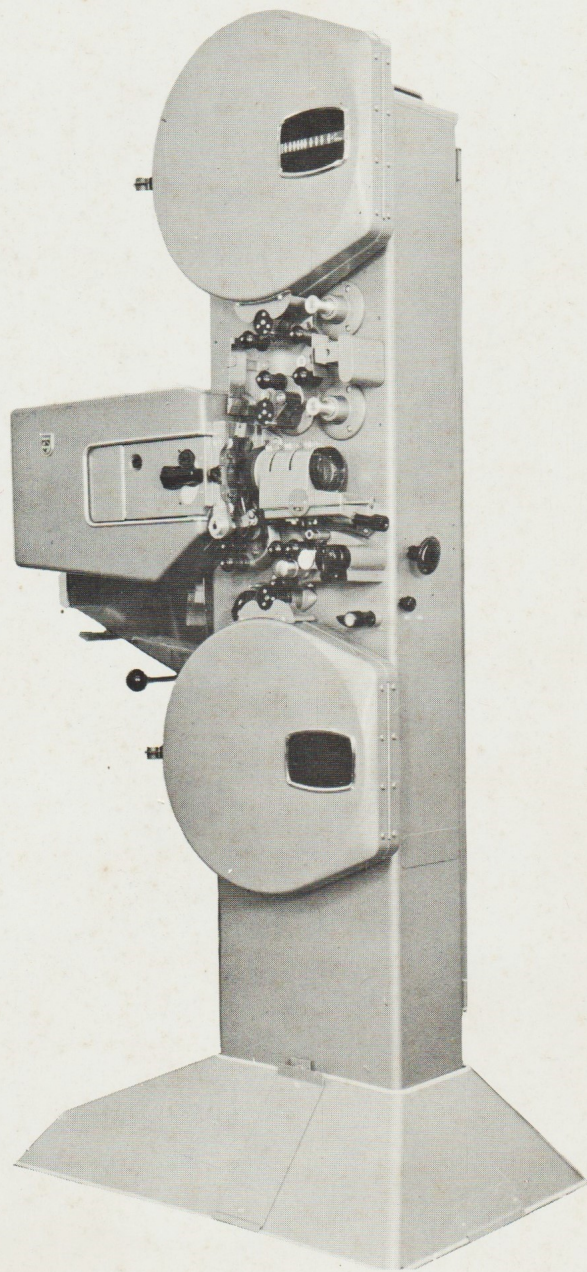


# Operation and maintenance of FP 25 S projector











## GENERAL DESCRIPTION

### CONTROLS AND SWITCHES (fig. 1)

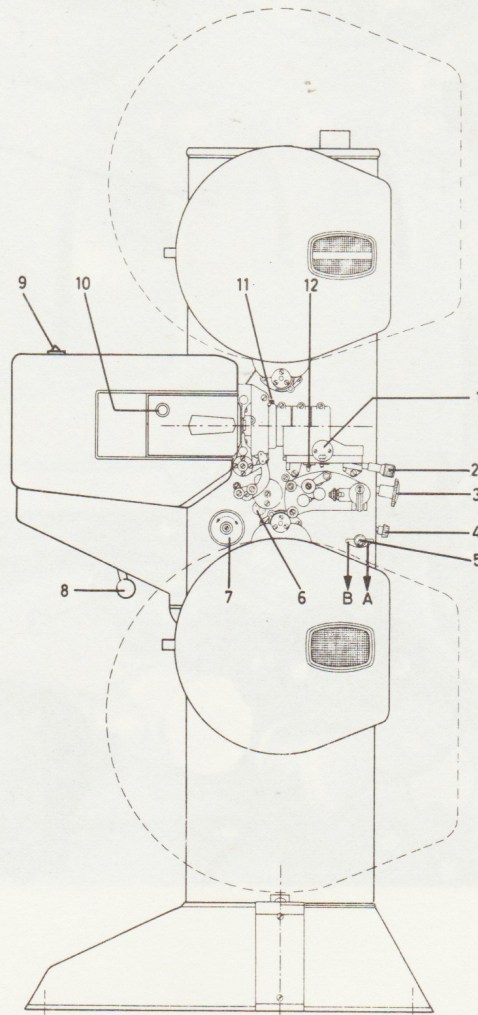


Fig. 1

- 1 = Scale for focusing the projection lens.
- 2 = Knob for focusing the projection lens.
- 3 = Framing knob.
- 4 = Knob for adjusting the skate pressure.
- 5 = Start/Stop/Change-over switch:
  - depressed ..... = change-over
  - pushed in direction of arrow "A" = start
  - pushed in direction of arrow "B" = stop.
- 6 = Scale for the adjustment of the skate pressure.
- 7 = Inching knob.
- 8 = 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).
- 9 = Lamp switch.
- 10 = Knob for change-over to stand-by lamp.
- 11 = Knob for operating the stray-light screen.
- 12 = Locking pin for lens holder.



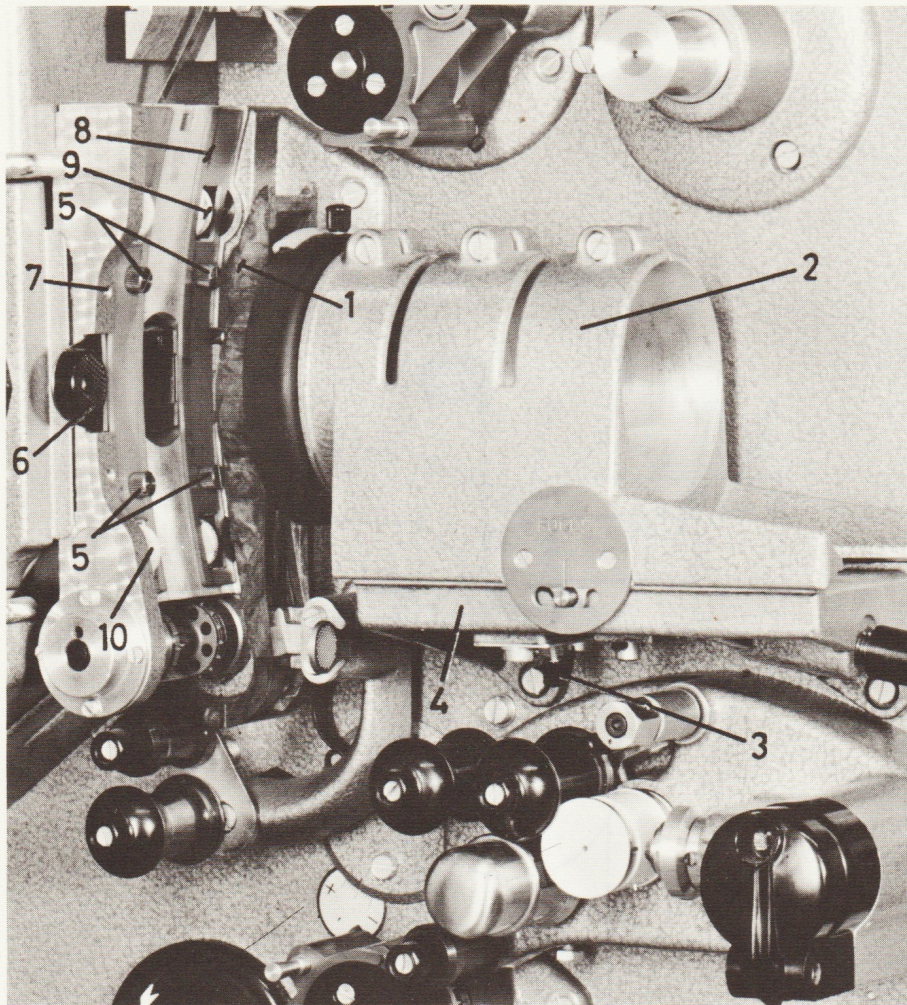


Fig. 2





### 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 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 it can easily be replaced by another unit for change-over to another aspect ratio.

During the installation of the projector the projection lenses have been adjusted in their holders in such a way that after replacement of the unit "lens holder + lens" 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 a blind aperture plate and plates for normal film (aspect ratio 1:1.37), marked N  
CinemaScope (aspect ratio 1:2.34), marked C.0.  
Wide Screen (aspect ratio 1:1.85), marked 1:1.85

The aperture plates are inserted through a slit located close behind the runner plate; the marks N - C.0. - 1:1.85 must face the film. The plates can easily be replaced, even during projection. To facilitate removal and insertion, each plate is provided with a small knob 6.

### RUNNING FACES OF THE RUNNER PLATE (fig. 2)

The curved runner plate which, after the excellent experiences with the Philips Universal 70/35 mm projector, is also used in the FP 25 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 runner 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.:

a pair of Novotext strips (thickness  $1/16" = 1.5$  mm); these strips have a very long life since, when the running faces are worn at one side, they can be interchanged; moreover, each strip can be turned over and used again;





- . a pair of steel strips with one face covered with velvet; like 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 spacers supplied with the projectors have to be placed under the running faces.

