

PHILIPS

ELECTRO-ACOUSTICS





DIRECTIONS FOR THE OPERATION AND MAINTENANCE
OF PROJECTOR FP 20

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. Ammeter for the arc lamp.
 7. Arc-lamp switch.
 8. Knob for operating the stray-light screen.
 9. Pin for replacing the lens holder.
- C. Scale for the adjustment of the skate pressure.
D. Scale for focusing the projection lens.

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.



OPERATION

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)

- . Switch on the arc lamp.
- . Start the projector by pushing knob "4" in the direction of arrow "A".
- . Open the light dowsers of the lamphouse.
- . 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".

D I R E C T I O N S F O R 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 "1" (fig. 5); 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 working hours and replenish with fresh oil.

Drainage of the oil:

- . Hold a receptacle under drain plug "3" (fig. 5), remove this plug and let the oil run out completely.
- . Fit plug "3" again and fix it tightly.

Replenishing with oil:

- . Remove the lid of oil-level gauge "1".
- . 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 6)	Quantity
Front bearing of intermittent shaft	-	Esso Handy oil	some drops
Gear-wheel transmission "4"	5	type 8657	some drops
Chain "5" and chain wheels	5	Esso Handy oil	some drops
Flywheel on motor shaft "2"	5	projector oil	one drop



• Once a week (cont'd)

Part	Fig.	Oil or grease (see page 6)	Quantity
Spindle "1" of the Start-Stop-Change-over switch	6	Esso-Handy oil	some drops
Locking piece of both spool boxes	-	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 page 6)	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	1 drop; spread with finger
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:

Part	Fig.	Oil or grease (see page 6)	Quantity
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	6	type 8657	immerse in oil
Hinges "3" of rear door	6	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° to 80° F (5 to 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

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 to projector parts.

The various parts can be found in the drawing bearing the same initial characters as their order number (e.g. part B0o1 is indicated in fig. B0).

Quantity	Description	Order number
1	Micro-switch	B0o1 (=BP13=BP21)
1	Sprocket	B0o3 (=B023)
1	Torsion spring	B0o4A (=B025A)
1	Torsion spring (clockwise)	B018
1	Glass rod	B021
1	Intermittent sprocket	B031
2	Lateral guide rollers	B034
1	Set of velvet-covered runner strips	B039A
1	Gate shutter	B037
1	V-belt	BP07
2	Pieces of gun-cotton for safety switch	BP20
2	Photocells	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 4818/00.



ORDER NUMBERS OF THE PRINCIPAL PARTS

When ordering parts, always indicate:

1. the type of projector (FP 20),
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 0

Order number	Description
B0o1	Micro-switch
B0o2	Metal strip for film-rupture switch
B0o3	Sprocket, complete
B0o4	Tightening cap
B0o4A	Torsion spring
B0o5	Guide shoe, complete
B0o6	Pressure skate
B0o7	Locking nut
B0o8	Lens holder, dia. 2.78" (70.6 mm), type EL 4029/00
B0o9	Adapter tube 70.6/62.5 mm
B010	Pressure spring (thin)
B010A	Pressure-torsion spring (thick)
B011	Threaded spindle with knob
B012	Framing shaft with knob
B013	Lamp holder, complete
B013A	Lid of lamp holder, complete
B013B	Exciter lamp: type 3874C = 6 V, 1.48 A when using the M2 amplifier; type 7251C = 5 V, 4 A when using any other amplifier
B014	Threaded spindle
B014A	Knob
B015	Knob
B016	Slit lens
B017	Lever with spindle
B018	Torsion spring (clockwise)
B019	Sound shaft
B019A	Ball bearing for B019
B020	Pressure roller
B020A	Ball bearing
B020B	Locking ring
B020C	Dust ring (front)
B020D	Dust ring (rear)
B020E	Ornamental cap with screw
B021	Glass rod
B022	Photocell, type 3546 PW
B023	Sprocket, complete
B024	Guide shoe, complete
B025	Tightening cap
B025A	Torsion spring
B026	Knob
B027	Guide roller
B027A	Ornamental cap with screw
B028	Spring
B029	Lever



F i g. B O - Continued

Order number	Description
B030	Guide roller
B030A	Ornamental cap with screw
B031	Intermittent sprocket
B031A	Shaft of intermittent sprocket
B032	Spigot
B033	Box with coils
B034	Lateral guide roller
B034A	Bush
B034B	Spring
B035	Screw
B036	Mask for normal film (1:1.37)
B036A	Mask for Wide Screen (1:1.85)
B036B	Mask for CinemaScope (1:2.34)
B036C	Blind mask
B037	Gate shutter
B038	Framing lamp, No. C1 408 02
B039	Set of Novotext runner strips
B039A	Set of velvet-covered runner strips

F i g. B P

Order number	Description
BP01	Light dowser
BP02	Shutter
BP03	Shutter shaft
BP04	Ball-bearing
BP04A	Locking ring for BP04
BP05	Pulley
BP05A	Rubber plug
BP05B	Pin
BP06	Asynchronous motor, 110 and 220 V, 50 c/s
BP06A	Synchronous motor, 220/380 V, 50 c/s
BP07	V-belt
BP08	Oil-drain screw
BP09	Chain wheel
BP09A	Ball-bearing for shaft BP09B
BP09B	Sprocket shaft
BP10	Chain for driving a 2000-ft (600-m) spool
BP10A	Chain for driving a 6000-ft (1800-m) spool
BP11	Photocell cable
BP12	Insulating cap
BP13	Micro-switch
BP14	Pressure switch
BP15	Flywheel
BP16	Chain wheel
BP16A	Set screw
BP17	Gear wheel with chain wheels and ball-bearings
BP17A	Gear wheel
BP17B	Ball-bearing
BP18	Chain
BP19	Chain wheel
BP19A	Ball-bearing for BP19B
BP19B	Sprocket shaft



