

PROJECTOR FP 20

The FP 20 projector is the result of the latest developments in the field of cinematography, and has been designed in accordance with practical requirements as revealed by thorough investigations. Its principal features are:

- Simple driving mechanism, using a minimum of transmissions
- Easy threading of the film, the path of which contains a minimum of parts
- Perfectly steady picture; curved film gate
- Framing device of special design
- Little maintenance
- Suitable for all kinds of 35 mm films
- Easy interchange of projection lenses without re-focusing
- Double-speed single-blade shutter; hence very high light efficiency
- Suitable for all kinds of arc and Xenon lamps
- Possibilities for remote control of focusing and framing
- Easily adaptable for SPP-lamphouse, type EL 4465

CONSTRUCTION OF THE PROJECTOR

Rectangular steel housing

The housing is a rectangular sheet-steel construction. Its front panel is completely flat so that the components fitted will not require any special alignment to ensure a smooth running of the film. Projection up to 15° upwards or 25° downwards is possible by tilting the column with respect to its base.

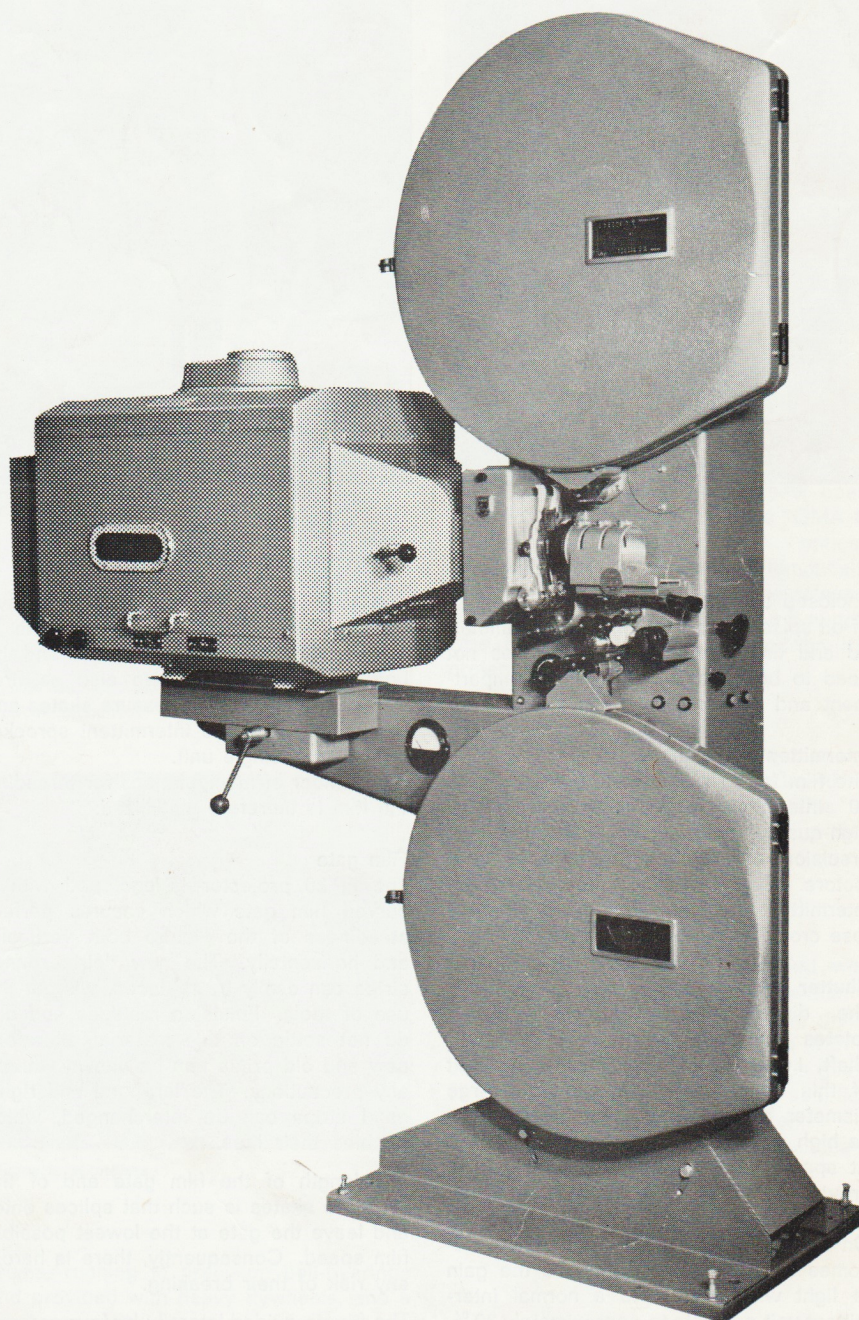
Simple driving mechanism

