50 c/s	BG19
BF07	V-belt	
BF08	Oil-drain screw	
BF09	Chain wheel	
BF09A	Ball bearing for shaft BF09B	
BF09B	Sprocket shaft	
BF10	Chain for driving a 2000-ft (600-m) spool	BH01
BF10A	Chain for driving a 6000-ft (1800-m) spool	BH02
BF11	Photocell cable	BH03
BF12	Flywheel	BH04
BF13	Chain wheel	BH05
BF13A	Adjusting ring	BH06
BF14	Gear wheel, complete with chain wheels and ball bearing	BH07
BF14A	Gear wheel	
BF14B	Ball bearing	
BF15	Chain	
BF16	Chain wheel	
BF16A	Ball bearing for shaft BF16A	
BF16B	Sprocket shaft	
BF17	Gun-cotton for safety switch	
BF18	Micro-switch	
BF19	Insulating cap	
BF20	Maltese-cross unit	
BF21	Cap for oil-level gauge	
BF21A	Oil-level gauge	
BF22	Exhaust pipe	
BF23	Coil for puls generator	

F i g. B G

Order number	Description
BG01	Condenser
BG02	Condenser
BG03	Condenser
BG04	Condenser
BG05	Lock of the spool boxes
BG05A	Spring for BG05
BG06	Relay, complete with wiring
BG07	Terminal strip
BG08	Fuse, 2 A
BG08A	Fuse holder



F i g. B G - Continued

Order number	Description	Order number
BG09	Switch	BF01
BG09A	Lever for BG09	BF02
BG10	Water return tube	BF03
BG11	Water feed tube	BF04
BG12	Pressure spring	BF04A
BG13	Milled screw	BF04B
BG14	Spool shaft	BF04C
BG14A	Locking ring	BF04D
BG14B	Ball bearing	BF04E
BG15	Felt disc	BF05
BG16	Chain wheel	BF05A
BG17	Micro switch	BF05B
BG18	Push-button switch	BF06
BG19	Insulating cap	BF06A

F i g. B H

Order number	Description	Order number
BH01	Gauze	BF10A
BH02	Time scale	BF11
BH03	Scale	BF12
BH04	Lever for changing over to slide projection	BF13
BH05	Knob	BF13A
BH06	Inspection window	BF14
BH06A	Rubber packing ring for BH06	BF14A
BH07	Angle plate	BF14B

F i g. B C

Description	Order number
Condenser	BG01
Condenser	BG02
Condenser	BG03
Condenser	BG04
Lock of the spool boxes	BG05
Spring for BG05	BG05A
Relay, complete with wiring	BG06
Terminal strip	BG07
Fuse, 2 A	BG08
Fuse holder	BG08A