F i g. B P - Continued

Order number	Description
BP20	Gun-cotton for safety switch
BP21	Micro-switch
BP22	Insulating cap
BP23	Maltese-cross unit
BP24	Cap for oil-level gauge
BP24A	Oil-level gauge
BP25	Exhaust pipe

F i g. B Q

Order number	Description
BQ01	Condenser
BQ02	Condenser
BQ03	Condenser
BQ04	Relay, complete with wiring
BQ05	Terminal strip
BQ06	Fuse, 2 A
BQ06A	Fuse holder
BQ07	Switch
BQ07A	Lever for BQ07
BQ08	Terminal strip for arc-lamp rectifier
BQ09	Pressure spring
BQ10	Milled nut
BQ11	Spool shaft
BQ11A	Locking ring
BQ11B	Ball bearing
BQ12	Felt disc
BQ13	Chain wheel

F i g. B R

Order number	Description
BR01	Gauze
BR02	Time scale
BR03	Scale
BR04	Lock for spool box
BR04A	Spring for BR04
BR05	Ammeter
BR06	Knob
BR07	Switch
BR08	Arc-lamp cable
BR09	Glass disc
BR10	Angle plate

FP 20

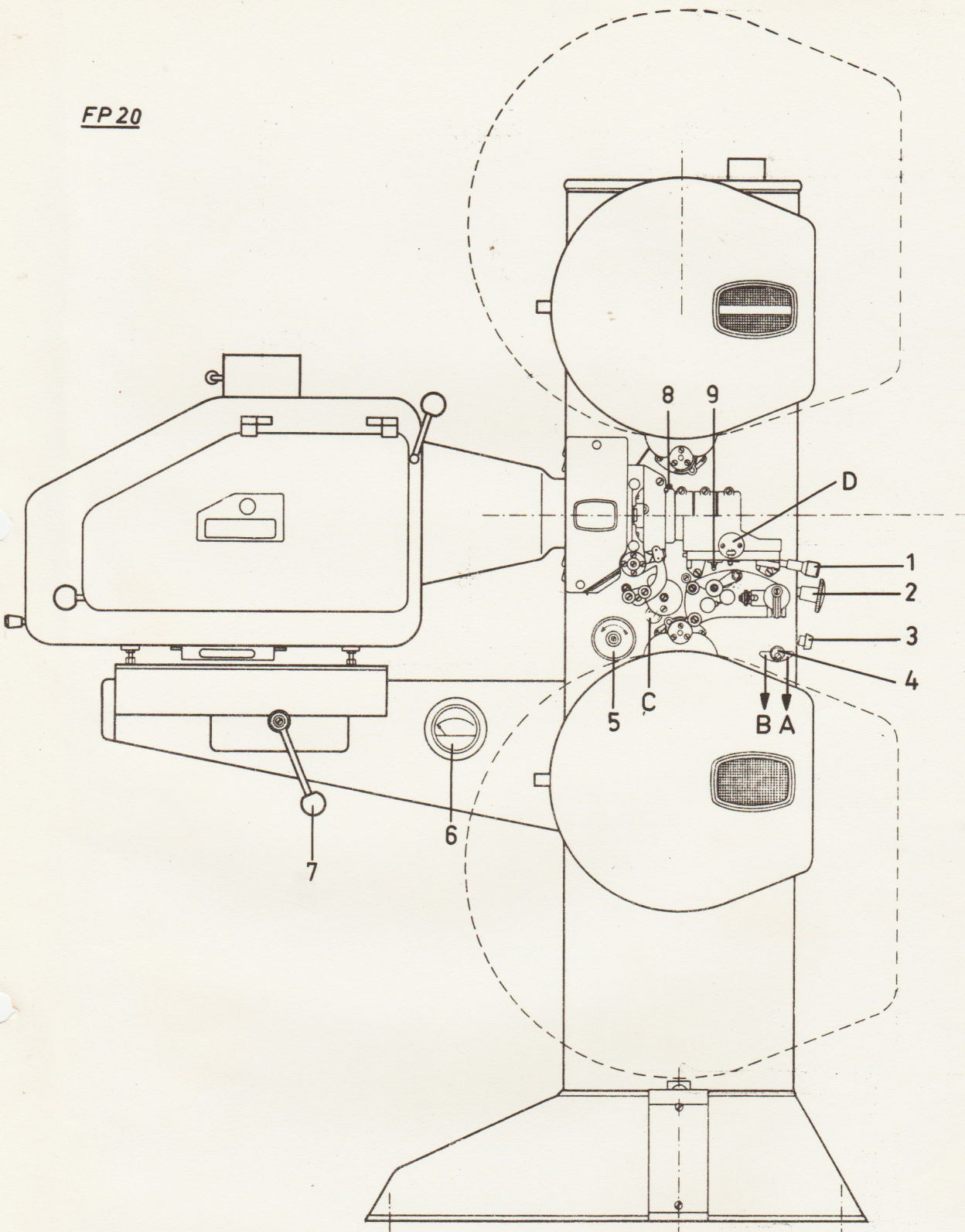


FIG.1

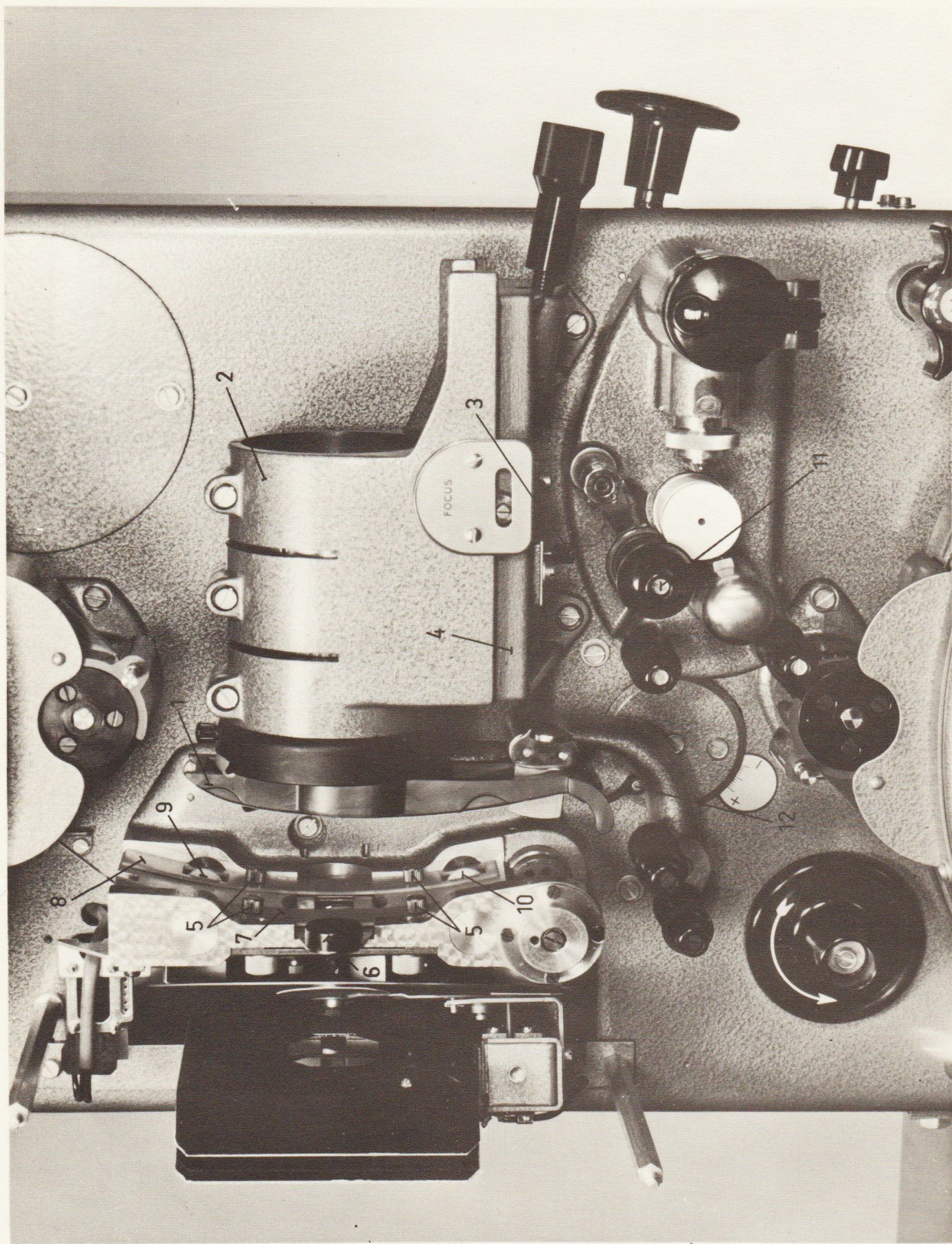


FIG.2

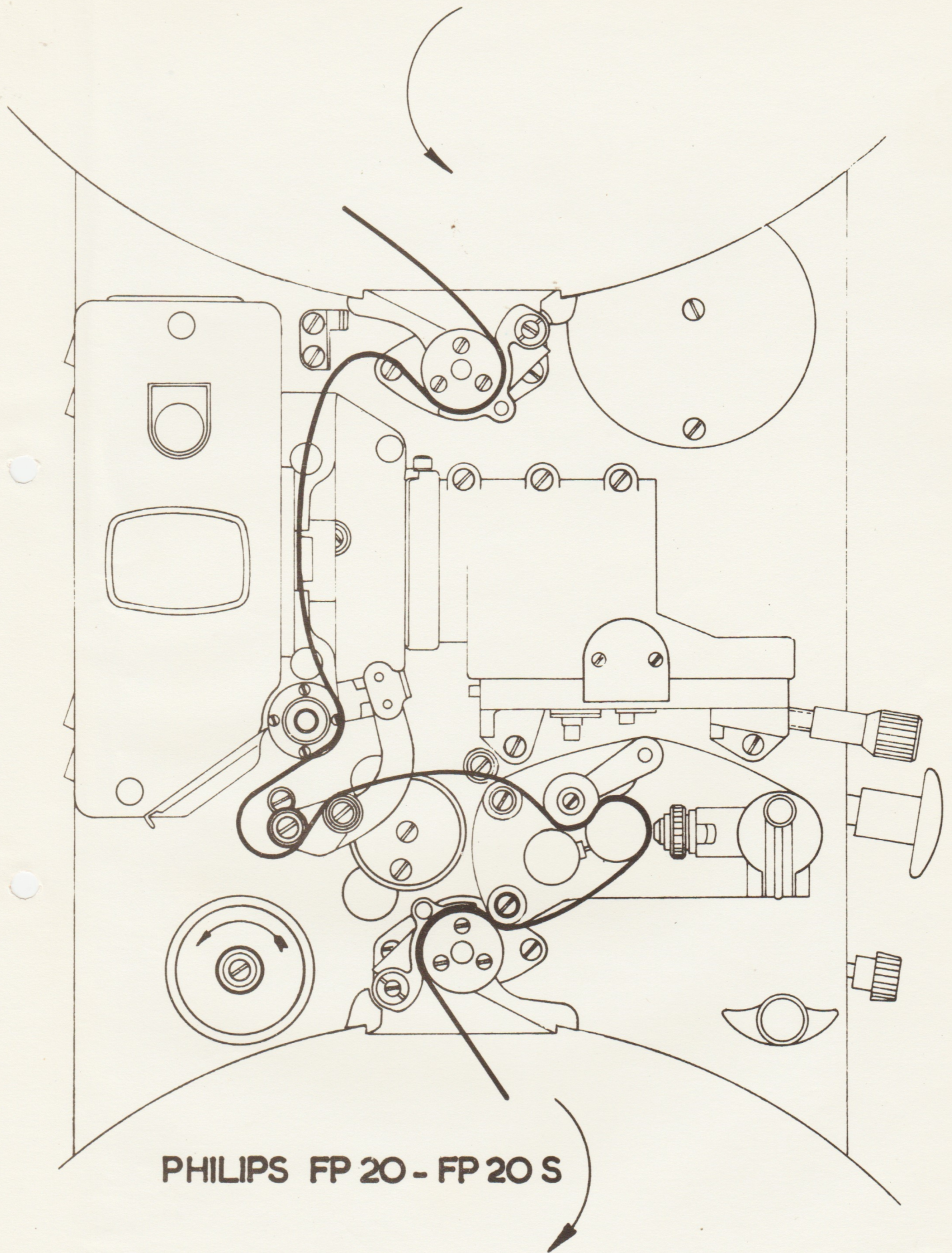
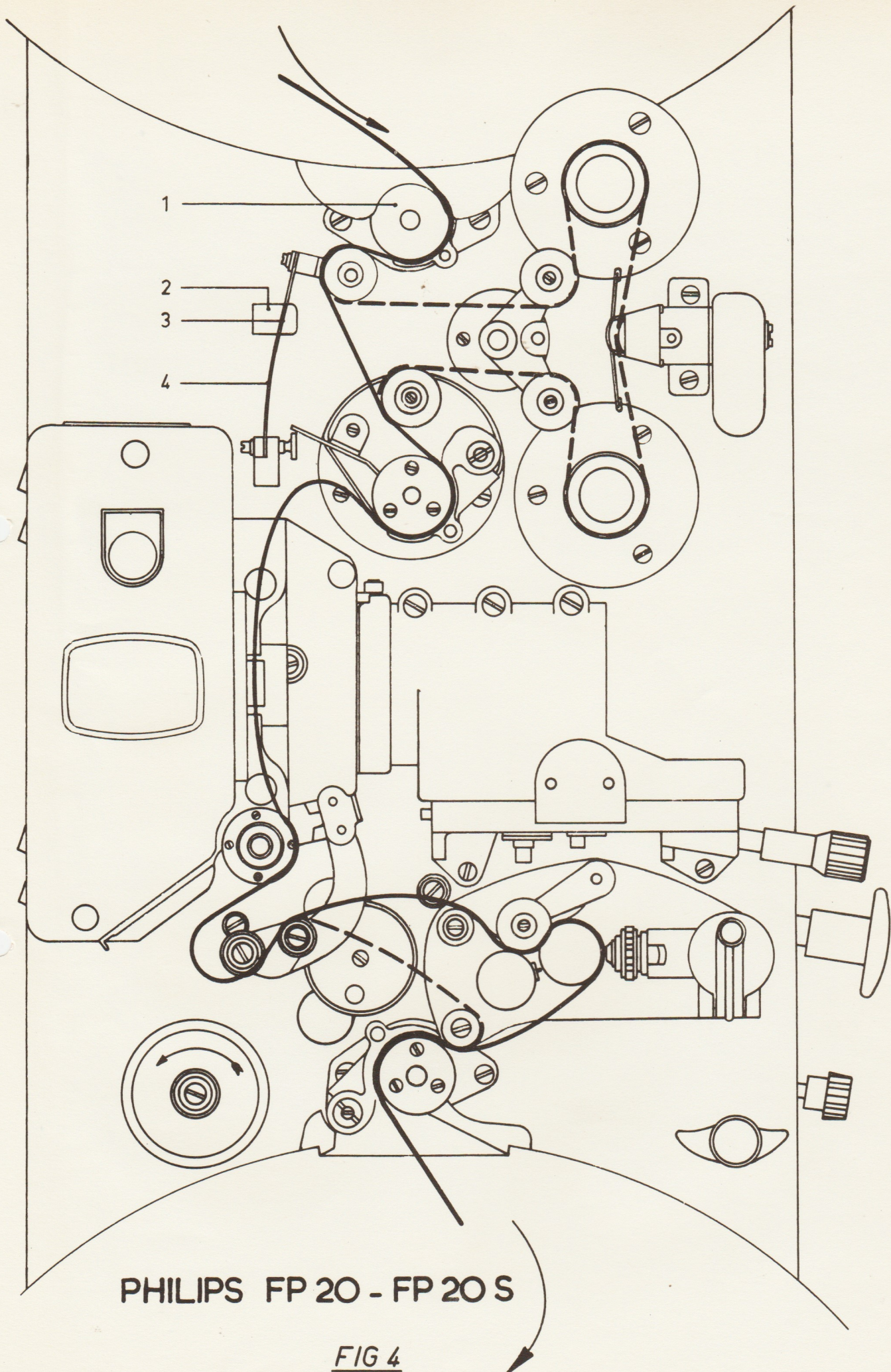