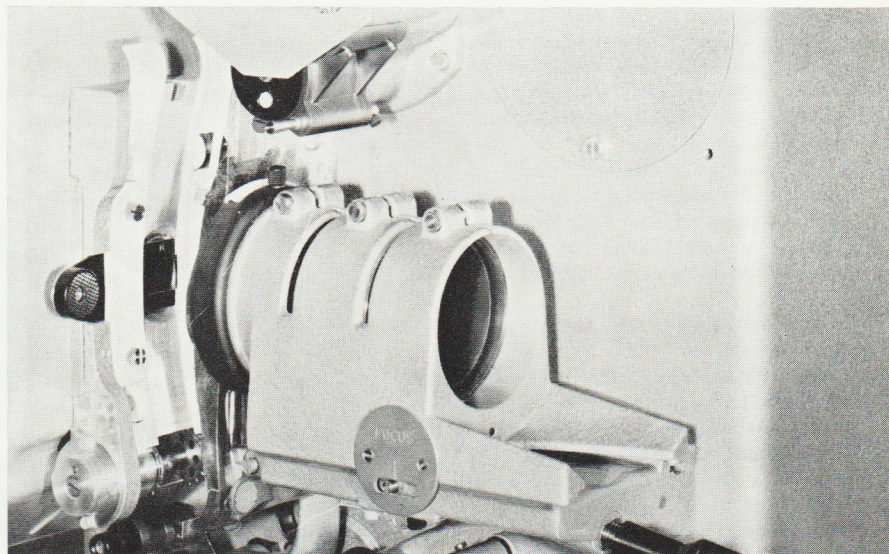
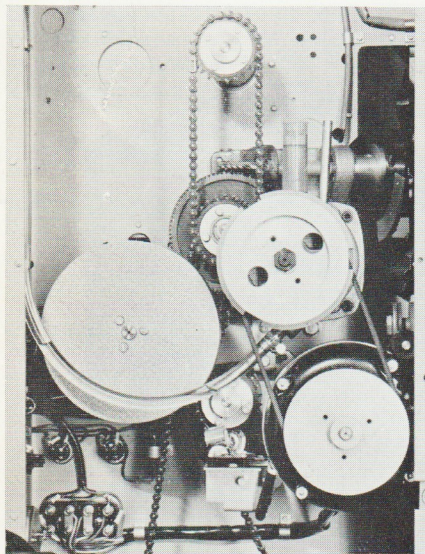
Owing to the ingenious combination of various transmission systems and a central framing device, the driving mechanism is extremely simple. The feed and the hold-back sprockets as well as the lower spool are driven by chains. These are slow-running chains on wheels of a synthetic material which is practically indestructible and ensures silent operation.

The framing device requires no phase correction and hence no gear transmission for this purpose.

All the spindles and shafts run in sealed ball-bearings, requiring no lubrication, and all the guide rollers are made of self-lubricating material.

The oil bath of the Maltese cross is fully





enclosed and easy to replenish. The risk of oil splashes on the film is thus eliminated and the driving mechanism does not need to be housed in a sealed compartment and is therefore readily accessible.

Intermittent mechanism

The film is moved by means of a normal 90° intermittent unit, made of the same high-quality material and with the same precision as that of other Philips projectors. On account of the light-weight intermittent sprocket, wearing of the Maltese cross is reduced to a minimum.

