8c. Shutter Speed Setting Mechanism

Introductory Remarks

A. Size 00 Shutters

1. In the Section 3a (Escapement Mechanism), the fact has already been mentioned that two selectively operable escapement levers are associated with the star wheel. Therefore, the shutter speed setting ring of the new shutter model has to cooperate with these two levers. For this purpose the speed setting ring as shown in Figs. 35a and 35b on Sheet 83 has been provided with a cam slot 223.

2. During an initial period of manufacture of the new shutter, the following operative relation existed between the movement, the escapement levers and the shutter speeds:-

Shutter Speed sec.	Geared Escapement	Small Lever	Large Lever
1/300	Inoperative	Inoperative	Inoperative
1/125	Operative	Inoperative	Inoperative
1/60	Operative	Inoperative	Inoperative
1/30	Operative	Operative	Inoperative
1/15	Operative	Operative	Inoperative
1/8	Operative	Inoperative	Operative
1/4	Operative	Inoperative	Operative
1/2	Operative	Inoperative	Operative
1	Operative	Inoperative	Operative

Table 1

The shutter speed setting ring used in the case of Table 1 is shown in Fig. 35a; the escapement 00381-G20 was used in connection with this setting ring.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
Maßstab:	Repair Instructions				Sheet No. 81

Shutter Speed Setting Mechanism, cont.

3. In due time, while the escapement 00381-G20 was retained, a different relationship between the two escapement levers and the various shutter speeds was adopted; in other words, the small escapement lever is operative at 1/30, 1/15 and 1/8 sec., the large escapement lever being operative at 1/4 sec. and more. While this relationship is shown in Table 2 below, Fig. 35b shows the corresponding shutter speed setting ring.

Shutter Speed sec.	Geared Escapement	Small Lever	Large Lever
1/300	Inoperative	Inoperative	Inoperative
1/125	Operative	Inoperative	Inoperative
1/60	Operative	Inoperative	Inoperative
1/30	Operative	Operative	Inoperative
1/15	Operative	Operative	Inoperative
1/8	Operative	Operative	Inoperative
1/4	Operative	Inoperative	Operative
1/2	Operative	Inoperative	Operative
1	Operative	Inoperative	Operative

Table 2

4. A third type of shutter speed setting ring is required in cases in which the escapements 00475-G20.1 or 00476-G20, respectively, are used. See also Para. 1c, Sheet 58 (Escapement Mechanism). This setting ring 00375-137.1 is shown in Fig. 36 on Sheet 84.

5. IMPORTANT: Where it is intended to interchange the various escapements, it will also be necessary to exchange the speed setting rings also.

Shutter Speed Setting Mechanism, cont.

The shutter speed setting rings shown in Figs. 35a and 35b differ at the points A, B and C.

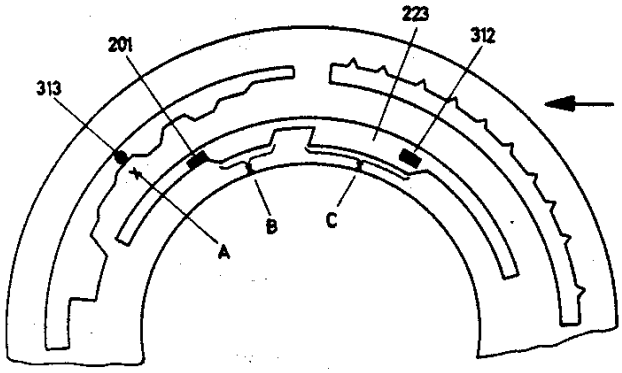


Fig. 35a

Fragmentary View of Setting Ring for Escapement 00381-G20

Setting for 1/8 sec.

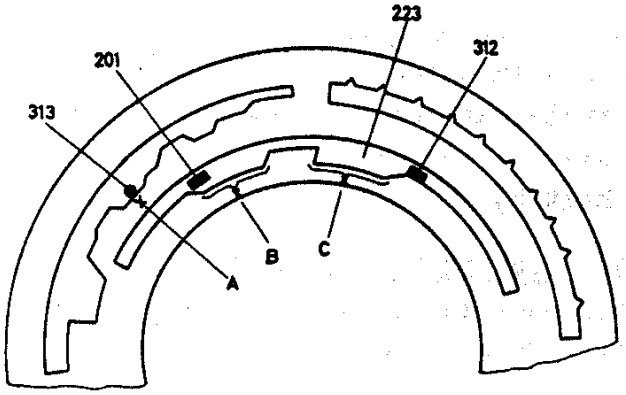
312 Arm of Large Lever
313 Escapement Control Pin
201 Arm of Small Lever
223 Cam Slot for the Two Escapement Levers

Fig. 35b

Fragmentary View of Modified Setting Ring for Escapement 00381-G20

Setting for 1/8 sec.

312 Arm of Large Lever
313 Escapement Control Pin
201 Arm of Small Lever
223 Cam Slot for the Two Escapement Levers



When ordering setting rings, please state which design (Fig. 35a or Fig. 35b) is involved.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
Maßstab:	Repair Instructions				Sheet No. 83

Shutter Speed Setting Mechanism, cont.

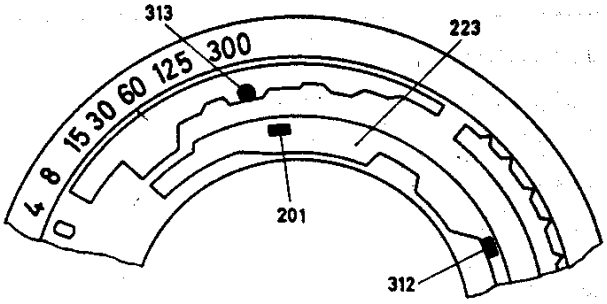


Fig. 36

Fragmentary View of Setting Ring 00375-137.1 for escapements 00475-G20.1 and 00476-G20

Setting for 1/8 sec.

201 Arm of Small Lever

312 Arm of Large Lever

313 Escapement control Pin

223 Cam Slot for the Two Escapement Levers

6. All shutter speed setting rings are arranged to be caught in the positions corresponding to the indicated shutter speeds. For this purpose, the shutter speed setting rings have a set of detent notches which cooperate with the rivet 314 of detent lever 00375-U543 (see Fig. 37 below and Sheet 63 (Selftimer and Flash Synchronizer).

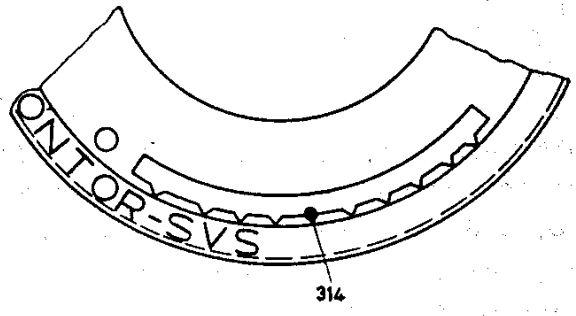


Fig. 37

Rivet 314 Cooperating with Detent Notches

B. Size O Shutters

1. The design of the escapement of Size O shutters is shown in the illustrations of the "Escapement Mechanism" section. Table 3 on the following sheet shows the relationship between the escapement parts and the various shutter speeds.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
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Shutter Speed Setting Mechanism, cont.

Shutter Speed sec.	Lever Escapement on Upper Plate	Lower Geared Escapement	Lever of Lower Geared Escapement
1/300	Inoperative	Inoperative	Inoperative
1/125	Operative	Inoperative	Inoperative
1/60	Operative	Inoperative	Inoperative
1/30	Operative	Operative	Inoperative
1/15	Operative	Operative	Inoperative
1/8	Operative	Operative	Operative
1/4	Operative	Operative	Operative
1/2	Operative	Operative	Operative
1	Operative	Operative	Operative

Table 3

The shutter speed setting ring for the relationship shown in Table 3 is illustrated in Fig. 38.

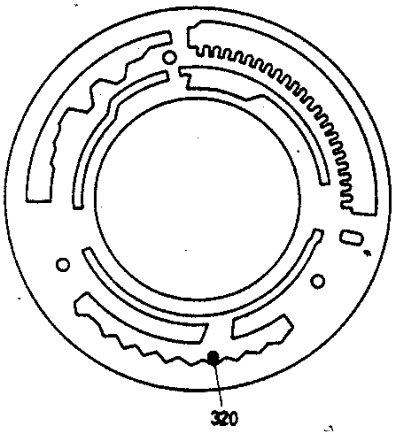

Fig. 38
Setting Ring 0475-159 and Position of Detent Rivet 320

2. The shutter speed setting ring is arranged to be caught in the positions corresponding to the indicated shutter speeds. For this purpose, a detent rivet 314 is secured to a two-armed lever 0475-U362 pivoted on a pin 106 (see Sheet 35) of cocking arm 1. The arrangement of lever 0475-U362 will be seen from Fig. 39 on Sheet 86.

3. IMPORTANT: In shutters produced during an initial period, the rivet 320 carries a loose roller 0475-434. In shutter of later manufacture, this roller is positively held in position.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
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Shutter Speed Setting Mechanism, cont.

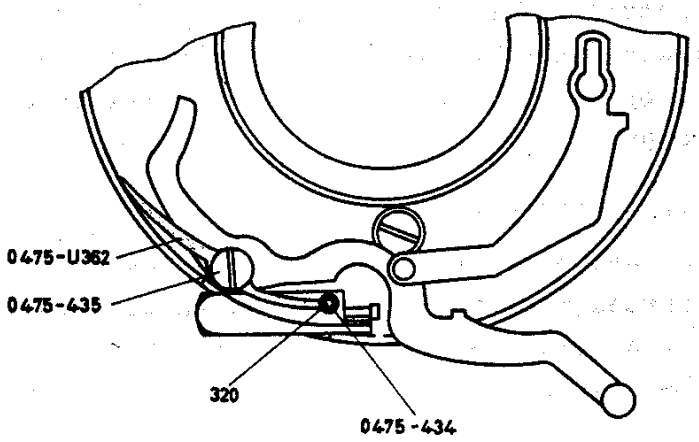

Fig. 39

Arrangement of locking lever 0475-U362. In the above figure, the rivet 320 carries a positively located roller 0475-434. - The screw 0475-435 is screwed into the upstanding pin 106.

C. IMPORTANT: When repairing Size 0 and Size 00 shutters, care should be taken to apply a thin film of Molykote (Paste G) which is a grease-free lubricant to the detent notches.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
Maßstab:	Repair Instructions				Sheet 86

9. Shutter-speed/f-stop Coupling

Introductory Remarks

The newly introduced shutters, in contrast to earlier PRONTOR-SVS shutters, incorporate as novel equipment a so-called shutter-speed/f-stop coupling whose design is explained in the following paragraphs.

A. Size 00 Shutters with Cocking Shaft

Part of the periphery of the cylindrical skirt of the speed setting ring is formed with square teeth which cooperate with detent dogs 224a (see Fig. 39) which are provided on a flexible coupling lever 224 secured to the diaphragm setting ring.

In order to permit the shutter speed and the f-stop to be set separately in the customary manner, it is necessary to depress the finger piece of coupling lever 224 while the settings are being made.

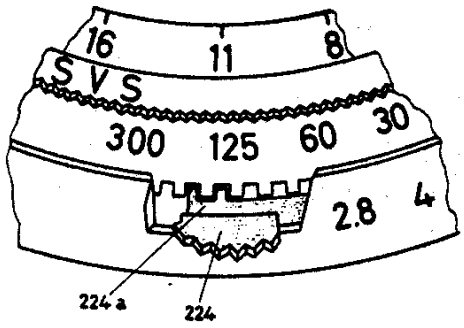

Fig. 39
Fragmentary view of shutter. Part of the cylindrical skirt of the diaphragm setting ring is shown broken away to expose the teeth on the speed setting ring and their cooperation with the teeth 224a on the coupling lever 224.

B Size 00 Shutters with Manually Operated Cocking Lever

As shown in Fig. 40 on Sheet 88, these shutters have a flexible coupling lever 312 secured to the diaphragm setting ring This coupling lever cooperates with detent notches provided in the exposure value setting ring 00475-U568 mounted for rotation with the shutter speed setting ring, the coupling lever also engaging the notches of the speed setting ring.

Shutter-Speed/f-stop Coupling, cont.

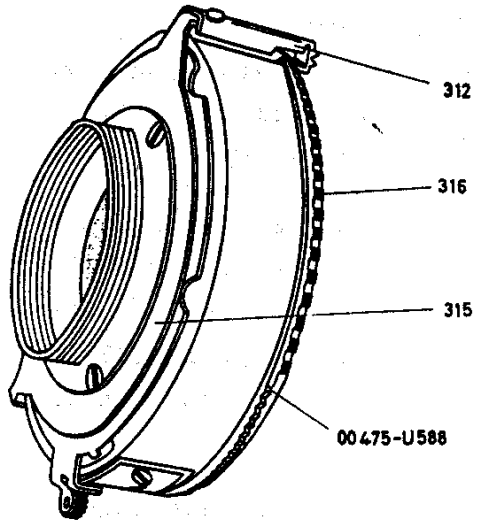

Fig. 40

Diagonal front view of Size 00 shutter with manually operated cocking lever.

312 Coupling Lever

315 Diaphragm Setting Ring

316 Detents on Exposure Value Setting Ring

00475-U588 with Exposure value Setting Ring

C. Size 0 Shutters

a. In the case of Size 0 shutters, the shutter-speed/f-stop coupling can be selectively engaged and disengaged.

b. For this purpose, there is provided a coupling control lever 226 (see Fig. 41 on Sheet 89) which has to be depressed to permit it to be moved either into the position marked with a dot (coupling engaged) or into the position marked with a circle (coupling disengaged).

c. The control lever 226 is secured to a radially flexible sliding member 227 the end 227a of which has an inclined cam track cooperating with one arm of a two-armed lever 0475-U395 pivoted to the side wall of the shutter case. The other arm of this lever carries a rivet 229 abutting a collar provided on a pinion assembly 0475-370 which is mounted for axial movement on a bush riveted to the bottom of the shutter case. The bush is surrounded by a spring 0475-397. Extending through the bush is a shaft carrying a pinion 230 located on the rear of the shutter, this pinion being in mesh with the teeth of the diaphragm setting ring. (The pinion 230 and the shaft inserted through the bush form a subassembly which is covered by the Stock Number 0475-371.)

Shutter-Speed/f-stop Coupling, cont.

The subassembly 0475-370 is held in position by a pin 0475-399 which extends through the upper end of the pinion shaft and through a slot provided in the subassembly 0475-370. Thus, the drive assembly 0475-371 is positively connected in its proper direction of rotation with the subassembly 0475-370.