#### LATERAL PRESSURE ROLLERS (fig. 2)

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

The rollers can easily be removed for cleaning them as well as the space in which they turn. They need only be pulled by hand in the direction of the projection-room window. They are mounted again by simply pushing them back into the original position.

#### CENTRIFUGAL SWITCH

The projector is provided with a centrifugal switch which has a double purpose:

- . it prevents the projector from being started when its dowser is not closed, thus avoiding that the light of the SPP lamps falls on to the film before the projector has attained its rated speed;
- . it stops the projector in the event of film rupture or if the film is not attached correctly to the take-up spool.

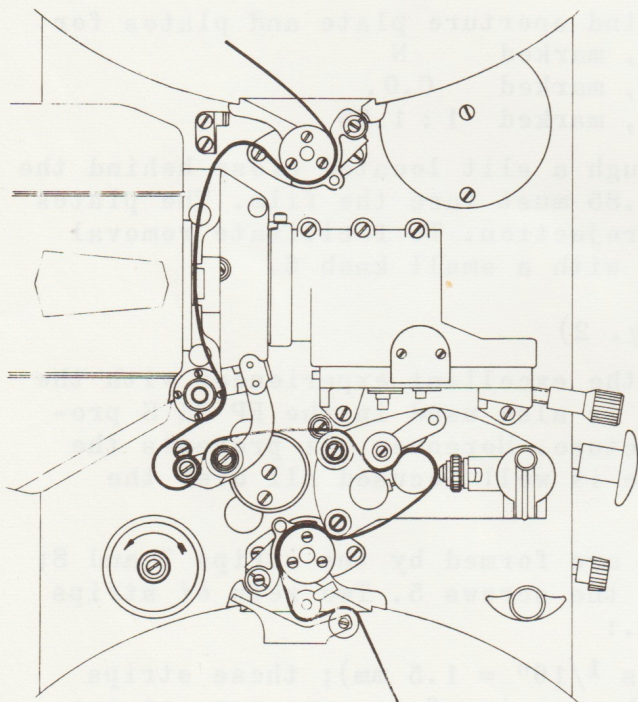


Fig. 3

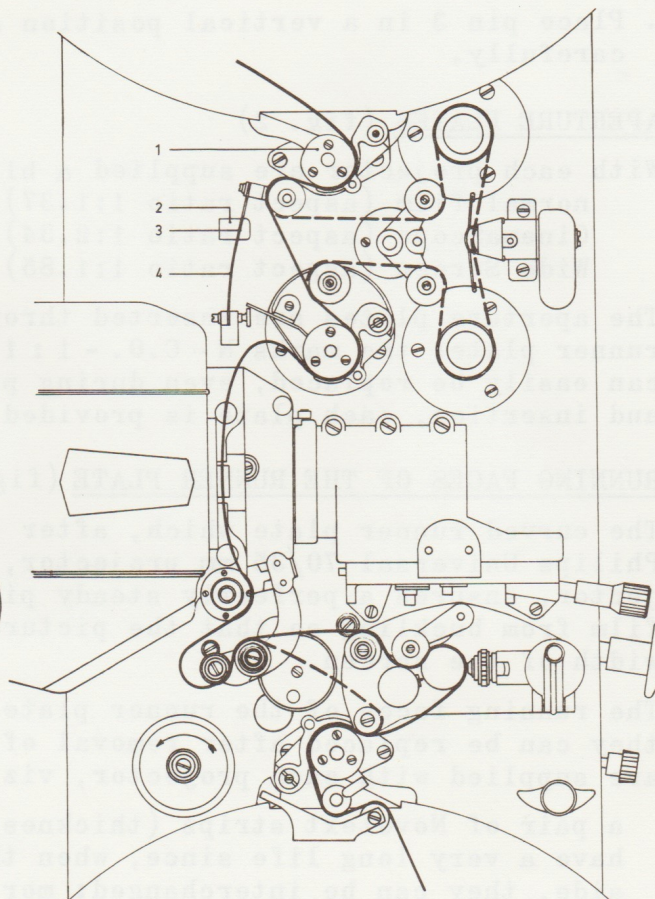


Fig. 4





## OPERATION

### THREADING OF THE FILM

- . Turn framing knob 3 (fig. 1) so that its white dot is at the top; the framing device is then in its centre position.
- . Check whether the projector is equipped with the lens holder containing the correct projection lens (for exchanging the lens holder see page 3).
- . 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:

- . in projectors without magnetic soundhead: as indicated in fig. 3;
- . in projectors with optical and magnetic sound heads:
  - films with magnetic tracks: as indicated by dotted line in fig. 4;
  - films with optical track: as indicated by plain line in fig. 4.

Note: In case of films with magnetic sound tracks pull the film so over sprocket 1 that spring 4 coincides with the marking line 3 on bracket 2.





- . 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 downward direction is impossible.
- . Close the doors of the upper and the lower spool boxes.
- . Check by turning knob 7 (fig. 1) whether the film has been threaded correctly.
- . Turn knob 7 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 tap in the water-supply tube (the control tap in the base has already been adjusted when the projector was installed).
- . Put lamp switch 9 in its "on" position (the SPP lamp does not yet ignite).
- . Check whether the dowser is closed; if not, close it by depressing knob 5 (the knob springs back automatically).
- . Start the projector by pushing knob 5 in the direction of arrow A; the SPP lamp then ignites.  
Note: The projector does not start when its dowser is open.
- . Wait a few seconds (until the projector has attained its rated speed), then open the dowser by depressing knob 5.
- . If necessary, turn knob 3 so that a full frame is in the gate.
- . Adjust the skate pressure in the following way:
  - . first turn knob 4 in an anti-clockwise direction (decrease of the pressure) until the picture becomes unsteady;
  - . then turn knob 4 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 2.

#### SPP LAMP (fig. 5)

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

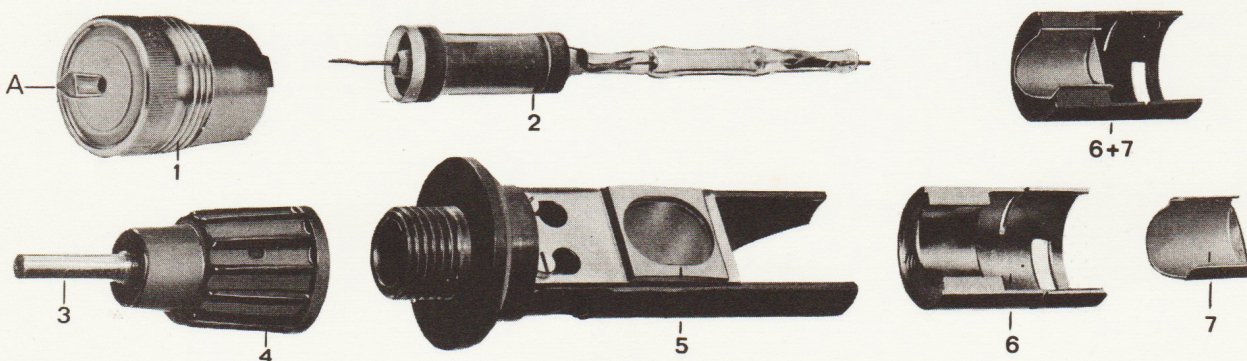


Fig. 5





### Removal:

- . Unscrew retainer 1 and remove the lamp holder with lamp.
- . Remove contact piece 4, take out the lamp and remove packing bush 2.  
Note: If a lamp is broken near the packing bush, the part remaining in the bush can be removed as follows:
  - . push contact pin 3 over the projecting connecting wire and then push the lamp out of the packing bush.
- . Take mirror holder 6 with mirror 7 out of the lamp holder.
- . Hold the nail of the thumb in the slit of the mirror holder and pull the latter out of the lamp holder.
- . Remove the mirror.  
Note: More than half of the light radiated by the lamp is thrown on to the film via mirror 7. Consequently, it is very important to replace the mirror in time, as a rule each time when replacing the lamp.