FP20 S

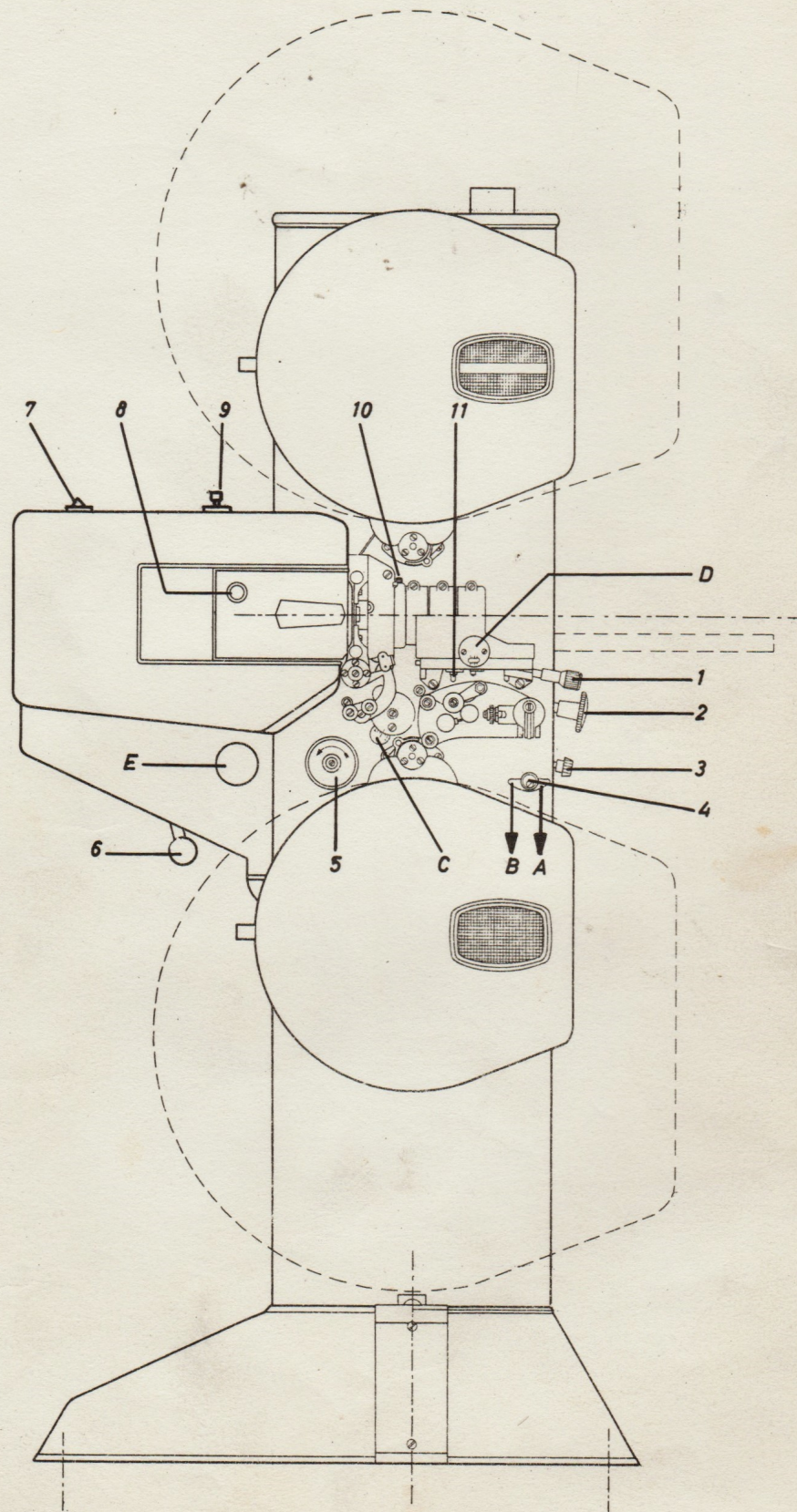


FIG. 1

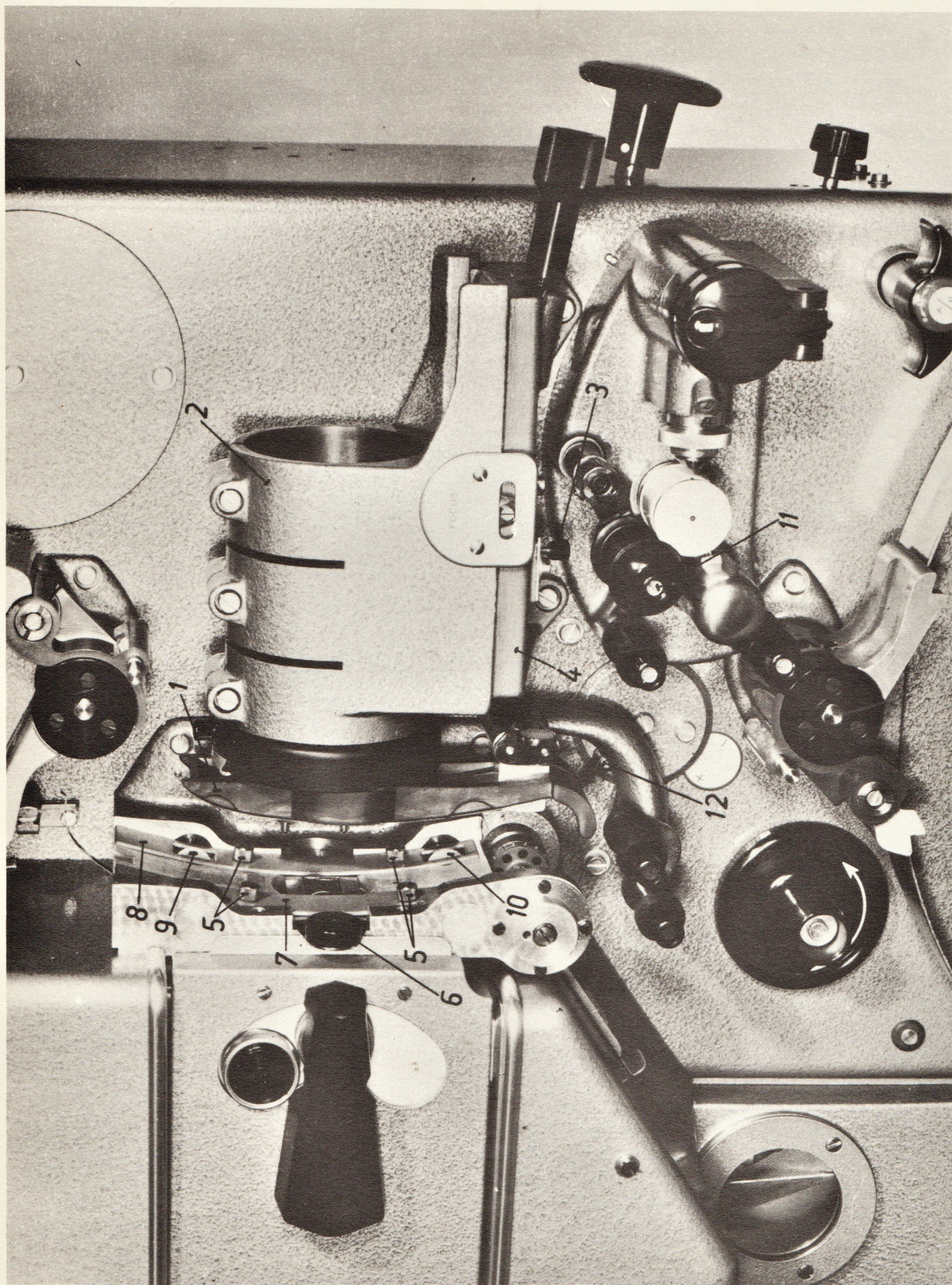
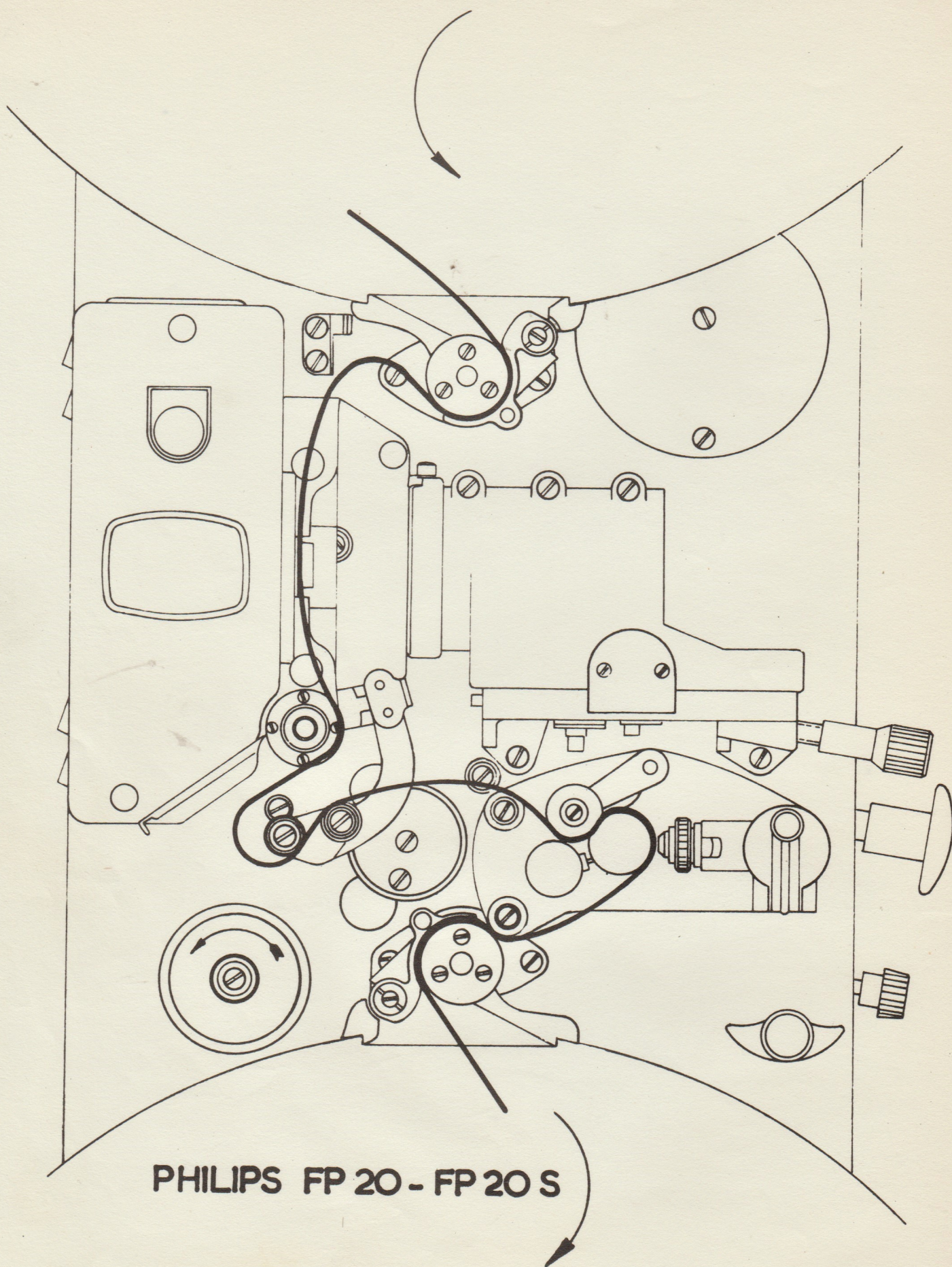
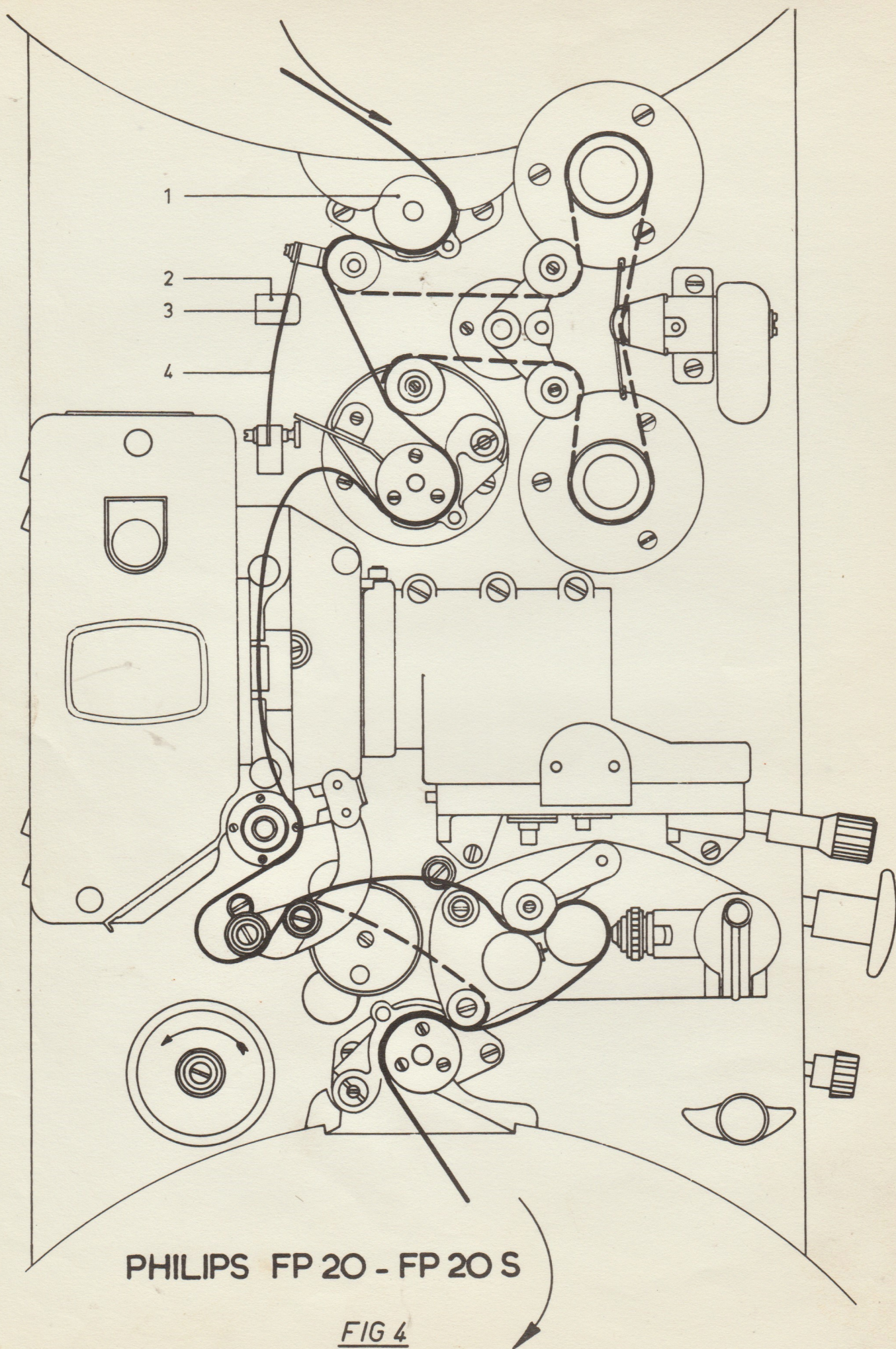