Setting the coupling lever 226 at the circular mark will cause the sliding member to raise the cooperating arm of lever 0475-U395, this in turn causing the arm 228 to urge the subassembly 0475-370 downwardly against the force exerted by spring 0475-397, thus moving the pinion on top of the shaft out of mesh with the teeth of the shutter speed setting ring 318.

With the shutter-speed/f-stop coupling engaged, the subassembly 0475-370 is in mesh with the teeth of shutter speed setting ring 318, thus transmitting the motion of the latter to the diaphragm setting ring. 317.

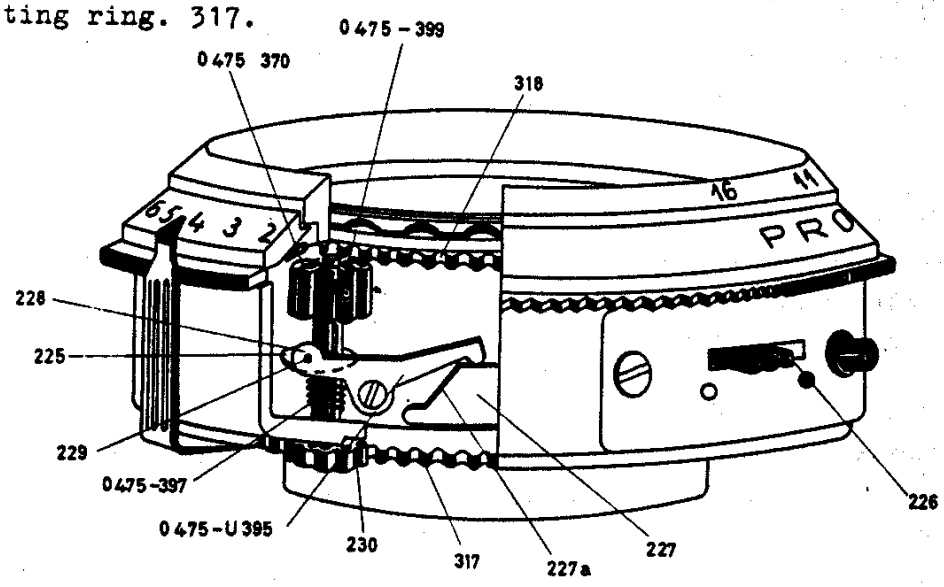

Fig. 41

Cut-away view of a Size 0 shutter fitted with a selectively engageable and disengageable shutter-speed/f-stop coupling. Part of the wall of the shutter case is broken away to show the coupling mechanism which in the present case is in its disengaged position.

0475-370	Subassembly
0475-U395	Two-armed Lever
0475-397	Spring
0475-399	Locking Pin

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
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Shutter-Speed/f-stop Coupling, cont.

d. Important hints concerning the assembling of the coupling device:

1. Before inserting the subassembly 0475-371, apply a light film of Molykote paste on its shaft.

2. When forcing in the locking pin 0475-399 into the shaft of the subassembly, care should be taken to have the pin ends projecting on either side of the shaft to be of equal length. In order to lock the pin in position, bend its pointed end upwardly in an axial direction.

TROUBLE	CAUSE	CORRECTION
Shifting the coupling control from the circle (disengaged position) to the dot mark (engaged position) will not cause the coupling to be engaged.	The sliding member 227 and the coupling lever 0475-U395 are superimposed in a radial direction so that it is impossible to operate the two-armed coupling lever 0475-U395.	Bend one of the two parts involved, preferably the sli-ding member, (227), in such a manner as to provide for proper functioning as described on Sheets 88 and 89.

Werkstoff	Modell Nr.	Gezeichnet			Alfred Gauthier G.m.b.H. Calmbach a. d. Enz
	Lager Nr.	Geprüft			
Maßstab:					Sheet 90

CONTENTS

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Preface to Folder 2

General

a) The present folder is a supplement to and the continuation of the previously published "Instructions for Repair Shops". The shutter mechanisms are classified in the traditional manner and enlarged by the addition of the new systems "10" and "11".

According to this the shutter is classified in the following systems:

1 Cocking System
2 Trigger System
3 Slow Speed Assembly System
4 Delayed Action Device System
5 Shutter Blade System
6 Diaphragm System
7 Flash Contact System
8 Setting System for Speeds
9 Speed-Aperture Coupling
10 Exposure Control Mechanism
11 System of Cover Shutter Blades

b) In order to help you to find the supplements of this folder the heading of each supplement (new shutter type) has a different color.
With each new supplement you also receive a new table of contents which is to be exchanged for the old one which can be destroyed.

c) For reason of simplification, beginning with the 5th supplement on size "00" the two ciphers are no longer written in front of the indentification number of the model.

for instance: PRONTOR-SVS 00375 is PRONTOR-SVS 375
PRONTOR-SLK 00520 is PRONTOR-SLK 520

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d) The comments on page 1 - 4 in folder 1 are also valid for this folder and we ask yuu to take note of them.

Spare Parts

Each order of spare parts must bear the description of the part and its part number.

For instance:	Part Description	Part number
	Frontplate	345-U143
	Slow speed ass.	381-G20
	Synchro switch ring	476- 212

This information can be gathered from the spare parts list which is included in each supplement.

In case of doubt, please send us the part to be replaced, and if possible, indicate the camera in which the shutter is used, by brand and model number.

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Fourth Supplement

CONCERNING THE SINGLE "CONTROL-RING" SHUTTER

PRONTORMAT

Contents

General Introduction

The PRONTORMAT shutter is designed and in combination with an exposure meter, distinguishes itself from the traditional shutter through the following characteristics:

1. All settings of the shutter are made simply by rotating a single "control-ring" comprising the "daylight range" and the "flash range".
2. There are no scales for speed and diaphragm adjustments. Only the "flash range" has a scale with the diaphragm values.
3. By rotating the "control-ring", point and pointer of the exposure meter are brought into coincidence. In this way the best speed-aperture combination is set in accordance with the prevailing light conditions.
4. When lighting conditions in the "daylight" range are too poor for perfect pictures, the exposure meter is automatically switched off and simultaneously, the shutter is switched to the "flash" range. The constant speed of 1/30 sec. and the X-synchronization adjustments permit the use of flash bulb, as well as electronic flash equipment.
5. On shutters with a depth of field indicator, the two index pointers are set on the value scale attached to the diaphragm by rotating the "control-ring".

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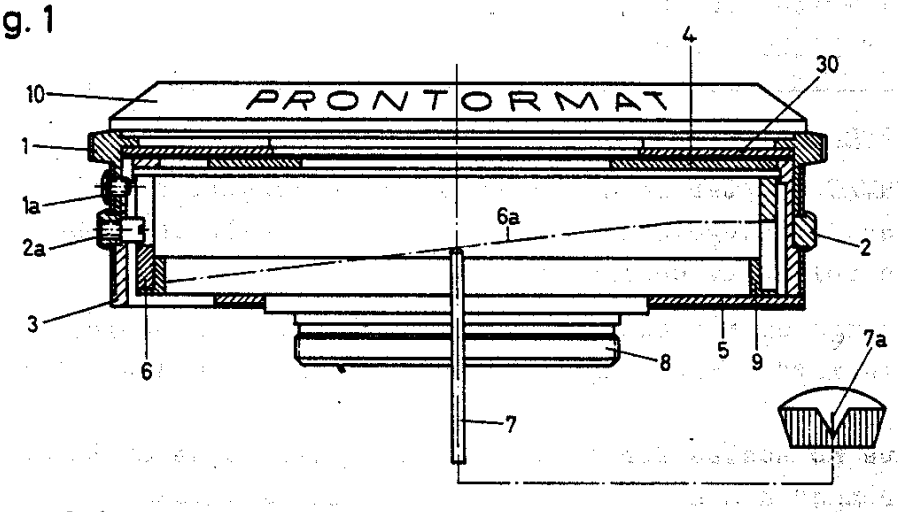
DESIGN AND FUNCTIONAL OPERATION OF THE "CONTROL-RING" SHUTTER

The sectional drawing of fig. 1 shows the rings and control cams engaged to be carried on a rotating movement. The single "control-ring" (1) is rigidly engaged to the notched ring (3) by means of a pin-slot-connection (1a) while the ring for the film speed (2) is adjustable and coupled with the notched ring by means of a click spring and connecting to the driver slot of the exposure control cam ring (6) by means of a scew head (2a).

Fig. 1



All rotary driver connections of the rings and disks are turned to the sectional field resp. plane.

1. setting ring ("single control-ring") 00555-137
2. film speed ring 00555-722
3. notched ring 00555-772
4. control disk 00555-24
5. diaphragm ring 00555-7.1
6. exposure-control cam ring 00555-705
7. tracing-pin of the exposure meter
8. shutter housing 00555-U1
9. holding ring for exposure control cam ring 00555-700
0. front plate 00555-U143
0. base plate 00555-794.1

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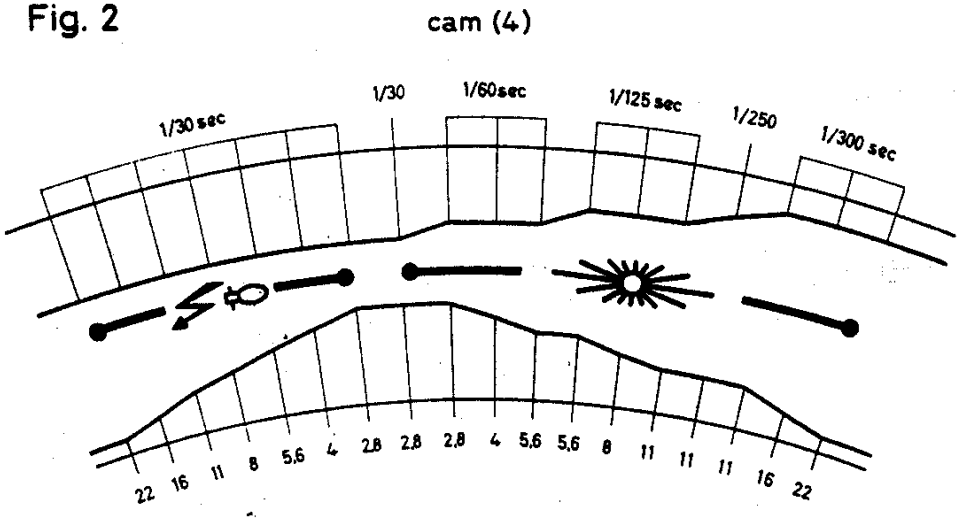
From fig. 1 results that the rotating of the "One"-Ring as well as the setting of the film speed on the film speed ring influences the pointer (7a) of the exposure meter over the control cam (6a) of the exposure meter control cam ring. And in order to change speed and aperture in dependence of the exposure meter indication by rotating the "One"-Ring, drivers are formed on the control disk (4) and on the diaphragm ring (5) which engage with the notch ring (3).

Fig. 2



speed-aperture-diagram

The diagram shows how speed and aperture are associated.

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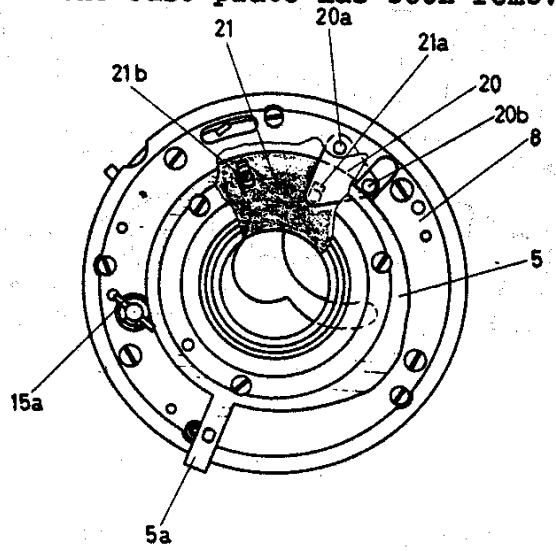
6b Diaphram System

The PRONTORMAT has a new system of diaphragm control (fig. 3 and 4). By this method the adjustment of the diaphragm ring (5) over the diaphragm lever (20) and the diaphragm disk (21) controls the setting of the blades (23).
The diaphragm lever, performs as an angle lever, the pivot bearing (20a) which is a stay-bolt riveted into the base plate (8), engages with a control-rivet in the control-slot (21a) of the diaphragm disk, while the eccentric rivet (20b), protruding trough a slot in the base plate, comes to rest on the diaphragm ring (5).

Fig. 3 shows the shutter as seen from the camera side. For better illustration part of the base plate has been removed.

Fig. 3



5 diaphragm ring 00555-7.1
5a driver stud
15a cocking spindle
20 diaphragm lever 00555-U760.1
20a pivot bearing
20b eccentric rivet
21 diaphragm disk 00555-8
21a control slot
21b inset slot for blades

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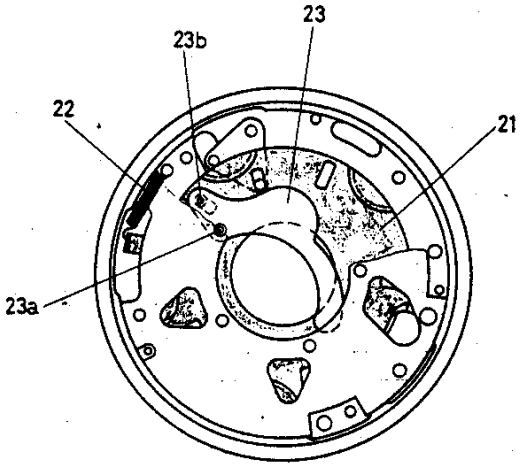
A tension spring (22) (fig.4) which is anchored to a spring-lug of the diaphragm disk, guarantees the shifting of the blades without any "play" as well as making positive contact with the eccentric rivet on the control-cam of the diaphragm ring. The object of the eccentric rivet is to adjust the diaphragm from the originating point ALFRED GAUTHIER GMBH to the nominal value of a certain point of the control system.

Reference

Should the diaphragm system be dismantled, it will be necessary that after the re-assembly and before the tension spring (22) is anchored, that a check be made to determine whether the diaphragm-disk and diaphragm lever can both be operated smoothly.

Fig. 4 shows the shutter after a part of the diaphragm cover disk has been removed.