### Mounting:

- . Strew some talcum-powder in the bore of packing bush 2; this facilitates the mounting and the removal of the lamp.
- . Push a new mirror in the mirror holder. For this purpose:
  - . take the mirror holder in the hand at the slotted end;
  - . hold the mirror at either of the oblique ends between thumb and forefinger of the other hand, bend it very slightly and push it carefully over the ridge of the mirror holder until both oblique ends protrude.
- . Hold the mirror holder so that the mirror faces window 5 and insert it into the lamp holder as far as the stop.
- . Push packing bush 2 over the stamped end of the lamp as indicated in fig. 5 until the glass rod protrudes about  $\frac{3}{16}$ " (5 mm).
- . Insert the lamp with packing bush into the bore of the lamp holder and turn the packing bush with lamp until the latter is as close as possible to the mirror, but does not touch it.
- . Screw contact piece 4 tightly by hand on the lamp holder (do not bend the protruding contact wire). The optical centre of the lamp is then automatically in the centre of window 5.
- . Insert the lamp holder with lamp and contact piece into one of the bores of the turret (if necessary, clean the bore first with the rod-shaped cleaner supplied with the projector), screw on retainer 1 and turn the protecting cup of the contact pin so that it points towards the black dot on the projector housing; the contact pin then makes a good contact with the contact spring.

### Note:

Window 5 is absolutely indispensable; it serves as an ultraviolet filter and protects the optical system. If it is damaged, it has to be replaced immediately; for this purpose:

- . take the lamp holder in the hand with the contact pin upwards and lift slightly the upper spring plate with a finger nail; the glass then falls out and a new glass can be inserted.





## WATER COOLING

The water supply has to be  $4-6 \text{ dm}^3$  ( $= 1 - 1\frac{1}{2}$  Imp.gallons  $= 1\frac{1}{2} - 2$  US gallons) per minute. The temperature of the cooling water supplied should not exceed  $95^\circ \text{ F}$  ( $35^\circ \text{ C}$ ).

### Water filter (fig. 8)

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

- . Close the main supply tap.
- . Loosen the two screws of the cover of the rear compartment and remove the cover.
- . Put a moist cloth under water lock 1.
- . Remove the four nuts 2; 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 when it is damaged.

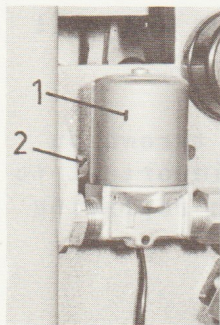


Fig. 6

Mounting: In the reverse order.

## Water sprinkler

The water sprinkler is mounted at the end of the bore in the turret; it has the following functions:

- . to form the negative contact of the SPP 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 stand-by lamp; if now the water supply is correct, this indicates that the sprinkler of the first lamp 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 above).

## GATE LENS (fig. 7)

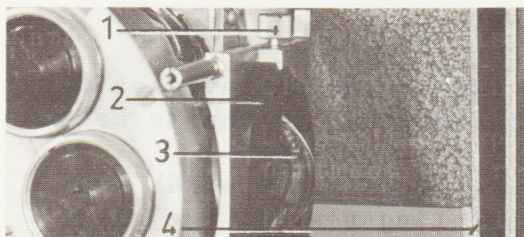


Fig. 7

### Removal:

- . Push the lamp compartment so far away from the runner plate with the aid of lever 8 (fig. 1) that support 4 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 is 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

### SPP LAMP (fig. 5)

- Every morning take the lamp holders out of the turret and inspect the lamps through window 5. 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 volume per cents of alcohol (96 %)
- 25 volume per cents of 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  $1/2$ " to 1" (1 - 2 cm) from the flange in the cleaning agent. Do not immerse contact piece 1 nor the flange and the packing in the lamp holder.

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.

### WINDOW 5 OF LAMP HOLDER

- Check daily whether the window is dirty. If so, take it out of the holder (see page 7) and clean it with metal polish.





## LUBRICATION

### INTERMITTENT MECHANISM (fig. 8)

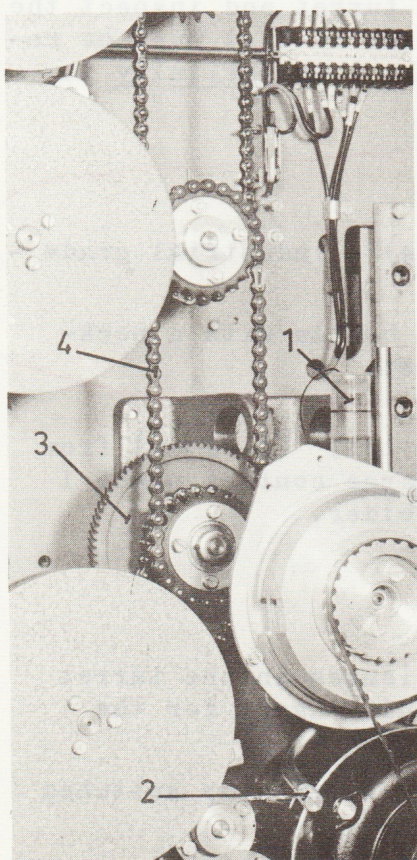


Fig.

The Maltese cross is located in a fully enclosed oil bath. The oil level can be checked by means of oil-level gauge 1; the green circle on this glass indicates the highest and the red circle the lowest permissible 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 2, remove this plug and let the oil run out completely.
- . Fit plug 2 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<br>(see page 12) | Quantity         |
|---|------|--------------------------------|------------------|
| Front bearing of intermittent shaft       | -    | Esso Handy oil                 | some drops       |
| Gear-wheel transmission 3 ...             | 8    | type 8657                      | some drops       |
| Chain 4 and chain wheels ....             | 8    | Esso Handy oil                 | some drops       |
| Spindle of Start/Stop/Change-over switch  | -    | Esso Handy oil                 | some drops       |
| Locking pieces of both spool boxes        | -    | type EL 4852                   | grease sparingly |
| Stops for film spools in both spool boxes | -    | type EL 4852                   | grease sparingly |



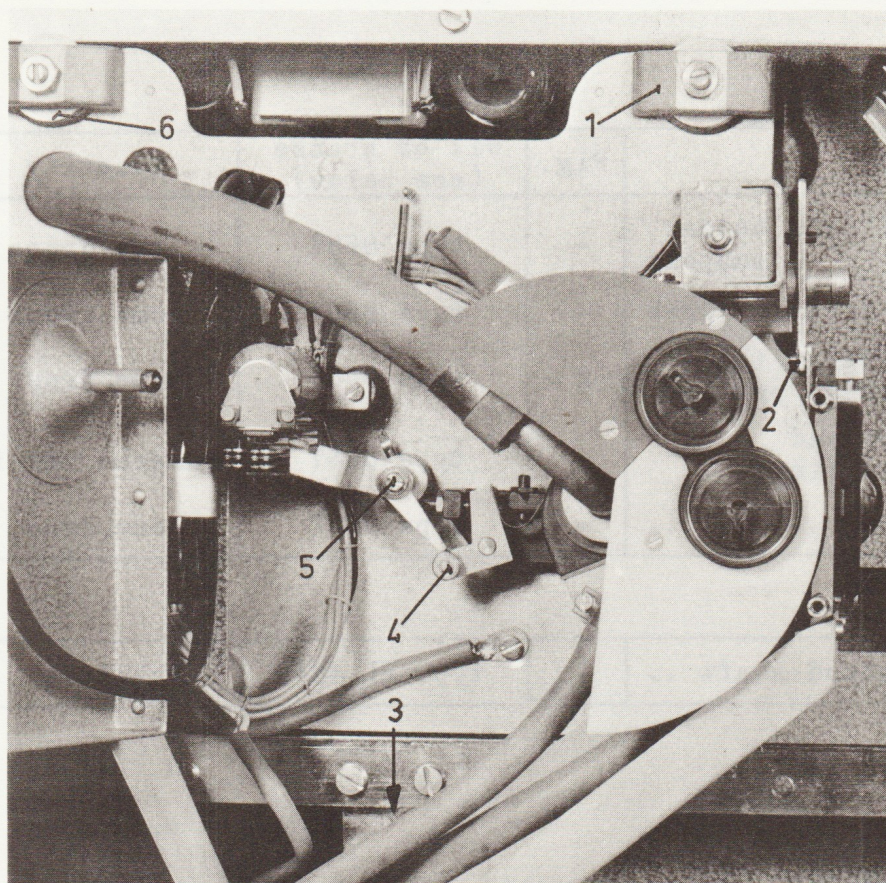


Fig. 9

Once a month:

| Part  | Fig. | Oil or grease<br>(see page 12) | Quantity                        |
|---|------|--------------------------------|---------------------------------|
| Sliding faces at the bottom of<br>the lens holder         | -    | type 8657                      | lubricate                       |
| Sliding faces at the top of<br>lens holder support        | -    | type 8657                      | lubricate                       |
| Pivot and pin 1 of dowser ....                            | 9    | Esso Handy oil                 | one drop                        |
| Hinge joint 2 .....                                       | 9    | Esso Handy oil                 | one drop                        |
| Spindles of the guide rollers<br>(remove the rollers)     | -    | Esso Handy oil                 | one drop; spread<br>with finger |
| Spindle of the turret .....                               | -    | Esso Handy oil                 | one drop                        |
| Pivot 3 of the lever for<br>shifting the lamp compartment | 9    | Esso Handy oil                 | one drop                        |
| Spindle of roller 4 .....                                 | 9    | Esso Handy oil                 | one drop                        |
| Pivot 5 .....   | 9    | Esso Handy oil                 | one drop                        |
| Pivots and running faces of<br>rollers 6                  | 9    | Esso Handy oil                 | one drop                        |
| Pivot of pressure roller 11 ...                           | 2    | type 8557                      | lubricate<br>sparingly          |
| Ball-bearing of roller 11 .....                           | 2    | projector oil                  | some drops                      |