FIG 2





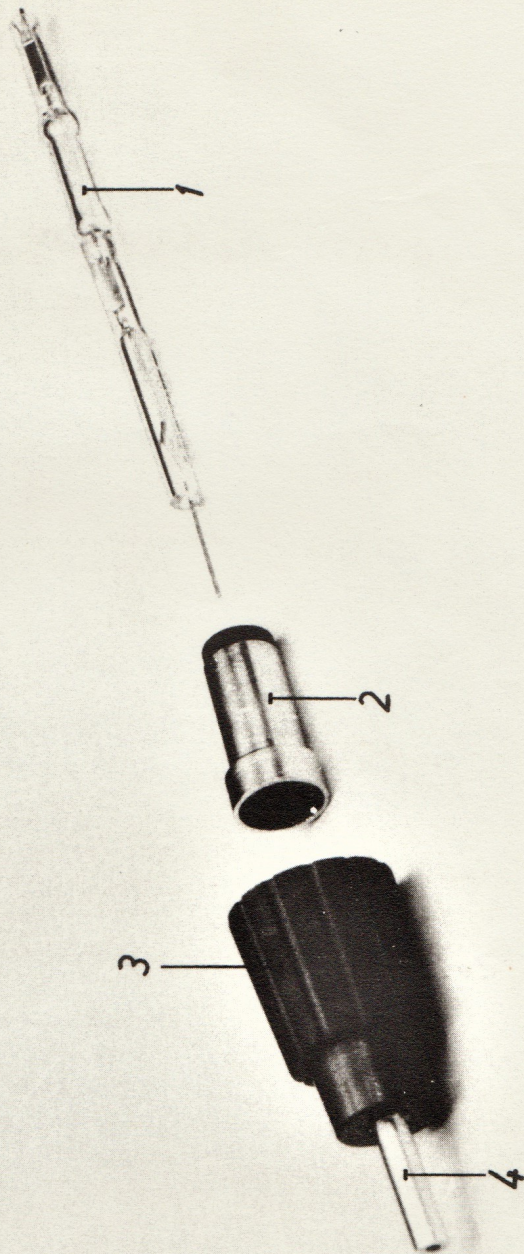


FIG. 5

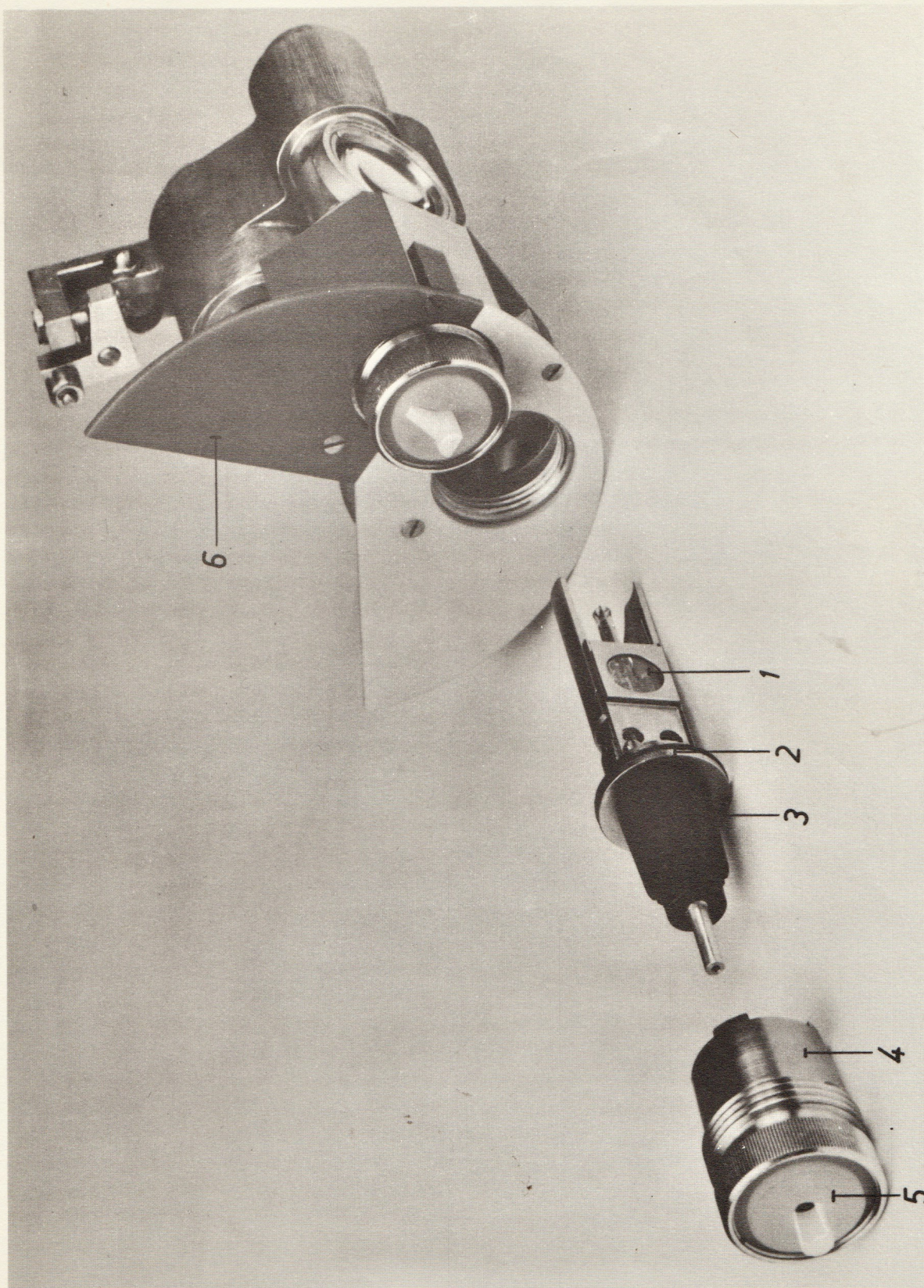


FIG. 6

