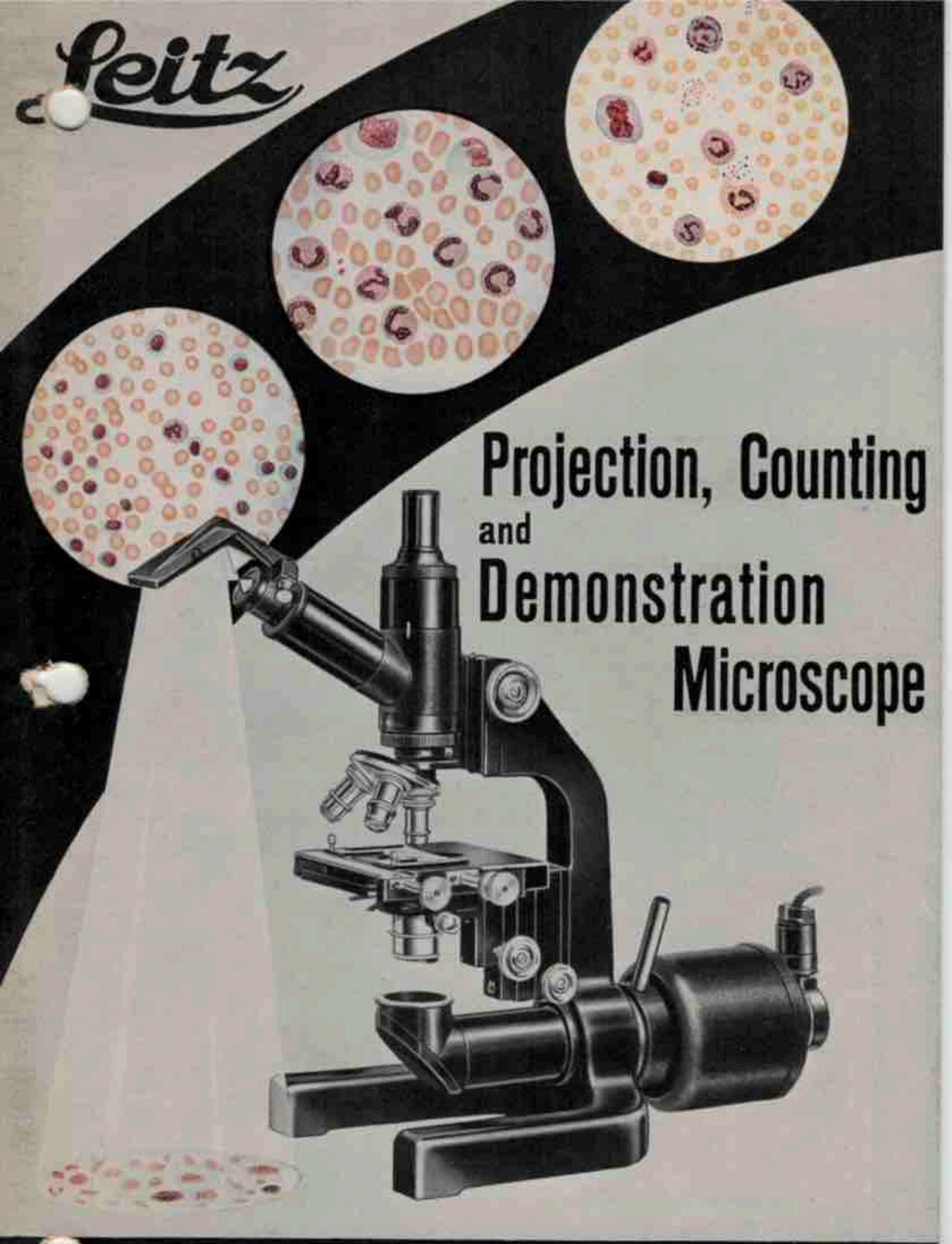
Leitz



Projection, Counting and Demonstration Microscope

E. LEITZ, INC., NEW YORK

Introductory Note.

