Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjustments to anything you may read about in these Adobe manual downloads.

www.film-tech.com

C5/0-6

SIEMENS

2000 PROJECTOR

Instruction Manual

SIEMENS & HALSKE AKTIENGESELLSCHAFT
BERLIN · MÜNCHEN

CONTENTS

The Siemens 2000 Silent Projector is the basic unit of all Siemens 16 mm Projectors. Additional interchangeable units can be fitted to convert the Silent Projector to an Optical or an Optical and Magnetic Sound Projector, using all types of magnetically striped film as well as to a Double Band Projector whereby 8 or 16 mm fully coated magnetic film can be utilised in perfect lip synchronization. A range of amplifiers and loudspeakers, or loudspeaker systems completes the unique flexibility of the Siemens Projector system.

All parts are individually matched and can be attached without further adjustments. This unit system principle gives a choice of more than 50 Projector combinations.

Whether a lounge room Projector or a highly specialised Studio Unit, the Siemens 2000 Silent Projector remains the basic unit of all combinations.

To simplify the reading of this instruction book, fold open picture 1 on page 20.

Adjusting the Projector for use

On page 20, when folded open, a picture is shown of the Silent Projector, after it has been taken out of the carrying case.

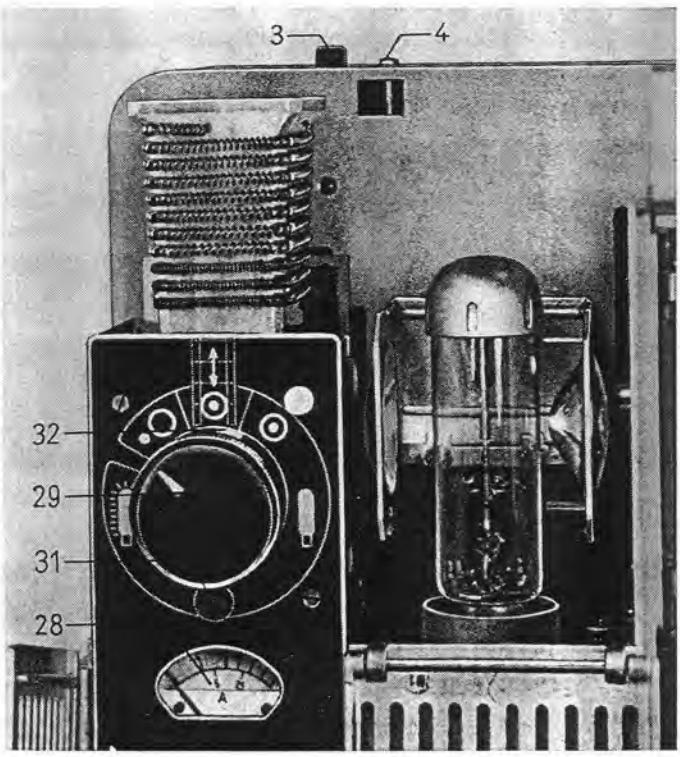
The carrying handle (1) is released by pressing the black catching lever (3) towards the back of the Projector. When the handle is pulled forward, it will click into the correct position and acts as front reel arm. On the reel arm spindle the full film reel is attached. The same catching lever (3) will also release the catch of the mains lead compartment on the other side of the Projector. The mains lead is stored into this compartment (picture 9).

Before the mains lead is connected ensure that the correct lamp resistor is inserted according to the voltage used. The mains voltage can easily be ascertained by checking the electricity box or any lightbulb in the room. On the interchangeable resistor, behind the Projector lamp, the correct Voltage (V) and Wattage (W) of lamp to be used are printed on the ceramic core.

When inserting or changing the resistor or lamp or even when removing the lamphouse cover, the power plug should be disconnected from the mains.

To get at the resistor and/or projection lamp, again the same catching lever (3) releases the catch of the lamphouse grille. After making certain that the mains lead is not connected to the power supply, the lamphouse cover can be removed, simply by lifting it straight up. The resistor and lamp can now easily be seen (picture 2). The resistor can be lifted off its base and can only be replaced in one position, due to the triangular position of the base pins. The lamp holder is of the bayonet type with 2 flanges, one large and one small. The lamp can only be replaced by inserting it in such a way, that the larger flange on the lamp base is facing towards the lens of the Projector, whilst the smaller flange faces the reflector side. In this position the lamp is pushed into the lamp holder and turned in a clockwise direction for a full 90 degrees until it cannot be turned any further.

Picture 2 The lamphouse after the cover has been removed



The lamp itself should not touch either condenser holder or reflector fitting. If this should happen, the lamp adjustment screw (24) should be loosened and the lamp holder moved forward or backward whatever the case may be, by sliding both adjustment knobs (22 and 23) forwards or backwards (see also picture 14).

After the resistor has been inserted, the lamp cover can be replaced, the lamphouse grille closed and locked by the locking screw (4) then the mains plug can be connected to the power supply.

The next step is to familiarise yourself with the master switch (29). With this main Projector switch, several operations are controlled.

A. Forward operation

Turn the master switch clockwise, without pushing the knob in.

1st position: Motor is engaged in forward running. The Projector transports the film forwards.

2nd position: The Projection lamp goes on and the picture is projected.

By turning the knob further clockwise after the second position, the screen brilliance can be increased. The Ampere-meter (28) under the master switch should be used to control the lamp circuit, which depends on the type of lamp used.

250 to 500 Watts — 5 Amps
750 Watts — 7.5 Amps
1000 Watts — 10 Amps

Only if 100-Volt lamps are used.

When higher voltage lamps are utilised the amperage should never exceed the wattage divided by the voltage, e.g. when using a 110-Volt/750-Watt lamp, the ampere-meter should not exceed a reading of

$$\frac{750}{110} = 6.8 \text{ Amps}$$

To set the switch so that the correct amperage is not exceeded, release the locking screw (31) and turn the master switch clockwise until the meter shows the maximum correct amperage. Then the stop lever (32) which is now movable, should be moved in an anti-clockwise direction until it rests against the knob. When the locking screw (31) is again tightened it will be impossible to turn the master switch knob too far and thus overloading of the lamp is prevented. This operation should be checked and if necessary repeated when a new lamp is inserted.

B. Reversing

Push the master switch knob against the Projector body and turn clockwise.

1st position: Motor runs in reverse.

2nd position: Projection lamp is on and the picture is visible on the screen (reverse projection).