Once every three months:

| Part  | Fig. | Oil or grease<br>(see below) | Quantity       |
|---|------|------------------------------|----------------|
| Pin and spring of lens holder support           | -    | type 8657                    | some drops     |
| Screw spindle of focusing knob                  | -    | type 8657                    | some drops     |
| Pivot 12 for adjusting the skate pressure       | 2    | type 8657                    | one drop       |
| Felt disc of upper and lower friction couplings | -    | type 8657                    | immerse in oil |
| Hinges of rear door .....                       | -    | type 8657                    | one drop       |

After overhaul:

|                                |   |              |           |
|--------------------------------|---|--------------|-----------|
| Ball-bearing of sound shaft .. | - | type EL 4850 | lubricate |
|--------------------------------|---|--------------|-----------|

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

LUBRICANTS TO BE USED 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





# FAULT-FINDING CHART<sup>†</sup>

| DEFECT  | CAUSE   | REMEDY  |
|---|---|---|
| <p>Turret does not change over to stand-by position</p> <p>Measure the voltage between terminals 123 and 124; it must be approx. 130 V d.c.</p> | Relay for turret defective or turret pinched to its shaft | Replace relay; lubricate pivot of turret with Esso Handy oil                                    |
|   | (P) VL2 defective   | (P) Replace VL2   |
|   | (P) B4 defective  | (P) Replace B4  |
|   | (P) GR63 defective  | (P) Replace GR63  |
|   | (P) Filament voltage of B4 fails                          | (P) Measure the voltage: 6 V a.c.   |
|   | (P) RE2 does not change over; its contacts stick          | (P) Replace RE2   |
|   | (P) One or more resistors R77...R79 defective             | (P) Measure the values  |
|   | (P) C13 defective   | Measure the voltage across C13;<br>(P) indication on 100-V scale of meter AVO 8: 12 V d.c.      |
|   | Locking device (4 and 5 of fig. 9) out of position        | Re-adjust   |
| <p>One of the SPP lamps gives too little light</p>  | Forgotten to insert the mirror of the lamp holder         | Insert the mirror   |
|   | Dirt deposit on lamp                                      | Clean the lamp with the cleansing agent (page 9)  |
|   | Dirty lenses  | Clean with lens cloth   |
|   | Lamp itself defective                                     | Replace the lamp  |
| <p>Both SPP lamps give too little light</p>   | (P) Switch SK2 not turned up sufficiently                 | (P) Turn up SK2   |
|   | Mains voltage too low                                     | Measure the mains voltage and<br>(P) if necessary use another soldering point on T1             |
|   | Light dowser does not open wide enough                    | Lubricate the pivot and pin 1 of the dowser (page 11)   |
| <p>One of the SPP lamps flickers irregularly</p>  | Leakage in lamp holder                                    | Dry contact piece 4 (fig. 5) and fix it tightly; if necessary, replace packing bush 2           |
|   | Bad contact at input or output side of lamp               | Correct the contact   |
| <p>Both SPP lamps flicker irregularly</p> <p>B1 or B2 then does (P) not emit a blue light</p>   | Irregular water supply                                    | Trace and, if possible, eliminate the cause (perhaps too much water consumption somewhere else) |
|   | Too much air in the cooling water                         | - -   |
|   | Leakage on both lamp holders                              | Dry contact piece 4 (fig. 5) and fix it tightly; if necessary, replace packing bush 2           |
|   | (P) B1 or B2 defective                                    | (P) Replace B1 or B2  |

<sup>†</sup>) (P) = on pulsator





| DEFECT  | CAUSE  | REMEDY  |
|---|--|---|
| Both SPP lamps flicker irregularly<br>B1 or B2 then does (P) not emit a blue light<br>(Continued) | (P) L1 or L2 defective   | Measure the voltage before and after the coil with respect to terminal 137; it must be approx. 1000 V d.c.  |
|   | (P) Secondary winding of T1 interrupted  | Measure the voltage across R73 (P) or R74; it must be approx. 1000 V d.c.   |
|   | (P) One or more defective rectifying cells GR49...GR51 or GR52...GR54 defective or one or more resistors R63...R70 defective               | Measure the rest current (meter connected for example between R63 and R64); it must be approx. 65 mA d.c.   |
|   | (P) Winding S6 <sup>a+b</sup> or S6 <sup>c+d</sup> defective   | Measure the voltage across S6 <sup>a+b</sup> (P) or S6 <sup>c+d</sup> ; it must be approx. 100 V a.c.   |
|   | (P) GR69 defective   | (P) Measure the voltage across C18; it must be approx. 70 V d.c.  |
|   | (P) R75 or R76 defective (brown discolouring)  | Measure the value (see list on (P) page 11 of pulsator documentation)   |
|   | (P) B1 or B2 has no filament voltage   | (P) Measure the filament voltage; it must be 2.5 V a.c.   |
| One of the SPP lamps does not ignite  | Insufficient water supply because of choked sprinkler  | Clean the sprinkler and replace the gauze filter (page 8)   |
|   | Pin 3 (fig. 5) makes no contact with the positive contact spring because of wrong position of the cup on retainer 1 (fig. 5)               | Turn the cup so that it points to the black dot on the projector  |
|   | Negative contact piston sticks   | Remove the sprinkler and check the bore   |
|   | Lamp itself defective  | Replace the lamp  |
| Neither of the SPP lamps ignites<br><br>(Continued on page 15)                                    | Both lamps defective   | Replace the lamps   |
|   | Lamps not switched on  | Switch on with switch 9 (fig. 1)  |
|   | Insufficient water flow:<br>• Main tap in supply tube not far enough opened<br>or<br>• Armature or coil of water lock 1 (fig. 6) defective | • Open main tap fully<br>• Loosen the tube from the water lock; remove the locking spring and take out the armature; replace the armature or the coil immediately after the performance |
|   | Pulsator does not work:<br>(P) • Not switched on<br>or<br>• Valves not yet warm enough   | • Switch on the pulsator<br>• Wait; in future, switch on the pulsator earlier before the performance  |





| DEFECT  | CAUSE  | REMEDY   |
|---|--|--|
| Neither of the SPP lamps ignites<br>(Continued) | (P) The ignition unit does not operate   | Measure the open voltage between terminals 137 and 138 (remove the cable from terminal 138); it must be approx. 1300 V d.c.  |
|   | (P) C22...C24 defective  | Remove the cable from terminal 138 and measure the voltage (P) across C22...C24; the total voltage must be approx. 900 V d.c.  |
|   | (P) GR70...GR74 or GR75...GR77 defective   | Measure the resistance in forward and backward direction; (P) forward direction = 10-25 $\Omega$ backward direction = 10 M $\Omega$  |
|   | (P) RE2 defective  | Check with SPP lamp operating (P) whether RE2 is operated and its contacts have changed over   |
|   | (P) No voltage on primary of T1  | Check whether the white/yellow wire is connected to terminal C (P) when no remote control is used and to terminal B when remote control is used  |
| The light is dark yellow                        | SPP lamp remains drawing starting current (it is permanently alight, i.e. it does not flash):<br><ul style="list-style-type: none"> <li>. B1 and B2 are defective</li> <li>. The synchronisation circuit does not operate</li> <li>. Filament voltage of B1 and B2 fails (S7 of T2 defective)</li> </ul> | <ul style="list-style-type: none"> <li>. Replace B1 and B2</li> <li>. S6 of T1 - GR69 - C18 - R96 -</li> <li>(P) - R75 or C11 defective</li> <li>. Measure the voltage across C7; it must be 2.5 V a.c.</li> </ul> |
|   | Arc voltage of SPP lamp too low  | Voltage between the terminals 138.137 must be 420-520 V d.c.   |
| Travel ghost                                    | Arc voltage of SPP lamp too low  | Measure during operation the voltage between the terminals 138-137; it must be 420-520 V d.c.  |
|   | Wrong position of the pulleys or of the toothed belt   | See Directions for Installation, page 4  |
| Alarm circuit does not operate                  | (P) VL3 defective  | (P) Replace VL3  |
|   | (P) B5 defective   | If the power is too high, B5 (P) must emit a red light; if it does not, replace this valve   |
|   | (P) Switch SK2 not turned up sufficiently  | (P) Turn up SK2  |
|   | One or more of the resistors (P) R100 - R103 - R104 - R105 - R106 defective  | (P) Measure the values; replace the resistors if necessary   |
|   | Buzzer in lamp compartment out order   | Replace the buzzer   |