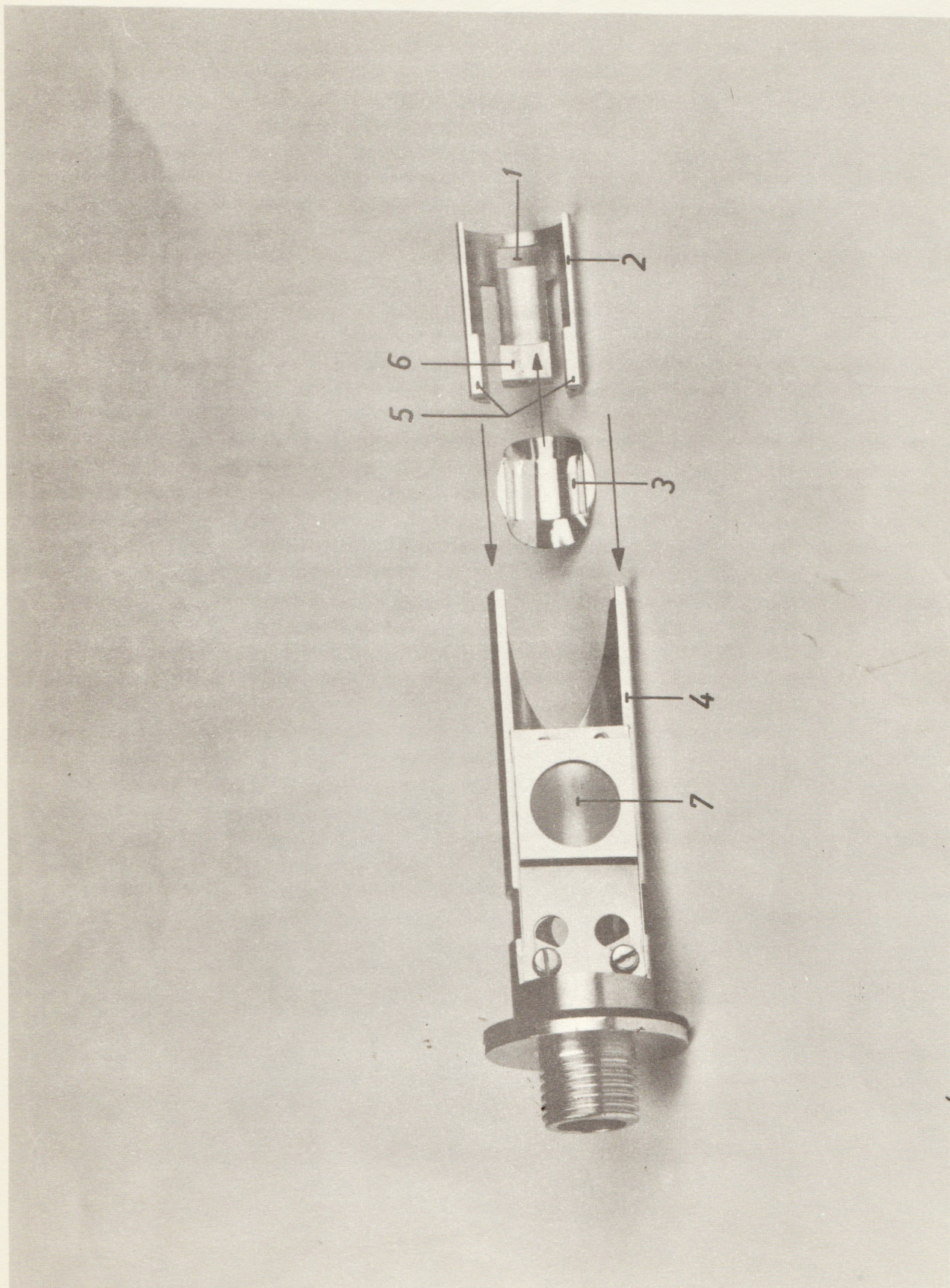


FIG. 7

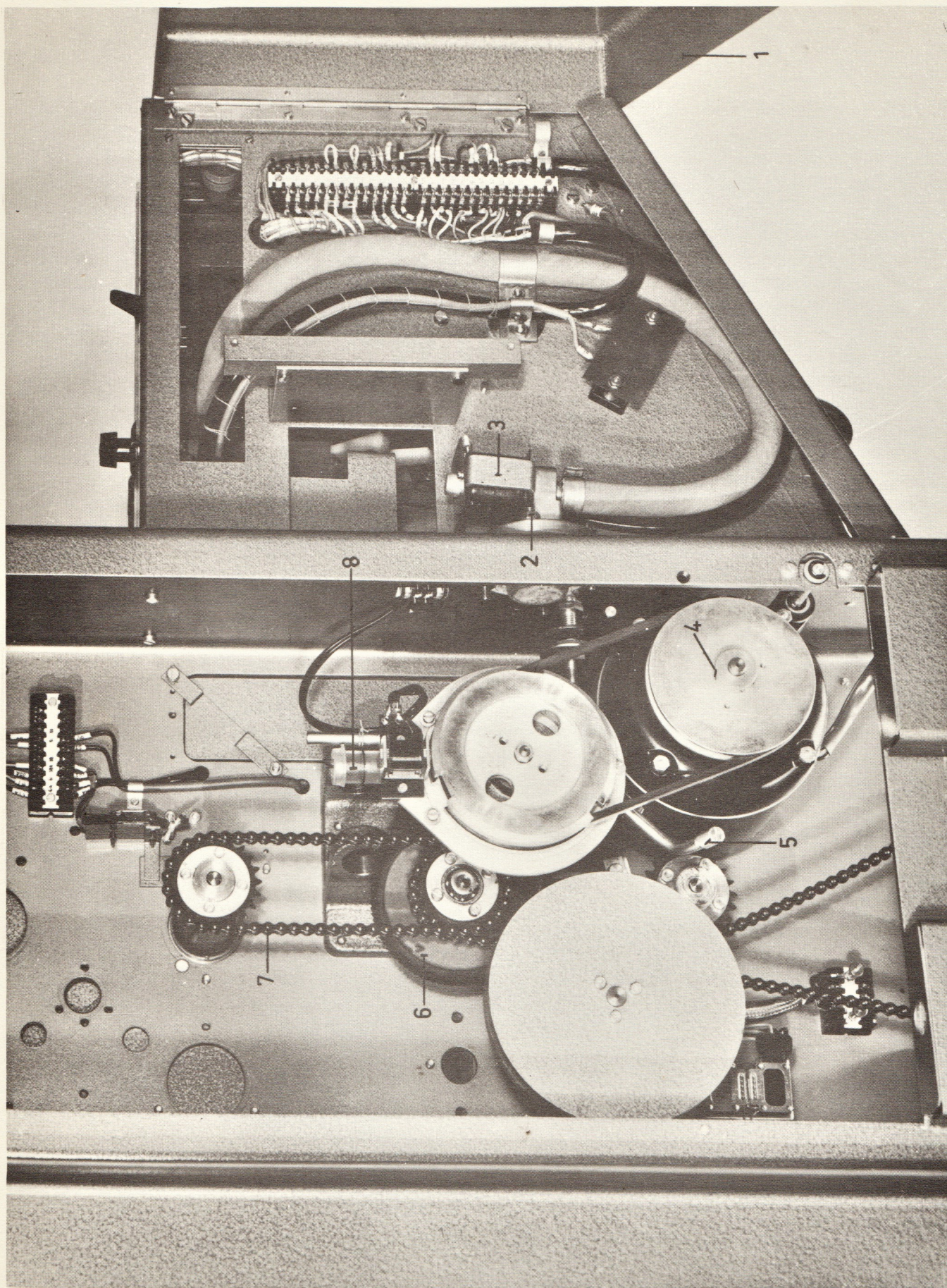


FIG. 8

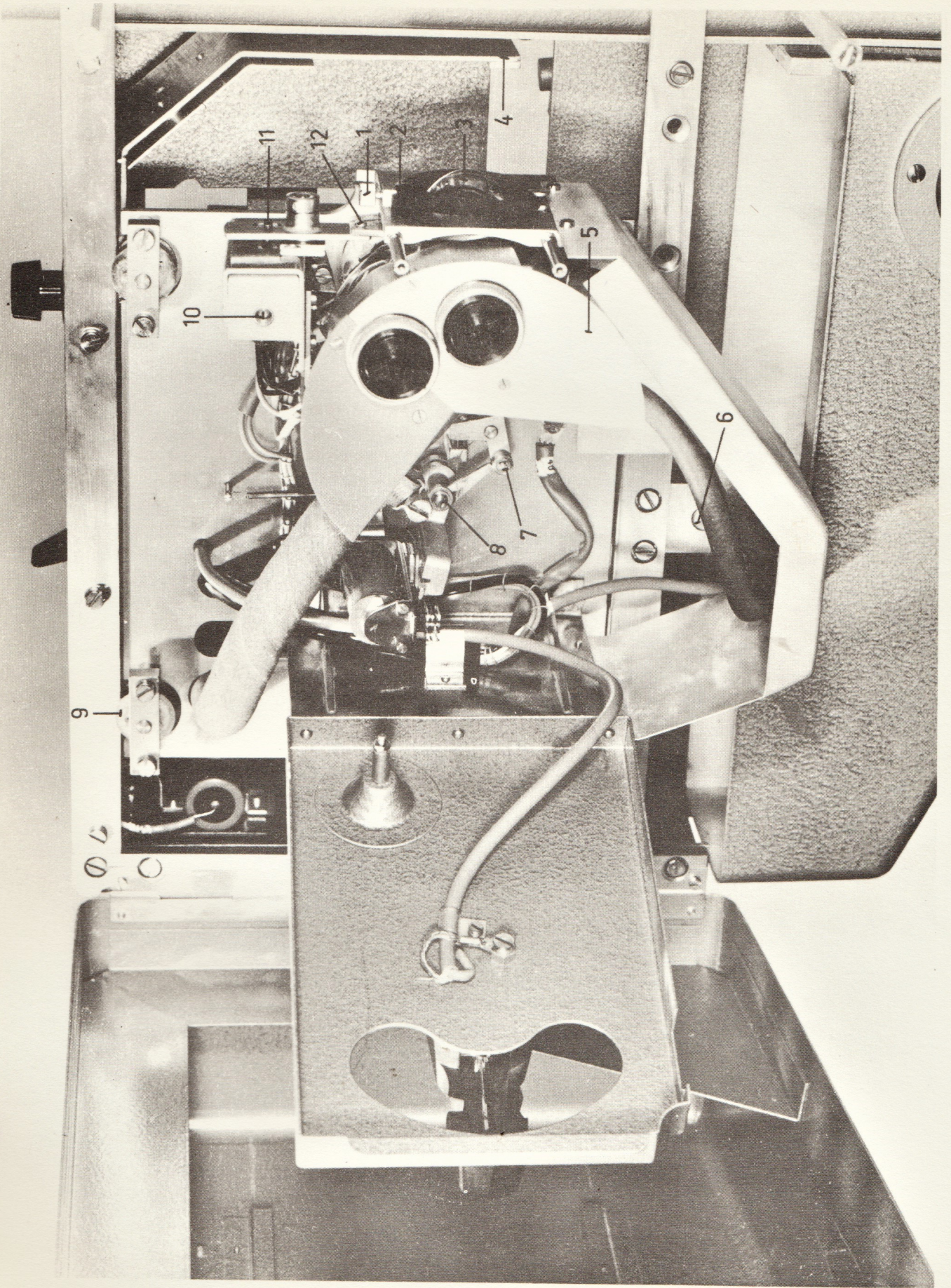