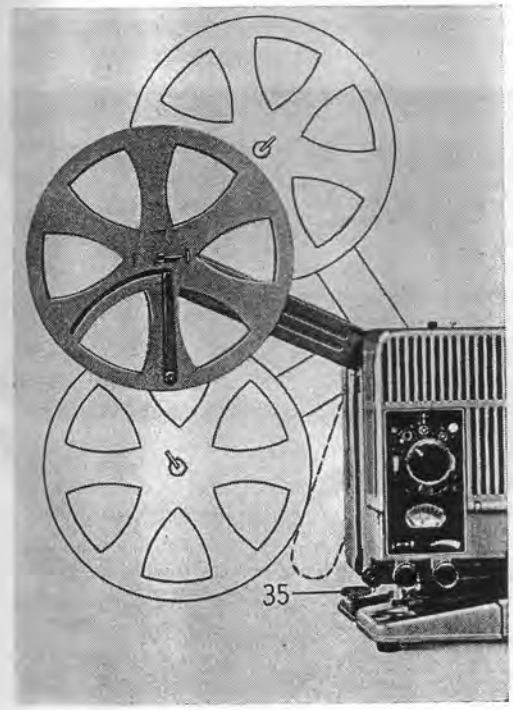
In the reverse position, the knob cannot be turned past the 2nd position and the lamp brilliance cannot be regulated by reverse Projection.

When the knob is turned anti-clockwise, it will automatically spring out to its rest position.

When the use of the master switch is fully understood, the Projector can be prepared for showing a film.

Preparations for screening a film

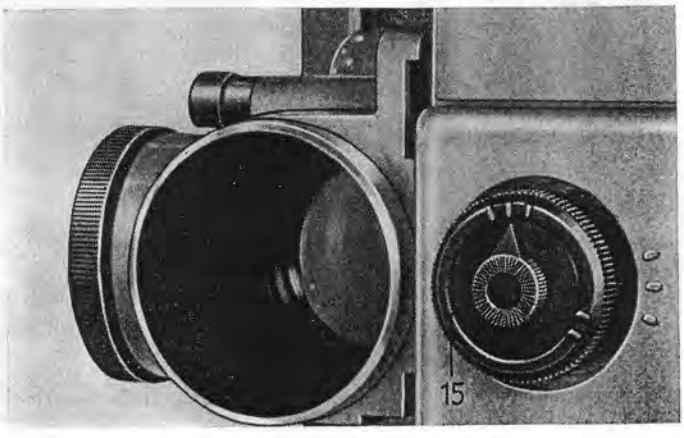
The rear spool arm which holds the empty take-up spool can be set in four different positions (see picture 3). The top position is only to be used when rewinding a film, as the take-up spindle is not driven in that position.
To alter the position of the rear spool arm or to return it in its rest position, hold the arm as close as possible to the Projector body and press it against the spring pressure in the direction of the mains lead compartment.
The same applies to the front spool arm, which can be returned to its rest position by pressing it in the direction of the mains lead compartment and folding it back. After it clicks into the rest position, it acts again as a carrying handle for the Projector.



Picture 3
Positions of rear spool arm

Shutter selection

Apart from the fact that screen brilliance can be selected for maximum light output, there is also a selection possible of shutter-blade operation.
When operating on 16 or 18 frames per second, the 3 bladed shutter position should be used. By using 20 or 24 frames per second the 2-bladed shutter position is selected, which increases the light output even further.
This selection is done by means of the selector knob (15) in front of the Projector. The inner turning circle is pressed against the Projector and can then be turned until the arrow points either to the II or to III on the outer knob. The inner knob should be turned after depressing and should spring back into its normal position when fully turned towards either the II or the III.
The position of the inner knob is very important and should be checked carefully. Any in-between position could result in noisy operation or "picture ghosting". In such a case, stop the Projector and check the position of the selection knob.



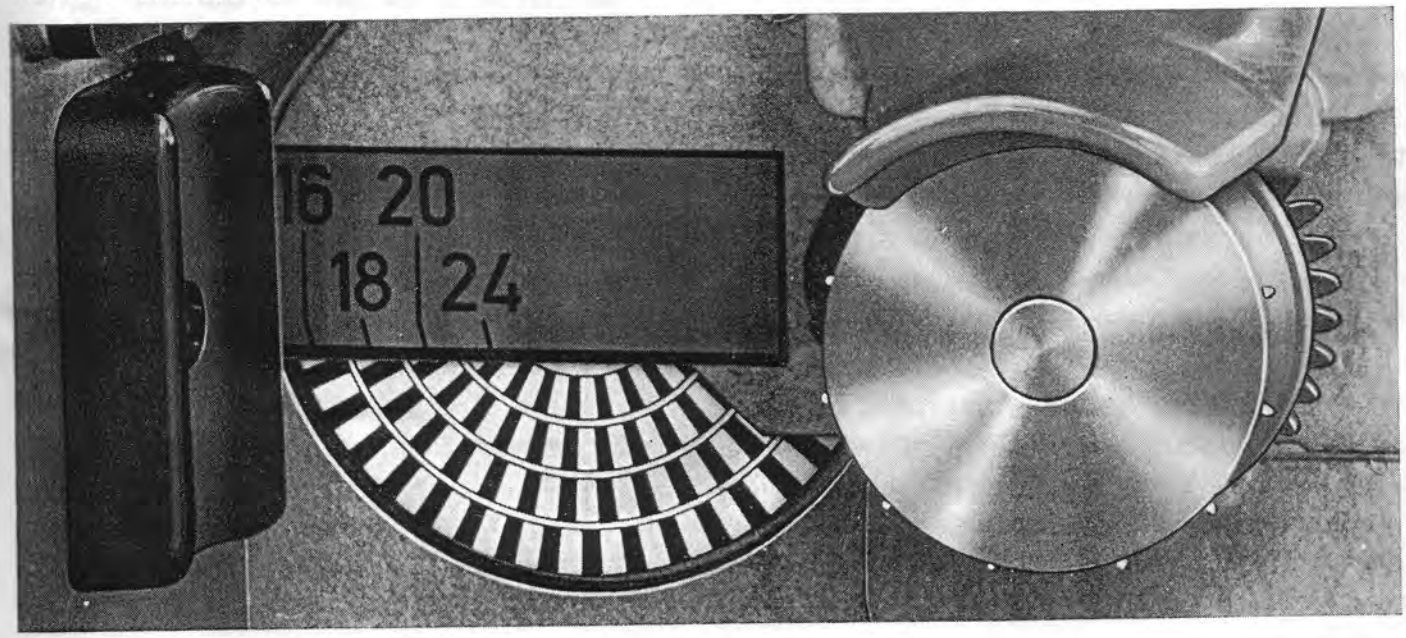
Picture 4
Inching knob with shutter selection knob on the outside

Speed control setting

Turn master switch (29) to the 1st position, whereby the motor starts running.
Switch the pilot lamp (20) on. This lamp illuminates the stroboscope, which is marked with four circles for four speeds. From outside to inside:
16 f.p.s., 18 f.p.s., 20 f.p.s., and 24 f.p.s. (picture 18 and picture 5). By turning the knurled speed control knob (25) the speed should be adjusted until the desired speed setting is reached, whereby the particular circle of black lines on the stroboscope appears to stand still. Clockwise turning of the speed control knob (25) increases the motor speed, whilst anti-clockwise turning decreases the speed. When the speed is approximately correct and slight "wander" of the stroboscope occurs, turn the knob (21) slightly into the direction of the "wander".