Shutter efficiency

The disc-shaped, single-blade shutter rotates at twice the speed of the cam shaft, i.e. with 2880 r.p.m. As a result of this double speed and of the large diameter of the shutter, its efficiency is as high as 54%.

At special request, the projector can be provided with an accelerated intermittent unit and a shutter with a smaller blade. On account of this, the efficiency becomes as high as 70%. Hence the gain of light with respect to a normal intermittent unit amounts to approximately 30%.

Film path

The carefully designed film path is simple

and logical. As several functions have been combined, the number of parts is surprisingly small. Thus, the feed and the hold-back sprockets serve also as fire-trap rollers, while the pressure skates and the pad shoe of the intermittent sprocket constitute a single unit.

The number of manipulations for threading the film is therefore minimized.

Film gate

The FP20 projector is equipped with a curved film gate which ensures perfect steadiness of the picture both vertically and horizontally. The new delrin runner strips can easily be replaced, without the use of tools. Emulsion residues and dirt do not settle on this material, therefore new and old prints can be shown without any precautions. The left-hand and right-hand strips can be interchanged, which doubles their lives.

The length of the film gate and of the pressure skates is such that splices enter and leave the gate at the lowest possible film speed. Consequently, there is hardly any risk of their breaking.

The film is guided laterally by four ceramic rollers, two at the top and two at the bottom of the film gate, which can easily be replaced if necessary.

The skate pressure is adjusted with one central knob; a scale facilitates checking and re-adjustment.

The aperture plates for different aspect ratios are inserted into a slit directly behind the gate; they snap automatically into their correct position and can readily be interchanged, even during projection.

In order to prevent too much heat dissipation at the film gate when using a heavy duty arc or Xenon lamp, the projector can be provided with a cooling system (water), type EL 4212/00.

Lensholder

The lensholder is suitable for lenses with a diameter of up to 70,6 mm ($2\frac{25}{32}$ "). It slides over a sturdy support fixed to the projector. The fine-focusing screw, in conjunction with a pressure spring, makes it possible to shift the lens without any backlash.

The lensholder with lens can be taken from the support in a single manipulation so that, for change-over to another aspect ratio, it can readily be replaced by a holder fitted with the requisite lens. During installation the lenses are so adjusted in their holders that they can be interchanged without any focusing apart from

a possible correction imposed by the film itself. A scale has been provided for checking the focusing.

On request, the projector can be equipped with an electric remote-control device for adjusting the focus from any part of the theatre.

Push button operation

Two push buttons are mounted at the operation side of the projector. A green one for starting and a red one for stopping. Both push buttons are located in such a way that a fast search for the starting frame is obtained by depressing the start and stop push buttons in quick succession, (inching).

Another pair of push buttons for change over of picture and sound is placed at the front side of the cabinet. A green push button for picture and sound on (change over), and a red one for switching off the amplifier.

Centrifugal switch

This switch, located in the lower spool box, is driven by the film; in the event of film rupture or if the film is not fixed correctly to the lower film spool it automatically switches off the motor and closes the electro-magnetic dowser.

Spoolboxes

The projector can be supplied with spool boxes for either 2000 ft (600 m) or 6000 ft (1800 m) of film.

The upper spool box has a time scale and an inspection lamp. At request, the projector can be supplied with american spool shafts (diam. $\frac{5}{16}$ ").

Soundheads

The projector can be equipped with both a magnetic and an optical soundhead. These form separate units which can easily be fitted and removed. The necessary mounting holes for the soundheads are already provided in the projector cabinet. When not used, they are covered.

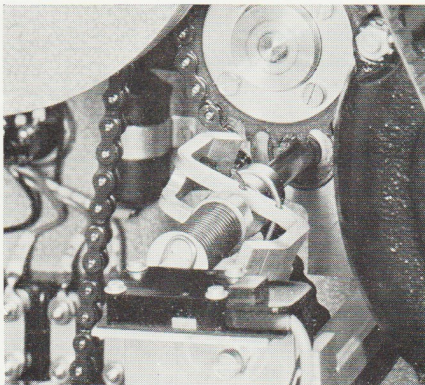
Optical soundhead

This soundhead is of the same construction as that of the other well-known Philips projectors. The sound drum is driven by the film. The starting time is only about 3 seconds and a very small pull is sufficient to keep the drum rotating at its rated velocity. The film is therefore not stretched between the sound drum and the take-up sprocket but forms a slack loop which absorbs all the small shocks caused by the teeth engaging in the film perforations, thereby precluding any risk of hoarseness on account of sprocket modulation.