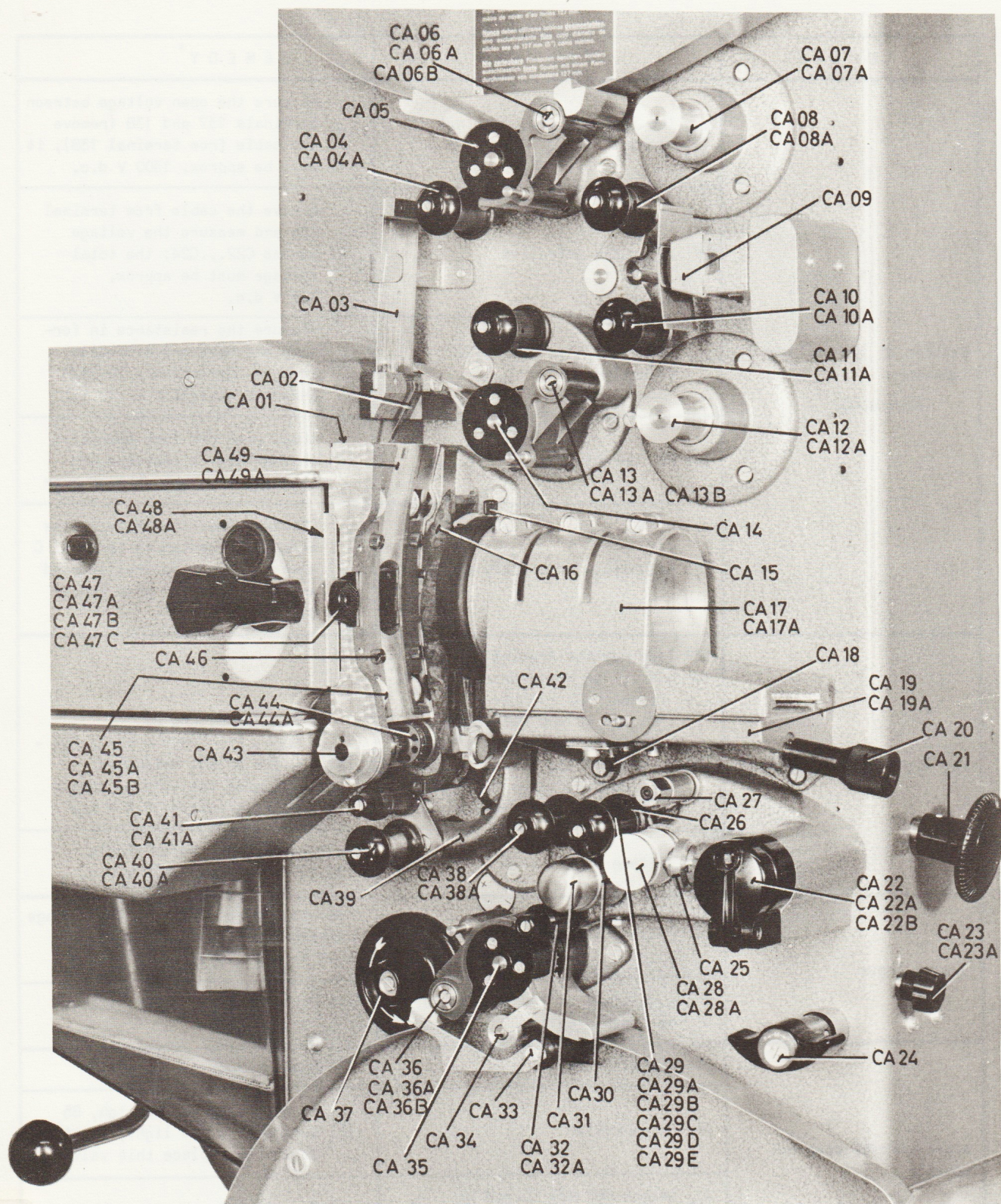


Fig. CA





Fig. CA

|   |   |
|---|---|
| CA01 = micro-switch   | CA28 = capstan                              |
| CA02 = metal strip for film-rupture device                              | CA28A = ball-bearing for CA28               |
| CA03 = spring   | CA29 = pressure roller                      |
| CA04 = roller   | CA29A = ball-bearing                        |
| CA04A = cap   | CA29B = locking ring                        |
| CA05 = sprocket   | CA29C = dust ring (front)                   |
| CA06 = pad shoe, complete   | CA29D = dust ring (rear)                    |
| CA06A = torsion spring  | CA29E = cap                                 |
| CA06B = tightening cap  |   |
| CA07 = capstan  | CA30 = glass rod                            |
| CA07A = ball-bearing for CA07   | CA31 = photocell, type 3546 PW              |
| CA08 = roller   | CA32 = roller                               |
| CA08A = cap   | CA32A = cap                                 |
| CA09 = mu-metal cap   | CA33 = roller                               |
|   | CA34 = roller                               |
| CA10 = roller   | CA35 = sprocket                             |
| CA10A = cap   | CA36 = pad shoe, complete                   |
| CA11 = roller   | CA36A = torsion spring                      |
| CA11A = cap   | CA36B = tightening cap                      |
| CA12 = capstan  | CA37 = knob                                 |
| CA12A = ball-bearing for CA12   | CA38 = roller                               |
| CA13 = pad shoe, complete   | CA38A = cap                                 |
| CA13A = torsion spring  | CA39 = lever                                |
| CA13B = tightening cap  |   |
| CA14 = sprocket   | CA40 = roller                               |
| CA15 = locking nut  | CA40A = cap                                 |
| CA16 = pressure skate   | CA41 = roller                               |
| CA17 = lens holder, dia. 2.78" (70.6 mm),<br>type EL 4029/00            | CA41A = cap                                 |
| CA17A = adapter tube 70.6/62.5 mm                                       | CA42 = spring                               |
| CA18 = cap nut  | CA43 = spigot                               |
| CA19 = pressure spring  | CA44 = intermittent sprocket                |
|   | CA44A = shaft of intermittent sprocket      |
| CA20 = pressure spring  | CA45 = lateral guide roller                 |
| CA21 = framing shaft with knob  | CA45A = bearing bush for CA45               |
| CA22 = lamp holder, complete  | CA45B = spring                              |
| CA22A = lid of lamp holder  | CA46 = screw                                |
| CA22B = exciter lamp; type 3874C = 6 V, 1.48 A<br>type 7251C = 5 V, 4 A | CA47 = mask for normal film (1:1.37)        |
|   | CA47A = mask for Wide Screen (1:1.85)       |
| CA23 = threaded spindle   | CA47B = mask for CinemaScope (1:2.34)       |
| CA23A = knob  | CA47C = blind mask                          |
| CA24 = knob   | CA48 = fire plate                           |
| CA25 = slit lens  | CA48A = framing lamp, No. C1 40R 12         |
| CA26 = lever with spindle   | CA49 = set of Novotext runner strips        |
| CA27 = torsion spring   | CA49A = set of velvet-covered runner strips |