FIG 3



- 1
- 2
- 3
- 4

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FIG 4

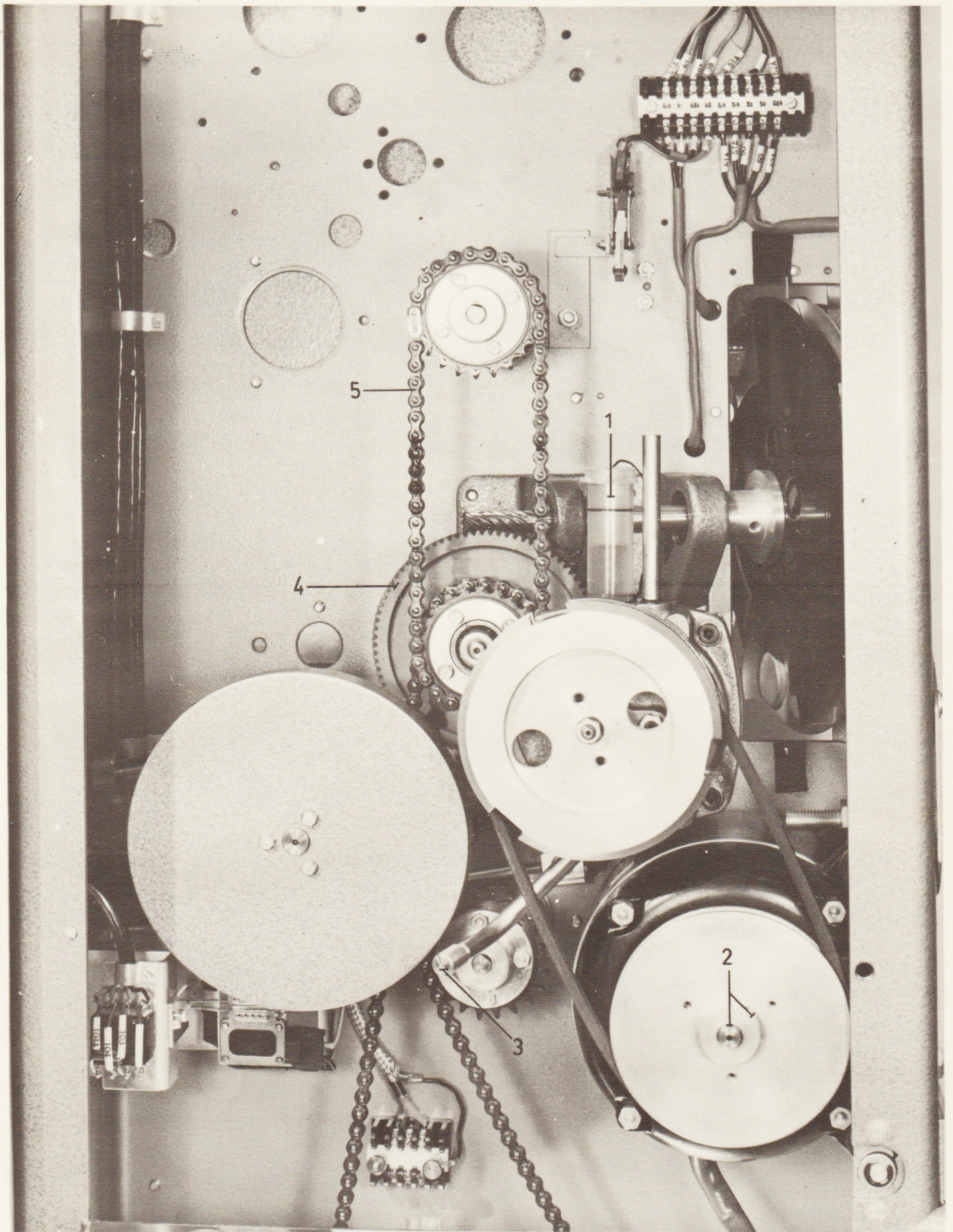


FIG.5

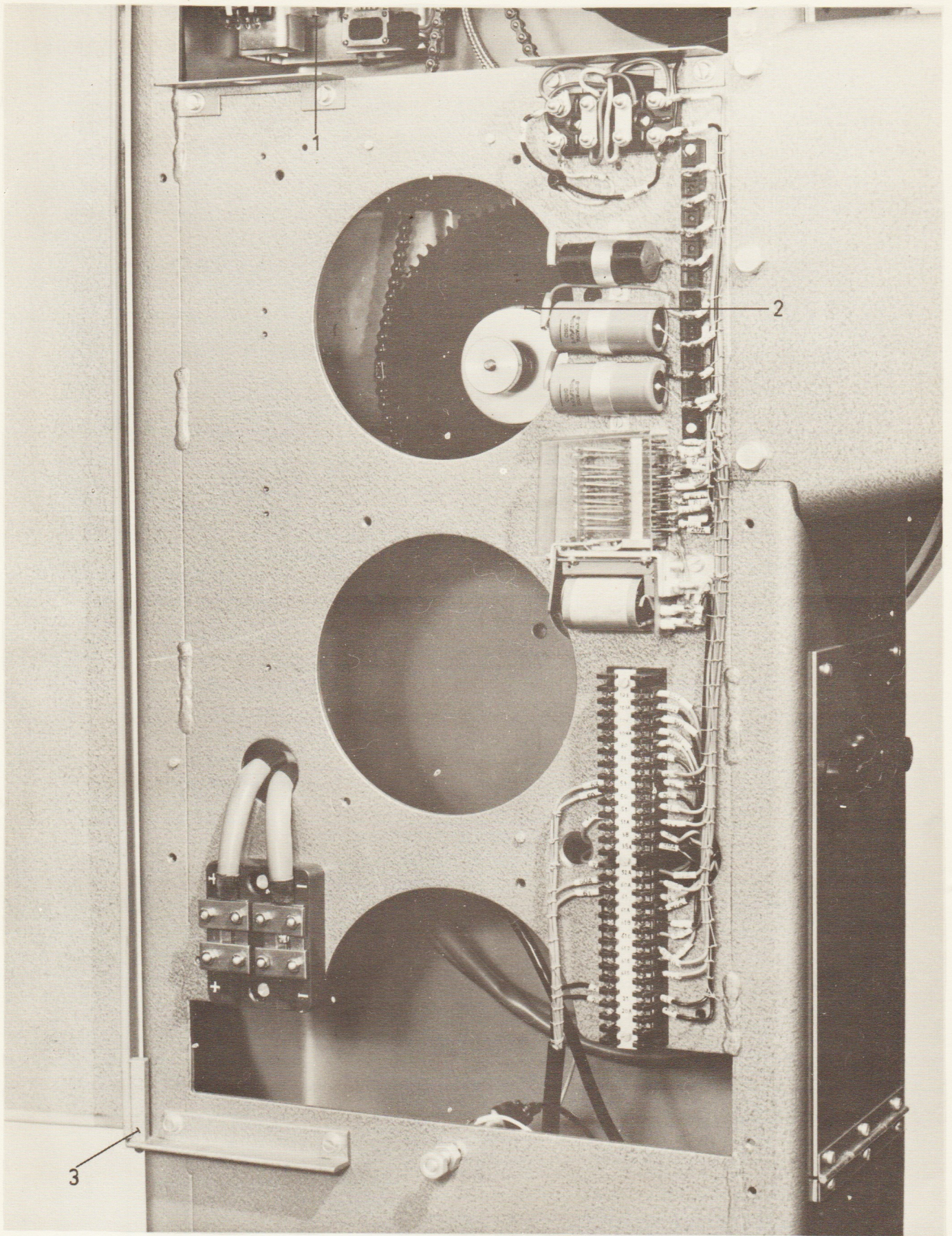


FIG. 6