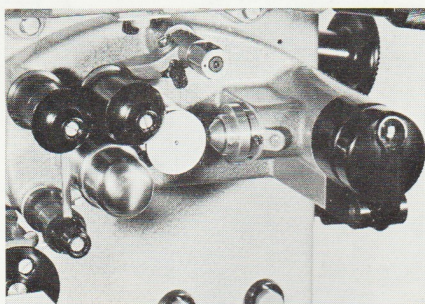
As a standard, the soundhead is provided with a photocell, which can be substituted, if required, by a solar cell, type EL 4402.

Magnetic soundhead

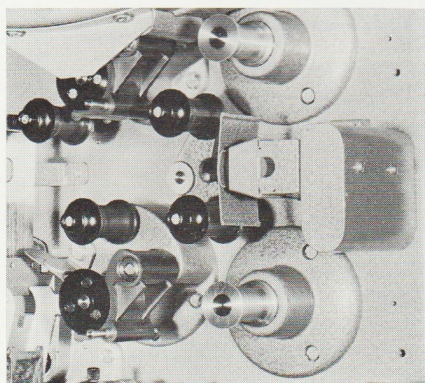
The magnetic soundhead has two sound



Centrifugal switch



Optical soundhead



Magnetic soundhead

drums, running in precision ball-bearings and provided with heavy flywheels, and a head assembly for one-to-four-track reproduction. If a magnetic soundhead is used, the projector is equipped with two feed sprockets, the upper one for pulling

the film from the reel and the lower one for pulling it through the soundhead.

The requisite tension in the piece of film between the two feed sprockets is obtained by means of spring-loaded rollers.

Some important advantages of this design over the usual construction — where the sprocket of the soundhead is not coupled to the mechanism but driven by the film — are:

- lower stress on the film perforations;
- smoother running of the film through the soundhead, irregularities originating from the unwinding reel being completely excluded.

AUTOMATIC SYSTEM-SELECTOR SWITCH

If an FP 20 projector, equipped with an optical and a magnetic soundhead, operates in conjunction with a Philips "OMA 4" amplifying equipment the choice "optical/magnetic" can be effected automatically when the film is threaded in the relevant soundhead by means of a selector switch, type EL 4214/00, to be mounted on the projector.

SLIDE ATTACHMENT

The projector can be equipped with a device for projecting lantern slides of $3\frac{1}{4}'' \times 4''$ (83 x 100 mm) or of $3\frac{1}{4}'' \times 3\frac{1}{4}''$ (83 x 83 mm).

LIGHT SOURCES

The projector is normally provided with a mounting table, of which the distance between optical axis and mounting plane is 255 mm (10"). If a lamphouse with a different height of the optical axis is going to be used, the projector can be supplied with an adjustable mounting table. For an SPP lamphouse is also available a special mounting table.

TYPE NUMBERS AND WEIGHTS

Description	type	Net weight		
		lbs	ozs	kg
FP 20 projector with optical soundhead and 2000 ft (600 m) spool boxes	LCB 0020/00*)	310	—	151
6000 ft (1800 m) spool boxes	LCB 0020/02*)	370	—	179
Magnetic soundhead	EL 4028/00	14	5	6.5
Lens holder	EL 4029/00	1	5	0.6

*) The above projectors are provided with an asynchronous motor for 110/220 V, 50 c/s, 24 frames/sec.

On request, they can also be equipped with:

- asynchronous motor for 110/220 V, 60 c/s, 24 frames/sec;
- synchronous motor 220/380 V, 50 c/s, or 60 c/s, 24 frames/sec;
- synchronous motor 220/380 V, 50 c/s, 25 frames/sec.