FIG. 9

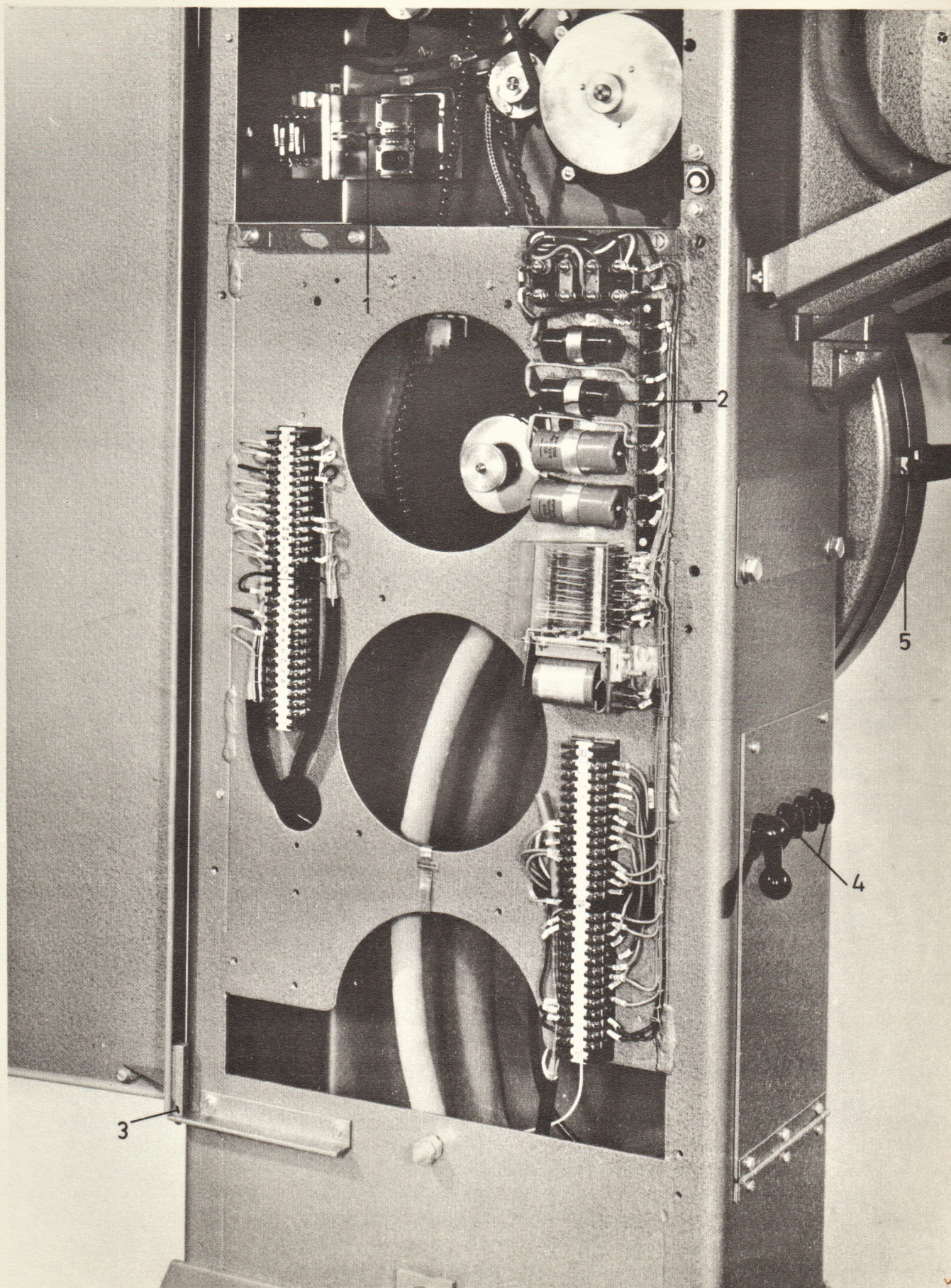


FIG. 10

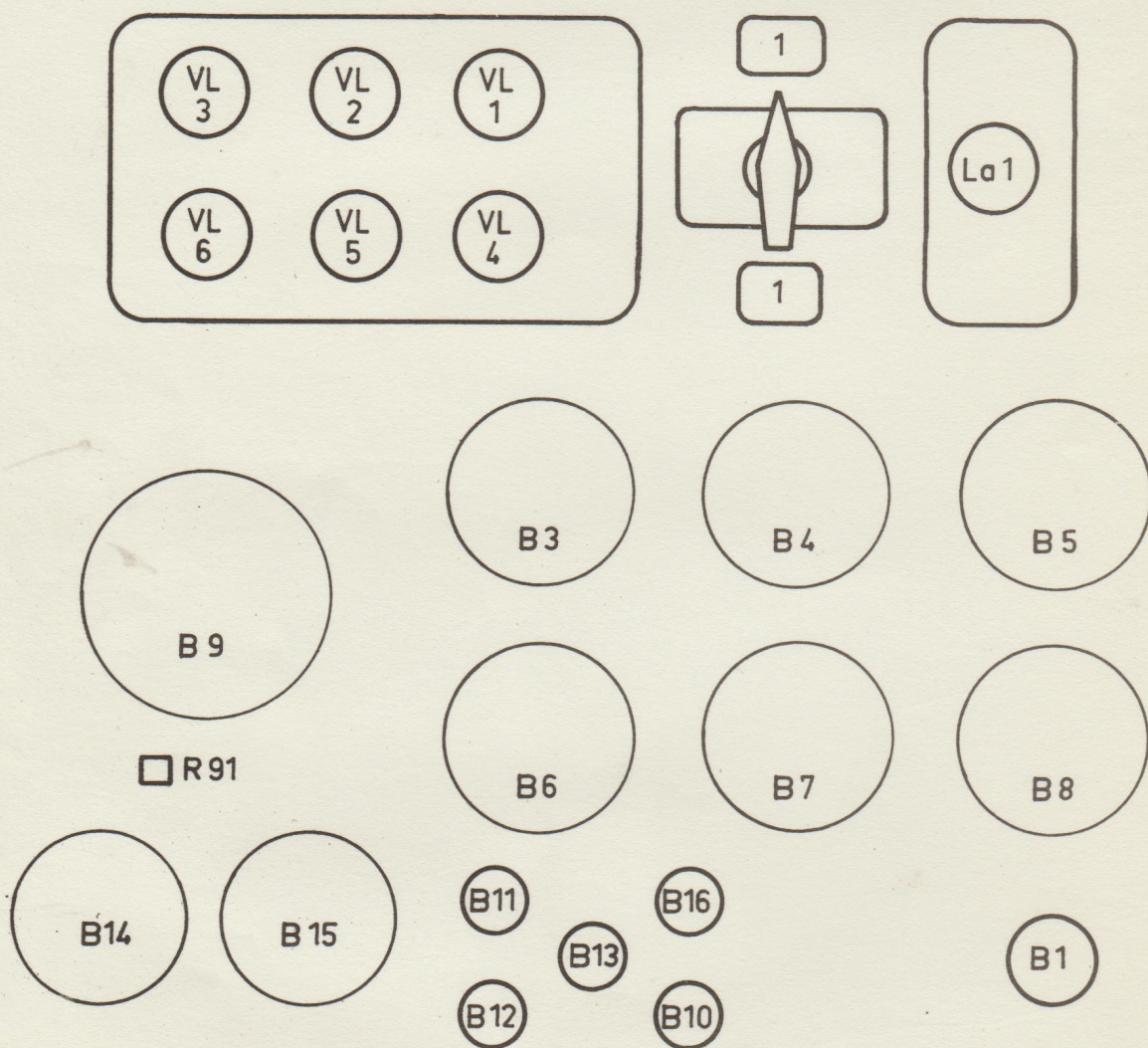


FIG. 11

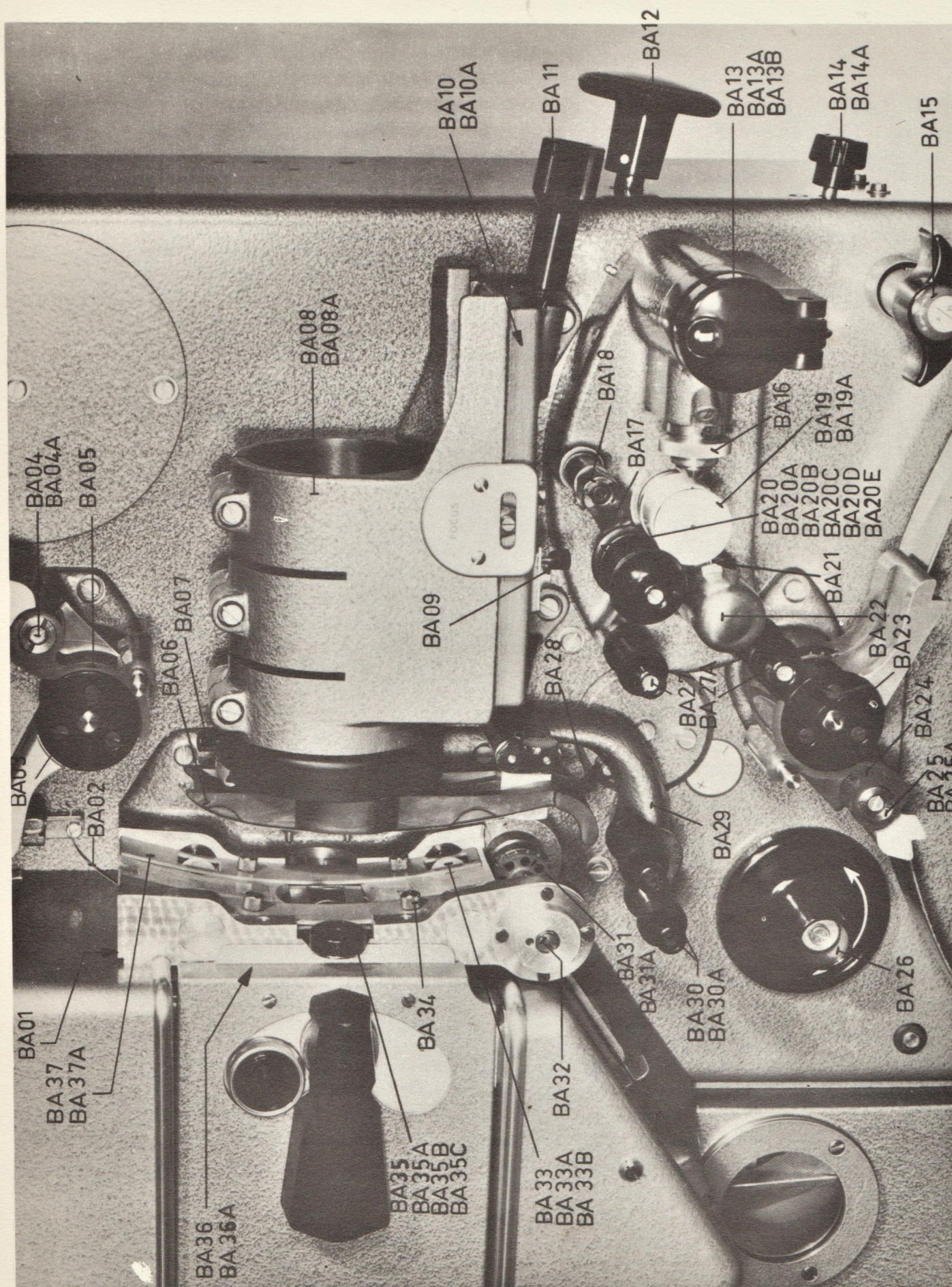