When the black lines on the selected speed circle appear to stand still, the Projector is running exactly at that speed. This speed will remain constant no matter what size of film-spool or length of operation.

Picture 5 Stroboscope



Projection preparation

Place the Projector on a stand which has a minimum height of 4' 6", so that all persons, even the ones sitting at the back of the auditorium or hall will have a good and clear view of the picture.
Test the Projector on the stand without film. The gate should be closed, by turning the gate locking lever (9) fully towards the left. The lens should be inserted in the lens holder (8).
When the master switch is turned past the first position, until it clicks for the second time, the lamp is switched on and the white light projected onto the screen. The tilt of the screen image can be altered by turning the tilt control knob (26). An anticlockwise turn will lower the image, whilst turning in a clockwise direction will lift it.
Sideways adjustments can only be made by moving the Projector stand.
When the top of the stand is not level, a levelling knob on the Projector (35, picture 3) will adjust any uneveness, by lengthening or shortening one of the feet on the Projector base.

Focussing

So far no film has been inserted, however it is important to focus the lens as soon as possible. The gate should remain closed.

The large knob (11) on the side of the lens carrier is the focussing knob. By turning this knob the frame of the projected surface can be focussed. The outlines on the screen are that of the gate frame. The filmpath is not exactly in the same plane and you should therefore re-focus after it is inserted. However, this test is purely to ensure that the gate frame can be focussed so that the screening does not have to be interrupted because the film cannot be focussed.

When the gate frame cannot be focussed, it is due to the following:

1. The gate has not been closed completely. Turn gate locking lever (9) fully to the left.
2. The lens has not been pushed right back into the lens holder. Push lens (10) back in the tube as far as it will go.
3. The lens has misted up. This could happen by extreme temperature changes (e.g. transportation in winter time). People who wear glasses know of this. Wait till the lens has the same temperature as the room.

   The projector could be left running for a little while with the lamp on.
4. The lens is dirty.
   This should not happen and will have to be remedied immediately. Dust can be removed with a soft lens brush (which should be used for this purpose only). Finger prints should be carefully cleaned with a clean chamois. Polish the lens for as short a time

as possible and with the least possible pressure. Make certain that the Projector in future is always replaced in its carrying case and be careful not to touch the lens under any circumstances.

Check whether the gate frame is sharp all over and that no dust or film particles are projected on to the screen. In that case the gate should be immediately cleaned. This should have been done after the last film show and should never be forgotten. Film channel and gate should at all times be spotlessly clean.

For instructions turn to page 13 "Projector maintenance".

Checking of filmreel

Check whether the film is correctly wound onto the filmreel and that the loose end is actually the start of the film.

Hold the reel as in picture 6. When looking through the film the image should be upright and left/right correct. If the film is single perforated, the sprocket holes should be on the left hand side.

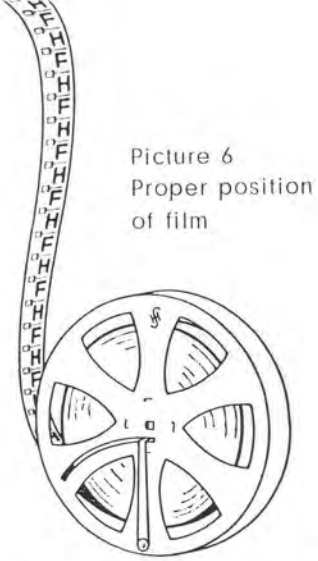
Mounting the spools

The full film reel is attached to the spindle (2, picture 7) on the front spool arm. An empty reel of the same size is to be attached to the rear spool arm spindle. The catch (2a) on the end of the spindle is now turned in such a way that the threading lever (36) on 400 and 800 foot reels is free. When reel arms with knurled knobs are used, the knobs should be screwed right in.

Film Threading

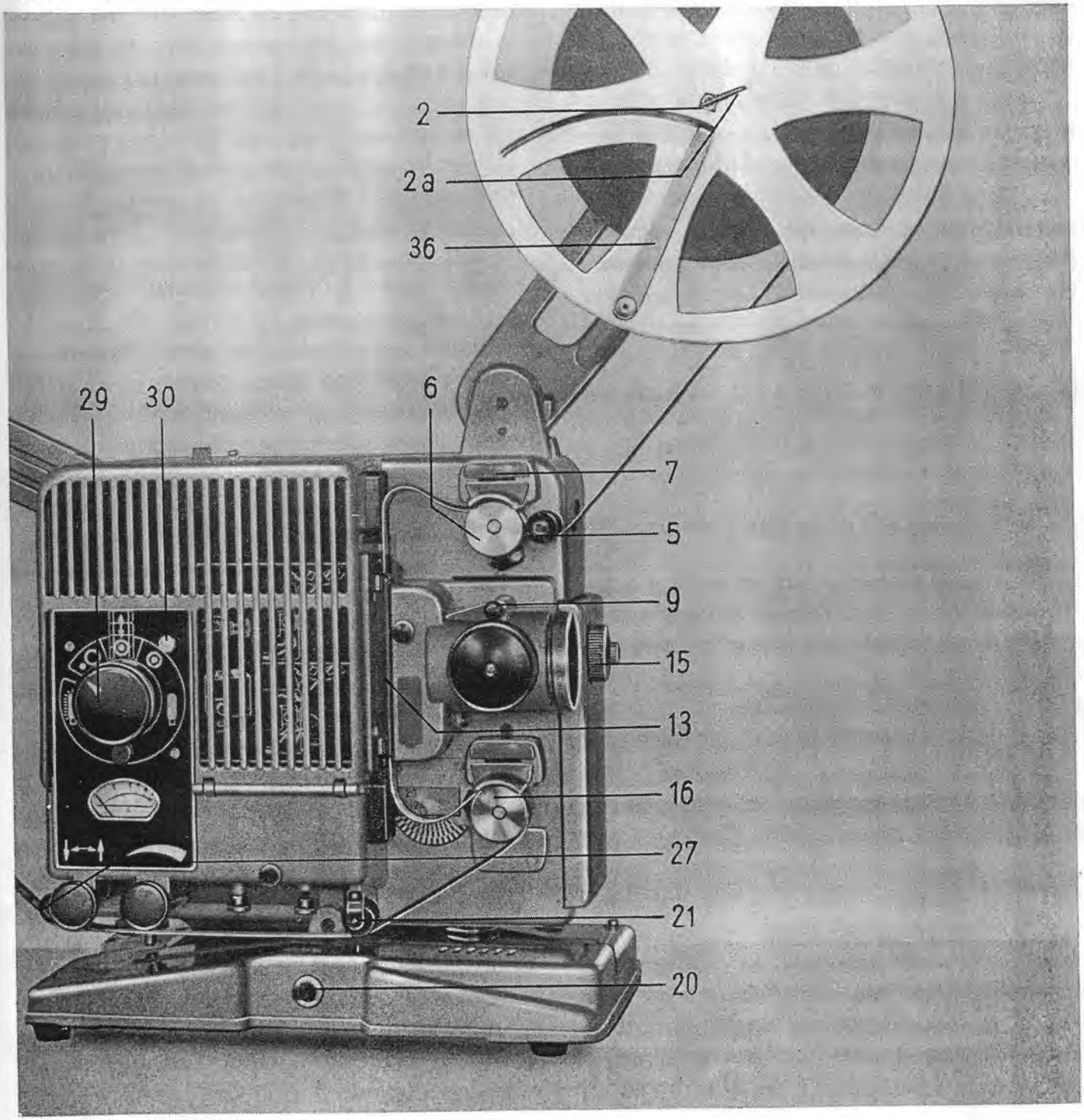
Open the film gate by turning the gate locking lever (9) fully to the right. The inching knob (15) is to be turned so that the III printed on it is in the 3 o'clock position opposite the same mark on the Projector housing. In this position the claw is pulled away from the film channel and cannot possibly hinder the threading. Pull approximately 5 ft of film from the reel.