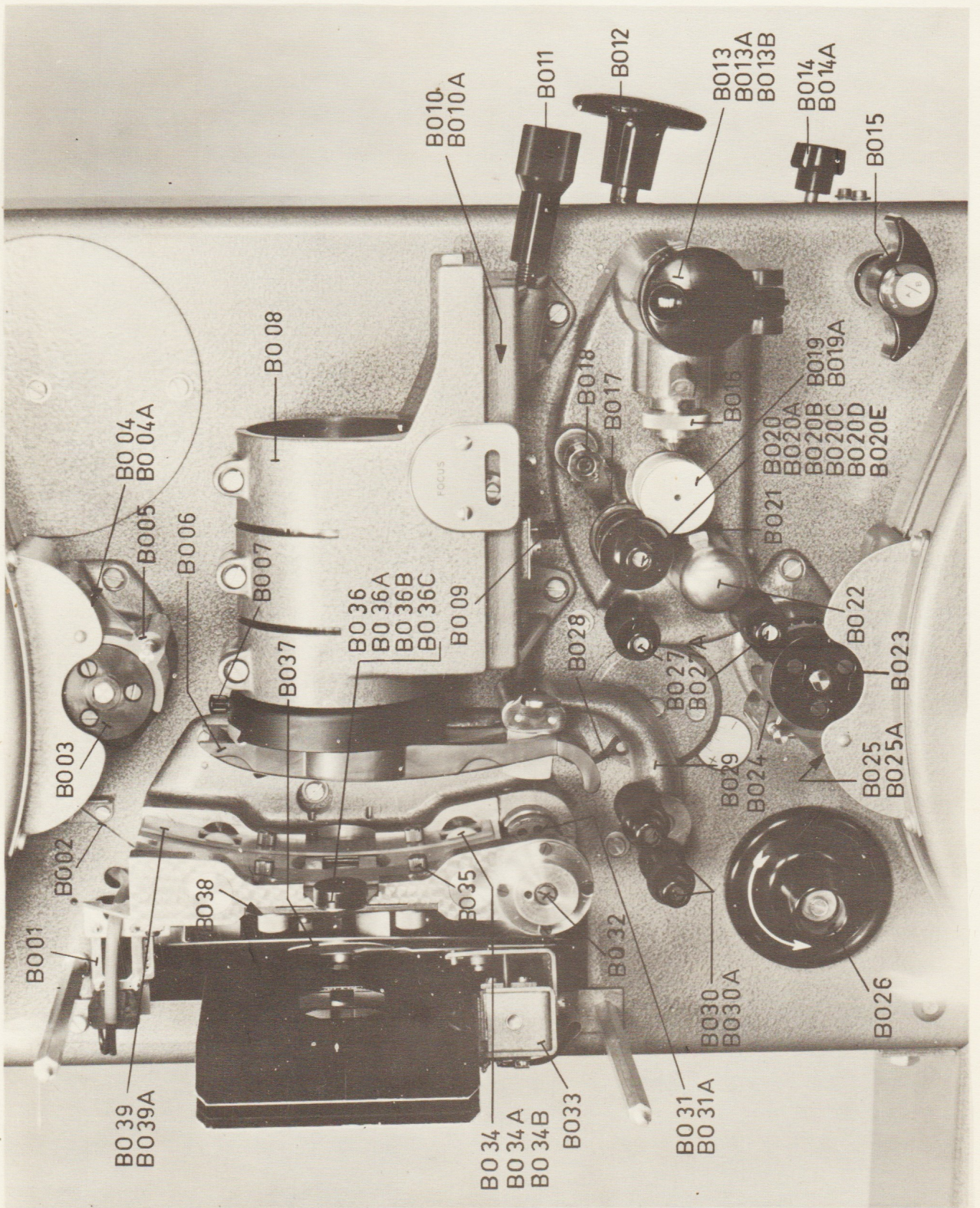


FIG. B0

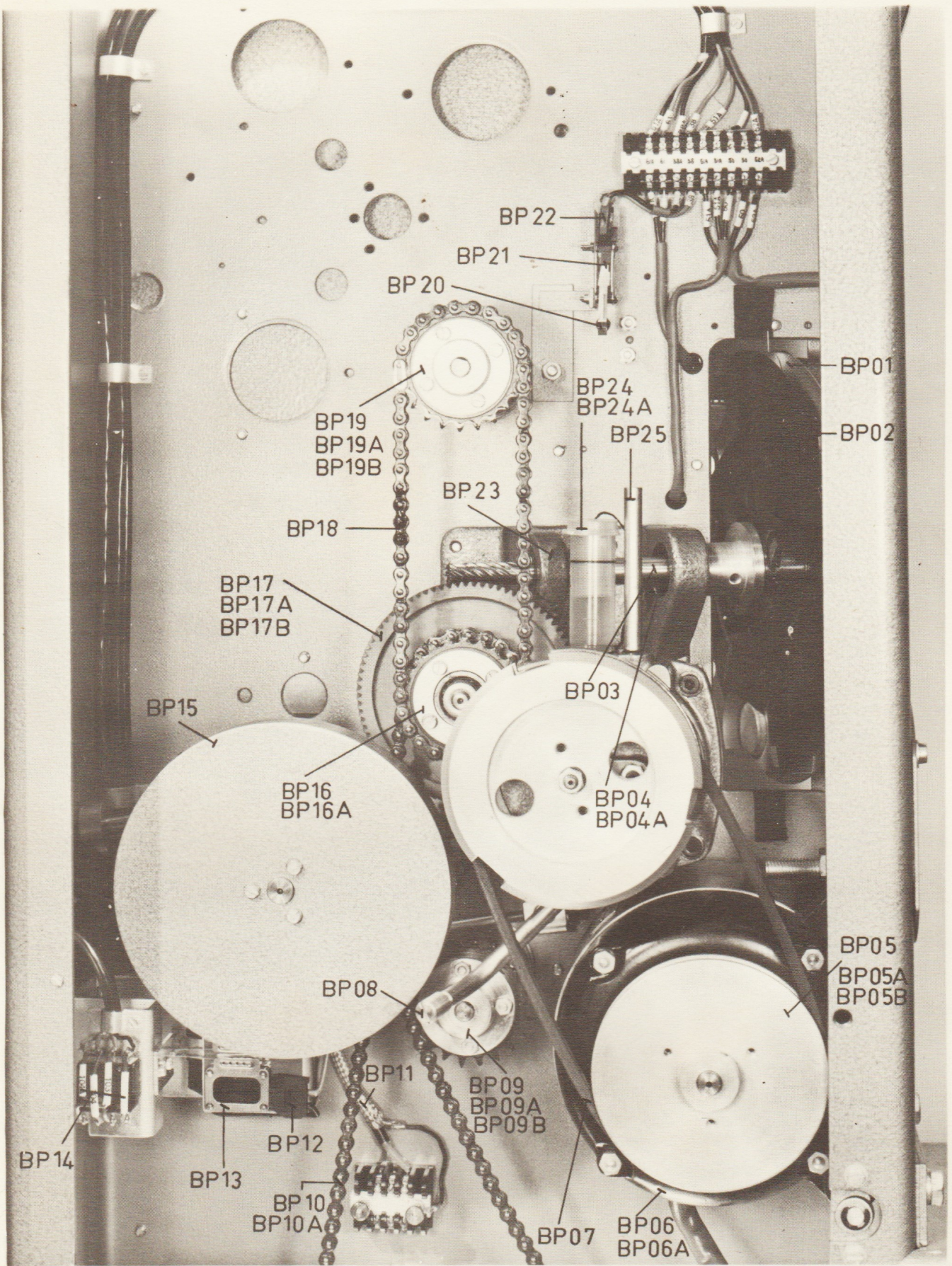


FIG. BP