FIG.BA

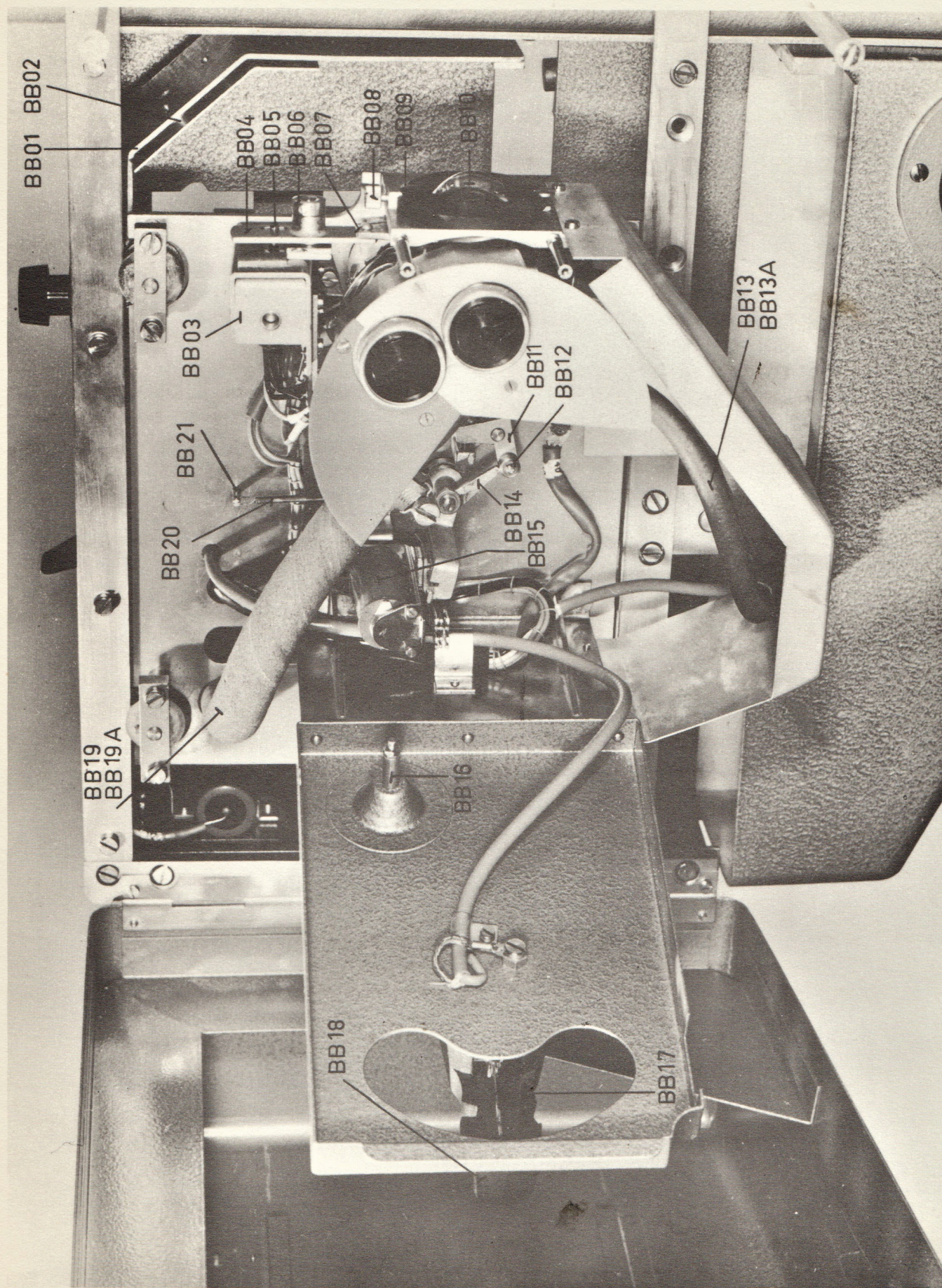


FIG.BB

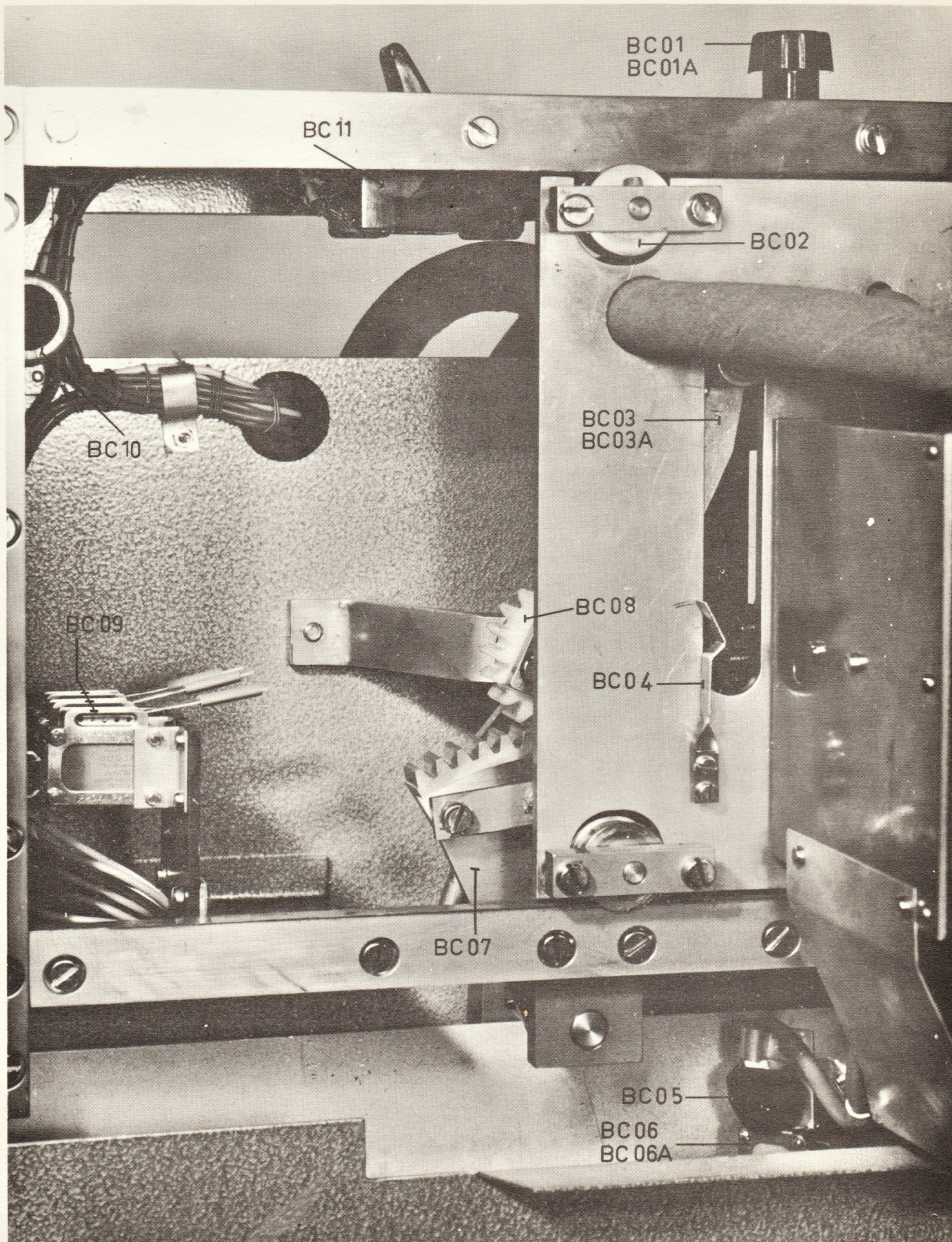


FIG.BC