Put the film in the gate and press it in between the guide rails, thereby ensuring that it is not caught when the gate is closed.



Picture 6
Proper position
of film

Picture 7 Correct threading of film



Stretch the film taut, so that the pressure of the filmgate plate can be felt, when pressing the film in between the guide rails of the film channel.
The gate can only then be closed when the film lies perfectly flat on the gate plate between the guide rails. Close the gate by turning the gate locking lever (9) fully to the left in a horizontal position. After the gate is closed the film could freely be moved up and down. If this cannot be done the claw is in the sprocket holes (the inching knob with mark III has been moved and is no longer in the 3 o'clock position opposite the marking on the Projector body), or the film is caught in the gate and does not lie perfectly flat in the film channel. In that case the gate should be opened again and the film replaced properly in the film channel.
When the film lies properly in the film gate, the sprocket clip (7) of the top sprocket (6) can be opened by pushing it upwards. The film should be placed over the sprockets, the teeth of which should go right through the sprocket holes before the clip is closed.
The film which comes off the full reel is to be led underneath the guide roller (5) before it gets to the top sprocket. A loop should be made between sprocket and film channel as shown on picture 7.
The film is also fed over the bottom sprocket (16) in a similar fashion. Here also the loop between film channel and sprocket should be adjusted as in picture 7. A threading diagram is printed on the side of the lamp house cover for your convenience.

Watch both loops carefully during the screening. When a loop is lost due to damaged sprocket holes on the film the projector should be immediately stopped.

There will also be a noise noticeable in that case, which is louder than the normal operational noise.

After the bottom sprocket the film is led underneath the 2 guide rollers (21) and (27) and the end of the film attached to the empty take-up reel.

Turn the reel clockwise to take up any slackness. Two or three turns should secure the film on to the reel and a trouble free screening.

Automatic inching

To check whether the threading is correct, do not use the master switch (29), but the automatic inching button (30). When the button is pushed in, the motor starts up and the film threading can be properly checked for free transportation, correct loops and free movement of both reels.

The screening can now commence. Turn on the pilot lamp (20) and switch the room lights off.

Turn the master switch on to its first click which starts the motor. After the second click the lamp turns on and when the master switch is turned around further the screen brilliance can be regulated. Focus the picture by means of the focussing knob (11). All this has been explained earlier.

Reverse projection and scene repeats

A new instruction is:

Framing of the image is performed by turning the knurled knob (12). Sometimes a frame line is visible either on top or at the bottom of the picture, due to the fact that different cameras have been used.

By turning the framing knob this line will disappear and only one picture is visible.
By altering the framing the image does not leave the screen and remains static (optical framing).

The Siemens 2000 Projector allows the film to be viewed during reverse Projection. Whilst reversing, the lamp can either be turned on or off.

When part of the film has to be shown again, turn the master knob (29) to the left thereby stopping the Projector. Then the knob can be pushed in against the Projector body and turned clockwise.

1st position. Motor runs in reverse and film is transported in reverse through the gate.

2nd position. The projector lamp is turned on and the picture is visible on the screen. (Lamp brilliance cannot be regulated with the master switch set in the reverse position.)

When the point is reached from where a scene repeat is required, the Projector is stopped by turning the master switch to the left. The master switch (29) which is spring loaded will return to its rest position and can then be turned clockwise again for normal projection.

When the re-running is completed the lamp is turned off after the "End" title, but the motor should be kept running until the film has completely run off the front reel and is fully wound on to the take-up reel. Then the motor is switched off.

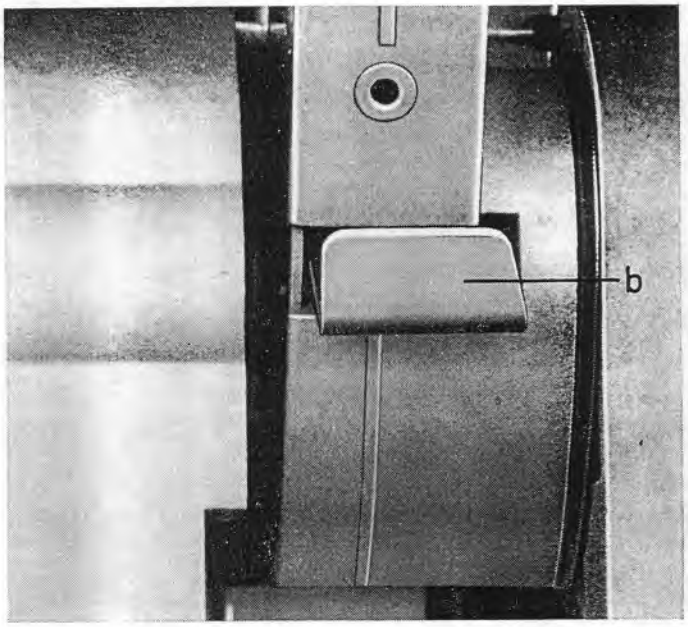
Rewinding the film

The most ideal way of rewinding is to do this on a separate rewinder. However, this can also be done on the Projector by:

1. Setting the take-up spool arm in the upper most position.
2. Replacing the end of the film, on the front reel.
3. Switching the Projector into reverse by pressing the master switch (29) against the Projector body and turning it clockwise to the 1st position. Do not switch the Projector lamp on (2nd position).

When the rewinding speed slows down or stops, press the clutch lever (picture 8) near the hinge of the take-up arm. This releases the clutch on the take-up spindle. It is only necessary to do this if the speed actually slows down considerably, as the film should be rewound at a constant tension. The following points should be watched:

1. Rewinding is only to be done from left to right (looking at the operation side of the Projector).
2. Both reels should turn anticlockwise. An S-form rewind, whereby both reels turn in opposite directions is incorrect and will result in threading difficulties when the film is used again.