Fig. 4

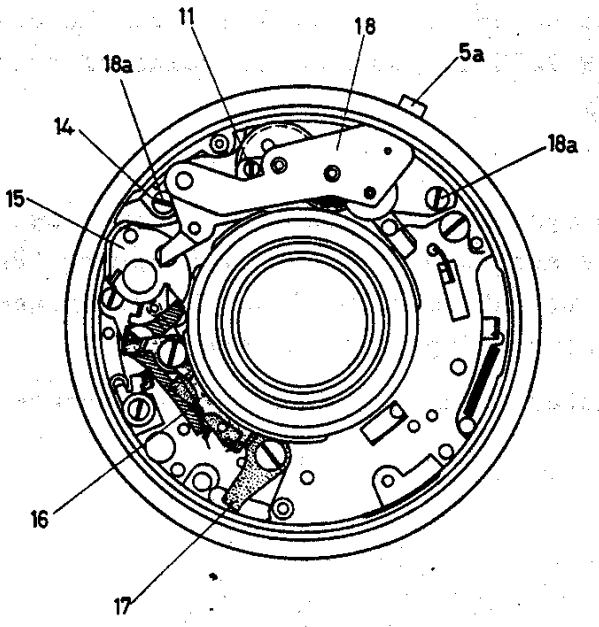


22 tension spring 00412-672
23 blade 00555-U5
23a bearing rivet (diaphragm control disk)
23b control rivet (diaphragm disk)

7b Flash Contact System

Fig. 5 shows the shutter mechanism after the control disk and the notch ring have been removed.

Fig. 5

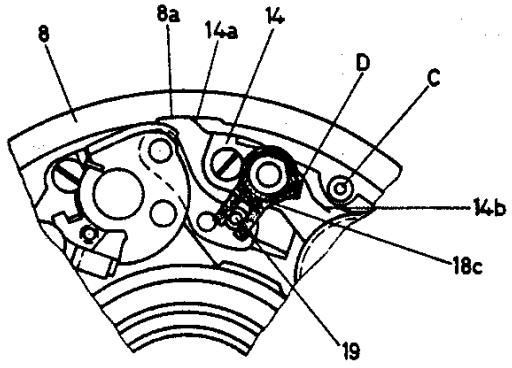


5a driver stud of the diaphragm ring 00555-7.1
14 contact plate 00555-173
15 cocking lever 00555-U96
16 stud of the speed lever 00555-119
17 trigger 00346-U85.1
18 slow speed assembly 00555-G20
18a fixing screws for contact plate and slow speed assembly 00499-135

After removing the two fixing screws (18a), the slow speed assembly (18) can be lifted off the shutter housing. The contact plate (14) held by the fixing screw, rests with a contact flap (14a, fig. 6) on the bright finished side of the housing (8a) in order to effect a small electrical contact (ground) resistance, during the time the

contact spring (14b) is being pressed against the contact pin (C) from the dog (D) of the contact lever (18c) during the shutter action.

Fig. 6



8a bright finish turning on housing 00555-U1
18c contact lever
19 drive latch rivet
D dog point of contact lever
C contact pin

Reference:

1. When installing the slow speed assembly (18) notice that the stud of the drive latch rivet (19) is encircled by the fork of the contact lever (18c).

2. Regarding the cocking – release - and shutter blade systems, we refer to the instructions for the operation of the PRONTOR-SVS SHUTTER.

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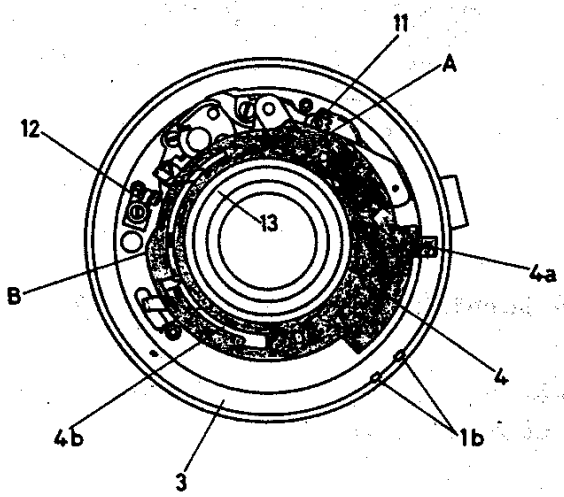
3d Setting System for Shutter Speeds

The speed is set with the driver stud (4a) which is engaged with the notched ring (3), of the control disk (4) embedded on the socket of the base plate (13) and in connection with the eccentric rivet (11) of the slow speed assembly, the control cam (A) and the control slot (4b). The shutter speeds which are used in the "daylight" range go from 1/30 sec to 1/300 sec, while in the "flash range a constant speed of 1/30 sec is employed. (see fig. 2).

Fig. 7



1b inset slots for "Control-Ring".
3 notched ring 00555-772
4 control disk 00555-24
4a driver stud
4b control slot
A control cam for shutter speeds
B switch cam for exposure meter
11 eccentric rivet for slow-speed-assembly
12 short circuit switch (short circuit spring 1 00555-767)
(short circuit spring 2 00555-768)
13 base plate 00555-U15

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References:

1. Contrary to the methods used in traditional shutters, the adjustment of the PRONTORMAT shutter speeds is not done by filing or chiseling the speed-control disk. The adjustment is done by turning the eccentric rivet (11). This requires a feeler gauge. This can be made according to the specifications as shown in fig. 8 or can be ordered from the manufacturer of the shutter. (ALFRED GAUTHIER GMBH or it's Representatives).
   The radius 19.1 mm of the feeler gauge corresponds to the position of the eccentric rivet on the control-disk at setting 1/250 sec. Only this speed has to be adjusted as the precise manufacture of the control disk and the slow speed assembly, which is specifically designed for the PRONTORMAT, guarentees the accuracy of the other speeds according to the control program shown in fig. 2.

2. Of special importance when gauging the shutter speed, is the setting of the diaphragm. With the "light-true" PRONTORMAT the speed is always tied to a certain aperture (see fig. 2) and the control-cam is accordingly set to same. The given speed is thus guaranteed effectively by the shape of the control cam. As a result, the shutter speed can only be gauged with a setting disk (1/250 sec) at an aperture setting of 11. For this the aperture has to be set on the aperture value 11 given in the flash range or to the standard value which can be gathered from table 8a.

   For simpler and greater accuracy, adjustment of the shutter speed can be made with the use of a special setting device, as used by the shutter manufacturer. The diaphragm ring and control disk are fixed exactly in positions (1/250 sec - aperture 11) so that the speed can be checked and corrected at once. This setting device can also be ordered from the shutter manufacturer or through it's distributors.

3. When the control disk is installed into the shutter housing attention must be paid not to bend the short circuit springs (12).

Fig. 8

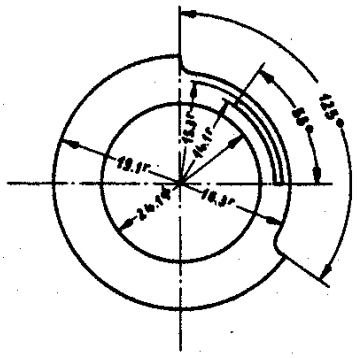

Table 8a

Focal Length	Standard Value
f = 4,5 cm	3,25 mm
f = 5 cm	3,6 mm

The "standard value" is the approx. dimension of the radius of the inner circle of the pentagon formed by the blades.

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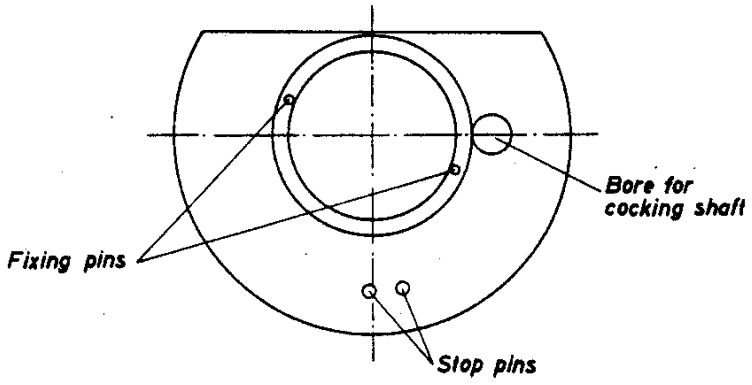
Supplement to Setting System for Shutter Speeds (Sheet 98-100)

The completely assembled shutter without automatic depth-of-field mechanism, as illustrated in Fig. 7, is placed on the setting gauge 4 CCF 1953. Any possible fixing screws will have to be removed previously, because the threaded holes will be used for centering.

For examining, the shutter is placed over the two fixing pins of the nozzle, so that the cocking shaft is located above the bore of the flange. The notched ring must be rotated until the lug (5a) of the diaphragm ring (see Fig. 3) is located between the stop pins. As the lugs of the diaphragm ring and control disc (4, Fig. 7) rest in the recesses of the notched ring, the diaphragm is thus set for aperture 11 and the shutter speed for 1/250 sec. If an examination reveals that the shutter speed of 1/250 sec. exceeds the permissible tolerance, the speed is adjusted by turning the eccentric rivet (11, Fig. 7).

Setting Gauge for Model 555

Stock No. 4 CCF 1953



10 Automatic Depth of Field

Preface

The PRONTORMAT shutter is equipped with an automatic depth of field indicator showing the depth of field range after the distance is set on the lens. Together with the front plate and the "Control-Ring" the parts of the depth-of-field automatic system form one unit. The positive coupling of "Control-Ring" and depth of field, automatically effecting the positions of the two depths-of-field indicators can always be changed depending upon the resulting apertures when rotating the "Control-Ring". The arrangement of the indicators permits simultaneous reading of (a) the range of the depth-of-field, and (b) the distance scale of the lens at a glance.

References:

The PRONTORMAT shutter readily can be purchased with or without the automatic depth-of-field system. The "depth-of-field automatic" unit front plate (fig.9) is replaceable when requested.

Structure

The depth-of-field automatic system is a closed unit, built into a housing similar to the front plate, and held together and enclosed by the base. Fig. 9 shows the component parts of the depth-of-field system in step-up process of assembly. All geared parts have a mark (M) which must coincide with the stroke-point-stroke line, leading from the center of the shutter trough bearing point (G). Pointer ring 1 (24) is placed on the front plate (10) and aligned, then, female pinion (25) is shifted over bearing bolt (G), and pointer ring 2 (26) and equalizing spring (27) is then placed around stay bolt (H), which serves as a bearing spindle for the bore (k) of the segment ring (28), over pin (S). The depth-of-field indicators are controlled by means of control cam (L) of the cam disk (29).

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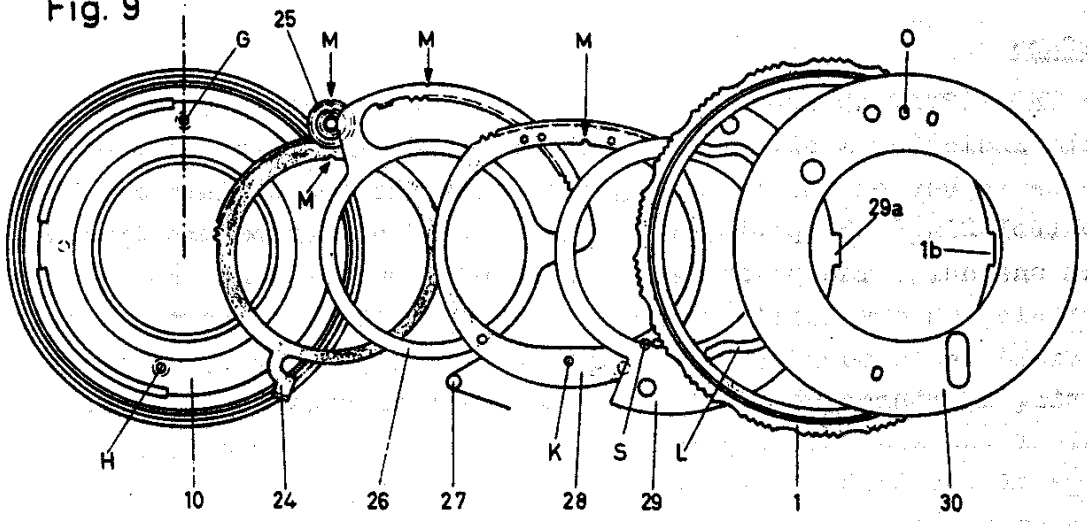
Fig. 9



10	front plate	00555-U143
24	pointer ring 1	00555- 790
25	female pinion	00555-U785
26	pointer ring 2	00555- 791
27	equalizing spring	00555- 783
28	segment ring	00555-U780
29	cam disk	00555- 775
1	setting ring (Control-Ring)	00555- 137
30	base	00555- 794.1

Fig. 10 shows the position after the equalizing spring (27) has been installed. Notice that the spring is moved in the direction of the arrow with a screw driver after the segment ring (28) and the cam disk (29) have been seated. Then the "Control-Ring" (1) is inserted and rotated until driver stud (29a) comes to rest in notch (1b). Finally the base (30) is mounted and rotated until the bearing bolt (G) comes to rest in bore (O). Now the base can be pressed on the socket of the front plate. Should the seat of the base be not tight enough, it can if desired, be narrowed by slightly stemming in the inner diameter.

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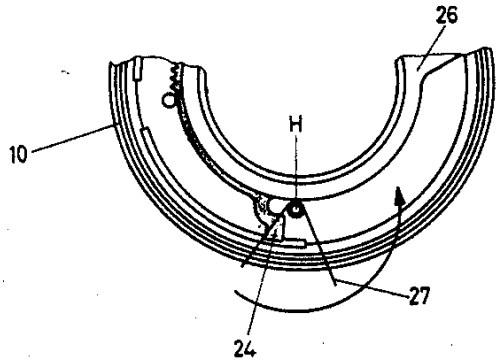
Fig. 10



References:

1. The shutter is opened by unscrewing the front plate retaining ring, which (in the first phase of production) is secured by varnish. Shutters of later manufacture are fixed by an angular lever engaging the profile of the front plate retaining ring.

2. It should be pointed out that when it is necessary to remove the "Control-Ring" together with the depth-of-field automatic system, that the unit, which is held together by the base, remains together. For general practical purposes, the depth-of-field automatic system should not be dismantled.

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Appendix to the Automatic Depth of Field

The shutter models PRONTORMAT 555bo (Aka), PRONTORMAT 555e (Franka), PRONTORMAT 555w (Balda) and PRONTOR-SLK X546w1 (Balda) differ in some details from the "Instructions for Repair Shops" given on sheets 101-103.