The present pamphlet describes a new type of microscope stand which will interest microscopists since it departs radically from existing instruments by having the illuminant incorporated in the stand itself. The source of light gives perfectly even illumination of the field of view, and the finstrument provides microscopic images which render the new "Projection Counting and Demonstration Microscope" particularly suitable for diagnostic, haematological and bacteriological examinations in the clinic and hospital. It is a tedious business to count blood corpuscles with the ordinary microscope, but the process is simplified to such an extent by the projection of the counting plate of Metz's haemacytometer that no fatigue is experienced. Darkfield illumination becomes a very simple matter, as the built-in source of light always supplies a properly adjusted beam. This is a very important point in photomicrography, for photomicrographs can of course be taken with the new instrument by using a camera attachment and without changing the illuminant. The convenient short-distance projection of the microscopic image, and the possibility of being able to discuss it in a small circle of observers, or even to draw it, give to the instrument a scope for which the ordinary microscope is unsuited. It thus fills a gap which only the "Panphot" could otherwise fill, but for which the versatility of the "Panphot" is not always necessary.

WETZLAR, July 1938.

ERNST LEITZ.

Description of the Microscope

The lower end of a horse-shoe shaped stand is formed so that a light-tight housing may be attached to it, while the housing is continued in front to form a tubular portion, with elbow, containing a plane mirror and suitable illuminating components. The only components contained on the upper portion of the stand are the rack-and-pinion motion for the coarse focusing of the image, and the tube changing device, associated with the large microscope stands, for the insertion of different tubes (monocular, binocular, etc.) and the objective nosepiece. At approximately the middle of the stand-pillar or limb is mounted the carrier for the object stage, the substage, and the low micrometer screw fine focusing adjustment mounted on double ball bearings and acting on the stage.

For monocular viewing, and for the projection or drawing of microscopic images, the combined viewing and photographic tube (from the "Panphot") is used. This tube is conveniently sloped to allow of visual observation with the head and body in the natural, comfortable position.

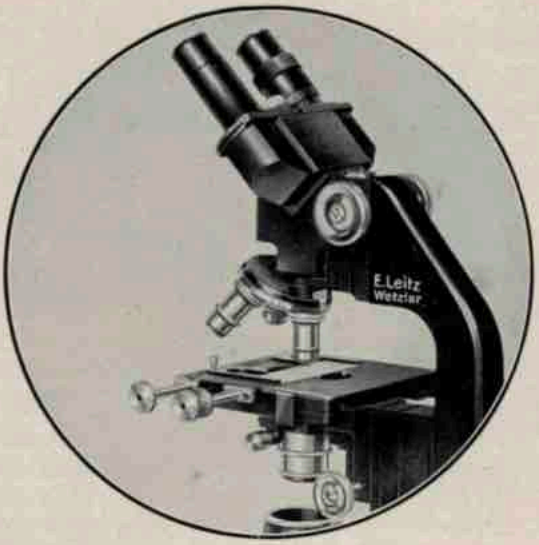


Fig. 1.

On the lateral viewing eyepiece may be placed the drawing mirror which projects the microscopic image on to the drawing surface situated in front of the microscope. Here the image can either be re-drawn or discussed by a small circle of onlookers.*

* H. E. Büttner and L. Mohr: "The Simplification of Teaching in Medical Microscopy." **Zeitschrift für wissenschaftl. Mikroskopie u. Mikroskopische Technik,** Vol. 53, 1936, pp. 273 - 278.

For protracted visual work it is advisable to use the binocular tube with inclined eyepieces (Fig. 1) which, as on the standard microscope, is interchangeable with the monocular tube. For dissecting work, our Greenough type stereo-binocular tube with inclined eyepieces may be fitted to the instrument in the same way as the other tubes.

As regards the object stages, there is the same wide freedom of choice with the "Projection, Counting and Demonstration Microscope" as there is with the other conventional types of stand. In recent years, medical men have shown an increasing preference for the built-in square mechanical stage, the guides of which are now mounted on ball-bearing tracks. The microscope can also be supplied with a simpler type of stage, viz., mechanical stage No. 22621. In many cases, however, the round revolving and centering stage will be found to meet most requirements; the centering screws of this stage enable the object to be displaced to an extent of 10 mm. A special adaptor (mechanical stage No. 22616) can be supplied separately at any time to fit this simple stage.