Picture 8 Clutch release lever at the bottom of the take-up arm

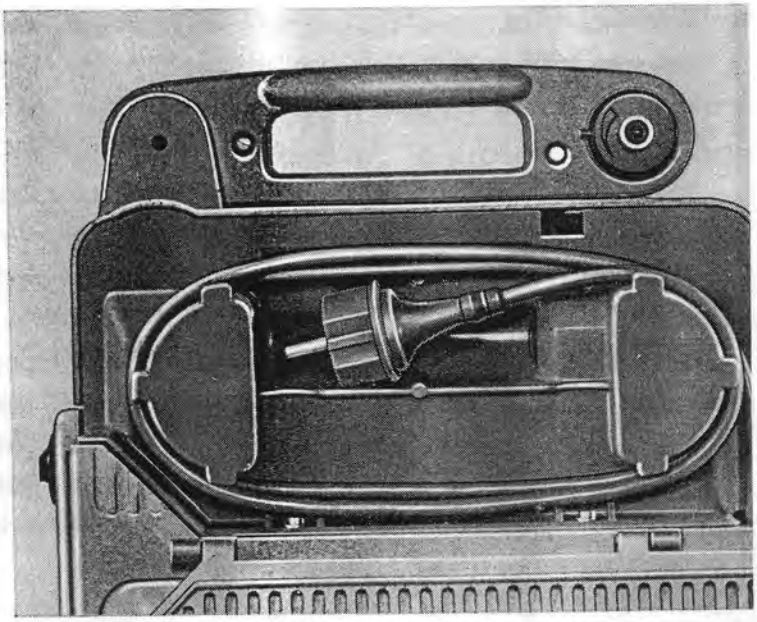
Packing the Projector

Remove the Plug from the mains power supply and replace this lead in its own compartment. Make sure that there are no kinks in the lead. When replacing the lead, go straight up and wind the lead from the top to the left and around the guides (picture 9). The plug can then be inserted in the centre of the compartment and the cover closed.

Release front spool arm by pressing it (near the Projector body) towards the lead compartment and fold it backwards into the slot until it clicks into its position as carrying handle. Release take-up arm in the same way and return to its rest position in the reel arm compartment at the rear of the Projector body.

The take-up arm is loose in its compartment and should be moveable. To check this, tilt the Projector forward by way of its tilt control knob (26) until the take-up arm fits neatly and without strain in its compartment.

When replacing the Projector in its carrying case, the operation side should face the case lock. The base should be placed in between the guides on the bottom of the case.
The lid can now be closed without any resistance and the Projector is protected against dust and against damage during transportation.



Picture 9 Mains lead folded away in its compartment

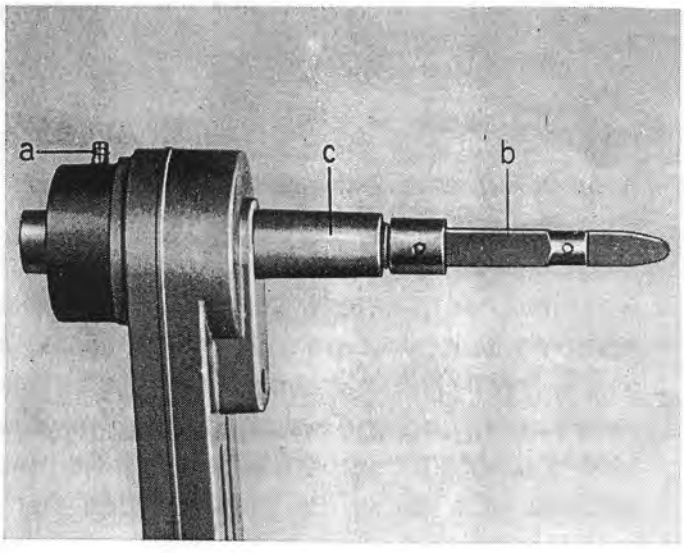
Replacing the reel arm spindles

For a more positive fitting of large reels on to the reel arm spindle, another spindle can be used which utilises a threaded knurled knob.

The spindle can easily be removed (picture 10). The locking pin (a) has to be lifted a few mm, whilst with the other hand the spindle (b) can be removed from its bushing (c).

The other type spindle can now be inserted by reversing the above handlings. Again the locking pin (a) is lifted, the spindle replaced and turned until the locking pin returns to its rest position and the spindle is firmly locked.

Picture 10 Film reel spindle

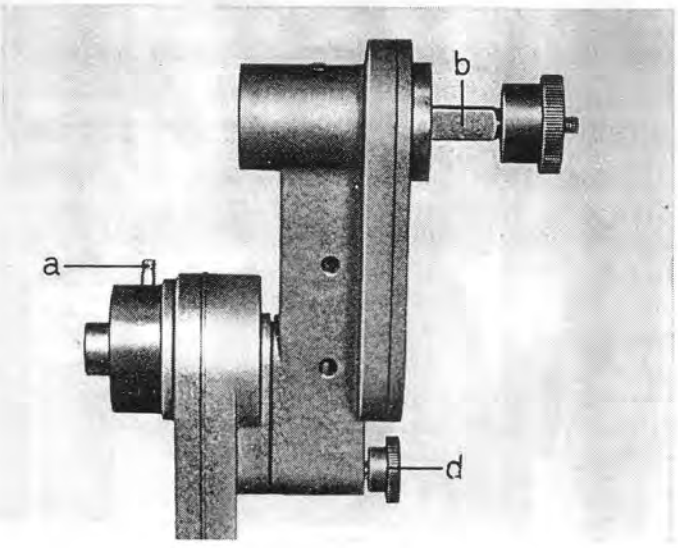


Attaching 4000 ft extension arms

Remove the standard reel arm spindles, as explained earlier, by lifting locking pin (a).

The axle of the extension arm (picture 11) is placed in the bushing (c, picture 10) and locking pin (a) lifted. The screw (d) has to be tightened, and to complete this operation turn the spindle until locking pin (a) returns to its rest position.

Picture 11 4000 ft extension arm



Wherever possible, the filmgate should be cleaned after each screening.
Occasional crackling during a screening is not due to the Projector, but often to a smudged soundtrack. To clean the filmgate, the lens carrier will have to be removed.

Removal of Lens Carrier

Turn the inching knob, until the mark III on it corresponds with the same mark on the Projector body. Open the filmgate by turning the gate locking lever (9) fully to the right. Pull this lever towards you and it can then be turned further to the right until it rests against the lens carrier behind the focussing knob (11) (see picture 12).
The lens carrier is now unlocked and by gripping it with both hands, can be removed by shifting it towards the screen.