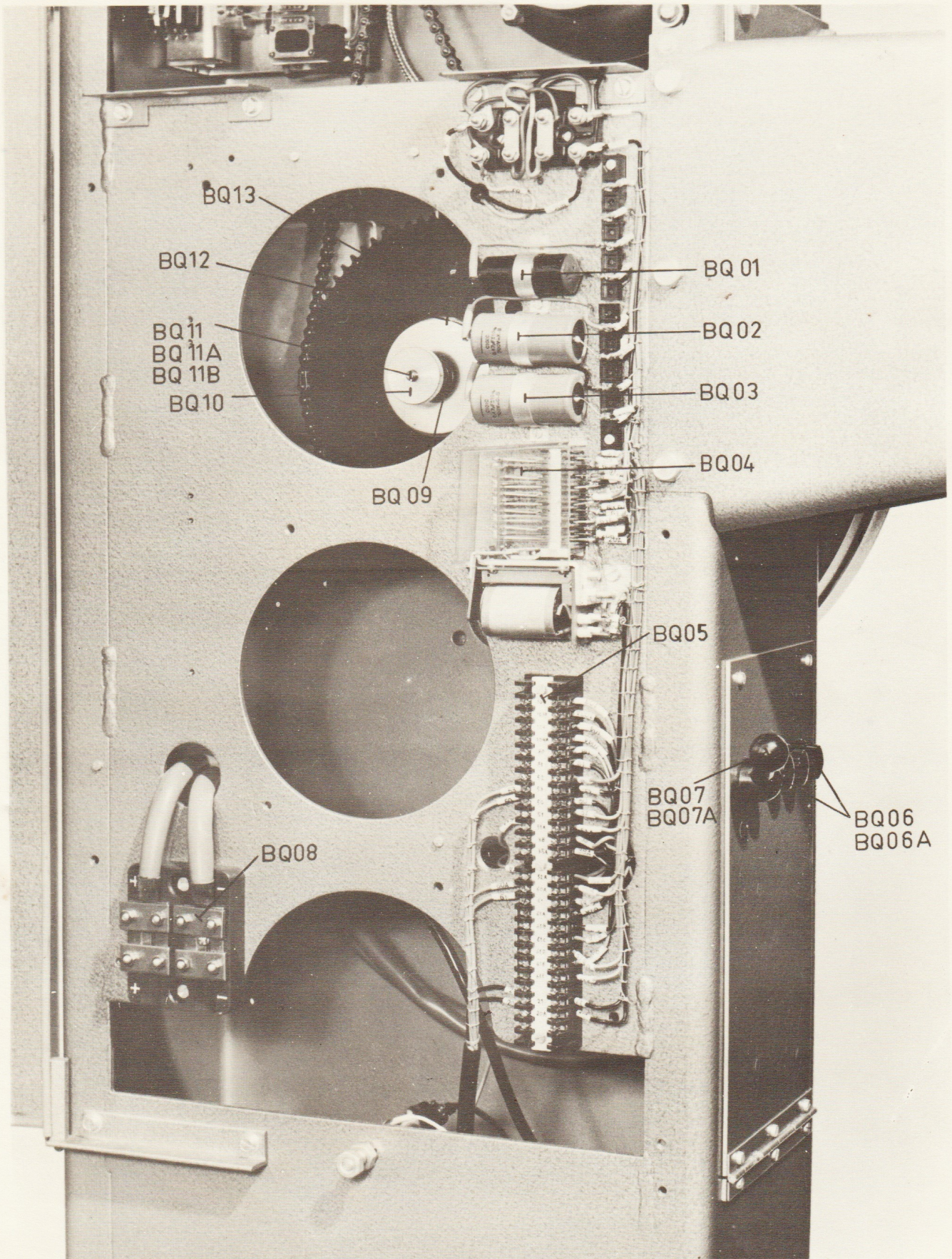


FIG. BQ

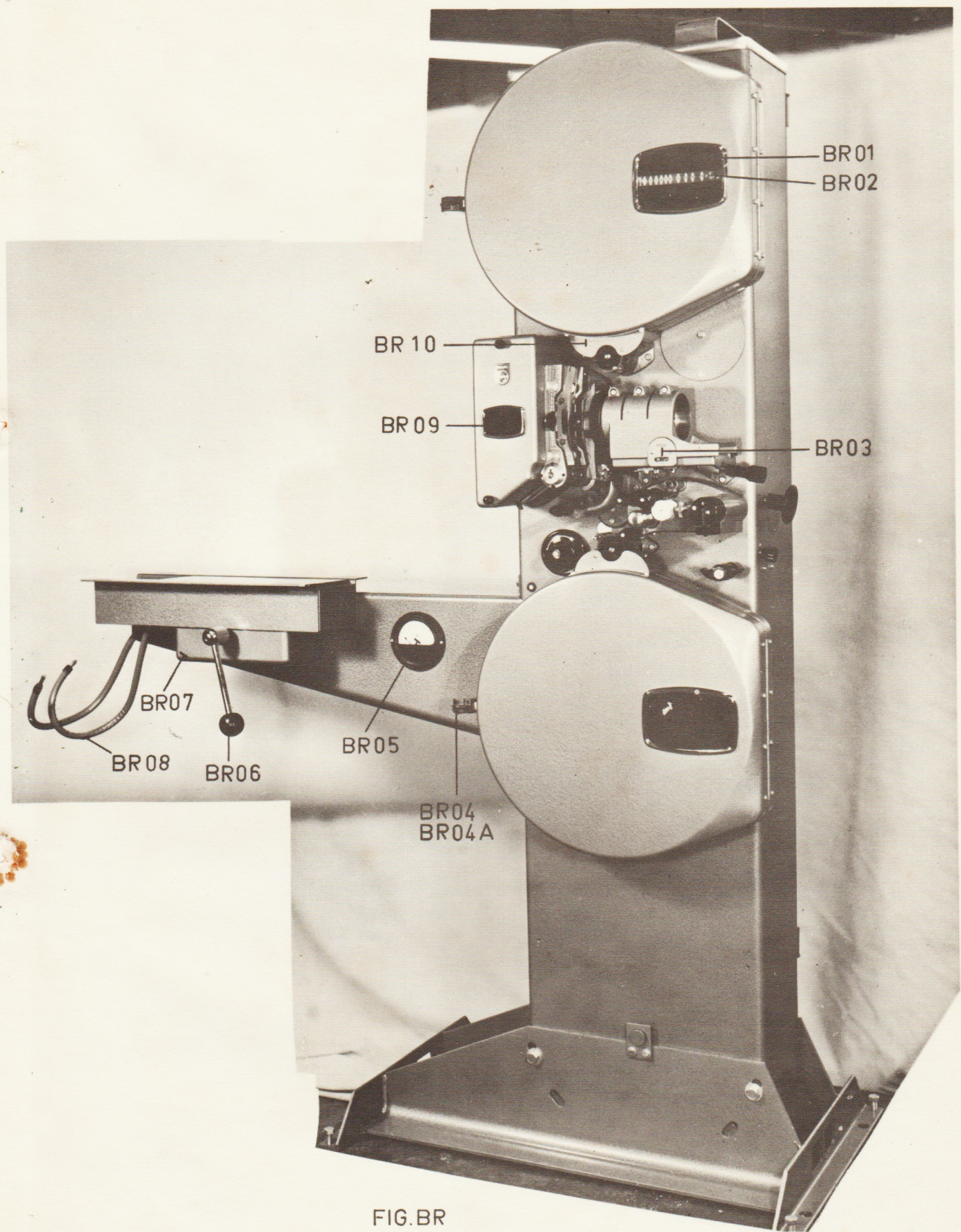


FIG. BR