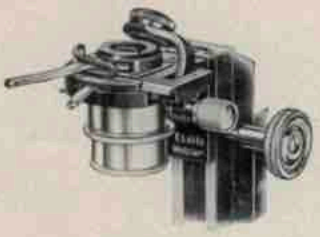


Fig. 2a.



Fig. 2b.

At the lower end of the tube changing device is a detachable carrier portion which can be fixed by a clamping screw. To this is attached the triple or quadruple nosepiece for quickly changing the objectives used for visual work in ordinary transmitted light.

The substage for transmitted light is similar to that of our polarising microscopes and fitted with a condenser system with two iris diaphragms. It is displaceable in the optical axis by rack and pinion, and comprises a two-lens condenser, the top lens of which may be swung out of the path of the rays at will according to the focus of the objective in use (Fig. 2a). Between these two condenser lenses is situated the aperture iris diaphragm for the objectives of higher power; for objectives 1 and 2 however, the aperture diaphragm is located on the lower end of the substage. The swing-out portion of the condenser intended for higher-power objectives only is fitted on a dovetail slide into which may be inserted one of the darkfield condensers, similarly mounted. Further information regarding darkfield illumination, can be obtained from our special catalogue D No. 7059a.

Illumination for the new microscope is provided by a low-voltage filament lamp in pre-centred socket. It is mounted in a light-tight housing which screws on to the lower part of the stand by means of a thread cut in the helical focusing mount of the aspherical illuminating lens. The illuminating tube with its elbow portion contains suitable optical components for illumination, and the plane mirror set at an angle of 45°.

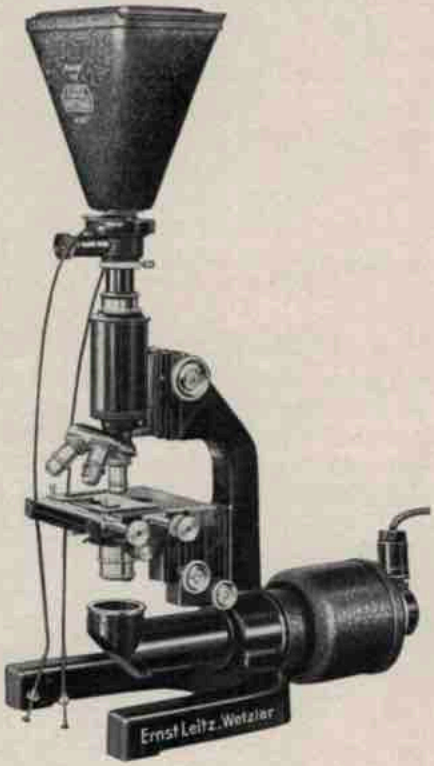


Fig. 3.

For taking photomicrographs in conjunction with the Projection, Demonstration and Counting Microscope, all our camera attachments may be used — the "Makam" or "Macca" plate cameras and, in addition, the micro ibso attachment for the Leica camera. To make it more convenient to photograph microscopic objects with the camera attachment, we advise users to procure an ordinary monocular tube without drawtube, which is interchangeable with the standard viewing and photographic tube. As shown in Fig. 3, this permits of more convenient observation through the lateral focusing telescope of the "Makam"

camera attachment. In all three camera attachments, sharp focusing of the image is controlled by the lateral viewing telescope mentioned before, which is accurately adjusted to the plane of the plate or film.

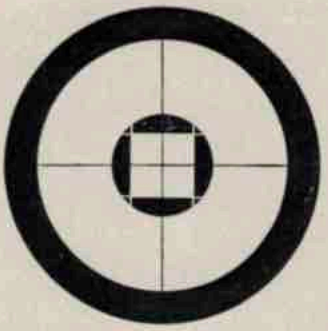


Fig. 4. Counting Plate of the Metz Eyepiece.