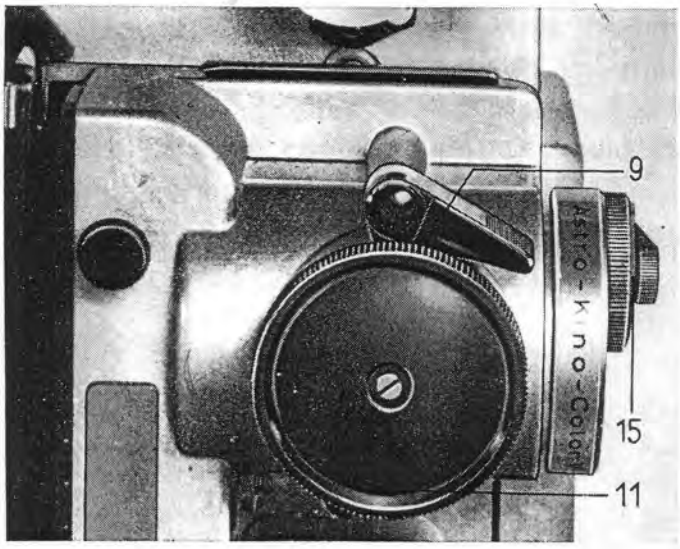
The filmgate can now be cleaned.

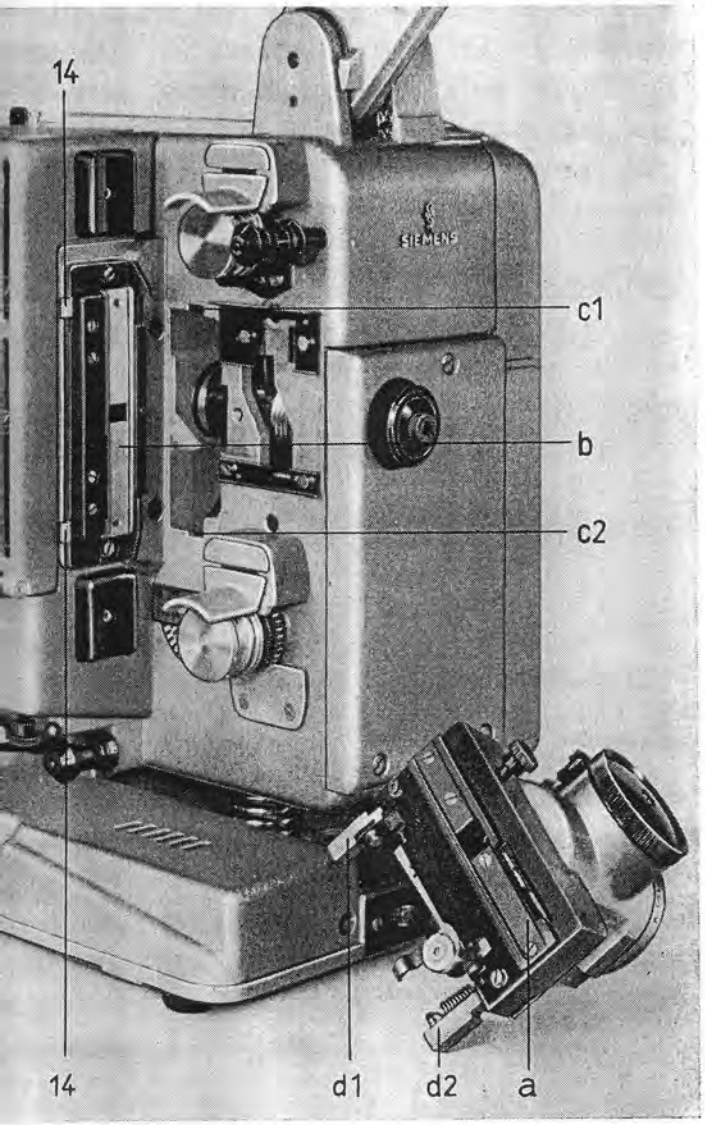
Cleaning of the filmgate

See picture 13.

Between the pressure plate C, which is fitted to the lens carrier and the filmgate plate B (in front of the lamphousing) is the filmpath. It is most important that this path is scrupulously clean. Specially when a green film (new film) is screened, it is possible that emulsion particles adhere to the filmpath. They are in the form of dark lines on the gate. These should always be cleaned and the gate should be left spotless. Any particles automatically "grow" during the next screening and could be the cause of scratches.
Although it is difficult to clean the gate of these particles, metal tools should never be used!

Picture 12





Picture 13 Lens carrier removed

The danger of damaging the gate by metal tools is great as it can so easily result in sharp edges, which will damage films.

Special jewellers wood slivers can be used. Siemens supplies these in the special Projector accessory kit, which is available as an extra.

For thorough cleaning the filmgate plate — also on the side —, it can be removed completely. This is easily done by pulling out the 2 levers (14). The filmgate plate can then be removed for cleaning. When replacing the gate plate make sure that the long slot for the claw is underneath. Simply press and return the 2 levers to their original position. Then the filmpath is thoroughly cleaned the lens carrier can be replaced.

Replacing the lens carrier

This is done by reversing the removing procedure (see page 13). Always make sure that the gate locking lever rests against the lens carrier and is thus turned fully to the right. Has the lever position been changed after removal of the carrier, then it should be returned to the position as on picture 12.

The 2 guides d1 and d2 are placed in their seatings c1 and c2 (picture 13).

Firstly press the lens carrier flush against the Projector and thereafter push it back towards the gate. When the gate locking lever 9 is turned to the left, it will click back and lock the carrier. By moving it to and fro you could check whether the lens carrier is properly seated.
From time to time the sprockets should be cleaned as well as the guide rollers and claw. The reflector and optical condenser can be cleaned with a special lens brush, with which also the lens can be carefully cleaned.

Lubrication

As the Projector is self lubricating it is unnecessary to oil any part of it.

Motor

The Projector motor is fitted with brushes. These brushes last more than 100 hours. To prevent damage to the commutator the motor is automatically disconnected when the brushes become too small. The motor cannot be turned on and the brushes will have to be replaced.

It is quite simple to change the brushes yourself, but it would be better to let your Siemens Authorised Workshop do this for you.

Maintenance inspection

Each apparatus with movable parts e.g. your motorcar of watch etc. need periodic inspections by tradesmen.
Also your valuable Projector should not be forgotten. Your Dealer will assist you by accepting your Projector for a general maintenance inspection.

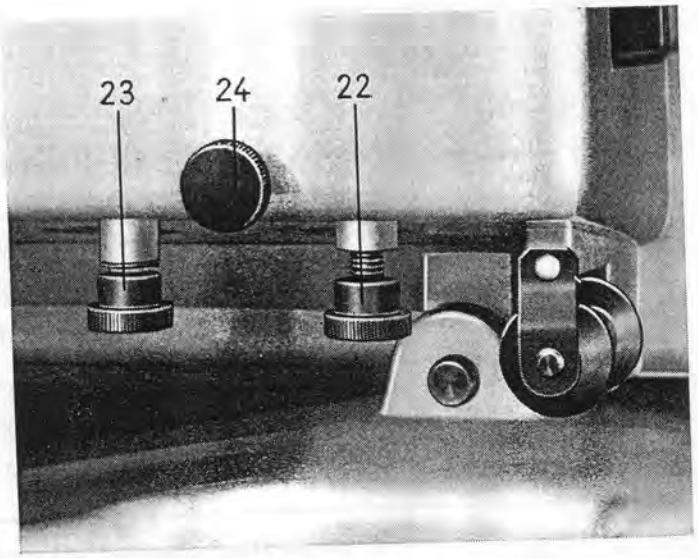
Lamp adjustment

The position of the lamp is already set to give you a bright clear image on the screen.