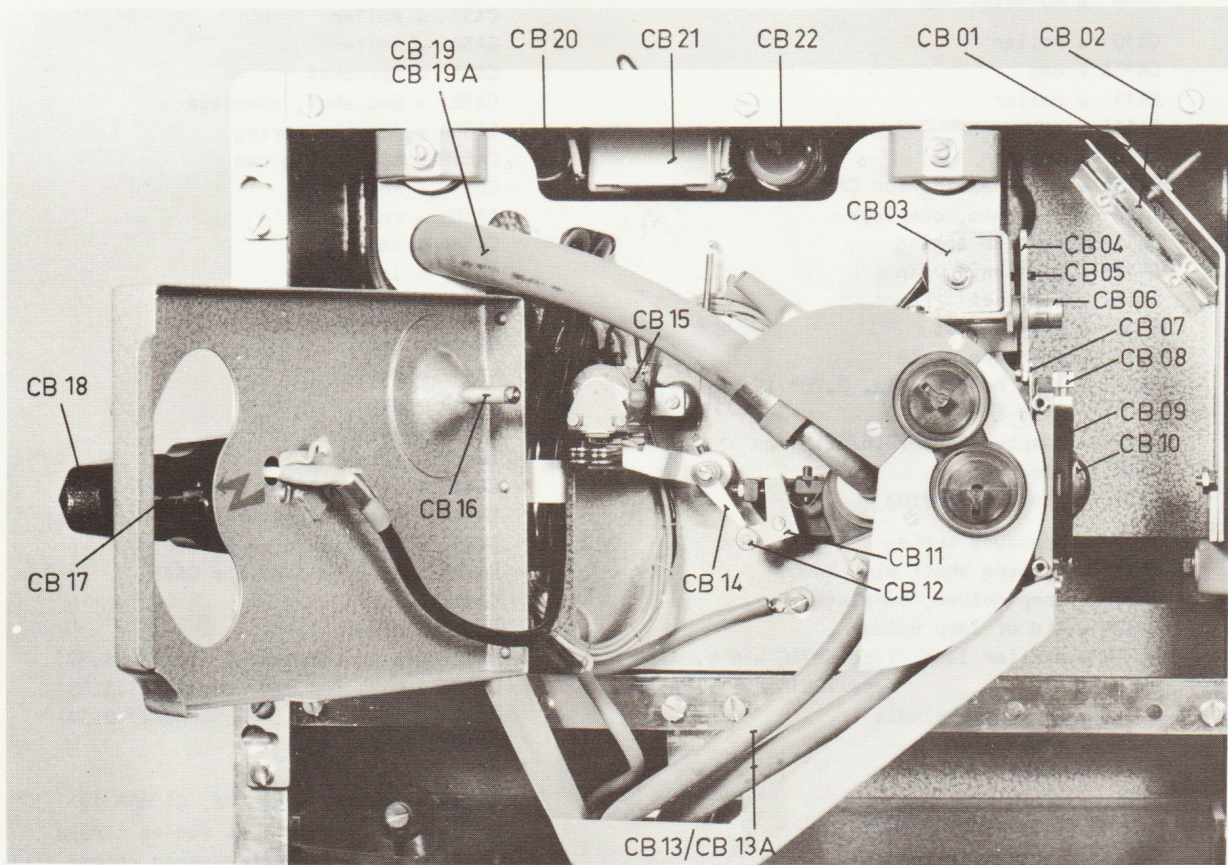


Fig. C B

|                                     |   |
|-------------------------------------|---|
| CB01 = shutter for slide projection | CB13 = rubber tube                      |
| CB02 = metal mirror                 | CB13A = clamp for CB13                  |
| CB03 = coils in housing             | CB14 = lever                            |
| CB04 = lever                        | CB15 = relay                            |
| CB05 = pin                          | CB16 = pin with spring, spacer and nuts |
| CB06 = ring                         | CB17 = contact spring                   |
| CB07 = dowser blade                 | CB18 = contact holder, complete         |
| CB08 = milled screw                 | CB19 = tube                             |
| CB09 = lens holder                  | CB19A = clamp for CB19                  |
| CB10 = aspherical condenser lens    | CB20 = capacitor                        |
| CB11 = lever                        | CB21 = switch                           |
| CB12 = roller                       | CB22 = capacitor                        |



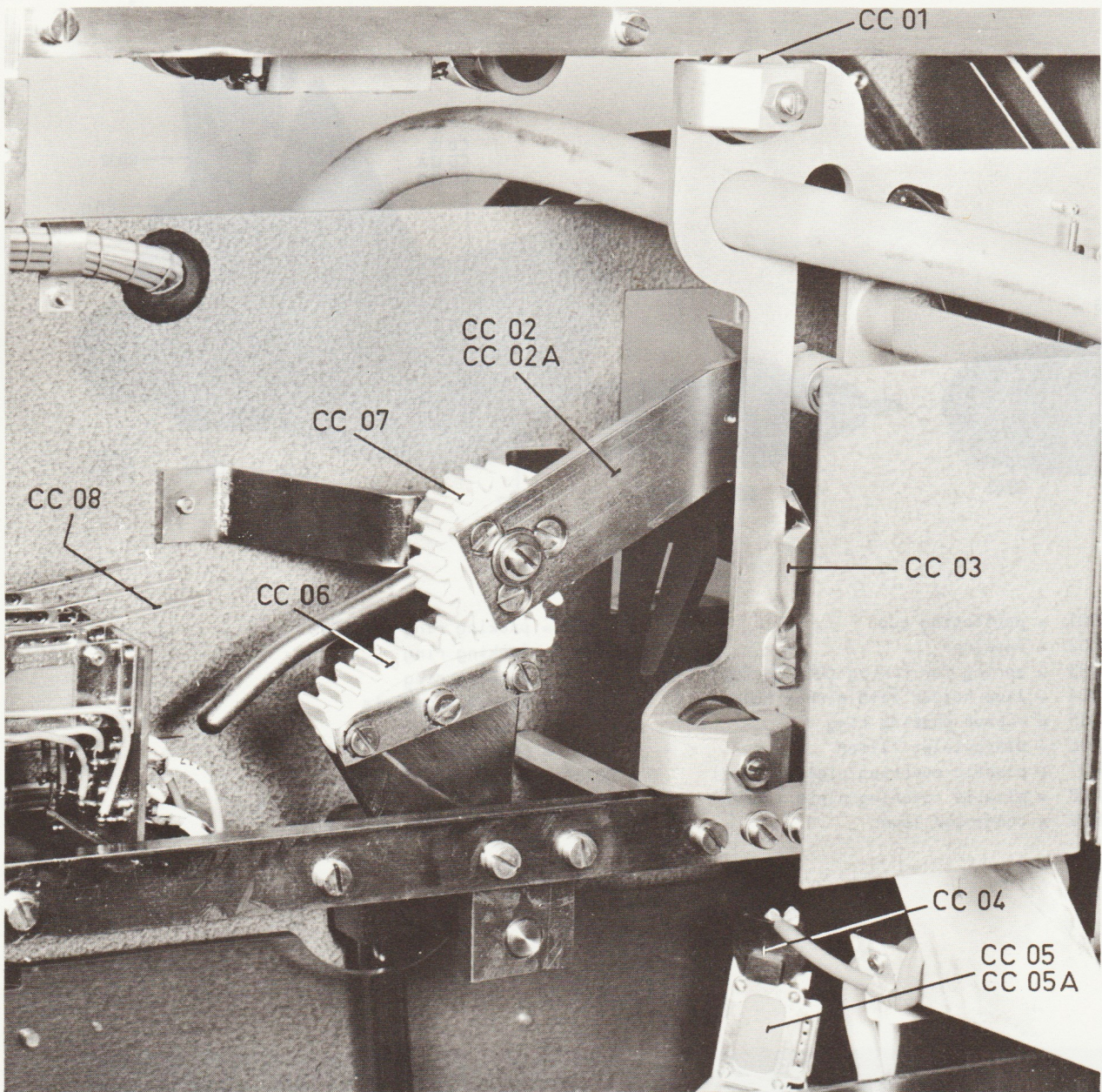


Fig. C C

|                       |                        |
|-----------------------|------------------------|
| CC01 = roller         | CC05 = micro-switch    |
| CC02 = lever          | CC05A = vane           |
| CC02A = roller        | CC06 = toothed segment |
| CC03 = spring         | CC07 = gear wheel      |
| CC04 = insulating cap | CC08 = micro-switch    |



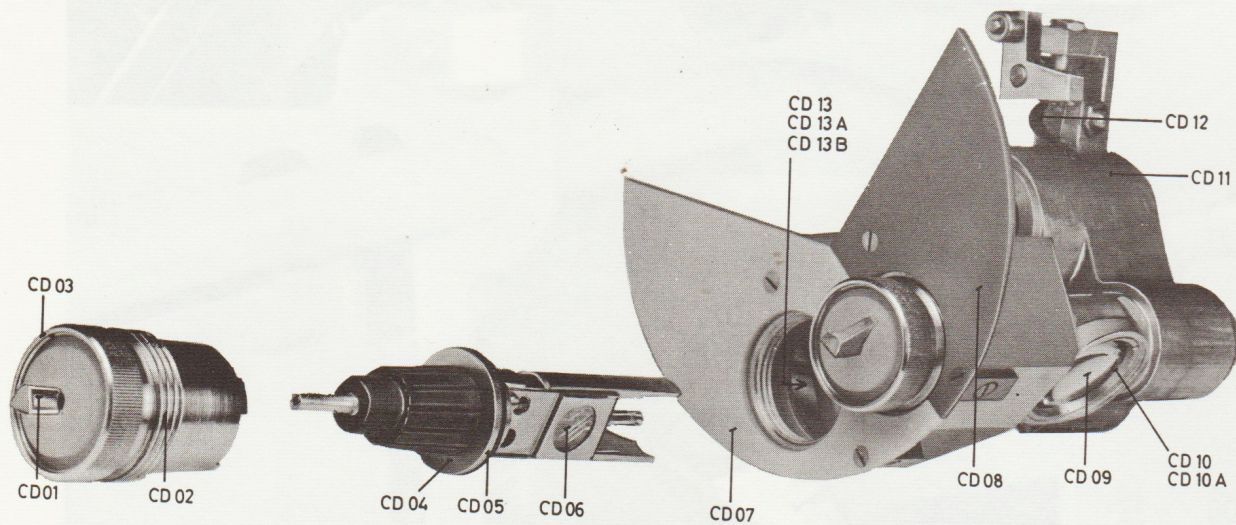


Fig. C D

- |                                       |   |
|---------------------------------------|---|
| CD01 = protecting cup                 | CD09A = packing ring for CD09                                   |
| CD02 = retainer                       | CD10 = locking ring   |
| CD03 = spring for fixing CD01 in CD02 | CD10A = packing ring  |
| CD04 = lamp holder with mirror holder | CD11 = turret, complete   |
| CD05 = rubber packing ring            | CD12 = leaf spring  |
| CD06 = ultraviolet filter             | CD13 = sprinkler  |
| CD07 = plastic covering plate (green) | CD13A = spring for CD13   |
| CD08 = plastic covering plate (red)   | CD13B = special key for the mounting<br>and the removal of CD13 |
| CD09 = condenser lens                 |   |