By using the Metz Counting Eyepiece (Fig. 4) in combination with the Projection, Counting and Demonstration Microscope, it is a much easier task to count blood corpuscles, since the counting plates can be projected. Experience shows that protracted counting with the monocular tube is extremely tiring, whereas it is far more convenient and much less fatiguing to count the corpuscles from the projected image. As regards the manipulation of Metz's haemocytometer, please refer to Pamphlet E No. 2356.

Outfits.

Outfit No. 1

Codeword

Projection and Counting Microscope comprising:

Large stand with horse-shoe foot without inclination joint, with rack-and-pinion motion on upper part for coarse focusing of the image, tube-changing device for the insertion of different tubes and the objective nosepiece on detachable carrier portion; low-lying fine focusing motion on ball bearings, acting on the object stage; round revolving and centering object stage No. 23 (stage-plate 122 mm diam.); large substage with double condenser with two iris diaphragms, with rack-and-pinion motion for displacing the condenser in the optical axis and filter carrier with 3 filter discs; built-on low voltage lamp 6 volts 5 amps. with pre-centered socket, in light-proof housing, and with aspherical illuminating lens in helical focusing mount, together with illuminating tube with elbow portion, and two illuminating lenses and deflecting mirror for the illuminating rays. Cabinet for the instrument **epame**

Interchangeable wide monocular tube with lateral inclined viewing tube which may be put in and out of action . . . . . **etqne**

Optical Outfit:

Nosepiece for 3 objectives . . . . . **Tripo**

Achromatic Objective 3 R, N. A. 0.25 — 0.15 initial magnification 4.5 — 10 × . . . . . **Guabc**

Achromatic Objective 6 L, N. A. 0.65, initial magnification 45 × **Acmat**

Achromatic Oil Immersion $^1/_{12}$, N. A. 1.25, initial magnification 90× **Gwlaw**

Huyghens Eyepieces 5 ×, 8 × and 12 × . . . . . **epboe**

Magnifications, 50 × to 1080 ×

Complete Outfit (less resistance for the lamp) . . . . . **epdse**

Accessories for drawing and projecting Microscopic Images:

Drawing Mirror in mount, with joint for focusing the mirror, for placing on the lateral viewing eyepiece . . . . . **piigl**

Case for above . . . . . **ipzki**

The following item if desired:

Wooden base plate with sliding board for the accommodation of the drawing paper . . . . . **piihy**

Outfit No. 2

Codeword

Projection and Counting Microscope as (1) above, but with simplified square mechanical stage No. 2262, without scale . . **epfwe**

Interchangeable wide monocular tube with lateral inclined viewing tube which may be put in and out of action . . . . . **etqne**

Optical Outfit as (1) above . . . . . **Guxte**
Magnifications, 50 × to 1080 ×

Complete Outfit (less resistance for the lamp) . . . . . **epgye**

Outfit No. 3

Projection and Counting Microscope as (1) above, but with built-in large square mechanical stage No. 24-50 with scales and verniers . . . . . **eprte**

Interchangeable wide monocular tube with lateral inclined viewing tube which may be put in and out of action . . . . . **etqne**

Optical Outfit as (1) above . . . . . **Guxte**
Magnifications, 50 × to 1080 ×

Complete Outfit (less resistance for the lamp) . . . . . **epone**

Outfit No. 4

Projection and Counting Microscope as (1) above, but with built-in large round revolving and centring mechanical stage No. 24–55 with scale and vernier . . . . . **epsve**

Interchangeable wide monocular tube with lateral inclined viewing tube which may be put in and out of action . . . . . **etqne**

Optical Outfit as (1) above . . . . . **Guxte**
Magnifications, 50 × to 1080 ×

Complete Outfit (less resistance for the lamp) . . . . . **epuze**

Other suggested Optical Outfits:

Outfit for clinical investigations:

Nosepiece for 4 objectives . . . . . **eetah**
Achromatic Objectives 1, 3R, 6L . . . . . **eetah**
Fluorite Oil Immersion $^{1}/_{12}$a, N. A. 1.32 . . . . . **eetah**
Huyghens Eyepieces 6 ×, 10 ×, 16 × . . . . . **eetah**
Periplanatic Eyepiece 25 × . . . . . **eetah**
Huyghens Micrometer Eyepiece 6 × . . . . . **eetah**
Magnifications, 10 × to 2375 × . . . . . **eetah**