However to get a maximum light output, the lamp can be adjusted in three directions.

The following 3 knobs control the adjustments. The use of knob (24) is already explained. This is a locking screw, which has to be loosened to bring the lamp forwards or backwards so that it does not touch the condenser or reflector holder. Knob (22) regulates the height position and brings the lamp up or down by turning it clockwise or anti-clockwise knob (23) adjusts the lamp sideways. Adjustments are made while the lamphouse cover is closed, the Projector is running and the lamp turned on.

Make sure that top and bottom of the screen image are evenly illuminated by adjusting knob (22). By turning knob (23) an eveness can be obtained over the width of the screen. When the image is bright and even all over the screen, the lamp has been adjusted correctly.



Picture 14 Lamp adjustment control knobs

Important

When replacing the Projection lamp check it carefully and make sure it is the correct type. Not only the Wattage is important but also the Voltage.

In the following table are listed the various resistances and lamps to be used in conjunction with each other.

Resistance table for Siemens 2000 Projectors.

Projection Lamp	Intensity of current[1]) Ampere	Mains voltage (V) 95 —115	115 —125	125 —140	140 —155	155 —170	170 —190	190 —210	210 —230	230 —250
		Sf WD	Sf WD	Sf WD	Sf WD	Sf WD	Sf WD	Sf WD	Sf WD	Sf WD
250 W/ 50 V	5 A	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
375 W/ 75 V	5 A	6.11	6.12	6.13	6.14	6.15	6.16	6.17	6.18	6.19
500 W/100 V	5 A	6.21[2])	6.21[2])	6.23	6.24	6.25	6.26	6.27	6.28	6.29
750 W/100 V	7,5 A	6.21[2])	6.21[2])	6.23	6.34	6.35	6.36	6.37	6.38	6.39
1000 W/100 V	10 A	6.21[2])	6.21[2])	6.23	6.34	6.35	6.46	6.47	6.48	6.49

1) Allowable amperage to be set by means of the master switch (29) on the ampere-meter (28).
2) This resistor is also to be used in conjunction with recommended mains transformers.

It is clearly seen that in the lower voltage range the same resistor can be used for different wattages.

Apart from using resistors we recommend that if the Projector is used for prolonged periods with 750-Watt and 1000-Watt lamps, a transformer should be used (Secondary 125 Volt).

In case a transformer is used, resistors with a voltage range of 115 Volt—125 Volt should be utilised.

Example of how to order:

Assuming a Projector is to be operated with a 500-Watt lamp from a 220-Volt power supply (a.c. or d.c.), the correct resistor is:

1 Plug-in resistor Sf WD 6.28

Projection distance scale

Interchangeable lenses of various focal distances can be supplied for Siemens Projectors.
The focal distance of the lens regulates the screen size at a certain given throw.

16 mm Film

Projection distance	Focal distances in mm 25	35	50	65	75	85	100
	Width of screen in cm						
1 m	38	27	19	15	13	11	9
3 m	115	82	58	44	38	34	29
4 m	154	109	77	59	51	45	38
5 m	192	137	96	74	64	56	48
6 m	230	164	115	89	77	68	58
7 m	268	192	134	104	90	79	67
8 m	307	219	153	118	102	90	77
9 m	345	246	172	133	115	102	86
10 m	384	274	192	148	128	113	96
12 m	460	329	230	177	154	135	115
15 m	576	411	288	222	192	169	144
20 m	—	548	384	295	256	230	192
30 m	—	—	576	443	384	338	288
40 m	—	—	—	590	512	451	384

Technical changes reserved

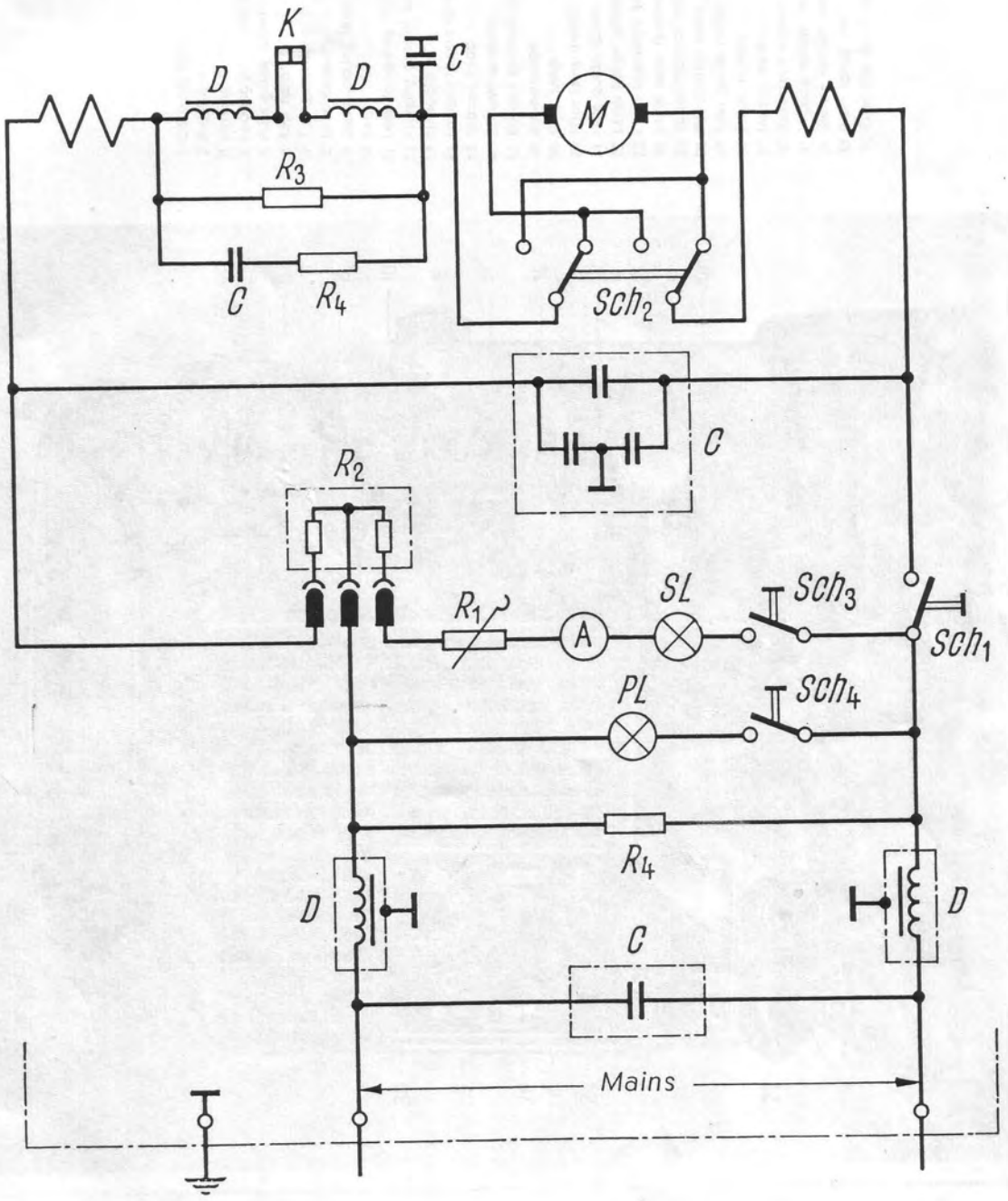
Worthwhile Technical Data

Actual picture size of 16 mm film 10,3×7,5 mm
Actual gate size of 16 mm film 9,6×7,0 mm
1 m of 16 mm film contains 131 frames