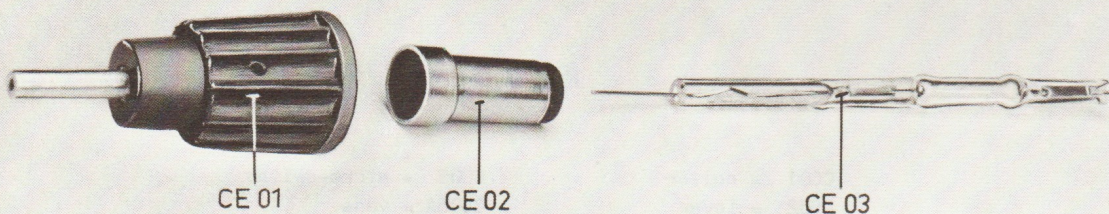


Fig. C E

- |                             |
|-----------------------------|
| CE01 = contact piece        |
| CE02 = packing bush         |
| CE03 = SPP lamp with mirror |



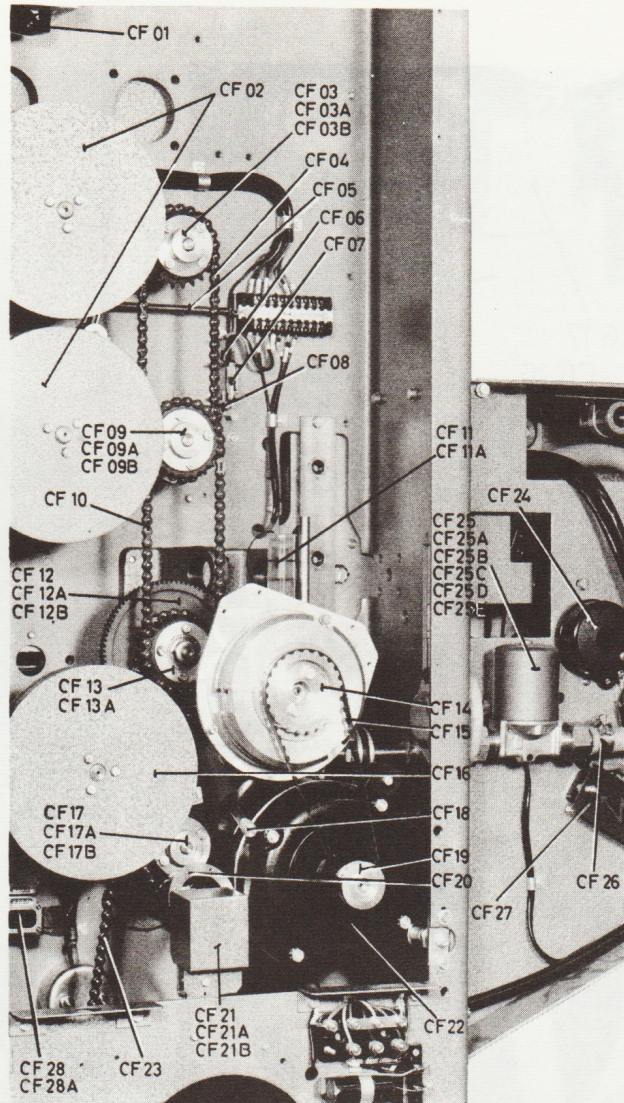


Fig. C F

- |  |   |
|--|---|
| CF 01 = lamp socket                                      | CF 16 = flywheel                                |
| CF 02 = flywheel   | CF 17 = chain wheel                             |
| CF 03 = chain wheel                                      | CF 17A = ball-bearing for CF 17B                |
| CF 03A = ball-bearing for CF 03B                         | CF 17B = sprocket shaft                         |
| CF 03B = sprocket shaft                                  | CF 18 = oil-drain screw                         |
| CF 04 = chain  | CF 19 = pulley                                  |
| CF 05 = spring   | CF 20 = ring for centrifugal switch             |
| CF 06 = insulating cap                                   | CF 21 = micro-switch                            |
| CF 07 = micro-switch                                     | CF 21A = insulating cap                         |
| CF 08 = gun-cotton for safety switch                     | CF 21B = nylon cap on shaft end                 |
| CF 09 = chain wheel                                      | CF 22 = synchronous motor,<br>220/380 V, 50 c/s |
| CF 09A = ball-bearing for CF 09B                         | CF 23 = chain                                   |
| CF 09B = sprocket shaft                                  | CF 24 = buzzer                                  |
| CF 10 = chain  | CF 25 = water lock, complete                    |
| CF 11 = oil-level gauge                                  | CF 25A = gauze filter                           |
| CF 11A = cap for CF 11                                   | CF 25B = coil of water lock                     |
| CF 12 = gear wheel with chain wheels<br>and ball-bearing | CF 25C = armature                               |
| CF 12A = gear wheel                                      | CF 25D = locking ring for CF 25C                |
| CF 12B = ball-bearing                                    | CF 25E = packing bush                           |
| CF 13 = chain wheel                                      | CF 26 = tube clamp                              |
| CF 13A = adjusting ring                                  | CF 27 = insulating plate                        |
| CF 14 = pulley   | CF 28 = micro-switch                            |
| CF 15 = toothed belt                                     | CF 28A = insulating cap                         |