Outfit for anatomical, histological and bacteriological work:	Codeword
Nosepiece for 4 objectives Achromatic Objectives 1, 3R, Fluorite 6a Fluorite Oil Immersion $^1/_{12}$a, N. A. 1.32 Huyghens Eyepieces 5 ×, 8 × Periplanatic Eyepieces 12 ×, 20 × Huyghens Micrometer Eyepiece 6 × Magnifications, 16 × to 1900 ×	**eetgu**
Apochromatic Outfit for scientific work:	
Nosepiece for 4 objectives Apochromatic Objectives 16 mm, 8 mm, 4 mm Apochromatic Oil Immersion 2 mm, N. A. 1.32 Periplanatic Eyepieces 5 ×, 8 ×, 12 ×, 25 × Periplanatic Micrometer Eyepiece 6 × Magnifications, 60 × to 2300 ×	**eetoi**
Accessories for binocular microscopy:	
Interchangeable binocular viewing tube "S" with inclined eyepieces, without case	**Aufse**
Case for above	**deegs**
The following items to choice:	
Paired Huyghens Eyepieces 6 × B	**Gizra**
Paired Huyghens Eyepieces 8 × B	**Gidro**
Paired Huyghens Eyepieces 10 × B	**Givyr**
Paired Periplanatic Eyepieces 6 × B	**Girse**
Paired Periplanatic Eyepieces 8 × B	**Girof**
Paired Periplanatic Eyepieces 10 × B	**Gizem**
Accessories for dark-field illumination:	
Centering darkfield condenser D 1.20 A for use with oil immersion objectives, fitting the slider guide of the substage	**pyiif**
Objective body with iris diaphragm, for reducing the aperture of the objective	**Irtis**
Accessories for working in polarised light:	
Triple nosepiece with independently centering screw threads for the objectives, on detachable carrier, with slit for insertion into compensators	**qiicw**
Polariser with sleeve and iris diaphragm for inserting in the substage	**iqsui**
Analyser in mount for insertion into the triple nosepiece	**iqtwi**
	eplge

For critical examinations in polarised light we recommend the use of objectives free from polarisation. The prices are higher than those shown on page 11.

Codeword

Accessories for photomicrography:

"Makam" Micro Camera Attachment for plates $3^1/_4 \times 4^1/_4$", with focusing head with lateral viewing telescope (focusable), and with time and instantaneous shutter, Periplanatic eyepiece 10×, 2 metal plate holders, 1 ground glass focusing screen, 2 wire releases and cabinet . . . . . **Makam**

The same camera, for plates $1^3/_4 \times 2^3/_8$" . . . . . **Macca**

Micro Attachment of the same construction, etc., for use with the Leica camera . . . . . **Mikas**

It is advisable to procure the following item for the above:

Interchangeable wide monocular tube with drawtube and scale; without case . . . . . **bxeef**

Accessories for counting blood corpuscles with the Metz haemacytometer:

Single chamber, counting eyepiece with counting plate inserted in the diaphragm plane of the eyepiece; 6 cover-glasses; 2 pipettes. In case . . . . . **Hemez**

Condenser lens, specially computed for the extra thickness of the Metz haemacytometer slide; it is interchangeable with the standard top condenser lens and is used only in conjunction with the Metzchamber . . . . . **etrpe**

Monocular tube „etqne", but with lateral viewing tube with focusing device to compensate for variations in the focus of different objectives when calibrating the Metz haemacytometer . . . . **etsre**

Accessories for counting blood corpuscles with the Metz haemacytometer, complete . . . . . **etuve**

Optical data of micro objectives for ordinary transmitted light.