Fig. 9a

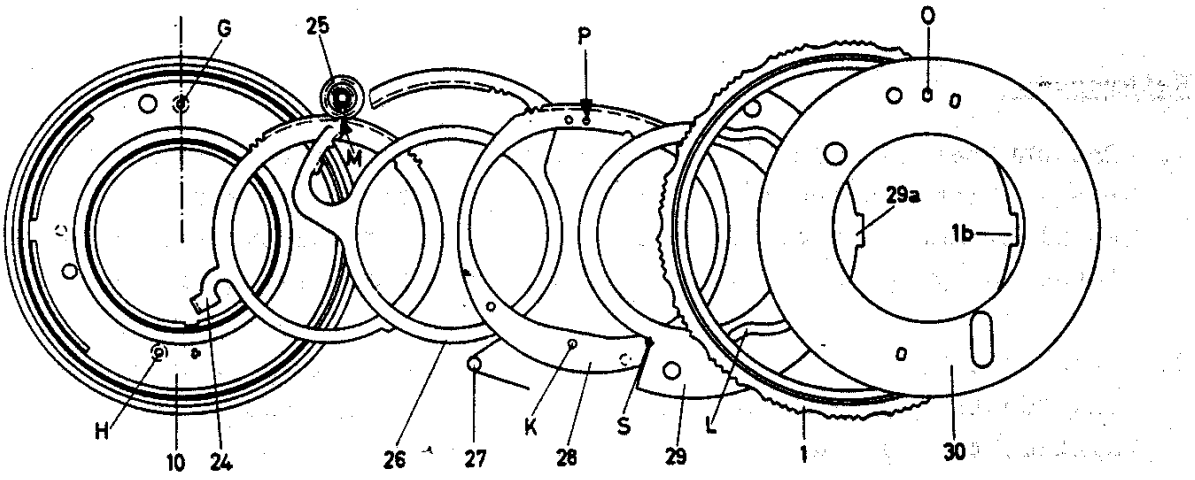

Figure 9a shows the assembly positions of the various components for the automatic depth of field system of the above-mentioned models. As shown, the positions of the pointer ring 1 (24), pointer ring 2 (26) and segment ring (28) differ from the respective positions shown in figure 9.

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Assembly of the Automatic Depth of Field

The assembly of the automatic depth of field system can be most easily done by use of an assembly block. You may prepare this assembly block yourself by use of the enclosed factory drawing CCF 1491 or order it from us quoting this number.

1) Shutter Models 555bo, 555e, 555w, and X546w1

As shown in Fig. 9, the front plate (10) is placed on the assembly block and all other parts are assembled in the sequence shown in Fig. 9a. In doing so, please see to it that when installing the two pointer rings their pointers (painted red) are inserted into the milled recesses "A" of the assembly block. The segment ring is installed in such a way that the boring hole (K) is shifted over the pin (H) and alined so that the boring hole (P) is in line with the central line traversing rivet (G). All other parts are assembled in accordance with the assembly instructions given on sheets 101, 102 and 103.

2) Shutter Models with Automatic Depth of Field in Accordance with Fig. 9

E.g.: The models PRONTORMAT 555bd (Dangelmaier), PRONTORMAT 555bf, 555bf1 (Adox), PRONTORMAT 555s (Montanus), PRONTORMAT 555t (Kodak). The automatic depth of field system for these models, described on sheets 101, 102 and 103, can also be assembled by use of the assembly block CCF 1491. In doing so, however, the pointers of the pointer rings have to be inserted into the milled recesses "B".

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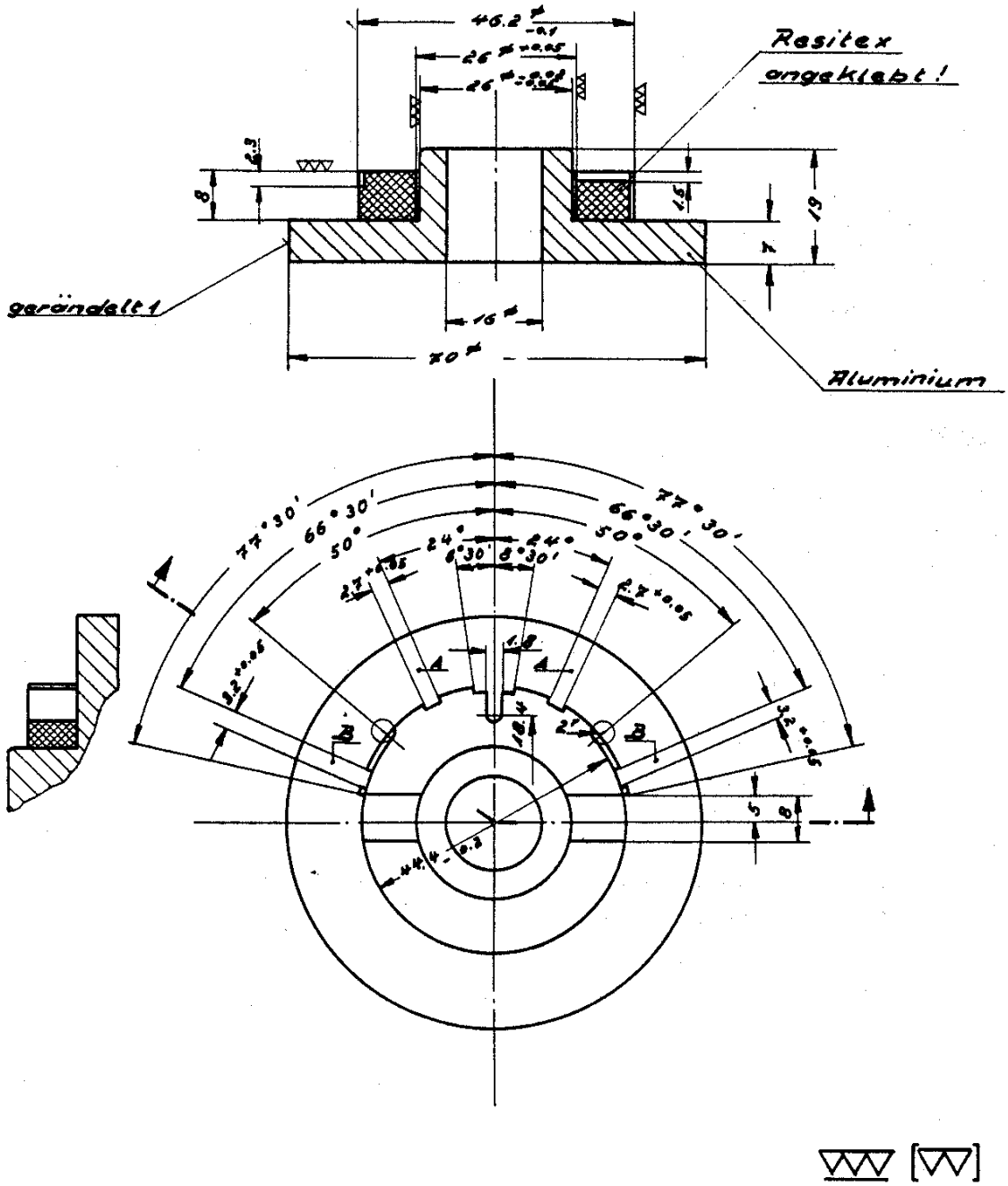
Important Notes for all Shutters with Automatic Depth of Field

a) After assembling, the "automatic depth of field system" should be held by the front plate and the base and checked by rotating the setting ring (1), whether the pointers run smoothly.
Then the front plate (10) and the setting ring (1) are rotated in such a way that the "distance setting" mark on the front plate and the "B" mark of the setting ring coincide.

b) The control disc (4, Fig. 1 and Fig. 7) should be rotated (clockwise) by means of the notched ring (3, Fig. 1) until it is stopped by the stop rivet (at the side of the trigger release slot). This rotation guarantees that after the insertion of the driver screws (1a, Fig. 1) into the slots of the notched ring shutter and automatic depth of field system are interlocked for proper functioning and secured by means of the front plate ring.



Werkstoff	Modell Nr.	Gezeichnet 25.3.59		Alfred Gauthier G.m.b.H. Calmbach a.d. Enz
	Lager Nr.	Geprüft		
Maßstab: 1:1	Montageblock u. Montagelehre			CCF 1491

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5. Supplement

concerning the Gauthier shutters

I. PRONTO, VERO, VARIO
II. PRONTOR-SLK, PRONTO-LK, VARIO-LK
III. PRONTOR-SVS, PRONTOR-SLK, PRONTO-LK
with the fastest speed of 1/500 sec.

Contents:

Reference:

This 5th supplement concerns itself only with those shutters featuring "non-interchangeable" lenses; shutters with interchangeable lenses, however, will be described in the 6th supplement.

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INSTRUCTIONS FOR REPAIR SHOPS

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I PRONTO, VERO and VARIO Shutters

with "linearized" settings
of shutter speeds and diaphragm values.

Preface

After having re-designed the PRONTOR-SVS shutter for "linear" shutter speed setting and diaphragm values, the PRONTO, VERO and VARIO shutters have been modified in an attempt to adapt them to the same structure as that of the PRONTOR-SVS shutter. The adaptation to the PRONTOR-SVS allows them the use of the same basic components in the shutter mechanisms.
The following operation factors in their fields of application show the differences in the features of these shutters:

A. PRONTO
speeds B 1/30 1/60 1/125 1/250 sec.
delayed action device, X-synchronization

B. VERO
the same as in item A, but without the delayed action device

C. VARIO
speeds B 1/25 1/50 1/200 sec.
X-synchronization

References:

a) In order to simplify description we will only list "PRONTO" in the text, but all the explanations written will also apply to the VARIO and VERO shutter because of their basically similar structure to the PRONTO.

b) In case that a specific type of shutter is not described here, the explanation as given in Folder No. 1 regarding this system should then be taken into consideration and study.

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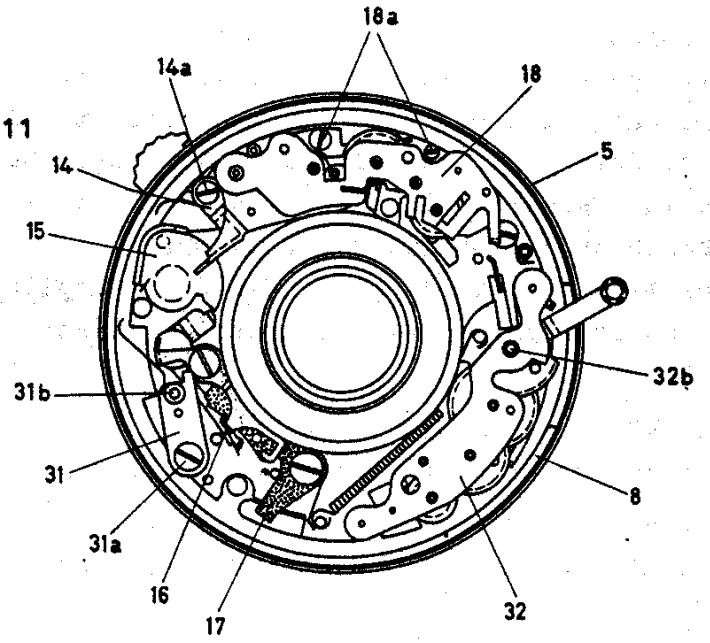
INSTRUCTIONS FOR REPAIR SHOPS

PHOTOGRAPHIC SHUTTERS

Structure of Shutter

Figure 11 shows the shutter mechanism of a PRONTO shutter in cocked position with the speed setting ring removed.

Fig. 11



5 Diaphragm index ring 377-U7
8 Shutter housing (case) 377-U1
14 Contact lever 475-111
14a Contact lever screw 257-113
15 Cocking lever 480-496.1
16 Control projection of the speed lever 375-119.1
17 Trigger release 346-U85.1
18 Slow speed assembly 480-G20
18a Fixing screws for slow speed assembly; 280-136 long
280-138 short
31 Notched lever 470-U543
31a Notched lever screw 475-387
31b Notched rivet
32 Delayed action device
32b Locating pin

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INSTRUCTIONS FOR REPAIR SHOPS

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3b Slow Speed Assembly

A) The slow speed assembly of the PRONTOR-SVS is also used in the PRONTO shutter, but without the large anchor. The cooperation of the slow speed assembly and the speed setting ring requires the coordinated setting of both. Should the slow speed assembly or the speed setting ring need replacing, the speeds must then be re-adjusted on the speed control steps of the speed setting ring.
In connection with the above mentioned slow speed assembly a new setting ring (see setting system for shutter speeds) is also required.
Fig. 12 shows the slow speed assembly 480-G20 installed in the shutter; and with shutter in cocked position.

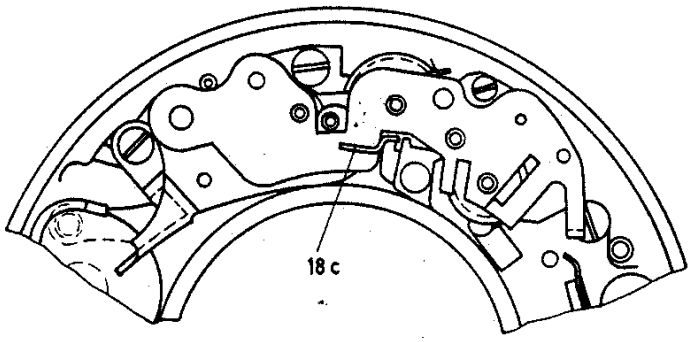


Fig. 12

18c Anchor Lever

B) The slow speed assembly 555-G20 (see sheet 96, fig. 5, item 18), is pre-mounted in some models. The gear holding plate is slightly changed in shape as compared to the aforementioned figure, but this difference does not affect the interchangeability with the same part of previous design. However, the slow speed assemblies 480-G20 und 555-G20 cannot be interchanged with one another.

References:

a) Before mounting or dismantling the slow speed assembly the shutter must be in cocked position.
b) The explanations "7b Flash Contact System" (sheet 96) regarding the slow speed assembly 555-G20 should be studied.

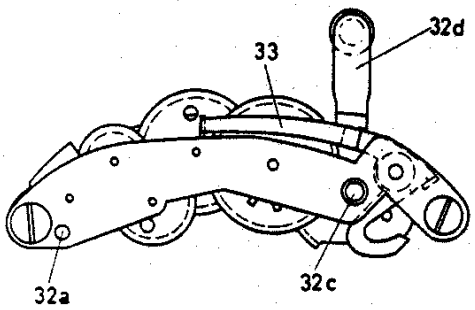
4d Delayed Action Device System

The new PRONTO shutter has a delayed action device which with its essential features, resembles somewhat the delayed action device of the PRONTOR-SV shutter. This similarity is noted in the manner in which the delayed action assembly is installed in the shutter, as well as in the well proven method of release of the delayed action device by means of the bar lever.