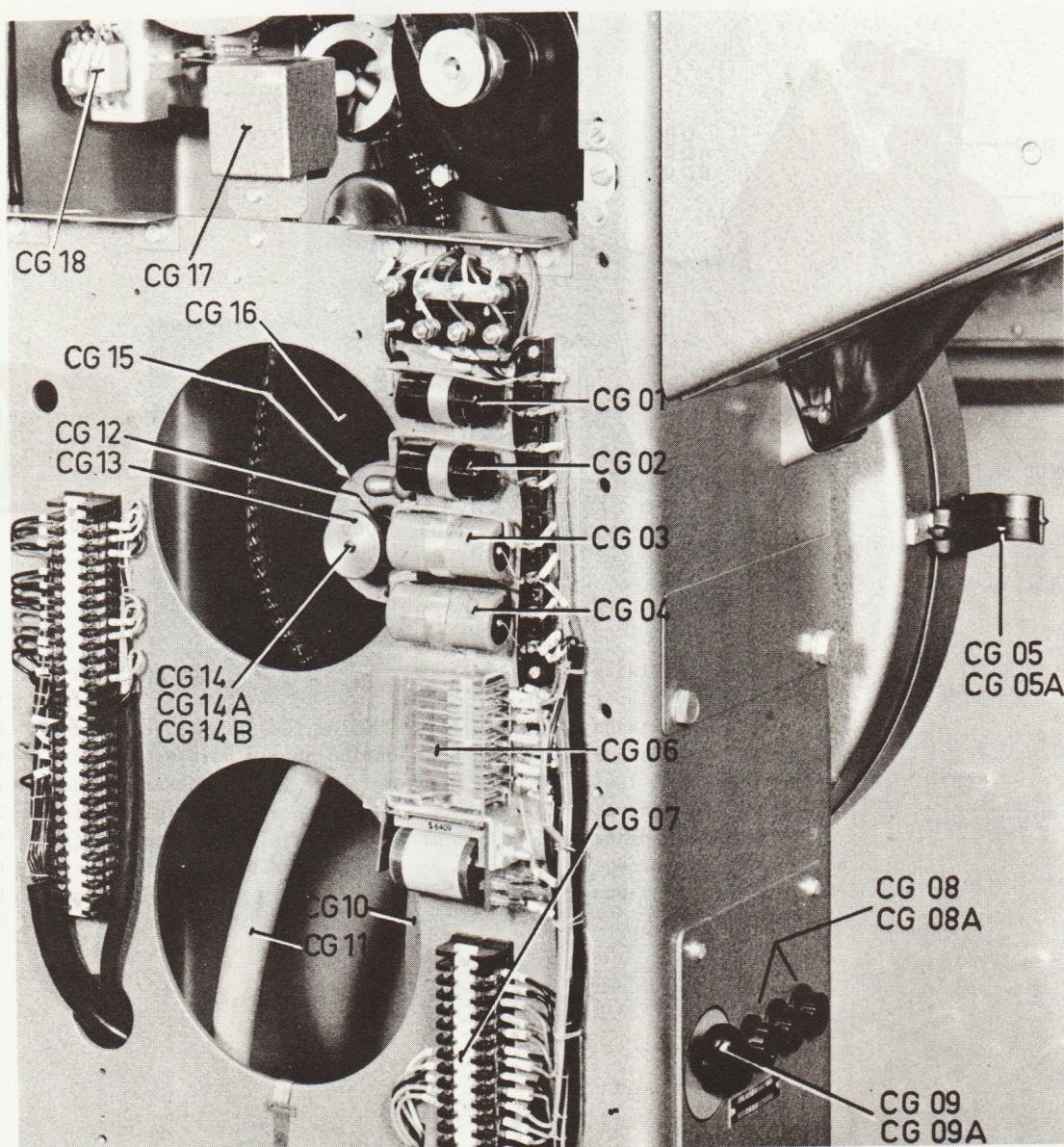


Fig. C G

- |                         |                           |
|-------------------------|---------------------------|
| CG01 = capacitor        | CG10 = tube (thick)       |
| CG02 = capacitor        | CG11 = tube (thin)        |
| CG03 = capacitor        | CG12 = spring             |
| CG04 = capacitor        | CG13 = milled nut         |
| CG05 = lock             | CG14 = spool shaft        |
| CG05A = spring for CG05 | CG14A = locking ring      |
| CG06 = relay            | CG14B = ball-bearing      |
| CG07 = terminal strip   | CG15 = felt disc          |
| CG08 = fuse, 2 A        | CG16 = chain wheel        |
| CG08A = fuse holder     | CG17 = micro-switch       |
| CG09 = switch           | CG18 = push-button switch |
| CG09A = lever for CG09  |                           |



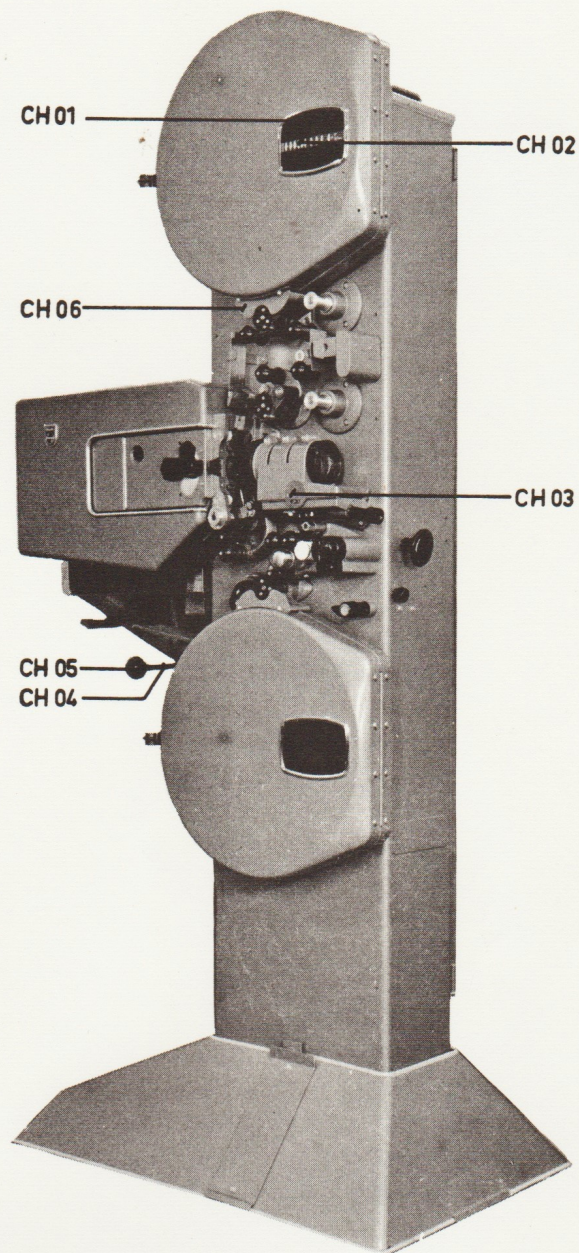


Fig. CH

- CH01 = gauze filter
- CH02 = time scale
- CH03 = scale
- CH04 = lever
- CH05 = knob
- CH06 = bracket



# ALTERNATIVE PARTS SERIAL NUMBERS

|           |                                     |       |
|-----------|-------------------------------------|-------|
| C1.904.76 | Guide Roller                        | CA41  |
| C1.317.56 | Ornamental Cap with Screw           | CA41A |
| C1.904.29 | Intermittent Sprocket               | CA44  |
| C1.752.31 | Shaft of Intermittent Sprocket      | CA44A |
| 22.414.47 | Spicot                              | CA43  |
| 2P.618.67 | Lateral Guide Roller                | CA45  |
| C1.752.46 | Bush                                | CA45A |
| C1.752.60 | Spring                              | CA45B |
| C1.752.48 | Screw                               | CA46  |
| C1.752.55 | Normal Aperture Plate (1:1.37)      | CA47  |
| C1.753.26 | Wide Screen Aperture Plate 1:1.85   | CA47A |
| C1.752.54 | Cinemascope Aperture Plate 1:2.34   | CA47B |
| C1.753.28 | Blank Aperture Plate                | CA47C |
| C1.415.52 | Fire Plate                          | CA48  |
| C1.408.02 | Framing Lamp (Festoon)              | CA48A |
| C1.753.33 | Set of Novotext Runner Strips       | CA49  |
| C1.753.34 | Set of Velvet Covered Runner Strips | CA49A |



|                  |  |       |
|------------------|--|-------|
| C1.050.74        | Micro Switch                           | CA01  |
| C1.412.47        | Metal Strip For Film Rupture Switch    | CA02  |
| C1.752.13        | Sprocket (Complete)                    | CA05  |
| C1.752.08        | Tightening Cap                         | CA06B |
| 22.413.24        | Torsion Spring                         | CA06A |
| C1.752.05        | Guide Shoe (Complete)                  | CA06  |
| P4.635.52        | Pressure Skate                         | CA16  |
| 63.149.50        | Locking Unit                           | CA15  |
| EL.4029/00       | Lens Holder 2.78" (70.6mm)             | CA17  |
| EL.4203/00       | Adapter Tube (70.6/62.5mm)             | CA17A |
| 63.149.50        | Cap Nut                                | CA15  |
| C1.706.10        | Pressure Spring (Thin)                 | CA19  |
| C1.706.09        | Pressure Torsion Spring (Big)          | CA20  |
| C1.706.12        | Threaded Spindle with Knob             | CA23  |
| P4.635.45        | Framing Shaft with Knob                | CA21  |
| 22.469.60        | Lamp Holder (Complete)                 | CA22  |
| 22.469.70        | Lid of Lamp Holder                     | CA22A |
| <del>3874C</del> | <del>Exciter Lamp (N2 Amplifier)</del> |       |
| 7251C            | Exciter Lamp (Any Amplifier)           | CA22B |
| C1.752.73        | Threaded Spindle                       | CA23  |
| 973/08           | Knob                                   | CA23A |
| C1.905.05        | Knob                                   | CA24  |
| 22.440.50        | Slit Lens                              | CA25  |
| C1.904.83        | Lever With Spindle                     | CA26  |
| 22.413.25        | Torsion Spring (Clockwise)             | CA27  |
| C1.904.75        | Sound Shaft                            | CA28  |
| C1.407.85        | Ball Bearing For (EA19)                | CA28A |
| 22.443.11        | Pressure Roller (Rubber Rings Out)     | CA29  |
| 89.180.99        | Ball Bearing                           | CA29A |
| B045/AF19        | Locking Ring                           | CA29B |
| 22.439.43        | Dust Ring (Front)                      | CA29C |
| 224439.59        | Dust Ring (Rear)                       | CA29D |
| C1.317.57        | Ornamental Cap with Screw              | CA29E |
| P5.636.72        | Glass Rod                              | CA30  |
| 3546 PW          | Photocell                              | CA31  |
| C1.752.13        | Sprocket (Complete)                    | CA35  |
| C1.752.05        | Guide Shoe (Complete)                  | CA36  |
| C1.752.08        | Tightening Cap                         | CA36B |
| 22.413.24        | Torsion Spring                         | CA36A |
| P4.635.43        | Knob                                   | CA37  |
| C1.904.76        | Guide Roller                           | CA38  |
| C1.317.56        | Ornamental Cap with Screw              | CA38A |
| C1.752.85        | Spring                                 | CA42  |