Designation of the Objectives		Initial Magnification	Focal Length (F/Ob.) mm	Numerical Aperture	Free Working Distance mm	Micrometer Values with Huyghens Eyepiece 6×	Codeword
Achromatic Dry Systems	0	1 ×	56	0.05	55	143 µ	Acrom
	1*	2.7 ×	42	0.08	40	58 µ	Acoll
	1 K	3.2 ×	24	0.08	3.2	44.5 µ	oenee
	1	3.2 ×	40	0.12	34.5	49 µ	Acube
	1b	4.3 ×	32	0.15	27	37 µ	Acaba
	2	6 ×	24	0.20	16	27.5 µ	Acedu
	2b	8 ×	20	0.25	7.7	20 µ	obpee
	3	10 ×	16	0.25	5.8	15.6 µ	Acora
	3F	11 ×	16	0 30	2.6	14 µ	Aflor
	3b	14 ×	13	0.40	3.2	12 µ	Acodo
	4	20 ×	9	0.45	2.0	8 µ	Aclan
	5	30 ×	6	0.65	0.75	5 µ	Acati
	6	45 ×	4	0.85	0.32	3.6 µ	Actis
	6L	45 ×	4	0.65	0.60	3.6 µ	Acmat
	7	62 ×	3	0.85	0.28	2.5 µ	Acise
Water Immersions	1/7 W	50 ×	3.6	1.00	0 40	3.0 µ	Wates
	10	90 ×	2 1	1.20	0,10	1.8 µ	Watim
Homogeneous Oil Immersions	16 mm	10 ×	16.0	0.25	0.65	16 µ	Oilex
	8 "	22 ×	8.0	0.65	0.45	8 µ	Oilat
	1/18	100 ×	1.8	1.30	0.11	1.6 µ	Oilim
Fluorite Dry Systems	6 a	42 ×	4.2	0.85	0.38	3.8 µ	Fluca
	7 a	58 ×	3.2	0.85	0.28	2.8 µ	Fluor
	8 a	70 ×	2.6	0.90	0.25	2.3 µ	Flume
	9 a	85 ×	2.2	0.90	0.13	1.8 µ	Flugo
Fluorite Homogeneous Oil Immersions	1/7 a	54 ×	3.45	0.95	0.20	3.0 µ	Fluim
	1/10 a	70 ×	2.60	1.30	0.18	2.2 µ	Fluri
	1/12 a	95 ×	1.95	1.32	0.11	1.7 µ	Flues
	1/16 a	114 ×	1 60	1.32	0.08	1.4 µ	Fluxu
Apochromatic Dry Systems	16 mm	12 ×	16	0.30	5.0	14.3 µ	Aposa
	8 "	23 ×	8	0.65	0.85	7.2 µ	Apoct
	4 "	46 ×	4	0.95	0.20	3.5 µ	with correct. collar Apovi
	3 "	65 ×	3	0.95	0.15	2.6 µ	Apore
Apochromatic Homogeneous Oil Immersions	3 mm	65 ×	3	1.32	0.13	2.5 µ	Apofo
	3 "	65 ×	3	1.40	0.13	2.5 µ	Apoty
	2 "	92 ×	2	1.32	0.11	1.75 µ	Apoim
	2 "	92 ×	2	1.40	0.05	1.75 µ	Apoxu

Huyghens eyepieces 4× to 12×
Huyghens eyepiece 16×
Periplanatic eyepiece 4×
Periplanatic eyepieces 5×, 6×, 8×
Periplanatic eyepieces 10×, 12×, 15×, 20×, 25×

Electrical Accessories:

	Codeword
Resistances and Spare Bulbs for the low voltage Filament Lamp 6 volts 5 amps.:	
For Alternating Current:	
Regulating Transformer for 110/220 volts, with ammeter	**Redyx**
Non-regulating Transformer for 110 and 220 volts	**rakee**
For Direct Current:	
Resistance for 110 volts, with additional regulating resistance and ammeter	**Rekur**
Resistance for 220 volts, with additional regulating resistance and ammeter	**Regam**
Fixed Resistance for 110 volts	**Redig**
Fixed Resistance for 220 volts	**Reduk**
Spare Bulb with pre-centered socket, 6 volts 5 amps.	**atiih**

E. LEITZ, INC.

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