Screening times
16 mm Film

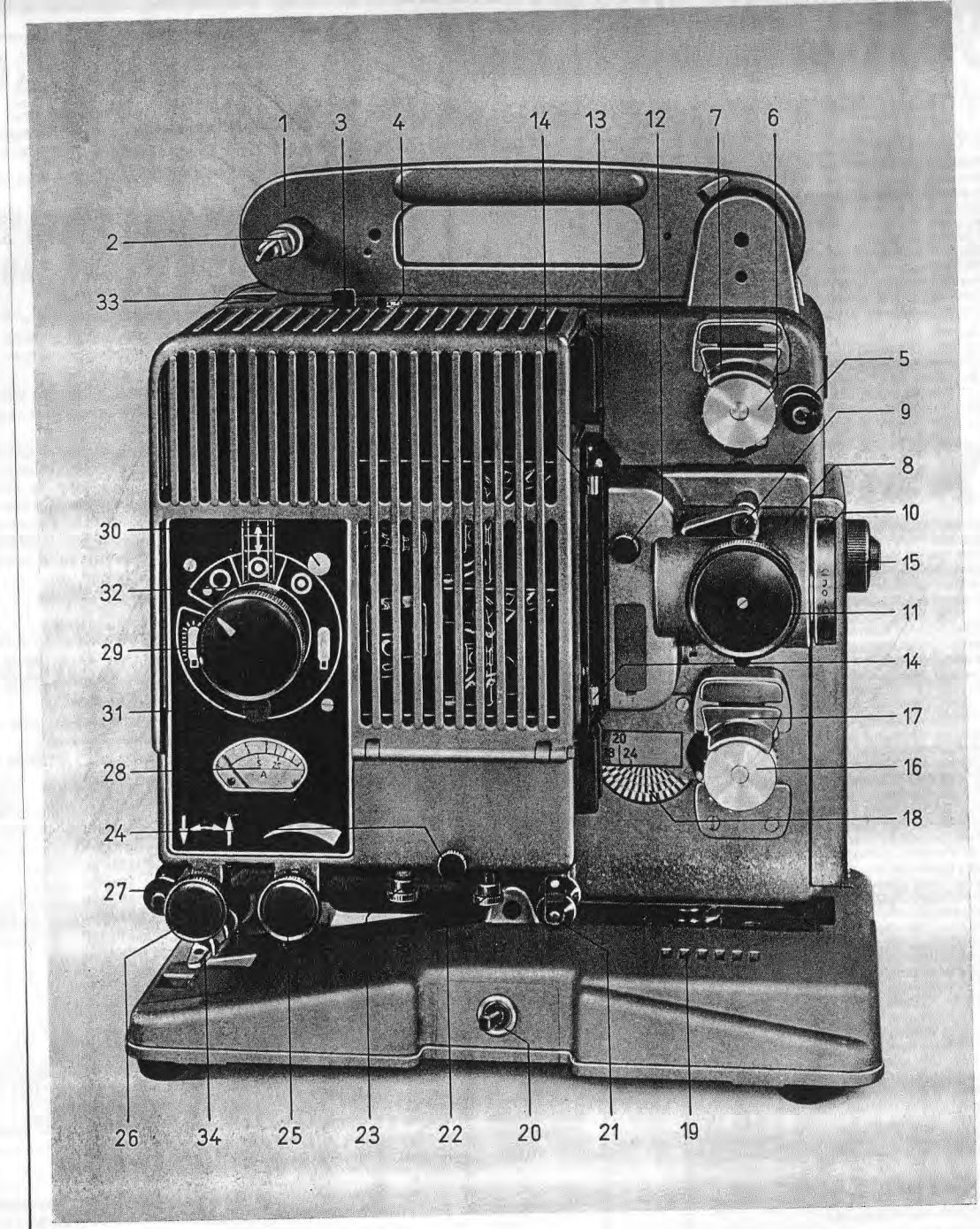
Film length	Projection time 16 f/s	24 f/s
1 m	8,2 sec	5,5 sec.
10 m	1 min. 22 sec.	55 sec.
20 m	2 min. 44 sec.	1 min. 50 sec.
30 m	4 min. 6 sec.	2 min. 45 sec.
50 m	6 min. 50 sec.	4 min. 33 sec.
100 m	13 min. 39 sec.	9 min. 6 sec.
120 m	16 min. 23 sec.	10 min. 55 sec.
240 m	32 min. 45 sec.	21 min. 50 sec.
300 m	40 min. 57 sec.	27 min. 18 sec.
600 m	1 hrs. 22 min.	54 min. 35 sec.
1000 m	2 hrs. 16 min.	1 hrs. 31 min.
1200 m	2 hrs. 44 min.	1 hrs. 50 min.

Circuit diagram of 2000 Projector



Explanation of symbols

A Ampere-meter
C Condenser
D Spark suppressor
K Contact governor
M Universal motor
PL Pilot lamp 15 Watts
SL Projection lamp
R_1 Rheostat control
R_2 Plug-in resistor
R_3 Balancing resistor
R_4 Discharge resistor
Sch_1 Motor switch
Sch_2 Reverse switch
Sch_3 Lamp switch
Sch_4 Pilot lamp switch



Picture 1 2000 Projector

1 Carrying handle/Front spool arm
2 Front arm spool spindle
3 Locking lever
4 Locking screw for lamphouse cover
5 Film guide roller
6 Top sprocket
7 Top sprocket clip
8 Lens carrier
9 Gate locking lever
10 Lens
11 Lens focussing knob
12 Framing control knob
13 Filmgate
14 Locking levers for filmgate plate
15 Inching knob
16 Bottom sprocket
17 Bottom sprocket clip
18 Stroboscope
19 Pilot lamp
20 Pilot lamp switch
21 Film guide roller
22 Lamp height adjustment knob
23 Lamp sideways adjustment knob
24 Lamp base locking screw
25 Speed control knob
26 Tilt control knob
27 Film guide roller
28 Ampere-meter
29 Master switch
30 Automatic inching button
31 Locking screw for rheostat control setting
32 Switch locking lever for rheostat control setting
33 Rear spool arm
34 Rear arm spool spindle