While the old PRONTO delayed action assembly was designed for pivotal movement, the new one is mounted rigidly in the housing. It is held in position by the peg (32b) (see Fig. 11) which is arranged on the base plate and serves also as locating pin, and a rivet (32a) which protrudes from the underside of the lower side plate of the delayed action device and which engages a bore in the base plate. The device is held in operating position in the traditional manner by the delayed action device spring. If the latter is unhooked, the device can be taken out of the housing after first following the instructions as given on page 20, items 2, 2a and 2b of folder I. The task and function of the bar lever can be understood from the references on pages 20-27 of folder 1, which must also be consulted when performing repair work.

View on the lower side of the delayed action device 377-G49

Fig. 13



32a Locating rivet of the delayed action device

32c Bore for locating pin of the base plate

33 Bar lever

32d Segment wheel (Cocking lever)

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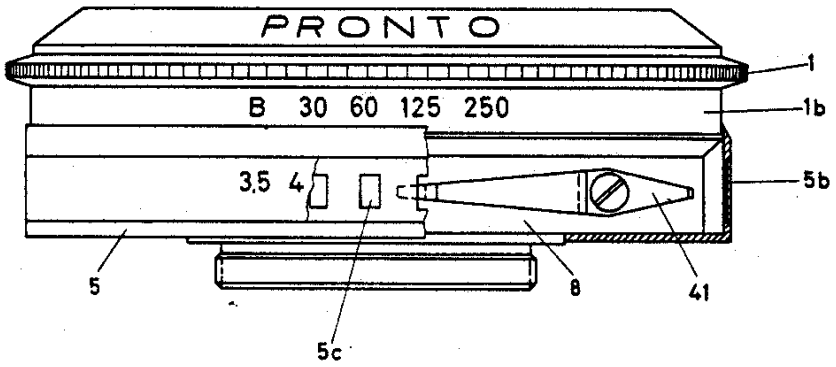
6c Diaphragm System

Various models of the PRONTO shutter are equipped with a notched device giving a "click" effect for the setting of the diaphragm aperture. This device consists of a notched spring (41) arranged on the cylinder jacket of the shutter housing, and which comes to a rest in the notched slots (5c) provided in the inside of the diaphragm index ring.
In Fig. 14 the diaphragm index ring is illustrated partly broken off in order to show the notches more clearly.

Fig. 14



1 Speed setting ring
1b Speed scale band
5 Diaphragm index ring
5b Diaphragm band
5c Notch slot
8 Shutter housing
41 Notched spring

Reference:

Further details regarding the linear diaphragm system can be found on page 77 of folder 1.

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8e Setting System for Shutter Speeds

As compared with its former design, the new PRONTO speed setting ring is additionally equipped with a control cam (4d) for the anchor lever (18c) and with a notched slot (4c). The notched lever, which is supported by a stud of the work plate, comes to a rest in the notched slot by means of the notched rivet (31b).
Every notch in which the notched rivet comes to rest corresponds to a speed setting.

Fig. 15 shows the speed setting ring set for 1/30 sec., with the small anchor engaged; the shutter in cocked position.

If the slow speed assembly type 555-G20 is mounted in some models, the setting ring shown in Fig. 15a is required.

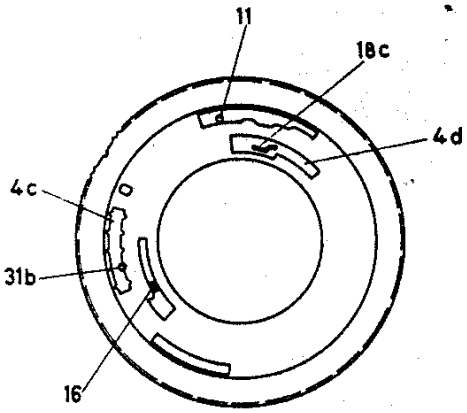

Fig. 15

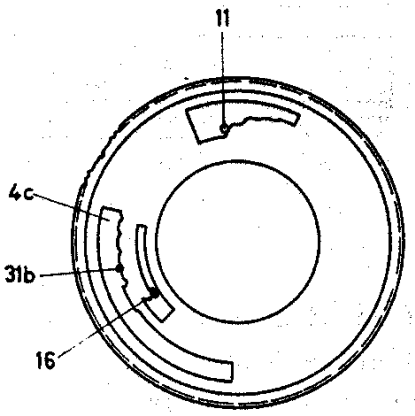

Fig. 15a

11 Stop lever rivet
16 Control projection of speed lever
18c Anchor lever

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PHOTOGRAPHIC SHUTTERS

II PRONTOR-SLK, PRONTO-LK and VARIO-LK

Shutters with Exposure Control Mechanism

Preface

Although the PRONTOR-SLK, PRONTO-LK and VARIO-LK shutters will invariably operate in accordance with the identical principle regarding the coupling of the shutter speed, f/stop and exposure meter readings will differ somewhat in their operation, as follows:

A) PRONTOR-SLK
Speeds B 1 ½ ¼ ⅛ 1/15 1/30 1/60 1/125 1/300 sec.
Delayed action device, M-X synchronization

B) PRONTO-LK
Speeds B 1/15 1/30 1/60 1/125 1/250 sec.
Delayed action device, X synchronization

C) VARIO-LK
Speeds B 1/30 1/60 1/125 1/250 sec.
X synchronization

During the course of manufacture and production, the shutters have been brought into the market equipped as follows:

1) Setting rings coupled for shutter speed and f/stop ("light value coupling")
2) without "light value coupling"
3) with setting of film sensitivity and without "light value coupling"

References:

a) PRONTOR-SLK
The shutter mechanism of the PRONTOR-SLK corresponds in all details of design with the "PRONTOR-SVS" with its "linearized" setting of speeds and aperture numbers (described in folder 1). The exposure control mechanism explained on sheets 113-117 was included as an added feature.

b) PRONTO-LK

The explanations contained in part "I" of this supplement are generally applicable to the shutter mechanism of the PRONTO shutter. There is only one difference: viz. unlike in the PRONTO shutter the small anchor of the slow speed assembly of the PRONTO-LK shutter does not only engage with the speed setting of 1/30 sec. but also with the speed setting of 1/15 sec.

PRONTO-LK shutters not equipped with settings for film speeds are provided with a sleeve for the cocking lever (segment wheel) of the delayed action device, which has to be removed before removing the speed setting ring. During the earlier period of production this sleeve was fastened with a rivet; later, it was fitted with a knurled screw and nut.

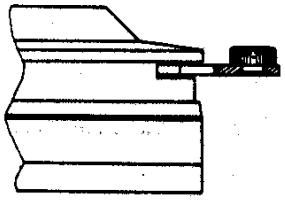

Fig. 16a

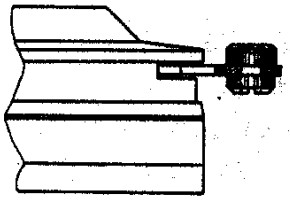

Fig. 16b

The above figures show the designs with the sleeve rivet (fig. 16a) and with the knurled screw and nut (fig. 16b).

c) VARIO-LK

Notice that the structure of the shutter mechanism of the VARIO-LK shutter is identical to that of the VERO shutter equipped with 'linear" settings.

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10 Exposure Control Mechanism

a) Principle of the Exposure Control

The exposure control consists primarily of two control rings (34 and 35) for shutter speeds and aperture numbers and a coupling of these two with the built-in exposure meter of the camera. One of these two control rings is connected with the speed setting ring and one with the aperture setting ring of the shutter in a way which will be explained later. The speed setting ring (35) is carried on the cylindrical jacket of the shutter housing in such a way that each rotation effects a

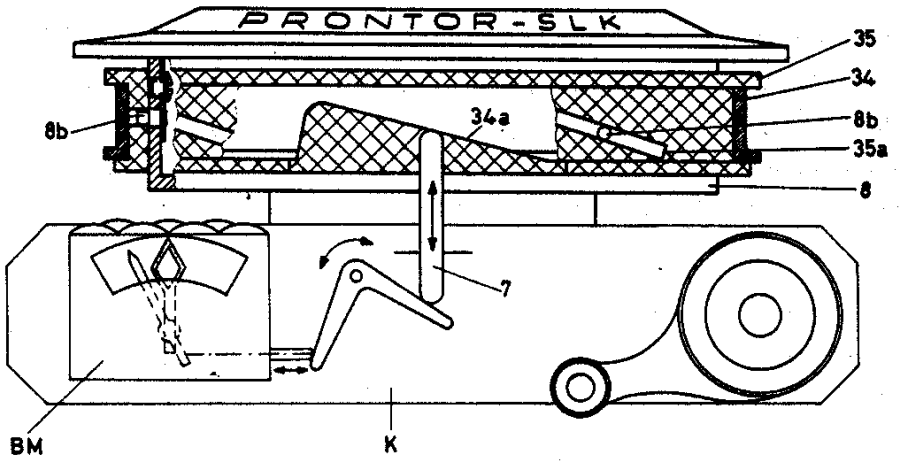

Fig. 17

Figure 17 shows an illustration of the principle of the exposure control.

7	exposure meter tracing pin	34a	control cam
8	shutter housing	35	speed setting ring
8b	guiding pin	35a	guiding slot
34	diaphragm ring	K	body of camera

spiral motion. At the same time the diaphragm setting ring (34) carried in the U-guide of the speed setting ring is rotated, too. The latter being provided with a control cam (34a) which cooperates with the exposure meter tracing pin (7) and which transfers every operation of the speed and diaphragm setting rings onto the exposure meter.

Important Note

The control cam (34a) of the diaphragm setting ring and the guide of the speed setting ring are provided with such an inclination that the simultaneous rotation of the speed setting ring and the diaphragm setting ring has no affect on the exposure meter. If one of the two rings is rotated separately by one speed or diaphragm interval (8^{o}) the tracing pin resting on the control cam is raised 0.35 mm (Fig.18)
Shutters equipped with film speeds settings are designed to raise the tracing pin 0.25 mm per exposure interval.

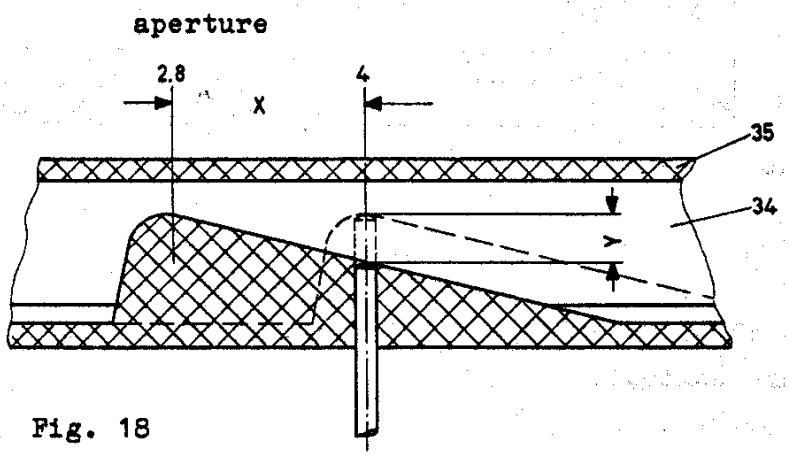

Fig. 18

X = rotation of the diaphragm ring for one exposure interval "8^{o}"
Y = raising of tracing pin by 0.35 mm or 0.25 mm respectively.

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b) Structure and Method of Operation of the Exposure Control Mechanism

1) To convey the reading of the exposure meter to the shutter setting controls, the speed setting ring (1) and the diaphragm setting ring (diaphragm index ring) (5) are coupled together to rotate with the control rings (34 or 35).

Between the diaphragm setting ring and the diaphragm ring, and between the speed setting ring and the speed ring, there are form-locking connections provided for by the guiding flutes (1a, 5a).

Fig. 19 shows a part-sectional view of the shutter. All connections for rotating parts are turned to the sectionplane. The figures below show the shutter housing together with the speed and diaphragm rings.

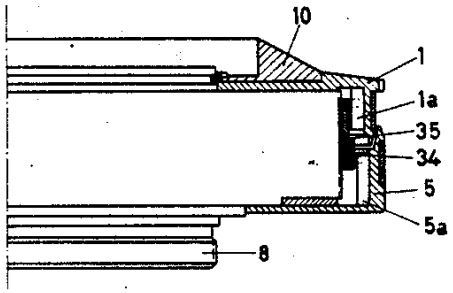


Fig. 19

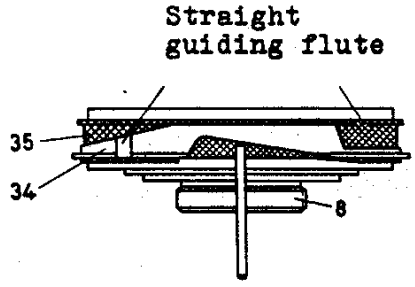
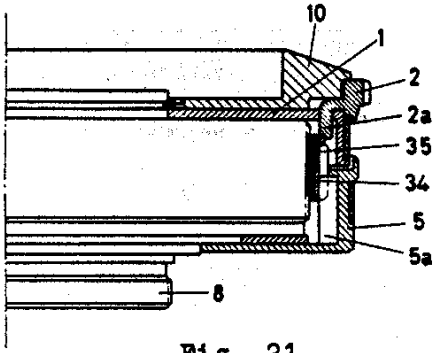


Fig. 20

1 speed setting ring 520-U137.1
1a straight guiding flute
5 diaphragm index ring 520-U7.1
5a straight guiding flute
8 shutter housing (case) 520-U1
10 front plate 520-U 143
34 diaphragm ring 522-700
35 speed ring 522-705

2) In shutters with shutter speed f/stop coupling, the speed and diaphragm setting rings are connected by a spring notch coupling having the same principle as used in the PRONTOR-SVS shutter (see sheet No. 87 of Folder 1).
The shutter can only be set, depending upon the exposure meter, if the notch spring coupling has been disengaged. With the coupling engaged, the shutter can only be set for a different speed-exposure combination by rotating in the respective direction.

3) Fig. 21 shows the model provided with a setting of the film speed. The film speed ring (2) is provided with a tappet (2a) designed as a straight guide, which is connected with the shutter speed scale ring in a form-locking manner. The film speed and shutter speed setting rings are connected by a notch spring coupling, which must be disengaged when setting the film speed.



1 speed setting ring
2 ring for setting the film speed
2a slightly bent guide
5 diaphragm index ring
5a straight guide
10 front plate
34 diaphragm segment
35 speed scale ring

Fig. 21

Reference:

a) During the earlier stages of production the spiral movement of the speed ring was caused by a pin-slot guide (Fig. 22). The pins of the pin-slot guide are fastened to the inside of the shutter housing with screws and can only be removed after the base plate has been removed from the shutter. Later, this guide was superseded by a multiple thread.