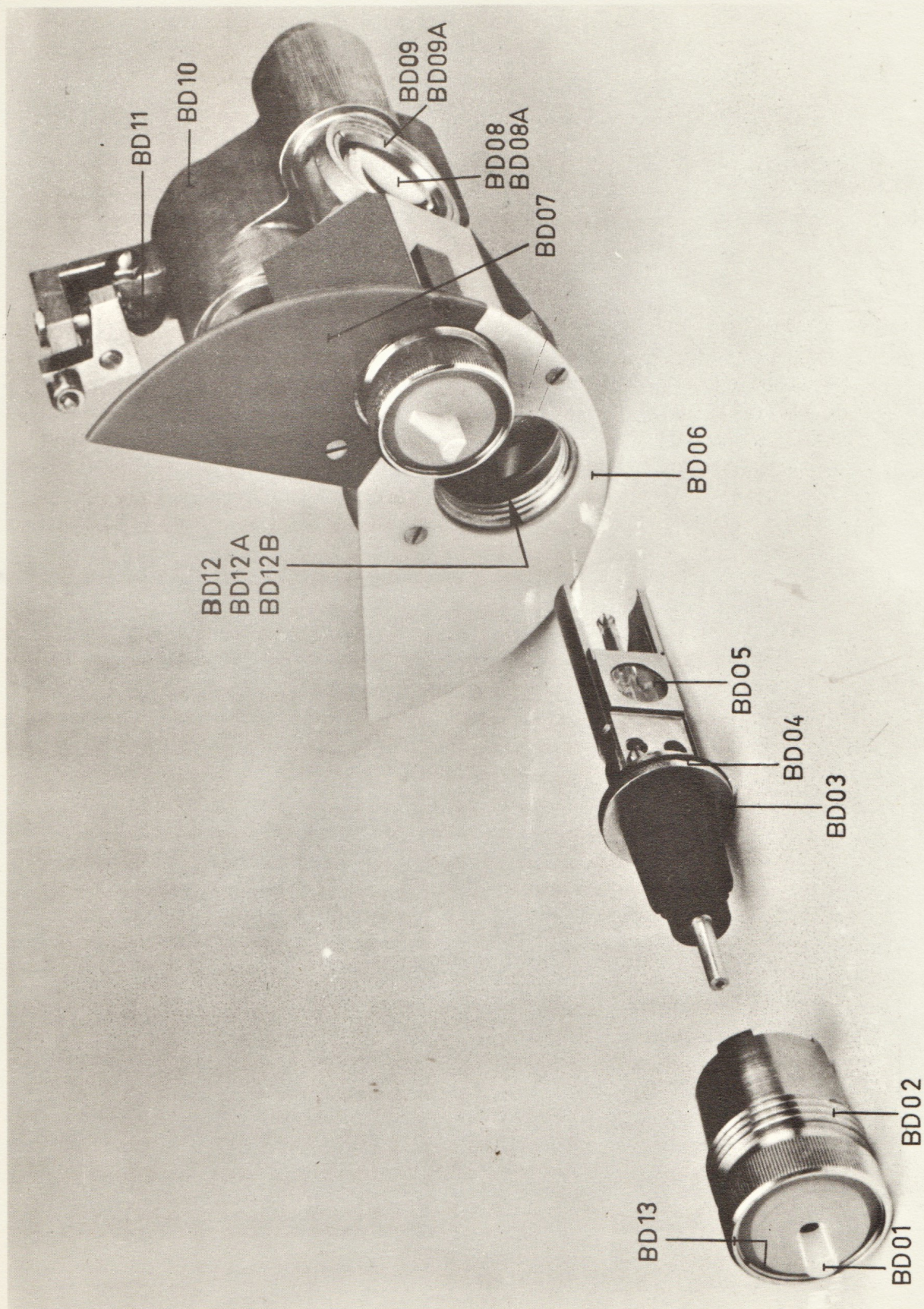


FIG. BD

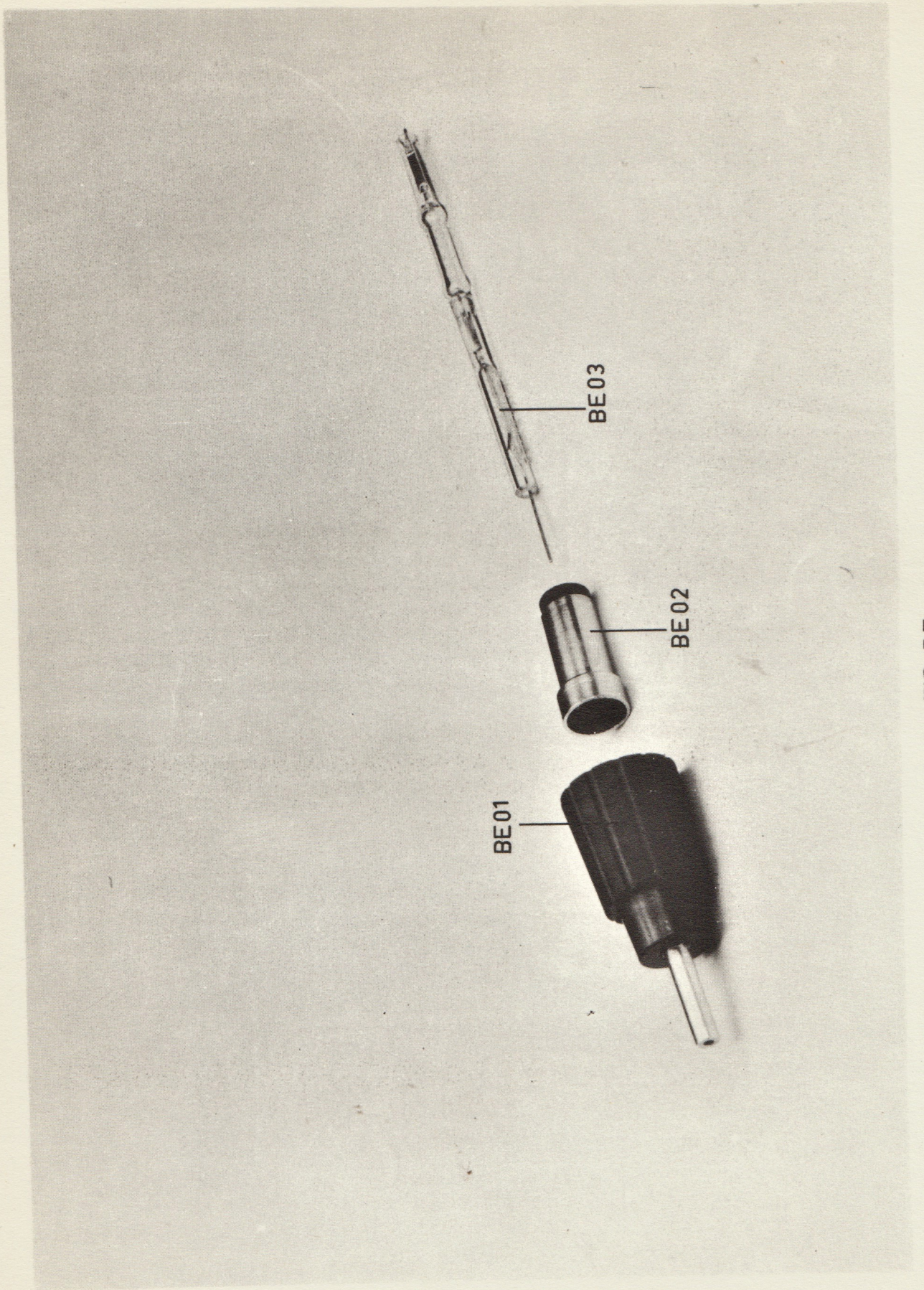


FIG. BE

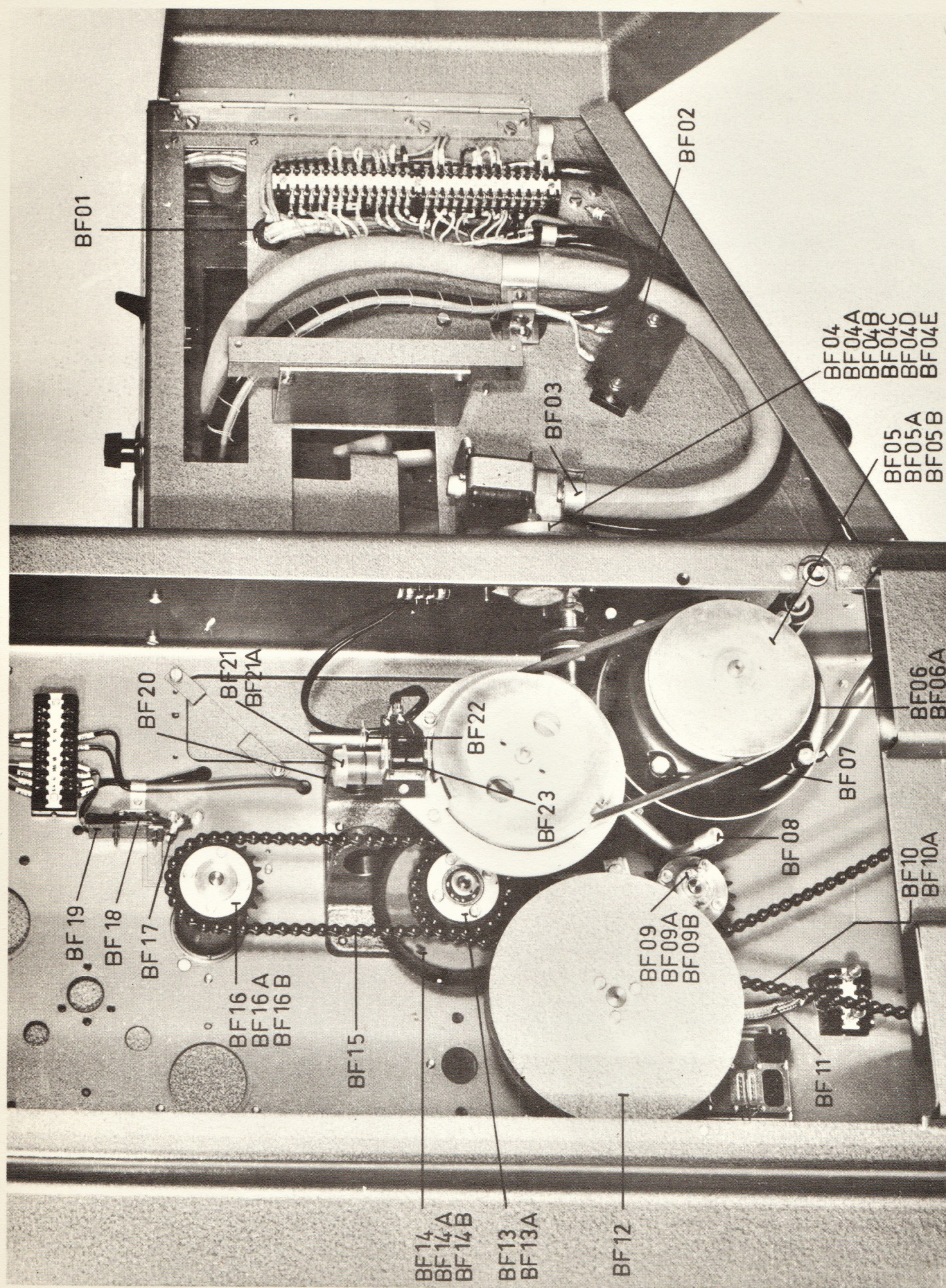


FIG BF

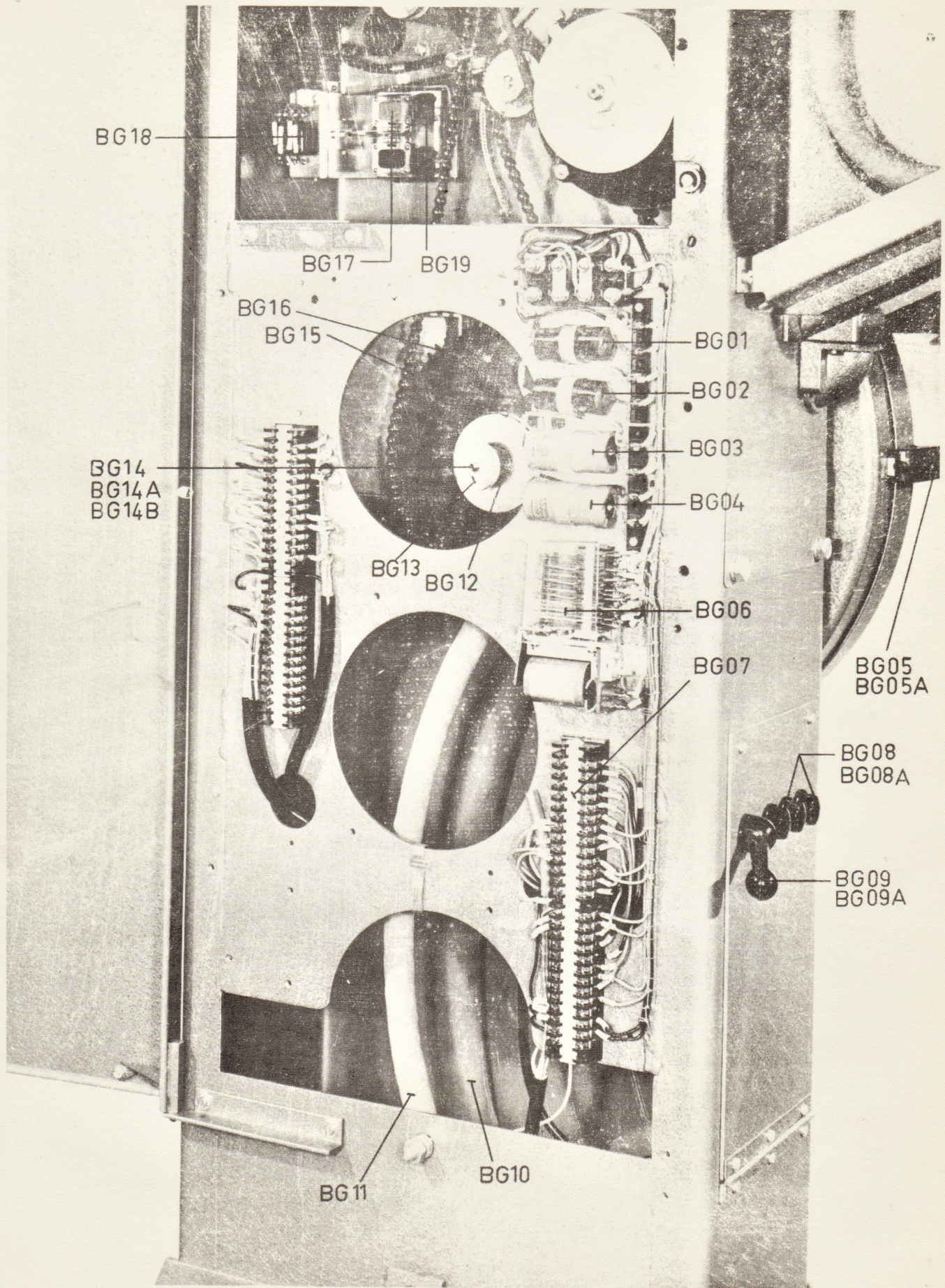


FIG. BG

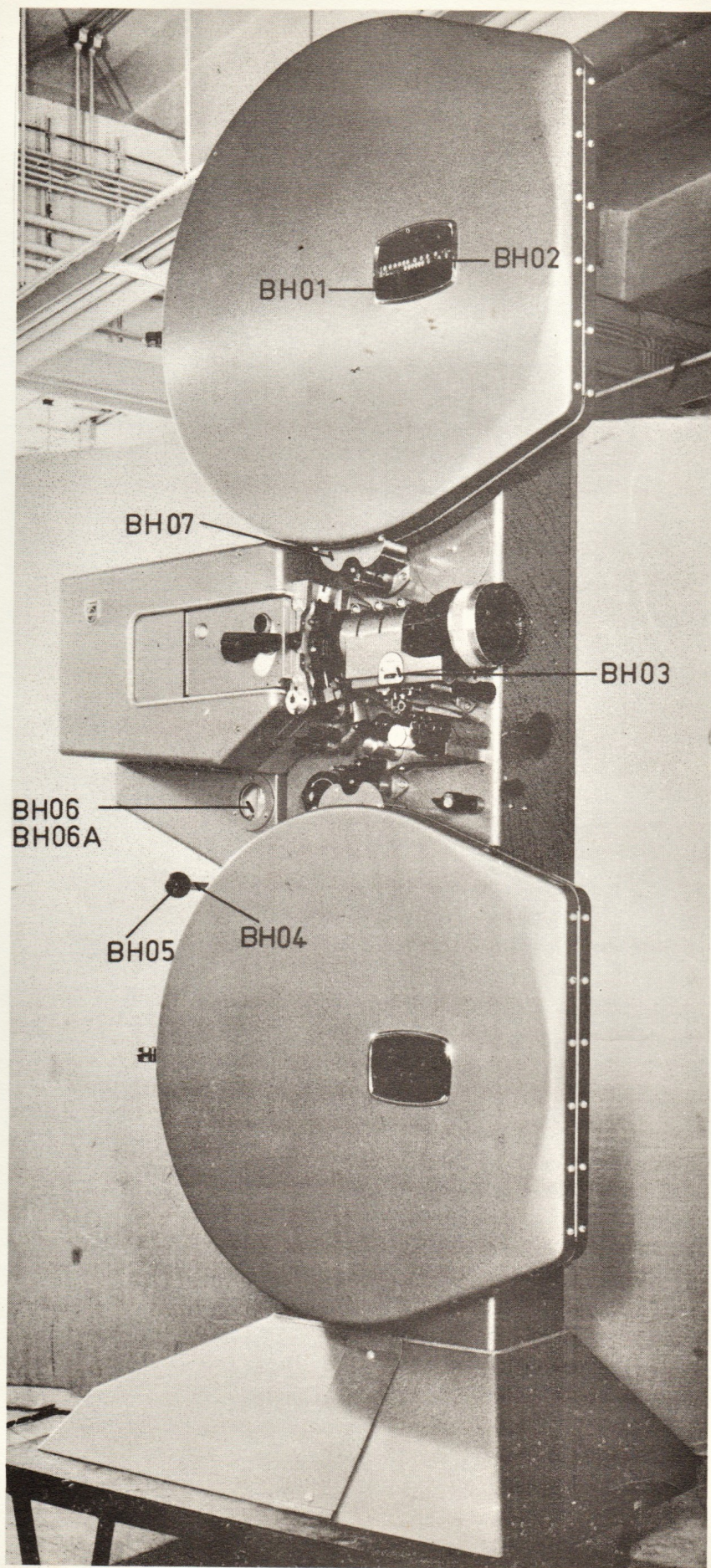


FIG. BH