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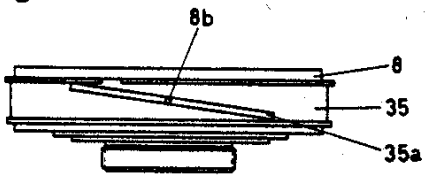
Fig. 22



8 shutter housing (case)
8b guide pin
35 speed ring
35a guide slot

b) In general, the shutter housing and the speed ring should not be disassembled. However, if the speed ring has to be removed from the shutter housing, both parts must be marked to enable them to be reassembled in exactly the same position. Marking can be done similarly to the way used when a front-lens mount is mounted into a shutter or removed from it.

c) During the earlier stages of production the diaphragm ring was slotted and inserted in the speed ring. In later production, after the dimensions of the speed ring had been changed, it was manufactured as a closed ring.
The two models of the diaphragm ring can only be replaced in conjunction with the speed ring.
Shutters provided with film speed settings are equipped with a diaphragm segment instead of the diaphragm ring.

d) For greater ease of handling the diaphragm setting rings of all designs are provided with two anti-slip sleeves of plastic material. To replace the diaphragm band which is screwed to the diaphragm setting ring, it is necessary only to remove the plastic sleeve. In so doing, it must not be forgotten that in cases of shutters provided with the film speed settings, the sleeves are screwed on from the inside of the diaphragm setting ring, whereas in the case of shutters that do not allow the setting of the film speed, the plastic material sleeve is firmly connected with the part on which it is mounted by its shape and glued. In the case of the latter type of shutter it is therefore recommended to obtain spare sleeves prior to dismantling, since the sleeves cannot be removed without being damaged.

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III PRONTOR-SVS, PRONTOR-SLK, PRONTO-LK

with the fastest shutter speed of 1/500 sec.

Preface

The alteration of the shutters PRONTOR-SVS, PRONTOR-SLK with 1/300 sec. and PRONTO-LK with 1/250 sec. to 1/500 sec. as the top speed entailed some changes in the shutter mechanism.

References:

a) Shutter models which have been previously manufactured with a top speed of 1/300 sec. or 1/250 sec. (PRONTO-LK) and then redesigned for the faster shutter speed of 1/500 sec. have as an identifying mark a letter before the model number. In the 1/500 sec. design, for example, there is an "X" (for instance X546).

b) Spare parts which have an "X" in front of the part number cannot be replaced by the similar parts which do not have the "X" marking.

c) Slow speed assembly and setting systems for shutter speeds for the PRONTO-LK shutter are described on sheets 127-128.

IMPORTANT: Please Note

a) Shutter models "X499" and "X549" vary in some features from the type described on the following sheets.

b) Various shutter models have shutter blades with varying thicknesses.
In order to guarantee a correct functioning of the shutter it is necessary to bear in mind the remarks regarding thicknesses and arrangement of shutter blades as mentioned in the spare parts lists.

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3c Slow Speed Assembly PRONTOR-SVS, PRONTOR-SLK

a) Slow Speed Assembly X546-G20

Using as a basis the slow speed assembly of the PRONTOR-SVS, a shutter designed for a top speed of 1/300 sec., the slow speed assembly for the shutter equipped with a top speed of 1/500 sec. has been re-designed by adding an engagement control lever. In the course of the running down of the shutter, the two anchors (A & B), are engaged alternately (see control programme under speed setting system, sheet 125). In addition, there is the possibility of reducing the retarding action by disengaging the engagement control lever. This engagement control lever is actuated by a swivel lever mounted on the slow speed assembly (37) (Fig. 25).

Fig. 23a shows a view of the slow speed assembly X546-G20 from above, while Fig. 23b shows a sectional view of the slow speed assembly from below.

Fig. 23a

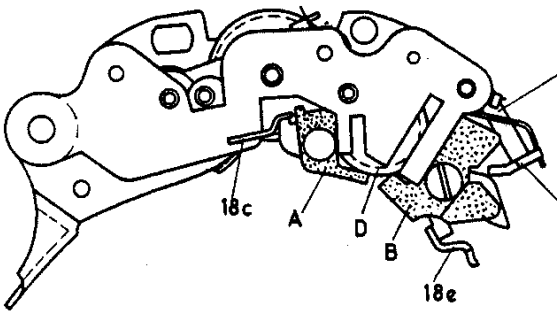
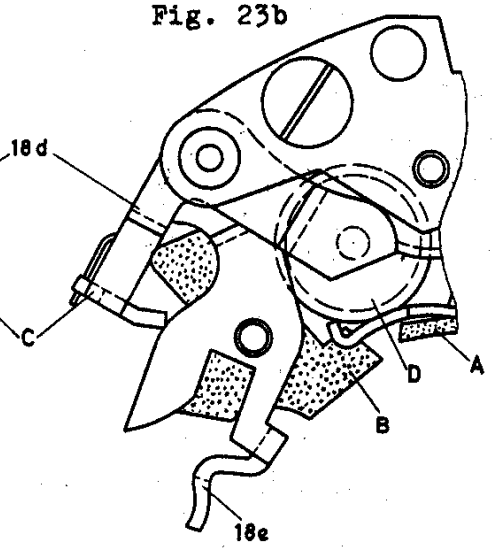


Fig. 23b



A small anchor
B large anchor
C projection
D anchor wheel
18c anchor to A.
18e anchor to B.
18d engagement control lever

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References:

1) A new setting ring has been fitted to the new re-designed slow speed assembly. Under "setting system for Shutter Speeds" the setting ring and the application of the engagement control lever and anchor at the various shutter speeds are explained.

2) During the course of production, the shape of the upper side plate has been modified. However, this does not in anyway affect the assembly during its cycle of operation.

b) Slow Speed Assembly X496-G20

By reasons of manufacturing procedures the slow speed assembly as used in the PRONTOR-SVS and PRONTOR-SLK shutters with a top speed of 1/500 sec. (shown in Fig. 23a and 23b) have been superseded by slow speed assembly X496-G20.
On sheet 126 the speed setting ring synchronized with the slow speed assembly X496-G20 is illustrated. This illustration also shows the application of the anchor at the various exposure speeds.
The slow speed assembly X496-G20 is similar to the slow speed assembly X547-G20 (see sheet 127); however, it differs from the latter in respect to the design of the anchor and the anchor lever.
Figures 24a and 24b show these differences.

Slow Speed Assembly X547-G20

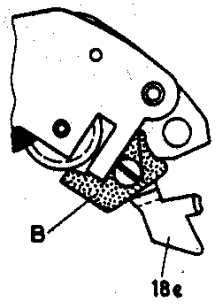

Fig. 24a

Slow Speed Assembly X496-G20

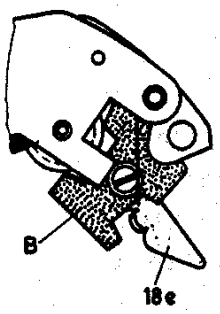

Fig. 24b

Sheet 120

INSTRUCTIONS FOR REPAIR SHOPS

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Reference:

The contact lever (Fig. 6, item 18c) described on pages 96-97 (flash contact system) is used for the X-flash contact of the new slow speed assembly.

The shape of the M-flash contact lever has also been changed. Further details and the part name (part no.) are shown in the spare parts list.

The slow speed assembly X496-G20 cannot be exchanged for a previous or different model.

4e Delayed Action Device System

The basic structure of this delayed action device has not been changed. The novel feature is that the upper wheel plate serves as bearings for the notch lever (38) and the swivel lever (37).

The fixing screw (36a) in the delayed action device serves as a bearing axis for the swivel lever. One arm of the twin-arm lever engages the control slot (4e) of the speed setting ring, whereas the other arm comes to rest on the projection (C) of the engagement control lever (18d) depending on the position of the speed setting ring (see "setting system for shutter speeds"). The engagement control lever is engaged or disengaged by this twin-arm lever. The notch lever (38) is fixed by means of a screw (36b); it rests on the upper wheel plate of the delayed action device (36) and by means of the head rivet (K) it comes to rest in the notch slot (4c) of the speed setting ring.

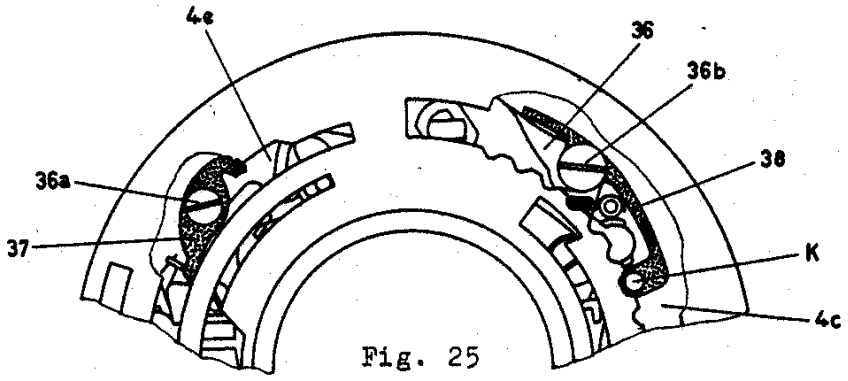

Fig. 25

36a Fixing screw for delayed action device
36b Fixing screw for delayed action device
37 Swivel lever
38 Notch lever
K Head rivet

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References:

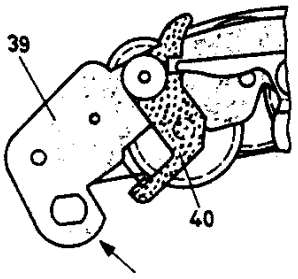
1) For manufacturing reasons the lower wheel plate and the synchro switch bridge have been re-shaped. This applies to both 1/300 sec. and 1/500 sec. models of the delayed action devices of the PRONTOR-SVS and PRONTOR-SLK shutters.

Delayed action device 375-G49 is no longer being manufactured and is superseded by exchangeable model 475-G49, which now becomes the standard model delayed action device for the PRONTOR shutters equipped with 1/500 sec.

The figures below are intended as a comparison of the two slow speed assemblies. They are views from below the lower wheel plates. The altered positions of the two slow speed assemblies are marked by arrows.

Fig. 26a

Slow speed assembly 375-G49

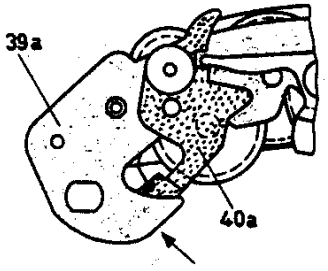


39 lower wheel plate

40 synchro switch bridge

Fig. 26b

Slow speed assembly 475-G49



39a lower wheel plate

40a synchro switch bridge (new design)

Further details are contained in Folder 1, sheet 41-51 and 62-70.

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2) When mounting the speed setting ring, the head rivet of the notch lever must be inserted into the notch slot of the setting ring (Fig. 27).

Figure 27 shows the notch lever and a section of the speed setting ring. It can be seen from the figure that the head rivet must be moved in direction A when assembling or dismantling the speed setting ring.

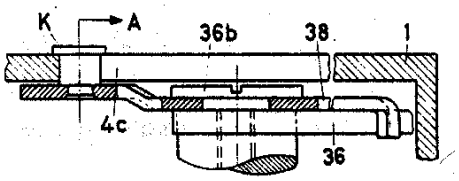

Fig. 27

1 Speed setting ring
4c Notch slot
36 Upper side wheel plate (DAD)
36b Screw of delayed action device (DAD)
38 Notch lever
38a Notch lever (new design)
K Head rivet
F Notch lever spring

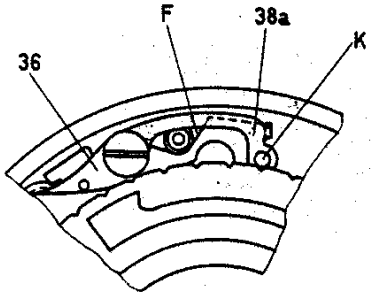

Fig. 28

3) In connection with the slow speed assembly X496-G20, and the new speed setting ring, a re-designed speed notch lever (38a) was installed.

Fig. 28 shows a section of a shutter with the new speed notch lever.

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8f Setting System for Shutter Speeds

a) It was noted in the "Slow Speed Assembly System" section that the two anchors and the engagement control lever come into rest optionally. This function control is affected by the control steps of the setting ring. The attachment of the single delays to the various exposure speeds can be understood from the chart below:

Speed sec.	Wheels slow speed ass.	Engagement control lever	Small anchor	Large anchor
1/500	without	without	without	without
1/250	with	without	without	without
1/125	with	without	without	without
1/60	with	with	without	without
1/30	with	with	without	without
1/15	with	with	with	without
1/8	with	with	with	without
1/4	with	with	without	with
1/2	with	with	without	with
1	with	with	without	with

Chart 1

Fig. 29a shows a part view of the setting ring at setting 1/8 sec. while fig. 29b demonstrates its position at setting 1/500 sec.

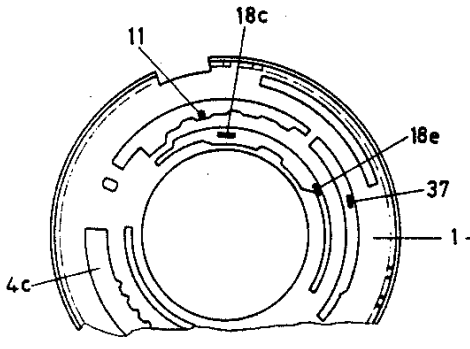

Fig. 29a

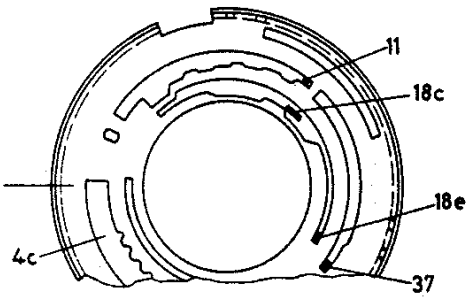

Fig. 29b

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1	Setting ring	18c	Small anchor lever
4c	Notch slot	18e	Large anchor lever
11	Stop lever rivet	37	Engagement control lever

b) The control plate (Fig. 30) synchronized with the slow speed assembly X496-G20 is shown at setting 1/15 sec.

Chart 2 shows at what speeds the anchor is engaged.

Speed sec.	Gear operated slow speed assy.	Anchor
1/500	without	without
1/250	with	without
1/125	with	without
1/60	with	without
1/30	with	without
1/15	with	with
1/8	with	with
1/4	with	with
1/2	with	with
1	with	with

Chart 2

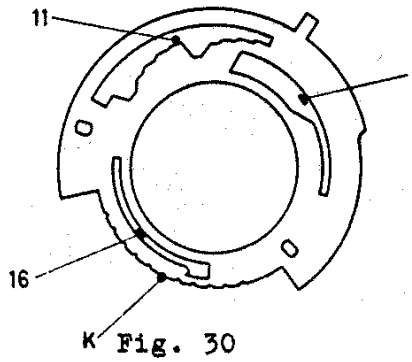

Fig. 30

11	Stop lever rivet
16	Speed lever
18c	Anchor
K	Head rivet

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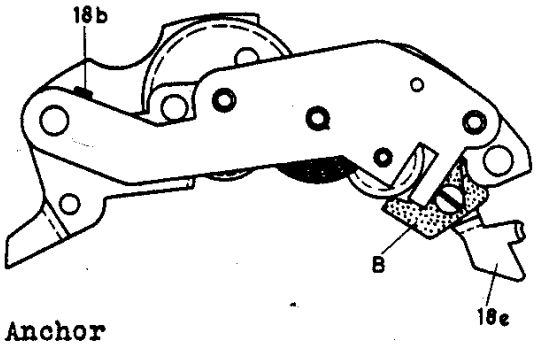
3d Slow Speed Assembly System PRONTO-LK

The PRONTO-LK shutter is provided with a slow speed assembly which is derived from adding an anchor to the slow speed assembly 555-G20. This Slow speed assembly has been assigned part No. X547-G20.

Fig. 31 shows the slow speed assembly X547-G20, whereas fig. 32 represents the speed setting ring in cooperation with the former.

Fig. 31



B Anchor
18b Control cams of the contact lever
18e Anchor lever

Reference:

The contact lever mounted in slow speed assembly X547-G20 is described on sheets 96-97 (flash contact system). The explanations contained in these sheets are also applicable to the PRONTO-LK shutter with top speed of 1/500 sec.

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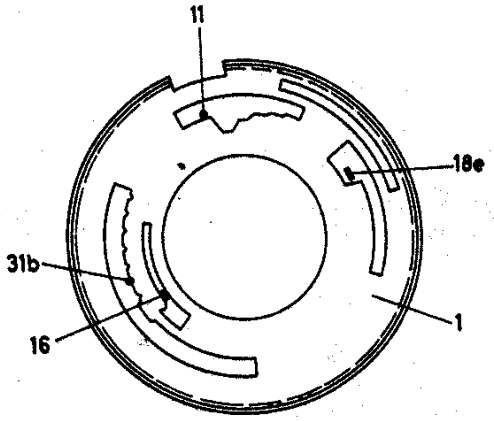
8g Setting System for Shutter Speeds PRONTO-LK

The PRONTO-LK with 1/500 sec. is equipped with a speed setting ring which, with a setting of 1/15 sec. allows the anchor to become engaged. All remaining shutter speeds are attained solely with the retarding action of the gears of the slow speed assembly.

Fig. 32 shows the speed setting ring set for 1/15 sec.

Fig. 32



1	Speed setting ring
11	Stop lever rivet
16	Projection of the speed lever
18e	Anchor lever
31b	Notch rivet

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6th Supplement

relating to GAUTHIER photographic shutters

for

interchangeable lenses

I PRONTOR - SVS
II PRONTOR - SLK

Contents:

INSTRUCTIONS FOR REPAIR SHOPS

GAUTHIER

PHOTOGRAPHIC SHUTTERS

General Introductory Remarks

a) GAUTHIER shutters for interchangeable lenses are shutters designed to accept interchangeable lenses fitted in front of the shutter blades. A special feature of this type of shutters is that when the lenses are interchanged the aperture (f/stop) setting on the shutter is in each case transferred to the newly fitted interchangeable lens.

b) Another innovation of considerable advantage is the M-X lock. Inadvertent shifting of the M-X-V lever in operating the camera is thus impossible.

c) To guarantee an absolutely light-tight closure when the lenses are interchanged, GAUTHIER photographic shutters for interchangeable lenses are provided with light-sealing shutter blades as an additional safeguard. The operation of the light-sealing shutter blades is positively controlled by the cycle of the shutter mechanism.

Note

a) Shutters for reflex cameras are dealt with in the 7th supplement of our "Instructions for Repair Shops".

b) PRONTOR-SVS and PRONTOR-SLK shutters for interchangeable lenses are also manufactured with a top speed of 1/500 sec. The instructions contained in the 5th supplement, used in their proper meaning, apply to these shutters (sheets 118 - 128).

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I PRONTOR-SVS Shutter for Interchangeable Lenses

Introductory Remarks

The design of the PRONTOR-SVS shutter for interchangeable lenses is similar to that of the PRONTOR-SVS shutter with exposure value scale.

For that reason the repairman in doing repair work on a PRONTOR-SVS shutter for interchangeable lenses may follow the instructions on sheets 55 to 90 of manual 1.

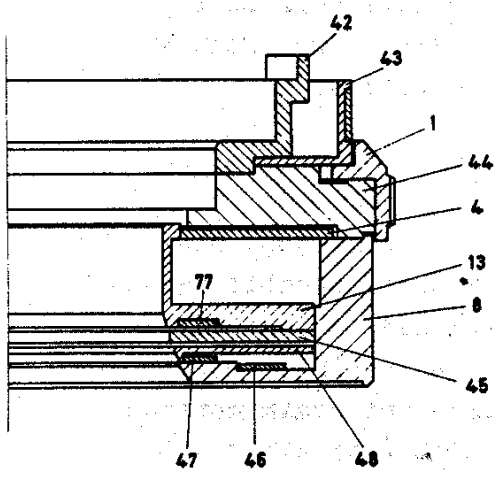
Design of the Shutter

Fig. 33 shows the shutter partly in section, so that the design of the PRONTOR-SVS shutter for interchangeable lenses can be seen. The shutter mechanism assembled on the base plate has already been described in the preceding instructions, and only deviations from the known design are again mentioned. The system of light-sealing shutter blades (see sheet 135) has been fitted on the bottom 8 of the shutter housing and secured by the base plate. A lug of the control disc 4 projects through the recess of the cover 44 to the outside. The cover is screwed to the shutter housing and the control disc is held in position by the cover.

The speed setting ring 1 is fitted to this cover and its recess accepts the lug of the control disc. Thus control disc and speed setting ring are positively locked to rotate together. The scale ring 43 is embedded in the speed setting ring. A spring-loaded detent dog of this scale ring engages the serrations provided on the speed setting ring.

Speed setting ring and scale ring are secured in position by the last mounted bayonet ring 42 that is screwed to the cover. The bayonet ring is provided with a slot to accept the coupling pin of the lens that transfers the aperture (f/stop) setting from the shutter to the lens (see Fig. 36).

Fig. 33



1 Speed setting ring 401-137
4 Control disc 401-24
8 Housing 401-U 1
13 Base plate 401-U 15
42 Bayonet ring 401-650
43 Scale ring 401-588
44 Cover 401-U 3
45 Covering disc 401-U 10
46 M-X-V ring 401-212
47 Drive ring for light-sealing shutter blades 401-U 630
48 Bearing disc for light-sealing shutter blades 401-U 635
77 Drive ring 399-U 80

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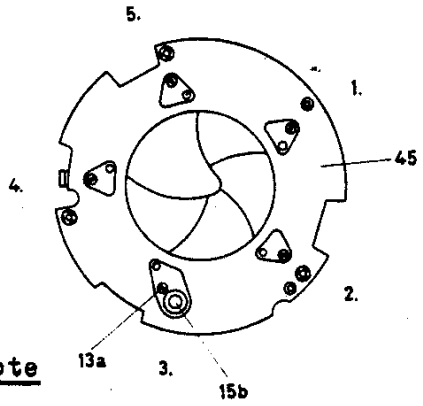
5b Shutter Blade System

When fitting the shutter blades into the shutter attention must be given to the fact that the shutter blade 401-116.1 is fitted next to the cocking lever. Fig. 34 shows the two types of shutter blades used in the PRONTOR-SVS shutter for interchangeable lenses, and Fig. 35 shows their respective position in the shutter.

Fig. 34

Fig. 35



13a Shutter blade screw 257-118
15b Cocking shaft 401-U 96
45 Covering disc 401-U 10

The numbers show the sequence in which the shutter blades are fitted into the shutter. Attention must be given to the fact that the third shutter blade is the type 401-116.1.

Note

To install the base plate into the shutter housing the repairman should place the housing in front of himself, install the base in the housing, and secure it by means of screws.

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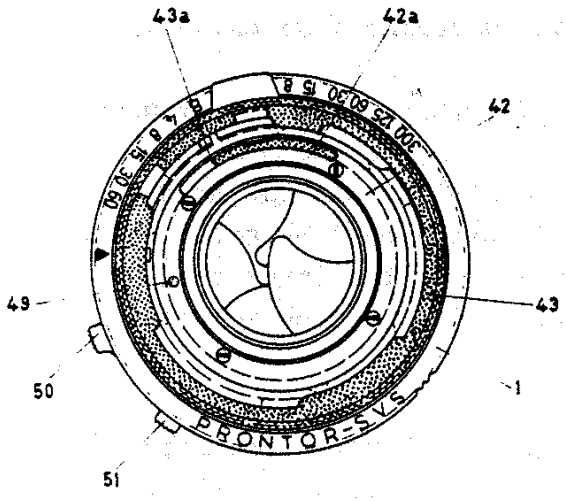
6d Diaphragm Blade System

The diaphragm blades installed in the lens are retained in the closed position by a spring and are connected with the scale ring 43 (diaphragm setting ring) by means of the coupling pin. The latter ring has been provided with a stop lug 43a that stops the motion of the coupling pin that projects through the slot 42a of the bayonet ring. A rotation of the lens assembly causes the stop lug 43a to stop the coupling pin and holds it in position, while the rotation is continued until the lens is securely locked. Thus every lens fitted into the shutter is set for the aperture (f/stop) indicated on the shutter when it is locked in the bayonet ring 42 (by rotation).

A tracing pin 49 projects from the front (Fig. 36) of the shutter. This pin transfers to the shutter the setting motion of a rangefinder control cam provided on the lens.

Fig. 36



1 Speed setting ring 401-137
42 Bayonet ring 401-650
42a Slot for coupling pin
43 Scale ring 401-588
43a Tracing pin 411-649
50 V-X-M lever
51 Locking lever
49 Diaphragm stop lug

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11 System of Light-Sealing Shutter Blades

a) **Design**

The drive ring 47 for the light-sealing shutter blades is located on the bottom of the shutter housing, and is held in position by the bearing disc 48 of the light-sealing shutter blades located on top of it. There is an intermediate lever 48a riveted to the rigidly mounted bearing disc for the light-sealing shutter blades. Arm A of this intermediate lever rests against a rivet of the drive ring for the light-sealing shutter blades, and arm B rests against the trigger release lever 17. Fig. 37 shows the position of the intermediate lever with the light-sealing shutter blades opened. For simplicity's sake the M-X-V lever, the locking key and the base plate with the shutter mechanism have been omitted in Figs. 37 and 38.

Fig. 37

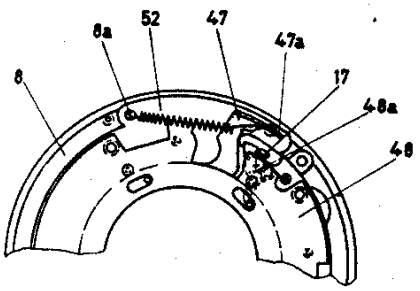
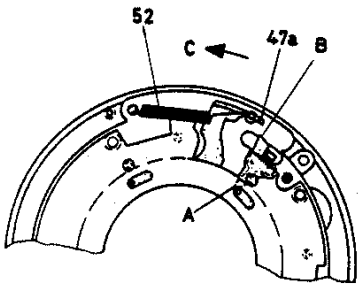


Fig. 37a



8 Shutter housing 410-U 1
17 Trigger release lever 401-U 85
47 Drive ring for light-sealing shutter blades 401-U 630
48 Bearing disc for light-sealing shutter blades 401-U 635
48a Intermediate lever
52 Spring for light-sealing shutter blade ring 401-634

The drive ring for the light-sealing shutter blades is held in the closed position (Fig.37a) by a tension spring 52 hooked on to the spring rivet 8a and on the locking lug 47a of the drive ring for the light-sealing shutter blades. While the shutter completes its cycle, the light-sealing shutter blades are held open by the locking lever that locks the drive ring of the light-sealing shutter blades. Fig. 37a shows the shutter with the light-sealing shutter blades closed.

b) Cycle of Functions

When the trigger release lever is depressed after the shutter has previously been cocked, the motion of this lever is utilized to displace the intermediate lever 48a resting against it, and to open the shutter blades by means of the drive ring for the light-sealing shutter blades being rotated. During this operation the locking lug 47a of the drive ring for the light-sealing shutter blades is positioned in front of the locking lug 53a of the bar lever, and the bar lever spring causes the locking lug to be caught in position. Thus the light-sealing shutter blades are held open. It is only after the shutter has completed its cycle when the cocking lever returns to its rest position that the light-sealing shutter blades are released and permitted to close. During this operation the bar lever is disengaged by the driving rivet 15a and the drive ring spring 52 for the light-sealing shutter blades, and the light-sealing shutter blades are closed (Fig. 38a).

Fig. 38

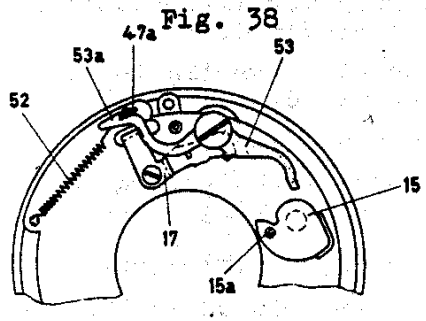


Fig. 38 shows the shutter during the release cycle. The trigger release lever is shifted to the left, the light-sealing shutter blades are opened and the bar lever arm 53a locks the drive ring for the light-sealing shutter blades.

Fig. 38a

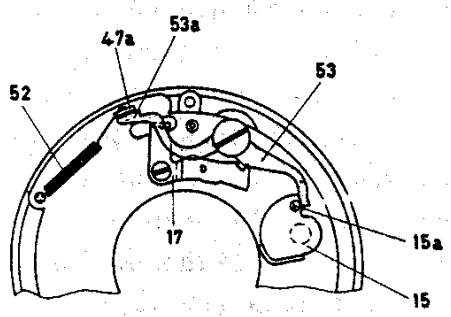


Fig. 38a on the other hand shows the shutter after the shutter mechanism has completed its cycle with the light-sealing shutter blades closed. The driving rivet 15a has displaced the locking hook 53a of the bar lever and has thus disengaged the lug 47a of the drive ring for the light-sealing shutter blades.

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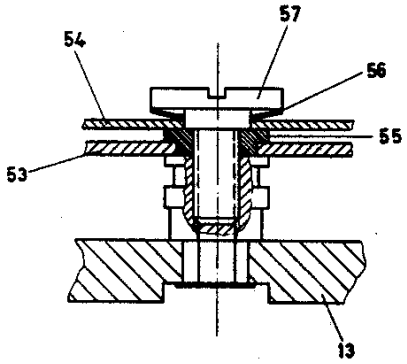
Fig. 39



13 Base plate 401-U 15
53 Bar lever 401-654
54 Cocking arm I 375-433
55 Bar lever bushing 401-655
56 Spring-loaded washer for the cocking arm 345-434
57 Cocking arm screw 381-435

Fig. 39 is a sectional view of the bar lever and the cocking arm with the shutter completely assembled.

Light-Sealing Shutter Blade System

Defect	Cause	Correction
1) Light-sealing shutter blades do not completely clear the shutter opening.	Driving lug of the driving ring for the light-sealing shutter blades is bent.	Bend lug 47a in the direction C (Fig. 37a)
2) Light-sealing shutter blades do not close completely.	Drive ring spring for the light-sealing shutter blades is unhooked.	Hook up spring 52. Press eyelet.
3) Bar lever does not become engaged, resulting that with speeds up to 1 sec the light-sealing shutter blades close immediately when the finger is taken off the trigger release lever.	a) Bar lever is bent	a) Replace bar lever
	b) Bar lever spring is not hooked up	b) Hook up the bar lever spring

II PRONTOR-SLK Shutter for Interchangeable Lenses

Introductory Remarks

The PRONTOR-SLK shutter for interchangeable lenses is manufactured as described in the 5th supplement with and without film sensitivity ring.

Necessitated by the design of the shutter, a new exposure control mechanism has been developed for the cooperation between the exposure meter and both the speed and diaphragm setting rings.

Fig. 40

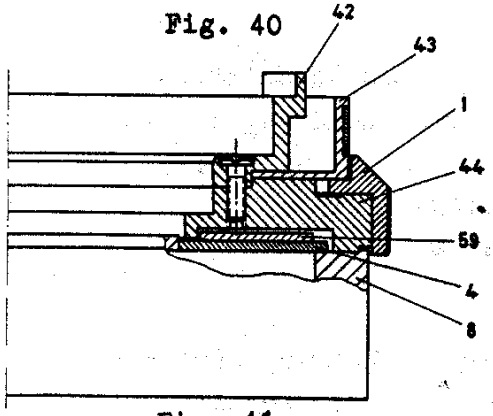
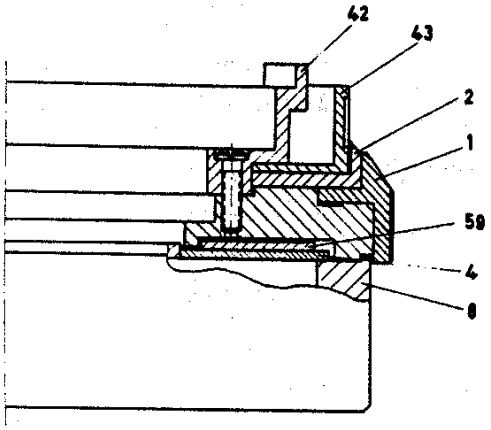


Fig. 41



The shutter mechanism is identical with that described in Section I, with the exception that the parts of the exposure control mechanism have been added.

1 Speed setting ring 411-137
2 Film sensitivity ring 411-U 722
4 Control disc 401-24
8 Shutter housing 410-U 1
42 Bayonet ring 411-650
43 Scale ring (diaphragm ring) 411-588
44 Cover 411-U 3
59 Tracing ring 410-U 715

Fig. 40 shows a sectional view of the PRONTOR-SLK shutter for interchangeable lenses. The same shutter model, however, with film sensitivity ring, is illustrated in Fig. 41. Neither drawing shows the shutter housing in section, as the shutter housing and its design have already been shown in Fig. 33.

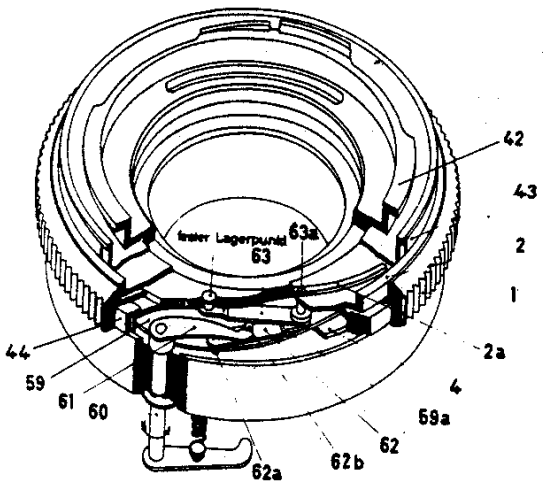
10a Exposure Control Mechanism

Design

The tracing ring 59 is fitted on a projection of the cover and connected by a pin to rotate with the control disc 4. Speed setting ring, scale ring and bayonet ring are connected and/or fitted to rotate together as described in Section I. The film sensitivity ring is positively locked with the scale ring by a spring-loaded detent dog.

Fig. 42 shows the tracing and transfer mechanism of the exposure control mechanism.

Fig. 42



1 Shutter housing 410-U 1
2 Film sensitivity ring 411-U 722
2a Control slot
4 Control disc 401-24
43 Scale ring 411-588
44 Cover 411-U 3
59 Tracing ring 410-U 715
59a Curve for control rivet I
60 Transfer shaft
61 Tracing lever
62 Compensating lever
62a Control rivet I
62b Transfer rivet
63 Control lever
63a Control rivet II

The tracing lever 61 riveted to the transfer shaft 60 that is carried in a bearing provided in the wall of the shutter housing comes to rest against the rivet 62 of the compensating lever. The control lever 63 that is riveted to the cover to pivot about its rivet is positively connected with the compensating lever.

Mode of Functioning

A rotation of the speed setting ring causes:

a) the control disc and the tracing ring locked to rotate with that disc to rotate to different relative positions, and

b) the scale ring connected with the setting ring by a spring-loaded detent dog to simultaneously rotate.

The relative setting of the exposure meter via the exposure control mechanism is only possible after previously disengaging the detent dog. Every rotation of the scale ring 43 is transferred by way of the slot 2a to the control rivet 63a; similarly every rotation of the speed setting ring 1 is transferred by way of the curve 59 of the tracing ring to the control rivet 62a. By way of the shaft 60 and the transfer arm the tracing lever 61 resting against the rivet 62b transfers every motion of the control rivets 62a and 63a to the exposure meter.

By rotating the rings 1 and 43 locked to rotate simultaneously by means of a detent dog the camera user selects a different speed-aperture combination. This does not effect the exposure meter.

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7th Supplement

relating to GAUTHIER photographic shutters

PRONTOR - REFLEX Models 412 and 413

for mirror reflex cameras

Contents:

General Introductory Remarks

The shutter mechanism of the models 412 and 413 corresponds on the whole to the design of the PRONTOR-SVS shutter with linearized settings for shutter speed and aperture described in manual 1.

The following text will deal only with deviations from the PRONTOR-SVS shutter with linearized speed and aperture settings.

Note

The model 413 is equipped with the exposure control mechanism described on sheets 139 to 140.

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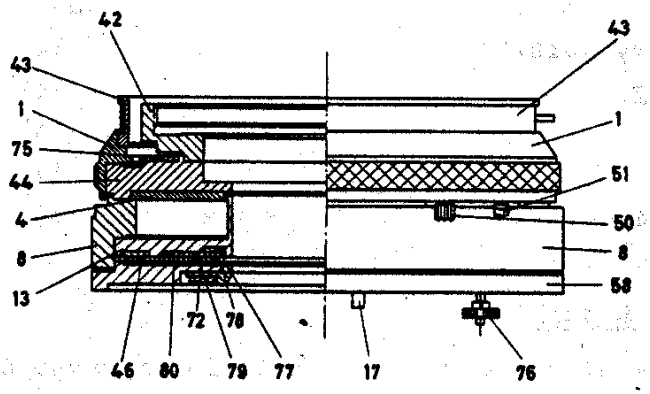
Mode of Functioning

The PRONTOR-REFLEX shutter for lenses with automatic stop-down diaphragm is a shutter without diaphragm blades, similar in design to the PRONTOR-SVS shutter for interchangeable lenses. Fig. 43 shows model 412h one half in section and the other half as general view.

Fig. 43



1 Setting ring 412-137
4 Control disc 413-24
8 Housing ring 412h-U 1
13 Base plate 412-U 15
17 Trigger release lever 412-U 85
42 Lens mounting flange 412h-650
43 Scale ring 412-U 588.1
44 Cover 412-3.1
46 Synchro switch ring 412-212
50 M-X-V lever
51 Bar spring 412-621
58 Bottom 412h-U 2.1
72 Cocking ring 412h-U 694
75 Opening ring 413-738
76 Opening pinion 412-741
77 Drive ring 412-U 80
78 Bearing ring 412h-445
79 Bearing ring for the shutter blades 413-U 685
80 Shutter blade levelling disc 412-732

The integral toothed segment of the cocking ring 72 cocks the shutter mechanism via the drive pinion mounted on the cocking shaft, while the pinion 76 of the opening shaft is in positive engagement with the toothed segment of the opening ring 75 via a gear train installed in the cover. When the shutter is cocked, cocking ring 72 and opening pinion 76 are synchronously controlled by the camera, with the result that the shutter blades and the diaphragm installed in the lens assembly are simultaneously opened by the opening ring 75. When the shutter is released, the shutter blades close completely and the diaphragm stops down to the aperture (f/stop) previously set on the shutter. The arrangement of locks that are positively controlled prevents the shutter blades from reopening until after the diaphragm has stopped down to the predetermined aperture.

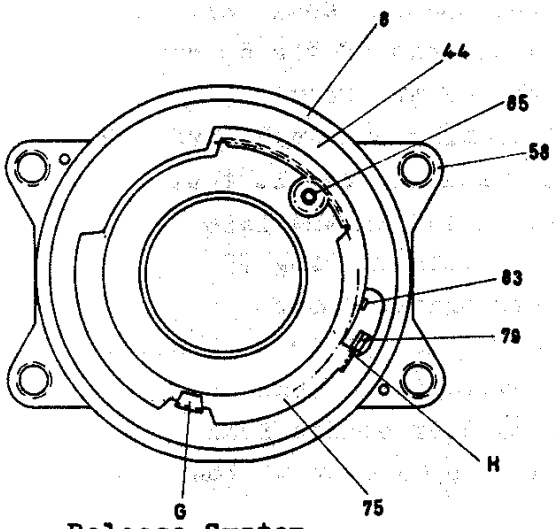
Cocking System

As can be seen in Fig. 44 the opening ring 75 is provided with a toothed segment which is positively connected with the opening shaft by way of the intermediate gear 85 and the gear train. Cocking of the shutter causes the pinion 76 of the opening shaft and the opening ring 75 in positive engagement with that pinion to simultaneously rotate.

The lug G of the opening ring 75 against which the diaphragm lever of the lens rests, opens the diaphragm and the lug H comes to rest against the bent-up lug of the shutter blade bearing ring 79 and opens the shutter blades.

The opening ring 75 is retained in this position until the camera release disengages the lock.

Fig. 44



8 Housing ring
44 Housing cover 412-3
58 Housing bottom 412h-U 2
75 Opening ring 413-738
79 Bearing ring for the shutter blades 413-U 685
83 Bar lever 413-674
85 Intermediate gear 412-269

Release System

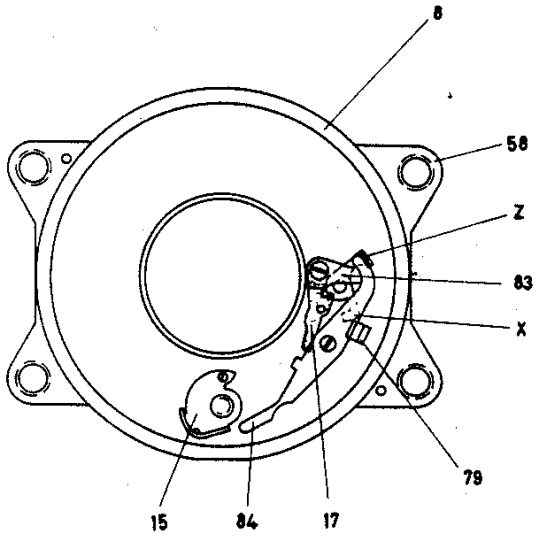
When the camera release is depressed the opening ring 75 is released and returned to its rest position by the spring action of the bearing ring spring for the shutter blades and the diaphragm stop-down spring of the diaphragm incorporated in the lens assembly. During this operation the shutter blades close completely and the diaphragm stops down to the aperture value previously set on the shutter. The integral stop lug of the scale ring 43 stops the diaphragm lever of the lens assembly.

The bar lever 83 is displaced by the trigger release lever 17 resting against it, and its arm X locks the shutter blade bearing ring. To hold the shutter blade bearing ring in its

position, while the shutter completes its cycle, the lug Z of the bar lever 83 bent-up at a right angle to the drawing plane remains locked until the shutter has completed its cycle and the cocking lever has returned to its resting position.

For manufacturing reason the locking system has been changed. The retaining lever 84 has been omitted and an integral curve of the opening ring 75, against which the bar lever 83 rests, locks the shutter blade bearing ring 79 while the shutter completes its cycle.

Fig. 45



8 Housing ring 412-U 1
15 Cocking lever 412-U 96
17 Trigger release lever 412-U 85
58 Bottom 412-U 2
79 Shutter blade bearing ring 413-U 685
83 Bar lever 412-674
84 Retaining lever 412-654

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Shutter Blade System

A sixth shutter blade, the cover blade, has been added to the five shutter blades used up to now. Its function is to hold the shutter blades tight together and prevent them from bending, when the camera is not handled with due care.

Fitting the Shutter Blades

The shutter blades are fitted in the customary sequence (see drawing of the drive ring 80 in the spare parts list), and the cover blade is fitted as the last one on top of the shutter blade first mounted.